

# 2004 Conference Program



**October 16 - 22, 2004  
Rome - Italy**

**Nuclear Science Symposium**

**Medical Imaging Conference**

**Symposium on Nuclear Power Systems**

**14th International Workshop on  
Room-Temperature Semiconductor  
X-Ray and Gamma-Ray Detectors**

**Special Focus Workshops**

Ergife Palace Hotel

<http://www.nss-mic.org/2004>



**ROME 2004, Italy**

**NSS - MIC Conference • October 16-22, 2004**



**IEEE**



**IEEE**

**ROME 2004**

**NSS - MIC - SNPS and RTSD**

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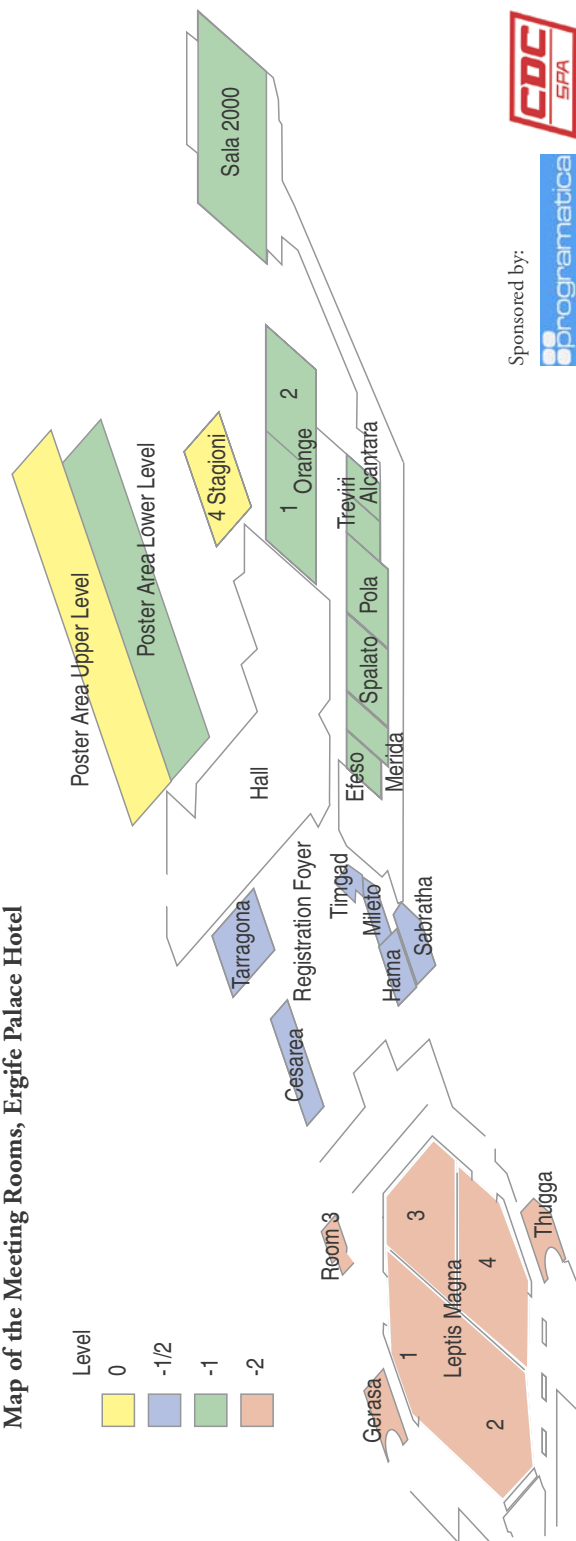
**Italy**



**Rome, Italy**

**October, 16 - 22, 2004**

Map of the Meeting Rooms, Ergife Palace Hotel



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## WELCOME FROM THE GENERAL CHAIR

Dear Colleagues and Friends,

It's Europe, again. And this time it's Italy!

The Nuclear Science Symposium, Medical Imaging Conference, Symposium on Nuclear Power Systems and the 14th International Workshop on Room Temperature Semiconductor X- and Gamma-Ray Detectors will be held for the first time in Italy, in the prestigious city of Rome, on October 16-22, 2004. This conference represents a unique appointment for scientists and engineers from all over the world to participate and present their original works in a variety of subjects related to nuclear science and medical imaging. The Nuclear Science Symposium offers an outstanding opportunity for scientists and engineers interested or actively working in the field of nuclear science, radiation instrumentation, software and their applications. The Medical Imaging Conference is the most productive international scientific meeting on the physics, engineering, and mathematical aspects of nuclear medicine based imaging. The Symposium on Nuclear Power Systems (SNPS) will again be held in conjunction with the Nuclear Science Symposium. The RTSD workshop represents the largest forum of scientists and engineers working to develop new solid-state radiation detectors and imaging arrays. This year two Special Focus Workshops on "Sensing, Control and Readout of Gravitational Wave Detectors" and on "Synchrotron Radiation Detectors" will be also held, together with the "2004 Workshop on Nuclear Radiology of Breast Cancer". We have received an extraordinary amount of submissions: about 1600 abstracts, without counting those submitted to the workshops. This number sets an all-times record for the Conference.

An outstanding scientific program has been laid down by the chairs of the various tracks with the help of more than 400 reviewers. In addition a very interesting "Short Courses" program on NSS and MIC related topics has been organized.

The venue of the conference is the Ergife Palace Hotel, one of the largest exhibition and congress areas in Europe. Its complex is unique, combining one of the largest hotels in Italy with one of the most extensive exhibition facilities in Europe on the same site.

I look forward to meeting you in the splendid city of Rome and wish you a pleasant and fruitful stay.

Alberto Del Guerra  
General Chair



## PROGRAM OUTLINE

### Saturday, October 16

|               |                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------|
| 08:00 – 18:00 | REGISTRATION OPEN, Galleria Expo                                                                    |
| 08:30 – 18:00 | NSS-SHORT COURSE 1: Radiation Detection and Measurement, Tarragona Room                             |
| 08:30 – 12:30 | NSS-SHORT COURSE 2: Detectors for Astroparticle and Synchrotron Radiation Experiments, Cesarea Room |
| 14:00 – 18:00 | NSS-SHORT COURSE 3: Semiconductor Strip, Pixel and Voxel Arrays, Cesarea Room                       |

### Sunday, October 17

|               |                                                         |
|---------------|---------------------------------------------------------|
| 08:00 – 18:00 | REGISTRATION OPEN, Galleria Expo                        |
| 08:30 – 18:00 | NSS-SHORT COURSE 4: GEANT4, Tarragona Room              |
| 14:00 – 17:00 | COMPANION PROGRAM TOUR 1: Rome seen from its Belvederes |

### Monday, October 18

|               |                                                                                   |
|---------------|-----------------------------------------------------------------------------------|
| 08:00 – 18:00 | REGISTRATION OPEN, Galleria Expo                                                  |
| 08:30 – 10:00 | GO: GRAND OPENING SESSION, Leptis Magna 1&2                                       |
| 08:30 – 18:00 | MIC-SHORT COURSE 5: Detectors for SPECT and PET, Cesarea Room                     |
| 08:30 – 12:00 | MIC-SHORT COURSE 6: Biomedical Applications of Particle Detectors, Tarragona Room |
| 09:00 – 12:30 | COMPANION PROGRAM TOUR 2: The glories of baroque Rome                             |
| 10:30 – 12:00 | NP: NSS PLENARY SESSION, Leptis Magna 1&2                                         |
| 12:00 – 14:00 | NSS Luncheon, Le Quattro Stagioni                                                 |
| 14:00 – 15:30 | NSS-N1: High Energy Physics Detectors I: Tracking, Leptis Magna 1&2               |
| 14:00 – 15:30 | NSS-N2: New Radiation Detectors I, Leptis Magna 4                                 |
| 14:00 – 15:30 | NSS-N3: Analog and Digital Circuits I, Leptis Magna 3                             |
| 14:00 – 15:30 | NSS-N4: Astrophysics and Space Instrumentation: Ground Based, Orange 2            |
| 14:00 – 15:30 | NSS-N5: Trigger and Front End Systems I, Spalato                                  |
| 14:00 – 15:30 | RTSD-R1: Opening and Overview, Orange 1                                           |
| 14:00 – 18:00 | MIC-SHORT COURSE 7: Optical Imaging, Tarragona Room                               |
| 16:00 – 18:00 | NSS-N6: High Energy Physics Detectors II: Calorimeters, Leptis Magna 1&2          |
| 16:00 – 18:00 | NSS-N7: Scintillation Detectors I, Leptis Magna 4                                 |
| 16:00 – 18:00 | NSS-N8: Analog and Digital Circuits II, Leptis Magna 3                            |
| 16:00 – 18:00 | NSS-N9: Astrophysics and Space Instrumentation: Satellite Based I, Orange 2       |
| 16:00 – 18:00 | NSS-N10: Nuclear Monitoring for Safeguards and Security, Spalato                  |
| 16:00 – 18:00 | RTSD-R2: CZT and CdTe Growth and Characterization I, Orange 1                     |
| 19:00 – 21:00 | Welcome Cocktail                                                                  |



## Tuesday, October 19

|               |                                                                                  |
|---------------|----------------------------------------------------------------------------------|
| 08:00 – 18:00 | REGISTRATION OPEN, Galleria Expo                                                 |
| 08:30 – 12:30 | MIC-SHORT COURSE 8: Statistical Methods for Image Reconstruction, Cesarea Room   |
| 08:30 – 10:30 | NSS-N11: High Energy Physics Detectors III: Muons, Leptis Magna 1&2              |
| 08:30 – 10:30 | NSS-N12: Scintillation Detectors II, Leptis Magna 4                              |
| 08:30 – 10:30 | NSS-N13: Data Acquisition and Analysis Systems I, Leptis Magna 3                 |
| 08:30 – 10:30 | NSS-N14: Astrophysics and Space Instrumentation: Satellite Based II, Orange 2    |
| 08:30 – 10:30 | NSS-N15: Nuclear Monitoring: Detectors and Assessments, Spalato                  |
| 08:30 – 10:30 | RTSD-R3: Other Semiconductor Materials for Detectors, Orange 1                   |
| 09:00 – 18:00 | INDUSTRIAL PROGRAM - Exhibition (Sala 2000), Technical Seminars (Treviri Room)   |
| 09:00 – 16:30 | COMPANION PROGRAM TOUR 3: Ostia antica                                           |
| 11:00 – 12:30 | RTSD-R4: Scintillator and Semiconductor Devices, Orange 1                        |
| 11:00 – 12:30 | NSS-N16: NSS Poster I, Poster Area Upper Level                                   |
| 14:00 – 15:30 | JNM1: NSS-MIC Joint Session I, Leptis Magna 1&2                                  |
| 14:00 – 15:30 | NSS-N17: Gaseous Detectors I, Leptis Magna 4                                     |
| 14:00 – 15:30 | NSS-N18: Analog and Digital Circuits III, Leptis Magna 3                         |
| 14:00 – 15:30 | NSS-N19 Scintillation Detectors III, Orange 2                                    |
| 14:00 – 15:30 | NSS-N20: New Radiation Detectors II, Spalato                                     |
| 14:00 – 15:30 | RTSD-R5: Systems for Safeguards, Monitoring and International Security, Orange 1 |
| 16:00 – 18:00 | JNM2: NSS-MIC Joint Session II, Leptis Magna 1&2                                 |
| 16:00 – 18:00 | NSS-N21: High Energy Physics Detectors IV: General, Leptis Magna 4               |
| 16:00 – 18:00 | NSS-N22: Trigger and Front-End Systems II, Leptis Magna 3                        |
| 16:00 – 18:00 | NSS-N23: Solid State Tracking Detectors I, Orange 2                              |
| 16:00 – 18:00 | NSS-N24: Nuclear Physics Instrumentation, Spalato                                |
| 16:00 – 18:00 | RTSD-R6: CZT and CdTe Growth and Characterization II, Orange 1                   |
| 19:00 – 22:00 | Exhibitors Reception                                                             |

## Wednesday, October 20

|               |                                                             |
|---------------|-------------------------------------------------------------|
| 08:00 – 18:00 | REGISTRATION OPEN, Galleria Expo                            |
| 08:30 – 10:30 | MIC-M1: OPENING, Leptis Magna 1&2                           |
| 08:30 – 10:30 | NSS-N25: Gaseous Detectors II, Leptis Magna 4               |
| 08:30 – 10:30 | NSS-N26: Solid State Tracking Detectors II, Leptis Magna 3  |
| 08:30 – 10:30 | NSS-N27: Data Acquisition and Analysis Systems II, Orange 2 |
| 08:30 – 10:30 | NSS-N28: New Solid State Detectors I, Spalato               |
| 08:30 – 10:30 | RTSD-R7: HgI <sub>2</sub> and Other Materials, Orange 1     |
| 09:00 – 12:00 | COMPANION PROGRAM TOUR 4: Imperial Rome                     |

|               |                                                                                |
|---------------|--------------------------------------------------------------------------------|
| 09:00 – 18:00 | INDUSTRIAL PROGRAM - Exhibition (Sala 2000), Technical Seminars (Treviri Room) |
| 11:00 – 12:30 | NSS-N29: Gaseous Detectors III, Leptis Magna 4                                 |
| 11:00 – 12:30 | NSS-N30: Photodetectors and Radiation Imaging I, Leptis Magna 3                |
| 11:00 – 12:30 | NSS-N31: Data Acquisition and Analysis Systems III, Orange 2                   |
| 11:00 – 12:30 | NSS-N32: New Solid State Detectors II, Spalato                                 |
| 11:00 – 12:30 | RTSD-R8: Detector/ASIC Hybridization and Interconnects, Orange 1               |
| 11:00 – 12:30 | MIC-M2: MIC Poster I, Poster Area Upper & Lower Level                          |
| 14:00 – 15:30 | NSS-N33: NSS Poster II, Poster Area Upper Level                                |
| 14:00 – 15:40 | JRM1: MIC-RTSD Joint Session, Leptis Magna 1&2                                 |
| 16:00 – 17:30 | RTSD-R9: Detector Arrays, Orange 1                                             |
| 16:00 – 18:00 | MIC-M3: Advances in PET and SPECT, Leptis Magna 1&2                            |
| 16:00 – 18:00 | NSS-N34: Gaseous Detectors IV, Leptis Magna 4                                  |
| 16:00 – 18:00 | NSS-N35: Photodetectors and Radiation Imaging II, Leptis Magna 3               |
| 16:00 – 18:00 | NSS-N36: Trigger and Front-End Systems III, Orange 2                           |
| 16:00 – 18:00 | NSS-N37: Radiation Damage Effects I – Solid State, Spalato                     |
| 19:00 – 23:00 | Conference Reception, Villa Miani                                              |

## Thursday, October 21

|               |                                                                                   |
|---------------|-----------------------------------------------------------------------------------|
| 08:00 – 18:00 | REGISTRATION OPEN, Galleria Expo                                                  |
| 08:30 – 10:30 | MIC-M4: Image Reconstruction, Leptis Magna 1&2                                    |
| 08:30 – 10:30 | NSS-N38: Computing and Software for HEP Experiments, Leptis Magna 4               |
| 08:30 – 10:30 | NSS-N39: Radiation Damage Effects II – Aging of Gaseous Detectors, Leptis Magna 3 |
| 08:30 – 10:30 | GW1: General Talks, Orange 2                                                      |
| 08:30 – 10:30 | RTSD-R10: Space Applications, Orange 1                                            |
| 09:00 – 11:30 | SNPS-P1: Nuclear Plant Modernization I, Spalato                                   |
| 09:00 – 16:00 | INDUSTRIAL PROGRAM - Exhibition (Sala 2000), Technical Seminars (Treviri Room)    |
| 09:00 – 16:30 | COMPANION PROGRAM TOUR 5: Tivoli and Stately Homes                                |
| 11:00 – 12:30 | NSS-N40: Software Enabling Technologies, Leptis Magna 4                           |
| 11:00 – 12:30 | NSS-N41: Photodetectors and Radiation Imaging III, Leptis Magna 3                 |
| 11:00 – 12:30 | GW2: Feedback Lock Acquisition, Orange 2                                          |
| 11:00 – 12:30 | RTSD-R11: RTSD Poster, Pola                                                       |
| 11:00 – 12:30 | MIC-M5: MIC Poster II, Poster Area Upper & Lower Level                            |
| 11:30 – 12:30 | SNPS-P2: Nuclear Plant Modernization II, Spalato                                  |
| 12:30 – 14:00 | RTSD Luncheon, Le Quattro Stagioni                                                |
| 14:00 – 15:30 | MIC-M6: Multimodality Imaging, Leptis Magna 1&2                                   |
| 14:00 – 15:30 | NSS-N42: Software for Bio-Medical Applications, Leptis Magna 4                    |

|               |                                                                                 |
|---------------|---------------------------------------------------------------------------------|
| 14:00 – 15:30 | NSS-N43: Instrumentation for Medical and Biological Research I, Leptis Magna 3  |
| 14:00 – 15:30 | GW3: Interferometer Suspensions, Orange 2                                       |
| 14:30 – 15:30 | RTSD-R12: Semiconductor Neutron Detectors, Orange 1                             |
| 14:30 – 15:30 | SNPS-P3: Nuclear Plant Modernization III, Spalato                               |
| 16:00 – 18:00 | MIC-M7: X-Ray Imaging, Leptis Magna 1&2                                         |
| 16:00 – 18:00 | NSS-N44: Software for Space Science and Detectors, Leptis Magna 4               |
| 16:00 – 18:00 | NSS-N45: Instrumentation for Medical and Biological Research II, Leptis Magna 3 |
| 16:00 – 18:00 | NSS-N46: Beam-line Instrumentation, Spalato                                     |
| 16:00 – 18:00 | GW4: Future Prospects for GW Interferometric Detectors, Orange 2                |
| 16:00 – 18:00 | RTSD-R13: CZT Devices Performance Improvements, Orange 1                        |
| 20:00 – 23:00 | MIC Dinner, Le Quattro Stagioni                                                 |

### Friday, October 22

|               |                                                                                       |
|---------------|---------------------------------------------------------------------------------------|
| 08:00 – 18:00 | REGISTRATION OPEN, Galleria Expo                                                      |
| 08:30 – 10:30 | MIC-M8: High Resolution and Animal Imaging, Leptis Magna 1&2                          |
| 08:30 – 10:30 | SR1: Session I, Leptis Magna 3                                                        |
| 08:30 – 18:00 | SR5: Poster, Leptis Magna 3                                                           |
| 09:00 – 12:30 | COMPANION PROGRAM TOUR 6: Vatican Museums                                             |
| 11:00 – 12:30 | MIC-M9: MIC Poster III, Poster Area Upper & Lower Level                               |
| 11:00 – 12:30 | SR2: Session II, Leptis Magna 3                                                       |
| 14:00 – 15:30 | MIC-M10: MIC Poster IV, Poster Area Upper & Lower Level                               |
| 11:00 – 12:30 | SR3: Session III, Leptis Magna 3                                                      |
| 13:45 – 16:30 | NRBC1: Breast Cancer Oncology, Biology, and Radiology Background, Orange 1            |
| 16:00 – 18:00 | SR4: Session IV, Leptis Magna 3                                                       |
| 16:00 – 18:15 | MIC-M11: Modelling and Quantitative Processing, Leptis Magna 1&2                      |
| 16:30 – 19:30 | NRBC2: Clinical Nuclear Medicine Imaging in the Management of Breast Cancer, Orange 1 |

### Saturday, October 23

|               |                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------|
| 08:30 – 12:30 | NRBC3: Research Radionuclide Imaging Systems Dedicated to Breast Cancer, Orange 1               |
| 10:35 – 12:30 | NRBC Poster Session and Funding Agency Displays, Orange 2                                       |
| 15:00 – 17:30 | NRBC4: Commercially Available Radionuclide Imaging Systems Dedicated to Breast Cancer, Orange 1 |

## CONTACT INFORMATION

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Studio EGA has been selected as the professional congress organizer that takes care of the registration and accommodation. Pre-registration is highly recommended to save both time and money. A number of methods are available to allow everyone to register early. Pre-registration ensures that your registration packet will be ready for you when you arrive at the conference. You may pre-register using the registration form contained within this booklet, or electronically through the conference website. Electronic registration is highly recommended, as it places your registration information directly into our database. When you register electronically, you may pay by credit card (VISA, MasterCard, CartaSi, Diners) through the secure web server. You may also mail a check or money order, made payable to Studio EGA - IEEE 2004. Checks or money orders must be drawn in Euro. Completed registration forms may also be mailed or faxed to Studio EGA with the appropriate form of payment. Additional copies of the registration may be downloaded from the Registration link on the main conference website.



Conference Coordinator

Lucia Lilli

There is *only one registration form* that includes registration to the Conference, to the Short Courses, Lunch and Dinner Program, Social Events, Tour and Companion Program and Hotel Accommodation. Once the registration has been processed you will receive the vouchers for all the events you have requested. Once you have submitted your registration form, modifications will require contacting the professional agency directly.

Registration and payment must be received by September 25, 2004 in order to qualify for the lower registration, short courses, lunch/dinner and tours fees.

For the electronic registration, connect to the conference website at <http://nss-mic-rtsd-2004.df.unipi.it/>, click on the Registration link and follow the instructions.

For registration by mail or fax, send all registration information and payments (made payable to Studio EGA - IEEE 2004) to:

Studio EGA Professional Congress Organizers  
Viale Tiziano, 19  
I-00196 Rome  
Italy  
Fax: (+39) 06 324 01 43  
Tel: (+39) 06 32 81 21  
(Attn: IEEE 2004 NSS/MIC)

An acknowledgement will be sent upon receipt of your registration and payment. Questions regarding registration may be sent via email to [ieee2004@ega.it](mailto:ieee2004@ega.it) (Attn: IEEE 2004 NSS/MIC), or by calling Studio EGA.

## Registration Hours at the Conference

Registration and general information will be available from Saturday, October 16 to Friday, October 22 at the IEEE Registration Desk located in the Galleria Expo Hall of the Ergife Palace Hotel. The daily opening hours are: 08:00 – 18:30.

## Conference Registration Fees

|                                                                                  | by Sept. 25 | on-site  |
|----------------------------------------------------------------------------------|-------------|----------|
| IEEE Member <sup>1</sup>                                                         | € 498,00    | € 608,00 |
| Non-IEEE Member                                                                  | € 598,00    | € 708,00 |
| IEEE Student <sup>1,2</sup>                                                      | € 175,00    | € 225,00 |
| Non-IEEE Student <sup>2</sup>                                                    | € 275,00    | € 325,00 |
| Retired/Unemployed (IEEE only)                                                   | € 175,00    | € 225,00 |
| One day Workshop only <sup>3</sup> :                                             |             |          |
| - Sensing, Control & Readout of Gravitational Wave Detectors (Thursday, 21 Oct.) | € 120,00    | € 170,00 |
| - Synchrotron Radiation Detectors (Friday, 22 Oct.)                              | € 120,00    | € 170,00 |
| One day only (available only on-site)                                            | –           | € 170,00 |

Please note that the 2004 Workshop on Nuclear Radiology of Breast Cancer (on Friday Oct. 22 and Saturday Oct. 23, 2004) has a separate registration form to be filled by August 15, 2004 (accessible only through the web page of the conference: <http://nss-mic-rtsd-2004.df.unipi.it/>)

<sup>1</sup> IEEE member number required at registration.

<sup>2</sup> Proof of student status required (registration form must be accompanied by a student ID and verification letter from a senior departmental staff member). The appropriate documentation must be attached to the registration form.

<sup>3</sup> Valid for 1 Workshop only – if more than 1 day, full registration is required.

## Short Courses Registration Fees

### NSS Courses

| Date                  | Course Name                                                     | Cost*    |
|-----------------------|-----------------------------------------------------------------|----------|
| Sat., Oct. 16 (1 day) | Radiation Detection and Measurement                             | € 300,00 |
| Sat., Oct. 16 (½ day) | Detectors for Astroparticle & Synchrotron Radiation Experiments | € 150,00 |
| Sat., Oct. 16 (½ day) | Semiconductor Strip, Pixel and Voxel Arrays                     | € 220,00 |
| Sun., Oct. 17 (1 day) | GEANT <sup>4</sup>                                              | € 250,00 |

### MIC Courses

| Date                  | Course Name                 | Cost*    |
|-----------------------|-----------------------------|----------|
| Mon., Oct. 18 (1 day) | Detectors for SPECT and PET | € 250,00 |

|                        |                                               |          |
|------------------------|-----------------------------------------------|----------|
| Mon., Oct. 18 (½ day)  | Biomedical Applications of Particle Detectors | € 150,00 |
| Mon., Oct. 18 (½ day)  | Optical Imaging                               | € 150,00 |
| Tues., Oct. 19 (½ day) | Statistical Methods for Image Reconstruction  | € 150,00 |

Please note:

- IEEE members qualify for a € 50 discount per course.
- Attendees may register for short courses only or can register for courses in addition to the Conference.
- Course fees are valid for registration received by September 25, 2004.
- Add € 50,00 per course for on-site registration. Lunch is provided at all full-day courses. Coffee break is provided at all courses.

## Lunch & Dinner Fees

Lunches are NOT included in the conference registration fees, but can be purchased (please refer to the relevant section in the registration form). Although there are few restaurants in the area, we suggest you to have lunch at the Hotel, so as to fully participate in the conference scientific activities. A reasonable price for the lunches has been negotiated with the Hotel. The NSS Luncheon, the RTSD Luncheon and the MIC Dinner have limited seating and are expected to sell out before September 25. Early registration is strongly encouraged. Reservations for the Packet Lunch, which includes the NSS Luncheon, the RTSD Luncheon and 3 Buffet Lunches at a special discounted rate, will not be available on-site.

| <i>All rates are inclusive of VAT</i>   | by Sept. 25 | on-site |
|-----------------------------------------|-------------|---------|
| NSS Luncheon (Monday, October 18)       | € 30,00     | € 35,00 |
| Buffet Lunch (Tuesday, October 19)      | € 18,00     | € 22,00 |
| Buffet Lunch (Wednesday, October 20)    | € 18,00     | € 22,00 |
| RTSD Luncheon (Thursday, October 21)    | € 30,00     | € 35,00 |
| Buffet Lunch (Friday, October 22)       | € 18,00     | € 22,00 |
| Packet Lunch (all 5 lunches Mon.– Fri.) | € 90,00     | NA      |
| MIC Dinner (Thursday, October 21)       | € 40,00     | € 45,00 |

## Social Events

The organizing committee is happy to offer an entertaining social events program to all attendees and their companions.

|                                                    |                               |                                                    |
|----------------------------------------------------|-------------------------------|----------------------------------------------------|
| <b>Welcome Cocktail</b><br>Ergife Palace Hotel     | Monday, October 18, at 19:00  | Free for conference attendees and their companions |
| <b>Exhibitors Reception</b><br>Ergife Palace Hotel | Tuesday, October 19, at 19:00 | Free for conference attendees and their companions |

|                                                                                                                  |                                 |                                                                           |
|------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------|
| <b>Conference Dinner</b><br>Villa Miani<br><br>(transportation from/to the Ergife Palace Hotel will be provided) | Wednesday, October 20, at 19:00 | Free for conference attendees<br><br>(Payment is required for companions) |
|------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------|

Additionally the accompanying persons can participate in the Grand Opening on Monday October 18 (8:30-10:00) in Leptis Magna. However, they are not allowed either to attend the Scientific Sessions or to visit the Industrial Exhibition.

### Hotel Accommodation

There is *only one registration form* that comprises registration to the Conference, to the Short Courses, Lunch and Dinner Program, Social Events, Tour and Companion Program and Hotel Accommodation.

In order to book Hotel Accommodation you have to register for the Conference. Hotel accommodation for attendees and companions is provided at Ergife Palace Hotel.

Rates are in €, per room, per night, inclusive of breakfast and 10% VAT.

The total amount for the full length of your stay needs to be paid in advance.

|                               |          |
|-------------------------------|----------|
| Double Room, Single Occupancy | € 128,00 |
| Double Room, Double Occupancy | € 149,00 |

### Cancellation & Refund Policy

#### Registrations

Refunds (less administration fee of 10%) will be granted to registered persons unable to attend, provided written notice is received by Studio EGA before October 12, 2004.

No refunds will be made for cancellations received after October 12, 2004. Please note that all refunds will be handled after the Conference.

#### Lunch & Dinner Programs & Social Events

Full refund will be given for cancellations, provided written notice is received by Studio EGA before October 12, 2004.

No refunds will be made for cancellations received after October 12, 2004. Please note that all refunds will be handled after the Conference.

#### Hotel Accommodation

Any cancellation must be provided in writing to Studio EGA. Cancellations are liable for the following refunds and penalties if received by Studio EGA:

- before October 12, 2004                      one-night penalty fee
- after October 12, and in case of no-show      no refund

## GENERAL INFORMATION

### IEEE Membership

An IEEE membership desk will be located in Galleria Expo near the Registration Desk. Vernon Price, IEEE Membership Chairman, will be available to answer questions and explain the benefits of IEEE membership. A portion of your non-member conference registration fee (€ 41) will be deducted from your new IEEE membership (not applicable to student memberships). By joining IEEE during the conference, you will also receive one year's free membership in the Nuclear Plasma Sciences Society, and also a subscription to either the Transactions on Nuclear Science or Transactions on Medical Imaging. Students may join at the conference and the membership fee will be covered if the students provide a statement from their professor that they are full-time students. They should be encouraged to join IEEE and NPSS over the web prior to coming to the conference. If they do, they can qualify for the reduced student rate.

### Message Board

A message board will be located in the Galleria Expo near the Registration Desk for posting messages and notifications.

### Speaker's Preparation Room

Please note that only digital material will be allowed for oral presentations at 2004 IEEE NSS/MIC/SNPS and RTSD Conference.

Please bring your presentation on a CD, a floppy disk or a USB flash drive. All presentations will be loaded onto a central server, thus avoiding delays in switching laptops prior to each presentation. It is mandatory that the data carriers are delivered to the computer room Hama four hours before the starting of the session at the latest. The conference will provide networked computers in each meeting room. Own laptops/notebooks are not allowed for presentations.

The Efeso Room has been designated for speakers to practice their presentations. The presentations can be in Microsoft PowerPoint PPT or in Adobe PDF format. Both Macintosh and Windows OS are supported. The software available in the computer room is Microsoft PowerPoint 2003, Adobe Acrobat Reader 6.2, the latest version of Microsoft Media Player, the latest version of Apple QuickTime Player.

The Efeso and Hama rooms will be open Monday (October 18) at 08:00, and close on Friday (October 22) at 17:00. The daily hours are from 08:00 to 20:00 unless otherwise stated. Please communicate any special request in advance to the program chairs.

### Computer Availability

We are planning to provide a complete computer facility including Internet access at the conference. A staff of very experienced personnel will be at hand to assist all attendees with the use of the computers and equipment in the facility. The facility will consist primarily of PC platforms, several printers, and additional stations allowing laptop



Internet connections both wired and wireless. The facility is intended for use by all attendees to perform last minute editing of papers and presentation material and to retrieve email from parent organizations. Standard word processing, spreadsheet, and presentation software will be available. Though these machines will be publicly available, you will not be able to receive messages. Located in Hama Room, Sabratha Room, Thugga Room and Gerasa Room, the computer rooms will be open Monday (October 18) at 08:00 and close on Friday (October 22) at 17:00. The daily hours will be 08:00 to 20:00 unless otherwise stated. In addition, a wireless connection will be available in the exhibitors area on Tuesday 19, Wednesday 20, and Thursday 21 October, during the opening hours of the exhibition.

### Web Site

Information for up-to-date conference program (NSS, MIC, RTSD, SNPS, Special Focus Workshops and NRBC Workshop), short courses, and tours can be found at: <http://nss-mic-rtsd-2004.df.unipi.it/>.

### Conference Shuttle Service

Free continuous shuttle bus service between Ergife Palace Hotel and the underground (metro) stop "Cornelia" will be provided during the conference days Saturday (October 16) through Friday (October 22) from 07:30 to 19:30 every 20 minutes.

### Parking

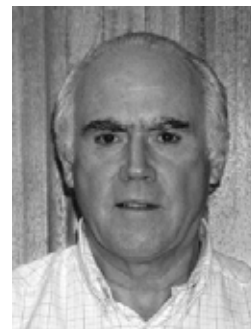
Parking at Ergife Palace Hotel is available at 3 € per day.

### Smoking Policy

The conference site has adopted a strict no-smoking policy.

## INDUSTRIAL PROGRAM

The IEEE NSS/MIC/SNPS and RTSD Industrial Program provides our conference attendees with ample opportunities to meet the different exhibitors on Tuesday 19, Wednesday 20 and Thursday 21 October. More than 50 companies from all around the world will be present to meet conference attendees and to demonstrate their latest products. These represent the state-of-the-art in detectors, pulse processing instrumentation, imaging, software, and other associated areas. The exhibition area is located in Sala 2000.



Industrial Program Chair  
**Chris Parkman**

The three-day exhibition is complemented by a series of seminars and technical presentations in the Treviri room which will allow an in-depth exchange of information between attendees and exhibitors on existing products, future developments and needs.

The morning and afternoon coffee breaks will be held in the exhibit area. On Tuesday evening from 19:00 to 22:00, the exhibiting companies will be hosting the Exhibitor Reception.

A prize draw will be held every day in the afternoon coffee break. Participants should place their coupons in the container to be found in the exhibition area during the exhibition's opening hours. The name of the winners will be posted in the exhibition area. Prizes can be claimed at the main conference registration.

The Exhibition opening hours are as follows:

|                       |               |
|-----------------------|---------------|
| Tuesday, October 19   | 09:00 – 18:00 |
| Exhibitor Reception   | 19:00 – 22:00 |
| Wednesday, October 20 | 09:00 – 18:00 |
| Thursday, October 21  | 09:00 – 16:00 |

**Industrial Seminar Program Schedule:** (as of August 3, 2004)

|       | Wednesday, Oct. 19                                             | Thursday, Oct. 20                                                  |
|-------|----------------------------------------------------------------|--------------------------------------------------------------------|
| 09:00 | <b>Ideas ASA</b><br>Dirk Meier                                 | <b>Radiant Detector Technologies</b><br>Jan S. Iwanczyk            |
| 10:00 | <b>Saint-Gobain Crystals</b><br>Corinne Dathy                  | <b>CAEN</b><br>Giovanni Grieco                                     |
| 11:00 | <b>ORTEC</b><br>Ron Keyser                                     | <b>ISE-Ingegneria dei Sistemi Elettronici</b><br>Andrea Cremoncini |
| 11:30 | <b>Canberra Industries</b><br>Chris Leveque<br>Frazier Bronson |                                                                    |

A list of exhibitors as of August 3 is included at the end of this booklet. Check our website (<http://ess.web.cern.ch/ESS/IEEE2004/IndustrialProgramme/index.html>) for the up-to-date list. An Industrial Program brochure will be available at the meeting with full details of the exhibitors and the seminar program. Companies interested in participating should contact Christopher Parkman, Industrial Program Chair, at [chris.parkman@cern.ch](mailto:chris.parkman@cern.ch).



Guest Editor

J. Anthony Seibert

The *Conference Record* is the official repository for manuscripts presented at the 2004 NSS/MIC/RTSD/SNPS Conference in Rome, Italy, and will be published on CD-ROM, complimentary for all registered attendees to the conference. Anticipated is a January 2005 release of the materials. The approved word processing templates, available in PDF, MS Word and LaTeX formats can be downloaded from <http://www.nss-mic.org/2004/pubs>.

All presenters are required to upload their completed manuscripts using the approved word processing templates (available at the website) prior to the end of the conference to <http://www.ieee.org/organizations/pubs/confpub>. Use "nss-mic04" for the conference ID. Within 24 hours of submission, an electronic proof (PDF format) will be generated. The corresponding author is responsible for electronically reviewing the final proof and providing a signed copyright release form by November 1, 2004, which is the absolute deadline. All articles will be published in the *Conference Record*, provided the submission conforms to the requirements of the IEEE publications instructions, and the author or designate has presented the work at the conference.

During the production of the CD, available manuscripts will be posted without citable page numbers at the NSS/MIC/SNPS/RTSD web site <http://nss-mic.bnl.gov/2004/conferencerecord>.

#### Transactions on Nuclear Science (TNS) Publication Information

Additionally, papers presented at the conference that contain important information of lasting value may be submitted for review and publication in the conference issue of the *Transactions on Nuclear Science* (TNS). The TNS is a premier peer-reviewed journal with a significant distribution within the nuclear science and medical imaging communities. Papers submitted for review and possible publication in the TNS must be submitted through Manuscript Central. When prompted for Manuscript Type during the submission process, select "Nuclear Science Symposium Manuscript" if your paper was presented in the NSS, RTSD, SNPS or the Special Focus Workshops and select "Nuclear Medical Imaging Sciences Manuscript" if your paper was presented at the MIC. The preferred manuscript submission formats are Microsoft Word (.doc), rich text format (.rtf), PostScript (.ps), and PDF. These files should be uploaded to Manuscript Central, which will then convert the file to PDF format. Note that the authors must upload LaTeX files as .ps or .pdf to be readable. The files should adhere to the 8-page limit and conform to the 8.5" x 11" U. S. standard. A template file is available in PDF and MS Word format through the NSS Editor's pages.

There are several considerations for the authors to keep in mind when submitting:

- A five-page limit will be enforced (including references), unless approved by the guest editor for the *Conference Record*, and an eight-page limit for the TNS submission.

- As the manuscripts submitted to the *Conference Record* are totally electronic, authors are encouraged to use color photographs, line drawings, and figures where appropriate. This is not the case for the peer-reviewed conference issue of the *Transactions on Nuclear Science* (TNS), where black and white or half tone images are required, except in special situations where color can be used, but at a cost to the author. Specific information can be found in the template instructions

- Templates for either Microsoft Word or LaTeX with explicit instructions that conform to the publication requirements of the *Conference Record* and the TNS are available at <http://www.ieee.org/organizations/pubs/confpub>. Source documents of Microsoft Word or LaTeX or other "approved" word processing documents are converted to PDF format at the IEEE publications website, where explicit instructions for the conversion process are posted.

- Philosophy of the *Conference Record* submission vs. the TNS submission: The value of the *Conference Record* is chiefly accrued by the immediate and timely release of the information, which excludes the possibility of peer-review for manuscript content. It is possible that a similar (or even the same) article can be submitted to both the *Conference Record* and the TNS special issue. However, the authors must keep in mind that the content of the articles designated for TNS publication must meet the level of scrutiny by scientific review, and publication is not guaranteed for the TNS submission.

- In order for a manuscript to be published in the *Conference Record*, required is a copyright form to be filled out by the author and signed. There are no exceptions; copyright forms must be turned in at the meeting, otherwise the manuscript cannot be published with the CD ROM contents. The copyright form and author-information form for the TNS issue may be found on the conference web site and at the Guest Editor's office at the conference. These forms should be submitted directly to the appropriate conference editor.

As guest editor of the 2004 *Conference Record*, I look forward to receiving your manuscripts and producing an ON-TIME CD ROM publication. Should you have any questions please do not hesitate to contact me via email or during the conference in Rome. The TNS-NSS and the TNS-MIC editors will also be available at the meeting.

Best regards, and see you in Roma!!

Tony Seibert  
Conference Record Guest Editor

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Companion Program Chair

Marta Martini

Visiting Rome means more than simply visiting a city, it means revisiting the entire history of the western world from its early beginnings. With its Coliseum, its timeless Forum, its ancient Spas and pagan temples, Rome offers a unique opportunity to breathe the atmosphere which once reigned during the great Emperors' days. With its more than three hundred churches ranging from Michelangelo's magnificent St Peter's Basilica to more humble buildings where the first Christians gathered, Rome also offers visitors a unique window

on the history of Christianity. Moreover, thanks to its unsurpassed art collections, Rome provides a rare opportunity to meet up close with the work of such Renaissance and Baroque geniuses as Raphael, Bernini and Caravaggio.

Attendees and their companions will be offered the opportunity of taking part in a series of exclusive and unforgettable excursions around the city.

| Tour Name                        | Date                   | Cost*   |
|----------------------------------|------------------------|---------|
| 1: Rome Seen from Its Belvederes | Sun. 17 Oct. afternoon | € 26,00 |
| 2: The Glories of Baroque Rome   | Mon. 18 Oct. morning   | € 26,00 |
| 3: Ostia Antica                  | Tues. 19 Oct. full day | € 52,00 |
| 4: Imperial Rome                 | Wed. 20 Oct. morning   | € 26,00 |
| 5: Tivoli and Stately Homes      | Thu. 21 Oct. full day  | € 52,00 |
| 6: Vatican Museums               | Fri. 22 Oct. morning   | € 46,00 |

\* Cost is per person and for registration before 25 September 2004. (VAT included).

Please note:

- Tours will depart from and return to Ergife Palace Hotel.
- Each tour includes transportation, entrance tickets (where applicable), an English-speaking guide and hostess.
- Lunches are on your own. They are not included in tour fees.
- Tours reservations will be processed on a first-come-first-served basis. An additional €5,00 will be charged per tour for on-site registration. On-site reservations availability cannot be guaranteed.
- Tour programs and hours may be modified due to last-minute logistics issues.
- The organisers reserve the right to cancel tours accounting for less than 20 participants without liability other than refunding the cost of the tour to participants.
- Cancellations of tours must be sent to EGA in writing. For cancellations received before September 25, 2004 a full refund (less 10% administration fee) will be given. For cancellations received after this date no refund will be given. All refunds will be handled after the Conference.

In order to register for the Tours & Companion Program you have to use the conference registration form.

### Tour 1: Rome Seen from Its Belvederes

Sunday, October 17, 2004 (depart at 14:00 – 17:00)

An extraordinary walk through the Eternal City, featuring stops at some of Rome's most panoramic sites, including:

- The Gianicolo hilltops which is the best place to walk and admire the panorama of Rome from above. The ancient Romans, the romantic travellers of the 18<sup>th</sup> Century and the poets and writers of the 19<sup>th</sup> Century walked here looking for inspiration.

From the Gianicolo hill every day at noon since 1904, an Austrian-Hungarian cannon fires a shoot. Its echo can be heard throughout the whole city.

- The Aventino area, set among the greenery and the mystical silence of Rome's most characteristic monasteries, cloisters and gardens. The view will surely take your breath away: up at the river, close to the centre, Rome will show you all its incredible beauty; it's a wonderful place to have a rest from the chaotic roman life.

- The Campidoglio is the lowest of the seven roman hills but at the same time is the most majestic since it was the acropolis and the religious centre of the ancient town, always remaining the heart and the seat of the town's government.

The square was created only starting in 1538, when Pope Paul III entrusted its arrangement to Michelangelo. On this hill the ancient and the modern World find their ideal connection point.



### Tour 2: The Glories of Baroque Rome

Monday, October 18, 2004 (depart at 09:00 – 12:30)

If there is a period in art that can be said to have left its nature indelibly impressed on the city of Rome, it is the Baroque: the robust expression of a triumphant Church that managed to overcome the crisis caused by the Protestant Reformation. Baroque is the style of theatre, wonder and amazement par excellence that emotionally involves the viewer. During the 17th century, palaces, fountains, squares and churches were created, totally invading the city and giving it a new face which today still sets it apart in the World. Throughout this itinerary, two names are alternately repeated: Gianlorenzo Bernini and Francesco Borromini, the two great and undisputed protagonists of this epoch.

The viewers will discover the splendid Colonnade of St Peter's Square with the elliptical shape symbolising the Church's embrace of all of mankind. It is defined by a series of 284 columns arranged in four rows. If, however, you stand on one of the two focuses of the ellipse, marked by a

### Tour 4: Imperial Rome

Wednesday, October 20, 2004 (depart at 09:00 – 12:30)

From the huts where, according to legend, Romulus and Remus were raised before going on to found Rome in the 8th century BC, to the imposing remains of Domitian's Palace, the Palatine guards the secrets and traces of Rome's entire history.

The Palatine forms a spectacular itinerary, both for its grandiose ruins and for its splendid panoramic views of the city and also of the underlying Roman Forum that is definitely the very place from where it is possible to admire the Eternal City with basilicas, temples, arches, domus one after another. The tour will be completed with a stop at the imposing Coliseum, which is considered to be a symbol of the eternal Rome. It is the biggest monument of the Roman period and more famous for the austerity and purity of its style.



### Tour 5: Tivoli and Stately Homes

Thursday, October 21, 2004 (depart at 09:00 – 16:30)

Right outside Rome, Tivoli, the ancient *Tibur*, was already a favourite holiday resort for the Romans as well as a place for the worship of local divinities.

Tivoli is also the site of an imposing architectural complex which is the Villa Adriana, a perfect union of nature and architecture. The impressive ruins have fascinated generations of visitors and artists, attracted by the beauty of its surroundings and the perfection of its architecture. Built by Emperor Hadrian in the 2nd century, the villa consists of an intricate maze of ancient spas, squares, colonnades, underground passages, triclinia and nymphae, characteristic of the supreme inventiveness of ancient Roman architects.

The Villa d'Este, built on the ruins of a Roman villa, was first a Benedictine convent and then the Governor's Palace, which was magnificently restored by Pirro Ligorio in the 16th century for Cardinal Ippolito d'Este. The Villa is known for its



granite disk, it seems that the colonnade is made up of only a single row of columns; Piazza Navona that recalls, with its perimeter, its original use for athletic games in Republican times with three magnificent fountains; the Fountain of the Four Rivers, Fountain of the Moor, the Fountain of Neptune. St. Agnese in Agone's Church is one of the most symbolic places of the Roman Baroque. In addition there is the superb church of St Ivo alla Sapienza that was conceived to be the chapel of the University of Rome which was transferred only in 1935 to the modern seat. The task of building the chapel was originally assigned to Bernini who, considering the work troublesome and difficult, entrusted it to Borromini, who instead created a structure as extraordinary as it was complex. In between these visits, you will get a glimpse of other remarkable landmarks, such as the church of St Ignazio, with its superb frescoes by Andrea Pozzo, a Jesuit priest, painter, architect and mathematician who also worked as a cook for his religious order. The lovely little square which contains this church is one of the most successful Rococo creations.

### Tour 3: Ostia Antica

Tuesday, October 19, 2004 (depart at 09:00 – 16:30)

The beautifully preserved ruins of Ostia Antica, Rome's ancient seaport, lie twenty miles from the modern metropolis, in the meadows between the Tiber River and the Tyrrhenian Sea. It was probably founded in the 4th century BC as a military colony to guard the river mouth against seaborne invasions. Later, during the centuries when virtually all imports reached the Capital via the Tiber, Ostia gained prominence as the domestic landing for cargo boats. By the 2nd century AD it had become a flourishing commercial centre inhabited by upwards of 100,000 people, whose apartment buildings, taverns and grocery shops are still preserved intact thanks to a mud covering.



The excavations brought to light Porta Romana, the Forum, the Theatre, the Baths and many other buildings providing evidence of Roman public and private life and of its great magnificence.



innumerable fountains, streams, cascades and fishponds, which form a spectacular backdrop to the perfect symmetry of its terraced gardens.

**Tour 6: Vatican Museums**

Friday, October 22, 2004 (depart at 09:00 – 12:30)

The Vatican Museums are one of the most famous and renowned cultural institutions of the Holy See. They are known everywhere because of the masterpieces which the Roman Pontiffs have commissioned, collected and preserved during the ages. Together with the immense heritage of movable works of art, sculptures and paintings which are displayed in the galleries, the itineraries of the Vatican Museums include the most important and artistically significant rooms of the Vatican Apostolic Palace, such as the “Cappella Niccolina” with paintings by Beato Angelico, the “Appartamento Borgia” with decorations by Pinturicchio, the “Stanze” painted by Raphael and, of course, the Sistine Chapel with frescoes by Michelangelo as well as the most important 15th century masters from Umbria and Tuscany.



**CONTINUING EDUCATION PROGRAM**

An excellent set of short courses will be given at the start of the NSS/MIC programs, covering a wide range of nuclear and medical technology. All courses include refreshments, lecture notes, and a certificate of completion as part of the registration fee. Full day courses also include lunch.

Claus Grupen

*Short Course Program Chair*



| Short Course Name                                                      | Date           |          |
|------------------------------------------------------------------------|----------------|----------|
| NSS Courses                                                            |                |          |
| SC1: Radiation Detection and Measurement                               | Sat., Oct. 16  | Full day |
| SC2: Detectors for Astroparticle and Synchrotron Radiation Experiments | Sat., Oct. 16  | Half day |
| SC3: Semiconductor Strip, Pixel and Voxel Arrays                       | Sat., Oct. 16  | Half day |
| SC4: GEANT4                                                            | Sun., Oct. 17  | Full day |
| MIC Courses                                                            |                |          |
| SC5: Detectors for SPECT and PET                                       | Mon., Oct. 18  | Full day |
| SC6: Biomedical Applications of Particle Detectors                     | Mon., Oct. 18  | Half day |
| SC7: Optical Imaging                                                   | Mon., Oct. 18  | Half day |
| SC8: Statistical Methods for Image Reconstruction                      | Tues., Oct. 19 | Half day |

**Short Course 1: Radiation Detection and Measurement**

Saturday, October 16, 08:30 -18:00 Room Tarragona

Organizer: Konrad Kleinknecht, *Universität Mainz*

Instructors: Archana Sharma, *CERN*  
Dietrich Wegener, *Universität Dortmund*  
Juergen Engelfried, *Univ. of Mexico City*  
Konrad Kleinknecht, *Universität Mainz*

The course will start with a description of the interactions of particles and radiation with matter. Elementary particles are usually not directly detected but rather their interaction products. Depending on the purpose of the experiment one can do tracking with gaseous detectors with the aim e.g. of momentum measurement in a magnetic field. For higher energies calorimetric techniques yield excellent results with electromagnetic or hadronic calorimeters for electrons and hadrons. In many cases the nature of the incident particle has to be determined. For



that purpose different techniques like  $dE/dx$  measurements, Cherenkov and transition radiation detection or time-of-flight techniques can be employed. The course follows closely the book on Radiation Detection and Measurement (Konrad Kleinknecht, Cambridge University Press), which will be provided by the organizer.

### Short Course 2: Detectors for Astroparticle and Synchrotron Radiation Experiments

Saturday, October 16, 08:30 -12:30 Room Cesarea

Organizer: Albert H. Walenta, *Universität Siegen*

Instructors: Razmik Mirzoyan, *MPI München*  
Albert H. Walenta, *Universität Siegen*

Particle detectors can have a large variety of applications. The subject of astroparticle physics has evolved from the field of cosmic rays. Cosmic ray experiments in the past were mainly involved with earthbound detectors. e.g. to measure the various cosmic ray components at sea level. More recently experiments in space have provided a wealth of information on primary particle spectra and electromagnetic radiation in many different spectral ranges. The detectors used for these applications are similar to experiments at accelerators, however they have to work under relatively harsh conditions. In contrast, synchrotron radiation experiments require techniques for the measurement of keV photons at high repetition rates. In addition, the reduction of noise, and the use of large area detectors is a challenge for dedicated detectors in this field.

### Short Course 3: Semiconductor Strip, Pixel and Voxel Arrays

Saturday, October 16, 14:00 -18:00 Room Cesarea

Organizer: Lothar Strüder, *Semiconductor Lab., MPI for Physics and Extraterrestrial Physics, München*

Instructors: Gerhard Lutz, *MPI München*  
Lothar Strüder, *MPI München*

The measurement of ionizing radiation like optical photons, X- and  $\gamma$ -rays on one side and electrons, protons,  $\alpha$  or other massive particles on the other side is of great interest in many fields of basic science (e.g. astrophysics, high energy physics), applied science (e.g. material analysis, medical imaging, synchrotron research) and industrial science (e.g. X-ray fluorescence analysis, quality control). Semiconductor detectors, in particular with the introduction of new concepts and principles have very strongly improved the measurement capabilities. This half day course intends to review the basic physics of semiconductor devices used as detectors as well as for integrated electronics. A short treatment of further signal processing electronics will be given. Resulting implications for front-end electronics will be discussed.

The basic physical limitations of the measurement precision will be derived from physical concepts. Special emphasis will be given to the physical limits of position resolution, energy resolution, time resolution, the quantum efficiency and the 'cleanliness' of the spectra. Basic effects affecting the long-term stability under various experimental boundary conditions will be discussed. We will concentrate on pn-junction type detectors as single and double sided silicon strip detectors, pin and pad detectors, silicon drift detectors, charge coupled devices and active pixel sensors. The impact of those detectors on readout and data acquisition

strategies will be derived from the intrinsic detector properties and the specific application and its primary measurement goal. For all detector types examples of applications will be presented. A textbook (G. Lutz, *Semiconductor Radiation Detectors*, Springer) will be supplied and is part of the registration fee.

### Short Course 4: GEANT4

Sunday, October 17, 08:30 -18:00 Room Tarragona

Organizer: Maria Grazia Pia, *INFN Genova*

Instructors: Katsuya Amako, *KEK*

Makoto Asai, *SLAC*

Gabriele Cosmo, *CERN*

Susanna Guatelli, *Univ. and INFN Genova*

Aatos Heikkinen, *Helsinki Institute of Physics*

Maria Grazia Pia, *INFN Genova*

Geant4 is a software toolkit for the simulation of the interaction of particles with matter, developed and maintained by a world-wide collaboration of physicists and computer scientists. Its application areas include high energy physics experiments, astrophysics and astroparticle physics, space science, medical physics and medical imaging, nuclear physics, radioprotection and radiation background studies. It exploits advanced software engineering techniques and Object Oriented technology to achieve transparency of the physics implementation, as well as openness to extension and evolution. Geant4 provides a wide set of tools for all the domains of detector simulation, such as Geometry modeling, Detector Response, Run and Event management, Tracking, Visualisation and User Interface. An abundant set of Physics Processes handles the diverse interactions of particles with matter across a wide energy range, as required by Geant4 multi-disciplinary nature; for many physics processes a choice of different models is available. The Geant4 source code and libraries are freely available, accompanied by an extensive set of user documentation. The course provides an overview of Geant4 capabilities, and illustrates in detail the major features available in the toolkit to simulate an experimental set-up. Specific lectures are devoted to Geant4 capabilities for medical applications. Finally, the students are guided through a real-life simulation example, offering a practical implementation of the basic concepts of a user application. As a result of the course the students would learn how to develop simulation applications based on the Geant4 Toolkit. A CD with Geant4 source code and libraries, examples and further training material is distributed to all course participants. To best profit of the course, some basic knowledge of the C++ computing language is recommended. For more details of the course, see <http://www.ge.infn.it/geant4/events/nss2004/geant4course.html>

### Short Course 5: Detectors for SPECT and PET

Monday, October 18, 08:30 -18:00 Room Cesarea

Organizer: Harrison Barrett, *Univ. Arizona*

Instructors: Lars Furenlid, *Univ. Arizona*  
Harrison Barrett, *Univ. Arizona*

This course will survey the state of the art in gamma-ray detectors for SPECT and PET, with a discussion of emerging technologies as well

as traditional semiconductor and scintillator devices. Considerable emphasis will be placed on statistical characterization of the detectors and on optimal estimation methods that take the statistical properties into account. Advanced data-acquisition methods will be discussed, and examples will be given of some current detector projects at the Center for Gamma-ray Imaging of the University of Arizona. Topics will include:

- Survey of technologies for gamma-ray detection
- Detector requirements for SPECT and PET
- State of the art in scintillation detectors
- State of the art in semiconductor detectors
- Statistical modeling and estimation methods
- Data acquisition systems
- Examples of applications

### Short Course 6: Biomedical Applications of Particle Detectors

Monday, October 18, 08:30 -12:00 Room Tarragona

Organizer: Ralf H. Menk, *ELETTRA, Trieste*

Instructors: Fulvia Arfelli, *Trieste Univ., and INFN Trieste*  
Ralf H. Menk, *ELETTRA, Trieste*

The course starts with the discussion of the concept of basic properties for the detection of X-rays in various particle detectors. The relevant quantities are the conversion probability of photons into charged particles (quantum efficiency), the signal to noise ratio, the spatial resolution, the point spread function and the noise power spectrum. These considerations result in a characteristic 'detective quantum efficiency DQE' for a detector.

In the following these concepts are applied to examples like

- Non-invasive coronary angiography
- bronchography
- multi-energy tomography
- mammography

Special emphasis will be placed on the digital subtraction technique to obtain images of suitable contrast allowing a reliable diagnosis. The detector types used for these applications are segmented ionization chambers, Si(Li) drift detectors, segmented 'edge on' silicon detectors and germanium detectors.

### Short Course 7: Optical Imaging

Monday, October 18, 14:00 -18:00, Room Tarragona

Organizer: Rinaldo Cubeddu, *Politecnico Milano*

Instructors: Paola Taroni, *Politecnico Milano*  
Alessandro Toricelli, *Politecnico Milano*  
Rinaldo Cubeddu, *Politecnico Milano*

This half-day course will cover Optical Imaging for medical and biological applications, focusing on non-invasive techniques for in vivo bulk tissue investigations, while not dealing with techniques for microscopic (cellular and/or structural) studies (like optical coherence tomography and microscopy). The study of light propagation in highly diffusive media, like biological tissues, has gained much interest due to the exciting challenge to develop novel in vivo, non-invasive diagnostic tools.

Indeed, the possibility to explore bulk tissues by analyzing photons that have traveled through tissue —after being injected or generated by fluorescence — offers potential for applications with great social impact such as tumor detection in the female breast and functional imaging of the brain.

The course is organized in four modules covering: i) Fluorescence lifetime imaging; ii) Photon Migration; iii) Optical Mammography; and iv) Molecular Imaging. The course is targeted to three types of attendees: engineers/physicists who desire understanding the basics of photon migration and fluorescence in order to develop/use related type of instrumentation; engineers/physicists/managers who need to understand these technologies and the performance achievable in order to manage or work with a development team utilizing these technologies; and people interested in an overview for personal technical development. In detail the following subjects will be presented:

- fluorescence
- photon migration
- optical mammography
- molecular imaging

### Short Course 8: Statistical Methods for Image Reconstruction

Tuesday, October 19, 08:30 -12:30 Room Cesarea

Organizer: Jeffrey A. Fessler, *Univ. Michigan*

Instructor: Jeffrey A. Fessler, *Univ. Michigan*

The recent commercial introduction of iterative algorithms for tomographic image reconstruction, and the increasing interest in scanners with nonstandard imaging geometries, has brought new relevance and timeliness to the topic of statistical methods for image reconstruction. This course will provide an orderly overview of the potpourri of statistical reconstruction methods that have been proposed recently. Rather than advocating any particular method, this course will emphasize the fundamental issues that one must consider when choosing between different reconstruction approaches. The intended audience is anyone who would like to reconstruct 'better' images from photon-limited measurements, and who wants to make informed choices between the various methods. Recent advances in convergent forms of 'ordered subsets' algorithms will be given particular attention, since these algorithms can be both practical for routine use, while also having desirable theoretical properties. Both emission tomography and transmission tomography algorithms will be discussed. Attendees should be familiar with photon-counting imaging systems at the level presented in the Medical Imaging short course offered in previous years. Some past attendees have commented that at least a little experience with some type of iterative reconstruction (e.g., ART or OS-EM) would be helpful for getting the most value from this course.

## NUCLEAR SCIENCE SYMPOSIUM (NSS)

The Nuclear Science Symposium is a unique opportunity to convene for scientists and engineers in the fields of nuclear science, instrumentation for nuclear, particle physics and astrophysics, biomedical and imaging applications, and related software. In addition there are dedicated special focus workshops on Synchrotron Radiation and Gravitational Wave Detectors. Topical short courses on detection technologies and related software, devoted to students and young scientists, complement the scientific program.

This year a record number of 760 abstract submissions (1600 for all conferences together) has been received, making their analysis and assignment to sessions extremely excruciating. This selection would not have been possible without the dedicated help of 20 Topic Conveners and more than 200 reviewers; with their assistance, we believe we have put together a very interesting and sound scientific program.

Following stringent criteria, the papers were assigned to two oral plenary sessions, 44 oral parallel and two plenary poster sessions. Moreover, two dedicated joint NSS-MIC sessions include contributions bridging the fields of nuclear detectors and medical imaging. To limit the disturbances provoked by frequent changes of location, we have tried to schedule successive sessions in the same topic in the same room; we also tried to avoid the overlap of sessions having related subject, but in view of the number of sessions in parallel some conflict was inevitable.

To encourage the participation of authors and involvement of the audience in the poster sessions, and in view of the large number of posters, each poster set-up will be visible for a full day, with a dedicated session not having any other NSS activity in parallel. To encourage participation of young scientists, two conspicuous student poster awards have been instituted and will be announced in the course of the NSS conference dinner.

The Nuclear Science Symposium will start on Monday, October 18, 2004 through Thursday, October 21 included; Short Courses begin already on Saturday, October 16.

After the Grand Opening, two distinguished invited speakers will shed light on subjects of general interests: Prof. Pier Andrea Mandò (Florence University) on "Nuclear Techniques for the Cultural



NSS Program Chair  
**Fabio Sauli**



NSS Deputy Program Chair  
**Archana Sharma**

Heritage", and Prof. Lothar Strüder, (Max Plank Institute, Munich) on "Semiconductor Detectors — In Heaven and on Earth".

The opening sessions will be followed by the traditional NSS Luncheon, during which Prof. Ugo Amaldi (University of Milano Bicocca and TERA Foundation) will discuss on "Advances in Radiotherapy: from the Discovery of X-Rays to Hadrontherapy".

We would like to take this opportunity to thank all reviewers and topic conveners, who dedicated time and efforts to examine and select the submitted papers, permitting to complete the program within the scheduled times despite the unexpectedly large number of received abstracts. In advance, we thank all designated session chairs for their cooperation in keeping the tight schedule of the presentations.

We sincerely hope that you enjoy the 2004 IEEE NSS/MIC/RTSD both professionally and socially, and we look forward to meeting you in Rome!

Fabio Sauli, NSS Program Chair  
Archana Sharma, NSS Deputy Program Chair

Monday, October 18, 12:00 – 14:00, *Le Quattro Stagioni*

**Advances in Radiotherapy: from the Discovery of X-Rays to Hadrontherapy**

**Speaker: Professor Ugo Amaldi**

*University of Milano Bicocca and TERA Foundation*



The talk will be preceded by a short recollection of the discovery of neutron induced radioactivity made in Rome seventy years ago by Enrico Fermi and collaborators, a fundamental step in the development of nuclear and medical physics.

The main subject will be tackled with an overview of the development of X ray radiotherapy, starting from the first attempts in 1896 and ending with Intensity Modulated Radiation Therapy. The latter part will then describe the use of hadron accelerators in cancer therapy. The technique of hadrontherapy was proposed by Bob Wilson more than fifty years ago, but only in the last ten years have cyclotrons and synchrotrons been developed as effective medical tools. The focus will be on hospital-based centers featuring proton and/or carbon ion beams and, in particular, on the study made at CERN to design an optimized synchrotron for carbon ions (PIMMS) and on the centers designed by GSI (HICAT) and TERA (CNAO), which are at present under construction in Heidelberg and Pavia. Finally, the very recent developments of hadron linear accelerators will be discussed.

**Ugo Amaldi** was the Director of Physics Research at the Istituto Superiore di Sanità (Rome) during the late 1960s. In 1973 he then moved to CERN as Senior Scientist, a position he occupied for more than twenty years. In 1995 he was nominated full Professor by the University of Milan and at present teaches Medical Physics at the University of Milano Bicocca. He is a member of the Accademia Nazionale delle Scienze (Rome) and Doctor Honoris Causa at the Universities of Uppsala, Lyon, Helsinki and Valencia. He has studied single particle states in nuclei at the electron-synchrotron in Frascati (1964), started a new line in atomic physics research, Electron Momentum Spectroscopy (1967) and discovered the rise of hadronic cross-sections with energy at CERN (1973). He made the first proposal for a high-energy linear collider (1975) and published a much-quoted paper about the supersymmetric unification of the four fundamental forces (1991). In 1980 he proposed, with a group of colleagues, an experiment for LEP at CERN called “DELPHI” (Detector with Lepton, Photon and

Hadron Identification) which was constructed by about 500 physicists and engineers. Ugo Amaldi was then the spokesman of DELPHI from 1980 to 1993. In 1992 he created the TERA Foundation, a non-profit organisation which aims at realizing modern radiotherapy techniques based on hadron beams. Professor Amaldi has published about 400 scientific papers, two treaties on radiation physics and more than twenty textbooks in physics. By now, more than one million Italian high-school students have learnt physics from his books.

**NSS Plenary Invited Speakers**

**Nuclear Techniques for the Cultural Heritage**

**Professor Pier Andrea Mandò**

*Universita degli Studi di Firenze, Italy*

Monday, October 18, 10:30-11:15, Leptis Magna 1&2

Pier Andrea Mandò is full professor at the Faculty of Sciences of Florence University, where he delivers basic courses on general and applied physics, as well as on more advanced topical subjects as “Nuclear Techniques for the cultural Heritage”. He is also teaching post-graduate Master courses at the Universities of Rome, Pisa, and Lecce.



Head of the Laboratory of nuclear techniques applied to the Cultural Heritage of the National Institute of Nuclear Physics in Florence, his main scientific activity is in the field of basic physics of the nucleus and of the application of its technologies to the Cultural Heritage and to environmental monitoring. He is the author of a large number of specialized articles on scientific journals, as well as of general reviews and extended articles on encyclopedias.

Prof. Mandò is member of the INFN National Committee for Research and Development and Interdisciplinary applications, as well as of several international Advisory Boards: the International Conference on Particle-Induced X ray Emission and its Analytical applications, the European Conference on Accelerators Applied to Research and Technology, the Laboratoire Accélérateur Grand Louvre d'Analyse Élémentaire).



Professor Lothar Strüder

*MPI für Extraterrestrische Physik, Germany*

Monday, October 18, 11:15-12:00, Leptis Magna 1&amp;2



Prof. Lothar Strüder is head of the Semiconductor Laboratory at the Max-Planck-Institut für Extraterrestrische Physik (MPE) in Munich; he is also Professor of Physics and member of the physics faculty at the University of Siegen. His main research areas are in the fields of imaging X-ray detectors, physical limitations of measurement processes, high speed, radiation hard electronics, applications of state-of-the-art semiconductor detector systems for astrophysics applications. He

has contributed to the development of PN-CCD detector for XMM-Newton and ABRIXAS, of pixel detectors for the SOHO and XEUS missions. Other developments include X-ray spectrometers for X-ray fluorescence analysis in industry, and applications in medical and material science as well as in basic and applied research

Prof. Strüder is the author of a large number of specialized articles on solid state detectors, as well as of several general interest reviews on CCD and active pixel detectors and their use in space applications. He is also giving, jointly with Prof. Gerhard Lutz, a course on Semiconductor Strip, Pixel and Voxel Arrays as part of the Continuing Education Program at this Symposium.

**GO Grand Opening**

Monday, Oct. 18 08:30-10:00, Leptis Magna 1&amp;2

Session Chairs: Alberto Del Guerra, *Univ. of Pisa and INFN, Pisa*  
M. Giuseppina Bisogni, *Univ. of Pisa and INFN Pisa*

**NP NSS Plenary**

Monday, October 18 10:30-12:00, Leptis Magna 1&amp;2

Session Chairs: Fabio Sauli, *CERN*  
Archana Sharma, *CERN*

**NP-1, invited: (10:30) Nuclear Techniques for the Cultural Heritage**  
P. A. Mandò, *Universita degli Studi di Firenze, Italy*

**NP-2, invited: (11:15) Semiconductor Detectors — In Heaven and on Earth**

L. Strüder, *MPI für Extraterrestrische Physik, Germany*

**N1 High Energy Physics Detectors I: Tracking**

Monday, October 18 14:00-15:30, Leptis Magna 1&amp;2

Session Chair: Uwe Bratzler, *CERN and Tokyo Metropolitan University*

**N1-1: (14:00) Development of a Prototype Module for a DEPFET Pixel Vertex Detector for a Linear Collider**

L. Andricek<sup>1</sup>, P. Fischer<sup>2</sup>, M. Harter<sup>2</sup>, M. Karagounis<sup>3</sup>, H. Krüger<sup>3</sup>,  
G. Lutz<sup>1</sup>, I. Peric<sup>3</sup>, M. Porro<sup>1</sup>, L. Reuen<sup>3</sup>, R. Richter<sup>1</sup>, L. Strüder<sup>4</sup>,  
M. Trimpl<sup>1</sup>, N. Wermes<sup>3</sup>, R. Kohrs<sup>3</sup>

<sup>1</sup>Max-Planck-Institut für Physik, Germany; <sup>2</sup>Institut für Technische Informatik, Universität Mannheim, Germany; <sup>3</sup>Physikalisches Institut der Universität Bonn, Germany; <sup>4</sup>Max-Planck-Institut für extraterrestrische Physik, Germany

**N1-2: (14:15) Beam Test Results of the New Readout Chip for the BTeV Silicon Pixel Detector**

L. Upplegger<sup>1</sup>, J. A. Appel<sup>1</sup>, M. Artuso<sup>2</sup>, G. Cardoso<sup>1</sup>, H. P. Cease<sup>1</sup>,  
D. C. Christian<sup>1</sup>, D. A. Cinabro<sup>3</sup>, S. Kwan<sup>1</sup>, S. Magni<sup>4</sup>, D. Menasce<sup>4</sup>,  
C. Newsom<sup>5</sup>, A. Schreiner<sup>3</sup>, M. A. Turqueti<sup>1</sup>, J. Wang<sup>2</sup>

<sup>1</sup>Fermi National Accelerator Laboratory, USA; <sup>2</sup>Syracuse University, USA; <sup>3</sup>Wayne State University, USA; <sup>4</sup>Sezione INFN di Milano, Italy; <sup>5</sup>University of Iowa, USA

**N1-3: (14:30) Characterization, Calibration and Performance of the TPC of the HARP Experiment at the CERN PS**

E. Radicioni, *INFN, Italy*  
 On behalf of the HARP TPC group

#### **N1-4: (14:45) The LHCb Triple-GEM Detector for the Inner Region of the First Station of the Muon System: Construction and Module 0 Performance**

W. Bonivento<sup>1</sup>, A. Cardini<sup>1</sup>, D. Raspino<sup>1,2</sup>, B. Saitta<sup>1,2</sup>,  
G. Bencivenni<sup>3</sup>, F. Murtas<sup>3</sup>, P. DeSimone<sup>3</sup>, M. PoliLener<sup>3</sup>,  
M. Alfonsi<sup>3</sup>, D. Pinci<sup>4</sup>

<sup>1</sup>I.N.F.N. Cagliari, Italy; <sup>2</sup>Università degli Studi Cagliari, Italy;  
<sup>3</sup>I.N.F.N. Laboratori Nazionali di Frascati, Italy; <sup>4</sup>Università degli Studi La Sapienza, Italy

#### **N1-5: (15:00) The Assembly of the ALICE Silicon Pixel Detector**

S. Moretto<sup>1</sup>, F. Antinori<sup>1</sup>, G. E. Bruno<sup>2</sup>, M. Caselle<sup>2</sup>, M. Cinausero<sup>3</sup>,  
A. Dalessandro<sup>2</sup>, R. Dima<sup>1</sup>, D. Elia<sup>2</sup>, D. Fabris<sup>1</sup>, R. A. Fini<sup>2</sup>,  
E. Fioretto<sup>3</sup>, B. Ghidini<sup>2</sup>, V. Lenti<sup>2</sup>, M. Lunardon<sup>1</sup>, V. Manzari<sup>2</sup>,  
M. Morel<sup>4</sup>, F. Navach<sup>2</sup>, A. Pepato<sup>1</sup>, G. Prete<sup>3</sup>, P. Riedler<sup>4</sup>, R. Santoro<sup>2</sup>,  
F. Scarlassara<sup>1</sup>, G. Segato<sup>1</sup>, F. Soramel<sup>5</sup>, G. Stefanini<sup>4</sup>, R. Turrisi<sup>1</sup>,  
L. Vannucci<sup>3</sup>, G. Viesti<sup>1</sup>

<sup>1</sup>Dipartimento di Fisica dell' Università and INFN - Sezione di Padova, Italy; <sup>2</sup>Dipartimento di Fisica dell' Università and INFN - Sezione di Bari, Italy; <sup>3</sup>INFN - Laboratori Nazionali di Legnaro, Italy; <sup>4</sup>CERN, Switzerland; <sup>5</sup>Dipartimento di Fisica dell' Università and INFN - Sezione di Udine, Italy

#### **N1-6: (15:15) Setup and Test of the Optical Alignment System for the ATLAS Muon Spectrometer**

F. Bauer, DAPNIA, CEA-Saclay, France  
On behalf of the ATLAS Muon Collaboration

### **N2 New Radiation Detectors I**

Monday, October 18 14:00-15:30, Leptis Magna 4  
Session Chair: Christian Joram, CERN

#### **N2-1: (14:00) Photon Detection and Localization with GEM**

F. Sauli, T. Meinschad, L. Musa, L. Ropelewski, CERN, Switzerland

#### **N2-2: (14:15) A Scintillating Gem Detector for Dose Imaging in Proton Therapy**

E. Seravalli<sup>1</sup>, T. C. Delvigne<sup>1</sup>, C. W. E. van Eijk<sup>1</sup>, J. Hendrikse<sup>1</sup>,  
R. Kreuger<sup>1</sup>, J. M. Schippers<sup>2</sup>, A. Simon<sup>1</sup>

<sup>1</sup>IRI-TuDelft, the Netherlands; <sup>2</sup>Paul Scherrer Institute, Switzerland

#### **N2-3: (14:30) Advances in the TGEM: a Thick GEM-like Gaseous Multiplier**

C. Shalem, R. Chechik, A. Breskin, The Weizmann Institute of Science, Israel

#### **N2-4: (14:45) Cylindrical High Pressure Xenon Spectrometer Using Scintillation Light Pulse Correction**

J. L. Lacy, A. Athanasiades, N. N. Shehad, L. Sun, T. D. Lyons,  
C. S. Martin, L. Bu, Proportional Technologies, Inc, USA

#### **N2-5: (15:00) From Silicon Drift Detector Fields to Macro Pixel Arrays**

H. Soltau, P. Lechner, R. Eckhard, PNSensor GmbH, Germany; G. Lutz, L. Strueder, MPI HLL, Germany; C. Fiorini, A. Longoni, Politecnico di Milano, Italy

#### **N2-6: (15:15) The Avalanche Drift Diode: a New Detector Concept for Single Photon Detection**

G. Lutz, N. Otte, R. H. Richter, L. Strüder, MPI Semiconductor Laboratory, Germany

### **N3 Analog and Digital Circuits I**

Monday, October 18 14:00-15:30, Leptis Magna 3  
Session Chair: Mitch Newcomer, Penn University

#### **N3-1, keynote: (14:00) MOSFET Optimization in Deep Submicron Technology for Charge Amplifiers**

G. De Geronimo, P. O'Connor, Brookhaven National Laboratory, USA

#### **N3-2: (14:30) Fast Binary Front-End for Silicon Strip Detectors in a Submicron CMOS Technology**

J. Kaplon, CERN, Switzerland; W. Dabrowski, AGH University of Science and Technology, Poland

#### **N3-3: (14:45) A Charge Sensitive Preamplifier for High Peak Stability in Spectroscopic Measurements at High Counting Rates**

C. Fiorini<sup>1,2</sup>  
<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy

#### **N3-4: (15:00) High-Order Microsecond-Range Current-Feedback Filtering Cell for High-Resolution Spectroscopy in BiCMOS Technology**

S. Buzzetti<sup>1,2</sup>, C. Guazzoni<sup>1,2</sup>, A. Longoni<sup>1,2,3</sup>  
<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>IFN-CNR, Italy

#### **N3-5: (15:15) DRAGO Chip: a Low-Noise CMOS Preamplifier-Shaper for Silicon Drift Detectors with on-Chip JFET**

C. Fiorini<sup>1,2</sup>, M. Porro<sup>1,2</sup>  
<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy

### **N4 Astrophysics and Space Instrumentation: Ground Based**

Monday, October 18 14:00-15:30, Orange 2  
Session Chair: Dietrich Mueller, University of Chicago

#### **N4-1, keynote: (14:00) Status and First Results of H.E.S.S.**

W. Benbow, Max Planck Institut fuer Kernphysik, Germany  
On behalf of the H.E.S.S. Collaboration

#### **N4-2: (14:30) The STACEE Ground-Based Gamma-Ray Detector**

D. M. Gingrich, University of Alberta, Canada  
On behalf of the STACEE Collaboration

#### **N4-3: (14:45) UHE Cosmic Ray Detection with the Pierre Auger Observatory**

H. Gemmeke, Forschungszentrum Karlsruhe, IPE, Germany  
On behalf of the Auger Collaboration

#### **N4-4: (15:00) 5@5: Ground Based Gamma Ray Astronomy at GeV Energies**

G. Rowell<sup>1</sup>, F. Aharonian<sup>1</sup>, L. Costamante<sup>1</sup>, D. Horns<sup>1</sup>,  
S. Plyasheshnikov<sup>1,2</sup>, H. Voelk<sup>1</sup>

<sup>1</sup>Max Planck Institut fuer Kernphysik, Germany; <sup>2</sup>Altai State University, Russia

**N4-5: (15:15) A FADC-Based Data Acquisition System for the KASCADE-Grande Experiment**

W. Walkowiak, *University of Siegen, Germany*

On behalf of the KASCADE-Grande Collaboration

**N5 Trigger and Front-End Systems I**

Monday, October 18 14:00-15:30, Spalato

Session Chair: **Hartmut Sadrozinski**, *UC Santa Cruz*

**N5-1: (14:00) The MINOS Near Detector Front End Electronics**

G. Drake<sup>1</sup>, T. Cundiff<sup>1</sup>, J. W. Dawson<sup>1</sup>, L. DalMonte<sup>2</sup>, T. Fitzpatrick<sup>2</sup>, W. Haberichter<sup>1</sup>, D. Huffman<sup>2</sup>, W. Luebke<sup>3</sup>, C. Nelson<sup>2</sup>, D. Reyna<sup>1</sup>, J. L. Schlereth<sup>1</sup>, P. Shanahan<sup>2</sup>, J. L. Thron<sup>1</sup>, M. Watson<sup>2</sup>

<sup>1</sup>Argonne National Laboratory, USA; <sup>2</sup>Fermi National Accelerator Laboratory, USA; <sup>3</sup>Illinois Institute of Technology, USA

**N5-2: (14:15) The Trigger System of the MAGIC Telescope**

R. Cecchi, R. Paoletti, R. Pegna, N. Turini, *University of Siena and INFN Pisa, Italy*; D. Corti, M. Mariotti, *University of Padova and INFN Padova, Italy*

**N5-3: (14:30) Test Beam Results from the ATLAS LVL1 Muon Barrel Trigger and RPC Readout Slice**

Speaker T.B.A., *Istituto Nazionale di Fisica Nucleare, Italy*

On behalf of the ATLAS LVL1 Muon Barrel Trigger Group

**N5-4: (14:45) Diagnostic System of the RPC Muon Trigger of the CMS Detector – Design and Test Beam Results**

K. Bunkowski<sup>1</sup>, A. Colaleo<sup>2</sup>, G. Iaselli<sup>2</sup>, M. Iskanian<sup>3</sup>, J. Krolikowski<sup>1</sup>, K. Kierzkowski<sup>1</sup>, M. Kudla<sup>1</sup>, F. Loddo<sup>2</sup>, K. Pozniak<sup>4</sup>, A. Ranieri<sup>2</sup>, T. Tuuva<sup>3</sup>, D. Ungaro<sup>5</sup>, G. Wrochna<sup>6</sup>, W. Zabolotny<sup>4</sup>

<sup>1</sup>Institute of Experimental Physics, Warsaw University, Poland; <sup>2</sup>INFN, Italy; <sup>3</sup>Lappeenranta University of Technology, Finland; <sup>4</sup>Institute of Electronic Systems, Warsaw University of Technology, Poland; <sup>5</sup>Helsinki Institute of Physics, Finland; <sup>6</sup>Soltan Institute for Nuclear Studies, Poland

**N5-5: (15:00) The D0 Central Track Trigger Hardware Upgrade**

J. Olsen, *Fermi National Accelerator Laboratory, USA*

On behalf of the D0 Collaboration

**N5-6: (15:15) Fast Electronics for a Liquid Xenon Scintillation Detector with Very Low Energy Threshold**

V. Solovoy, F. Neves, V. Chepel, M. I. Lopes, A. Pereira, C. Fonseca, R. Meleiro, R. Ferreira Marques, A. J. P. L. Policarpo, *LIP - Coimbra, Portugal*

**N6 High Energy Physics Detectors II: Calorimeters**

Monday, October 18 16:00-17:55, Leptis Magna 1&2

Session Chair: **Marcella Diemoz**, *INFN Sezione di Roma*

**N6-1: (16:00) The Electromagnetic Calorimeter of CMS**

W. Funk, *CERN, Switzerland*

On behalf of the CMS ECAL Collaboration

**N6-2: (16:15) Digital Hadron Calorimetry for the Linear Collider Using Gas Electron Multiplier Technology**

A. P. White, A. Brandt, K. De, S. Habib, V. Kaushik, J. Li, M. Sosebee, J. Yu, C. Han, J. Heatherly, J. Smith, *University of Texas at Arlington, USA*

**N6-3: (16:30) Performance of the Monitoring Light Source for the CMS Lead Tungstate Crystal Calorimeter**

L. Zhang, D. Bailleux, A. Bornheim, K. Zhu, R.-Y. Zhu, *California Institute of Technology, USA*

**N6-4: (16:45) A Scintillator Based Calorimeter with Novel Photo-Detectors**

F. Sefkow, *DESY, Germany*

On behalf of the CALICE Collaboration, Scintillator HCAL group

**N6-5: (17:00) The ATLAS Liquid Argon Electromagnetic Calorimeter: Construction, Commissioning, and Selected Test Beam Results**

M. Fanti, *Milano University and INFN, Italy*

On behalf of the ATLAS Liquid Argon Electromagnetic Calorimeter Group

**N6-6: (17:25) The ATLAS Hadronic Tile Calorimeter: from Construction Toward Physics**

C. Roda, *University and INFN Pisa, Italy*

On behalf of the The TileCal system of the ATLAS Collaboration

**N6-7: (17:40) Fine Grained Silicon-Tungsten Calorimetry for a Linear Collider Detector**

D. Strom, R. Frey, *University of Oregon, USA*; M. Breidenbach, D. Freytag, N. Graf, G. Haller, O. Milgrome, *Stanford Linear Accelerator Center, USA*; V. Radeka, *Brookhaven National Laboratory, USA*

**N7 Scintillation Detectors I**

Monday, October 18 16:00-18:00, Leptis Magna 4

Session Chair: **Craig Woody**, *BNL*

**N7-1: (16:00) Large Size LYSO Crystals for Future High Energy Physics Experiments**

R.-Y. Zhu, J. Chen, L. Zhang, *Caltech, USA*

**N7-2: (16:15) The Electromagnetic Calorimeter of the BTeV Experiment**

J. V. Yarba, *Fermilab, USA*; A. A. Derevschikov, V. I. Kravtsov, Y. A. Marulenko, N. G. Minaev, V. V. Mochalov, A. V. Ryazantsev, P. A. Semenov, K. E. Shestermanov, A. V. Uzunian, A. N. Vasiliev, *Institute for High Energy Physics, Russia*

**N7-3: (16:30) The Target Tracker Detector for OPERA Experiment**

Y. Gornushkin, *IREs, France*

On behalf of the Target Tracker group of OPERA Collaboration

**N7-4: (16:45) Liquid Xenon Scintillation Detector for the MEG Experiment**

T. Iwamoto, *University of Tokyo, Japan*

On behalf of the MEG Collaboration

**N7-5: (17:00) Liquid/Gas Double Phase Xenon Proportional Scintillation Detector for Underground Physics**

S. Suzuki, M. Yamashita, *Waseda University, Japan*

**N7-6: (17:15) Scintillation Spectroscopy with Phototubes in Liquid Xenon**

E. Aprile, K. L. Giboni, P. Majewski, K. Ni, M. Yamashita, *Columbia University, USA*

**N7-7: (17:30) CaMoO<sub>4</sub> Scintillation Crystal for the Search of Mo-100 Double Beta Decay**

S. Belogurov<sup>1</sup>, V. Kornoukhov<sup>1</sup>, A. Annenkov<sup>2</sup>, A. Borisevich<sup>2</sup>, A. Fedorov<sup>2</sup>, M. Korzhik<sup>2</sup>, V. Ligoun<sup>2</sup>, O. Missevitch<sup>2</sup>, S. K. Kim<sup>3</sup>, S. C. Kim<sup>3</sup>, S. Y. Kim<sup>3</sup>, J. W. Kwak<sup>3</sup>, H. S. Lee<sup>3</sup>, J. Lee<sup>3</sup>, S. S. Myung<sup>3</sup>, M. J. Lee<sup>3</sup>, Y. D. Kim<sup>4</sup>, J. Y. Lee<sup>4</sup>, J. I. Lee<sup>4</sup>, H. J. Kim<sup>5</sup>, Y. J. Kwon<sup>6</sup>, M. J. Hwang<sup>6</sup>, J. J. Zhu<sup>3,7</sup>

<sup>1</sup>*Institute for Theoretical and Experimental Physics, Russia*; <sup>2</sup>*Institute for Nuclear Problems, Belarus*; <sup>3</sup>*Seoul National University, South Korea*; <sup>4</sup>*Sejong University, South Korea*; <sup>5</sup>*Kyungpook National University, South Korea*; <sup>6</sup>*Yonsei University, South Korea*; <sup>7</sup>*Tsinghua University, China*

**N7-8: (17:45) Lanthanum Halide Scintillation Detectors: Industrialization & Performance**

B. P. Aléonard, A. Iltis, G. Gautier, *Saint-Gobain Cristaux & Détecteurs, France*; R. Csaba, R. Paul, M. Peter, *Saint-Gobain Crystals & Detectors, USA*

## N8 Analog and Digital Circuits II

Monday, October 18 16:00-18:00, Leptis Magna 3

Session Chair: Daniel Whiteson, *FNAL*

**N8-1: (16:00) Performance of the Optically-Coupled Current-Mirror with Its Input Stage Cooled to Cryogenic Temperature**

D. V. Camin, V. Grassi, *Dipartimento di Fisica dell'Università and INFN-Milano, Italy*

**N8-2: (16:15) 3DX: a Fast, Pixelated, Radiation Hard Readout Chip for Macro Molecular Crystallography Applications**

E. Mandelli<sup>1</sup>, D. Gnani<sup>2</sup>, C. Kenney<sup>2</sup>, G. J. Meddler<sup>1</sup>, S. Parker<sup>3</sup>, E. Westbrook<sup>2</sup>

<sup>1</sup>*Lawrence Berkeley National Laboratory, USA*; <sup>2</sup>*Molecular Biology Consortium, USA*; <sup>3</sup>*University of Hawaii, USA*

**N8-3: (16:30) Multichannel Energy and Timing Measurements with the Peak Detector/Deconvolutor ASIC**

P. O'Connor<sup>1</sup>, G. De Geronimo<sup>1</sup>, J. Grosholz<sup>2</sup>, A. Kandasamy<sup>1</sup>, S. Junnarkar<sup>1</sup>, J. Fried<sup>1</sup>

<sup>1</sup>*Brookhaven National Laboratory, USA*; <sup>2</sup>*eV Products, Inc., USA*

**N8-4: (16:45) A High Performance, Low-Noise 128-Channel Readout Integrated Circuit for Instrumentation and X-Ray Applications**

E. B. Beuville, M. Belding, A. Costello, R. Hansen, S. Petronio, *Indigo Systems Corp., USA*

**N8-5: (17:00) RX64DTH - a Fully Integrated 64-Channel ASIC for Digital X-Ray Imaging System with Energy Window Selection**

P. Grybos<sup>1</sup>, A. E. Cabal Rodriguez<sup>2</sup>, W. Dabrowski<sup>1</sup>, M. Idzik<sup>1</sup>, L. J. Gaitan<sup>3</sup>, F. Prino<sup>4</sup>, L. Ramello<sup>4,5</sup>, K. Swientek<sup>1</sup>, P. Wiacek<sup>1</sup>  
<sup>1</sup>*AGH University of Science and Technology, Poland*; <sup>2</sup>*CEADEN, Cuba*; <sup>3</sup>*University de los Andes, Columbia*; <sup>4</sup>*INFN, Italy*; <sup>5</sup>*DISTA, Università del Piemonte Orientale, Italy*

**N8-6: (17:15) Front-End Counting Mode Electronics for CZT Sensor Readout**

D. Moraes, P. Jarron, J. Kaplon, *CERN, Switzerland*; E. Nygard, *Interon AS, Norway*

**N8-7: (17:30) The MGPA Electromagnetic Calorimeter Readout Chip for CMS**

M. Raymond<sup>1</sup>, J. Crooks<sup>2</sup>, M. French<sup>2</sup>, G. Hall<sup>1</sup>  
<sup>1</sup>*Imperial College London, UK*; <sup>2</sup>*Rutherford Appleton Laboratory, UK*

**N8-8: (17:45) Four-Channel Current-Mode VLSI Shaping Amplifier with Selectable Time Constant for High-Resolution X-Ray Spectroscopy**

S. Buzzetti<sup>1,2</sup>, C. Guazzoni<sup>1,2</sup>, A. Longoni<sup>1,2,3</sup>  
<sup>1</sup>*Politecnico di Milano, Italy*; <sup>2</sup>*INFN, Italy*; <sup>3</sup>*IFN-CNR, Italy*

## N9 Astrophysics and Space Instrumentation: Satellite Based I

Monday, October 18 16:00-18:00, Orange 2

Session Chair: Michela Prest, *Università dell'Insubria, Como and INFN Trieste*

**N9-1, keynote: (16:00) The Alpha Magnetic Spectrometer on the International Space Station**

B. Borgia, *Università di Roma, Italy*  
On behalf of the AMS Collaboration

**N9-2, keynote: (16:30) The Silicon Strip Tracker of the GLAST Large Area Telescope**

L. Baldini, *INFN - Pisa, Italy*  
On behalf of the GLAST Collaboration

**N9-3: (17:00) A Position Sensitive Gamma-Ray Detector Based on Silicon Drift Detectors Coupled to Scintillators for Application in the MEGA Compton Telescope**

M. Marisaldi<sup>1</sup>, C. Labanti<sup>1</sup>, A. Bulgarelli<sup>1</sup>, G. Di Cocco<sup>1</sup>, G. Kanbach<sup>2</sup>, F. Gianotti<sup>1</sup>, A. Mauri<sup>1</sup>, E. Rossi<sup>1</sup>, A. Traci<sup>1</sup>, M. Trifoglio<sup>1</sup>  
<sup>1</sup>*CNR/INAF-IASF Istituto di Astrofisica Spaziale e Fisica Cosmica, Italy*; <sup>2</sup>*Max Planck Institute für Extraterrestrische Physik, Germany*

**N9-4: (17:15) The AGILE Gamma Ray Satellite: the Construction and Performance of the Silicon Tracker**

E. Vallazza<sup>1</sup>, G. Barbiellini<sup>1,2</sup>, F. Liello<sup>1,2</sup>, F. Longo<sup>1,2</sup>, B. Nadalut<sup>1</sup>, C. Pontoni<sup>1</sup>, M. Prest<sup>1,3</sup>  
<sup>1</sup>*INFN - Istituto Nazionale di Fisica Nucleare, Sezione di Trieste, Italy*; <sup>2</sup>*Università degli Studi di Trieste, Italy*; <sup>3</sup>*Università dell'Insubria, sede di Como, Italy*



**N9-5: (17:30) The Development of the High Energy Particle Detectors Onboard the SELENE Spacecraft**

T. Takashima, *Institute of Space and Astronautical Science, Japan*; T. Kashiwagi, *S. Okuno, Kanagawa University, Japan*; K. Mori, *CLEAR Pulse Corporatin, Japan*; H. Onabe, *Raytech Corporation, Japan*

**N9-6: (17:45) Compton Gamma-Ray Imager Using Electron Tracking Gaseous TPC and Scintillation Camera**

H. Kubo, *K. Hattori, K. Miuchi, T. Nagayoshi, H. Nishimura, Y. Okada, R. Orito, H. Sekiya, A. Takada, A. Takeda, T. Tanimori, M. Ueno, Kyoto University, Japan*

**N10 Nuclear Monitoring for Safeguards and Security**

Monday, October 18 16:00-18:00, Spalato  
Session Chair: **Thomas Otto, CERN**

**N10-1: (16:00) A Real Time, Isotope Identifying Gamma Spectrometer for Monitoring of Pedestrians**

R. Arlt, *International Atomic Energy Agency, Austria*; M. Schrenk, *H. Boeck, Atom Institute of the Austrian Universities, Austria*; P. Beck, *Austrian Research Center Seibersdorf, Austria*; F. Schmidt, *Federal Ministry Labour and Work, Austria*; G. Marosi, *Federal Ministry of Finance (Customs), Austria*; C. Krol, *G. Moser, Federal Ministry of the Interior, Austria*

**N10-2: (16:15) Field Test of a NaI(Tl)-Based Vehicle Portal Monitor at a Border Crossing**

D. C. Stromswold, *B. D. Milbrath, D. L. Stephens, L. C. Todd, R. R. Hansen, R. T. Kouzes, Pacific Northwest National Laboratory, USA*

**N10-3: (16:30) Unattended Monitoring Experience at the International Atomic Energy Agency**

M. Aparo, *M. Schanfein, J. Halbig, IAEA, Austria*

**N10-4: (16:45) Thermal Neutron Backscatter Imaging**

P. E. Vanier, *L. Forman, G. C. Smith, Brookhaven National Laboratory, USA*

**N10-5: (17:00) The PELAN System for UXO, Landmine, and Container Inspection**

D. T. Holslin, *R. deHaas, G. Borgonovi, J. J. Martinez, SAIC, USA*

**N10-6: (17:15) Tracking Fuel Burn-up with Antineutrino Detectors**

A. Bernstein<sup>1</sup>, J. K. Estrada<sup>2</sup>, N. Bowden<sup>2</sup>, C. Hagmann<sup>2</sup>, C. M. Greaves<sup>2</sup>, D. Carr<sup>1</sup>, J. Batteux<sup>1</sup>

<sup>1</sup>Lawrence Livermore National Laboratory, USA; <sup>2</sup>Sandia National Laboratories, USA

**N10-7: (17:30) On-Line Interrogation of Pebble Bed Reactor Fuel**

A. I. Hawari, *North Carolina State University, USA*; J. Chen, *University of Cincinnati, USA*

**N10-8: (17:45) ISOCS Characterization of Sodium Iodide Detectors for Gamma-Ray Spectrometry**

S. A. Philips, *F. Bronson, R. Venkataraman, B. M. Young, Canberra Industries, Inc., USA*

**N11 High Energy Physics Detectors III : Muons**

Tuesday, October 19 08:30-10:30, Leptis Magna 1&2  
Session Chair: **Anna Di Ciaccio, University of Roma "Tor Vergata" and INFN**

**N11-1: (08:30) System Test of the ATLAS Muon Spectrometer in the H8 Beam at the CERN SPS**

R. Voss, *CERN, Switzerland*  
On behalf of the ATLAS Muon Collaboration

**N11-2: (08:45) Test and Calibration of Large Drift Tube Chambers with Cosmic Muons**

O. Biebel<sup>1</sup>, T. Christiansen<sup>1</sup>, J. Dubbert<sup>1</sup>, F. Fiedler<sup>1</sup>, R. Hertenberger<sup>1</sup>, O. Kortner<sup>1,2</sup>, T. Nunnemann<sup>1</sup>, F. Rauscher<sup>1</sup>, D. Schaile<sup>1</sup>, A. Staud<sup>1</sup>, R. Ströhrmer<sup>1</sup>, B. Ujavri<sup>1</sup>, C. F. Vollmer<sup>1</sup>  
<sup>1</sup>Ludwig-Maximilians-Universität, Germany; <sup>2</sup>Max-Planck-Institut für Physik, Germany

**N11-3: (09:00) Performance of 2nd Generation BaBar Resistive Plate Chambers**

H. R. Band, *Univ. of Wisconsin, USA*  
On behalf of the BABAR IFR Group

**N11-4: (09:15) Aging Test of ATLAS RPCs at CERN's Gamma Irradiation Facility**

A. Di Simone, *INFN, Italy*  
On behalf of the ATLAS RPC Collaboration

**N11-5: (09:30) Cathode Strip Chambers for the CMS Muon System**

A. Korytov, *University of Florida, USA*  
On behalf of the CMS Collaboration

**N11-6: (09:45) Recent and Ongoing Ageing Studies for the ATLAS Muon Spectrometer Drift Tubes**

C. Adorisio<sup>1</sup>, M. Cirilli<sup>2</sup>, S. Palestini<sup>2</sup>, A. D. Domenico<sup>3</sup>, A. D. Girolamo<sup>3</sup>, P. Valente<sup>3</sup>, S. Zimmermann<sup>4</sup>, C. Cernoch<sup>2</sup>  
<sup>1</sup>Università della Calabria, Italy; <sup>2</sup>CERN, Switzerland; <sup>3</sup>Università La Sapienza, Italy; <sup>4</sup>Albert-Ludwigs-Universitaet, Germany

**N11-7: (10:00) The Certification of ATLAS Thin Gap Chambers Produced in Israel and China**

E. Etzion, *Tel Aviv University, Israel*  
On behalf of the ATLAS TGC Group

**N11-8: (10:15) Mapping the Large Area Straw Detectors of the COMPASS Experiment with X-Rays**

K. Platzter, W. Dünnweber, N. Dedek, M. Faessler, R. Geyer, C. Ilgner, *Ludwig-Maximilians-Universität, Germany*; V. Peshekhonov, *JINR, Russia*; H. Wellenstein, *Brandeis University, USA*

## N12 Scintillation Detectors II

Tuesday, October 19 08:30-10:30, Leptis Magna 4  
Session Chair: **Renyuan Zhu**, *Caltech*

### N12-1: (08:30) Cerium Oxidation State in LSO and LYSO Scintillators

C. L. Melcher<sup>1</sup>, S. Friedrich<sup>2</sup>, M. A. Spurrier<sup>1</sup>, P. Szupryczynski<sup>1</sup>, R. Nutt<sup>1</sup>

<sup>1</sup>CTI Molecular Imaging, Inc., USA; <sup>2</sup>Lawrence Livermore National Laboratory, USA

### N12-2: (08:45) Evaluations of Properties of YAG (Ce) Ceramic Crystal Scintillators

T. Yanagida, H. Takahashi, T. Ito, D. Kasama, M. Kokubun, K. Makishima, *University of Tokyo, Japan*; T. Yanagitani, H. Yagi, *Konoshima chemical Co., Ltd., Japan*; T. Shigeta, T. Ito,  *Baikowski Japan Co., Ltd., Japan*

### N12-3: (09:00) Development of Inorganic Thermal-Neutron Scintillators

A. Bessiere, P. Dorenbos, J. T. M. de Haas, C. W. E. van Eijk, *Delft University of Technology, the Netherlands*

### N12-4: (09:15) A New Sensor for Thermal Neutron Imaging

I. Shestakova<sup>1</sup>, S. V. Tipnis<sup>1</sup>, V. Gaysinskiy<sup>1</sup>, J. Antal<sup>2</sup>, L. Bobek<sup>2</sup>, V. V. Nagarkar<sup>1</sup>

<sup>1</sup>RMD Inc., USA; <sup>2</sup>University of Massachusetts, USA

### N12-5: (09:30) Preliminary Results of a Comparative Study of Fast Scintillators for a Thermal Neutron Activation Landmine Detector

J. E. McFee, A. A. Faust, *Defence R&D Canada - Suffield, Canada*; H. R. Andrews, T. Clifford, H. Ing, *Bubble Technology Industries, Canada*

### N12-6: (09:45) Performance of Large Segmented Liquid Scintillator Arrays

A. Bernstein, J. Millaud, N. Madden, *Lawrence Livermore National Laboratory, USA*

### N12-7: (10:00) Evaluation of ZnO:Ga Alpha Detectors for Use in Neutron Generators

J. S. Neal<sup>1</sup>, J. C. Cooper<sup>2</sup>, D. S. Koltick<sup>2</sup>, J. T. Mihalcz<sup>1</sup>, E. Bourret-Courchesne<sup>3</sup>, S. E. Derenzo<sup>3</sup>

<sup>1</sup>Oak Ridge National Laboratory, USA; <sup>2</sup>Purdue University, USA;

<sup>3</sup>Lawrence Berkeley National Laboratory, USA

### N12-8: (10:15) Optical and Scintillation Properties of Cs<sub>2</sub>LiYCl<sub>6</sub>:Ce<sup>3+</sup> and Cs<sub>2</sub>LiYCl<sub>6</sub>:Pr<sup>3+</sup> Crystals

E. V. Van Loef, J. Glodo, W. M. Higgins, K. S. Shah, *Radiation Monitoring Devices, USA*

## N13 Data Acquisition and Analysis Systems I

Tuesday, October 19 08:30-10:30, Leptis Magna 3  
Session Chair: **Luciano Musa**, *CERN*

### N13-1: (08:30) Digital Pulse-Shape Technique for Charge Discrimination in Reversed CHIMERA Silicon Detectors

P. Guazzoni<sup>1</sup>, M. Alderighi<sup>2</sup>, A. Anzalone<sup>1</sup>, R. Bassini<sup>1</sup>, C. Boiano<sup>1</sup>, G. Cardella<sup>3</sup>, S. Cavallaro<sup>1</sup>, E. De Filippo<sup>3</sup>, E. Geraci<sup>3</sup>, F. Giustolisi<sup>1</sup>,

E. Laguidara<sup>1</sup>, G. Lanzano<sup>3</sup>, G. Lanzalone<sup>1</sup>, A. Pagano<sup>3</sup>, M. Papa<sup>3</sup>, S. Pirrone<sup>3</sup>, G. Politi<sup>3</sup>, F. Porto<sup>1</sup>, S. Russo<sup>1</sup>, M. Sassi<sup>1</sup>, G. Sechi<sup>2</sup>, L. Zetta<sup>1</sup>

<sup>1</sup>Università degli Studi and INFN, Italy; <sup>2</sup>CNR, Italy; <sup>3</sup>Università and INFN, Italy

### N13-2: (08:45) PeakDoctor Spectral Analysis Software

S. E. Garner, *Los Alamos National Laboratory, USA*

### N13-3: (09:00) Evaluation of Digitizer Properties on Pulse Shape Discrimination in an EJ-301 Cell

M. A. Nelson, D. R. Dinwiddie, W. Baird, B. D. Rooney, *Los Alamos National Laboratory, USA*

### N13-4: (09:15) A New Filter Concept Yielding Improved Resolution and Throughput in Radiation Detection Systems

A. Geraci, R. Abbiati, G. Ripamonti, *Politecnico di Milano, Italy*

### N13-5: (09:30) Wavelet Analysis of Gamma-Ray Spectra

C. J. Sullivan, S. E. Garner, K. B. Butterfield, *Los Alamos National Laboratory, USA*

### N13-6: (09:45) Digital Signal Processing Based on a Clustering Algorithm for Ir/Au TES Microcalorimeter

N. Zen<sup>1</sup>, H. Takahashi<sup>1</sup>, D. Fukuda<sup>2</sup>, Y. Kunieda<sup>1</sup>, K. Hiramoto<sup>1</sup>, M. Nakazawa<sup>1</sup>, M. Ukibe<sup>2</sup>, M. Ohkubo<sup>2</sup>

<sup>1</sup>University of Tokyo, Japan; <sup>2</sup>National Institute of Advanced Industrial Science and Technology, Japan

### N13-7: (10:00) Signal Digitizer-Finder Prototype for TA Fluorescence Telescope

S. Ogio, *Tokyo Institute of Technology, Japan*; M. Fukushima, H. Sagawa, A. Taketa, S. Udou, *University of Tokyo, Japan*; M. Tanaka, T. Matsuda, *High Energy Accelerator Research Organization (KEK), Japan*; K.-I. Kadota, *Musashi Institute of Technology, Japan*

### N13-8: (10:15) A Sampling ADC Data Acquisition System for Positron Emission Tomography

A. Mann, B. Grube, I. Konorov, S. Paul, L. Schmitt, D. McElroy, S. Ziegler, *Technische Universität München, Germany*

## N14 Astrophysics and Space Instrumentation: Satellite Based II

Tuesday, October 19 08:30-10:30, Orange 2  
Session Chair: **Simonetta Gentile**, *University of Rome and INFN*

### N14-1, keynote: (08:30) The Swift Gamma-Ray Burst Mission

N. Gehrels, *NASA-GSFC, USA*

On behalf of the Swift Team

### N14-2, keynote: (09:00) Low Temperature Detectors for Photon Spectroscopy in Astronomy and Astrophysics

A. E. G. Giuliani, *Università dell'Insubria, Italy*

### N14-3: (09:30) The Space Borne Multi-Wavelength Gamma-Ray Burst Detector ECLAIRS

S. Schanne, *CEA Saclay, France*

On behalf of the ECLAIRS Collaboration

#### **N14-4: (09:45) Development of the HXD Anti Counters Onboard Astro-E2**

K. Yamaoka<sup>1</sup>, M. Ohno<sup>2</sup>, Y. Terada<sup>3</sup>, S. Hong<sup>3,4</sup>, J. Kotoku<sup>5</sup>, Y. Okada<sup>6</sup>, A. Tsutsui<sup>1</sup>, M. Mori<sup>3</sup>, K. Makishima<sup>6</sup>, M. Kokubun<sup>6</sup>, T. Murakami<sup>7</sup>, D. Yonetoku<sup>7</sup>, M. Nomachi<sup>8</sup>, T. Kamae<sup>9</sup>, T. Takahashi<sup>10</sup>, K. Nakazawa<sup>10</sup>, M. Tashiro<sup>3</sup>, I. Takahashi<sup>6</sup>, S. Watanabe<sup>10</sup>, Y. Fukazawa<sup>2</sup>

<sup>1</sup>Aoyama Gakuin University, Japan; <sup>2</sup>Hiroshima University, Japan; <sup>3</sup>Institute of Physical and Chemical Research, Japan; <sup>4</sup>Saitama University, Japan; <sup>5</sup>Tokyo Institute Technology, Japan; <sup>6</sup>Tokyo University, Japan; <sup>7</sup>Kanazawa University, Japan; <sup>8</sup>Osaka University, Japan; <sup>9</sup>Stanford Linear Accelerator Center (SLAC), USA; <sup>10</sup>Institute of Space and Astronautical Science, Japan

#### **N14-5: (10:00) Design and Performance of Soft Gamma-Ray Detector for NeXT Mission**

H. Tajima<sup>1</sup>, T. Kamae<sup>1</sup>, G. Madejski<sup>1</sup>, T. Mitani<sup>2,3</sup>, K. Nakazawa<sup>2</sup>, T. Tanaka<sup>2,3</sup>, T. Takahashi<sup>2,3</sup>, S. Watanabe<sup>2</sup>, Y. Fukazawa<sup>4</sup>, M. Kokubun<sup>5</sup>, K. Makishima<sup>3</sup>, Y. Terada<sup>5</sup>, M. Nomachi<sup>6</sup>, J. Kataoka<sup>7</sup>, M. Tashiro<sup>8</sup>

<sup>1</sup>Stanford Linear Accelerator Center, USA; <sup>2</sup>Institute of Space and Astronautical Science, Japan; <sup>3</sup>University of Tokyo, Japan; <sup>4</sup>Hiroshima University, Japan; <sup>5</sup>RIKEN, Japan; <sup>6</sup>Osaka University, Japan; <sup>7</sup>Tokyo Institute of Technology, Japan; <sup>8</sup>Saitama University, Japan

#### **N14-6: (10:15) The XEUS Wide Field Imager**

P. H. Lechner, PNsensor GmbH, Germany  
On behalf of the XEUS Instrument Working Group

### **N15 Nuclear Monitoring: Detectors and Assessments**

Tuesday, October 19 08:30-10:30, Spalato  
Session Chair: Marco Silari, CERN

#### **N15-1: (08:30) Detection Sensitivity with Compton Imagers**

L. Mihailescu, K. Vetter, K. E. Nelson, M. Burks, E. Hull, Lawrence Livermore National Laboratory, USA

#### **N15-2: (08:45) Source-Search Sensitivity of a Large-Area, Coded-Aperture, Gamma-ray Imager**

K. P. Ziolk<sup>1</sup>, W. W. Craig<sup>1</sup>, L. Fabris<sup>1</sup>, R. C. Lanza<sup>2</sup>, S. Gallagher<sup>2</sup>, B. K. P. Horn<sup>2</sup>, N. W. Madden<sup>1</sup>, E. Smith<sup>3</sup>, M. Woodring<sup>3</sup>

<sup>1</sup>LLNL, USA; <sup>2</sup>MIT, USA; <sup>3</sup>PNNL, USA

#### **N15-3: (09:00) Detection of Sr-90 with Aerogel Cherenkov Detector with Low Background**

R. Pestotnik<sup>1</sup>, S. Korpar<sup>2,1</sup>, P. Krizan<sup>3,1</sup>, A. Stanovnik<sup>3,1</sup>

<sup>1</sup>Joyef Stefan Institute, Slovenia; <sup>2</sup>University of Maribor, Slovenia; <sup>3</sup>University of Ljubljana, Slovenia

#### **N15-4: (09:15) A Micrometric Thickness Silicon Diode Proposed as a Microdosimeter**

A. Fazzi, S. Agosteo, A. Pola, V. Varoli, Politecnico di Milano, Italy; P. Zotto, INFN e Università di Padova, Italy

#### **N15-5: (09:30) Response of RadFET Dosimeters to High Fluences of Fast Neutrons**

F. Ravotti, M. Glaser, M. Moll, C. Ilgner, CERN, Switzerland; B. Camanzi, Rutherford Appleton Laboratory, UK; A. Holmes-Siedle, REM Oxford Ltd., UK

#### **N15-6: (09:45) The Efficiency of Thermal Neutron Detection and Collimation with Microchannel Plates of Square and Circular Geometry**

A. S. Tremsin, University of California at Berkeley, USA; W. B. Feller, R. G. Downing, NOVA Scientific, Inc., USA; D. F. R. Mildner, National Institute of Standards and Technology, USA

#### **N15-7: (10:00) Generalized Multicoincidence Analysis Methods**

G. A. Warren, L. E. Smith, C. E. Aalseth, J. E. Ellis, A. E. Valsan, W. Mengesha, Pacific Northwest National Laboratory, USA

#### **N15-8: (10:15) Dose Rate Assessment in Complex Geometries**

J. M. Perez, E. Burgos, J. M. Perez, CIEMAT, Spain

### **N16 NSS Poster I**

Tuesday, October 19 11:00-12:30, Poster Area Upper Level  
Session Chairs: Maxim Titov, Freiburg University / ITEP Moscow  
Ingrid Gregor, DESY  
Hiroyuki Iwasaki, KEK

### **Astrophysics and Space Instrumentation**

#### **N16-1: The Alpha Magnetic Spectrometer Transition Radiation Detector**

B. Borgia, INFN Rome, Italy

#### **N16-2: A Monolithic, Multi-Channel GSa/s Transient Waveform Recorder for Measuring Radio Emissions from High Energy Particle Cascades**

G. S. Varner, P. W. Gorham, M. K. Wilcox, Univ. of Hawaii, USA

#### **N16-3: The X-Ray Facility of the Physics Department of the Ferrara University**

G. Loffredo<sup>1</sup>, F. Frontera<sup>1,2</sup>, D. Pellicciotta<sup>1</sup>, A. Pisa<sup>1</sup>, V. Carassiti<sup>3</sup>, S. Chiozzi<sup>3</sup>, F. Evangelisti<sup>3</sup>, M. Melchiorri<sup>3</sup>, L. Landi<sup>3</sup>, S. Squerzanti<sup>3</sup>  
<sup>1</sup>Università di Ferrara, Italy; <sup>2</sup>IASF, CNR, Italy; <sup>3</sup>Istituto Nazionale di Fisica Nucleare, Italy

#### **N16-4: Gas Permeation Barriers for Polyimide X-Ray Windows**

H. J. Sipila, M. V. T. Kaipainen, Metorex International, Finland

#### **N16-5: The MiniCalorimeter for the AGILE Satellite**

C. Labanti<sup>1</sup>, A. Argan<sup>1</sup>, A. Bulgarelli<sup>1</sup>, G. Di Cocco<sup>1</sup>, M. Galli<sup>2</sup>, F. Gianotti<sup>1</sup>, M. Marisaldi<sup>1</sup>, A. Mauri<sup>1</sup>, E. Rossi<sup>1</sup>, M. Tavani<sup>1</sup>, A. Traci<sup>1</sup>, M. Trifoglio<sup>1</sup>

<sup>1</sup>IASF CNR-INAF, Italy; <sup>2</sup>ENEA, Italy

#### **N16-6: The Power Supply System of the AMS-02 Tracker Detector**

M. Menichelli, G. Ambrosi, R. Battiston, M. Bizzarri, S. Blasko, D. Cosson, E. M. Fiori, O. Maris, A. Papi, G. Scolieri, INFN Sezione di Perugia, Italy

#### **N16-7: Long Position-Sensitive CsI(Tl) Detectors for the GLAST Project**

O. V. Gekhtin, D. Zosim, A. Y. Boyarintsev, V. Gavryluk, Institute for Scintillation Materials, Ukraine; S. Bergenius, P. Carlson, M. Pearce, Royal Institute of Technology (KTH), Sweden; S. Carius, G. Johansson, Kalmar University, Sweden; J. E. Grove, Naval Research Laboratory, USA

#### N16-8: Performances and Space Qualification Tests of the AMS Time of Flight

C. Sbarra<sup>1</sup>, L. Amati<sup>2</sup>, D. Baldassari<sup>2</sup>, V. Bindi<sup>2</sup>, D. Casadei<sup>1</sup>, G. Castellini<sup>3</sup>, F. Cindolo<sup>1</sup>, A. Contin<sup>2</sup>, F. Giovacchini<sup>2</sup>, G. Laurenti<sup>1</sup>, G. Levi<sup>2</sup>, R. Martelli<sup>2</sup>, A. Oliva<sup>2</sup>, F. Palmonari<sup>2</sup>, L. Quadrani<sup>2</sup>, L. Villa<sup>2</sup>, A. Zichichi<sup>2</sup>

<sup>1</sup>INFN-Bologna, Italy; <sup>2</sup>Bologna University, Italy; <sup>3</sup>CNR-Iroé, Italy

#### N16-9: ALTEA: Flight Model Calibration at GSI

V. Zaconte<sup>1,2</sup>, <sup>1</sup>University of Rome Tor Vergata, Italy; <sup>2</sup>INFN, Italy  
On behalf of the ALTEA Team

#### N16-10: The Data Handling System for the AGILE Satellite

A. Argan<sup>1</sup>, A. Bulgarelli<sup>2</sup>, V. Cocco<sup>3</sup>, M. Feroci<sup>4</sup>, T. Froyland<sup>3</sup>, M. Galli<sup>3</sup>, F. Gianotti<sup>2</sup>, A. Giuliani<sup>1</sup>, C. Labanti<sup>2</sup>, I. Lapshov<sup>4</sup>, F. Longo<sup>6,7</sup>, M. Marisaldi<sup>2</sup>, L. Nicolini<sup>8</sup>, M. Palazzo<sup>8</sup>, A. Pellizzoni<sup>1</sup>, F. Perotti<sup>1</sup>, B. Preger<sup>4</sup>, M. Prest<sup>9,7</sup>, P. Soffitta<sup>4</sup>, M. Tavani<sup>4</sup>, M. Trifoglio<sup>2</sup>, E. Vallazza<sup>2</sup>, S. Vercellone<sup>1</sup>

<sup>1</sup>IASF-CNR Sezione Milano, Italy; <sup>2</sup>IASF-CNR Sezione Bologna, Italy; <sup>3</sup>Univ. Roma-II and INFN, Italy; <sup>4</sup>IASF-CNR Sezione Roma, Italy; <sup>5</sup>ENEA Sezione Bologna, Italy; <sup>6</sup>Univ. di Trieste, Italy; <sup>7</sup>INFN Sezione di Trieste, Italy; <sup>8</sup>LABEN S.p.A, Italy; <sup>9</sup>Univ. dell'Insubria Sezione di Como, Italy

#### N16-11: Detection of Gamma Ray Polarization Using a 3D Position Sensitive CdZnTe Detector

D. Xu, Z. He, F. Zhang, University of Michigan, USA

#### N16-12: Status of SuperAGILE an X-Ray Monitor on-Board the AGILE Mission: the Engineering Model

P. Soffitta<sup>1</sup>, E. Costa<sup>1</sup>, E. Del Monte<sup>1</sup>, G. Di Persio<sup>1</sup>, I. Donnarumma<sup>1</sup>, M. Feroci<sup>1</sup>, I. Lapshov<sup>1</sup>, F. Lazzarotto<sup>1</sup>, M. Mastropietro<sup>2</sup>, E. Morelli<sup>3</sup>, L. Pacciani<sup>1</sup>, B. Preger<sup>1</sup>, M. Rapisarda<sup>1</sup>, A. Rubini<sup>1</sup>, M. Tavani<sup>1</sup>, M. Prest<sup>4</sup>, E. Vallazza<sup>5</sup>, A. Argan<sup>6</sup>, S. Mereghetti<sup>6</sup>, S. Vercellone<sup>6</sup>

<sup>1</sup>IASF/CNR, Italy; <sup>2</sup>Istituto di Metodologie Inorganiche e dei Plasmi del CNR, Italy; <sup>3</sup>IASF/CNR - Sezione di Bologna, Italy; <sup>4</sup>Università dell'Insubria - sede di Como, Italy; <sup>5</sup>INFN-sezione di Trieste, Italy; <sup>6</sup>IASF/CNR - Sezione di Milano, Italy

#### N16-13: The Thermal and Vibrational Tests of the AGILE Silicon Tracker

C. Pontoni<sup>1</sup>, G. Barbiellini<sup>1,2</sup>, F. Liello<sup>1,2</sup>, F. Longo<sup>1,2</sup>, B. Nadalut<sup>1</sup>, M. Prest<sup>1,3</sup>, E. Rotta<sup>4</sup>, E. Vallazza<sup>1</sup>

<sup>1</sup>Istituto Nazionale di Fisica Nucleare, Italy; <sup>2</sup>Università degli Studi di Trieste, Italy; <sup>3</sup>Università dell'Insubria, sede di Como, Italy; <sup>4</sup>Politecnico di Milano, Italy

#### N16-14: Thermal Design and Performance of the Gamma Ray Spectrometer for the Mercury MESSENGER Spacecraft

M. Burks, C. Cork, E. Hull, N. Madden, W. Miller, Lawrence Livermore National Laboratory, USA; E. Rhodes, J. Goldsten, B. Williams, Applied Physics Laboratory, Johns Hopkins University, USA

#### N16-15: X-Ray Imaging Telescope Using Fresnel Zone Plates and Pixelated APDs to Achieve Extremely High Spatial Resolution

G. Entine<sup>1</sup>, R. Myers<sup>1</sup>, R. Farrell<sup>1</sup>, T. Tiernan<sup>1</sup>, J. Christian<sup>1</sup>, A. Kogan<sup>1</sup>, F. Robertson<sup>1</sup>, M. Woodring<sup>2</sup>, M. Squillante<sup>1</sup>

<sup>1</sup>Radiation Monitoring Devices, Inc., USA; <sup>2</sup>Pacific Northwest Laboratories, USA

#### N16-16: Characterization of Birefringence Signals in Vacuum with the PVLAS Ellipsometer

E. Zavattini<sup>1</sup>, G. Zavattini<sup>2</sup>, G. Ruoso<sup>3</sup>, E. Polacco<sup>4</sup>, E. Milotti<sup>5</sup>, M. Karuza<sup>1</sup>, U. Gastaldi<sup>3</sup>, G. Di Domenico<sup>2</sup>, F. Della Valle<sup>1</sup>, R. Cimino<sup>6</sup>, S. Carusotto<sup>4</sup>, G. Cantatore<sup>1</sup>

<sup>1</sup>Università di Trieste e INFN-Trieste, Italy; <sup>2</sup>Università di Ferrara e INFN-Ferrara, Italy; <sup>3</sup>INFN - Lab. Naz. di Legnaro, Italy; <sup>4</sup>Università di Pisa e INFN-Pisa, Italy; <sup>5</sup>Università di Udine e INFN-Trieste, Italy; <sup>6</sup>INFN - Lab. Naz. di Frascati, Italy

#### N16-17: Development of a Monte Carlo Simulator for the Astro-E2 Hard X-Ray Detector (HXD-II)

Y. Terada<sup>1</sup>, S. Watanabe<sup>2</sup>, T. Takahashi<sup>2</sup>, M. Ohno<sup>3</sup>, M. Suzuki<sup>4</sup>, M. Murashima<sup>5</sup>, M. Tashiro<sup>4</sup>, M. Kokubun<sup>3</sup>, K. Makishima<sup>1,5</sup>, T. Kamae<sup>6</sup>, T. Murakami<sup>7</sup>, M. Nomachi<sup>8</sup>, Y. Fukazawa<sup>3</sup>, K. Yamaoka<sup>9</sup>, K. Nakazawa<sup>2</sup>, D. Yonetoku<sup>7</sup>

<sup>1</sup>RIKEN, Japan; <sup>2</sup>JAXA, Japan; <sup>3</sup>Hiroshima University, Japan; <sup>4</sup>Saitama University, Japan; <sup>5</sup>University of Tokyo, Japan; <sup>6</sup>Stanford University, USA; <sup>7</sup>Kanazawa University, Japan; <sup>8</sup>Osaka University, Japan; <sup>9</sup>Aoyama University, Japan

#### N16-18: Laue Lens Development for Hard X-Rays (>60 keV)

D. Pellicciotta<sup>1</sup>, F. Frontera<sup>1,2</sup>, G. Loffredo<sup>1</sup>, A. Pisa<sup>1</sup>, K. Andersen<sup>3</sup>, P. Courtois<sup>3</sup>, B. Hamelin<sup>3</sup>, L. Amati<sup>2</sup>, T. Franceschini<sup>2</sup>, G. Landini<sup>2</sup>, S. Silvestri<sup>2</sup>

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#### N16-19: Apparatus to Search for Optical Flashes of Extragalactic Origin

S. Stankiewicz<sup>1</sup>, A. Burd<sup>1</sup>, M. Cwiok<sup>2</sup>, W. Dominik<sup>2</sup>, M. Grajda<sup>1</sup>, G. Kasprowicz<sup>1</sup>, M. Jegier<sup>1</sup>, L. Mankiewicz<sup>3</sup>, K. Nawrocki<sup>4</sup>, B. Pilecki<sup>3</sup>, L. W. Piotrowski<sup>2</sup>, G. Pojmanski<sup>3</sup>, K. Pozniak<sup>1</sup>, R. Romaniuk<sup>1</sup>, R. Salanski<sup>1</sup>, M. Sokolowski<sup>4</sup>, D. Szczygiel<sup>5</sup>, G. Wrochna<sup>4</sup>

<sup>1</sup>Institute of Electronics Systems, Warsaw University of Technology, Poland; <sup>2</sup>Institute of Experimental Physics, Warsaw University, Poland; <sup>3</sup>Center for Theoretical Physics PAS, Poland; <sup>4</sup>Soltan Institute for Nuclear Studies, Poland; <sup>5</sup>Astronomical Observatory, Warsaw University, Poland

#### N16-20: Preflight Calibration and Performance of the Astro-E2/HXD-II Anti Counter as the All Sky Monitor

M. Ohno<sup>1</sup>, Y. Fukazawa<sup>1</sup>, K. Yamaoka<sup>2</sup>, M. Kokubun<sup>3</sup>, Y. Terada<sup>4</sup>, J. Kotoku<sup>5</sup>, S. Hong<sup>4,6</sup>, M. Mori<sup>6</sup>, K. Makishima<sup>3</sup>, T. Murakami<sup>7</sup>, K. Nakazawa<sup>8</sup>, T. Takahashi<sup>8</sup>, M. Tashiro<sup>6</sup>

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#### N16-21: The Effect of Radiation Damage and Background Events on Optical CCDs Operating in Time Delay Integration Mode

R. M. Ambrosi, M. Denby, University of Leicester, UK

#### N16-22: Use of CZT Detectors for Transient Event Detection

E. M. Quadriani, M. Alderighi, G. Conti, S. D'Angelo, B. Falconi, M. Fiorini, N. La Palombara, G. Sarri, G. Sechi, M. Uslenghi,



G. La Rosa, A. Segreto, M. Federici, M. Frutti, L. Natalucci, P. Ubertini, *IASF/CNR, Italy*

**N16-23: The AMS Brick: an HV Power Supply for the Space Experiment AMS-02**

S. Galeotti, F. Cervelli, M. Incagli, F. Spinella, F. Pilo, G. Venanzoni, E. Pedreschi, S. DiFalco, M. Pindibene, F. Gherarducci, *I.N.F.N. sez. Pisa, Italy*; G. Castellini, *IROE CNR Firenze, Italy*; D. Casadei, F. Palmonari, *University and INFN sez. Bologna, Italy*; J. Marin Munoz, J. Berdugo, *CIEMAT Madrid, Spain*; F. Petroni, S. D'Argliano, L. Fontani, A. Puccini, *CAEN Aerospace, Viareggio, Italy*; M. Capell, A. Lebedev, *MIT, USA*; G. Ambrosi, *INFN sez. Perugia, Italy*

**N16-24: Pressure and Temperature Dependence of the Primary Scintillation in Air**

M. F. R. Fraga<sup>1</sup>, A. Onofre<sup>1,2</sup>, N. Castro<sup>1</sup>, R. Ferreira Marques<sup>1</sup>, S. Fetal<sup>1,3</sup>, F. Fraga<sup>1</sup>, M. Pimenta<sup>4</sup>, A. Policarpo<sup>1</sup>, F. Veloso<sup>1</sup>

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**N16-25: Status of the CERN Axion Solar Telescope (CAST) Experiment**

M. Davenport, *CERN, Switzerland*  
On behalf of the CAST Collaboration

**N16-26: A Sealed Gaseous Electron Multiplier for X-Ray Astronomy**

J. Heino<sup>1</sup>, H. Andersson<sup>2</sup>, T. Andersson<sup>2</sup>, M. Eräluoto<sup>1</sup>, F. Garcia<sup>1</sup>, J. Huovelin<sup>3</sup>, K. Kurvinen<sup>1</sup>, R. Lauhakangas<sup>1</sup>, S. Nenonen<sup>2</sup>, A. Numminen<sup>1</sup>, J. Ojala<sup>1</sup>, R. Orava<sup>3</sup>, J. Schultz<sup>3</sup>, H. Sipilä<sup>3</sup>, O. Vilhu<sup>3</sup>

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**N16-27: CASTER - a Scintillator-Based Black Hole Finder Probe**

W. S. Paciesas<sup>1</sup>, M. Cherry<sup>2</sup>, J. Cravens<sup>3</sup>, T. G. Guzik<sup>2</sup>, R. M. Kippen<sup>4</sup>, J. R. Macri<sup>5</sup>, M. McConnell<sup>5</sup>, R. S. Miller<sup>1</sup>, J. M. Ryan<sup>5</sup>, B. Schaefer<sup>2</sup>, J. G. Stacy<sup>2,6</sup>, W. T. Vestrand<sup>4</sup>, P. von Ballmoos<sup>7</sup>, J. P. Wefel<sup>2</sup>

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**N16-28: Performance of a Chamber for Studying the Liquid Xenon Response to Nuclear Recoils**

V. Chepel, F. Neves, V. Solovov, A. Pereira, M. I. Lopes, J. Pinto da Cunha, P. J. B. Mendes, A. Lindote, C. F. P. Silva, R. Ferreira Marques, A. J. P. L. Policarpo, *LIP-Coimbra and CFRM of the Physics Department of the University of Coimbra, Portugal*

**N16-29: The IceCube Digital Optical Module**

A. Goldschmidt, *Lawrence Berkeley National Laboratory, USA*  
On behalf of the IceCube Collaboration

**N16-30: Fast Timing Measurement of Gamma Ray Events in Liquid Xenon**

P. Majewski, E. Aprile, K.-L. Giboni, K. Ni, M. Yamashita, *Columbia University, Astrophysics Laboratory, USA*

**N16-31: Separation of Cosmic-Ray Components in Water Cherenkov Detectors**

L. Villaseñor, *University of Michoacan, Mexico*; H. Salazar, *University of Puebla, Mexico*

**N16-32: Performance of a Purification System with Continuous Circulation Developed for Liquid Xenon Detector**

E. Aprile, K. L. Giboni, P. Majewski, N. Kaixuan, M. Yamashita, *Columbia University, USA*

**N16-33: Electronics for an Space Fluorescence Detector Prototype**

L. Villaseñor, *University of Michoacan, Mexico*; T. Murrieta, E. Ponce, E. Moreno, H. Salazar, *University of Puebla, Mexico*

**Gas Detectors**

**N16-34: Study of the Drift Properties of High Pressure Drift Tubes for the ATLAS Muon Spectrometer**

P. Branchini, A. Baroncelli, E. Graziani, M. Iodice, A. Passeri, F. Petrucci, S. Tagliaventi, A. Tonazzo, P. Bagnaia, P. Mastrandrea, *INFN, Italy*

**N16-35: Optimization of the Light Emission in a GPSC for Neutron Detection**

G. Manzin, B. Guerard, P. Van Esch, *Institut LaueLangevin, France*

**N16-36: Monte Carlo Simulation Study of the Characteristics of Xe-Ne Gas Mixtures as Detection Media in Proportional Ionization Counters**

F. P. Santos, T. H. V. T. Dias, P. J. B. M. Rachinhas, C. A. N. Conde, *Universidade de Coimbra, Portugal*; A. D. Stauffer, *York University, Canada*

**N16-37: A New Technology of Making Resistive Plate Counters Without Linseed Oil Treatment**

J. W. Zhang, *Institute of High Energy Physics, Chinese Academy of Sciences, China*; M. F. Su, *Beijing Gaonengke Science and Technology Co. Ltd, China*; T. Zhao, *University of Washington, USA*

**N16-38: A High Rate Gas Mixture for Glass RPC Operated in Streamer Mode**

S. Ando<sup>1</sup>, T. Fujikawa<sup>1</sup>, H. Hayasaka<sup>2</sup>, Y. Hoshi<sup>2</sup>, N. Kikuchi<sup>1</sup>, M. Kumagai<sup>2</sup>, T. Nagamine<sup>1</sup>, A. Yamaguchi<sup>1</sup>

<sup>1</sup>Tohoku University, Japan; <sup>2</sup>Tohoku Gakuin University, Japan

**N16-39: Performance of Rate Capability for Glass RPC Operated in Streamer Mode with Nitrogen Laser Beam**

M. Kumagai, K. Abe, H. Hayasaka, Y. Hoshi, K. Neichi, *Tohoku Gakuin University, Japan*; A. Yamaguchi, *Tohoku University, Japan*; H. Yuta, *Aomori University, Japan*

**N16-40: Effect of Finite Dimensions of Gas Detectors on Electric Field Configurations**

S. Mukhopadhyay, N. Majumdar, *Saha Institute of Nuclear Physics, India*

**N16-41: Design and Performance of the Triple GEM Detector for TOTEM**

M. Bozzo<sup>1</sup>, M. Oriunno<sup>2</sup>, L. Ropelewski<sup>2</sup>, F. Sauli<sup>2</sup>, J. Ojala<sup>3</sup>, K. Kurvinen<sup>3</sup>, R. Lauhakangas<sup>3</sup>, J. Heino<sup>3</sup>, W. Snoeys<sup>2</sup>, F. Ferro<sup>1</sup>, M. Van Stenis<sup>2</sup>, E. David<sup>2</sup>

<sup>1</sup>INFN, Italy; <sup>2</sup>CERN, Switzerland; <sup>3</sup>Inst. of Physics, Finland



#### **N16-42:** Operational Characteristics of a GEM-MSGC System for X-Ray Detection

J. A. Mir, N. J. Rhodes, E. M. Schooneveld, G. E. Derbyshire, R. Stephenson, *CCLRC Rutherford Appleton Laboratory, UK*; J. F. C. A. Veloso, J. J. M. F. Dos Santos, *Coimbra University, Portugal*; N. Spooner, T. B. Lawson, *University of Sheffield, UK*

#### **N16-43:** Large Area Neutron Detector Based on 6Li Ionization Chamber with Integrated Body-Moderator of High Density Polyethylene

K. D. Ianakiev, M. T. Swinhoe, K. Chung, E. A. McKigney, *Los Alamos National Laboratory, USA*

#### **N16-44:** Preamplification Structures Based on Micromegas

S. Andriamonje, S. Aune, E. Ferrer Ribas, A. Giganon, Y. Giomataris, *DAPNIA/CEA/Saclay, France*; P. Salin, *College de France, France*

#### **N16-45:** Study and Optimization of Multi Wire Proportional Counters for Synchrotron Facilities

E. Fernández<sup>1</sup>, I. Ramos-Lerate<sup>1</sup>, J. C. Martínez<sup>1</sup>, D. Beltran<sup>1</sup>, M. Kocsis<sup>2</sup>, J. Bordas<sup>1</sup>, J. F. Toledo<sup>3</sup>

<sup>1</sup>Laboratori de Llum de Síncrotró, Spain; <sup>2</sup>European Synchrotron Radiation Facility, France; <sup>3</sup>Polytechnical University of Valencia, Spain

#### **N16-46:** A 2D-GMSD Based Imaging Detector for X-Rays

D. M. Duxbury, *CCLRC Rutherford Appleton Laboratory, UK*

#### **N16-47:** A 2-D GMSD Based Imaging Detector for Neutrons

D. M. Duxbury, *CCLRC Rutherford Appleton Laboratory, UK*

#### **N16-48:** A New Coplanar-Grid High-Pressure Xenon Gamma-Ray Spectrometer

S. D. Kiff, Z. He, *University of Michigan, USA*; G. Tepper, *Virginia Commonwealth University, USA*

#### **N16-49:** Test of a GEM Detector in the PHENIX Experiment at RHIC

B. Azmoun<sup>1</sup>, M. Purschke<sup>1</sup>, N. Smirnov<sup>2</sup>, S. Stoll<sup>1</sup>, C. Woody<sup>1</sup>

<sup>1</sup>Brookhaven National Lab, USA; <sup>2</sup>Yale University, USA

#### **N16-50:** Properties of the Neutron Detector Based on Ionisation Chamber with <sup>6</sup>Li Converters

R. Engels, U. Clemens, G. Kemmerling, J. Schelten, *Forschungszentrum Juelich GmbH, Germany*

#### **N16-51:** High Position Resolution X-Ray Detectors: Multilayer Solid Converters Combined with a Microgap Parallel-Plate Gas Amplification Structure

C. Jacobaeus<sup>1</sup>, T. Francke<sup>2</sup>, B. Lund-Jensen<sup>3</sup>, J. Ostling<sup>4</sup>, N. Pavlopoulos<sup>5,6</sup>, V. Peskov<sup>3,5</sup>, F. Tokana<sup>3,7</sup>

<sup>1</sup>Karolinska Institute, Sweden; <sup>2</sup>Xcounter AB, Sweden; <sup>3</sup>Royal Institute of Technology, Sweden; <sup>4</sup>Stockholm University, Sweden; <sup>5</sup>Leonardo de Vinci University, France; <sup>6</sup>CERN, Switzerland; <sup>7</sup>Yamagata University, Japan

#### **N16-52:** A Low-Background Digital Anticoincidence Beta Counting System for C-14 Dating Using a Gas Counter Combined with Tiled CdTe Wall Detectors

W. QiuWei, T. Hiroyuki, H. Yoneichi, N. Masaharu, Y. Kunio, M. Yumiko, *The University of Tokyo, Japan*

#### **N16-53:** Fluctuation of Ionization, Scintillation, and Proportional Scintillation

M. Saito, T. Nishikawa, *Fukui University, Japan*; M. Miyajima, *Waseda University, Japan*

#### **N16-54:** Calculation of Drift Velocities and Diffusion Coefficients of Xe<sup>+</sup> Ions in Gaseous Xenon

J. A. S. Barata, *Universidade da Beira Interior, Portugal*; C. A. N. Conde, *Universidade de Coimbra, Portugal*

#### **N16-55:** The OPERA Spectrometers RPC System

A. Paoloni, *INFN - LNF, Italy*

On behalf of the OPERA RPC Group

#### **N16-56:** Development of Simple Position Encoding Structures for Wire Chambers

M. Moon, C. Lee, J. Cheon, V. T. Em, Y. Choi, K. Hong, *Korea Atomic Energy Research Institute, South Korea*; U. Nam, K. Kong, *Korea Astronomy Observatory, South Korea*; S. Lee, *Korea Basic Science Institute, South Korea*

#### **N16-57:** Study of Electroluminescent Readout in Xenon Gas Detector for High-Precision Energy Measurements and Tracking

A. A. Burenkov, *Institute for Theoretical and Experimental Physics, Russia*

On behalf of the EXO collaboration

#### **N16-58:** Potential and Challenges of the CMS Barrel Muon System

K. Hoepfner, *RWTH Aachen University, III.Phys. Inst. A, Germany*

On behalf of the CMS Muon Barrel Coll.

#### **N16-59:** Thermal Influences of the Front-End Electronics on the Alice TPC Readout Chamber

S. Popescu<sup>1,2</sup>, U. Frankenfeld<sup>3</sup>, H. R. Schmidt<sup>3</sup>

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#### **N16-60:** Neutron Detection with a GEM

S. H. Park, Y. K. Kim, S. M. Kang, J. H. Ha, *Korea Atomic Energy Research Institute, South Korea*; J. K. Kim, *Hanyang University, South Korea*

#### **N16-61:** Design of Guard Ring Geometry in the Thimble Type Ionization Chamber

Y. K. Kim, S. H. Park, S. M. Kang, *Korea Atomic Energy Research Institute, South Korea*; H. S. Kim, S. Y. Cho, *Yonsei University, South Korea*

#### **N16-62:** Experimental Study of Xe-Ne Proportional Counters

F. I. G. M. Borges<sup>1</sup>, F. P. Santos<sup>1</sup>, F. Amaro<sup>1</sup>, T. H. V. T. Dias<sup>1</sup>, J. F. C. A. Veloso<sup>2</sup>, C. A. N. Conde<sup>1</sup>

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#### **N16-63:** Dependence of Bakelite Resistivity on Temperature and Humidity

A. Piccotti<sup>1</sup>, R. Arnaldi<sup>1</sup>, E. Chiavassa<sup>2</sup>, P. Cortese<sup>3</sup>, G. Dellacasa<sup>3</sup>, N. De Marco<sup>1</sup>, A. Ferretti<sup>2</sup>, M. Gallio<sup>2</sup>, A. Musso<sup>1</sup>, C. Oppedisano<sup>2</sup>, E. Scomparin<sup>1</sup>, G. Travaglia<sup>2</sup>, E. Vercellin<sup>2</sup>

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**N16-64: Systems for the MWPC Test at the LNF Production Site**

D. Pinci, E. Dane', G. Martellotti, G. Penso, *INFN-Roma1, Italy*; M. Anelli, P. Campana, U. Denni, C. Forti, A. Frani, M. Santoni, A. Sarti, A. Sciubba, *INFN-Laboratori Nazionali di Frascati, Italy*

**N16-65: Tracking Resolution of a Time Projection Chamber with Micropattern Gas Detector Readout in a Magnetic Field**

D. Karlen, T. Michailopoulos, P. Poffenberger, G. Rosebaum, *University of Victoria, Canada*

**N16-66: Development of a Two-Dimensional Multi-Grid-Type Microstrip Gas Chamber Using Global-Local Grouping Method**

P. Siritiprussamee, H. Takahashi, M. Kai, M. Nakazawa, *The University of Tokyo, Japan*; T. Ino, M. Furusaka, S. Kishimoto, *Institute of Materials Structure Science, Japan*; M. Taniguchi, S. Ito, M. Kanazawa, *Futaba Corporation, Japan*

**N16-67: Industrially Mass-Produced MICROMEGAS Chambers**

J. Miyamoto, A. Irrgang, B. Hogan, R. Perera, I. Shipsey, *Purdue University, USA*

**N16-68: Large Scale Test and Performances of the RPC Trigger Chambers of the Atlas Experiment at LHC**

M. Della Pietra, *University of Naples, Italy*  
On behalf of the ATLAS RPC Collaboration

**N16-69: Novel Geometries to Reduce the Spectroscopic Degradation Associated with the Drift-Field of Radiation Detectors: a Monte Carlo Simulation Study for Xe-Filled Counters**

P. N. B. Neves<sup>1</sup>, L. M. N. Távora<sup>1,2</sup>, C. A. N. Conde<sup>1</sup>

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**N16-70: Magnetic Field Studies of a Time Projection Chamber with GEM-Technology**

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**N16-71: Ionization Yields for Heavy Ions in Gases as a Function of Energy**

S. Sasaki, T. Sanami, K. Saito, K. Iijima, H. Tawara, *High Energy Accelerator Research Organization (KEK), Japan*; E. Shibamura, *Saitama Prefectural University, Japan*; A. Fukumura, *National Institute of Radiological Sciences, Japan*

**N16-72: Scintillation Yield in High Pressure Xenon and Xenon Doped with Methane**

K. N. Pushkin<sup>1,2</sup>, N. Hasebe<sup>1</sup>, T. Doke<sup>1</sup>, S. Kobayashi<sup>1</sup>, T. Hosojima<sup>1</sup>, M. Mimura<sup>1</sup>, M. Miyajima<sup>1</sup>, T. Miyachi<sup>1</sup>, M. Kobayashi<sup>1</sup>, C. Tezuka<sup>1</sup>, E. Shibamura<sup>3</sup>, V. V. Dmitrenko<sup>3</sup>, S. E. Ulin<sup>1,2</sup>

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**N16-73: Multiple GEM Detectors at High Pressure**

E. F. Barasch, *UC Davis, USA*; M. C. Altunbas, *University of Texas, USA*; M. R. Maier, *University of California, USA*; D. Bednarek, S. Rudin, *SUNY at Buffalo, USA*

**N16-74: A Monte Carlo Study of Backscattering Effects in the Photoelectron Emission into Ar-CH<sub>4</sub> Mixtures**

J. M. D. Escada, P. J. B. M. Rachinhas, T. H. V. T. Dias, J. A. M. Lopes, F. P. Santos, C. A. N. Conde, *Universidade de Coimbra, Portugal*; A. D. Stauffer, *York University, Canada*

**N16-75: Using a Multilayer Printed Circuit Board as the Position Sensing Electrode in a Triple-GEM Detector**

P. R. B. Marinho, A. F. Barbosa, *Centro Brasileiro de Pesquisas Físicas, Brazil*; G. P. Guedes, *Universidade Estadual de Feira de Santana, Brazil*

**N16-76: Study of ATLAS Monitored Drift Tube Gas Flushing**

U. Bratzler, *CERN and TMU, Switzerland*; P. Mockett, D. Forbush, M. Twomey, *University of Washington, USA*

**N16-77: The Chemistry of Resistive Plate Chamber Operation**

C. Petitjean, *CERN, Switzerland*

**N16-78: Study of Secondary Scintillation in Xenon Vapour**

A. C. A. C. Fonseca, R. M. O. Meleiro, V. Y. Chepel, V. Solovov, M. I. Lopes, *LIP-Coimbra and C.F.R.M. of the Department of Physics of the University of Coimbra, Portugal*

**N16-79: Optimization of a Gas Based X-Ray Photon Counter Using the Geant4 Toolkit**

L. Adelöw, *Xcounter AB, Sweden*

**N16-80: Ultra-Low Background Alpha Particle Counter Using Pulse Shape Analysis**

W. K. Warburton, B. Dwyer-McNally, M. Momayezi, *X-Ray Instrumentation Associates, USA*; J. E. Wahl, *MIT Lincoln Laboratory, USA*

**High Energy Physics Detectors****N16-81: Status of the Production of the CMS Silicon Tracker**

A. Dierlamm, *CERN, Switzerland*  
On behalf of the CMS Tracker Collaboration

**N16-82: Influence of Radiation Hardness Parameters of the PWO Scintillation Crystals on Energy Resolution of Electromagnetic Calorimeter**

G. Y. Drobychev<sup>1</sup>, A. N. Annenkov<sup>2</sup>, V. I. Dormenev<sup>1</sup>, M. V. Korjik<sup>1</sup>, V. L. Kostylev<sup>2</sup>, P. Lecoq<sup>3</sup>, J.-P. Peigneux<sup>4</sup>, D. Sillou<sup>4</sup>

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**N16-83: Psec TOF for Particle Identification at HEP Colliders**

R. D. Schroll, H. J. Frisch, H. Sanders, T. Fukun, *University of Chicago, Enrico Fermi Institute and Physics Dept., USA*

**N16-84: Upgrade of the BGO Endcap Calorimeter for the CMD-3 Detector**

R. R. Akhmetshin, D. N. Grigoriev, V. F. Kazanin, A. A. Ruban, Y. V. Yudin, *The Budker Institute of Nuclear Physics, Russia*

**N16-85: Design and Preliminary Results of a Silicon-Tungsten Calorimeter for the Forward Direction in the PHENIX Experiment at RHIC**

E. P. Kistenev, C. Woody, *Brookhaven National Laboratory, USA*; M. Merline, *Moscow State University, Russia*; R. Seto,

University of California, USA; V. Bonvicini, A. Vacchi, INFN, sezione di Trieste, Italy

**N16-86: A New Configuration for a Strawtube-Microstrip Detector**

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**N16-87: A Proposed Silicon Vertex Tracker for the PHENIX Detector at Forward Rapidity**

D. M. Lee, Los Alamos National Laboratory, USA  
On behalf of the PHENIX Collaboration

**N16-88: ALICE T0 Detector**

W. H. Trzaska, University of Jyväskylä, Finland  
On behalf of the ALICE collaboration

**N16-89: Low Temperature  $\gamma$ -Induced Color Centers in Quartz Fibers**

I. Rustamov<sup>1</sup>, M. Ashurov<sup>1</sup>, M. Baydjanov<sup>1</sup>, E. Gasanov<sup>2</sup>, A. Islamov<sup>1</sup>, I. Nam<sup>2</sup>, A. Nebesniy<sup>2</sup>, A. Rakov<sup>1</sup>, B. Yuldashev<sup>2</sup>

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**N16-90: The Forward RPC Sub-Detector in CMS**

A. Marinov, CERN, Switzerland  
On behalf of the CMS

**N16-91: The CMS Silicon Tracker : Testing of Hybrids, Modules and Substructures at Operating Temperature**

M. Poettgens, RWTH, Germany  
On behalf of the CMS Collaboration

**N16-92: Calorimetry in the STAR Experiment at RHIC**

D. G. Underwood, Argonne National Laboratory, USA  
On behalf of the STAR Collaboration

**N16-93: RPCs as a Medium for Digital Hadron Calorimetry**

D. G. Underwood, Argonne National Laboratory, USA

**N16-94: Analysis of the Eddy Current Distribution in the CMS Magnet Yoke During the Solenoid Discharge**

V. I. Klyukhin<sup>1,2</sup>, D. Campi<sup>1</sup>, B. Curé<sup>1</sup>, A. Gaddi<sup>1</sup>, H. Gerwig<sup>1</sup>, J.-P. Grillet<sup>1</sup>, A. Hervé<sup>1</sup>, R. Loveless<sup>3</sup>, R. Smith<sup>4</sup>

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**N16-95: The HERMES Recoil Detector**

Y. Van Haarlem, University of Gent, Belgium  
On behalf of the HERMES Collaboration

**N16-96: Potential and Challenges of the CMS Muon Barrel Detectors**

K. Hoepfner, RWTH Aachen University, III.Phys. Inst. A, Germany  
On behalf of the CMS Barrel Muon Coll.

**N16-97: The Proton Zero Degree Calorimeter for the ALICE Experiment**

E. Siddi, Università di Cagliari and INFN Sezione di Cagliari, Italy  
On behalf of the ALICE collaboration

**N16-98: BTeV Electromagnetic Calorimeter Light Monitoring System**

A. S. Lobko<sup>1</sup>, A. A. Fedorov<sup>1</sup>, M. V. Korzhik<sup>1</sup>, Y. Kubota<sup>2</sup>, B. Lang<sup>2</sup>, A. R. Lopatik<sup>1</sup>, O. V. Missevitch<sup>1</sup>

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**N16-99: Development of Technique for Testing the Long-Term Stability of Silicon Microstrip Detectors**

N. I. Maslov, A. V. Kosinov, S. V. Naumov, V. D. Ovchinnik, A. F. Starodubtsev, G. P. Vasilyev, V. I. Yalovenko, National Scientific Centre "Kharkov Institute of Physics and Technology", Ukraine; L. Bosisio, I. Rachevskaya, Istituto Nazionale di Fisica Nucleare Sezione di Trieste, Italy

**N16-100: LCcal: an Hybrid ElectroMagnetic Calorimeter Prototype for Future Linear Colliders**

P. Checchia, INFN sezione di Padova, Italy  
On behalf of the LCcal Collaboration

**N16-101: A RICH with Aerogel**

T. Bellunato, D. Perego, M. Alemi, M. Musy, C. Matteuzzi, M. Calvi, INFN Sezione di Milano, Italy

**N16-102: Experience Gained in the Certification of Seattle MDT ATLAS End-Cap Chambers**

D. A. Forbush, P. M. Mockett, J. Rothberg, M. S. Twomey, University of Washington, USA

**N16-103: Readout System for the Dzero Run II Luminosity Monitor**

B. C. K. Casey, Brown University, USA  
On behalf of the Dzero Collaboration

**N16-104: Quality Assurance of 30000 Monitored Drift Tubes for the BIS-Chambers of the ATLAS Muon Spectrometer**

R. M. Avramidou<sup>1</sup>, T. Alexopoulos<sup>1</sup>, M. Dris<sup>1</sup>, M. Fokitis<sup>1</sup>, A. Filippas<sup>1</sup>, E. N. Gazis<sup>1</sup>, E. Katsoufis<sup>1</sup>, A. Maltezos<sup>2</sup>, S. Maltezos<sup>1</sup>, N. Papadakis<sup>1</sup>, T. Papadopoloulou<sup>1</sup>, P. Savva<sup>1</sup>, G. Stavropoulos<sup>1</sup>, Y. Tsiopolitis<sup>1</sup>, E. Tzamarioudaki<sup>1</sup>, N. Vodinas<sup>1</sup>

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**N16-105: A Very Forward Calorimeter at the LHC**

S. N. White, Brookhaven National Lab, USA; A. Denisov, IHER, Russia

**N16-106: CMS ECAL Optical Data Links**

A. Singovski, University of Minnesota, USA  
On behalf of the CMS Collaboration

**N16-107: Study of Scintillation, Fluorescence and Scattering in Mineral Oil for the MiniBooNE Neutrino Detector**

B. C. Brown, S. Brice, S. Maza, A. Pla-Dalmau, Fermi National Accelerator Laboratory, USA; E. Hawker, University of Cincinnati, USA; H.-O. Meyer, R. Tayloe, Indiana University, USA; D. Toptygin, Johns Hopkins University, USA; H. A. Tanaka, Princeton University, USA

# **N16-108: A Fine Pitch Bump Bonding Process Compatible with the Manufacture of the Pixel-HPD's of the LHCb RICH Detector**

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# **N16-109: The Barrel Resistive Plate Chambers for the CMS Experiment**

P. Vitulo, *Università di Pavia & INFN Pavia, Italy*

On behalf of the CMS Collaboration/ RPC Group

# **N16-110: The Impact of the ATLAS Alignment System on Track Reconstruction at the H8 Test Beam**

D. S. Levin, *University of Michigan, USA*

On behalf of the ATLAS Collaboration

# **N16-111: Investigation of the ATLAS Monitored Drift Tubes Response to Fast Neutron Background Radiation**

T. Alexopoulos<sup>1</sup>, R. Avramidou<sup>1</sup>, M. Dris<sup>1</sup>, T. A. Filippas<sup>1</sup>, E. N. Gazis<sup>1</sup>, E. Katsoufis<sup>1</sup>, M. Kokkoris<sup>1</sup>, E. Kossionidis<sup>2</sup>, A. Lagogiannis<sup>2</sup>, S. Maltezos<sup>1</sup>, G. Perdikakis<sup>2</sup>, V. Polychronakos<sup>3</sup>, P. Savva<sup>1</sup>, A. Spyrou<sup>2</sup>, G. Tsipolitis<sup>1</sup>, E. Tzanioudaki<sup>1</sup>

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# **N16-112: LHCb Outer Tracker Detector Construction and Production**

B. Hommels, *NIKHEF Amsterdam, the Netherlands*

On behalf of the LHCb Outer Tracker Group

# **N16-113: The Design and Prototyping of the ATLAS Inner Detector Evaporative Cooling System**

B. Gorski, *CERN, Switzerland*

On behalf of the The ATLAS inner detector collaboration

# **N16-114: Layer 0 Silicon Detector Electronics for the D-Zero Experiment**

L. Bagby, *Fermilab, USA*

On behalf of the D0 Collaboration

# **N16-115: Physics Analysis with the PHENIX Electromagnetic Calorimeter**

P. Tarjan, *University of Debrecen, Hungary*; S. P. Stoll, *Brookhaven National Laboratory, USA*

# **N16-116: Development of New Silica Aerogel for the RICH Radiator of the Super Belle Detector**

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# **N16-117: The CDF Forward Detectors**

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On behalf of the CDF Collaboration

## New Radiation Detectors

# **N16-118: Dose distribution measurement of clinical proton beams with an imaging plate**

A. Nohtomi, *National Institute of Advanced Industrial Science and Technology, Japan*; T. Sakae, T. Terunuma, Y. Tsunashima, *University of Tsukuba, Japan*; Y. Hayakawa, *Toin University of Yokohama, Japan*

# **N16-119: Low-Level Radiation Measuring System Using Magnetically Levitated Electrode Ionization Chamber**

T. Kawaguchi, K. Futagami, M. Matoba, *Kyushu Sangyo University, Japan*; G. Wakabayashi, N. Ikeda, Y. Uozumi, N. Yamanaka, M. Kaneko, *Kyushu University, Japan*

# **N16-120: New Micro Pattern Gas Detector Based on a 2D Position Readout Mesh**

F. Fernández, I. Ramos-Lerate, J. C. Martínez, D. Beltran, J. Bordas, *Laboratori de Llum de Sincrotró, Spain*; M. Key, *Centre Nacional de Microelectrónica, Spain*

# **N16-121: A Fast Monolithic Active Pixel Sensor with Pixel Level Reset Noise Suppression and Binary Outputs for Charged Particle Detection**

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# **N16-122: The Measurement of Sub-Brownian Lever Deflections**

M. D. Hammig, D. K. Wehe, *University of Michigan, USA*

# **N16-123: Potential on Liquid Light Guide as Distributed Radiation Sensor**

J. Kawarabayashi, R. Mizuno, D. Inui, K. Watanabe, T. Iguchi, *Nagoya University, Japan*

# **N16-124: Fast Neutron Spectrometer Composed of Position-Sensitive Proportional Counters and Si(Li)-SSDs with Excellent Energy Resolution and Detection Efficiency**

T. Matsumoto, A. Uritani, H. Harano, G. Katano, K. Kudo, *National Institute of Advanced Industrial Science and Technology, Japan*

# **N16-125: Novel Dose Rate Monitoring for Intense Radiation Fields Based on Cavity Ring-down Laser Spectroscopy**

H. Tomita, K. Watanabe, J. Kawarabayashi, T. Iguchi, *Nagoya University, Japan*; N. Nariyama, *Japan Synchrotron Radiation Research Institute, Japan*

# **N16-126: Spectroscopic Performances of DePMOS Detector/ Amplifier Device with Respect to Different Filtering Techniques and Operating Conditions**

M. Porro<sup>1,2</sup>, O. Haelker<sup>3</sup>, M. Harter<sup>4</sup>, S. Herrmann<sup>3</sup>, N. Hoernel<sup>5</sup>, R. Kohrs<sup>6</sup>, P. Lechner<sup>7</sup>, G. Lutz<sup>5</sup>, I. Peric<sup>6</sup>, R. Richter<sup>5</sup>, L. Strueder<sup>3</sup>, J. Treis<sup>3</sup>, M. Trimpl<sup>6</sup>, N. Wermes<sup>6</sup>, P. Fischer<sup>4</sup>, G. Ferrari<sup>1</sup>

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#### **N16-127: Radiation Monitoring with Chemical-Vapor-Deposition Diamonds**

A. J. Edwards, B. A. Petersen, P. R. Burchat, *Stanford University, USA*; H. Kagan, T. Pulliam, R. Kass, *Ohio State University, USA*; D. Kirkby, M. Bruinsma, *UC Irvine, USA*

#### **N16-128: Radiation Measurements with Piezoelectric PZT by Irradiating 400MeV/n Xe Ions (1) onto PZT and (2) into Water**

T. Miyachi, M. Fujii, N. Hasebe, M. Kobayashi, G. Kuraza, A. Nagashima, Y. Nakamura, O. Okudaira, N. Yamashita, *Advanced Research Institute for Science and Engineering, Waseda University, Japan*; H. Shibata, *Graduate School of Engineering, Kyoto University, Japan*; T. Murakami, Y. Uchiho, *National Institute of Radiological Sciences, Japan*; N. Okada, T. Tou, *Honda Electronics Co.LTD., Japan*

#### **N16-129: A Xenon GPSC/MSGC Detector for Hard X-Ray Detection**

D. S. Covita<sup>1</sup>, J. F. C. A. Veloso<sup>1,2</sup>, L. C. C. Coelho<sup>1</sup>, L. F. R. Ferreira<sup>1</sup>, J. M. F. dos Santos<sup>1</sup>

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#### **N16-130: Investigation of Basic Characteristics of Synthetic Diamond Radiation Detectors**

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#### **N16-131: A Single Chip Telescope: Implementation Using Fast Digital Sampling Techniques and Simulation of Silicon Current Signals**

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On behalf of the NUCL-EX collaboration

### **Radiation Damage Effects**

#### **N16-132: Projections of the Annealing Behaviour of Irradiated Si Sensors in the LHC Environment**

S. Chatterji, A. Bhardwaj, K. Ranjan, N. Bhardwaj, R. K. Shivpuri, A. K. Srivastava, M. Jha, A. Kumar, B. C. Choudhary, M. Naimuddin, S. S. Chauhan, P. Gupta, *Centre for Detector and Related Software Technology, Deptt. of Physics, University of Delhi, India*

#### **N16-133: Influence of Si-Codoping on YAG:Ce Scintillation Characteristics**

S. Baccaro, A. Cecilia, *ENEA, Italy*; E. Mihokova, M. Nikl, *Institute of Physics AS CR, Czech Republic*; K. Nejezchle, K. Blazek, *CRYTUR Ltd., Czech Republic*

#### **N16-134: Effect of SiO<sub>2</sub> Passivating Layer in Segmented Silicon Planar Detectors on the Detector Response**

E. M. Verbitskaya, V. K. Eremin, *Ioffe Physico-Technical Institute of Russian Academy of Sciences, Russia*; G. Ruggiero, S. Roe, P. Weilhammer, *CERN, Switzerland*; N. N. Egorov, S. A. Golubkov, K. A. Konkov, A. I. Sidorov, *Research Institute of Material Science and Technology, Russia*

#### **N16-135: TID Test for SDRAM Based IEEM Calibration System**

S. Bertazzoni, D. Di Giovenale, M. Salmeri, M. Florean, A. Salsano, *University of Rome Tor Vergata, Italy*; J. Wyss, *University of Cassino, Italy*; R. Rando, *University of Padova, Italy*

#### **N16-136: Response of SOI Bipolar Transistors Exposed to Gamma-Rays under Different Dose Rate and Bias Conditions**

L. Ratti<sup>1,2</sup>, M. Manghisoni<sup>1,2</sup>, E. Oberti<sup>1,2</sup>, V. Re<sup>3,2</sup>, V. Speziali<sup>1,2</sup>, G. Traversi<sup>3,2</sup>, G. Fallica<sup>4</sup>, R. Modica<sup>4</sup>

<sup>1</sup>Università di Pavia, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>Università di Bergamo, Italy; <sup>4</sup>STMicroelectronics, Italy

#### **N16-137: Measurement of the Charge Collection Efficiency after Heavy Non-Uniform Irradiation in BaBar Silicon Detectors**

S. Bettarini<sup>1</sup>, M. Bondioli<sup>1</sup>, L. Bosisio<sup>2</sup>, G. Calderini<sup>1</sup>, S. Dittongo<sup>2</sup>, F. Forti<sup>1</sup>, M. A. Giorgi<sup>1,3</sup>, G. Marchiori<sup>1</sup>, G. Rizzo<sup>1</sup>

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#### **N16-138: Strong Reduction of Radiation Damage in Plastic Scintillators**

K. M. Wick, T. Gosau, R. Hornung, *Institut fuer Experimentalphysik, Germany*

#### **N16-139: Fluence Dependent Recombination in the $\gamma$ -Rays Irradiated Silicon Determined by Microwave Absorption Transients**

E. Gaubas, J. V. Vaitkus, *Vilnius University, Lithuania*; J. Härkönen, *Helsinki University, Finland*; Z. Li, *Brookhaven National Laboratory, USA*

#### **N16-140: Irradiation Tests of FPGAs for the ALICE TPC Experiment**

K. Roed<sup>1</sup>, T. Alt<sup>1,2</sup>, V. Lindenstruth<sup>2</sup>, L. Musa<sup>3</sup>, D. Röhrich<sup>1</sup>, K. Ullaland<sup>1</sup>, W. Olsen<sup>1</sup>, B. Pommersche<sup>1</sup>, J. Wikne<sup>4</sup>, E. Olsen<sup>4</sup>

<sup>1</sup>University of Bergen, Norway; <sup>2</sup>University of Heidelberg, Germany; <sup>3</sup>CERN, Switzerland; <sup>4</sup>University of Oslo, Norway

#### **N16-141: Effect of Gamma Irradiation on Optical Components**

I. Di Sarcina, *INOVA-CNR c/o ENEA, Italy*; A. Piegari, S. Baccaro, A. Cecilia, *ENEA, Italy*

#### **N16-142: Radiation Hardening of Silicon for Detectors by Preliminary Irradiation**

P. G. Litovchenko<sup>1</sup>, D. Bisello<sup>2</sup>, A. P. Litovchenko<sup>1,2</sup>, A. A. Groza<sup>1</sup>, V. Khomenkov<sup>2</sup>, A. P. Dolgolenko<sup>1</sup>, V. Khivrich<sup>1</sup>, L. I. Barabash<sup>1</sup>, V. F. Lastovetsky<sup>1</sup>, L. A. Polivtsev<sup>1</sup>, A. Candelori<sup>2</sup>, R. Rando<sup>2</sup>, W. Wahl<sup>3</sup>, J. Wyss<sup>4</sup>, M. Boscardin<sup>5</sup>, S. Ronchin<sup>5</sup>, N. Zorzi<sup>5</sup>, G.-F. Dalla Betta<sup>6</sup>

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#### **N16-143: Measurement of the Radiation Environment at a Hadron Collider Experiment: CDF at Tevatron**

S. D'Auria<sup>1</sup>, R. J. Tesarek<sup>2</sup>, K. Kordas<sup>3</sup>, S. McGimpsey<sup>2</sup>, A. Hocker<sup>4</sup>, S. Worm<sup>5</sup>, L. Nicolas<sup>1,2</sup>, W. Schmitt<sup>2</sup>, R. Wallny<sup>6</sup>

<sup>1</sup>University of Glasgow, UK; <sup>2</sup>Fermi National Accelerator Laboratory, USA; <sup>3</sup>University of Toronto, Canada; <sup>4</sup>University of Rochester, USA; <sup>5</sup>Rutgers University, USA; <sup>6</sup>University of California, Los Angeles, USA

#### **N16-144: Radiation Qualification of Electronics Components Used for the ATLAS Level 1 Muon Endcap Trigger System**

Y. Arai, M. Ikeno, O. Sasaki, *KEK, Japan*; R. Ichimiya, S. Tsuji, *Kobe University, Japan*; H. Ohshita, N. Takada, *Shinshu University, Japan*; Y. Hane, K. Hasuko, H. Nomoto, H. Sakamoto, K. Shibuya,

T. Takemoto, *University of Tokyo, Japan*; C. Fukunaga, K. Toshima, *Tokyo Metropolitan University, Japan*; K. Sakuma, *Tokyo University of Agriculture and Technology, Japan*

**N16-145: Fluence-Induced Pulse-Height-Defect in SSB Detectors**

E. F. Aguilera, P. Rosales, F. J. Ramirez, *Instituto Nacional de Investigaciones Nucleares, Mexico*

**Scintillation Detectors**

**N16-146: Boron Loaded Plastic Scintillators Applied to Active Neutron Measurements of Waste Drum**

S. Normand, P. Delacour, *CEA Saclay, France*; P. Christian, L. Joël, *CEA Cadarache, France*

**N16-147: FNAL-NICADD Extruded Scintillator**

V. Rykalin<sup>1</sup>, A. Pla-Dalmay<sup>2</sup>, A. Bross<sup>2</sup>, A. Dyshkant<sup>1</sup>, D. Beznosko<sup>1</sup>  
<sup>1</sup>NICADD, USA; <sup>2</sup>FNAL, USA

**N16-148: Performance of a Pixelated BGO Scintillator Array**

C. Aedy, S. Quillin, *AWE Aldermaston, UK*

**N16-149: Control over Light Collection in Scintillation Elements for Electromagnetic Calorimeters**

M. Globus, B. Grinyov, V. Lyubinskiy, *Institute for Scintillation Materials, Ukraine*; M. Ratner, *Institute for Single Crystals, Ukraine*

**N16-150: CdWO<sub>4</sub> Crystal in Gamma-Ray Spectrometry**

M. Moszynski, M. Balcerzyk, M. Kapusta, A. Syntfeld, *Soltan Institute for Nuclear Studies, Poland*; G. Pausch, J. Stein, *target Systemelectronic GmbH, Germany*; P. Schotanus, *Scionix Holland B.V., the Netherlands*

**N16-151: Development of Industrial Production of PWO Monocrystals for High-Energy Physics Applications**

S. Burachas, S. Beloglowsky, D. Elizarov, E. Kuznetsova, I. Makov, Y. Savelliev, R. Nikitin, N. Vassilieva, M. Ziomo, «North Crystals» Company, Russia; M. Ippolitov, V. Lebedev, V. Manko, S. Nikulin, A. Nyanin, A. Vasiliev, *RRC «Kurchatov Institute», Russia*; G. Tamulaitis, *Vilnius University, Lithuania*

**N16-152: A Review of the Statistical Foundations of the Classical Pulse Shape Discrimination Techniques in Scintillation Applications**

G. Ranucci, *Istituto Nazionale di Fisica Nucleare, Italy*

**N16-153: Ce-Doped Lutetium Pyrosilicate Scintillators LPS and LYPs**

P. Szupryczynski<sup>1</sup>, C. L. Melcher<sup>1</sup>, M. A. Spurrier<sup>1</sup>, A. A. Carey<sup>1</sup>, M. P. Maskarinec<sup>1</sup>, B. C. Chakoumakos<sup>2</sup>, C. Rawn<sup>2</sup>, R. Nutt<sup>1</sup>  
<sup>1</sup>CTI Molecular Imaging, Inc., USA; <sup>2</sup>ORNL, USA

**N16-154: Chaotic Light Collection in Scintillators and Geometric-Optical Factors Affecting Their Light Output**

S. V. Naydenov, B. V. Grinyov, V. D. Ryzhikov, *Institute of Single Crystals, Ukraine*

**N16-155: Luminescence and Scintillation Properties of Gd<sub>2</sub>O<sub>2</sub>S: Tb,Ce Ceramics**

E. I. Gorokhova<sup>1</sup>, S. B. Mikhlin<sup>2</sup>, P. A. Rodnyi<sup>2</sup>, C. W. E. van Eijk<sup>3</sup>, V. A. Demidenko<sup>1</sup>

<sup>1</sup>S. I. Vavilov State Optical Institute, Russia; <sup>2</sup>Petersburg State Polytechnical University, Russia; <sup>3</sup>Delft University of Technology, the Netherlands

**N16-156: Analysis of the Response of Capture-Gated Organic Scintillators**

S. A. Pozzi<sup>1</sup>, R. B. Oberer<sup>2</sup>, J. S. Neal<sup>1</sup>

<sup>1</sup>Oak Ridge National Laboratory, USA; <sup>2</sup>Y-12 National Security Complex, USA

**N16-157: Non-Proportionality and Thermoluminescence of LSO**

M. Kapusta<sup>1</sup>, P. Szupryczynski<sup>2</sup>, C. Melcher<sup>2</sup>, M. Moszynski<sup>1</sup>, M. Balcerzyk<sup>1</sup>, A. A. Carey<sup>2</sup>, W. Czarnacki<sup>1</sup>, M. A. Spurrier<sup>2</sup>, A. Syntfeld<sup>1</sup>

<sup>1</sup>Soltan Institute for Nuclear Studies, Poland; <sup>2</sup>CTI Molecular Imaging, Inc., USA

**N16-158: Solid State and Scintillation Detectors for Electron Volt Neutron Spectroscopy**

A. Pietropaolo<sup>1</sup>, C. Andreani<sup>1</sup>, R. Senesi<sup>1</sup>, A. D'angelo<sup>1</sup>, G. Gorini<sup>2</sup>, M. Tardocchi<sup>2</sup>, N. Rhodes<sup>3</sup>, E. M. Schooneveld<sup>3</sup>, E. Perelli-Cippo<sup>2</sup>

<sup>1</sup>Università di Tor Vergata, Italy; <sup>2</sup>Università di Milano-Bicocca, Italy; <sup>3</sup>Rutherford Appleton Laboratory, UK

**N16-159: <sup>6</sup>Li Doped Glass Scintillators for the Detection of Ultra Cold Neutrons**

G. Ban, X. Flechard, M. Labalme, T. Lefort, E. Lienard, O. Naviliat, ENSICAEN / LPC Caen, France; P. Fierlinger, K. Kirch, PSI, Switzerland; P. Geltenbort, ILL, France; K. Bodek, JU-Cracow, Poland

**N16-160: Self-Trapped Quasi-Particles in Tungsten Lead Crystals**

A. Rakov<sup>1</sup>, M. Ashurov<sup>1</sup>, E. Gasanov<sup>2</sup>, S. Ismoilov<sup>1</sup>, I. Rustamov<sup>1</sup>, B. Yuldashev<sup>2</sup>

<sup>1</sup>Phonon Scientific Industrial Association, Uzbekistan; <sup>2</sup>Institute of Nuclear Physics, Uzbekistan

**N16-161: Scintillation Response of Molecular Cluster to Charged Particles**

T. Kagawa, F. Sato, T. Iida, *Osaka University, Japan*

**N16-162: RBPO<sub>5</sub> (R=Ca, Sr) Based Storage Phosphors for Neutron Detection**

K. Sakasai, M. Katagiri, M. Matsubayashi, T. Nakamura, *Japan Atomic Energy Research Institute, Japan*; Y. Kondo, *Tohoku University, Japan*

**N16-163: Improvement of Photon Collection Uniformity from an NE213 Scintillator Using a Light Guide**

H. Harano, Y. Shibata, T. Matsumoto, G. Katano, A. Uritani, K. Kudo, *National Institute of Advanced Industrial Science and Technology, Japan*

**N16-164: Non-Proportionality of Light Output and Absorbed Energy of Ionizing Radiation Detectors Based on Organic Scintillators**

A. A. Ananenkov, Y. T. Vyday, V. A. Tarasov, B. V. Grinyov, L. A. Andryushchenko, *Institute for Scintillation Materials, Ukraine*

#### **N16-165: Scintillation Response Studies and Performance of Ce-Doped Scintillators**

J. A. Mares, A. Beiterova, M. Nikl, N. Solovieva, *Institute of Physics, AS CR, Czech Republic*; C. D'Ambrosio, *CERN, Switzerland*; K. Blazek, P. Maly, K. Nejezchleb, *Crytur Ltd., Czech Republic*; F. de Notaristefani, *INFN, Italy*

#### **N16-166: Stabilizing Scintillation Detector Systems: Determination of the Scintillator Temperature Exploiting the Temperature Dependence of the Light Pulse Decay Time**

G. Pausch, J. Stein, *target Systemelectronic GmbH, Germany*

#### **N16-167: Image Performance of Scintillation Pixel Arrays: Effect of Pixel Size, Light Yield and the Detector Sampling Pitch**

D. J. Herbert, N. Belcari, M. Camarda, N. D'Ascenzo, A. Del Guerra, *University of Pisa, Italy*

#### **N16-168: Stabilizing Scintillation Detector Systems with Pulsed LEDs: a Method to Derive the LED Temperature from Pulse Height Spectra**

K. Saucke, G. Pausch, J. Stein, *target Systemelectronic GmbH, Germany*; H.-G. Ortlepp, *Optronic, Hauptstr. 72, Germany*; P. Schotanus, *SCIONIX Holland B.V., the Netherlands*

#### **N16-169: Recent Progress in LaCl<sub>3</sub>:10% Ce<sup>3+</sup>: High Energy Background and X-Rays Energy Resolution**

A. Iltis, G. Gautier, J.-F. Nee, *Saint Gobain Crystals, France*; P. Raby, *Saint Gobain Crystals, USA*

#### **N16-170: Performance Comparison of Four Compact Room-Temperature Detectors – Two Cadmium Zinc Telluride (CZT) Semiconductor Detectors, a LaCl<sub>3</sub>(Ce) Scintillator, and a NaI(Tl) Scintillator**

J. K. Hartwell, R. J. Gehrke, M. E. Mc Ilwain, *Idaho National Engineering and Environmental Laboratory, USA*

#### **N16-171: Comparative Measurements of LaBr<sub>3</sub>:Ce, LaCl<sub>3</sub>:Ce, NaI:TI and BGO Scintillator Energy Resolution**

W. Lee, D. Wehe, B. Kim, *University of Michigan, USA*

#### **N16-172: Protective Function of the Coating on the Surface of CsI Scintillator**

A. Kudin, L. A. Andrushchenko, B. V. Grinyov, T. A. Charkina, *Inst. for Scintillation Materials, Ukraine*; V. Y. Gres, *National Airspace University, Ukraine*

#### **N16-173: Results of Environmental Testing of a Large NaI(Tl) Gamma Radiation Detector**

L. L. Clarke, J. Williams, *General Electric Reuter-Stokes, USA*

#### **N16-174: Fabrication of Fiber-Optic Radiation Sensor Tips with Inorganic Scintillator for Remote Sensing of X or $\gamma$ -Ray**

B. Lee, Y. Hwang, S. Chung, *Konkuk University, South Korea*; H. Cho, *Yonsei University, South Korea*; S. Kim, *Cheju National University, South Korea*; S. Cho, *Sejong University, South Korea*

#### **N16-175: Polyimide-Based Scintillators Studied by Ion Beam Induced Luminescence**

S. Carturan<sup>1,2</sup>, A. Quaranta<sup>1,3</sup>, A. Vomiero<sup>1,2</sup>, M. Bonafini<sup>1</sup>, G. Maggioni<sup>1,2</sup>, G. Della Mea<sup>1,3</sup>

<sup>1</sup>INFN- National Laboratories of Legnaro, Italy; <sup>2</sup>University of Padova, Italy; <sup>3</sup>University of Trento, Italy

#### **N16-176: Simulating the Emission Efficiency and Resolution Properties of Fluorescent Screens by Monte Carlo Methods**

P. Liaparinos<sup>1</sup>, I. Kandarakis<sup>2</sup>, D. Cavouras<sup>2</sup>, D. Nikolopoulos<sup>2</sup>, G. Panayiotakis<sup>1</sup>

<sup>1</sup>University of Patras, Greece; <sup>2</sup>Technological Educational Institute (TEI) of Athens, Greece

#### **N16-177: Optimization of High Energy X-Ray Detector Using Detector SNR**

S.-W. Kwak, G. Cho, J. S. Kim, *Korea Advanced Institute of Science and Technology, South Korea*

#### **N16-178: Optimization of Scintillator-Photodiode Assembly for X-Rays and Low Energy Gamma Rays Detection**

B. V. Grinyov, Y. A. Borodenko, A. V. Didenko, A. M. Kudin, V. V. Nekrasov, L. A. Piven, E. M. Selegenev, *Inst. for Scintillation Materials, Ukraine*

#### **N16-179: Enhanced Beta-Gamma Coincidence Counting Gas Cell**

J. I. McIntyre, A. J. Carman, J. C. Hayes, C. W. Hubbard, T. R. Heimbigner, K. E. Litke, S. J. Morris, M. D. Ripplinger, R. Suarez, *Pacific Northwest National Laboratory, USA*

### **Solid State Tracking Detectors**

#### **N16-180: ATLAS Pixel Testbeam Results**

M. Mass, *University of Dortmund, Germany*  
On behalf of the ATLAS Pixel Collaboration

#### **N16-181: Realisation of Serial Powering of ATLAS Pixel Modules**

T. Stockmanns<sup>1</sup>, D. B. Ta<sup>1</sup>, P. Fischer<sup>2</sup>, F. Hügging<sup>1</sup>, I. Peric<sup>1</sup>, Ö. Runolfsson<sup>1</sup>, N. Wermes<sup>1</sup>

<sup>1</sup>Physikalisches Institut der Universität Bonn, Germany; <sup>2</sup>Institut für Technische Informatik der Universität Mannheim, Germany

#### **N16-182: The Improved Ladder Production for the Belle Silicon Vertex Detector (SVD2.1)**

T. Ziegler, *Princeton university, USA*  
On behalf of the SVD group of the Belle collaboration

#### **N16-183: Analysis of the Radiation Hardness and Charge Collection Efficiency of Thinned Silicon Diodes**

M. Boscardin<sup>1</sup>, M. Bruzzi<sup>2,3</sup>, A. Candelori<sup>2</sup>, G.-F. Dalla Betta<sup>4</sup>, E. Focardi<sup>2,3</sup>, V. Khomenkov<sup>2</sup>, C. Piemonte<sup>1</sup>, S. Ronchin<sup>1</sup>, C. Tosi<sup>3</sup>, N. Zorzi<sup>1</sup>

<sup>1</sup>ITC-irst, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>Università di Firenze, Italy; <sup>4</sup>Università di Trento, Italy

#### **N16-184: Large Scale Qualification of Silicon Micro-Strip Sensors for CMS Tracker**

N. Dinu, *National Institute of Nuclear Physics, Italy*  
On behalf of the CMS Collaboration / Tracker group

**N16-185:** Toward the SLHC: Simulation of Ultra Radiation Hard Silicon Pixel Tracking Detectors

T. Lari<sup>1,2</sup>, C. Troncon<sup>1,2</sup>

<sup>1</sup>University of Milan, Italy; <sup>2</sup>INFN, Italy

**N16-186:** Novel Silicon Stripixel Detectors on High Resistivity P-Type Magnetic Czochralski Silicon Wafers for Super LHC Upgrade

Z. Li, D. Lissauer, D. Lynn, P. O'Connor, V. Radeka, *Brookhaven National Lab, USA*

**N16-187:** The Design of the Layer-0 Silicon Detector for the D-Zero Experiment

C. Daly, H. J. Lubatti, W. Kuykendall, C. J. Wang, T. Zhao, *University of Washington, USA*

**N16-188:** ALICE Silicon Drift Detector: Qualification Procedure of the Mass Production

A. Rashevsky, *INFN, Italy*

On behalf of the ALICE collaboration

**N16-189:** Planar Edgeless Silicon Detectors for the TOTEM Experiment

G. Ruggiero<sup>1</sup>, E. Alagoz<sup>1</sup>, V. Avati<sup>2</sup>, K. Eggert<sup>1</sup>, N. Egorov<sup>3</sup>, I. Eremin<sup>4</sup>, H. Niewiadomski<sup>1</sup>, E. Noschis<sup>1</sup>, M. Oriunno<sup>1</sup>, A. Sidorov<sup>3</sup>, W. Snoeys<sup>1</sup>

<sup>1</sup>CERN, Switzerland; <sup>2</sup>Helsinki University, Finland; <sup>3</sup>Research Institute of Material Science and Technology, Russia; <sup>4</sup>Megaimpulse / Ioffe Physico-Technical Institute, Russia

**N16-190:** Sensor Array Testing Using a Temporary Conductor

C. Kenney, E. Westbrook, *Molecular Biology Consortium, USA*; S. Parker, *University of Hawaii, USA*

**N16-191:** Three-Dimensional Sub-Strip Position Interpolation in Thick Silicon Detectors

E. A. Wulf, B. F. Philips, W. N. Johnson, J. D. Kurfess, *Naval Research Laboratory, USA*

**New Solid State Detectors**

**N16-192:** A T-CAD Analysis and Comparison of the Semi-Insulator and Dielectric Passivated Silicon Microstrip Detector: Impact on Breakdown Voltage

A. K. Srivastava<sup>1,2</sup>, A. Bhardwaj<sup>2</sup>, K. Ranjan<sup>2</sup>, N. Agrawal<sup>2</sup>, S. Chatterji<sup>2</sup>, R. K. Shivpuri<sup>2</sup>

<sup>1</sup>Banasthali Vidyapith, India; <sup>2</sup>Centre for Detector and Related Software Technology, University of Delhi, India

**N16-193:** Rectification Properties of Amorphous Germanium Contacts on Germanium Detectors

E. L. Hull, *Lawrence Livermore National Laboratory, USA*; R. H. Pehl, *Lawrence Berkeley National Laboratory, USA*

**N16-194:** Bulk SiC as a Detector Material

W. R. Cunningham<sup>1</sup>, J. J. Melone<sup>1</sup>, M. Horn<sup>1</sup>, V. Kazukauskas<sup>2</sup>, J. P. Grant<sup>1</sup>, M. Glaser<sup>3</sup>, J. V. Vaitkus<sup>2</sup>, M. Rahman<sup>1</sup>

<sup>1</sup>University of Glasgow, Scotland; <sup>2</sup>Vilnius University, Lithuania; <sup>3</sup>CERN, Switzerland

**N16-195:** Undoped InSb Schottky Detector for Gamma Ray Measurements

S. Hishiki, I. Kanno, *Kyoto University, Japan*; O. Sugiura, R. Xiang, *Tokyo Institute of Technology, Japan*; T. Nakamura, M. Katagiri, *Japan Atomic Energy Research Institute, Japan*

**N16-196:** Two-Dimensional Microstrip Germanium Detector for X-Ray Spectroscopy of Highly Charged Heavy Ions

D. Protic<sup>1</sup>, T. Stoehlker<sup>2</sup>, T. Krings<sup>1</sup>, I. Mohos<sup>1</sup>, U. Spillmann<sup>2</sup>

<sup>1</sup>Forschungszentrum Juelich, Germany; <sup>2</sup>Gesellschaft fuer Schwerionenforschung, Germany

**N16-197:** Large-Volume Si(Li) Orthogonal-Strip Detectors for Compton Effect Based Instruments

D. Protic<sup>1</sup>, E. L. Hull<sup>2</sup>, T. Krings<sup>1</sup>, K. Vetter<sup>2</sup>

<sup>1</sup>Forschungszentrum Juelich, Germany; <sup>2</sup>Lawrence Livermore National Laboratory, USA

**N16-198:** Properties of Neutron Pixel Detector Based on Medipix-2 Device

J. Jakubek<sup>1</sup>, T. Holy<sup>1</sup>, E. Lehmann<sup>2</sup>, S. Pospisil<sup>1</sup>, J. Uher<sup>1</sup>, J. Vacik<sup>3</sup>

<sup>1</sup>Institute of Experimental and Applied Physics of the Czech Technical University, Czech Republic; <sup>2</sup>Paul Scherrer Institute, Switzerland; <sup>3</sup>Nuclear Physics Institute, Academy of Sciences of the Czech Republic, Czech Republic

**N16-199:** A Model for the Development of Transition Edge Sensors for Fast Neutron and X-Ray Spectroscopy Based on Conventional and High Temperature Superconductors

S. J. Smith<sup>1</sup>, R. M. Ambrosi<sup>1</sup>, G. W. Fraser<sup>1</sup>, J. I. W. Watterson<sup>2</sup>, T. Stevenson<sup>1</sup>, C. W. Whitford<sup>1</sup>

<sup>1</sup>University of Leicester, UK; <sup>2</sup>University of the Witwatersrand, South Africa

**JNM1 NSS-MIC Joint Session I**

Tuesday, October 19 14:00-15:30, Leptis Magna 1&2

Session Chair: **Christian Morel**, *EPFL, LPHE-IPEP, Lausanne*

**JNM1-1:** (14:00) Tomographic Reconstruction for Cosmic Ray Muon Radiography

L. J. Schultz, *Los Alamos National Laboratory, USA*

On behalf of the Muon Radiography Collaboration

**JNM1-2:** (14:15) U-SPECT-I: a Stationary Molecular Imaging System with 0.1 Micro-Litre Resolution

E. J. Beekman, B. Vastenhouw, F. van der Have, *University Medical Center, the Netherlands*

**JNM1-3:** (14:30) Application of Lower Energy, Gamma Emitting Sources to Transmission Imaging in PET

S. Siegel, D. F. Newport, *Concorde Microsystems, USA*; J. T. Yap, *University of Tennessee Medical Center, USA*

**JNM1-4:** (14:45) A PET System Dedicated to Breast Cancer Imaging

Y.-C. Tai, H. Wu, M. Janecek, *Washington University in St. Louis, USA*



### JNM1-5: (15:00) Design Considerations for a Combined, APD-Based $\mu$ PET/ $\mu$ CT Scanner

R. Lecomte<sup>1</sup>, P. Bérard<sup>1</sup>, C. M. Pepin<sup>1</sup>, F. Bélanger<sup>1</sup>, J. Cadorette<sup>1</sup>, L. Convert<sup>1</sup>, M. D. Lepage<sup>1</sup>, J.-D. Leroux<sup>1</sup>, J.-B. Michaud<sup>1</sup>, J.-F. Pratte<sup>2</sup>, S. Robert<sup>1</sup>, D. Rouleau<sup>1</sup>, V. V. Selivanov<sup>1</sup>, M.-A. Tétrault<sup>1</sup>, R. Fontaine<sup>1</sup>

<sup>1</sup>Université de Sherbrooke, Canada; <sup>2</sup>Brookhaven National Laboratory, Canada

### JNM1-6: (15:15) A CCD-Based High Resolution CT System for Analysis of Trabecular Bone Tissue

A. Pasini<sup>1</sup>, F. Barrufaldi<sup>2</sup>, B. Rosa<sup>1</sup>, C. Franco<sup>1</sup>, C. Samantha<sup>1</sup>, L. Nico<sup>1</sup>, M. Mariapia<sup>1</sup>, E. Di Nicola<sup>1</sup>, S. Pani<sup>3</sup>, E. Perilli<sup>1,2</sup>, D. Romani<sup>1</sup>, A. Rossi<sup>1</sup>, M. Bettuzzi<sup>1</sup>

<sup>1</sup>University of Bologna, Italy; <sup>2</sup>Istituti Ortopedici Rizzoli, Italy;

<sup>3</sup>Sincrotrone Trieste S.C.p.A., Italy

## N17 Gaseous Detectors I

Tuesday, October 19 14:00-15:30, Leptis Magna 4  
Session Chair: Alessandro Ferretti, *Torino University*

**N17-1:** (14:00) Experience with the ZEUS Central Tracking Detector  
R. J. Hall-Wilton, M. R. Sutton, *University College London, UK*

**N17-2:** (14:15) Acceptance Tests and Criteria of the ATLAS Transition Radiation Tracker

P. Cwetanski, *CERN, Switzerland*

On behalf of the ATLAS TRT Collaboration

**N17-3:** (14:30) Gas Pixel Detectors

R. Bellazzini, *INFN Pisa, Italy*

**N17-4:** (14:45) The Readout of Gaseous Detectors by Means of a Micromegas-Covered Pixel-Segmented CMOS Anode

P. Colas, Y. Giomataris, *CEA Saclay, France*; A. P. Colijn, A. Fornaini, H. V. D. Graaf, P. Kluit, J. Timmermans, J. Visschers, *NIKHEF, the Netherlands*; J. Schmitz, *University of Twente, the Netherlands*; M. Campbell, E. Heijne, X. Llopart, *CERN, Switzerland*

**N17-5:** (15:00) First Images Acquired with a New Portal Imager Prototype

J. Ostling<sup>1</sup>, A. Brahmé<sup>2</sup>, M. Danielsson<sup>3</sup>, C. Iacobaeus<sup>2</sup>, E. Nordström<sup>3</sup>, V. Peskov<sup>3</sup>

<sup>1</sup>Stockholm University, Sweden; <sup>2</sup>Karolinska Institutet, Sweden; <sup>3</sup>Royal Institute of Technology, Sweden

**N17-6:** (15:15) Large Area Curved Detector for Neutron Diffraction Instrumentation

K. Medjoubi, J.-F. Clergeau, B. Guerard, F. Millier, P. Van Esch, G. Viande, *Institut Laue Langevin, France*

## N18 Analog and Digital Circuits III

Tuesday, October 19 14:00-15:30, Leptis Magna 3  
Session Chair: Christophe Lataille, *LAL (IN2P3)*

**N18-1:** (14:00) Fermilab Silicon Strip Readout Chip for BTEV

R. J. Yarema, J. Hoff, A. Mekkaoui, *Fermi National Accelerator Laboratory, USA*; V. Angeleri, P. F. Manfredi, L. Ratti, V. Speziali,

*Università di Pavia and INFN, Italy*; M. Manghisoni, V. Re, *Università di Bergamo and INFN Pavia, Italy*

**N18-2:** (14:15) A 64-Channel Wide Dynamic Range Charge Measurement ASIC for Strip and Pixel Ionization Detectors

G. Mazza, R. Cirio, M. Donetti, F. Marchetto, *INFN sez. di Torino, Italy*; C. Peroni, *Università di Torino, Italy*

**N18-3:** (14:30) A High-Resolution Time Digitizer Utilizing Dual PLL Circuits

Y. Arai, *KEK, High Energy Accelerator Research Organization, Japan*

**N18-4:** (14:45) The DRS2 Chip: a 4.5 GHz Waveform Digitizing Chip for the MEG Experiment

S. Ritt, *Paul Scherrer Institute, Switzerland*

On behalf of the MEG Collaboration

**N18-5:** (15:00) Radiation-Hard ASICs for Optical Data Transmission in the ATLAS Pixel Detector

K. E. Arms, K. K. Gan, M. Johnson, H. Kagan, R. Kass, A. M. Rahimi, C. Rush, S. Smith, R. Ter-Antonian, M. M. Zoeller, *The Ohio State University, USA*; A. Ciliox, M. Holder, S. Nderitu, M. Ziolkowski, *Universitaet Siegen, Germany*

**N18-6:** (15:15) The DIALOG Chip in the Front-End Electronics of the LHCb Muon Detector

S. Cadeddu, C. Deplano, A. Lai, *Istituto Nazionale Fisica Nucleare, Italy*

## N19 Scintillation Detectors III

Tuesday, October 19 14:00-15:30, Orange 2  
Session Chair: Paul Lecoq, *CERN*

**N19-1:** (14:00) Scintillation Properties of  $\text{LuI}_3: \text{Ce}^{3+}$

M. D. Birowosuto, P. Dorenbos, C. W. E. van Eijk, *Interfaculty Reactor Institute, Delft University of Technology, The Netherlands*; K. W. Krämer, H. U. Güdel, *University of Bern, Switzerland*

**N19-2:** (14:15) Perspectives for High Resolution and High Light Output  $\text{LuAP:Ce}$  Crystals

M. Balcerzyk<sup>1</sup>, M. Moszynski<sup>1</sup>, Z. Gałazka<sup>2</sup>, M. Kapusta<sup>1</sup>, A. Syntfeld<sup>1</sup>, J.-L. Lefaucheur<sup>2</sup>

<sup>1</sup>Soltan Institute for Nuclear Studies, Poland; <sup>2</sup>Photonic Materials Ltd., UK

**N19-3:** (14:30) Intrinsic Luminescence and Luminescence of Inadvertent Impurities in  $\text{LuAP}$  and  $\text{LuYAP}$

I. A. Kamenskikh, N. V. Guerassimova, V. V. Mikhailin, *M. V. Lomonosov Moscow State University, Russia*; C. Pedrini, C. Dujardin, *University Claude Bernard Lyon 1, France*; A. G. Petrosyan, *Institute for Physical Research, Armenia*

**N19-4:** (14:45) Gamma Ray and Neutron Detection with  $\text{LaBr}_3:\text{Ce}$  and  $\text{LaCl}_3:\text{Ce}$  Scintillators

P. Dorenbos, J. T. M. de Haas, C. W. E. van Eijk, *Delft University of Technology, the Netherlands*

**N19-5: (15:00) Effects of Ce Concentration on Scintillation Properties of LaBr<sub>3</sub>:Ce**

J. Glodo<sup>1</sup>, W. W. Moses<sup>2</sup>, W. M. Higgins<sup>1</sup>, E. V. D. van Loeft, P. Wong<sup>1</sup>, S. E. Derenzo<sup>2</sup>, M. J. Weber<sup>2</sup>, K. S. Shah<sup>1</sup>

<sup>1</sup>Radiation Monitoring Devices, Inc., USA; <sup>2</sup>Lawrence Berkeley National Laboratory, USA

**N19-6: (15:15) Self-Activity of Lanthanum Halides**

W. J. Kernan<sup>1,2</sup>

<sup>1</sup>Bechtel Nevada Remote Sensing Laboratory, USA; <sup>2</sup>University of Nevada, USA

**N20 New Radiation Detectors II**

Tuesday, October 19 14:00-15:30, Spalato  
Session Chair: **Graham Smith, BNL**

**N20-1, keynote: (14:00) Ultra-High Resolution Gamma Spectrometers Based on Superconducting Mo/Cu Multilayer Sensors**

S. Friedrich, S. F. Terracol, O. B. Drury, Z. A. Ali, T. Miyazaki, S. Ali, Lawrence Livermore National Laboratory, USA

**N20-2: (14:30) High Resolution X-Ray Photon-Counting Detector with Scintillator-Deposited Charge-Coupled Device**

E. Miyata, N. Tawa, K. Mukai, Osaka University, Japan; K. Miyaguchi, Hamamatsu Photonics K.K., Japan

**N20-3: (14:45) X and Gamma-Ray Detection with a Silicon Drift Detector Coupled to a CsI(Tl) Scintillator Operated with Pulse Shape Discrimination Technique**

M. Marisaldi<sup>1</sup>, C. Labanti<sup>1</sup>, H. Soltan<sup>2</sup>, C. Fiorini<sup>3</sup>, A. Longoni<sup>3</sup>, F. Perotti<sup>1</sup>

<sup>1</sup>CNR/INAF-IASF Istituto di Astrofisica Spaziale e Fisica Cosmica, Italy; <sup>2</sup>PN Sensor GmbH, Germany; <sup>3</sup>Politecnico di Milano, Italy

**N20-4: (15:00) DEPMOSFET Active Pixel Sensor Prototypes for the XEUS Wide Field Imager**

J. Treis<sup>1</sup>, P. Fischer<sup>2</sup>, O. Haelker<sup>1</sup>, M. Harter<sup>2</sup>, S. Herrmann<sup>1</sup>, R. Kohrs<sup>3</sup>, H. Krueger<sup>3</sup>, P. Lechner<sup>4</sup>, G. Lutz<sup>5</sup>, I. Peric<sup>3</sup>, M. Porro<sup>6</sup>, R. H. Richter<sup>5</sup>, L. Strueder<sup>1</sup>, M. Trimpl<sup>3</sup>, N. Wermes<sup>3</sup>

<sup>1</sup>Max-Planck-Institut fuer extraterrestrische Physik, Germany; <sup>2</sup>Lehrstuhl fuer Schaltungstechnik und Simulation der Universitaet Mannheim, Germany; <sup>3</sup>Physikalisches Institut der Universitaet Bonn, Germany; <sup>4</sup>PN Sensor GmbH, Germany; <sup>5</sup>Max-Planck-Institut fuer Physik, Germany; <sup>6</sup>Politecnico di Milano, Italy

**N20-5: (15:15) Recent Developments in the Processing of P-Type Spiral Drift Detectors**

W. Chen<sup>1</sup>, E. Gatti<sup>2</sup>, Z. Li<sup>1</sup>, P. Rehak<sup>1</sup>

<sup>1</sup>Brookhaven National Lab, USA; <sup>2</sup>Politecnico di Milano, Italy

**JNM2 NSS-MIC Joint Session II**

Tuesday, October 19 16:00-18:00, Leptis Magna 1&2  
Session Chair: **Kanai Shah, Radiation Monitoring Devices, Inc**

**JNM2-1: (16:00) Factors Influencing Timing Resolution in a Commercial LSO PET Camera**

W. W. Moses, Lawrence Berkeley National Laboratory, USA

**JNM2-2: (16:15) Comparison of Mercuric Iodide and Lead Iodide X-Ray Detectors for X-Ray**

G. Zentai, L. Partain, R. Pavlyuchkova, Varian Medical Systems, USA; M. Schieber, Hebrew University, Israel; K. Shah, P. Bennett, Radiation Monitoring Devices, USA

**JNM2-3: (16:30) Imaging Performances of LaCl<sub>3</sub>:Ce Scintillation Crystals in SPECT**

R. Pani<sup>1</sup>, M. N. Cinti<sup>1</sup>, F. de Notaristefani<sup>2</sup>, R. Pellegrini<sup>1</sup>, P. Bennati<sup>1</sup>, M. Betti<sup>1</sup>, G. Trotta<sup>1</sup>, A. Karimian<sup>1</sup>, M. Mattioli<sup>1</sup>, F. Garibaldi<sup>3</sup>, F. Cusanno<sup>3</sup>, V. Orsolini Cencelli<sup>4</sup>

<sup>1</sup>University La Sapienza, Italy; <sup>2</sup>University Roma III, Italy; <sup>3</sup>ISS, Italy; <sup>4</sup>INFN, Italy

**JNM2-4: (16:45) A New Multi-Modality System for Quantitative in Vivo Studies in Small Animals: Combination of Nuclear Magnetic Resonance and the Radiosensitive B-Microprobe**

A. Desbree, F. Pain, H. Gurden, P. Laniece, R. Mastrippolito, Institut de Physique Nucléaire d'ORSAY, France

**JNM2-5: (17:00) First Results on Real-Time Imaging and Dosimetry of Beta Emitting Sources for Medical Applications Using Silicon Strip Detectors**

C. Cappellini<sup>1</sup>, C. Bianchi<sup>1</sup>, A. Bulgheroni<sup>1</sup>, M. Caccia<sup>1</sup>, L. Conte<sup>1</sup>, E. Grigoriev<sup>2</sup>, W. Kucewicz<sup>3</sup>, A. Mozzanica<sup>1</sup>, M. Presti<sup>1</sup>, M. Rovere<sup>1</sup>, C. Sampietro<sup>1</sup>, E. Vallazza<sup>4</sup>

<sup>1</sup>Università dell'Insubria, Italy; <sup>2</sup>Université de Geneve, Switzerland; <sup>3</sup>University of Science and Technology, Poland; <sup>4</sup>Istituto Nazionale di Fisica Nucleare, Italy

**JNM2-6: (17:15) Preliminary Results of a Data Acquisition Sub-System for Distributed, Digital, Computational, APD-Based, Dual-Modality PET/CT Architecture for Small Animal Imaging**

R. Fontaine, F. Bélanger, N. Viscogliosi, M.-A. Tétraut, P. Bérard, J. Cadorette, J.-D. Leroux, J.-B. Michaud, C. Pepin, J.-F. Pratte, S. Robert, R. Lecomte, University of Sherbrooke, Canada

**JNM2-7: (17:30) Time Discrimination Techniques Using Artificial Neural Networks for Positron Emission Tomography**

J.-D. Leroux, D. Rouleau, C. Pepin, J.-B. Michaud, J. Cadorette, R. Fontaine, R. Lecomte, Université de Sherbrooke, Canada

**JNM2-8: (17:45) Imaging Performance of Tiled Solid-State Detectors**

M. Petrillo, J. Ye, J. Vesel, L. Shao, Philips Medical Systems, USA; H. Wiczorek, A. Goedicke, Philips Research Laboratories, Germany

## N21 High Energy Physics Detectors IV: General

Tuesday, October 19 16:00-18:00, Leptis Magna 4  
Session Chair: **Fernando Ferroni**, *Università di Roma "La Sapienza"*

### N21-1: (16:00) System Test of a Three-Column LHCb RICH-2 Prototype Detector

N. Harnew, *University of Oxford, UK*  
On behalf of the LHCb RICH Collaboration

### N21-2: (16:15) Design, Construction, and Initial Performance of SciBar Detector in K2K Experiment

S. Yamamoto, *Kyoto University, Japan*  
On behalf of the K2K-SciBar Group

### N21-3: (16:30) Status of the HMPID CsI-RICH Project for ALICE at CERN-LHC

A. Di Mauro, *CERN, Switzerland*  
On behalf of the ALICE-HMPID Group

### N21-4: (16:45) Prospects to Use Silicon Photomultipliers for the Astro Particle Physics Experiments EUSO and MAGIC

N. Otte<sup>1</sup>, J. Hose<sup>1</sup>, L. Strüder<sup>2</sup>, B. Dolgoshein<sup>3</sup>, E. Popova<sup>3</sup>,  
S. Klemin<sup>4</sup>, E. Lorenz<sup>1</sup>, G. Lutz<sup>1</sup>, R. Mirzoyan<sup>1</sup>, R. H. Richter<sup>1</sup>,  
M. Teshima<sup>1</sup>  
<sup>1</sup>Max-Planck-Institute für Physik, Germany; <sup>2</sup>Max-Planck-Institute for extraterrestrial Physics, Germany; <sup>3</sup>Moscow Engineering and Physics Institute, Russia; <sup>4</sup>PULSAR Enterprize, Russia

### N21-5: (17:00) The ALICE Transition Radiation Detector - Design and Performance

J. P. Wessels, *University of Muenster, Germany*  
On behalf of the ALICE TRD Collaboration

### N21-6: (17:15) The CDF Run II Upgrade

R. S. Wallny, *UCLA, USA*  
On behalf of the CDF Collaboration

### N21-7: (17:30) Development of the MRPC Detectors for STAR-TOF at RHIC

C. Li, *University of Science and Technology of China (USTC), China*  
On behalf of the STAR TOF Group

### N21-8: (17:45) Status of the LHCb Experiment

W. Witzeling, *CERN, Switzerland*  
On behalf of the LHCb Collaboration

## N22 Trigger and Front-End Systems II

Tuesday, October 19 16:00-18:00, Leptis Magna 3  
Session Chair: **Harrison Prosper**, *Florida State University*

### N22-1: (16:00) Physics Performance of the D0 Central Track Trigger

C. Hensel, *University of Kansas, USA*  
On behalf of the D0 CTT Group

### N22-2: (16:15) Overview of the ECAL Off-Detector Electronics of the CMS Experiment

P. Gras<sup>1</sup>, R. Benetta<sup>2</sup>, M. Gastal<sup>2</sup>, M. Hansen<sup>2</sup>, K. Kloukinas<sup>2</sup>,  
C. Ljuslin<sup>2</sup>, M. Dejjardin<sup>1</sup>, J.-L. Faure<sup>1</sup>, O. Gachelin<sup>1</sup>,  
I. Mandjavidze<sup>1</sup>, M. Mur<sup>1</sup>, P. Verrecchia<sup>1</sup>, C. B. Almeida<sup>3</sup>, V. Bexiga<sup>3</sup>,

P. Machado<sup>3</sup>, M. Santos<sup>3</sup>, I. Teixeira<sup>3</sup>, J. P. Teixeira<sup>3</sup>, R. Alemany<sup>4</sup>,  
N. Almeida<sup>4</sup>, N. Cardoso<sup>4</sup>, J. C. D. Silva<sup>4</sup>, M. Husejko<sup>4</sup>, A. Jain<sup>4</sup>,  
J. Varela<sup>5</sup>, M. Bercher<sup>5</sup>, J. Bourrotte<sup>5</sup>, P. Bussone<sup>5</sup>, Y. Geerebaert<sup>5</sup>,  
M. Cerrutti<sup>5</sup>, J. Gilly<sup>5</sup>, A. Karar<sup>5</sup>, P. Paganini<sup>5</sup>, N. nicolas.Regnauld<sup>5</sup>,  
L. Zlatevski<sup>5</sup>

<sup>1</sup>CEA Saclay, France; <sup>2</sup>CERN, Switzerland; <sup>3</sup>INESC, Portugal; <sup>4</sup>LIP, Portugal; <sup>5</sup>CNRS, France

### N22-3: (16:30) The "Road Warrior" for the CDF Online Silicon Vertex Tracker

F. Spinella<sup>1</sup>, A. Annovi<sup>1</sup>, A. Bardi<sup>1</sup>, R. Carosi<sup>1</sup>, P. Catastini<sup>1</sup>,  
M. Dell'orso<sup>1</sup>, P. Giannetti<sup>1</sup>, F. Morsani<sup>1</sup>, E. Pedreschi<sup>1</sup>,  
M. Piendibene<sup>1</sup>, L. Ristori<sup>1</sup>, J. Adelman<sup>2</sup>, T. Maruyama<sup>2</sup>, M. Shocker<sup>2</sup>,  
U.-K. Yang<sup>2</sup>, J. Lewis<sup>3</sup>, T. Liu<sup>3</sup>, M. Pitkanen<sup>3</sup>, B. Reisert<sup>3</sup>, A. Cerri<sup>4</sup>,  
S. Belforte<sup>1</sup>

<sup>1</sup>Italian Institute for Nuclear Physics, Italy; <sup>2</sup>University of Chicago, USA;  
<sup>3</sup>Fermilab, USA; <sup>4</sup>BNL, USA

### N22-4: (16:45) The ATLAS Level-1 Central Trigger Processor Core Module (CTP\_CORE)

P. Borrego Amaral<sup>1</sup>, N. Ellis<sup>1</sup>, P. Farthouat<sup>1</sup>, P. Gallno<sup>1</sup>, H. Pessoa Lim a Junior<sup>1,2</sup>,  
T. Maeno<sup>1</sup>, I. Resurreccion Arcas<sup>1</sup>, J. Seixas<sup>2</sup>, G. Schuler<sup>1</sup>,  
R. Spiwoks<sup>1</sup>, R. Torga Teixeira<sup>1</sup>, T. Wengler<sup>1</sup>

<sup>1</sup>CERN, Switzerland; <sup>2</sup>Universidade Federal do Rio de Janeiro (UFRJ), Brazil

### N22-5: (17:00) The Level-3 Trigger at the CDF Experiment at Tevatron Run II

Y. Chung, G. De Lentdecker, S. Demers, B. Han, B. Kilminster,  
J. Lee, K. McFarland, A. Vaiciulis, *University of Rochester, USA*;  
F. Azfar, *Oxford University, UK*; T. Akimoto, H. Kobayashi,  
H. Matsunaga, M. Shimojima, *University of Tsukuba, Japan*;  
D. Waters, *University College London, UK*

### N22-6: (17:15) Experience with the High Level Procedural Language, Handel-C, in Programming FPGAs: the Readout Driver for the ATLAS Endcap Muon Trigger

L. J. Levinson, A. Roich, *Weizmann Institute of Science, Israel*

### N22-7: (17:30) An Asynchronous Level-1 Tracking Trigger for Future LHC Detector Upgrades

A. Madorsky, D. Acosta, *University of Florida, USA*

### N22-8: (17:45) CDF Level 2 Trigger Upgrade - the Pulsar Project

R. Demaat, M. Hakala, J. Lewis, C.-J. Lin, T. T. Liu, T. Mansikkala,  
F. Marjamaa, M. Pitkanen, B. Reisert, P. Wilson, *Fermilab, USA*;  
M. Bogdan, Y.-K. Kim, W. Fedorko, H. Frisch, S. Kwang,  
V. Rusu, H. Sanders, M. Shochet, *University of Chicago, USA*;  
K. Hahn, P. Keener, J. Kroll, C. Neu, H. Stabenau,  
R. Van Berg, D. Whiteson, P. Wittich, *University of Pennsylvania, USA*

## N23 Solid State Tracking Detectors I

Tuesday, October 19 16:00-18:00, Orange 2  
Session Chair: **Phil Allport**, *University of Liverpool*

### N23-1: (16:00) The ATLAS Pixel Detector

F. Huegging, *Physikalisches Institut der Universität Bonn, Germany*  
On behalf of the ATLAS Pixel Collaboration

## **N23-2: (16:15) Operation and Performance of the NA60 Pixel Telescope in Heavy-Ion Collisions**

M. Keil<sup>1,2</sup>, <sup>1</sup>*CERN, Switzerland*; <sup>2</sup>*University of Heidelberg, Germany*  
On behalf of the NA60 collaboration

## **N23-3: (16:30) Results of the Tests of a CMS Tracker Inner Barrel Sub-Structure with a 25 ns Beam**

G. Segneri, *Universita' degli Studi di Pisa and INFN Pisa, Italy*  
On behalf of the CMS Collaboration

## **N23-4: (16:45) The Active DEPFET Pixel Sensor for Future e+e- Linear Collider Experiments**

L. Andricek<sup>1</sup>, P. Fischer<sup>2</sup>, M. Haerter<sup>2</sup>, K. Heinzinger<sup>1</sup>, M. Karagounis<sup>3</sup>, R. Kohrs<sup>3</sup>, H. Krueger<sup>3</sup>, P. Lechner<sup>1</sup>, G. Lutz<sup>1</sup>, I. Peric<sup>2</sup>, M. Porro<sup>1</sup>, L. Reuen<sup>3</sup>, R. Richter<sup>1</sup>, G. Schaller<sup>1</sup>, M. Schneck<sup>1</sup>, F. Schopper<sup>1</sup>, H. Soltau<sup>1</sup>, L. Strueder<sup>1</sup>, J. Treis<sup>1</sup>, M. Trimpl<sup>3</sup>, N. Wermes<sup>3</sup>

<sup>1</sup>*MPI Halbleiterlabor, Munich, Germany*; <sup>2</sup>*Mannheim University, Germany*; <sup>3</sup>*Bonn University, Germany*

## **N23-5: (17:00) Design and Characterisation of Active Pixel Sensors in 0.25 $\mu\text{m}$ CMOS**

R. A. D. Turchetta<sup>1</sup>, J. Velthuis<sup>2</sup>, G. Casse<sup>2</sup>, M. Tyndel<sup>1</sup>, A. Evans<sup>2</sup>, G. Villani<sup>1</sup>, P. Allport<sup>2</sup>

<sup>1</sup>*CCLRC - Rutherford Appleton Laboratory, UK*; <sup>2</sup>*University of Liverpool, UK*

## **N23-6: (17:15) Development of a Super B-Factory Monolithic Active Pixel Detector – the Continuous Acquisition Pixel (CAP) Prototypes**

M. Barbero<sup>1</sup>, T. Browder<sup>1</sup>, F. Fang<sup>1</sup>, M. Hazumi<sup>2</sup>, N. Kent<sup>1</sup>, S. Olsen<sup>1</sup>, H. Palka<sup>3</sup>, L. Ruckman<sup>1</sup>, S. Stanic<sup>4</sup>, K. Trabelsi<sup>1</sup>, T. Tsuboyama<sup>2</sup>, K. Uchida<sup>1</sup>, G. Varner<sup>1</sup>

<sup>1</sup>*University of Hawaii, USA*; <sup>2</sup>*KEK, High Energy Accelerator Research Organization, Japan*; <sup>3</sup>*H. Niewodniczanski Institute of Nuclear Physics, Poland*; <sup>4</sup>*University of Tsukuba, Japan*

## **N23-7: (17:30) Tracking Performance Optimization of CMOS Monolithic Active Pixel Sensors**

W. Dulinski<sup>1</sup>, J.-D. Berst<sup>1</sup>, A. Besson<sup>2</sup>, G. Claus<sup>1</sup>, C. Colledani<sup>1</sup>, G. Deptuch<sup>1</sup>, D. Grandjean<sup>2</sup>, C. Hu<sup>2</sup>, M. Szeleznia<sup>1</sup>, I. Valin<sup>2</sup>, M. Winter<sup>2</sup>

<sup>1</sup>*LEPSI, France*; <sup>2</sup>*IREs, France*

## **N23-8: (17:45) Advances in Radiation Active Pixel Sensors (RAPS) Architectures**

G. Matrella<sup>1,2</sup>, P. Placidi<sup>2,3</sup>, A. Marras<sup>1,2</sup>, M. Petasecca<sup>2,3</sup>, D. Passeri<sup>2,3</sup>, G. M. Bilei<sup>2</sup>, P. Ciampolini<sup>1,2</sup>

<sup>1</sup>*University of Parma, Italy*; <sup>2</sup>*I.N.F.N., Italy*; <sup>3</sup>*University of Perugia, Italy*

## **N24 Nuclear Physics Instrumentation**

Tuesday, October 19 16:00-17:45, Spalato

Session Chair: **Marcello Abbrescia**, *University of Bari and INFN*

### **N24-1, keynote: (16:00) Electrostatic Ion Beam Trap**

O. Heber<sup>1</sup>, N. Altstein<sup>1</sup>, I. Ben-Itzhak<sup>2</sup>, A. Diner<sup>1</sup>, M. Rappaport<sup>1</sup>, D. Strasser<sup>1</sup>, Y. Toker<sup>1</sup>, D. Zajfman<sup>1</sup>

<sup>1</sup>*Weizmann Institute of Science, Israel*; <sup>2</sup>*Kansas State University, USA*

## **N24-2: (16:30) Signal Interpolation in Germanium Strip Detectors for Improved 3-D Position Resolution**

M. Burks, E. Hull, E. Jordan, L. Mihailescu, K. Vetter, *Lawrence Livermore National Laboratory, USA*

## **N24-3: (16:45) A Scalable Enhanced Implementation of Pulse Shape Analysis for <sup>76</sup>Ge Neutrinoless Double-Beta Decay**

C. E. Aalseth, T. W. Hossbach, H. S. Miley, *Pacific Northwest National Laboratory, USA*

## **N24-4: (17:00) A Common Data Acquisition System for High Intensity Beam Experiments**

Y. Igarashi, H. Fujii, T. Higuchi, E. Inoue, M. Nakao, K. Nakayoshi, M. Tanaka, K. Tauchi, M. Saitoh, S. Shimazaki, S. Y. Suzuki, Y. Yasu, *High Energy Accelerator Research Organization (KEK), Japan*; Y. Nagasaka, *Hiroshima Institute of Technology, Japan*

## **N24-5: (17:15) Electronics Packaging Issues for Future Accelerators and Experiments**

R. S. Larsen, *Stanford Linear Accelerator Center, USA*; R. W. Downing, *Fermi National Laboratory, USA*

## **N24-6: (17:30) GARFIELD: a Multi-Detection Apparatus for the Heavy Ion Reaction Studies at Low and Intermediate Energies**

F. Gramegna, S. Barlini, V. Kravchuk, A. Lanchais, P. Mastinu, L. Vannucci, *I.N.F.N. - Laboratori Nazionali di Legnaro, Italy*; M. D'Agostino, M. Bruno, E. Geraci, G. Vannini, B. Guiot, J. De Sanctis, *I.N.F.N. and Dep. of Physics of Bologna, Italy*; A. Moroni, A. Giussani, *I.N.F.N. - sez. di Milano, Italy*; G. Casini, M. Chiari, A. Nannini, *I.N.F.N. - Sez. di Firenze, Italy*; U. Abbondanno, *I.N.F.N. - Sez. di Trieste, Italy*; A. Ordine, *I.N.F.N. - Sez. di Napoli, Italy*

## **N25 Gaseous Detectors II**

Wednesday, October 20 08:30-10:30, Leptis Magna 4

Session Chair: **Christoph Ilgner**, *CERN*

## **N25-1: (08:30) A Hadron Blind Detector for the PHENIX Experiment at RHIC**

I. Tserruya<sup>1</sup>, R. Azmoun<sup>2</sup>, C. Woody<sup>2</sup>, S. Sawada<sup>3</sup>, S. Yokkaichi<sup>4</sup>, A. Milov<sup>5</sup>, T. Gunji<sup>6</sup>, H. Hamagaki<sup>6</sup>, M. Inuzuka<sup>6</sup>, T. Isobe<sup>6</sup>, Y. Morino<sup>6</sup>, S. Oda<sup>6</sup>, K. Ozawa<sup>6</sup>, S. Saito<sup>6</sup>, T. Sakaguchi<sup>6</sup>, Y. Yamaguchi<sup>7</sup>, Z. Fraenkel<sup>1</sup>, A. Kozlov<sup>1</sup>, M. Naglis<sup>1</sup>, I. Ravinovich<sup>1</sup>, L. Shekhtman<sup>1</sup>

<sup>1</sup>*Weizmann Institute, Israel*; <sup>2</sup>*Brookhaven National Laboratory, USA*; <sup>3</sup>*KEK, Japan*; <sup>4</sup>*RIKEN, Japan*; <sup>5</sup>*Stony Brook University, SUNY, USA*; <sup>6</sup>*University of Tokyo, Japan*; <sup>7</sup>*Waseda University, Japan*

## **N25-2: (08:45) Ion Feedback Suppression Using Inclined the MCP Holes in a "Single-MCP + Micromegas + Pads" Detector**

J. Va'vra, *SLAC, USA*; T. Sumiyoshi, *Tokyo Metropolitan University, Japan*

## **N25-3: (09:00) Operation of Gaseous Detectors with Solid Photocathodes at Cryogenic Temperatures**

L. Periale<sup>1,2</sup>, V. D. Peskov<sup>3,4</sup>, C. Iacobaeus<sup>5</sup>, K. Agehed<sup>3</sup>, T. Francke<sup>6</sup>, B. Lund-Jensen<sup>3</sup>, N. Pavlopoulos<sup>1,4</sup>, P. Picchi<sup>1,7</sup>, F. Pietropaolo<sup>1,7</sup>, F. Tokana<sup>1,8</sup>

<sup>1</sup>*CERN, Switzerland*; <sup>2</sup>*IFSI-CNR and INFN, Italy*; <sup>3</sup>*Royal Institute of Technology, Sweden*; <sup>4</sup>*Leonardo da Vinci University, France*; <sup>5</sup>*Karolinska*



*Institute, Sweden; <sup>6</sup>Xcounter AB, Sweden; <sup>7</sup>INFN, Italy; <sup>8</sup>Yamagata University, Japan*

#### **N25-4: (09:15) Optical Time Projection Chamber for Imaging of Two-Proton Decay of <sup>45</sup>Fe Nucleus**

M. Cwiok<sup>1</sup>, W. Dominik<sup>1</sup>, Z. Janas<sup>1</sup>, A. Korgul<sup>1</sup>, K. Miernik<sup>1</sup>, M. Pfutzner<sup>1</sup>, M. Sawicka<sup>1</sup>, A. Wasilewski<sup>1,2</sup>

<sup>1</sup>Warsaw University, Poland; <sup>2</sup>Soltan Institute for Nuclear Studies, Poland

#### **N25-5: (09:30) Electron Diffusion and Scintillation in Xenon Doped with Hydrogen for High-Pressure Xenon Time Projection Chamber**

C. Tezuka<sup>1</sup>, N. Hasebe<sup>1</sup>, S. Kobayashi<sup>1</sup>, T. Igarashi<sup>1</sup>, M. Mimura<sup>1</sup>, T. Hosojima<sup>1</sup>, M. Kobayashi<sup>1</sup>, T. Doke<sup>1</sup>, M. Miyajima<sup>1</sup>, T. Miyachi<sup>1</sup>, H. Okada<sup>1</sup>, E. Shibamura<sup>2</sup>, K. N. Pushkin<sup>1,3</sup>, S. E. Ulin<sup>1,3</sup>

<sup>1</sup>Waseda university, Japan; <sup>2</sup>College of Health Science, Saitama Prefectural University, Japan; <sup>3</sup>Moscow Engineering Physics Institute (State University), Russia

#### **N25-6: (09:45) Operation of MHSP Multipliers in High Pressure Pure Noble-Gas**

F. Amaro<sup>1</sup>, J. F. C. A. Veloso<sup>1,2</sup>, A. Breskin<sup>3</sup>, R. Chechik<sup>3</sup>, J. A. M. dos Santos<sup>1</sup>

<sup>1</sup>Universidade de Coimbra, Portugal; <sup>2</sup>Universidade de Aveiro, Portugal; <sup>3</sup>The Weizmann Institute of Science, Israel

#### **N25-7: (10:00) GEM-Based Avalanche Detectors Operated in Dense Noble Gases**

A. Bondar, A. Buzulutskov, D. Pavluchenko, L. Shekhtman, R. Snopkov, Y. Tikhonov, A. Vasiljev, *Budker Institute of Nuclear Physics, Russia*

#### **N25-8: (10:15) Soda Glass Capillary Plate Gas Detector**

F. Tokanai<sup>1,2</sup>, T. Atsumi<sup>3</sup>, S. Gunji<sup>2</sup>, T. Okada<sup>3</sup>, H. Sakurai<sup>2</sup>

<sup>1</sup>PRESTO, JST, Japan; <sup>2</sup>Yamagata University, Japan; <sup>3</sup>Hamamatsu Photonics K.K., Japan

### **N26 Solid State Tracking Detectors II**

Wednesday, October 20 08:30-10:30, Leptis Magna 3  
Session Chair: Cinzia Da Via, Brunel University

#### **N26-1: (08:30) A Novel 2D Position Sensitive Silicon Detector with Micron Resolution for Heavy Ion Tracking**

B. Yu, R. H. Beuttenmuller, D. C. Elliott, Z. Li, J. A. Mead, V. Radeka, *Brookhaven National Laboratory, USA*

#### **N26-2: (08:45) Performance of P-Type Microstrip Detectors Irradiated to $7.5 \times 10^{15}$ p/cm<sup>2</sup>**

P. P. Allport, G. Casse, *University of Liverpool, UK*; M. Lozano, *Centro Nacional de Microelectronica, Spain*

#### **N26-3: (09:00) Developments in Radiation Hard Silicon for the LHCb VELO**

A. G. Bates, *CERN and University of Glasgow, Switzerland*  
On behalf of the LHCb VELO

#### **N26-4: (09:15) The CDF Run II Silicon Detector**

J. R. Mumford, *Johns Hopkins University, USA*  
On behalf of the CDF Collaboration

#### **N26-5: (09:30) The Silicon Tracker of the LHCb Experiment**

S. Koestner, *CERN, Switzerland*  
On behalf of the LHCb Silicon Tracker Collaboration

#### **N26-6: (09:45) Lessons Learned from BaBar Silicon Vertex Tracker, Limits and Future Perspectives of the Detector**

B. A. Petersen, *Stanford University, USA*  
On behalf of the BaBar SVT Collaboration

#### **N26-7: (10:00) Macro-Assembly of the ATLAS Barrel SCT**

G. Viehhauser, *Oxford University, UK*  
On behalf of the ATLAS SCT collaboration

#### **N26-8: (10:15) Shielding and Electrical Performance of Silicon Sensor Supermodules**

M. M. Weber<sup>1</sup>, C. H. Haber<sup>1</sup>, R. P. Ely<sup>1</sup>, S. Zimmermann<sup>1</sup>, R.-S. Lu<sup>2</sup>, P. J. Lujan<sup>1</sup>

<sup>1</sup>Lawrence Berkeley National Laboratory, USA; <sup>2</sup>Academia Sinica, Taiwan

### **N27 Data Acquisition and Analysis Systems II**

Wednesday, October 20 08:30-10:25, Orange 2  
Session Chair: Pier Giorgio Innocenti, CERN

#### **N27-1: (08:30) Front End Calibration and Control for the ATLAS Semiconductor Tracker**

A. J. Barr, *University of Cambridge, UK*  
On behalf of the ATLAS collaboration semiconductor tracker group

#### **N27-2: (08:45) The CERN CMS Tracker Control System**

F. Drouhin, *Haute-Alsace University, France*; L. Gross, D. Vintache, *Institut de Recherches Subatomiques de Strasbourg, France*; A. Marchioro, C. Paillard, C. Ljuslin, P. Siegrist, A. Tsiro, *CERN, Switzerland*; L. Mirabito, *Institut de Physique Nuclaire, France*; P. G. Verдини, *Istituto Nazionale di Fisica Nucleare, Italy*

#### **N27-3: (09:00) TILECAL/ATLAS Detector Control System**

J. Pina, *LIP-Laboratório de Instrumentação e Física Experimental de Partículas, Portugal*

#### **N27-4: (09:15) Improvements to the Cosmic Rays Radio Detector System**

D. O. Damazio, H. Takai, *Brookhaven National Laboratory, USA*

#### **N27-5: (09:40) ALTEA Data Handling**

L. Di Fino<sup>1,2</sup>, <sup>1</sup>University of Rome Tor Vergata, Italy; <sup>2</sup>INFN, Italy  
On behalf of the ALTEA Team

#### **N27-6: (09:55) GNAM: a Low Level Monitoring Program for ATLAS Experiment**

C. Roda, A. Dotti, P. Adragna, *University and INFN Pisa, Italy*; F. Zema, *University of Calabria, Italy*; R. Ferrari, W. Vandelli, *University and INFN Pavia, Italy*

#### **N27-7: (10:10) The Global Trigger Emulator System for the CMS Experiment**

T. Geralis, S. Kyriazopoulou, C. Markou, I. Michailakis, K. Zachariadou, *NCSR Demokritos, Greece*

Wednesday, October 20 08:30-10:30, Spalato  
Session Chair: **Danek Kotlinski**, *Paul Scherrer Institute*

### N28-1: (08:30) Design and Characterization of a Novel, Radiation-Resistant Active Pixel Sensor in a Standard 0.25 $\mu\text{m}$ CMOS Technology

E. G. Villani<sup>1</sup>, R. Turchetta<sup>1</sup>, P. Allport<sup>2</sup>, G. Casse<sup>2</sup>, M. Tyndel<sup>1</sup>, J. Velthuis<sup>2</sup>, A. Evans<sup>2</sup>, B. Gallop<sup>1</sup>  
<sup>1</sup>*Rutherford Appleton Laboratory, UK*; <sup>2</sup>*Liverpool University, UK*

### N28-2: (08:45) Fully Depleted Monolithic Active Pixel Sensor in SOI Technology

W. Kuczewicz<sup>1</sup>, A. Bulgheroni<sup>2</sup>, M. Caccia<sup>2</sup>, K. Domanski<sup>3</sup>, P. Grabiec<sup>3</sup>, M. Grodner<sup>3</sup>, B. Jaroszewicz<sup>3</sup>, M. Jastrzab<sup>1</sup>, A. Kociubinski<sup>3</sup>, K. Kucharski<sup>3</sup>, S. Kuta<sup>1</sup>, J. Marczewski<sup>3</sup>, H. Niemiec<sup>1</sup>, M. Sapor<sup>1</sup>, D. Tomaszewski<sup>3</sup>

<sup>1</sup>*AGH-University of Science and Technology, Poland*; <sup>2</sup>*Università dell'Insubria, Italy*; <sup>3</sup>*Institute of Electron Technology, Poland*

### N28-3: (09:00) Silicon Semi 3D Radiation Detectors

S. Eränen, I. Luusua, T. Virolainen, *VTT Information Technology, Finland*; M. Eräluoto, *Helsinki Institute of Physics, Finland*; J. Härkönen, *Helsinki Institute of Physics, Switzerland*

### N28-4: (09:15) Two and One Half Dimension-Architecture Sensors

C. Kenney<sup>1</sup>, S. Parker<sup>2</sup>, E. Westbrook<sup>1</sup>, J. Morse<sup>3</sup>, C. Da Via<sup>4</sup>  
<sup>1</sup>*Molecular Biology Consortium, USA*; <sup>2</sup>*University of Hawaii, USA*; <sup>3</sup>*European Synchrotron Research Facility, France*; <sup>4</sup>*Brunel University, UK*

### N28-5: (09:30) Self-Triggered Multi-Linear Silicon Drift Detector

A. Castoldi<sup>1,2</sup>, A. Galimberti<sup>1,2</sup>, E. Gatti<sup>1</sup>, C. Guazzoni<sup>1,2</sup>, P. Rehak<sup>3</sup>, L. Strüder<sup>4</sup>  
<sup>1</sup>*Politecnico di Milano, Italy*; <sup>2</sup>*INFN, Italy*; <sup>3</sup>*Brookhaven National Laboratory, USA*; <sup>4</sup>*Max Planck Institut, Germany*

### N28-6: (09:45) Building Pixel Detector Modules in Multi Chip Module Deposited Technology

C. Grah, K.-H. Becks, T. Flick, P. Gerlach, P. Mättig, *University of Wuppertal, Germany*

### N28-7: (10:00) Simulation of the CMS Prototype Silicon Pixel Sensors and Comparison with Test Beam Measurements

V. Chiochia<sup>1</sup>, M. Swartz<sup>2</sup>, D. Bortoletto<sup>3</sup>, L. Cremaldi<sup>4</sup>, S. Cucciarelli<sup>5</sup>, A. Dorokhov<sup>1,6</sup>, M. Konecki<sup>7</sup>, K. Prokofiev<sup>1,6</sup>, C. Regenfus<sup>1</sup>, T. Rohe<sup>6</sup>, D. Sanders<sup>4</sup>, S. Son<sup>3</sup>, T. Speer<sup>1</sup>  
<sup>1</sup>*Physik Institut der Universitaet Zurich, Switzerland*; <sup>2</sup>*Johns Hopkins University, USA*; <sup>3</sup>*Purdue University, USA*; <sup>4</sup>*University of Mississippi, USA*; <sup>5</sup>*CERN, Switzerland*; <sup>6</sup>*Paul Scherrer Institut, Switzerland*; <sup>7</sup>*Institut fuer Physik der Universitaet Basel, Switzerland*

### N28-8: (10:15) High-Gain Bipolar Phototransistor on High-Resistivity Silicon Substrate: a New Device for the Detection of Ionising Radiation

G. Batignani<sup>1,2</sup>, S. Bettarini<sup>1,2</sup>, M. Bondioli<sup>1,2</sup>, M. Boscardin<sup>3</sup>, L. Bosio<sup>4,5</sup>, G. F. Dalla Betta<sup>6</sup>, S. Dittongo<sup>4,5</sup>, F. Forti<sup>1,2</sup>,

M. A. Giorgi<sup>1,2</sup>, P. Gregori<sup>3</sup>, C. Piemonte<sup>3</sup>, I. Rachevskaia<sup>4,5</sup>, S. Ronchin<sup>3</sup>, N. Zorzi<sup>3</sup>  
<sup>1</sup>*University of Pisa, Italy*; <sup>2</sup>*INFN-Pisa, Italy*; <sup>3</sup>*ITC-IRST, Italy*; <sup>4</sup>*University of Trieste, Italy*; <sup>5</sup>*INFN-Trieste, Italy*; <sup>6</sup>*University of Trento, Italy*

## N29 Gaseous Detectors III

Wednesday, October 20 11:00-12:30, Leptis Magna 4  
Session Chair: **Anna Colaleo**, *INFN BARI*

### N29-1: (11:00) Production and Quality Control of MWPC for LHCb Muon System at CERN

R. Dumps<sup>1</sup>, A. Franca Barbosa<sup>2</sup>, J. S. Graulich<sup>1</sup>, L. Manhaes De Andrade Filho<sup>2</sup>, E. Polycarpo<sup>2</sup>, W. Riegler<sup>1</sup>, B. Schmidt<sup>1</sup>, T. Schneider<sup>1</sup>, V. Souvovov<sup>1</sup>  
<sup>1</sup>*CERN, Switzerland*; <sup>2</sup>*Centro Brasileiro de Pesquisas Fisicas, Brazil*

### N29-2: (11:15) Operation of the ATLAS Muon Drift-Tube Chambers at High Irradiation Rates and in Magnetic Fields

O. Kortner, *Max-Planck-Institut fuer Physik, Germany*  
On behalf of the ATLAS Collaboration

### N29-3: (11:30) New Large Area Glass RPC: Development, Production and Performances

A. Calcaterra<sup>1</sup>, R. de Sangro<sup>1</sup>, D. Gamba<sup>2,3</sup>, G. Mannocchi<sup>4,1</sup>, P. Patteri<sup>1</sup>, P. Picchi<sup>1</sup>, M. Piccolo<sup>1</sup>, S. Ragazzi<sup>3</sup>, N. Redaelli<sup>3</sup>, L. Satta<sup>6</sup>, T. Tabarelli de Fatis<sup>5</sup>, G. C. Trincherò<sup>4,3</sup>  
<sup>1</sup>*INFN, Laboratori Nazionali di Frascati, Italy*; <sup>2</sup>*Università di Torino, Italy*; <sup>3</sup>*INFN Sezione di Torino, Italy*; <sup>4</sup>*CNR-IFSI Sezione di Torino, Italy*; <sup>5</sup>*Università di Milano Bicocca and INFN, Italy*; <sup>6</sup>*Università di Roma, Italy*

### N29-4: (11:45) F- Ions Production in RPC Operated with Fluorine Compound Gases

G. Aielli<sup>1,2</sup>, R. Santonico<sup>1,2</sup>, A. Di Ciaccio<sup>1,2</sup>, A. Di Simone<sup>1,2</sup>, R. Cardarelli<sup>1,2</sup>, P. Camarri<sup>1,2</sup>, B. Liberti<sup>1,2</sup>  
<sup>1</sup>*Università di Roma, Italy*; <sup>2</sup>*INFN, Italy*

### N29-5: (12:00) R&D on RPC for the Muon Trigger System for the ALICE Experiment in View of P-P Data Taking

R. Arnaldi<sup>1</sup>, A. Baldit<sup>2</sup>, V. Barret<sup>2</sup>, N. Bastid<sup>2</sup>, G. Blanchard<sup>2</sup>, E. Chiavassa<sup>1</sup>, A. Colla<sup>1</sup>, P. Cortese<sup>3</sup>, P. Crochet<sup>2</sup>, G. Dellacasa<sup>3</sup>, A. Devaux<sup>2</sup>, N. De Marco<sup>1</sup>, P. Dupieux<sup>2</sup>, A. Ferretti<sup>1</sup>, B. Forestier<sup>2</sup>, M. Gallio<sup>1</sup>, R. Gemme<sup>1</sup>, S. Grigoryan<sup>2</sup>, F. Guerin<sup>2</sup>, R. Guernane<sup>1</sup>, C. Insa<sup>2</sup>, F. Jouve<sup>2</sup>, F. Manso<sup>4</sup>, P. Mereu<sup>1</sup>, A. Musso<sup>1</sup>, C. Oppedisano<sup>1</sup>, A. Piccotti<sup>1</sup>, F. Poggio<sup>1</sup>, L. Royer<sup>2</sup>, P. Rosnet<sup>2</sup>, P. Saturnini<sup>2</sup>, E. Scomparin<sup>1</sup>, F. Sigaud<sup>1</sup>, G. Travaglia<sup>1</sup>, E. Vercellin<sup>1</sup>, F. Yermia<sup>1,2</sup>  
<sup>1</sup>*Dipartimento di Fisica Sperimentale, Università degli Studi di Torino - I.N.F.N. sezione di Torino, Italy*; <sup>2</sup>*LPC Clermont Ferrand, IN2P3/CNRS et Université B. Pascal, France*; <sup>3</sup>*Università del Piemonte Orientale, Italy*; <sup>4</sup>*LPC Clermont Ferrand, IN2P3/CNRS, I.U.T. de Montluçon Université B. Pascal, France*

### N29-6: (12:15) ENDCAP RPCs in CMS – Large Scale Assembly and Test System

A. Marinov, *CERN, Switzerland*  
On behalf of the CMS Collaboration

### N30 Photodetectors and Radiation Imaging I

Wednesday, October 20 11:00-12:30, Leptis Magna 3  
Session Chair: **Peter Krizan**, *University of Ljubljana*

**N30-1:** (11:00) Very Large Silicon Avalanche Photodiode Technology  
**K. S. Shah**<sup>1</sup>, R. Farrell<sup>1</sup>, F. Olschennr<sup>2</sup>, M. McClish<sup>1</sup>

<sup>1</sup>RMD, USA; <sup>2</sup>Cremat, USA

**N30-2:** (11:15) Development of a Multi-Anode (144 Ch) Hybrid Avalanche Photo-Diode

H. Ikeda<sup>1</sup>, I. Adachi<sup>1</sup>, M. Suyama<sup>2</sup>, P. Krizan<sup>3</sup>, S. Korpar<sup>3</sup>, S. Nishida<sup>1</sup>, S. Yamamoto<sup>4</sup>, T. Iijima<sup>3</sup>, T. Matsumoto<sup>4</sup>, T. Seki<sup>4</sup>, T. Sumiyoshi<sup>4</sup>

<sup>1</sup>High Energy Accelerator Research Organization (KEK), Japan;

<sup>2</sup>Hamamatsu Photonics K.K., Japan; <sup>3</sup>Jozef Stefan Institute, Slovenia;

<sup>4</sup>Tokyo Metropolitan University, Japan; <sup>5</sup>Nagoya University, Japan

**N30-3:** (11:30) Test of Scintillator Readout with New Single Photon Avalanche Photodiodes

P. Finocchiaro<sup>1</sup>, L. Cosentino<sup>1</sup>, G. Fallica<sup>2</sup>, S. Lombardo<sup>3</sup>, M. Mazzillo<sup>3</sup>, F. Musumeci<sup>1,4</sup>, A. Piazza<sup>3</sup>, G. Privitera<sup>1,4</sup>, S. Privitera<sup>1,4</sup>, E. Rimini<sup>3</sup>, D. Sanfilippo<sup>2</sup>, E. Sciacca<sup>3</sup>, S. Tudisco<sup>1,4</sup>

<sup>1</sup>Istituto Nazionale di Fisica Nucleare, Italy; <sup>2</sup>ST Microelectronics, Italy;

<sup>3</sup>CNR-IMM, Italy; <sup>4</sup>Facoltà Ingegneria Università degli Studi, Italy

**N30-4:** (11:45) Pixel Hybrid Photon Detector Magnetic Distortions Characterization and Compensation

G. Aglieri Rinella<sup>1,2</sup>, T. F. Bellunato<sup>3,4</sup>, C. D'Ambrosio<sup>1</sup>, R. Forty<sup>1</sup>, T. Gys<sup>1</sup>, M. Patel<sup>1</sup>, D. Piedigrossi<sup>1</sup>, A. Van Lysebetten<sup>1</sup>

<sup>1</sup>CERN, Switzerland; <sup>2</sup>University of Palermo, Italy; <sup>3</sup>University of Milano Bicocca, Italy; <sup>4</sup>INFN, Italy

**N30-5:** (12:00) GPD Modules for Scintillating Fiber Readouts  
**S. Vasile**, *aPeak, USA*

**N30-6:** (12:15) Development of a 16" UV-Ray Image Intensifier Tube

Y. Asaoka, Y. Aita, T. Aoki, M. Sasaki, *Institute for Cosmic Ray Research, the University of Tokyo, Japan*

### N31 Data Acquisition and Analysis Systems III

Wednesday, October 20 11:00-12:30, Orange 2  
Session Chair: **Chikara Fukunaga**, *Tokyo Metropolitan University*

**N31-1:** (11:00) Design, Performance and Control of the CDF Run II Data Acquisition System

**W. F. Badgett**, *Fermi National Accelerator Lab, USA*

On behalf of the CDF Collaboration

**N31-2:** (11:15) The Detector Control System for the ATLAS SemiConductor Tracker Assembly Phase

**A. Sfyrila**, *University of Geneva, Switzerland*

On behalf of the ATLAS-SCT collaboration

**N31-3:** (11:30) The CMS Tracker Readout Front End Driver

**C. Foudas**, *Imperial College London, UK*

On behalf of the CMS Tracker Collaboration

**N31-4:** (11:45) Electronics for the CMS Muon Drift Tube Chambers: the Read-Out Minicrate

**C. F. Bedoya**, J. Marín, J. C. Oller, C. Willmott, *CIEMAT, Spain*

**N31-5:** (12:00) Design, Deployment and Functional Tests of the Online Event Filter for the ATLAS Experiment at the LHC

**A. Negri**, *INFN Pavia, Italy*

On behalf of the ATLAS HTL Group

**N31-6:** (12:15) Development of Event Building Farm for SuperKEKB

**K. Itoh**, *University of Tokyo, Japan*; T. Higuchi, M. Nakao, R. Itoh, *High Energy Accelerator Research Organization (KEK), Japan*

### N32 New Solid State Detectors II

Wednesday, October 20 11:00-12:30, Spalato  
Session Chair: **Anna Peisert-Elliott**, *CERN*

**N32-1:** (11:00) A Monolithic Array of 77 Silicon Drift Detectors for X-Ray Spectroscopy and Gamma-Ray Imaging Applications

**C. Fiorini**<sup>1,2</sup>, M. Bellini<sup>1</sup>, A. Gola<sup>1,2</sup>, A. Longoni<sup>1,2</sup>, F. Perotti<sup>3</sup>, P. Lechner<sup>4</sup>, H. Soltau<sup>4</sup>, L. Strueder<sup>5</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>INAF, Italy; <sup>4</sup>PNSensor GmbH, Germany; <sup>5</sup>MPI für Extraterrestrische Physik Halbleiterlabor, Germany

**N32-2:** (11:15) XRF Spectrometers Based on Monolithic Arrays of Silicon Drift Detectors: Elemental Mapping Analyses and Advanced Detector Structures

**A. Longoni**<sup>1,2,3</sup>, C. Fiorini<sup>1,2</sup>, C. Guazzoni<sup>1,2</sup>, S. Buzzetti<sup>1,2</sup>, M. Bellini<sup>1</sup>, A. Gola<sup>1,2</sup>, L. Strüder<sup>4</sup>, H. Soltau<sup>5</sup>, P. Lechner<sup>5</sup>, A. Bjeoumikhov<sup>6</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>IFN-CNR, Italy; <sup>4</sup>Max Planck Institut, Germany; <sup>5</sup>PN Sensor GmbH, Germany; <sup>6</sup>IfG GmbH, Germany

**N32-3:** (11:30) Planar LAAPDs: Temperature Dependence, Performance, and Application in Low Energy X-Ray Spectroscopy

**L. Ludhova**<sup>1,2</sup>, F. D. Amaro<sup>3</sup>, A. Antognini<sup>4</sup>, F. Biraben<sup>5</sup>, J. M. R. Cardoso<sup>3</sup>, C. A. N. Conde<sup>3</sup>, A. Dax<sup>6</sup>, S. Dhawan<sup>6</sup>, L. M. P. Fernandes<sup>3</sup>, T. W. Hänsch<sup>4</sup>, F. J. Hartman<sup>7</sup>, V. W. Hughes<sup>6</sup>, O. Huot<sup>2</sup>, P. Indelicato<sup>5</sup>, L. Julien<sup>5</sup>, P. E. Knowles<sup>2</sup>, F. Kottmann<sup>8</sup>, J. A. M. Lopes<sup>3</sup>, Y. W. Liu<sup>9</sup>, C. M. B. Monteiro<sup>3</sup>, F. Mulhauser<sup>2</sup>, F. Nez<sup>5</sup>, R. Pohl<sup>4</sup>, P. Rabinowitz<sup>10</sup>, J. M. F. dos Santos<sup>3</sup>, L. A. Schaller<sup>2</sup>, C. Schwob<sup>5</sup>, D. Taqqu<sup>1</sup>, J. F. C. A. Veloso<sup>3</sup>

<sup>1</sup>Paul Scherrer Institute, Switzerland; <sup>2</sup>University of Fribourg, Switzerland; <sup>3</sup>University of Coimbra, Portugal; <sup>4</sup>MPI für Quantenoptik, Germany; <sup>5</sup>LKB, France; <sup>6</sup>University of Yale, USA; <sup>7</sup>Technical University, Germany; <sup>8</sup>ETH, Switzerland; <sup>9</sup>National Tsing Hua University, Taiwan; <sup>10</sup>Princeton University, USA

**N32-4:** (11:45) 3D Medipix – a New Generation of X-Ray Detectors

**V. A. Wright**, M. Rahman, V. O'Shea, K. Smith, *University of Glasgow, UK*; X. Badel, J. Linnros, *KTH, Sweden*; A. Fauler, M. Fiederle, J. Ludwig, *Freiburger Materialforschungszentrum, Germany*; S. Nenonen, H. Sipila, *Metorex International Oy, Finland*; K. Robb, L. Lea, *Surface Technology Systems Limited, UK*; D. Jones, D. Jaroszynski, *University of Strathclyde, UK*

**N32-5:** (12:00) Neutron Measurements with Boron Carbide Semiconductor Detectors

W. K. Pitts, A. J. Carman, K. C. Antolick, B. D. Milbrath, *Pacific Northwest National Laboratory, USA*; J. I. Brand, A. N. Caruso, P. A. Dowben, *University of Nebraska-Lincoln, USA*

**N32-6:** (12:15) Novel Silicon Solid State Photomultipliers – Recent Development and Study

V. Saveliev, *Obninsk State University, Russia*

**N33 NSS Poster II**

Wednesday, October 20 14:00-15:30, Poster Area Upper Level

Session Chairs: Stefaan Tavernier, *Vrije Universiteit Brussels*

Bettina Mikulec, *University of Geneva*

Daniel Whiteson, *FNAL*

**Analog and Digital Circuits**

**N33-1:** Study of n-Channel MOSFETs with an Enclosed-Gate Layout in a 0.18 micron CMOS Technology

L. Chen, D. M. Gingrich, *University of Alberta, Canada*

**N33-2:** A Fast-Stretcher for an Easy Acquisition of the Fast Component of BaF Detectors Signals

C. Boiano<sup>1</sup>, R. Bassini<sup>1</sup>, A. Pullia<sup>2</sup>, F. Camera<sup>2</sup>, G. Benzoni<sup>2</sup>, A. Bracco<sup>2</sup>, S. Brambilla<sup>1</sup>, B. Million<sup>1</sup>, O. Wieland<sup>1</sup>

<sup>1</sup>INFN, Italy; <sup>2</sup>University of Milano, Italy

**N33-3:** A High-Speed, Low-Noise 16-Channel CSA with Automatic Leakage Compensation in 0.35-um CMOS Process for APD-Based PET Detectors

K. T. Z. Oo<sup>1,2</sup>, E. Mandelli<sup>1</sup>, W. W. Moses<sup>1</sup>

<sup>1</sup>Lawrence Berkeley National Laboratory, USA; <sup>2</sup>University of California, USA

**N33-4:** Parallel Hardware Implementation of RADAR Electronics Equipment for a LASER Inspection System

C. Neri<sup>1</sup>, G. Baccarelli<sup>2</sup>, S. Bertazzoni<sup>3</sup>, F. Pollastrone<sup>1</sup>, M. Salmeri<sup>3</sup>

<sup>1</sup>ENEA, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>University of Rome "Tor Vergata", Italy

**N33-5:** A New TAC Based Multi Channel Front-End Electronics for TOF Experiments with Very High Time Resolution

K. Koch, H. Hardel, R. Schulze, E. Badura, J. Hoffmann, *Gesellschaft fuer Schwerionenforschung mbH (GSI), Germany*

**N33-6:** RUA: Read-Out Unit ASIC for Gamma Ray Detector Readout

C. Labanti<sup>1</sup>, P. Malcovati<sup>2</sup>, F. Borghetti<sup>2</sup>, A. Fornasari<sup>2</sup>, M. Marisaldi<sup>1</sup>, A. Mauri<sup>1</sup>, E. Rossi<sup>1</sup>

<sup>1</sup>IASF CNR-INAF, Italy; <sup>2</sup>University of Pavia, Italy

**N33-7:** A Precise Cyclic CMOS Time-to-Digital Converter with Low Thermal Sensitivity

C.-C. Chen, W. Chang, P. Chen, *National Taiwan University of Science and Technology, Taiwan*

**N33-8:** Charge Sensitive Preamplifier with Pulsed Source Reset

V. T. Jordanov<sup>1</sup>, P. Burger<sup>2</sup>, J. Paepen<sup>2</sup>, O. Tench<sup>1</sup>

<sup>1</sup>Canberra Industries, USA; <sup>2</sup>Canberra Semiconductor, Belgium

**N33-9:** Survey of Noise Performances and Scaling Effects in Deep Submicron CMOS Devices from Different Foundries

V. Re<sup>1,2</sup>, M. Manghisoni<sup>1,2</sup>, L. Ratti<sup>3,2</sup>, V. Speziati<sup>3,2</sup>

<sup>1</sup>Università di Bergamo, Italy; <sup>2</sup>INFN - Pavia, Italy; <sup>3</sup>Università di Pavia, Italy

**N33-10:** Noise Analysis of 16Channel Charge Sensitive Amplifier for Poly CdZnTe

S. W. Yuk<sup>1</sup>, K. H. Kim<sup>2</sup>, S. U. Kim<sup>1</sup>, Y. Yi<sup>1</sup>

<sup>1</sup>Korea University, South Korea; <sup>2</sup>DXM Co., South Korea

**N33-11:** Active Control of the Baseline of Digitized Preamplifiers with Sliding-Scale Correction

A. Pullia<sup>1,2</sup>, S. Riboldi<sup>1,2</sup>, G. M. Franchi<sup>1</sup>, F. Zocca<sup>1,2</sup>

<sup>1</sup>University of Milano, Italy; <sup>2</sup>INFN, Italy

**N33-12:** Multi-Channel CMOS ASIC Preamplifiers for APD and MSGC Readouts

J. Y. Yeom, H. Takahashi, P. Siritiprussamee, M. Nakazawa, *University of Tokyo, Japan*; H. Murayama, *National Institute of Radiological Sciences, Japan*

**N33-13:** The Temperature Stabilization System of Cuoricino, an Array of Macro-Bolometers

C. Arnaboldi, G. Pessina, *Istituto Nazionale di Fisica Nucleare, Italy*

**N33-14:** The SYNC Chip in the Front-End Electronics of the LHCB Muon Detector

S. Cadeddu<sup>1</sup>, V. De Leo<sup>1,2</sup>, C. Deplano<sup>1</sup>, E. Floris<sup>1,2</sup>, A. Lai<sup>1</sup>

<sup>1</sup>Istituto Nazionale Fisica Nucleare, Italy; <sup>2</sup>Universita' degli studi, Italy

**N33-15:** Initial Readout Schemes for a New 1024ch Burle MCP PSPMT

F. J. Barbosa, S. Majewski, V. Popov, R. Wojcik, W. Gunning, *Jefferson Lab, USA*

**N33-16:** Performance of an Enhanced Throughput Feature in a High-Count Rate System

R. M. Keyser, R. C. Trammell, *ORTEC, USA*

**N33-17:** Optimization of Digital Spectrometers Using a Pulse Streaming Generator

J. M. Cardoso, J. Basilio Simões, C. M. B. A. Correia, *University of Coimbra - Portugal, Portugal*

**N33-18:** An Integrated CMOS Baseline Restorer Based on a Switched Current-Conveyor

A. Pullia<sup>1</sup>, G. Bertuccio<sup>2</sup>, D. Maiocchi<sup>1</sup>, S. Caccia<sup>2</sup>

<sup>1</sup>University of Milano, Italy; <sup>2</sup>Polytechnic of Milano, Italy

**N33-19:** Performances of Operational Amplifiers in Front End Electronics for Nuclear Radiation Detectors

V. Varoli, A. Fazzi, A. Cerizza, *Politecnico di Milano, Italy*

**N33-20:** High Count Rate Energy Correction in PET Using Analog and Digital Dynamic Baseline Restoration Circuits

M. S. Musrock, M. E. Casey, *CPS Innovations, Inc., USA*

**N33-21:** Performance of Front-End Electronics and ADC for MAPMT Readout ASIC

Y. Fujita, M. Tanaka, *High Energy Accelerator Research Organization (KEK), Japan*; P. Kapusta, *Institute of Nuclear Physics, Poland*



**N33-22: IDeF-X ASIC for Cd(Zn)Te Spectro-Imaging Systems**

B. Dirks, R. Chipaux, E. Delagnes, O. Gevin, B. Horeau, O. Limousin, F. Lugiez, *CEA Saclay, France*

**N33-23: The AGATA Charge-Sensitive Preamplifiers with Built-in Active-Reset Device and Pulser**

A. Pullia<sup>1,2</sup>, G. Pascovici<sup>3</sup>, B. Cahan<sup>4</sup>, D. Weisshaar<sup>3</sup>, C. Boiano<sup>2</sup>, R. Bassini<sup>2</sup>, M. Petcu<sup>4,5</sup>, F. Zocca<sup>1,2</sup>

<sup>1</sup>University of Milano, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>University of Koeln, Germany; <sup>4</sup>GANIL, France; <sup>5</sup>Nat. Inst. of Phys. & Nucl. Eng., Romania

**N33-24: An Integrated Reset/Pile-up Rejector Circuit for Pixel Readout ASIC's**

P. Bastia<sup>1</sup>, G. Bertuccio<sup>2</sup>, F. Borghetti<sup>3</sup>, S. Caccia<sup>2</sup>, V. Ferragina<sup>3</sup>, F. Ferrari<sup>1</sup>, D. Maiocchi<sup>4</sup>, P. Malcovati<sup>3</sup>, D. Martin<sup>5</sup>, A. Pullia<sup>4</sup>, N. Ratti<sup>1</sup>

<sup>1</sup>Laben SpA, Italy; <sup>2</sup>Politecnico di Milano, Italy; <sup>3</sup>University of Pavia, Italy; <sup>4</sup>University of Milan, Italy; <sup>5</sup>European Space Agency, the Netherlands

**N33-25: Time-Domain Noise Analysis of Linear Time-Invariant and Linear Time-Variant Systems Using MATLAB and HSPICE**

S. C. Terry, B. J. Blalock, *University of Tennessee, USA*; J. M. Rochelle, *Concorde Microsystems Inc., USA*; M. N. Ericson, *Oak Ridge National Laboratory, USA*

**N33-26: Front-End Electronics for High Rate Neutron Counters: Its Performance and Radiation Hardness Improvement**

T. H. Lee, H. D. Kim, S. W. Park, *Korea Atomic Energy Research Institute, South Korea*

**N33-27: A New Circuit for Digitizing Scintillation Events in PET**

Q. Xie<sup>1,2</sup>, C.-M. Kao<sup>3</sup>, C.-T. Chen<sup>3</sup>

<sup>1</sup>National Health Research Institutes, Taiwan; <sup>2</sup>Huazhong University of Science and Technology, China; <sup>3</sup>The University of Chicago, USA

**N33-28: Window Discriminator for Multiwires Chamber**

C. Venanzi, *Università di Trieste, Italy*; Z. Zhang, K. Nurdan, A. H. Walenta, H. J. Besch, *Univeritaet Siegen, Germany*

**N33-29: New Readout Integrated Circuits for Position-Sensitive X-Ray and Gamma-Ray Detectors**

T. O. Tumer, V. B. Cajipe, R. Calderwood, M. Clajus, S. Hayakawa, *NOVA R&D, Inc., USA*

**Data Acquisition and Analysis Systems****N33-30: Real Time Data Acquisition with Read Out Driver System**

J. Torres, V. Gonzalez, E. Sanchis, J. Soret, G. Torralba, *Universidad de Valencia - ETSE, Spain*

**N33-31: Enhanced 8K Pulse Height Analyzer and Multi-Channel Scaler (TUKAN) with PCI or USB Interfaces**

Z. J. Guzik, S. Borsuk, K. Traczyk, M. Płomiński, *SINS, Warsaw, Poland*

**N33-32: Analog Shaping Optimization for Digital Processing of Radiation Detector Signals**

R. Abbiati, A. Geraci, G. Ripamonti, *Politecnico di Milano, Italy*

**N33-33: Feasibility Studies of a XML-Based Software Environment to Manage Data Acquisition Hardware Devices**

R. Arcidiacono<sup>1</sup>, V. Brigljevic<sup>2,3</sup>, G. Bruno<sup>2</sup>, E. Cano<sup>2</sup>, S. Cittolin<sup>2</sup>, S. Erhan<sup>4</sup>, D. Gigi<sup>2</sup>, F. Glege<sup>2</sup>, R. Gomez-Reino<sup>2</sup>, M. Gulmini<sup>5,2</sup>, J. Gutleber<sup>2</sup>, C. Jacobs<sup>2</sup>, P. Kreuzer<sup>6</sup>, G. Lo Presti<sup>2</sup>, L. Magrans<sup>2</sup>, N. Marinelli<sup>7</sup>, G. Maron<sup>2</sup>, F. Meijers<sup>2</sup>, E. Meschi<sup>2</sup>, S. Murray<sup>2</sup>, A. Oh<sup>2</sup>, L. Orsini<sup>2</sup>, M. Pieri<sup>8</sup>, L. Pollet<sup>2</sup>, A. Rac<sup>2</sup>, P. Rosinsky<sup>2</sup>, C. Schwick<sup>2</sup>, P. Sphicas<sup>6,2</sup>, J. Varela<sup>9,2</sup>

<sup>1</sup>Massachusetts Institute of Technology, USA; <sup>2</sup>CERN, Switzerland; <sup>3</sup>Rudjer Boskovic Institute, Croatia; <sup>4</sup>University of California, Los Angeles, USA; <sup>5</sup>INFN - Laboratori Nazionali di Legnaro, Italy; <sup>6</sup>University of Athens, Greece; <sup>7</sup>Institute of Accelerating Systems and Applications, Greece; <sup>8</sup>University of California, San Diego, USA; <sup>9</sup>LIP, Portugal

**N33-34: Real-Time Analysis in CMS DC04**

N. De Filippis<sup>1</sup>, F. Fanzago<sup>2</sup>, A. Fanfani<sup>3</sup>, V. Innocente<sup>4</sup>, A. Pierro<sup>5</sup>, L. Silvestris<sup>5</sup>, D. Bonacorsi<sup>6</sup>, M. Corvo<sup>2</sup>, G. Donvito<sup>7</sup>, C. Grandi<sup>8</sup>

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**N33-35: Multichannel Data Acquisition System Based on FPGA for High Resolution Spectroscopy**

S. Buzzetti<sup>1,2</sup>, M. Capou<sup>3</sup>, C. Guazzoni<sup>1,2</sup>, A. Longoni<sup>1,2,4</sup>, R. Mariani<sup>1</sup>, S. Moser<sup>1</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>Ecole Centrale Lyon, France; <sup>4</sup>IFN-CNR, Italy

**N33-36: A Buffered Data Acquisition System with Flexible Triggers**

Y. Cui, K. A. Lan, E. V. Hungerford, *University of Houston, USA*

**N33-37: Experimental Comparison of State-of-the-Art Methods for Digital Optimum Filter Synthesis with Arbitrary Constraints and Noise**

S. Riboldi, R. Abbiati, A. Geraci, E. Gatti, *Politecnico di Milano, Italy*

**N33-38: New Communication Network Protocol for a Data Acquisition System**

T. Uchida<sup>1</sup>, H. Fujii<sup>2</sup>, Y. Nagasaka<sup>3</sup>, M. Tanaka<sup>2</sup>

<sup>1</sup>The Graduate University for Advanced Studies, Japan; <sup>2</sup>High Energy Accelerator Research Organization (KEK), Japan; <sup>3</sup>Hiroshima Institute of Technology, Japan

**N33-39: A Data Readout System with High-Speed Serial Data Link for Balloonborne X-ray Detectors**

M. Nomachi<sup>1</sup>, S. Ishii<sup>2</sup>, Y. Kuroda<sup>2</sup>, H. Nakamura<sup>1</sup>, T. Sugimoto<sup>2</sup>, T. Takahashi<sup>3</sup>

<sup>1</sup>Osaka University, Japan; <sup>2</sup>Mitsubishi Heavy Industries, Japan; <sup>3</sup>ISAS, Japan

**N33-40: The Performance of the DAQ and Online System of the PHENIX Experiment in the RHIC Run 4**

M. L. Purschke, *Brookhaven National Laboratory, USA*  
On behalf of the PHENIX Collaboration

### N33-41: PDAQ – a Fast Data Acquisition System for the RatCAP Tomograph

M. L. Porschke<sup>1</sup>, S. Junnakar<sup>2</sup>, A. Kandasamy<sup>1</sup>, P. O'Connor<sup>1</sup>, J.-F. Pratte<sup>1</sup>, D. Schlyer<sup>1</sup>, S. Shokouhi<sup>2</sup>, S. P. Stoll<sup>1</sup>, P. Vaska<sup>1</sup>, A. Villanueva<sup>1</sup>, C. L. Woody<sup>1</sup>

<sup>1</sup>Brookhaven National Laboratory, USA; <sup>2</sup>State University of New York at Sony Brook, USA

### N33-42: High Density and High Cost Performance Data Acquisition System for Multiple Gamma-Ray Detection

A. Kimura, M. Koizumi, Y. Toh, A. Osa, J. Goto, M. Oshima, Japan Atomic Energy Research Institute, Japan; Y. Arai, High Energy Accelerator Research Organization (KEK), Japan; M. Sagara, S. Iri, H. Kobayashi, Y. Suzuki, AMSC Co., Ltd., Japan

### N33-43: Advanced Data Acquisition for Gamma Spectrometric Measurements

M. T. Nikkinen, Doletum Oy, Ltd., Finland; M. J. Kettunen, Defence Forces Technical Research Centre, Finland

### N33-44: The ALICE DAQ Read-Out Receiver Card

C. Soos<sup>1</sup>, F. Carena<sup>1</sup>, W. Carena<sup>1</sup>, E. Denes<sup>2</sup>, R. Divia<sup>1</sup>, J.-C. Marin<sup>1</sup>, T. Kiss<sup>2</sup>, K. Schossmaier<sup>1</sup>, A. Vascotto<sup>1</sup>, P. Vande Vyvre<sup>1</sup>

<sup>1</sup>CERN, Switzerland; <sup>2</sup>RMKI-KFKI, Hungary

### N33-45: A Very High Dynamic Range and High-Sampling Rate VME Digitizing Board

E. Delagnes, CEA/DSM, France; D. Breton, IN2P3, France; M. Houry, CEA/DAM, France

### N33-46: A Pre-Analysis and Data-Storage Unit for the CHIMERA DAQ

M. Alderighi<sup>1</sup>, A. Anzalone<sup>2</sup>, G. Cardella<sup>2</sup>, S. Cavallaro<sup>2</sup>, E. DeFilippo<sup>2</sup>, D. Ghilardi<sup>3</sup>, F. Giustolisi<sup>2</sup>, P. Guazzoni<sup>3</sup>, E. Laguidara<sup>2</sup>, G. Lanzano<sup>2</sup>, G. Lanzalone<sup>2</sup>, A. Pagano<sup>2</sup>, M. Papa<sup>2</sup>, S. Pirrone<sup>2</sup>, G. Politi<sup>2</sup>, F. Porto<sup>2</sup>, S. Russo<sup>3</sup>, M. Sassi<sup>3</sup>, G. Sechi<sup>1</sup>, L. Zetta<sup>3</sup>

<sup>1</sup>INFN and IASF-CNR, Italy; <sup>2</sup>INFN & Università di Catania, Italy;

<sup>3</sup>Università di Milano & INFN, Italy

### N33-47: Development of a Reliable Multicast Communication System

S. Kajiyama, Y. Nagasaka, Hiroshima Institute of Technology, Japan; Y. Tanaka, M. Shimojima, Nagasaki Institute of Applied Science, Japan; Y. Yasu, H. Fujii, High Energy Accelerator Research Organization (KEK), Japan

### N33-48: The Modular Data Acquisition System for Semiconductor Tracking Detectors Testing

G. Claus, G. Deptuch, W. Dulinski, LEPSI, France; K. Jaaskeinen, C. Tran, IReS, France

### N33-49: VME-Based Data Acquisition System for High-Resolution Position-Sensing Silicon Drift Detectors

A. Castoldi<sup>1,2</sup>, A. Galimberti<sup>1,2</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy

### N33-50: A Fast Data Acquisition System for Gas-Filled Detectors Based on Linux and a PCI Acquisition Card

D. Beltran<sup>1</sup>, J. Toledo<sup>2</sup>, A.-C. Klorá<sup>1</sup>, J. Bordas<sup>1</sup>, I. Ramos-Lerate<sup>1</sup>, J. C. Martínez<sup>1</sup>, F. Fernandez<sup>1</sup>

<sup>1</sup>CELLS, Spain; <sup>2</sup>Universidad Politecnica de Valencia, Spain

### N33-51: A TDC-Based System for X-Ray Imaging Detectors

H. P. Lima JR, L. M. de Andrade Filho, A. F. Barbosa, Brazilian Center for Physics Research, Brazil

### N33-52: High Performance Data Acquisition Methods Based on Waveform Digitization

Z. Yuan, Y. Jin, Tsinghua Univ., China

### N33-53: Implementation and Performance of the Event Filter Muon Selection Software for the ATLAS Experiment at LHC

G. Cataldi, INFN, Italy

On behalf of the ATLAS HLT-TDAQ and TrigMoore groups

### N33-54: A 96 Channel, 16 Bit, 500kHz ADC, and Bus LVDS-Based 9U VME Readout System for the CALICE Electromagnetic Calorimeter

P. D. Dauncey, Imperial College London, UK

On behalf of the CALICE-UK collaboration

### N33-55: Design and Performance of a PCI Interface with Four 2 Gbit/s Serial Optical Links

W. Iwanski, Institute of Nuclear Physics, Poland; S. Haas, M. Joos, CERN, Switzerland

### N33-56: Data Acquisition for a Neutron Interrogation System Using Associated Particle Technique

D. S. Koltick, J. C. Cooper, C. D. Wenger, Purdue University, USA

### N33-57: FAIR Data Acquisition System Development and Upgrading

A. Ordine, I.N.F.N. - Sez. di Napoli, Italy

On behalf of the NUCL-EX

## Nuclear Measurements and Monitoring Techniques

### N33-58: High-Resolution Compton-Suppressed CZT Detector for Fission Products Identification

R. Aryacinejad, J. K. Hartwell, Idaho National Engineering and Environmental Laboratory, USA

### N33-59: <sup>6</sup>Li(Eu) in Neutron and Gamma-Ray Spectrometry - a High Sensitive Thermal Neutron Detection

A. Syntfeld, M. Moszynski, M. Balcerzyk, M. Kapusta, D. Wolski, Solan Institute for Nuclear Studies, Poland; M. Majorov, Scientific Engineering Center, Russia; P. Schotanus, SCIONIX Holland B.V., the Netherlands

### N33-60: A Gamma Locator for Remote Radioactivity Mapping and Dose Rate Control

V. N. Potapov, N. K. Kononov, O. P. Ivanov, S. M. Ignatov, V. E. Stepanov, A. V. Chesnokov, V. G. Volkov, Russian Research Centre Kurchatov Institute, Russia

### N33-61: Radiographic Spectroscopy of Atomic Composition of Materials: a Multi-Energy Approach

S. V. Naydenov, V. D. Ryzhikov, Institute of Single Crystals, Ukraine; C. F. Smith, Lawrence Livermore National Laboratory, USA

**N33-62:** New Portable Gamma-Camera for Nuclear Environment and Its Application at Rehabilitation Works

O. P. Ivanov, V. E. Stepanov, V. G. Volkov, A. G. Volkovich, S. V. Smirnov, A. S. Danilovich, *Russian Research Centre Kurchatov Institute, Russia*

**N33-63:** Methodology for the Correction of Surface Reflection on a Neutron Detector

D. J. Loaiza, K. Butterfield, D. Dinwiddie, *Los Alamos National Laboratory, USA*

**N33-64:** Monte Carlo Validation Measurements

J. B. Czirr, E. Wilcox, *Photogenics, USA*

**N33-65:** CdZnTe Dose Rate Probe for Radiation Monitoring System

O. V. Maslov, V. A. Mokritsky, U. E. Nikolaenko, M. V. Maksimov, *Odessa National Polytechnic University, Ukraine*

**N33-66:** On-Line Gamma Scan Evaluation for Crude Oil Distillation Packed Tower

P. A. Vasquez S., P. R. Rela, F. E. Costa, W. A. P. Calvo, M. M. Hamada, *Institute for Nuclear Energetic Research, Brazil*

**N33-67:** A Monitor for Continuous and Remote Control of Radon Level and Environmental Parameters

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**N33-69:** Design Considerations for Passive Gamma-Ray Spectrometers

L. E. Smith, A. R. Swickard, G. A. Warren, K. D. Jarman, A. Heredia-Langner, S. D. Miller, *Pacific Northwest National Laboratory, USA*

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D. L. Stephens, Jr., A. J. Peurrung, R. Runkle, D. K. Carlson, *Pacific Northwest National Laboratory, USA*

**N33-71:** Application of Monte Carlo Simulation to Cs-134 Standardization by Means of 4pi-Beta-Gamma Coincidence System

M. S. Dias, M. N. Takeda, M. F. Koskinas, *IPEN - Instituto de Pesquisas Energéticas e Nucleares, Brazil*

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M. S. Dias, C. C. Braga, *IPEN, Brazil*

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D. V. Jordan, B. D. Geelhood, P. L. Reeder, D. L. Stephens, G. A. Warren, *Pacific Northwest National Laboratory, USA*

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J. H. Ely, E. R. Siciliano, R. T. Kouzes, *The Pacific Northwest National Laboratory, USA*

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J. K. Estrada<sup>1</sup>, A. Bernstein<sup>2</sup>, N. Bowden<sup>1</sup>, M. Greaves<sup>1</sup>, C. Hagmann<sup>2</sup>, J. Brennan<sup>1</sup>, J. Lund<sup>1</sup>

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A. Calderón, A. L. Virto, *Instituto de Física de Cantabria (CSIC-Universidad de Cantabria), Spain*; J. M. Luque, *CIEMAT, Spain*

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E. Lamadie, J. R. Costes, F. Delmas, C. Mahe, P. Gironès, C. Le Goaller, *CEA, France*

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P. Shagin, P. Cushman, *University of Minnesota, USA*; K. S. Shah, R. Farrell, *Radiation Monitoring Devices, Inc., USA*

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C. E. Lehner, Z. He, *University of Michigan, USA*

**N33-80:** Design Improvement of a Portable Digital Radiographic System Using FOP-Coupled CMOS Image Sensor and Its Performance Evaluation

M. H. Jeong<sup>1</sup>, K. Y. Kim<sup>1</sup>, S. I. Choi<sup>1</sup>, H. S. Cho<sup>1</sup>, B. S. Han<sup>1</sup>, S. Kim<sup>1,2</sup>, B. S. Lee<sup>1,3</sup>

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A. S. Tremsin, O. H. W. Siegmund, J. V. Vallerga, *University of California at Berkeley, USA*

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M. Kapusta, D. Wolski, M. Moszynski, M. Balcerzyk, A. Syntfeld, *Soltan Institute for Nuclear Studies, Poland*; C. Fontaine, P. Lavoute, P. Bascle, C. Moussant, *Photonis, France*

**N33-83:** Neutron Imaging with a Micromegas Detector

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R. M. Kippen, M. Rawool-Sullivan, J. P. Sullivan, A. S. Hoover, W. Baird, E. B. Sorensen, *Los Alamos National Laboratory, USA*

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J. Zeng, Z. Li, K. Kang, *Tsinghua University, China*

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M. Uslenghi, C. Botta, *CNR, Italy*

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Y. S. Kim<sup>1</sup>, G. Cho<sup>1</sup>, K. H. Kim<sup>2</sup>, Y. K. Chi<sup>1</sup>

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J.-H. Kim, S.-G. So, *Se-Young NDC, Ltd., South Korea*; K.-S. Joo, *Myongji University, South Korea*

### N33-93: Uniformity of the APD Response after Irradiation

A. Gorisek<sup>1,2</sup>, I. Mandic<sup>2</sup>, S. Korpar<sup>3,2</sup>, M. Zavrtanik<sup>2</sup>, Y. Musienko<sup>4</sup>, P. Krizan<sup>1,2</sup>

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Y. K. Chi, G. Cho, Y. S. Kim, *Korea Advanced Institute Science and Technology(KAIST), South Korea*

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B. K. Lubsandorzhiev, R. V. Vasiliev, Y. E. Vyatchin, *Institute for Nuclear Research of RAS, Russia*

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S. Korpar<sup>1,2</sup>, I. Adachi<sup>3</sup>, S. Fratina<sup>1</sup>, T. Fukushima<sup>4</sup>, A. Gorisek<sup>1,5</sup>, T. Iijima<sup>6</sup>, H. Kawai<sup>4</sup>, M. Konishi<sup>4</sup>, Y. Kozakai<sup>6</sup>, S. Ogawa<sup>7</sup>,

S. Ohtake<sup>7</sup>, P. Krizan<sup>1,5</sup>, T. Matsumoto<sup>8</sup>, S. Nishida<sup>3</sup>, R. Pestotnik<sup>1</sup>, S. Saitoh<sup>3</sup>, T. Seki<sup>8</sup>, T. Sumiyoshi<sup>8</sup>, Y. Uchida<sup>3</sup>, Y. Unno<sup>4</sup>, S. Yamamoto<sup>8</sup>

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D. S. A. P. Freitas, C. A. N. Conde, *Universidade de Coimbra, Portugal*

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K. Vetter, M. Burks, E. Hull, L. Mihailescu, T. Niedermayr, *Lawrence Livermore National Laboratory, USA*; D. Protic, T. Krings, *Forschungszentrum Juelich, Germany*; P. Luke, C. Tindall, *Lawrence Berkeley National Laboratory, USA*

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D. Ferenc, A. Laille, D. Kranich, E. Lorenz, *University of California Davis, USA*

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H. Sanders, M. Bogdan, A. Paramonov, M. Heintz, H. Frisch, *The University of Chicago, USA*; T. Miao, P. J. Wilson, *Fermi National Accelerator Lab, USA*

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G. S. Varner, D. L. Ridley, P. W. Gorham, L. Murakami, C. Zhu, *Univ. of Hawaii, USA*

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A. Gabrielli, S. Antinori, D. Falchieri, E. Gandolfi, *University of Bologna, Italy*

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P. Borrego Amaral<sup>1</sup>, N. Ellis<sup>1</sup>, P. Farthouat<sup>1</sup>, P. Gallno<sup>1</sup>, H. Pessoa Lim a Junior<sup>1,2</sup>, T. Maeno<sup>1</sup>, I. Resurreccion Arcas<sup>1</sup>, J. Seixas<sup>2</sup>, G. Schuler<sup>1</sup>, R. Spiwoks<sup>1</sup>, R. Torga Teixeira<sup>1</sup>, T. Wengler<sup>1</sup>

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J. Ero, *HEPHY, Austria*

### N33-106: The Design of the Trigger of BES III

Y. Guo, *Institute of High Energy Physics, China*  
On behalf of the BES III trigger group



**N33-107: Online B-Tagging Selection for the ATLAS Experiment at the LHC**

A. Kootz, *University of Wuppertal, Germany*  
On behalf of the ATLAS HLT

**N33-108: Cold Electronics for the Liquid Argon Hadronic Endcap Calorimeter of ATLAS**

L. Kurchaninov, *CERN, Switzerland*  
On behalf of the ATLAS HEC Collaboration

**N33-109: A Readout and Control System for Four-Layer BELLE Silicon Vertex Detector**

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R. S. Moore, *Fermi National Accelerator Laboratory, USA*  
On behalf of the CDF Collaboration

**N33-111: The Level 1.5 Trigger System Using the New Silicon Vertex Detector SVD2 at Belle**

R. Stamen, *KEK, Japan*  
On behalf of the SVD group of the Belle collaboration

**N33-112: Front-End Electronics of the LHCb Outer Tracker**

U. Uwer, *Physikalisches Institut, University of Heidelberg, Germany*  
On behalf of the LHCb Outer Tracker Collaboration

**N33-113: Beam Test of the ATLAS Level-1 Calorimeter Trigger System**

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**N33-115: The Power Supply System for the ATLAS Pixel Detector**

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M. Hazumi, *KEK, Japan*  
On behalf of the Belle SVD group

**N33-117: The Selective Read-Out Processor for the CMS Electromagnetic Calorimeter**

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**N33-119: Online Muon Reconstruction in the ATLAS Level-2 Trigger System**

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**N33-120: Overview of the Second Level Trigger System for the FAST Detector**

G. Martinez, J. Berdugo, J. Casaus, C. Mana, J. Marin, E. Sanchez, C. Willmott, *CIEMAT, Spain*

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**N33-122: Design Prototyping and Testing of the Detector Control System for the ATLAS End-Cap Muon Trigger**

S. Tarem, A. Harel, R. Lifshitz, N. Lupu, S. Bressler, E. Hadash, *Technion Israel Institute of Technology, Israel*; L. J. Levinson, *Weizmann Institute of Technology, Israel*

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**N33-124: The Detector Mounted Analog and Digital Read-Out System of the Transition Radiation Tracker of the ATLAS Experiment**

A. Munar, *University of Pennsylvania, USA*  
On behalf of the TRT

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**N33-127: EMC-Based Design of Switching Power Supplies for HEP Front-End Electronics**

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**Instrumentation for Medical and Biological Research**

**N33-128: Deep Characterization of a Fast Monitoring System for Radiotherapeutic Proton Beams Based on Scintillating Screens and a CCD Camera**

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**N33-129: Diode Array for Intensity Modulated Radiotherapy Applications**

C. Rönqvist, J. Kempe, T. Matzen, *Scanditronix Wellhöfer AB, Sweden*

**N33-130:  $4\pi$  NaI(Tl) Detector Array for In-Vivo Neutron Activation Analysis**

S. H. Byun, W. V. Prestwich, K. Chin, F. E. McNeill, D. R. Chettle, *McMaster University, Canada*

**N33-131: Evaluation of a microMOSFET Radiation Sensor for the Monitoring of in Vivo Dosimetry During Total Scalp Radiotherapy**

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**N33-132: An Overview on the Developments and Improvements of a New Treatment Planning System for BNCT**

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**N33-133: The Effects of Positron Binding and Annihilation Mechanisms in Biomolecules on PET Resolution**

L. Pichl, *University of Aizu, Japan*; M. Tachikawa, *Yokohama City University, Japan*; R. J. Buenker, *Bergische Universitaet Wuppertal, Germany*; M. Kimura, *Kyushu University, Japan*

**N33-134: A Novel Method to Evaluate the Carbon-Beam Attenuation Due to Nuclear Fragmentation Reactions for Cancer Therapy**

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**N33-135: Range measurements using visible scintillation light for proton therapy**

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**N33-136: Fully Digital Trigger and Pre-Processing Electronics for Planar Positron Emission Mammography (PEM) Scanners**

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**Accelerator and Beam Line Instrumentation**

**N33-137: Application and Design of Photon Beam Position Monitor in HLS**

B. Sun, D. He, P. Lu, Y. Wang, H. Xu, J. Wang, Y. Cao, J. Li, P. Zheng, C. Zhang, *NSRL, University of Science and Technology of China, China*

**N33-138: Design and Simulation of Beam Position Monitor for 200MeV LINAC in HLS**

J. Li, B. Sun, P. Lu, Y. Wang, D. He, Y. Cao, P. Zheng, *NSRL, University of Science and Technology of China, China*

**N33-139: PEP-II Hardware Reliability**

C. W. Allen, W. S. Colocho, R. A. Erickson, M. W. Stanek, *Stanford Linear Accelerator Center, USA*

**N33-140: Gas Electron Multiplier Beam Profile Monitor**

K. Gnanvo, L. Ropelewski, F. Sauli, J. Spanggaard, G. Tranquille, *CERN, Switzerland*

**N33-141: Numerical Simulation of Permanent Magnet Hexapole Used for Cold Neutron Beam Focusing**

P. Bodo, *Budapest University of Technology and Economics, Hungary*

**N33-142: The R&D of Residual-Gas Beam Profile Monitor**

R. Ishida, Y. Nakahama, M. Iwasaki, H. Aihara, *University of Tokyo, Japan*; H. Noumi, Y. Sato, A. Toyoda, *High Energy Accelerator Research Organization (KEK), Japan*

**N33-143: Methods of Measurement for the Beam-Based Alignment System in HLS**

Y. Cao, B. Sun, P. Lu, W. Li, D. He, Z. Liu, J. Wang, P. Zheng, J. Li, *NSRL, University of Science and Technology of China, China*

**N33-144: Beam Profile Diagnostics for the Fermilab Medium Energy Electron Cooler Prototype**

A. A. Warner, K. Desler, G. Kazakevich, S. Nagaitsev, A. Shemyakin, G. R. Tassotto, *Fermi National Accelerator Lab, USA*; W. Gai, *Argonne National Lab, USA*

**N33-145: Validation of Synthetic Diamond for a Beam Conditions Monitor in the Compact Muon Solenoid Experiment**

A. Macpherson, *CERN, Switzerland*

On behalf of the CMS BCM Group

**N33-146: Development of a New Data Acquisition System for the Fermilab Beam Loss Monitors**

J. Lewis, C. Drennan, K. Knickerbocker, A. Marchionni, M. Olson, S. Pordes, A. Baumbaugh, *Fermilab, USA*

**Computing and Software for Experiments**

**N33-147: Monitoring CMS Tracker Construction and Data Quality Using a Grid/web Service Based on a Visualization Tool**

G. Zito, *INFN, Italy*; M. S. Mennea, A. Regano, *Bari University, Italy*

**N33-148:** Monte Carlo Based Treatment Planning System for Proton Therapy: a Possible Approach Using the GEANT4 and GRID Technologies

G. A. P. Cirrone<sup>1</sup>, R. Barbera<sup>2</sup>, G. Cuttone<sup>1</sup>, S. Lo Nigro<sup>2</sup>, G. Russo<sup>1</sup>

<sup>1</sup>Laboratori Nazionali Del Sud, Italy; <sup>2</sup>Dipartimento di Fisica ed Astronomia, Italy

**N33-149:** Simulation of Antiproton-Nuclear Annihilation at Rest

M. V. Kosov, CERN, Switzerland

**N33-150:** SMI++ Object Oriented Framework for Designing and Implementing Distributed Control Systems

B. Franek, Rutherford Appleton Laboratory, UK; C. Gaspar, CERN, Switzerland

**N33-151:** CMS Tracker Visualization Tools

M. S. Menna<sup>1</sup>, I. Osborne<sup>2</sup>, A. Regano<sup>1</sup>, G. Zito<sup>3</sup>

<sup>1</sup>University & INFN Bari, Italy; <sup>2</sup>Northeastern University, USA; <sup>3</sup>INFN Bari, Italy

**N33-152:** A PC Based Calibration Bench for the ATLAS-Muon Alignment

V. Gautard, CEA-Saclay, France

On behalf of the Saclay ATLAS alignment group

**N33-153:** Fast Tracking for the Second Level Trigger of the ATLAS Experiment Using Silicon Detectors Data

C. Schiavi, Università degli Studi di Genova, Italy

On behalf of the ATLAS High-Level Trigger Group

**N33-154:** Automatic 3D Tetrahedral Mesh Generation for Neutron Transport Calculation in Non-linear Magnetostatic Fields

P. Bodo, Budapest University of Technology and Economics, Hungary

**N33-155:** Computer Simulation of Parameters of the Bremsstrahlung Converter

T. V. Malykhina, Kharkiv National University, Ukraine; A. V. Torgovkin, Kharkiv Institute of Physics and Technology, Ukraine

**N33-156:** Quality Improvement of Digitized Radiographs via a Filtering Technique Development Based on Morphological Transformations

A. Movafeghi<sup>1,2</sup>, M. Taheri<sup>1</sup>, M. H. Kargarnovin<sup>2</sup>, K. Edalati<sup>1</sup>, M. Seiedi<sup>1</sup>, A. Kermani<sup>1</sup>, N. Rastkhah<sup>1</sup>

<sup>1</sup>Atomic Energy Organization of Iran, Iran; <sup>2</sup>Sharif University of Technology, Iran

**N33-157:** Production of Simulated Events for the BaBar Experiment by Using LCG

C. Bozzi, INFN Sezione di Ferrara, Italy

On behalf of the BaBar Computing Group

**N33-158:** Performance of Vanilla Linux Based Readout System for B-Factory Upgrade

S. Y. Suzuki<sup>1</sup>, T. Higuchi<sup>1</sup>, Y. Nagasaka<sup>2</sup>, R. Itoh<sup>1</sup>, M. Tanaka<sup>1</sup>, M. A. Bukin<sup>3</sup>

<sup>1</sup>High Energy Accelerator Research Organization (KEK), Japan;

<sup>2</sup>Hiroshima Institute of Technology, Japan; <sup>3</sup>Budker Institute of Nuclear Physics, Russia

**N33-159:** Nanodosimetric Cluster Size Distributions of Therapeutic Proton Beams

A. J. Wroe<sup>1</sup>, R. Schulte<sup>2</sup>, V. Bashkirov<sup>2</sup>, A. B. Rosenfeld<sup>1</sup>, A. Breskin<sup>3</sup>, S. Shchemelin<sup>3</sup>, B. Grosswendt<sup>4</sup>

<sup>1</sup>University of Wollongong, Australia; <sup>2</sup>Loma Linda University Medical Center, USA; <sup>3</sup>Weizmann Institute of Science, Israel; <sup>4</sup>Physikalisch-Technische Bundesanstalt, Germany

**N33-160:** The Offline Software Framework of the Pierre Auger Observatory

S. Argiro<sup>1,2</sup>, L. Nellen<sup>3</sup>, T. C. Paul<sup>4</sup>, T. F. Porter<sup>5</sup>, L. Prado<sup>6</sup>

<sup>1</sup>Università di Torino, Italy; <sup>2</sup>Istituto Nazionale di Fisica Nucleare, Italy;

<sup>3</sup>Universidad Nacional Autonoma de Mexico, Mexico; <sup>4</sup>Northeastern University, Usa; <sup>5</sup>University of Louisiana, USA; <sup>6</sup>State University at Campinas, Brasil

**N33-161:** Monte Carlo Simulation of Hi-Rez PET Scanner with Geant4: Comparison with Experimental Data

H. Rothfuss, M. Conti, C. Michel, V. Panin, CPS Innovations, Inc., USA

**N33-162:** Neural Networks for the H1 Experiment

J. Zimmermann, C. Kiesling, Forschungszentrum Juelich and MPI fuer Physik, Germany

**N33-163:** A Management System of a Multi-CPU Based Data Acquisition System

Y. Nagasaka, Hiroshima Institute of Technology, Japan; T. Higuchi,

Y. Igarashi, M. Nakao, S. Y. Suzuki, M. Tanaka, High Energy Accelerator Research Organization (KEK), Japan

**N33-164:** Is the Software Engineering Essential in the Nuclear Sciences?

E. Gaytán Gallardo, Instituto Nacional de Investigaciones Nucleares, Mexico

On behalf of the Elvira Gaytán Gallardo

**N33-165:** Geant4 Low-Energy Electromagnetic Package

V. N. Ivanchenko<sup>1,2</sup>, <sup>1</sup>BINP, Russia; <sup>2</sup>CERN, Switzerland

On behalf of the Geant4 Collaboration/Low-Energy Group

**N33-166:** The Simulation for the ATLAS Experiment: Present Status and Outlook

A. Rimoldi, Università di Pavia, Italy

On behalf of the ATLAS Simulation Group

**N33-167:** The GANGA User Interface for Physics Analysis in a GRID Environment

A. Soroko<sup>1</sup>, K. Harrison<sup>2</sup>, C. L. Tan<sup>3</sup>, J. T. Moscicki<sup>4</sup>, D. Adams<sup>5</sup>, P. Charpentier<sup>4</sup>, P. Mato<sup>4</sup>, R. Jones<sup>6</sup>, U. Egede<sup>7</sup>, J. Martyniak<sup>7</sup>

<sup>1</sup>Oxford University, UK; <sup>2</sup>Cambridge University, UK; <sup>3</sup>Birmingham University, UK; <sup>4</sup>CERN, Switzerland; <sup>5</sup>Brookhaven National Laboratory, USA; <sup>6</sup>Lancaster University, UK; <sup>7</sup>Imperial College London, UK

**N33-168:** Hadronic Physics Simulation Engines for Geant4

J. P. Wellisch, CERN, Switzerland

**N33-169:** Modeling Nuclear Physics in the Cascade Energy Range

J. P. Wellisch, CERN, Switzerland

**N33-170: The BaBar Data Reconstruction Control System**A. Ceseracciu, *SLAC / Stanford Linear Accelerator Center, USA*

On behalf of the BaBar Computing Group

**N33-171: HARP Monte Carlo**V. N. Ivanchenko, *CERN, Switzerland*

On behalf of the HARP Collaboration

**N33-172: Design of Simulation Framework for Generic Radiotherapy**K. Murakami<sup>1</sup>, K. Amako<sup>1</sup>, M. G. Pia<sup>2</sup>, T. Sasaki<sup>1</sup>, H. Yoshida<sup>3</sup>, N. Kanematsu<sup>4</sup><sup>1</sup>KEK, Japan; <sup>2</sup>INFN Genova, Italy; <sup>3</sup>Naruto University of Education, Japan; <sup>4</sup>NIRS, Japan**N33-173: Medical Applications on a Grid Infrastructure Connection: the MAGIC-5 Project**R. Bellotti, *Università di Bari and INFN, Italy*

On behalf of the MAGIC-5 Collaboration

**N33-174: Harp Data Management - Progressive Overview**D. I. Kolev, *CERN, Switzerland*

On behalf of the HARP Collaboration

**N33-175: Software Management in the HARP Experiment**E. Tcherniaev, *CERN, Switzerland*

On behalf of the HARP experiment

**N33-176: PAX: New Applications in Physics Analyses at Tevatron and LHC**S. Kappler, M. Erdmann, D. Hirschbuehl, C. Jung, M. Kirsch, T. Mueller, G. Quast, K. Rabbertz, J. Rehn, S. Schalla, P. Schemitz, A. Schmidt, T. Walter, C. Weiser, *Karlsruhe University, Germany***N33-178: Tests of the Full Simulation Program for the ATLAS Detector: an Overview on Performance & Robustness**A. Rimoldi, *Università di Pavia, Italy*

On behalf of the ATLAS Simulation Group

**N33-179: Geant4 Standard Electromagnetic Package for HEP Applications**V. N. Ivanchenko<sup>1,2</sup>, M. Maire<sup>2,3</sup>, L. Urban<sup>2</sup><sup>1</sup>BINP, Russia; <sup>2</sup>CERN, Switzerland; <sup>3</sup>LAPP, France**N33-180: Low pT Non-Isolated Muon Identification and Combined Reconstruction with MUID for the ATLAS Detector at the LHC at CERN**T. Lagouri, *Aristotle University of Thessaloniki, Greece*

On behalf of the MUID Group

**Nuclear Physics Instrumentation****N33-181: DVD Based Electronic Pulser**S. J. Morris, R. M. Pratt, M. A. Hughes, R. T. Kouzes, W. K. Pitts, R. E. Robinson, *Pacific Northwest National Laboratory, USA***N33-182: Compact 4-Pi Ge Spectrometer for Neutron Capture Cross Section Measurement**M. Oshima, J. Goto, Y. Toh, M. Mizumoto, *Japan Atomic Energy Research Institute, Japan*; M. Sugawara, *Chiba Institute of Technology, Japan*; M. Igashira, T. Ohsaki, *Tokyo Institute of Technology, Japan*; H. Harada, K. Furutaka, *Japan Nuclear Cycle Development Institute, Japan*; Y. Nagai, *Osaka University, Japan***N33-183: Improvement of Automatic Scanning System of Nuclear Emulsion Detector by Using CMOS Camera**J.-T. Rhee, S.-Y. Jung, M. Jamil, *Konkuk University, South Korea***N33-184: Timing Resolution of Large Volume HgI2 Detectors**L.-J. Meng, Z. He, *University of Michigan, USA***N33-185: Use of a Rad-Hard Silicon Diode for Photon Spectrometry**J. A. C. Gonçalves<sup>1,2</sup>, C. C. Bueno<sup>1,2</sup>, F. Camargo<sup>1</sup>, A. A. S. Corrêa<sup>1</sup>, J. K. C. Pinto<sup>3</sup><sup>1</sup>Instituto de Pesquisas Energéticas e Nucleares - IPEN-CNEN/SP, Brasil; <sup>2</sup>Pontifícia Universidade Católica de São Paulo - PUC/SP, Brasil; <sup>3</sup>Escola Politécnica, Universidade de São Paulo - EPUSP, Brasil**N33-186: EXODET: a New Approach to Detection Systems for RIB Nuclear Physics Based on ASIC Chip Developed for High-Energy Experiments**M. Romoli<sup>1</sup>, M. Di Pietro<sup>1</sup>, E. Vardaci<sup>1,2</sup>, A. De Francesco<sup>1</sup>, R. Bonetti<sup>3</sup>, A. De Rosa<sup>1,2</sup>, T. Glodariu<sup>1,4</sup>, A. Guglielmetti<sup>3</sup>, G. Inglima<sup>1,2</sup>, M. La Commara<sup>1,2</sup>, B. Martin<sup>1,2</sup>, M. Mazzocco<sup>5</sup>, D. Pierrousakou<sup>1</sup>, M. Sandoli<sup>1,2</sup>, C. Signorini<sup>5</sup>, F. Soramel<sup>6</sup><sup>1</sup>INFN, Italy; <sup>2</sup>Università di Napoli, Italy; <sup>3</sup>Università di Milano and INFN, Italy; <sup>4</sup>NIPNE, Romania; <sup>5</sup>Università di Padova and INFN, Italy; <sup>6</sup>Università di Udine and INFN, Italy**N33-187: An Improved Cooled FET Assembly for Ultra-Low-Background Germanium Spectrometers**C. E. Aalseth, T. W. Hossbach, H. S. Miley, *Pacific Northwest National Laboratory, USA***N34 Gaseous Detectors IV**

Wednesday, October 20 16:00-18:00, Leptis Magna 4

Session Chair: Harry van der Graaf, *NIKHEF***N34-1, keynote: (16:00) High Magnetic Field Performance of a GEM-TPC**M. Ball<sup>1</sup>, T. Behnke<sup>1</sup>, N. Ghodbane<sup>2</sup>, M. Hamann<sup>1</sup>, M. E. Janssen<sup>1,3</sup>, T. Kuhl<sup>1</sup>, T. Lux<sup>4</sup>, F. Sefkow<sup>1</sup>, P. Wienemann<sup>1</sup><sup>1</sup>DESY, Germany; <sup>2</sup>CERN, Switzerland; <sup>3</sup>University of Dortmund, Germany; <sup>4</sup>University of Hamburg, Germany**N34-2: (16:30) Test Beam Studies of a GEM-Based Time Projection Chamber**J. Kaminski<sup>1</sup>, M. Ball<sup>2</sup>, F. Bieser<sup>3</sup>, M. E. Janssen<sup>2</sup>, S. Kappler<sup>1,4</sup>, B. Ledermann<sup>1</sup>, T. Müller<sup>1</sup>, M. Ronan<sup>3</sup>, P. Wienemann<sup>2</sup><sup>1</sup>Universität Karlsruhe, Germany; <sup>2</sup>DESY, Germany; <sup>3</sup>LBNL, USA; <sup>4</sup>CERN, Switzerland**N34-3: (16:45) Design and Construction of a TPC Using GEM Foils for Gas Amplification**S. Roth, M. Killenberg, S. Blatt, S. Lotze, J. Mnich, A. Muennich, A. Vogel, M. Weber, *RWTH Aachen, Germany***N34-4: (17:00) MHSP Reverse Mode Operation for Ion Back-Flow Reduction in GEM/MHSP Cascades**J. F. C. A. Veloso<sup>1,2</sup>, F. Amaro<sup>1</sup>, J. M. Maia<sup>1,3,4</sup>, A. Breskin<sup>4</sup>, R. Chechik<sup>4</sup>, O. Bouianov<sup>5</sup>, M. Bouianov<sup>6</sup>, J. M. F. dos Santos<sup>1</sup><sup>1</sup>Universidade de Coimbra, Portugal; <sup>2</sup>Universidade de Aveiro, Portugal; <sup>3</sup>Universidade da Beira Interior, Portugal; <sup>4</sup>The Weizmann Institute



of Science, Israel; <sup>5</sup>Massachusetts Institute of Technology, USA; <sup>6</sup>CSC – Scientific Computing Ltd, Finland

**N34-5: (17:15) Precision Measurements of Diffusion and Resolution for a Large-Area Micromegas Time Projection Chamber**

M. T. Ronan, Lawrence Berkeley National Laboratory, USA; P. Colas, Y. Giomataris, DAPNIA, France; V. Lepeltier, LAL, France

**N34-6: (17:30) Resolution of a MPGD Readout TPC Using the Charge Dispersion Signal**

M. S. Dixit<sup>1,2</sup>, R. K. Carnegie<sup>1</sup>, J. P. Martin<sup>3</sup>, H. Mes<sup>1</sup>, E. Neuheimer<sup>1</sup>, A. Rankin<sup>1</sup>, K. Sachs<sup>1</sup>

<sup>1</sup>Carleton University, Canada; <sup>2</sup>TRIUMF, Canada; <sup>3</sup>University of Montreal, Canada

**N34-7: (17:45) TPG, Test Result**

V. Ableev<sup>1</sup>, M. Apollonio<sup>2</sup>, P. Bene<sup>3</sup>, A. Blondel<sup>3</sup>, M. G. Catanesi<sup>1</sup>, G. Chiefari<sup>4</sup>, P. Chimenti<sup>2</sup>, P. Favaron<sup>1</sup>, U. Gastaldi<sup>1</sup>, S. Giani<sup>5</sup>, G. Giannini<sup>2</sup>, E. Gschwendtner<sup>3</sup>, J.-C. Legrand<sup>5</sup>, M. Lollo<sup>1</sup>, G. Musso<sup>5</sup>, M. Napolitano<sup>4</sup>, R. de Oliveira<sup>5</sup>, V. Palladino<sup>4</sup>, E. Radicioni<sup>1</sup>, J.-P. Richeux<sup>3</sup>, M. Rigato<sup>1</sup>, L. Ropelewski<sup>3</sup>, L. Roscilli<sup>4</sup>, R. Sandstroem<sup>3</sup>, G. Saracino<sup>4</sup>, F. Sauli<sup>2</sup>, P. Temnikov<sup>1</sup>

<sup>1</sup>I.N.F.N., Italy; <sup>2</sup>Università e sezione I.N.F.N. di Trieste, Italy;

<sup>3</sup>Université de Genève, Switzerland; <sup>4</sup>Università e sezione I.N.F.N. di Napoli, Italy; <sup>5</sup>CERN, Switzerland

**N35 Photodetectors and Radiation Imaging II**

Wednesday, October 20 16:00-18:00, Leptis Magna 3  
Session Chair: Volker Dangendorf, PTB Braunschweig

**N35-1: (16:00) MicroHole & Strip Plate Based Photosensor**

E. D. C. Freitas<sup>1</sup>, J. F. C. A. Veloso<sup>1,2</sup>, J. M. Maia<sup>1,3</sup>, A. Breskin<sup>4</sup>, R. Chechik<sup>4</sup>, J. M. F. dos Santos<sup>1</sup>

<sup>1</sup>University of Coimbra, Portugal; <sup>2</sup>University of Aveiro, Portugal;

<sup>3</sup>University of Beira Interior, Portugal; <sup>4</sup>Weizmann Institute of Science, Israel

**N35-2: (16:15) Study of Timing and Efficiency Properties of Multi-Anode Photomultipliers**

T. Hadig, C. R. Field, D. W. G. S. Leith, G. Mazaheri, B. N. Ratcliff, J. Schwenning, J. Va'vra, Stanford Linear Accelerator Center, USA

**N35-3: (16:30) A Systematic Study in High Magnetic Fields of Fine-Mesh Photomultipliers for Time-of-Flight Detectors**

M. Bonesini<sup>1</sup>, G. Baccaglioni<sup>2</sup>, F. Broggi<sup>2</sup>, G. Volpini<sup>2</sup>, G. Ceccher<sup>1</sup>, A. De Bari<sup>1</sup>, R. Nardo<sup>1</sup>, M. Rossella<sup>1</sup>

<sup>1</sup>Sezione INFN, Italy; <sup>2</sup>LASA (Sezione INFN Milano), Italy

**N35-4: (16:45) A TOF Counter of  $s_t \sim 10$  ps with Cherenkov Photons and a MCP-PMT**

T. Ohshima, K. Inami, Y. Enari, K. Hayasaka, M. Tomita, T. Kubota, S. Yoshino, N. Kishimoto, Y. Akita, Y. Endo, Nagoya University, Japan

**N35-5: (17:00) Studies of a Proximity Focusing Aerogel RICH for the Belle Upgrade**

I. Adachi<sup>1</sup>, S. Fratina<sup>2</sup>, T. Fukushima<sup>3</sup>, A. Gorisek<sup>2</sup>, T. Iijima<sup>4</sup>, H. Kawai<sup>3</sup>, M. Konishi<sup>3</sup>, S. Korpar<sup>2</sup>, Y. Kozakai<sup>4</sup>, P. Krizan<sup>2</sup>, T. Matsumoto<sup>5</sup>, S. Nishida<sup>1</sup>, S. Ogawa<sup>6</sup>, S. Ohtake<sup>6</sup>, R. Pestotnik<sup>2</sup>,

S. Saitoh<sup>1</sup>, T. Seki<sup>5</sup>, T. Sumiyoshi<sup>5</sup>, Y. Uchida<sup>1</sup>, Y. Unno<sup>3</sup>, S. Yamamoto<sup>5</sup>

<sup>1</sup>High Energy Accelerator Research Organization (KEK), Japan; <sup>2</sup>Jozef Stefan Institute, Slovenia; <sup>3</sup>Chiba University, Japan; <sup>4</sup>Nagoya University, Japan; <sup>5</sup>Tokyo Metropolitan University, Japan; <sup>6</sup>Toho University, Japan

**N35-6: (17:15) Performance of a Thick Silicon Polarimeter**

S. O. Nelson<sup>1,2</sup>, J. D. Kurfess<sup>1</sup>, B. F. Philips<sup>1</sup>, E. A. Wulf<sup>1</sup>, E. I. Novikova<sup>1,3</sup>

<sup>1</sup>Naval Research Lab, USA; <sup>2</sup>National Research Council, USA; <sup>3</sup>George Mason University, USA

**N35-7: (17:30) The Feasibility of Searching for Contraband Materials Using a Gamma-Ray ‘Radar’ System**

D. Ramsden, C. Ferguson, M. Dallimore, G. Crossingham, Symetrica Ltd, UK

**N35-8: (17:45) A Dual Scintillator – Dual Silicon Photodiode Detector Module for Intraoperative Gamma/beta Probe and Portable anti-Compton Spectrometer**

A. B. Rosenfeld, M. L. F. Lerch, G. J. Takacs, D. Inwood, University of Wollongong, Australia; A. V. Gektin, Amcrys-H, Ukraine; V. L. Per evertaylo, SPO BIT, Ukraine; S. Meikle, Royal Prince Alfred Hospital, Australia

**N36 Trigger and Front-End Systems III**

Wednesday, October 20 16:00-18:00, Orange 2  
Session Chair: Flavio Loddo, INFN BARI

**N36-1: (16:00) First Experience with the Readout Electronics on the ATLAS EM Barrel Calorimeter at Cold**

H. G. S. Wilkens, CERN, Switzerland

On behalf of the Atlas LAr Electronics group

**N36-2: (16:15) Design and Test of Prototype Boards for the L1 Calorimeter Trigger Upgrade at the D0 Experiment**

D. Calvet, P. Demine, E. Perez, CEA Saclay, France; M. Abolins, D. Edmunds, P. Laurens, Michigan State University, USA

**N36-3: (16:30) Performance of the H1 Fast Track Trigger**

N. Berger<sup>1</sup>, A. Baird<sup>2</sup>, R. Baldinger<sup>1</sup>, S. Baumgartner<sup>1</sup>, M.-O. Boenig<sup>3</sup>, D. P. Brown<sup>4</sup>, Y. H. Fleming<sup>4,5</sup>, M. Kolander<sup>3</sup>, S. Kolya<sup>6</sup>, K. Krüger<sup>7</sup>, D. Meer<sup>1</sup>, D. Mercer<sup>6</sup>, D. Müller<sup>8</sup>, J. Müller<sup>8</sup>, J. Naumann<sup>3</sup>, P. R. Newman<sup>5</sup>, D. P. C. Sankey<sup>2</sup>, A. Schöning<sup>1</sup>, H.-C. Schultz-Coulon<sup>7</sup>, C. Wissing<sup>3</sup>, W. Yan<sup>4</sup>

<sup>1</sup>ETH Zürich, Switzerland; <sup>2</sup>Rutherford Appleton Laboratory, UK;

<sup>3</sup>Universität Dortmund, Germany; <sup>4</sup>Deutsches Elektronen-Synchrotron DESY, Germany; <sup>5</sup>University of Birmingham, UK; <sup>6</sup>University of Manchester, UK; <sup>7</sup>Universität Heidelberg, Germany; <sup>8</sup>Supercomputing Systems, Switzerland

**N36-4: (16:45) The PHENIX Trigger System Hardware and Software**

S. V. Belikov, Brookhaven National Laboratory, USA

On behalf of the PHENIX Collaboration

### N36-5: (17:00) Low Latency High Speed Event Processing Using S-LINK S32PCI64 Cards and Commodity CPUs for CDF Level 2 Trigger Upgrade

M. Bogdan<sup>1</sup>, R. Demaat<sup>2</sup>, W. Fedorko<sup>1</sup>, H. Frisch<sup>1</sup>, K. Hahn<sup>3</sup>, M. Hakala<sup>2</sup>, P. Keener<sup>3</sup>, Y.-K. Kim<sup>1</sup>, J. Kroll<sup>3</sup>, S. Kwang<sup>1</sup>, J. Lewis<sup>2</sup>, C.-J. Lin<sup>2</sup>, T. Liu<sup>2</sup>, F. Marjamaa<sup>2</sup>, T. Mansikkala<sup>2</sup>, C. Neu<sup>3</sup>, S. Pitkanen<sup>2</sup>, B. Reisert<sup>2</sup>, V. Rusu<sup>1</sup>, H. Sanders<sup>1</sup>, M. Shochet<sup>1</sup>, F. Stabenau<sup>2</sup>, R. Van Berg<sup>2</sup>, P. Wilson<sup>2</sup>, D. Whiteson<sup>3</sup>, P. Wittich<sup>3</sup>

<sup>1</sup>University of Chicago, USA; <sup>2</sup>Fermi National Accelerator Laboratory, USA; <sup>3</sup>University of Pennsylvania, USA

### N36-6: (17:15) Modularized Pipeline Readout Electronics for SuperKEKB

T. Higuchi, M. Hazumi, M. Ikeno, Y. Igarashi, R. Itoh, Y. Iwasaki, M. Nakao, K. Nakayoshi, S. Y. Suzuki, M. Tanaka, K. Tauchi, *High Energy Accelerator Research Organization (KEK), Japan*; V. Aulchenko, M. Bukin, B. Schwartz, Y. Usov, *Budker Institute of Nuclear Physics, Russia*; B. Wei, G. S. Varner, *University of Hawaii, USA*; T. Kawasaki, *Niigata University, Japan*; E. Nakano, *Osaka City University, Japan*; P. J. Kapusta, Z. M. Natkaniec, *H. Niewodniczanski Institute of Nuclear Physics, Poland*

### N36-7: (17:30) The RPC Level-1 Muon Trigger of the ATLAS Experiment at the LHC

E. A. Conventi, *Universita degli studi di Napoli, Italy*  
On behalf of the ATLAS TDAQ group

### N36-8: (17:45) Front-End Electronics for RPCs of the ALICE Dimuon Trigger

P. Rosnet, *Université Blaise Pascal - CNRS/IN2P3, France*  
On behalf of the ALICE collaboration

## N37 Radiation Damage Effects I - Solid State

Wednesday, October 20 16:00-18:00, Spalato  
Session Chair: Giorgio Chiarelli, *INFN Pisa*

### N37-1, invited: (16:00) Recent Results on Radiation Hard Semiconductor Detectors for SuperLHC

M. Bruzzi, *INFN Firenze, Italy*  
On behalf of the CERN RD50 Collaboration

### N37-2: (16:15) Radiation Hard Avalanche Photodiodes for High Energy Physics Applications: Present and Future

J. D. Swain, S. Reucroft, Y. Musienko, *Northeastern University, USA*

### N37-3: (16:30) Study of the Radiation Hardness of Irradiated AToM Front-End Chips of the BaBar Silicon Vertex Tracker

S. Bettarini<sup>1</sup>, M. Bondioli<sup>1</sup>, L. Bosisio<sup>2</sup>, G. Calderini<sup>1</sup>, S. Dittongo<sup>2</sup>, F. Forti<sup>1</sup>, M. A. Giorgi<sup>1,3</sup>

<sup>1</sup>Istituto Nazionale Fisica Nucleare - Sez. Pisa e Università degli Studi di Pisa, Italy; <sup>2</sup>Istituto Nazionale Fisica Nucleare - Sez. Trieste e Università degli Studi di Trieste, Italy; <sup>3</sup>Stanford University, USA

### N37-4: (16:45) P+/n-/n+ Cz-Si Detectors Processed on P-Type Boron Doped Substrates with Thermal Donor Induced Space Charge Sign Inversion

J. Härkönen, E. Tuovinen, P. Luukka, E. Tuominen, *Helsinki Institute of Physics, Finland*; Z. Li, *Brookhaven National Laboratory, USA*; V. Eremin, E. Verbitskaya, *Ioffe PTI, Russia*

### N37-5: (17:00) Current Injected Detectors - a New Approach for Detector Operation in Very High Radiation Environment

V. K. Eremin, I. N. Ilyashenko, E. M. Verbitskaya, *Ioffe Physico-Technical Institute of Russian Academy of Sciences, Russia*; N. N. Egorov, S. A. Golubkov, K. A. Konkov, A. I. Sidorov, *Research Institute of Material Science and Technology, Russia*; Z. Li, *Brookhaven National Laboratory, USA*; K. M. Smith, *Glasgow University, UK*; T. O. Niinikoski, *CERN, Switzerland*

### N37-6: (17:15) Defect Characterization in Silicon Detectors Irradiated with Li Ions

M. Scaringella, M. Bruzzi, D. Menichelli, *Università di Firenze, Italy*; A. Candelori, R. Rando, *Università di Padova, Italy*

### N37-7: (17:30) Irradiation Effects on Glasses Containing ZnO as Emission Centres

A. Cecilia, S. Baccaro, *ENEA, Italy*; C. Guorong, Z. Donghui, X. Fang, Y. Yunxia, *ECUST, China*

### N37-8: (17:45) On the Radiation Damage of Hard-clad Fused-silica Optical Fibers

R. D. Thomas, N. Akchurin, K. Carrell, *Texas Tech University, USA*

## N38 Computing and Software for HEP Experiments

Thursday, October 21 08:30-10:30, Leptis Magna 4  
Session Chair: Maria Grazia Pia, *INFN Genova*

### N38-1: (08:30) A Millennium of Work in under a Year - BaBar Simulation Production

D. A. Smith, *Stanford Linear Accelerator Center, USA*  
On behalf of the BaBar Computing Group

### N38-2: (08:42) Overview of the LCG Application Area Software Project

J. Harvey, *CERN, Switzerland*

### N38-3: (08:54) An Object-Oriented Simulation Program for CMS

M. Stavrianakou, *FNAL, USA*  
On behalf of the CMS Collaboration

### N38-4: (09:06) Use of Grid Tools to Support CMS Distributed Analysis

A. Fanfani, *University of Bologna, INFN, Italy*  
On behalf of the CMS Collaboration

### N38-5: (09:18) Performance of R-GMA Based Grid Job Monitoring System for CMS Data Production

R. Byrom<sup>1</sup>, D. Colling<sup>2</sup>, S. M. Fisher<sup>1</sup>, C. Grandi<sup>3</sup>, P. R. Hobson<sup>4</sup>, P. Kyberd<sup>4</sup>, B. MacEvoy<sup>2</sup>, J. J. Nebrensky<sup>4</sup>, H. Tallini<sup>2</sup>, S. Traylen<sup>1</sup>  
<sup>1</sup>Rutherford Appleton Laboratory, UK; <sup>2</sup>Imperial College London, UK; <sup>3</sup>Istituto Nazionale di Fisica Nucleare, Italy; <sup>4</sup>Brunel University, UK

### N38-6: (09:30) Offline Software for the ATLAS Combined Test Beam

A. Farilla<sup>1</sup>, M. Biglietti<sup>2</sup>, M. J. Costa<sup>3</sup>, B. Di Girolamo<sup>3</sup>, M. V. Gallas<sup>3</sup>, R. Hawkins<sup>3</sup>, R. McPherson<sup>4</sup>, C. Padilla<sup>3</sup>, R. Petri<sup>3</sup>, S. Rosati<sup>3</sup>, A. Solodkov<sup>5</sup>

<sup>1</sup>I.N.F.N. Roma III, Italy; <sup>2</sup>Univ. of Michigan, USA; <sup>3</sup>CERN, Switzerland; <sup>4</sup>Univ. of Victoria, Canada; <sup>5</sup>IHEP, Russia

### N38-7: (09:42) Implementation and Performance of the High-Level Trigger Electron and Photon Selection for the ATLAS Experiment at the LHC

C. Schiavi, *INFN Genova, Italy*

On behalf of the ATLAS High-Level Trigger Group

### N38-8: (09:54) Geant4 Simulation of High Energy Muon Interactions

R. Kokoulin, *MEPhI, Russia*

On behalf of the Geant4 Standard Electromagnetic Group

### N38-9: (10:06) Geant4 Hadronic Physics Validation for Large HEP Detectors

J. P. Wellisch, *CERN, Switzerland*

On behalf of the Geant4 hadronic working group

### N38-10: (10:18) Software for the LHCb Experiment

P. Mato<sup>1</sup>, P. Charpentier<sup>1</sup>, G. Corti<sup>1</sup>, P. Koppenburg<sup>1</sup>, M. Frank<sup>1</sup>, F. Ranjard<sup>1</sup>, S. Roiser<sup>1</sup>, I. Belyaev<sup>2</sup>, G. Barrand<sup>3</sup>, M. Cattaneo<sup>1</sup>

<sup>1</sup>CERN, Switzerland; <sup>2</sup>ITEP, Russia; <sup>3</sup>LAL, France

## N39 Radiation Damage Effects II - Aging of Gaseous Detectors

Thursday, October 21 08:30-10:30, Leptis Magna 3

Session Chair: Mar Capeans, CERN

### N39-1, invited: (08:30) Strategy of the Aging Tests to Optimize the Particle Detector Performance

A. G. Krivshich, G. E. Gavrilo, *Petersburg Nuclear Physics Institute, Russia*

### N39-2: (08:45) Aging of Proportional Counters with Gas Mixtures Containing Impurities of Aromatic Hydrocarbons

K. Kurvinen<sup>1</sup>, H. Andersson<sup>2</sup>, T. Andersson<sup>2</sup>, M. Eräluoto<sup>1</sup>, F. Garcia<sup>1</sup>, J. Heino<sup>1</sup>, J. Huovelin<sup>3</sup>, R. Lauhakangas<sup>1</sup>, S. Nenonen<sup>2</sup>, A. Numminen<sup>1</sup>, J. Ojala<sup>1</sup>, R. Orava<sup>3</sup>, J. Schultz<sup>3</sup>, H. Sipilä<sup>2</sup>, O. Vilhu<sup>3</sup>

<sup>1</sup>Helsinki Institute of Physics, Finland; <sup>2</sup>Metorex International Oy, Finland; <sup>3</sup>University of Helsinki, Finland

### N39-3: (09:00) Aging in the Large CDF Axial Drift Chamber

D. Ambrose, M. Binkley, C. Bromberg, K. Burkett, R. Kephart, R. Madrak, T. Miao, A. Mukherjee, R. Roser, R. L. Wagner, *Fermilab, USA*

### N39-4: (09:15) Ageing Studies for the Straw Tube Detectors for the LHCb Outer Tracking System

S. Bachmann<sup>1</sup>, I. Bagaturia<sup>1</sup>, H. Deppe<sup>1</sup>, F. Eisele<sup>1</sup>, T. Haas<sup>1</sup>, L. Hajduk<sup>2</sup>, U. Langenegger<sup>1</sup>, J. Michalowski<sup>2</sup>, A. Nawrot<sup>3</sup>, G. Polok<sup>2</sup>, A. Pellegrino<sup>4</sup>, H. Schuijlenburg<sup>4</sup>, R. Schwier<sup>2</sup>, T. Sluijk<sup>4</sup>, B. Spaan<sup>5</sup>, J. Spelt<sup>4</sup>, M. Szczekowski<sup>3</sup>, U. Stange<sup>1</sup>, K. Syrczynski<sup>3</sup>, U. Trunk<sup>1</sup>, M. Walter<sup>1</sup>, D. Wiedner<sup>1</sup>, U. Uwer<sup>1</sup>, G. van Appeldorn<sup>4</sup>

<sup>1</sup>Physikalisches Institut, Germany; <sup>2</sup>Institute of Nuclear Physics, Poland; <sup>3</sup>Soltan Institute for Nuclear Studies, Poland; <sup>4</sup>NIKHEF, the Netherlands; <sup>5</sup>Technical University of Dresden, Germany

### N39-5: (09:30) Aging Measurements on Triple-GEM Detectors Operated with CF<sub>4</sub>-Based Gas Mixtures

P. de Simone<sup>1</sup>, M. Alfonsi<sup>1</sup>, G. Bencivenni<sup>1</sup>, M. Poli Lerner<sup>1</sup>, W. Bonivento<sup>2</sup>, F. Murtas<sup>1</sup>, A. Cardini<sup>2</sup>, D. Raspino<sup>2</sup>, D. Pinci<sup>2</sup>, S. Baccaro<sup>3</sup>

<sup>1</sup>Laboratori Nazionali di Frascati, Italy; <sup>2</sup>Sezione INFN di Cagliari, Italy; <sup>3</sup>FIS/ION, Italy

### N39-6: (09:45) An Aging Study of Industrially Produced Micropatterned Gas Detectors: MICROMEAS and GEM

J. Miyamoto, A. I. Andrew Irrgang, B. Hogan, R. Perera, I. Shipsey, *Purdue University, USA*

### N39-7: (10:00) Study of the Performance of the ATLAS Monitored Drift Tube Chambers under the Influence of Heavily Ionizing $\alpha$ -Particles

D. Sampsonidis, M. Manolopoulou, C. Petridou, A. Liolios, *Aristotle University of Thessaloniki, Greece*

### N39-8: (10:15) Ageing Test of RPC for the Muon Trigger System for the ALICE Experiment

R. Arnaldi<sup>1</sup>, A. Baldit<sup>2</sup>, V. Barret<sup>2</sup>, N. Bastid<sup>2</sup>, G. Blanchard<sup>2</sup>, E. Chiavassa<sup>1</sup>, A. Colla<sup>1</sup>, P. Cortese<sup>3</sup>, P. Crochet<sup>2</sup>, G. Dellacasa<sup>3</sup>, A. Devaux<sup>2</sup>, N. De Marco<sup>1</sup>, P. Dupieux<sup>2</sup>, A. Ferretti<sup>1</sup>, B. Forestier<sup>2</sup>, M. Gallio<sup>1</sup>, R. Gemme<sup>1</sup>, S. Grigoryan<sup>2</sup>, F. Guerin<sup>2</sup>, R. Guernane<sup>1</sup>, C. Insa<sup>2</sup>, F. Jouve<sup>2</sup>, F. Manso<sup>4</sup>, P. Mereu<sup>1</sup>, A. Musso<sup>1</sup>, C. Oppedisano<sup>1</sup>, A. Piccotti<sup>1</sup>, E. Poggio<sup>1</sup>, L. Royer<sup>2</sup>, P. Rosnet<sup>4</sup>, P. Saturnini<sup>2</sup>, E. Scomparin<sup>1</sup>, F. Sigaudo<sup>1</sup>, G. Travaglia<sup>1</sup>, E. Vercellin<sup>1</sup>, F. Yermia<sup>1</sup>

<sup>1</sup>Università degli Studi di Torino -I.N.F.N. sezione di Torino, Italy; <sup>2</sup>LPC Clermont Ferrand, IN2P3/CNRS et Université Blaise Pascal, France; <sup>3</sup>Università del Piemonte Orientale, Italy; <sup>4</sup>LPC Clermont Ferrand, IN2P3/CNRS, I.U.T. de Montluçon Université Blaise Pascal, France

## N40 Software: Enabling Technologies

Thursday, October 21 11:00-12:36, Leptis Magna 4

Session Chair: Jürgen Knobloch, CERN

### N40-1: (11:00) Geant4 Simulation Toolkit: Status and Recent Developments

S. Guatelli, *INFN Genova, Italy*

On behalf of the Geant4 Collaboration

### N40-2: (11:12) Operating a Large Scale Production Grid for the LCG Project

M. W. Schulz, *CERN, Switzerland*

On behalf of the LCG Deployment Team

### N40-3: (11:24) LCG POOL Development Status and Production Experience

D. Duellmann, *CERN, Switzerland*

On behalf of the LCG POOL Team

### N40-4: (11:36) The LCG PI Project: Using Interfaces for Physics Data Analysis

A. Pfeiffer, *CERN, Switzerland*

On behalf of the LCG PI project team

#### **N40-5: (11:48) Application of Statistical Methods for the Comparison of Data Distributions**

G. A. P. Cirrone<sup>1</sup>, G. Cuttone<sup>1</sup>, S. Donadio<sup>2</sup>, S. Guatelli<sup>2</sup>,  
A. Mantero<sup>2</sup>, B. Mascalino<sup>2</sup>, S. Parlati<sup>1</sup>, A. Pfeiffer<sup>3</sup>, A. Ribon<sup>3</sup>,  
G. Russo<sup>1</sup>, P. Viarengo<sup>4</sup>

<sup>1</sup>INFN, Italy; <sup>2</sup>INFN Genova (Italy), Italy; <sup>3</sup>CERN, Switzerland;

<sup>4</sup>National Cancer Research Institute, Italy

#### **N40-6: (12:00) Developments of Mathematical Software Libraries for the LHC Experiments**

M. Lorenzo, CERN, Switzerland

On behalf of the MathLib/SEAL LCG project

#### **N40-7: (12:12) ArchaeoGRID, a GRID for Archaeology**

P. G. Pelfer, Università di Firenze and INFN, Italy; J. A. Barceló,  
Universitat Autònoma de Barcelona, Spain; C. MacDonaill, Dublin  
Institute of Technology, Ireland; G. Pelfer, Università di Bologna, Italy

#### **N40-8: (12:24) Experience with Software Process in Physics Experiments**

S. Guatelli, INFN Genova, Italy

On behalf of the Geant4 Low Energy electromagnetic Group

### **N41 Photodetectors and Radiation Imaging III**

Thursday, October 21 11:00-12:30, Leptis Magna 3

Session Chair: Jerry Va'vra, SLAC

#### **N41-1: (11:00) Detectors for Time-of-Flight Fast Neutron Radiography**

V. Dangendorf<sup>1</sup>, D. Bar<sup>2</sup>, A. Breskin<sup>3</sup>, R. Chechik<sup>3</sup>, G. Feldman<sup>2</sup>,  
M. B. Boldberg<sup>2</sup>, O. Jagutzki<sup>4</sup>, G. Laczkó<sup>1</sup>, I. Mor<sup>2</sup>, U. Spillmann<sup>4</sup>,  
D. Vartsky<sup>2</sup>, M. Weierganz<sup>1</sup>, W. Wendt<sup>1</sup>

<sup>1</sup>Physikalisch-Technische Bundesanstalt, Germany; <sup>2</sup>Soreq NRC,  
Israel; <sup>3</sup>Weizmann Institute of Science, Israel; <sup>4</sup>University of Frankfurt,  
Germany

#### **N41-2: (11:15) High-Resolution, Back-Side Illuminated Monolithic Active Pixel Sensor for Low Energy Electron Imaging**

G. Deptuch, W. Dulinski, LEPSI/ULP/IN2P3, Strasbourg,  
France; D. Grandjean, IReS/ULP/IN2P3, Strasbourg, France

#### **N41-3: (11:30) Performance Limits of a 55µm Pixel CdTe Detector**

G. Pellegrini<sup>1</sup>, M. Chmeissani<sup>2</sup>, M. Maiorino<sup>2</sup>, G. Blanchot<sup>2</sup>,  
J. Garcia<sup>1</sup>, M. Lozano<sup>1</sup>, R. Martinez<sup>1</sup>, C. Puigdengoles<sup>2</sup>, M. Ullan<sup>1</sup>

<sup>1</sup>Centro Nacional de Microelectronica IMB-CNM, Spain; <sup>2</sup>Institut de  
Física d'Altes Energies, Spain

#### **N41-4: (11:45) Development and Performance of Large Fine-Pitch Germanium Strip Detectors**

B. F. Philips<sup>1</sup>, S. O. Nelson<sup>2</sup>, E. A. Wulf<sup>1</sup>, W. N. Johnson<sup>1</sup>,  
J. D. Kurfess<sup>1</sup>, M. Amman<sup>3</sup>, P. N. Luke<sup>3</sup>

<sup>1</sup>Naval Research Laboratory, USA; <sup>2</sup>NRL/NRC Postdoctoral Fellow, USA;

<sup>3</sup>Lawrence Berkeley National Laboratory, USA

#### **N41-5: (12:00) Development of a Coded Aperture X-Ray Backscatter Imager for Explosive Device Detection**

A. A. Faust, Defence R&D Canada - Suffield, Canada; R. E. Rothschild,  
University of California, San Diego, USA

#### **N41-6: (12:15) Characterisation of an Integrated X-Ray Breast Imaging System Based on a Large Area Sensor and a Photon-Counting Spectroscopic Multi-Element Array**

D. G. Darambara, P. J. Sellin, G. Maehlum, University of Surrey, UK

### **N42 Software for Bio-Medical Applications**

Thursday, October 21 14:00-15:36, Leptis Magna 4

Session Chair: Maria Grazia Pia, INFN Genova

#### **N42-1: (14:00) Validation of Geant4 Electromagnetic Physics Versus Protocol Data**

S. Guatelli<sup>1</sup>, K. Amako<sup>2</sup>, G. Cirrone<sup>3</sup>, G. Cuttone<sup>3</sup>, V. Ivantchenko<sup>4</sup>,  
N. Kanematsu<sup>5</sup>, M. Maire<sup>6</sup>, A. Mantero<sup>1</sup>, B. Mascalino<sup>1</sup>,  
K. Murakami<sup>2</sup>, L. Pandola<sup>7</sup>, S. Parlati<sup>7</sup>, M. Piergentili<sup>1</sup>, S. Saliceti<sup>1</sup>,  
T. Sasaki<sup>2</sup>, H. Yoshida<sup>8</sup>

<sup>1</sup>INFN Genova, Italy; <sup>2</sup>KEK, Japan; <sup>3</sup>INFN - LNS Catania, Italy;

<sup>4</sup>CERN, Switzerland; <sup>5</sup>National Institute of Radiological Sciences, Japan;

<sup>6</sup>LAPP, France; <sup>7</sup>INFN - LNGS, Italy; <sup>8</sup>Naruto University of Education,  
Japan

#### **N42-2: (14:12) Systematic Comparison of Electromagnetic Physics Between Geant4 and EGS4 with Respect to Protocol Data**

K. Murakami<sup>1</sup>, K. Amako<sup>1</sup>, T. Sasaki<sup>1</sup>, M. G. Pia<sup>2</sup>, P. Cirrone<sup>3</sup>,  
G. Cuttone<sup>3</sup>, S. Guatelli<sup>2</sup>, V. Ivanchenko<sup>4</sup>, N. Kanematsu<sup>5</sup>,  
M. Maire<sup>6</sup>, A. Mantero<sup>2</sup>, B. Mascalino<sup>2</sup>, L. Pandola<sup>7</sup>, S. Parlati<sup>7</sup>,  
M. Piergentili<sup>2</sup>, S. Saliceti<sup>2</sup>, H. Yoshida<sup>8</sup>

<sup>1</sup>KEK, Japan; <sup>2</sup>INFN Genova, Italy; <sup>3</sup>INFN LNS, Italy; <sup>4</sup>CERN,  
Switzerland; <sup>5</sup>NIRS, Japan; <sup>6</sup>IN2P3/LAPP, France; <sup>7</sup>INFN LNGS, Italy;  
<sup>8</sup>Naruto Univ. of Education, Japan

#### **N42-3: (14:24) DICOM Data Handling for Geant4-Based Medical Physics Application**

A. Kimura, Japan Science and Technology Agency, Japan; T. Aso,  
Toyama College of Maritime Technology, Japan; H. Yoshida, Naruto  
University of Education, Japan; N. Kanematsu, National Institute  
of Radiological Sciences, Japan; S. Tanaka, Ritsumeikan University,  
Japan; T. Sasaki, High Energy Accelerator Research Organization  
(KEK), Japan

#### **N42-4: (14:36) A Geant4-Based Simulation of an Accelerator's Head Used for Intensity Modulated Radiation Therapy**

M. Piergentili, INFN, Italy; F. Foppiano, IST- Istituto Nazionale per  
la Ricerca sul Cancro, Italy

#### **N42-5: (14:48) Monte Carlo Based Implementation of a Energy Modulation System for Proton Therapy Treatment**

G. A. P. Cirrone, F. Di Rosa, S. Lo Nigro, L. Raffaele, G. Russo,  
Laboratori Nazionali Del Sud, Italy

#### **N42-6: (15:00) Verification of the Dose Distributions with Geant4 Simulation for Proton Therapy**

T. Aso<sup>1,2</sup>, A. Kimura<sup>3,2</sup>, S. Tanaka<sup>3,2</sup>, H. Yoshida<sup>4,2</sup>, N. Kanematsu<sup>5,2</sup>,  
T. Sasaki<sup>6,2</sup>, T. Akagi<sup>7,2</sup>

<sup>1</sup>Toyama College of Maritime Technology, Japan; <sup>2</sup>JST CREST, Japan;

<sup>3</sup>Ritsumeikan University, Japan; <sup>4</sup>Naruto University of Education, Japan;

<sup>5</sup>National Institute of Radiological Sciences, Japan; <sup>6</sup>High Energy  
Accelerator Research Organization (KEK), Japan; <sup>7</sup>Hyogo Ion Beam  
Medical Center, Japan



#### **N42-7: (15:12) Medical Applications on the GRID: Efficient Management of Parallel Jobs**

J. T. Moscicki, *CERN, Switzerland*

#### **N42-8: (15:24) Radiation Transport Calculations for Beam Therapy with Geant4 Toolkit**

I. Gudovska, S. Larsson, *Karolinska Institutet and Stockholm University, Sweden*

### **N43 Instrumentation for Medical and Biological Research I**

Thursday, October 21 14:00-15:30, Leptis Magna 3

Session Chair: Edoardo Castelli, *University & INFN, Trieste, Italy*

#### **N43-1, keynote: (14:00) The Project of Clinical Mammography with Synchrotron Radiation**

F. Arfelli, A. Bergamaschi, E. Castelli, D. Dreossi, R. Longo, A. Olivo, S. Pani, T. Rokvic, C. Venanzi, *Università & INFN, Italy*; A. Abrami, F. Bille', V. Chenda, C. Fava, R. H. Menk, G. Tromba, *Sincrotrone Trieste, SCpA, Italy*; P. Bregant, F. Brizzi, L. Dalla Palma, M. Tonutti, F. Zanconati, *Azienda Ospedaliero - Universitaria, Italy*

#### **N43-2: (14:30) Gamma-Ray Compton Imaging of Multitracer in Bio-Samples by Strip Germanium Telescope**

S. Motomura, H. Takeichi, R. Hirunuma, H. Haba, K. Igarashi, S. Enomoto, Y. Gono, Y. Yano, *RIKEN (The Institute of Physical and Chemical Research), Japan*

#### **N43-3: (14:45) Performance Characterization of the Medipix2 Silicon Detector Assembly**

L. Tlustos, R. Ballabriga, M. Campbell, E. Heijne, X. Llopart, *CERN, Switzerland*

#### **N43-4: (15:00) Microelectrode Arrays on Flexible and Rigid Substrates for the Recording of Neural Signals**

K. Mathieson, C. Adams, W. Cunningham, D. Gunning, V. O'Shea, M. Rahman, J. D. Morrison, *University of Glasgow, Scotland*; A. M. Litke, *University of California Santa Cruz, USA*; E. J. Chichilnisky, *The Salk Institute for Biological Studies, USA*

#### **N43-5: (15:15) The Feasibility of In-Beam PET for Accurate Monitoring of Proton Therapy: Results of a Comprehensive Experimental Study**

K. Parodi, F. Pönisch, W. Enghardt, *Forschungszentrum Rossendorf e.V., Germany*

### **N44 Software for Space Science and Detectors**

Thursday, October 21 16:00-18:00, Leptis Magna 4

Session Chair: Jürgen Knobloch, *CERN*

#### **N44-1: (16:00) Particle Radiation Environments and Effects on ESA Missions and Tools for Their Analysis**

G. Santin, H. Evans, P. Nieminen, E. Daly, *ESA - ESTEC, the Netherlands*

#### **N44-2: (16:12) Dosimetry for Interplanetary Missions**

S. Guatelli, M. G. Pia, *INFN Genova, Italy*

#### **N44-3: (16:24) Radiation Physics Simulator for Space X-Ray Observatory Astro-E2**

M. Ozaki<sup>1,2</sup>, S. Watanabe<sup>1,2</sup>, Y. Terada<sup>3</sup>, Y. Ishisaki<sup>4</sup>, T. Takahashi<sup>1</sup>

<sup>1</sup>*Inst. of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan*; <sup>2</sup>*CREST, Japan Science and Technology Agency, Japan*; <sup>3</sup>*Inst. of Physical and Chemical Research (RIKEN), Japan*; <sup>4</sup>*Tokyo Metropolitan University, Japan*

#### **N44-4: (16:36) Models for the Simulation of X-Ray Fluorescence and PIXE**

S. Saliceti, A. M. Mantero, *INFN Genova, Italy*

#### **N44-5: (16:48) A Library for Simulated X-Ray Emission from Planetary Surfaces**

A. M. Mantero, S. Saliceti, *INFN Genova, Italy*

#### **N44-6: (17:00) Simulation of LHCb RICH Detectors Using GEANT4**

S. Easo<sup>1</sup>, I. Belyaev<sup>2</sup>, P. Robbe<sup>3</sup>, G. Corti<sup>4</sup>, W. Pokorski<sup>4</sup>, F. Ranjard<sup>4</sup>, A. Papanestis<sup>1</sup>, C. R. Jones<sup>5</sup>

<sup>1</sup>*Rutherford-Appleton Laboratory, UK*; <sup>2</sup>*ITEP, Russia*; <sup>3</sup>*LAL, France*; <sup>4</sup>*CERN, Switzerland*; <sup>5</sup>*Cambridge University, UK*

#### **N44-7: (17:12) Muon Identification and Reconstruction in the ATLAS Detector at the LHC with the MOORE/MuID Combined Reconstruction Package**

S. M. Goldfarb, *University of Michigan, USA*

On behalf of the ATLAS MOORE and MuID Development Teams

#### **N44-8: (17:24) Background Radiation Studies at LHCb Using Geant4**

G. G. Daquino, G. Corti, G. Folger, *CERN, Switzerland*

#### **N44-9: (17:36) The Geant4 Geometry Modeler**

G. Cosmo, *CERN, Switzerland*

On behalf of the Geant4 Collaboration

#### **N44-10: (17:48) Toward the SLHC: Simulation of Ultra Radiation Hard Silicon Pixel Tracking Detectors**

T. Lari<sup>1,2</sup>, C. Troncon<sup>1,2</sup>

<sup>1</sup>*University of Milan, Italy*; <sup>2</sup>*INFN, Italy*

### **N45 Instrumentation for Medical and Biological Research II**

Thursday, October 21 16:00-18:00, Leptis Magna 3

Session Chair: Ralf Menk, *Sincrotrone Trieste S.C.p.A*

#### **N45-1: (16:00) A Front-End Readout ASIC for SPECT**

D. Pettersen, D. Meier, S. Mikkelsen, J. Talebi, *IDEAS ASA, Norway*

#### **N45-2: (16:15) Timing Discriminator and 32 Line Address Priority Serial Encoder for the Front-End Electronics of the RatCAP Mobile Animal PET Scanner**

J.-F. Pratte<sup>1</sup>, S. Junnarkar<sup>1</sup>, P. O'Connor<sup>1</sup>, C. Woody<sup>1</sup>, A. Kandasamy<sup>1</sup>, V. Radeka<sup>1</sup>, B. Yu<sup>1</sup>, S. Robert<sup>2</sup>, S. Stoll<sup>1</sup>, R. Lecomte<sup>2</sup>, R. Fontaine<sup>2</sup>

<sup>1</sup>*Brookhaven National Laboratory, USA*; <sup>2</sup>*Université de Sherbrooke, Canada*

**N45-3:** (16:30) A CMOS Detector for High Resolution Electron Microscopy

A. R. Faruqi, R. Henderson, *MRC Laboratory of Molecular Biology, UK*; M. L. Pryddetch, R. Turchetta, *Rutherford Appleton Laboratory, UK*; P. Allport, A. Evans, J. Velthuis, *Liverpool University, UK*

**N45-4:** (16:45) Detector Characteristics of a Pixellated Germanium Compton Camera for Nuclear Medicine

W. Ghoggali, R. D. Speller, G. J. Royle, J. Gabathuse, *University College London, UK*; P. J. Sellin, *University of Surrey, UK*; I. H. Lazarus, D. E. Appelbe, *CCLRC, UK*

**N45-5:** (17:00) Scintillating Fiber Dosimeter for Radiotherapy

A.-M. Frelin, J.-M. Fontbonne, G. Ban, M. Labalme, *LPC Caen, France*; A. Battala, A. Isambert, A. Vela, *CAC Baclesse, France*; T. Leroux, *ELDIM, France*

**N45-6:** (17:15) Suppression of Random Coincidences during In-Beam PET Measurements

P. Crespo<sup>1</sup>, T. Barthel<sup>1,2</sup>, H. Fraiss-Koelbl<sup>3</sup>, E. Griesmayer<sup>3</sup>, K. Heidel<sup>1</sup>, K. Parodi<sup>1</sup>, J. Pawelke<sup>1</sup>, W. Enghardt<sup>1</sup>

<sup>1</sup>Forschungszentrum Rossendorf, Germany; <sup>2</sup>Hochschule Mittweida, University of Applied Sciences, Germany; <sup>3</sup>FOTEC GmbH, Austria

**N45-7:** (17:30) New Silicon Drift Detector Design for High Resolution Compton Cameras for Radiopharmaceuticals Mapping

A. Castoldi<sup>1,2</sup>, A. Galimberti<sup>1,2</sup>, C. Guazzoni<sup>1,2</sup>, L. Strüder<sup>3</sup>, A. H. Walenta<sup>4</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>Max Planck Institut, Germany; <sup>4</sup>Siegen University, Germany

**N45-8:** (17:45) Intraoperative Solid-State Based Urethral Dosimetry in Low Dose Rate Prostate Brachytherapy

D. L. Cutajar, A. B. Rosenfeld, G. J. Takacs, M. L. F. Lerch, *University of Wollongong, Australia*; J. Bucci, L. Duggan, *St George Cancer Care Centre, Australia*; M. Zaider, M. Zelefsky, *Memorial Sloan Kettering Cancer Center, USA*

## N46 Beamline Instrumentation

Thursday, October 21 16:00-17:45, Spalato

Session Chair: **Giovanni Carboni**, *Università di Roma "Tor Vergata"*

**N46-1**, keynote: (16:00) MICE: the International Muon Ionisation Experiment

M. Bonesini, *Sezione INFN Milano, Italy*  
On behalf of the MICE Collaboration

**N46-2:** (16:30) Performance and Upgrade of the DAFNE Beam Test Facility

B. Buonomo, G. Mazzitelli, P. Valente, *Istituto Nazionale di Fisica Nucleare, Italy*

**N46-3:** (16:45) SLIM (Sem for Low Interception Monitoring) - An Innovative Non-Destructive Beam Monitor for the Extraction Lines of Medical Accelerators

L. Badano<sup>1</sup>, O. Ferrando<sup>1</sup>, T. Klatka<sup>2</sup>, M. Koziel<sup>2</sup>, G. Molinari<sup>3</sup>, S. Braccini<sup>1</sup>

<sup>1</sup>Fondazione TERA, Italy; <sup>2</sup>AGH-University of Science and Technology, Poland; <sup>3</sup>CERN, Switzerland

**N46-4:** (17:00) Design and Test of a High-Speed Beam Conditions Monitor for the ATLAS Experiment

H. Pernegger, *CERN, Switzerland*  
On behalf of the Atlas BCM group

**N46-5:** (17:15) Tagged Neutron Production by Use of YAP:Ce Scintillators

G. Nebbia, S. Pesente, *Istituto Nazionale di Fisica Nucleare, Italy*; M. Lunardon, G. Viesti, *Università di Padova, Italy*

**N46-6:** (17:30) Possibility for Spin Flip in High Energy Electron Rings

S. Stres, *University of Ljubljana, Slovenia*; R. Pestotnik, *Jozef Stefan Institute, Slovenia*

It is a pleasure to welcome you to Rome for the 2004 Medical Imaging Conference (MIC). Apart from its setting in the Eternal City, MIC2004 is remarkable due to its record number of abstract submissions. This shows the steadily increasing success of the MIC in recent years, due to the traditional cross-fertilization with the Nuclear Science Symposium and to the growth of topics such as small animal imaging and x-ray imaging.

The format of the meeting will closely follow the MIC tradition, and in particular the very successful Conference organized last year by Michael King and Stephen Glick. There will be 10 non-overlapping oral sessions, including two joint NSS-MIC and one joint RTSD-MIC. Each of the 66 oral contributions is allotted 12 minutes for presentation and 3 minutes for discussion.

One of the strengths of the MIC has always been the outstanding quality of the poster sessions. This tradition will also be continued in Rome. In addition to the 10 oral sessions, there will be 4 non-overlapping poster sessions. Posters will be up from Tuesday morning until the end of the meeting on Friday afternoon, and the poster area will be open all day until 23:00. Information on the poster size can be found on the Conference web site under "Guidelines". This year, there will also be two awards given to outstanding posters presented by students. The names of the recipients will be announced at the end of the last MIC session on Friday.

During the opening session, two distinguished speakers will present overviews of fields that are related to this conference but usually not widely represented. Professor Peter Morris from the Sir Peter Mansfield Magnetic Resonance Centre of the University of Nottingham will talk about functional magnetic resonance imaging, and Professor Michael Unser of the Swiss Federal Institute of Technology in Lausanne will speak about recent developments in Interpolation.

The MIC banquet on Thursday evening will feature a lecture by Professor Giovanni Ettore Gigante from the University La Sapienza in Rome. He will share his experience in using physical techniques



MIC Program Chair  
**Sibylle Ziegler**



MIC Deputy Program Chair  
**Michel Defrise**

for the analysis and restoration of art works. This promises to be an exciting talk, and is particularly topical in a city such as Rome! The other special event at the MIC banquet will be the presentation of the IEEE Senior Scientist Award for Medical Imaging. In view of the large attendance expected and the limited number of seats, we encourage you to register early for this banquet.

It is a tradition to acknowledge the essential role of the reviewers in building the MIC program. But this year the MIC is more than ever indebted to the 146 reviewers, as the large number of submissions led us to assign up to 20 papers to each of them. We thank them all for completing this difficult task in a timely manner. The general chair, Alberto Del Guerra, did a great job in organizing the conference and helping us meet all deadlines during the preparation of MIC 2004. Special thanks also go to Dr. Bo Yu, who provided remarkably efficient help with the conference web site.

We look forward to meeting you in Rome!

Sibylle Ziegler  
Michel Defrise

Thursday, October 21, 20:00 - 23:00, Le Quattro Stagioni

### The Modern Practice of Restoration and the Development of Scientific Investigations in the Field of Cultural Heritage

**Speaker: Giovanni Ettore Gigante**

*University of Roma "La Sapienza"*



The development of a scientific approach to restoration is quite a recent achievement, mostly due to the cultural action of Cesare Brandi, first director of the Italian Istituto Centrale del Restauro. The influence of an idealistic philosophy of the humanities has delayed, in recent years, the development of a rationalistic approach to restoration. This approach ascertains the need to recognise the work of art in its constituent materials consistency

and of defining the actions (restoration) to assure its survival. From this point of view, the development of diagnostic tools for analysis of the state of conservation of a work of art, and for the definition of the restoration project will be discussed with the help of some case histories, in which the diagnostic methods have given significant results. The strong development in the medical diagnostic field and the lesser known progress of diagnostic methods in the conservation field will be brought together: the results of the study of famous frescos and some important large metal artifacts will be shown as a case study.

**Giovanni Ettore Gigante** graduated in physics in 1971 from the University of Rome "La Sapienza". In the period 1972-76 he was a fellow and afterwards became a researcher in the Faculty of Medicine of the same university. Following this, in the period 1976-86, he was at the University of L'Aquila as assistant professor and, from 1983, as associate professor. From 1986 he was associate professor at the Department of Physics of University of Rome "La Sapienza" teaching, initially health and medical physics, and currently courses in Archaeometry and Conservation. In addition, he is involved in several post-graduate courses on health physics, nuclear medicine, medical imaging and on the safeguard of Cultural Heritage. He is now the president, and national coordinator, of the courses in Conservation Sciences, recently introduced in the Italian higher education system. He has been a guest of foreign research institutions in Belgium, the United States and Brazil. He is responsible for projects of cultural exchange with Mexico and Brazil. He is author of a large number of papers concerning X-ray physics and their applications and, more recently, on techniques for image acquisition and processing.

### Exploring the Mind with Functional Magnetic Resonance

**Professor Peter Morris**

*University of Nottingham, UK*

Wednesday, October 20, 08:30-09:30, Leptis Magna 1&2

The tremendous impact of magnetic resonance imaging (MRI) on medical diagnosis was recently recognised in the award of the 2003 Nobel Prize for Medicine to Paul Lauterbur and Sir Peter Mansfield. The development, in the last decade or so, of functional magnetic resonance imaging (fMRI), promises no less a revolution in neuroscience; it is the tool with which we can begin to understand the workings of the human mind. This lecture will review the developments in technology which have made this possible; it will also explore future prospects as much stronger magnets (7T and up) become available. Functional MRI locates the neural centres involved in brain activity; its sister technique, magnetic resonance spectroscopy (MRS), allows us to probe the chemical circuits responsible for that activity, and failures of which are the root cause of psychiatric illness. Though much less developed, the prospects for advances on this front will also be discussed.





## Professor Michael Unser

*Swiss Federal Institute of Technology, Switzerland*

Wednesday, October 20, 09:30-10:30, Leptis Magna 1&amp;2

Interpolation plays a crucial role in medical image processing. It is required for tomographic reconstruction (filtered backprojection, inverse Fourier or iterative reconstruction), for medical image visualization (in 2D or 3D), for image registration (rigid-body or elastic matching), and feature extraction (contours, differential geometry). In this presentation, we give an overview of recent developments in image interpolation, with an emphasis on spline-based methods that have been found to provide the best tradeoff between image quality and computational cost. To this end, we consider a generalized interpolation model where images are represented as weighted sums of compactly supported basis functions (e.g., B-splines)—not necessarily interpolating—that are positioned on a regular grid at the pixel (or voxel) locations. The expansion coefficients are determined by fitting the model to the image data; this leads to an efficient interpolation algorithm based on recursive digital filtering. We present a quantitative Fourier analysis that allows the objective comparison of interpolators associated with different basis functions. We show that a key determinant of reconstruction quality is the order of approximation of the representation. In this respect, polynomial B-splines have the remarkable property of having the minimal support for a given order of approximation, which explains their superior performance. We present some experimental comparisons of interpolators that perfectly correlate with the theoretical predictions. The advantage of high quality interpolation is illustrated with a rigid body registration task where it has a dramatic effect on accuracy at the subpixel level.



The final part of the talk is devoted to the problem of interpolation in the presence of noise. We show that this can be achieved analogously, using the same type of representation and filtering algorithm, by means of a so-called smoothing spline. The key is to introduce some a priori knowledge on the type of signal (in the form of a regularization functional or a covariance function) and on the statistical distribution of the noise. We present several formulations of the problem—variational (Tikhonov), MMSE estimator (Wiener), and Bayesian—which lead to equivalent solutions (optimum function space plus corresponding filtering algorithm) under the Gaussian hypothesis.

## JNM1 NSS-MIC Joint Session I

Tuesday, October 19 14:00-15:30, Leptis Magna 1&amp;2

Session Chair: **Christian Morel**, *EPFL, LPHE-IPEP, Lausanne***JNM1-1: (14:00) Tomographic Reconstruction for Cosmic Ray Muon Radiography**L. J. Schultz, *Los Alamos National Laboratory, USA*

On behalf of the Muon Radiography Collaboration

**JNM1-2: (14:15) U-SPECT-I: a Stationary Molecular Imaging System with 0.1 Micro-Litre Resolution**F. J. Beekman, B. Vastenhouw, F. van der Have, *University Medical Center, the Netherlands***JNM1-3: (14:30) Application of Lower Energy, Gamma Emitting Sources to Transmission Imaging in PET**S. Siegel, D. F. Newport, *Concorde Microsystems, USA*; J. T. Yap, *University of Tennessee Medical Center, USA***JNM1-4: (14:45) A PET System Dedicated to Breast Cancer Imaging**Y.-C. Tai, H. Wu, M. Janecek, *Washington University in St. Louis, USA***JNM1-5: (15:00) Design Considerations for a Combined, APD-Based  $\mu$ PET/ $\mu$ CT Scanner**R. Lecomte<sup>1</sup>, P. Bérard<sup>1</sup>, C. M. Pepin<sup>1</sup>, F. Bélanger<sup>1</sup>, J. Cadorette<sup>1</sup>, L. Convert<sup>1</sup>, M. D. Lepage<sup>1</sup>, J.-D. Leroux<sup>1</sup>, J.-B. Michaud<sup>1</sup>, J.-F. Pratte<sup>2</sup>, S. Robert<sup>1</sup>, D. Rouleau<sup>1</sup>, V. V. Selivanov<sup>1</sup>, M.-A. Tétreault<sup>1</sup>, R. Fontaine<sup>1</sup><sup>1</sup>*Université de Sherbrooke, Canada*; <sup>2</sup>*Brookhaven National Laboratory, Canada***JNM1-6: (15:15) A CCD-Based High Resolution CT System for Analysis of Trabecular Bone Tissue**A. Pasini<sup>1</sup>, F. Barrufaldi<sup>2</sup>, B. Rosa<sup>1</sup>, C. Franco<sup>1</sup>, C. Samantha<sup>1</sup>, L. Nico<sup>1</sup>, M. Mariapia<sup>1</sup>, E. Di Nicola<sup>1</sup>, S. Pani<sup>3</sup>, E. Perilli<sup>1,2</sup>, D. Romani<sup>1</sup>, A. Rossi<sup>1</sup>, M. Bettuzzi<sup>1</sup><sup>1</sup>*University of Bologna, Italy*; <sup>2</sup>*Istituti Ortopedici Rizzoli, Italy*;<sup>3</sup>*Sincrotrone Trieste S.C.p.A., Italy*

## JNM2 NSS-MIC Joint Session II

Tuesday, October 19 16:00-18:00, Leptis Magna 1&amp;2

Session Chair: **Kanai Shah**, *Radiation Monitoring Devices, Inc***JNM2-1: (16:00) Factors Influencing Timing Resolution in a Commercial LSO PET Camera**W. W. Moses, *Lawrence Berkeley National Laboratory, USA***JNM2-2: (16:15) Comparison of Mercuric Iodide and Lead Iodide X-Ray Detectors for X-Ray**G. Zentai, L. Partain, R. Pavlyuchkova, *Varian Medical Systems, USA*; M. Schieber, *Hebrew University, Israel*; K. Shah, P. Bennett, *Radiation Monitoring Devices, USA*

**JNM2-3: (16:30) Imaging Performances of LaCl<sub>3</sub>:Ce Scintillation Crystals in SPECT**

R. Pani<sup>1</sup>, M. N. Cinti<sup>1</sup>, F. de Notaristefani<sup>2</sup>, R. Pellegrini<sup>1</sup>, P. Bennati<sup>1</sup>, M. Betti<sup>1</sup>, G. Trotta<sup>1</sup>, A. Karimian<sup>1</sup>, M. Mattioli<sup>1</sup>, F. Garibaldi<sup>3</sup>, F. Cusanno<sup>3</sup>, V. Orsolini Cencelli<sup>4</sup>

<sup>1</sup>University La Sapienza, Italy; <sup>2</sup>University Roma III, Italy; <sup>3</sup>ISS, Italy;

<sup>4</sup>INFN, Italy

**JNM2-4: (16:45) A New Multi-Modality System for Quantitative in Vivo Studies in Small Animals: Combination of Nuclear Magnetic Resonance and the Radiosensitive B-Microprobe**

A. Desbree, F. Pain, H. Gurden, P. Laniece, R. Mastripolito, *Institut de Physique Nucléaire d'ORSAY, France*

**JNM2-5: (17:00) First Results on Real-Time Imaging and Dosimetry of Beta Emitting Sources for Medical Applications Using Silicon Strip Detectors**

C. Cappellini<sup>1</sup>, C. Bianchi<sup>1</sup>, A. Bulgheroni<sup>1</sup>, M. Caccia<sup>1</sup>, L. Conte<sup>1</sup>, E. Grigoriev<sup>2</sup>, W. Kucwicz<sup>3</sup>, A. Mozzanica<sup>1</sup>, M. Prest<sup>1</sup>, M. Rovere<sup>1</sup>, C. Sampietro<sup>1</sup>, E. Vallazza<sup>4</sup>

<sup>1</sup>Università dell'Insubria, Italy; <sup>2</sup>Université de Geneve, Switzerland;

<sup>3</sup>University of Science and Technology, Poland; <sup>4</sup>Istituto Nazionale di Fisica Nucleare, Italy

**JNM2-6: (17:15) Preliminary Results of a Data Acquisition Sub-System for Distributed, Digital, Computational, APD-Based, Dual-Modality PET/CT Architecture for Small Animal Imaging**

R. Fontaine, F. Bélanger, N. Viscogliosi, M.-A. Tétrault, P. Bérard, J. Cadorette, J.-D. Leroux, J.-B. Michaud, C. Pepin, J.-F. Pratte, S. Robert, R. Lecomte, *University of Sherbrooke, Canada*

**JNM2-7: (17:30) Time Discrimination Techniques Using Artificial Neural Networks for Positron Emission Tomography**

J.-D. Leroux, D. Rouleau, C. Pepin, J.-B. Michaud, J. Cadorette, R. Fontaine, R. Lecomte, *Université de Sherbrooke, Canada*

**JNM2-8: (17:45) Imaging Performance of Tiled Solid-State Detectors**

M. Petrillo, J. Ye, J. Vesel, L. Shao, *Philips Medical Systems, USA*; H. Wiczorek, A. Goedicke, *Philips Research Laboratories, Germany*

**M1 MIC Opening Session**

Wednesday, October 20 08:30-10:30, Leptis Magna 1&2

Session Chairs: Sibylle Ziegler, *TU München*  
Michel Defrise, *VU Brussels*

**M1-1, invited: (08:30) Exploring the Mind with Functional Magnetic Resonance**

P. Morris, *University of Nottingham, UK*

**M1-2, invited: (09:30) Medical Imaging Interpolation: the Quest for Higher Quality**

M. Unser, *Swiss Federal Institute of Technology, Switzerland*

**M2 MIC Poster I**

Wednesday, October 20, 11:00-12:30, Poster Area, Upper & Lower Level

Session Chair: **Andrew Reader**, *University of Manchester Institute of Science & Technology*

**M2-1: A Dedicated PET System for Breast Imaging (CYBPET)**

A. Karimian<sup>1,2,3</sup>, C. Thompson<sup>4</sup>, S. Sarkar<sup>5</sup>, G. Raisali<sup>2</sup>, R. Pani<sup>3</sup>, H. Davilu<sup>1</sup>, D. Sardari<sup>1</sup>

<sup>1</sup>Amirkabir University of Technology, Iran; <sup>2</sup>Nuclear Research Center for Agriculture and Medicine (NRCAM-AEOI), Iran; <sup>3</sup>University of La Sapienza, Italy; <sup>4</sup>McGill University, Canada; <sup>5</sup>Tehran University of Medical Sciences & (RCSTIM), Iran

**M2-5: New Approach to Obtain High Resolution Using Conventional Block Designs in PET**

M. Aykac<sup>1</sup>, R. Grazioso<sup>1</sup>, N. K. Doshi<sup>1</sup>, N. Zhang<sup>1</sup>, M. E. Andreaco<sup>2</sup>, L. Eriksson<sup>1</sup>, C. W. Williams<sup>1</sup>, J. Corbeil<sup>1</sup>, M. D. Loope<sup>1</sup>, M. Schmand<sup>1</sup>

<sup>1</sup>CPS Innovations, Inc, USA; <sup>2</sup>CTI Molecular Imaging, Inc, USA

**M2-9: Statistical Analysis of Incomplete Circular Orbits for Breast Pinhole SPECT Imaging**

K. V. Bobkov, J. E. Bowsher, R. J. Jaszczak, K. L. Greer, *Duke University Medical Center, USA*

**M2-13: Design Considerations for a Monolithic PET Detector Block**

R. A. Thompson, J. W. LeBlanc, *GE Research, USA*

**M2-17: Head Motion Correction for jPET-D4**

H. Muraishi, T. Hasegawa, K. Yoda, A. Takeuchi, Y. Shiba, K. Maruyama, *Kitasato University, Japan*; K. Kitamura, *Shimadzu Corporation, Japan*; T. Yamaya, E. Yoshida, H. Murayama, *National Institute of Radiological Sciences, Japan*

**M2-21: RPC-PET: a New Very High Resolution PET Technology**

A. Blanco<sup>1</sup>, N. Carolino<sup>1</sup>, N. Chichorro<sup>2</sup>, C. Correia<sup>3</sup>, M. Macedo<sup>3</sup>, L. Fazendeiro<sup>1</sup>, R. Ferreira Marques<sup>1,4</sup>, P. Fonte<sup>1,5</sup>, A. Policarpo<sup>1,4</sup>

<sup>1</sup>Laboratório de Instrumentação e Física Experimental de Partículas (LIP), Portugal; <sup>2</sup>Instituto Biomédico De Investigação De Luz e Imagem (IBILI), Portugal; <sup>3</sup>Centro de Electrónica e Instrumentação (CEI), Portugal; <sup>4</sup>Universidade de Coimbra, Portugal; <sup>5</sup>Instituto Superior de Engenharia de Coimbra, Portugal

**M2-25: A Central Positron Source to Perform the Timing Alignment of Detectors in a PET Scanner**

C. J. Thompson, *Montreal Neurological Institute, Canada*; M.-L. Camborde, *UBC/Triumf PET Group, Canada*; M. Casey, *CPS Innovations, USA*

**M2-29: A Novel Pulse Shape Discrimination Approach**

H. I. Saleh<sup>1</sup>, E. Zimmermann<sup>2</sup>, M. Streun<sup>2</sup>, M. A. Ashour<sup>1</sup>, A. E. Salama<sup>3</sup>, H. Halling<sup>2</sup>

<sup>1</sup>NCRRT, Atomic Energy Authority (AEA), Egypt; <sup>2</sup>ZEL, Research Center Jülich, Germany; <sup>3</sup>Faculty of Engineering, Cairo University, Egypt

**M2-33: Development of a Motion Correction System for Respiratory-Gated PET Study**

S. K. Woo, J. Y. Choi, T. Y. Song, M. H. Jeong, Y. Choi, K. H. Lee, B. T. Kim, *Samsung Medical Center, Sungkyunkwan University School of Medicine, South Korea*

**M2-37: An 1152 Channel Singles List-Mode Data Acquisition System for MADPET-II**

D. P. McElroy<sup>1</sup>, M. Hoose<sup>2</sup>, W. Pimpl<sup>3</sup>, T. Schueler<sup>2</sup>, S. I. Ziegler<sup>1</sup>  
<sup>1</sup>Technische Universität München, Germany; <sup>2</sup>Mixed-Mode GmbH, Germany; <sup>3</sup>Max-Planck-Institut für Physik, Germany

**M2-41: Evaluation of High Performance Data Acquisition Boards for Simultaneous Sampling of Fast Signals from PET Detectors**

M. S. Judenhofer, B. J. Pichler, S. R. Cherry, *University of California, USA*

**M2-45: A VLSI Design of Energy Extraction and Pileup Prevention for High Count-Rate Scintillation Signals**

L. Han, N. H. Clinthorne, *University of Michigan, USA*

**M2-49: Performance Evaluation of Compton Probe and SPECT in Lesion Detection**

L. Zhang, W. L. Rogers, N. H. Clinthorne, *University of Michigan, USA*

**M2-53: Continuous Bed Motion Acquisition for a 16-Slice LSO PET/CT Scanner**

D. W. Townsend<sup>1</sup>, J. Reed<sup>2</sup>, D. Newport<sup>3</sup>, D. Newby<sup>2</sup>, J. P. Carney<sup>1</sup>, J. T. Yap<sup>1</sup>, M. J. Long<sup>1</sup>  
<sup>1</sup>University of Tennessee, USA; <sup>2</sup>CPS Innovations, USA; <sup>3</sup>Concorde Microsystems, USA

**M2-57: DMice – a Depth-of-Interaction Detector Design for PET Scanners**

T. K. Lewellen, M. Janes, R. S. Miyaoka, *University of Washington, USA*

**M2-61: Investigation of the Quantitative Capabilities of a Positron Emission Mammography System**

S. D. Wollenweber, R. C. Williams, *Wake Forest University Baptist Medical Center, USA*; I. N. Weinberg, D. Beylin, *Naviscan PET Systems, USA*

**M2-65: Towards Single Ultra-Low Dose CT Scan for Both Attenuation Map Creation and Localization in PET-CT Application**

J. Li, J. Hsieh, J. G. Colsher, C. W. Stearns, A. Lonn, *GE Healthcare, USA*

**M2-69: Investigation of Fusion Strategies of Multi-Modality Images**

U. K. Pietrzyk<sup>1,2</sup>, C. Palm<sup>1</sup>, T. Beyer<sup>3</sup>  
<sup>1</sup>Institute of Medicine - FZ Juelich, Germany; <sup>2</sup>University of Wuppertal, Germany; <sup>3</sup>University Hospital Essen, Germany

**M2-73: Improved Prostate Cancer Imaging with SPECT/CT and MRI/MRSI**

Y. Seo, J. Kurhanewicz, B. L. Franc, R. A. Hawkins, B. H. Hasegawa, *University of California, San Francisco, USA*

**M2-77: Limited Angle Dual Modality Breast Imaging**

M. J. More<sup>1</sup>, P. J. Goodale<sup>1</sup>, H. Li<sup>1</sup>, Y. Zheng<sup>1</sup>, S. Majewski<sup>2</sup>, V. Popov<sup>2</sup>, B. Welch<sup>2</sup>, M. B. Williams<sup>1</sup>  
<sup>1</sup>University of Virginia, USA; <sup>2</sup>Thomas Jefferson National Accelerator Facility, USA

**M2-81: Design of a Small Animal PET System with High Detection Efficiency**

D. Brasse, I. Piqueras, J.-L. Guyonnet, *CNRS/IN2P3 et ULP, France*

**M2-85: Performance Optimization of Continuous Scintillator PET Detector Modules Using Cramér-Rao Theory Combined with Monte Carlo Simulations**

D. J. van der Laan<sup>1</sup>, P. Bruyndonckx<sup>2</sup>, S. Léonard<sup>2</sup>, M. C. Maas<sup>1</sup>, D. R. Schaart<sup>1</sup>, C. W. E. van Eijk<sup>1</sup>  
<sup>1</sup>Delft University of Technology, the Netherlands; <sup>2</sup>Vrije Universiteit Brussel, Belgium

**M2-89: Step and Shoot Versus Continuous Helical Pinhole Spect for Improved Axial Resolution**

N. H. Patil, S. D. Metzler, *Duke University, USA*

**M2-93: Performance of a Triple-Detector, Multiple-Pinhole SPECT System with Iodine Isotopes**

R. E. Zimmerman<sup>1,2</sup>, S. C. Moore<sup>1,2</sup>, A. Mahmood<sup>1,2</sup>  
<sup>1</sup>Harvard Medical School, USA; <sup>2</sup>Brigham & Women's Hospital, USA

**M2-97: The ClearPET Neuro Scanner: A LSO/LuYAP Phoswich Small Animal PET Scanner**

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**M2-101: Improving DOI Information Using 3-Layer Crystals for Small Animal PETs**

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**M2-105: Development of an Optimised LSO/LuYAP Phoswich Detector Head for the ClearPET Camera**

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**M2-109: First Results from the High-Resolution mouseSPECT Annular Scintillation Camera**

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**M2-113: CCD-Based Detector for SPECT**

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**M2-117: Promising Characteristics and Performance of Cadmium Zinc Telluride Detectors for Positron Emission Tomography**

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F. Duttweiler<sup>2</sup>, G. Huszar<sup>2</sup>, P. C. Leblanc<sup>2</sup>  
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**M2-121: Hybrid Phantom Representation for Simulation of CT Systems Using Intrinsic Shapes, Tomographic Volumes and Higher-Order Surfaces**

J. Peter, O. Nix, R. B. Schulz, German Cancer Research Center, Germany

**M2-125: Dual Low Profile Detector Heads for a Restraint Free Small Animal SPECT Imaging System**

A. G. Weisenberger, B. Kross, S. Majewski, V. Popov, M. F. Smith, V. H. Tran, B. L. Welch, R. Wojcik, Thomas Jefferson National Accelerator Facility, USA; J. S. Baba, S. S. Gleason, J. S. Goddard, M. J. Paulus, Oak Ridge National Laboratory, USA; S. R. Meikle, Royal Prince Alfred Hospital, Australia; M. Pomper, Johns Hopkins University, USA

**M2-129: Toward a Medipix2 Coded Aperture Gamma Microscope**

R. Accorsi<sup>1</sup>, M. Autiero<sup>2</sup>, L. Celentano<sup>2</sup>, P. Laccetti<sup>2</sup>, R. D. Lanza<sup>3</sup>, M. Marotta<sup>2</sup>, G. Mettivier<sup>2,4</sup>, M. C. Montes<sup>2,4</sup>, P. Riccio<sup>2</sup>, G. Roberti<sup>2</sup>, P. Russo<sup>2,4</sup>

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**M2-133: The Influence of Measurement Uncertainties on the Evaluation of the Distribution Volume Ratio in Rat Studies on a microPET® R4: a Phantom Study**

V. Sossi<sup>1</sup>, M.-L. Camborde<sup>2</sup>, D. Newport<sup>3</sup>, A. Rahmim<sup>1</sup>, G. Tropini<sup>1</sup>, D. Doudet<sup>1</sup>, T. J. Ruth<sup>2</sup>

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**M2-137: Optimization of Multipinhole Arrangements for Quantitative Mouse Brain SPECT by Monte Carlo Simulation**

Z. Cao<sup>1</sup>, G. Bal<sup>1,2</sup>, R. Accorsi<sup>2</sup>, P. D. Acton<sup>1</sup>

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**M2-141: Approximate Volumetric System Models for MicroSPECT**

J. Gregor<sup>1</sup>, S. Gleason<sup>2</sup>, S. Kennel<sup>2</sup>, M. Paulus<sup>2</sup>, T. Benson<sup>1</sup>, J. Wall<sup>1</sup>  
<sup>1</sup>University of Tennessee, USA; <sup>2</sup>Oak Ridge National Laboratory, USA

**M2-145: Investigation of Detector Light Response Modeling for a Thick Continuous Slab Detector**

R. S. Miyaoka, K. Lee, University of Washington, USA

**M2-149: Performance Characteristics of the High Resolution Research Tomograph - Comparison of Three Prototypes**

H. W. A. M. de Jong<sup>1</sup>, C. Knoess<sup>2</sup>, A. A. Lammertsma<sup>1</sup>, M. Lenox<sup>3</sup>, S. Vollmar<sup>2</sup>, M. Casey<sup>3</sup>, K. Wienhard<sup>2</sup>, W.-D. Heiss<sup>2</sup>, R. Boellaard<sup>1</sup>  
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**M2-153: PET Reconstruction with Measured System Matrix**

Y. Y. Panin, F. Kehren, H. Rothfuss, D. Hu, C. Michel, M. Casey, CPS Innovations, Inc., USA

**M2-157: Utilizing MRI A Priori Information to Estimate F18-FDG Distributions in Rat Flank Tumors**

J. E. Bowsher, H. Yuan, L. W. Hedlund, T. G. Turkington, W. C. Kurylo, C. T. Wheeler, G. P. Cofer, M. W. Dewhirst, G. A. Johnson, Duke University Medical Center, USA

**M2-161: A Fully 3D Iterative Image Reconstruction Algorithm Incorporating Data Corrections**

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<sup>1</sup>GE Global Research Center, USA; <sup>2</sup>GE Healthcare Technologies, USA

**M2-165: Parallel Statistical Image Reconstruction for Cone-Beam X-Ray CT**

J. S. Kole, F. J. Beekman, Image Sciences Institute, UMCU, the Netherlands

**M2-169: Analytical Volume Calculation of Voxel Fragments for Iterative 3D PET Reconstruction**

J. J. Scheins<sup>1</sup>, F. Boschen<sup>2</sup>, H. Herzog<sup>1</sup>  
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**M2-173: Correction for Imperfect Camera Motion and Resolution Recovery in Pinhole SPECT**

D. Beque<sup>1</sup>, C. Vanhove<sup>2</sup>, A. Andreyev<sup>2</sup>, J. Nuyts<sup>1</sup>, M. Defrise<sup>2</sup>  
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**M2-177: EM Reconstruction Algorithm with Resolution Modeling Applied to an RPC-PET Prototype**

L. Fazendeiro<sup>1</sup>, N. C. Ferreira<sup>2</sup>, A. Blanco<sup>1</sup>, P. Fonte<sup>1,3</sup>, R. Ferreira Marques<sup>1,4</sup>

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**M2-181: Systematic Investigation of the Reconstruction of Images from Transmission Tomography Using a Filtered Back-Projection and an Iterative OSML Reconstruction Algorithm**

A. Ziegler<sup>1</sup>, D. Heuscher<sup>2</sup>, T. Köhler<sup>1</sup>, T. Nielsen<sup>1</sup>, R. Proksa<sup>1</sup>, S. Utrup<sup>2</sup>

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**M2-185: PI-Partner Based Motion Detection and Motion Artifact Reduction**

T. Koehler, B. Schreiber, C. Bontus, M. Grass, R. Proksa, Philips Research Laboratories, Germany



**M2-189:** Inversion of Attenuated Radon Transform for Non-Parallel Geometry by Re-Phasing and Non-Uniform Hilbert Transform

T. Li<sup>1</sup>, J. Wen<sup>1</sup>, J. You<sup>2</sup>, Z. Liang<sup>1</sup>

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**M2-193:** New Filtered-Backprojection-Based Algorithms for Image Reconstruction in Fan-Beam Scans

D. Xia, Y. Zou, L. Yu, X. Pan, *The University of Chicago, USA*

**M2-197:** Effect of Noise and Modeling Errors on the Reliability of Fully 3D Monte Carlo Reconstruction in SPECT

D. Lazaro<sup>1</sup>, V. Breton<sup>2</sup>, Z. El Bitar<sup>2</sup>, I. Buvat<sup>1</sup>

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**M2-201:** Choosing Parameters in Block-Iterative Algorithms

C. L. Byrne, *University of Massachusetts Lowell, USA*

**M2-205:** A Statistical Image Reconstruction Method for PET Using Planograms

S. Mochers, A. Motta, A. Del Guerra, *University of Pisa and INFN Pisa, Italy*

**M2-209:** Reduction of Noise Amplification in SPECT Using Smaller Detector Bin Size

D. Hwang, G. L. Zeng, *University of Utah, USA*

**M2-213:** Improving Wrist SPECT with Fanbeam Collimators and an MLEM Algorithm

D. C. Anderson<sup>1,2</sup>, R. G. Wells<sup>1,2,3</sup>

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**M2-217:** Application of Various Iterative Reconstruction Methods for Quantitative 3D Dynamic Brain PET Studies

R. Boellaard, M. J. Lubberink, H. W. de Jong, M. A. Kropholler, A. A. Lammertsma, *VU University Medical Centre, the Netherlands*

**M2-221:** Resolution Improvement Using a Fiber Plate for a Small Field-of-View NaI(Tl) Gamma Camera

S. Yamamoto, *Kobe City College of Technology, Japan*

**M2-225:** Study and Development of Two Innovative Electron Beam Imaging Systems for Dosimetry in IORT (Intra Operative Radiation Therapy)

R. Brancaccio, M. Bettuzzi, F. Casali, S. Cornacchia, M. Morigi, A. Pasini, D. Romani, *University, Italy*; C. Ronsivalle, A. Tata, *ENEA, Italy*

**M2-229:** Determination of the Analytical Point Spread Function of a Pinhole Aperture SPECT System

Y. Bekaert, D. Brasse, B. Gizard, J.-L. Guyonnet, *CNRS/IN2P3 et ULP, France*

**M2-233:** Monte Carlo Simulation for the ECAT HRRT Using GATE

F. Bataille, C. Comtat, S. Jan, R. Trébossen, *French Atomic Energy Commission, France*

**M2-237:** Penetration and Scatter in Channel Micro Pinholes: a Monte Carlo Investigation

F. van der Have, F. J. Beekman, *Image Sciences Institute and Rudolf Magnus Institute of Neuroscience, University Medical Center Utrecht, the Netherlands*

**M2-241:** HADES, a Code for Simulating a Variety of Radiographic Techniques

M. B. Aufderheide, G. Henderson, A. E. Schach von Wittenau, D. M. Slone, A. Barty, H. E. Martz, *Lawrence Livermore National Laboratory, USA*

**M2-245:** Analytical Model for Pixelated SPECT Detector Concepts

H. Wiecek, A. Goedicke, *Philips Research Laboratories, Germany*; L. Shao, M. Petrillo, J. Ye, J. Vesel, *Philips Medical Systems, USA*

**M2-249:** Photon Depth of Interaction in Various Scintillation Crystals and Its Influence on PET Image Spatial Resolution

A. Sanchez-Crespo<sup>1,2</sup>, L. Persson<sup>1,2</sup>, C. Jonsson<sup>1,2</sup>, S. A. Larsson<sup>1,2</sup>

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**M2-253:** Towards an Analytic Unified Scatter and Attenuation System Model for 3D Whole Body PET Imaging

P. J. Markiewicz, A. J. Reader, M. Tamal, *UMIST, UK*; P. J. Julian, D. L. Hastings, *Christie Hospital NHS Trust, UK*

**M2-257:** Development of a Monte Carlo Simulation Package for APD Based PET Detectors Using Continuous Scintillation Crystals

P. Clowes, S. McCallum, A. Welch, *University of Aberdeen, Scotland*

**M2-261:** Application of Uniformly Redundant Arrays (URAs) for Breast Tumour Imaging: a Monte Carlo Study

M. Alnafe, M. I. Saripan, K. Wells, *University of Surrey, UK*; M. Guy, P. Hinton, *Royal Surrey County Hospital, UK*

**M2-265:** Neuro-Fuzzy Edge Detector: Experimental Results

F. Mayer, H. N. Teodorescu, *Academia Romana, Romania*

**M2-269:** 3D Data Acquisition Sampling Strategies for Dedicated Emission Mammotomography for Various Breast Sizes

C. N. Brzymialkiewicz<sup>1,2</sup>, M. P. Tornai<sup>1,2</sup>, R. L. McKinley<sup>1,2</sup>, J. E. Bowsher<sup>2</sup>

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**M2-273:** An Improved Method for Determining Radiotracer Dynamic Uptake and Volumetric Concentration in Breast Lesions

D. A. Kieper, T. Green, A. Munden, C. Keppel, *Hampton University, USA*

**M2-277:** System Matrix Calculation for Clear-PEM Using ART and Linograms

N. Matela<sup>1</sup>, M. Martins<sup>1</sup>, P. Rodrigues<sup>2</sup>, A. Trindade<sup>2</sup>, N. Oliveira<sup>1</sup>, L. Peralta<sup>2</sup>, N. C. Ferreira<sup>3</sup>, J. Varela<sup>2</sup>, P. Almeida<sup>1</sup>

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**M2-281:** Performance Evaluation of the Philips 'Gemini' PET/CT System

R. A. Fowler, M. Partridge, M. A. Flower, *Institute of Cancer Research, The Royal Marsden NHS Foundation Trust, UK*

**M2-285: Preliminary Performance Evaluation of the Prototype System for a Brain DOI-PET Scanner: jPET-D4**

T. Yamaya<sup>1</sup>, N. Hagiwara<sup>2</sup>, T. Obi<sup>2</sup>, T. Tsuda<sup>3</sup>, K. Kitamura<sup>4</sup>, T. Hasegawa<sup>5</sup>, H. Haneishi<sup>3</sup>, N. Inadama<sup>1</sup>, E. Yoshida<sup>1</sup>, H. Murayama<sup>1</sup>

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**M2-289: Optimization of Tracer Injection for 3D 18F-FDG Whole Body (WB) PET Studies Using an Acquisition-Specific NEC (AS-NEC) Curve Generation**

M. Danna<sup>1</sup>, M. Lecchi<sup>2</sup>, V. Bettinardi<sup>1</sup>, M. C. Gilardi<sup>1</sup>, C. W. Stearns<sup>3</sup>, G. Lucignani<sup>2</sup>, F. Fazio<sup>1</sup>

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**M2-293: Analysis of Observer Performance in Detecting Signals with Location Uncertainty for Regularized Tomographic Image Reconstruction**

A. Yendiki, J. A. Fessler, *The University of Michigan, USA*

**M2-297: Rapid Assessment of Parametric PET Images with Computer Observers**

J. Chen, X. Yu, *Univ. of Southern California, USA*

**M2-301: Tumor Detection Improvement in Scintimammographic Imaging: Multivariate Image Analysis Approach**

C. Bonifazzi<sup>1</sup>, M. N. Cinti<sup>2</sup>, L. Finos<sup>1</sup>, M. Betti<sup>2</sup>, A. Tartari<sup>1</sup>, G. De Vincentis<sup>2</sup>, R. Pani<sup>2</sup>

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**M2-305: 3D PET List-Mode Iterative Reconstruction Using Time-of-Flight Information**

C. J. Groiselle, S. J. Glick, *University of Massachusetts Medical School, USA*

**M2-309: Blurring and MTF Determination of a Radiotherapy EPID Using the Edge Spread Function**

L. Franco<sup>1</sup>, F. Gómez<sup>1</sup>, A. Iglesias<sup>1</sup>, F. Ledo<sup>2</sup>, R. Lobato<sup>3</sup>, J. Mosquera<sup>3</sup>, J. Pardo<sup>1</sup>, J. Pena<sup>1</sup>, M. Pombar<sup>3</sup>, J. R. Sendón<sup>3</sup>, A. Yáñez<sup>2</sup>

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**M2-313: Noise Characteristics of the FORE+OSEM(DB) Reconstruction Method for the MiCES PET Scanner**

K. Lee<sup>1</sup>, P. E. Kinahan<sup>1</sup>, R. S. Miyaoka<sup>1</sup>, J. A. Fessler<sup>2</sup>, T. K. Lewellen<sup>1</sup>

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**M2-317: Simultaneous Measurement of Transmission and Emission Contamination Using a Collimated 137Cs Point Source for the HRRT**

M. Sibomana, L. Byars, V. Panin, M. Lenox, F. Kehren, J. Rist, Z. Burbar, C. Michel, *CPS Innovations, Inc., USA*; C. Knoess, *Max Planck Institute for Neurological Research (MPIfR), Germany*; H. W. A. M. de Jong, *Clinical PET Center, VU Medical Center, the Netherlands*

**M2-321: Respiratory Motion Compensation Studies Using a 3D Robotic Motion Simulator and Optical Tracking**

K. H. Wong, J. Tang, T. Zhou, K. Cleary, *Georgetown University, USA*

**M2-325: An Application Specific Integrated Circuit for Multi Anodes PMT**

R. Gaglione, G. Böhner, J. Lecoq, G. Montarou, L. Royer, *Laboratoire de physique corpusculaire, France*

**M2-329: Statistical Error Analysis Based on Non-Parametric Bootstrap Method of Quantitative MBF Measurement with H<sub>2</sub><sup>15</sup>O PET**

N. Kawachi<sup>1,2</sup>, H. Watabe<sup>1</sup>, N. Teramoto<sup>1</sup>, Y. Ohta<sup>1</sup>, H. Jino<sup>3</sup>, N. Kudomi<sup>1</sup>, K. Koshino<sup>1</sup>, K. M. Kim<sup>1</sup>, T. Hayashi<sup>1</sup>, H. Iida<sup>1</sup>

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**M2-333: A Fully Automated Dose Delivery and Imaging System for PET Cognitive Studies**

K. Balakrishnan, R. Hichwa, G. L. Watkins, B. Bender, J. Richmond, *University of Iowa, USA*

**M2-337: Feasibility of Rapid Multi-Tracer PET Tumor Imaging**

D. J. Kadrmaz, T. C. Rust, *University of Utah, USA*

**M2-341: Fully Automatic Skull Stripping of Routine Clinical Neurological NMR Data**

J. P. Chiverton<sup>1</sup>, B. Podda<sup>2</sup>, K. Wells<sup>1</sup>, D. Johnson<sup>3</sup>

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**M2-345: A New Method of Deriving the Mice Cardiovascular Transit Time Without the Need of Region-of-Interest Drawing**

H.-M. Wu, M. C. Kreissl, W. Ladno, M. Prins, H. R. Schelbert, S.-C. Huang, *David Geffen School of Medicine, University of California, Los Angeles, USA*

**M2-349: Quantification of Radionuclide Uptake in Small Animal SPECT with Co-registered CT Defined ROI**

K. Iwata, T. Vandehei, H. Zhou, J. Li, B. E. Patt, *Gamma Medica, Inc., USA*; A. B. Hwang, B. H. Hasegawa, *University of California, San Francisco, USA*

**M2-353: Compton Scatter Correction in Dual Isotope (Kr81m and Tc99m) Lung SPECT**

A. Turzo, C. Cheze-Le Rest, P. Damien, D. Bourhis, Y. Bizais, D. Visvikis, *INSERM U650, France*

**M2-357: High Resolution Imaging with Positron Emitters: Modeling Range Blurring Effects**

M. R. Palmer, J. A. Parker, *Beth Israel Deaconess Medical Center, USA*

**M2-361: Segmentation of Contrast Enhanced CT Images for Attenuation Correction of PET/CT Data**

F. Qiao, Y. Yue, *Rice University, USA*; T. Pan, J. Clark, O. Mawlawi, *MD Anderson Cancer Center, USA*

**M2-365: Rapid Measurement of Quantitative CMRO<sub>2</sub>, CBF and OEF by Means of Basis Function Method**

N. Kudomi, H. Watabe, T. Hayashi, N. Teramoto, Y. Ohta, H. Iida, *National Cardiovascular Center - Research Institute, Japan*

**M2-369: Improved Reproducibility in D2-Receptor Studies with Automatic Segmentation of Striatum from PET Images**

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**M2-373: Mammogram Segmentation by Contour Searching and Massive Lesions Classification with Neural Network**

F. Fauci<sup>1,2</sup>, S. Bagnasco<sup>2</sup>, R. Bellotti<sup>3,2</sup>, D. Cascio<sup>1</sup>, S. C. Cheran<sup>4,2</sup>, G. De Nunzio<sup>5,2</sup>, M. E. Fantacci<sup>6,2</sup>, G. Forni<sup>7,2</sup>, A. Lauria<sup>8,2</sup>, E. Lopez Torres<sup>9</sup>, R. Magro<sup>1,2</sup>, G. L. Masala<sup>8,2</sup>, P. Oliva<sup>8,2</sup>, M. Quarta<sup>5,2</sup>, G. Raso<sup>1,2</sup>, A. Retico<sup>6,2</sup>, S. Tangaro<sup>3,2</sup>, E. Varrica<sup>1</sup>

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<sup>9</sup>CEADEN, Cuba

**M2-377: Characterization of Local Spatial Variability in the Left Ventricular Wall of the Heart Measured with PET**

S. Roy, F. O'Sullivan, *University College Cork, Ireland*; J. Caldwell, *University of Washington, USA*

**M2-381: The Influence of Attenuation Map Quality on Attenuation and Scatter Corrections in SPECT**

E. Vandervoort<sup>1</sup>, A. Celler<sup>2</sup>, G. Wells<sup>3</sup>, K. Dixon<sup>1</sup>, S. Blinder<sup>2</sup>, Y. Pang<sup>4</sup>

<sup>1</sup>University of British Columbia, Canada; <sup>2</sup>Vancouver Hospital and Health Sciences Centre, Canada; <sup>3</sup>Lawson Health Research Institute, Canada; <sup>4</sup>Simon Fraser University, Canada

**M2-385: Partial Volume Effect and Spillover Correction for Nuclear Medicine Oncology Imaging**

G. Boening, P. H. Pretorius, M. A. King, *University of Massachusetts Medical School, USA*

**M2-389: A Log Likelihood Based Method for Recovery of Localized Defects in PET Attenuation-Correction Images**

C. M. Laymon, *University of Pittsburgh, USA*; J. E. Bowsher, *Duke University, USA*

**M2-393: Three-Dimensional Registration and Analysis for Brain SPECT Images**

Y.-L. Liao, Y.-N. Sun, *National Cheng Kung University, Taiwan*; N.-T. Chiu, *National Cheng Kung University Hospital, Taiwan*

**M2-397: Measurement of Abdominal Tumour Blood Flow: Independent Assessment of Delay and Dispersion of the Arterial Input Function**

S. Rajasekharan<sup>1</sup>, R. Boellaard<sup>2</sup>, M. Lubberink<sup>2</sup>, P. Price<sup>1</sup>, A. A. Lammertsma<sup>1</sup>, T. Jones<sup>2</sup>

<sup>1</sup>University of Manchester, UK; <sup>2</sup>VU Medical Center, the Netherlands

**M2-401: In-Vitro Dose Distribution for Breast Brachytherapy**

P. L. Gueye, D. Kieper, C. Harmon, C. Keppel, L. Tynes, C. Velasco, *Hampton University, USA*; P. Wong, *Eastern Virginia Medical School, USA*

**M2-405: Zr-Doped GSO:Ce Single Crystals and Its Scintillation Performance**

N. Shimura, M. Kamada, A. Gunji, T. Usui, K. Kurashige, H. Ishibashi, N. Senguttuvan, S. Shimizu, *Hitachi Chemical Co., Ltd, Japan*; H. Murayama, *National Institute of Radiological Sciences, Japan*

**M2-409: EMCCD-Based Photon Counting Mini Gamma Camera**

G. de Vree, F. van der Have, F. Beekman, *Image Sciences Institute and Rudolf Magnus Institute of Neuroscience, University Medical Center Utrecht, the Netherlands*

**M2-413: Production of Ceramic Scintillators from Heavy Metal Halide and Complex Oxide Nanocrystals in a Plastic Binder for Position Sensitive Radiation Detectors**

N. V. Klassen<sup>1</sup>, S. Z. Shmurak<sup>1</sup>, I. M. Shmyr'ko<sup>1</sup>, N. P. Kobelev<sup>1</sup>, G. K. Strukova<sup>1</sup>, S. E. Derenzo<sup>2</sup>, M. J. Weber<sup>2</sup>, E. A. Kudrenko<sup>1</sup>, A. P. Kiseliov<sup>1</sup>

<sup>1</sup>Institute of Solid State Physics, Russian Academy of Sciences, Russia;

<sup>2</sup>Lawrence Berkeley National Laboratory, USA

**M2-417: Dose Imaging in Radiation Therapy with a Scintillating Gem**

A. Simon<sup>1</sup>, T. C. Delvigne<sup>1</sup>, C. W. E. van Eijk<sup>1</sup>, J. Hendrikse<sup>1</sup>, R. Kreuger<sup>1</sup>, J. M. Schippers<sup>2</sup>, E. Seravalli<sup>1</sup>

<sup>1</sup>IRI TUDelft, the Netherlands; <sup>2</sup>Paul Scherrer Institut, Switzerland

**M2-421: BGO DOI-Detector Composed of Three-Dimensional Crystal Array for PET**

N. Inadama<sup>1</sup>, H. Murayama<sup>1</sup>, T. Yamaya<sup>1</sup>, K. Kitamura<sup>1,2</sup>, T. Yamashita<sup>3</sup>, H. Kawai<sup>4</sup>, T. Tsuda<sup>1,4</sup>, M. Sato<sup>1</sup>, Y. Ono<sup>1,4</sup>, M. Hamamoto<sup>1,5</sup>

<sup>1</sup>National Institute of Radiological Sciences, Japan; <sup>2</sup>Shimadzu Corporation, Japan; <sup>3</sup>Hamamatsu Photonics K. K., Japan; <sup>4</sup>Chiba University, Japan; <sup>5</sup>Waseda University, Japan

**M2-425: Scintillation Performance of Large LYSO:Ce Crystals**

A. Caramanian, Z. Gou, P. McDade, Z. Galazka, J.-L. Lefaucheur, *Photonic Materials, UK*

**M2-429: On the Luminescence Efficiency of (Gd<sub>2</sub>SiO<sub>5</sub>:Ce) Scintillator under X-Ray Excitation**

I. Valais<sup>1</sup>, I. Kandarakis<sup>1</sup>, D. Nikolopoulos<sup>1</sup>, I. Sianoudis<sup>1</sup>, A. Episkopakis<sup>1</sup>, N. Dimitropoulos<sup>2</sup>, D. Cavouras<sup>1</sup>, C. Nomicos<sup>1</sup>, G. Panayiotakis<sup>3</sup>

<sup>1</sup>Technological Educational Institute (TEI) of Athens, Greece;

<sup>2</sup>"Euromedica" Medical Center, Greece; <sup>3</sup>University of Patras, Greece

**M2-433: The I-Imas Project. End-Users Driven Specifications for the Design of a Novel Digital Medical Imaging System**

A. Galbiati<sup>1</sup>, M. G. Metaxas<sup>1</sup>, B. Avset<sup>2</sup>, A. Bergamaschi<sup>3</sup>, D. Cavouras<sup>4</sup>, I. Evangelou<sup>5</sup>, A. Fant<sup>6</sup>, M. J. French<sup>6</sup>, H. Georgiou<sup>7</sup>, G. Hall<sup>8</sup>, G. Iles<sup>8</sup>, R. Longo<sup>3</sup>, N. Manthos<sup>3</sup>, J. M. Ostby<sup>2</sup>, S. Pani<sup>3</sup>, F. Psomadellis<sup>5</sup>, G. J. Royle<sup>1</sup>, H. Schulerud<sup>2</sup>, R. D. Speller<sup>1</sup>, P. F. van der Stelt<sup>9</sup>, S. Theodoridis<sup>7</sup>, F. Triantis<sup>5</sup>, R. Turchetta<sup>6</sup>

<sup>1</sup>University College London, UK; <sup>2</sup>SINTEF, Norway; <sup>3</sup>University of Trieste, Italy; <sup>4</sup>University of Ioannina, Greece; <sup>5</sup>ANCO S.A., Greece;

<sup>6</sup>CCLRC, UK; <sup>7</sup>University of Athens, Greece; <sup>8</sup>Imperial College, UK;

<sup>9</sup>University of Amsterdam, the Netherlands

**M2-437:** First DQE Measurement of 500  $\mu\text{m}$  Silicon Hybrid Pixel Sensor with Medipix 2 Readout Chip

J. Chaput, B. Surre, M. Caria, *University of Auvergne, France*; J. Maublant, *INSERM, France*

**M2-441:** First Tests and Monte Carlo Simulations of a Compton Camera with Si-Pad Detectors and Highly-Segmented HPGe Detectors

D. Mengoni<sup>1,2</sup>, M. Fantuzi<sup>1,2</sup>, C. Petrache<sup>1,2</sup>, G. Ambrosi<sup>3</sup>, E. Fiandrini<sup>3,2</sup>, N. Dinu<sup>3,2</sup>, M. Ionica<sup>3,2</sup>, G. Prete<sup>2</sup>, R. Ponchia<sup>2</sup>, G. Bassato<sup>2</sup>

<sup>1</sup>University of Camerino, Italy; <sup>2</sup>I.N.F.N., Italy; <sup>3</sup>university of Perugia, Italy

**M2-445:** Estimating the Magnitude of Scatter in Small Animal Cone-Beam CT

P. L. Chow, N. Vu, A. F. Chatziioannou, *Crump Institute for Molecular Imaging, University of California, USA*

**M2-449:** Simulation Study on a Photon Counting X-Ray CT System

H. Shibusawa, K. Ogawa, *Graduate School of Engineering, Hosei University, Japan*; Y. Harata, *School of Dentistry, Showa University, Japan*; T. Yamakawa, *M & C, Co. Ltd, Japan*

**M2-453:** A Short Scan Helical FDK Cone Beam Algorithm Based on Surfaces Satisfying the Tuy's Condition

J. Hu<sup>1</sup>, K. Tam<sup>2</sup>, R. Johnson<sup>3</sup>, J. Qi<sup>1</sup>

<sup>1</sup>Lawrence Berkeley National Laboratory, USA; <sup>2</sup>Tam Inc., USA; <sup>3</sup>Marquette University, USA

**M2-457:** Resolution Enhancement of X-Ray CT by Spatial and Temporal MLEM Deconvolution Correction

R. Carmi, O. Shapiro, D. Braunstein, *Philips Medical Systems Technologies, Israel*

**M2-461:** Noise Reduction for Low-Dose Single-Slice Helical CT Sinogram

J. Wang<sup>1</sup>, T. Li<sup>1</sup>, H. Lu<sup>2</sup>, Z. Liang<sup>1</sup>

<sup>1</sup>State University of New York at Stony Brook, USA; <sup>2</sup>The Fourth General Medical University, China

**M2-465:** Ultra-Fast Monte Carlo Scatter Estimation in Cone-Beam X-Ray CT

W. Zbijewski, F. J. Beekman, *UMC Utrecht, the Netherlands*

**M2-469:** Characterization of a Dedicated CT Scanner for Breast Cancer Screening

J. M. Boone, K. K. Lindfors, *University of California, Davis, USA*; T. R. Nelson, *University of California, San Diego, USA*

**M2-473:** Activation Detection in Multi-Subject Studies of fMRI Using GLRT

S. M. Shams<sup>1,2</sup>, G. A. Hossein-Zadeh<sup>1,2</sup>, H. Soltanian-Zadeh<sup>1,2,3</sup>

<sup>1</sup>School of Cognitive Science, IPM, Iran; <sup>2</sup>University of Tehran, Iran; <sup>3</sup>Henry Ford Health System, USA

**M2-477:** Automatic Volumetric Liver Segmentation for Use in Pre-Surgical Planning

H. Ibrahim, M. Petrou, K. Wells, S. Doran, *University of Surrey, UK*; O. Olsen, *Great Ormond Street Hospital for Children NHS Trust, UK*

**M2-481:** 3D Ultrasound-Computed Tomography: Data Acquisition Hardware

T. O. Müller, R. Stotzka, N. V. Ruiter, K. Schlote-Holubek, H. Gemmeke, *Forschungszentrum Karlsruhe, Germany*

**M2-485:** Measurement of Transmit Beamprofile and an Optimised Methodology for Acoustic Beam Axis Determination

S. K. Sen, R. K. Saha, S. Karmakar, M. K. Roy, *Saha Institute of Nuclear Physics, India*

**M2-489:** Microcalcification Detection in Synchrotron Radiation Imaging with Refraction-Enhancement Mode: Higher Sensitivity Through Contrast Increase

K. Imamura<sup>1</sup>, N. Ehara<sup>1</sup>, Y. Inada<sup>1</sup>, J. Okamoto<sup>1</sup>, Y. Kanemaki<sup>1</sup>, K. Umetani<sup>2</sup>, K. Uesugi<sup>2</sup>, Y. Nakajima<sup>1</sup>

<sup>1</sup>St. Marianna University School of Medicine, Japan; <sup>2</sup>Japan Synchrotron Radiation Research Institute, Japan

**JRM1 MIC-RTSD Joint Session**

Wednesday, October 20 14:00-15:40, Leptis Magna 1&2  
Session Chairs: Paul Siffert, *EMRS Headquarters*

Jennifer Huber, *Lawrence Berkeley National Laboratory*

**JRM1-1**, invited: (14:00) New Perspectives in Gamma-Ray Imaging with CdZnTe/CdTe

L. Verger, A. Drezet, E. Gros d'aillon, O. Monnet, G. Montemont, B. Pellicciari, O. Peyret, *CEA-LETI, France*

**JRM1-2**, invited: (14:20) New Progress in Large-Size CZT (Zn=10%) Single Crystal Growth Using MVB Technique for Room Temperature Radiation Detectors

L. Li<sup>1</sup>, Y. Zhou<sup>1</sup>, F. Lu<sup>1</sup>, M. Black<sup>1</sup>, R. James<sup>2</sup>, V. Gostilo<sup>3</sup>, R. Olsen<sup>1</sup>

<sup>1</sup>Ynnel Tech, Inc., USA; <sup>2</sup>Brookhaven National Lab, USA; <sup>3</sup>Baltic Scientific Instruments, Latvia

**JRM1-3:** (14:40) A Silicon Microstrip System Equipped with the RX64DTH ASIC for Dual Energy Mammography

L. Ramello<sup>1</sup>, G. Baldazzi<sup>2</sup>, D. Bollini<sup>2</sup>, A. E. Cabal Rodriguez<sup>3</sup>, C. Ceballos Sanchez<sup>3</sup>, W. Dabrowski<sup>4</sup>, A. Diaz Garcia<sup>3</sup>, M. Gambaccini<sup>5</sup>, P. Giubellino<sup>6</sup>, P. Grybos<sup>4</sup>, J. Lopez Gaitan<sup>7</sup>, A. Marzari-Chiesa<sup>8</sup>, F. Prino<sup>6</sup>, A. Sarnelli<sup>5</sup>, K. Swientek<sup>4</sup>, A. Taibi<sup>5</sup>, A. Tuffanelli<sup>5</sup>, P. Van Espen<sup>9</sup>, P. Wiacek<sup>4</sup>, M. Gombia<sup>2</sup>, P. Rossi<sup>10</sup>

<sup>1</sup>Università del Piemonte Orientale, Italy; <sup>2</sup>Università di Bologna e INFN, Italy; <sup>3</sup>CEADEN, Cuba; <sup>4</sup>AGH University of Science and Technology, Poland; <sup>5</sup>Università di Ferrara e INFN, Italy; <sup>6</sup>INFN, Italy; <sup>7</sup>Universidad de los Andes, Colombia; <sup>8</sup>Università di Torino, Italy; <sup>9</sup>University of Antwerp, Belgium; <sup>10</sup>Università di Bologna, Italy

**JRM1-4:** (14:55) Imaging Performance of Polycrystalline Mercuric Iodide on Large-Area TFT Arrays

N. E. Hartsoough, J. S. Iwanczyk, N. Skinner, L. A. Franks, *Photon Imaging Inc, USA*; B. E. Patt, *Gamma Medica Inc, USA*



**JRM1-5: (15:10) Investigation of a-Se Detector for Imaging in Radiotherapy**

G. Y. Fang<sup>1</sup>, D. Pearson<sup>1</sup>, B. Harper<sup>1</sup>, D. Spence<sup>1</sup>, R. Schmidt<sup>1</sup>, R. Mackie<sup>1,2</sup>, G. Olivera<sup>1,2</sup>, R. Jeri<sup>2</sup>, J. Rowlands<sup>3</sup>

<sup>1</sup>TomoTherapy Incorporated, USA; <sup>2</sup>University of Wisconsin, USA; <sup>3</sup>Sunnybrook and Women's College Health Science Center, Canada

**JRM1-6: (15:25) The RatCAP Concious Small Animal PET Tomograph**

C. Woody<sup>1</sup>, R. Fontaine<sup>2</sup>, S. Junnakar<sup>1</sup>, A. Kandasamy<sup>1</sup>, A. Kriplani<sup>3</sup>, S. Krishnamoorthy<sup>3</sup>, R. Lecomte<sup>2</sup>, P. O'Connor<sup>1</sup>, C. Page<sup>3</sup>, J.-F. Pratte<sup>1</sup>, M. Purschke<sup>1</sup>, V. Radeka<sup>1</sup>, I. Rampil<sup>3</sup>, D. Schlyer<sup>1</sup>, S. Shokouhi<sup>3</sup>, S. Southekal<sup>3</sup>, S. Stoll<sup>1</sup>, P. Vaska<sup>1</sup>, A. Villaneuva<sup>1</sup>, B. Yu<sup>1</sup>

<sup>1</sup>Brookhaven National Lab, USA; <sup>2</sup>Sherbrooke University, Canada; <sup>3</sup>Stony Brook University, USA

**M3 Advances in PET and SPECT**

Wednesday, October 20 16:00-18:00, Leptis Magna 1&2  
Session Chairs: Irene Buvat, U494 INSERM  
Joel Karp, University of Pennsylvania

**M3-1: (16:00) Implementation of Time-of-Flight on CPS HiRez PET Scanner**

M. Conti, M. Casey, F. Kehren, CPS Innovations, Inc., USA

**M3-2: (16:15) 3D Continuous Emission and Spiral Transmission Scanning for High-Throughput Whole-Body PET**

K. Kitamura<sup>1</sup>, S. Takahashi<sup>2</sup>, A. Tanaka<sup>2</sup>, A. Ishikawa<sup>1</sup>, T. Mizuta<sup>1</sup>, K. Tanaka<sup>1</sup>, M. Amano<sup>1</sup>, K. Matsumoto<sup>3</sup>, S. Yamamoto<sup>4</sup>, Y. Nakamoto<sup>3</sup>, S. Sakamoto<sup>3</sup>, M. Senda<sup>3</sup>

<sup>1</sup>Shimadzu Corporation, Japan; <sup>2</sup>Shimadzu SD Corporation, Japan; <sup>3</sup>Institute of Biomedical Research and Innovation, Japan; <sup>4</sup>Kobe City College of Technology, Japan

**M3-3: (16:30) PET Prostate Imaging with Small Planar Detectors**

T. G. Turkington<sup>1</sup>, M. F. Smith<sup>2</sup>, T. C. Hawk<sup>1</sup>, S. Majewski<sup>2</sup>, B. Kross<sup>2</sup>, R. Wojcik<sup>2</sup>, T. R. DeGrado<sup>3</sup>, R. E. Coleman<sup>1</sup>

<sup>1</sup>Duke University Medical Center, USA; <sup>2</sup>Thomas Jefferson National Accelerator Facility, USA; <sup>3</sup>Indiana University Medical Center, USA

**M3-4: (16:45) Positron Emission Imaging Using Acquired Cone-Surfaces from Opposing Compton Cameras**

J. E. Gillam, T. E. Beveridge, R. A. Lewis, MONASH UNIVERSITY, Australia

**M3-5: (17:00) PSAPD Gamma Camera for SPECT Imaging**

W. C. Barber<sup>1</sup>, M. McClish<sup>2</sup>, B. H. Hasegawa<sup>1</sup>, K. S. Shah<sup>2</sup>

<sup>1</sup>University of California San Francisco, USA; <sup>2</sup>Radiation Monitoring Devices, USA

**M3-6: (17:15) Comparison of Scintimammography and Dedicated Emission Mammotomography**

M. P. Tornai, C. N. Brzymialkiewicz, R. L. McKinley, Duke University Medical Center, USA

**M3-7: (17:30) On the Performance of Two Multi-Pinhole SPECT Systems for Small Animal Research**

N. U. Schramm<sup>1</sup>, C. Lackas<sup>1</sup>, J. Hoppin<sup>1</sup>, T. Schurrat<sup>2</sup>, M. Behe<sup>2</sup>, U. Engeland<sup>3</sup>, T. M. Behr<sup>2</sup>

<sup>1</sup>Research Center Juelich, Germany; <sup>2</sup>University of Marburg, Germany; <sup>3</sup>Scivis GmbH, Germany

**M3-8: (17:45) Resolution-Equivalent vs. Sensitivity-Equivalent Effective Diameter in Pinhole Collimation: Experimental Verification**

R. Accorsi, The Children's Hospital of Philadelphia, USA; S. D. Metzler, Duke University Medical Center, USA

**M4 Image Reconstruction**

Thursday, October 21 08:30-10:30, Leptis Magna 1&2  
Session Chairs: Grant Gullberg, Lawrence Berkeley National Laboratory  
Johan Nuyts, Katholieke Universiteit Leuven

**M4-1: (08:30) Performance Evaluation of Relaxed Block-Iterative Algorithms for 3-D PET Reconstruction**

A. Fukano, H. Kudo, University of Tsukuba, Japan

**M4-2: (08:45) Incremental Optimization Transfer Algorithms: Application to Transmission Tomography**

S. Ahn, J. A. Fessler, D. Blatt, A. O. Hero, University of Michigan, USA

**M4-3: (09:00) Noise Properties of Four Strategies for Incorporation of Scatter and Attenuation Information in 3D Whole Body PET**

M. Tamal, A. J. Reader, P. J. Markiewicz, UMIST, UK; D. L. Hastings, P. J. Julian, Christie Hospital NHS Trust, UK

**M4-4: (09:15) Fully 4D Dynamic PET Image Reconstruction from microPET R4 List Mode Data**

Q. Li, E. Asma, R. M. Leahy, University of Southern California, USA

**M4-5: (09:30) 4D Smoothing of Gated SPECT Images Using a Left-Ventricle Shape Model and a Deformable Mesh**

J. G. Brankov<sup>1</sup>, Y. Yang<sup>1</sup>, B. Feng<sup>2</sup>, M. A. King<sup>2</sup>, M. N. Wernick<sup>1</sup>  
<sup>1</sup>Illinois Institute of Technology, USA; <sup>2</sup>University of Massachusetts Medical Center, USA

**M4-6: (09:45) Motion Correction for Cardiac SPECT Using a RBI-ML Partial-Reconstruction Approach**

G. Boening<sup>1</sup>, P. P. Bruyant<sup>1</sup>, R. D. Beach<sup>1</sup>, C. L. Byrne<sup>2</sup>, M. A. King<sup>1</sup>  
<sup>1</sup>University of Massachusetts Medical School, USA; <sup>2</sup>University of Massachusetts, USA

**M4-7: (10:00) Effect of Errors in the System Matrix on Iterative Image Reconstruction**

J. Qi, R. H. Huesman, Lawrence Berkeley National Laboratory, USA

**M4-8: (10:15) Recentering Propeller Blades – Speed and Image Quality Considerations**

S. K. Patch, Applied Science Lab, USA  
On behalf of the GEHC Prop Recon Team

## M5 MIC Poster II

Thursday, October 21 11:00-12:30, Poster Area Upper & Lower Level

Session Chair: **Benjamin Tsui**, *Johns Hopkins University*

### **M5-2:** Measurements of the Effective Light Attenuation Length of YAP:Ce Crystals for a Novel Geometrical Concept for PET

R. De Leo<sup>1</sup>, A. Braem<sup>2</sup>, E. Chesi<sup>2</sup>, F. Ciocia<sup>1</sup>, N. Colonna<sup>1</sup>, F. Corsi<sup>3</sup>, F. Cusanno<sup>4</sup>, A. Dragone<sup>3</sup>, F. Garibaldi<sup>4</sup>, C. Joram<sup>2</sup>, S. Marrone<sup>1</sup>, E. Nappi<sup>1</sup>, J. Seguinot<sup>2</sup>, A. Valentini<sup>1</sup>, I. Vilardi<sup>1</sup>, P. Weilhammer<sup>2</sup>, H. Zaidi<sup>5</sup>

<sup>1</sup>Bari University, Italy; <sup>2</sup>CERN, Switzerland; <sup>3</sup>Politecnico di Bari, Italy; <sup>4</sup>ISS, Italy; <sup>5</sup>University Hospital, Switzerland

### **M5-6:** Stereo Computer Vision System for Measuring Movement of Patient's Head in PET Scanning

D. Hu, C. Hayden, M. Casey, Z. Burbar, *CPS Innovations, USA*

### **M5-10:** Statistical Normalization of 3D Panel PET Detector

M. Chen, C. Michel, V. Y. Panin, Z. Burbar, M. Lenox, M. E. Casey, *CPS Innovations, Inc., USA*

### **M5-14:** Adjusting the Low Energy Threshold for Large Bodies in PET

T. G. Turkington, J. W. Wilson, *Duke University Medical Center, USA*; J. G. Colsher, *GE Healthcare Technologies, USA*

### **M5-18:** Comparison Between Segmented and Non-Segmented Attenuation Correction on the HR+ Tomograph

T. J. Spinks<sup>1</sup>, A. Alaradi<sup>2</sup>, D. Hogg<sup>1</sup>, H. Kindler<sup>3</sup>

<sup>1</sup>Hammersmith Imanet Limited, UK; <sup>2</sup>University of Surrey, UK; <sup>3</sup>MRC Clinical Sciences Centre, UK

### **M5-22:** Basic Description and Performance Test of the Analog Signal Processing Electronics for MADPET-II

V. Spanoudaki<sup>1</sup>, D. McElroy<sup>1</sup>, W. Pimpl<sup>2</sup>, W. Buttler<sup>3</sup>, S. Ziegler<sup>1</sup>

<sup>1</sup>Klinikum rechts der Isar, TU Muenchen, Germany; <sup>2</sup>Max-Planck-Institut für Physik, Germany; <sup>3</sup>Ingenieurbüro Buttler, Germany

### **M5-26:** Initial Results of a Compact Positron Tomograph for Prostate Imaging

J. S. Huber, W.-S. Choong, W. W. Moses, J. Qi, J. Hu, G. C. Wang, D. Wilson, S. Oh, S. E. Derenzo, *Lawrence Berkeley National Lab, USA*

### **M5-30:** Measurements on the Timing Alignment and Stability of the MicroPET R4

C. J. Thompson, A. L. Goertzen, *Montreal Neurological Institute, Canada*

### **M5-34:** Compact Detector Modules for High Resolution PET Imaging with LSO and Avalanche Photodiode Arrays

M. Clajus<sup>1</sup>, V. Cajipe<sup>1</sup>, R. Calderwood<sup>1</sup>, S. Cherry<sup>2</sup>, B. Grattan<sup>1</sup>, S. Hayakawa<sup>1</sup>, T. Tumer<sup>1</sup>, O. Yossifor<sup>1</sup>

<sup>1</sup>NOVA R&D, Inc., USA; <sup>2</sup>University of California, Davis, USA

### **M5-38:** Investigation on a Bar Detector with 3D Position Decoding Scheme

J. Joung, S. Chowdhury, A. H. Vija, J. C. Engdahl, *Siemens Medical Solution, USA*

### **M5-42:** Feasibility Study of 3-D CdZnTe Detectors for PET Imaging

Z. He, L. J. Meng, *The University of Michigan, USA*

### **M5-46:** A Multilayer Detector for PET Based on APD Arrays and Continuous Crystal Elements

S. McCallum, P. Clowes, A. Welch, *University of Aberdeen, Scotland*

### **M5-50:** Intrinsic Spatial Resolution and Parallax Correction Using Depth-Encoding PET Detector Modules Based on Position-Sensitive APD Readout

P. A. Dokhale<sup>1</sup>, R. W. Silverman<sup>2</sup>, K. S. Shah<sup>3</sup>, M. A. McClish<sup>3</sup>, R. Farrell<sup>3</sup>, G. Entine<sup>3</sup>, S. R. Cherry<sup>1</sup>

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### **M5-54:** High Countrate Anger Camera Design for Electronically Collimated SPECT

S. S. Huh, N. H. Clinthorne, W. L. Rogers, L. Han, L. Zhang, K. Subramaniam, S.-J. Park, *University of Michigan, USA*

### **M5-58:** Detector Quality Assurance Using 137-Cs Singles Transmission Imaging

R. W. Wassenaar, R. deKemp, *University of Ottawa Heart Institute, Canada*

### **M5-62:** Optimization of the Relative Acquisition Duration for PET/CT Imaging in Oncology

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### **M5-66:** Initial Evaluation of the Scintillator LFS for Positron Emission Tomography Applications

T. K. Lewellen, M. S. Janes, R. S. Miyaoka, *University of Washington, USA*; F. Zerrouk, *Zecotech Innovations, Canada*

### **M5-70:** Performance of Liquid Xe PET Detector with High Quantum Efficiency PMT

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### **M5-74:** A Real-Time Multi-Threaded System to Detect Motion in SPECT Imaging Using Multiple Optical Cameras

J. D. Morgenstern<sup>1,2</sup>, M. A. Gennert<sup>1</sup>, S. Nadella<sup>1</sup>, N. Kumar<sup>1</sup>, G. C. Speckert<sup>3</sup>, P. P. Bruyant<sup>4</sup>, M. A. King<sup>4</sup>

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### **M5-78:** Time-Resolved Monte Carlo Simulation of Optical and Isotopic Photons in Hybrid Phantoms

J. Peter, R. B. Schulz, *German Cancer Research Center, Germany*

### **M5-82:** Minimizing CT Dose for Attenuation Compensation in SPECT

A. H. Vija, T. D. Rempel, E. G. Hawman, J. C. Engdahl, *Siemens Medical Solutions USA, Inc., Nuclear Medicine Group, USA*

**M5-86: Development of a Moving Lung Phantom for Evaluation of Motion Effects in Combined PET/CT Scanners**

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**M5-90: Accuracy and Variability of Quantitative Values Obtained for Mouse Imaging Using the microPET® FOCUS**

S. Jan, R. Boisgard, Y. Fontyn, C. Eroukhmanoff, C. Comtat, R. Trébossen, *CEA - Service Hospitalier Frédéric Joliot, France*

**M5-94: A "Mouse-Sized" Mini Gamma Camera for Biological Imaging**

E. L. Bradley<sup>1</sup>, S. Maajewski<sup>2</sup>, V. Popov<sup>2</sup>, J. Qian<sup>1</sup>, M. S. Saha<sup>1</sup>, M. F. Smith<sup>2</sup>, A. G. Weisenberger<sup>2</sup>, R. E. Welsh<sup>1</sup>

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**M5-98: Experimental Characterization of Novel Small Animal PET Detector Modules Based on Scintillation Crystal Blocks Read Out by APD Arrays**

M. C. Maas<sup>1</sup>, D. J. van der Laan<sup>1</sup>, D. R. Schaart<sup>1</sup>, J. Huizenga<sup>1</sup>, J. C. Brouwer<sup>1</sup>, P. Bruyndonckx<sup>2</sup>, S. Léonard<sup>2</sup>, C. Lemaître<sup>2</sup>, C. W. E. van Eijk<sup>1</sup>

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**M5-102: Simultaneous Multi-Head Calibration for Pinhole SPECT**  
S. D. Metzler, R. J. Jaszczak, *Duke University Medical Center, USA*

**M5-106: Full 3D-OSEM Reconstruction with Compressed Response of the System**

J. Lopez Herráiz<sup>1</sup>, S. España<sup>1</sup>, J. M. Udiás<sup>1</sup>, J. J. Vaquero Senior Member, IEEE<sup>2</sup>, J. Seidel<sup>3</sup>, M. Desco<sup>2</sup>

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**M5-110: Development of an FPGA-Based Data Acquisition Module for Small Animal PET**

D. Novák, G. Hegyesi, G. Kalinka, J. Molnár, J. Végh, *Institute of Nuclear Research, Hungary*; M. Emri, L. Balkay, L. Trón, *Positron Emission Tomograph Center, Hungary*; T. Bükki, S. Rózsa, *MEDISO Ltd, Hungary*; A. Kerek, *Royal Institute of Technology, Sweden*

**M5-114: Zoom-in Micro Tomography with the Combination of Full and Limited Field-of-View Projection Data**

S. Y. Lee, I. K. Chun, S. C. Lee, M. H. Cho, M. H. Cho, *Kyung Hee University, South Korea*

**M5-118: Performance Evaluation of the microPET®-Focus - F120**

R. Laforest, *Mallinckrodt Institute of Radiology, USA*; D. Longford, *PETNET RadioPharmaceuticals, USA*; S. Siegel, D. Newport, *Concorde MicroSystem Inc., USA*

**M5-122: Design Considerations and Initial Evaluation Results of a Small Animal PET Prototype**

S. Pavlopoulos<sup>1</sup>, D. Drakoulakos<sup>2</sup>, D. Karamitos<sup>2</sup>, G. Kontaxakis<sup>2</sup>, E. Logaras<sup>2</sup>, M. Nikolaou<sup>2</sup>, G. Panayotakis<sup>3</sup>, M. Skiadas<sup>2</sup>, G. Spyrou<sup>2,3</sup>, T. Thireou<sup>1</sup>, G. Tzanakos<sup>2</sup>, D. Vamvakas<sup>2</sup>

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**M5-126: Effect of Optical Coupling on Accuracy of DOI Measurement with LSO/LuYAP Phoswich Detector**

J. H. Jung<sup>1</sup>, O. Devroede<sup>2</sup>, M. Krieger<sup>2</sup>, P. Bruyndonckx<sup>2</sup>, S. Tavernier<sup>2</sup>, Y. H. Chung<sup>1</sup>, Y. Choi<sup>1</sup>

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**M5-130: A Thin Position Sensitive Avalanche Photodiode Has Been Fabricated for Ultra-High Resolution PET to Achieve Robust Scintillation Light Collection Efficiency with High Crystal Packing Fraction**

C. S. Levin<sup>1</sup>, R. Farrell<sup>2</sup>, A. M. K. Foudray<sup>1</sup>, P. D. Olcott<sup>1</sup>, M. McClish<sup>2</sup>, F. Habte<sup>1</sup>, J. Zhang<sup>1</sup>, K. Shah<sup>2</sup>

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**M5-134: A 15-µm Resolution Imager for Soft X-Ray Emitters**

R. Accorsi, *The Children's Hospital of Philadelphia, USA*

**M5-138: Design of Coded Aperture Collimator for High-Resolution & High-Sensitivity MicroSPECT**

S. Jiang, Z. Wu, T. Ma, Y. Jin, *Tsinghua Univ., China*

**M5-142: Performance Evaluation of the Upgraded Sherbrooke Small Animal PET Scanner**

M. D. Lepage, J. Cadorette, D. Rouleau, V. V. Selivanov, R. Lecomte, *Université de Sherbrooke, Canada*

**M5-146: Positioning Annihilation Photon Interactions in a Thin LSO Crystal Sheet with a Position-Sensitive Avalanche Photodiode**

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**M5-150: Performance Evaluation of the Fully Engineered YAP-(S)PET Scanner for Small Animal Imaging**

A. Del Guerra, A. Bartoli, N. Belcari, D. Herbert, A. Motta, A. Vaiano, *University of Pisa and INFN, Italy*; G. Di Domenico, N. Sabba, E. Moretti, G. Zavattini, *University of Ferrara and INFN, Italy*; M. Lazzarotti, L. Sensi, *I.S.E. Ingegneria dei Sistemi Elettronici s.r.l., Italy*; M. Larobina, *C.N.R. - Institute of Biostructure and Bioimages, Italy*

**M5-154: Combined Clinical PET/CT and microPET Small Animal Imaging**

J. T. Yap, N. C. Hall, D. W. Townsend, J. S. Wall, A. Solomon, G. W. Kabalka, *University of Tennessee Medical Center, USA*; S. J. Kennel, *Oak Ridge National Laboratory, USA*; D. F. Newport, S. B. Siegel, D. Bailey, A. M. Smith, R. E. Nutt, *Concorde Microsystems, USA*

**M5-158: A Prototype Low-Energy, Multi-Pinhole SPECT System for Small-Animal Imaging**

T. E. Peterson, *Vanderbilt University, USA*; D. W. Wilson, H. H. Barrett, *University of Arizona, USA*

**M5-162: Practical Hybrid Convolution Algorithm for Helical CT Reconstruction**

A. A. Zamyatin<sup>1</sup>, K. Taguchi<sup>2</sup>, M. D. Silver<sup>1</sup>

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**M5-166: Advances in Scatter Correction for 3D PET/CT**

C. C. Watson, M. E. Casey, C. Michel, B. Bendriem, *CPS Innovations, Inc., USA*

**M5-170: Reducing Incomplete-Sampling Artifacts in Pinhole SPECT Breast Imaging Using Patient-Contour Constraints**

J. E. Bowsher, R. J. Jaszcak, *Duke University Medical Center, USA*

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S. K. Patch, *GE Healthcare Technologies, USA*

**M5-178: Statistical Monte-Carlo Based SPECT Reconstruction: Influence of Number of Photon Tracks**

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N. V. Denisova, *Institute of Theoretical and Applied Mechanics, Russia*;  
A. R. Formiconi, *University of Florence, Italy*

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T. Tozaki, T. Fujimoto, *Kobe City College of Technology, Japan*; M. Senda, S. Sakamoto, K. Matsumoto, *Biomedical Research and Innovation, Japan*

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C. Bontus, T. Koehler, R. Proksa, *Philips Research, Germany*

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M. Ramos Pascual, S. Ferrer Tormos, G. Verdu Martin, *Polytechnic University of Valencia, Spain*; J. I. Villaseca, *Hospital La Fe de Valencia, Spain*; J. M. Campayo, *Hospital Clínico Universitario, Spain*

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M. D. Jones, R. Yao, *State University of New York at Buffalo, USA*

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C.-M. Kao, *The University of Chicago, USA*

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J. E. Ortuño, G. Kontaxakis, P. Guerra, A. Santos, *Universidad Politécnica de Madrid, Spain*

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I. G. Kazantsev, S. Matej, R. M. Lewitt, *University of Pennsylvania, USA*

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B. Bai<sup>1</sup>, A. M. Smith<sup>2</sup>, D. F. Newport<sup>2</sup>, R. M. Leahy<sup>1</sup>

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J. Wu, G. L. Zeng, *University of Utah, USA*

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G.-H. Chen, S. Leng, *University of Wisconsin-Madison, USA*

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B. Gizard, D. Huss, *CNRS/IN2P3 et ULP, France*

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S. Yamamoto, *Kobe City College of Technology, Japan*; T. Higashi, *Kyoto University Hospital, Japan*; K. Matsumoto, S. Sakamoto, M. Senda, *Institute of Biomedical Research and Innovation, Japan*

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M. G. Metaxas, R. D. Speller, G. J. Royle, *University College London, UK*; J. Seco, *Royal Marsden Hospital, UK*

**M5-238: A Simulation Tool for X-Ray Imaging Systems**

A. Bernardini, V. Fanti, R. Marzeddu, G. Massazza, P. Randaccio, *Dipartimento di Fisica dell'Università di Cagliari e INFN sezione di Cagliari, Italy*

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**M5-246: A Hybrid Approach to Simulate X-Ray Imaging Techniques, Combining Monte Carlo and Deterministic Algorithms**

N. Freud, J. M. Létang, D. Babot, *INSA, France*

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G. M. Fitzpatrick, R. G. Wells, *Lawson Health Research Institute, St. Joseph's Hospital, Canada*

**M5-254: Impact of the Light Detection Chain on the NEC in a Full-Body PET Scanner**

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**M5-258: A Delta-Scatter Monte Carlo Model of a Rotating Parallel-Hole Collimator for I-131 Brain Tumor Imaging**

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**M5-262: Modeling the Acquisition Front-End in High Resolution Gamma-Ray Imaging**

P. Guerra Gutiérrez, J. E. Ortuño Fisac, G. Kontaxakis, A. Santos, *Universidad Politécnica de Madrid, Spain*



**M5-266: A Robust Visual Tracking System for Motion Detection in SPECT: Improved Design and Validation Against the Polaris Infra-Red Tracking System**

P. P. Bruyant<sup>1</sup>, M. A. Gennert<sup>2</sup>, G. C. Speckert<sup>3</sup>, R. D. Beach<sup>1</sup>, J. D. Morgenstern<sup>2</sup>, N. Kumar<sup>2</sup>, S. Nadella<sup>2</sup>, M. A. King<sup>1</sup>

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**M5-270: A Simulation Study on Optically Decoding Reflecting Windows for PMT Quadrant Sharing Scintillation Detector Block**

H. Li, W.-H. Wong, S. Kim, R. Ramirez, S. Xie, Y. Wang, T. Xing, J. Uribe, H. Baghaei, Y. Zhang, *University of Texas, M.D. Anderson Cancer Center, USA*

**M5-274: Validation of Absorbed-Dose Calculations Using Y-90 in Different Source and Target Geometries**

M.-A. Park<sup>1,2</sup>, S. C. Moore<sup>1,2</sup>, N. Limpa-Amara<sup>1,2</sup>, R. E. Zimmerman<sup>1,2</sup>, A. Mahmood<sup>1,2</sup>, G. M. Makrigiorgos<sup>2,3</sup>

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**M5-278: NEC and Local Image Noise in PET Imaging**

C. W. Stearns, *GE Healthcare Technologies, USA*

**M5-282: Data Rebinning and Reconstruction in 3D PET/CT Oncological Studies: a Monte Carlo Evaluation**

G. Rizzo, I. Castiglioni, G. Russo, M. Gilardi, A. Panzacchi, F. Fazio, *IBFM-CNR, University of Milan-Bicocca, Scientific Institute H San Raffaele, Italy*

**M5-286: Describing Three-Class Task Performance: Three-Class Volume under ROC Surface (VUS) and Three-Class Hotelling Trace (3-HT) as Figures of Merit**

X. He, E. C. Frey, J. M. Links, B. M. W. Tsui, *Johns Hopkins Medical Institutions, USA*

**M5-290: Performance Improvement of the PET/CT Biograph Sensation 16 Using Faster Electronics**

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**M5-294: A Study of the Effects of Attenuation Correction on Tumor Detection in SPECT Oncology**

C. Bai, L. Shao, *Philips Medical Systems, USA*

**M5-298: Performance Characteristics of Siemens CTI ECAT EXACT 47 PET Scanner Using NEMA NU2-2001**

J. S. Kim, J. S. Lee, D. S. Lee, J.-K. Chung, M. C. Lee, *Seoul National University College of Medicine, South Korea*

**M5-302: An Evaluation of the Effect of Partial-Septa on Detection of Small Lesions in Brain Phantom Study Using MDAPET Camera**

H. Baghaei, W.-H. Wong, J. Uribe, H. Li, Y. Wang, T. Xing, R. Ramirez, S. Xie, S. Kim, Y. Zhang, *The University of Texas M. D. Anderson Cancer Center, USA*

**M5-306: Measurement and Interpolation of the System Matrix for Pinhole SPECT; Comparison Between MLEM and ART Reconstructions**

Y. Chen, L. R. Furenlid, D. W. Wilson, H. H. Barrett, *University of Arizona, USA*

**M5-310: A Simulation Study of a Bedside Cardiac PET Imager**

U. J. Tipnis<sup>1</sup>, M. F. Smith<sup>2</sup>, T. G. Turkington<sup>3</sup>, J. Wilson<sup>3</sup>, S. Majewski<sup>2</sup>, D. R. Gilland<sup>1</sup>

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**M5-314: Monte-Carlo Simulation of the PhotoDetection Systems Prototype PET Scanner Using GATE: a Validation Study**

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**M5-318: Study of Different Pinhole Locations for Small Animal Tumor Imaging**

G. Bal, *Children's Hospital of Philadelphia, USA*; G. L. Zeng, *University of Utah, USA*; R. M. Lewitt, Z. Cao, P. D. Acton, *University of Pennsylvania, USA*

**M5-322: Modified Dead Time Correction for Prompt Gamma Radiation Emitting PET Isotopes**

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**M5-326: Nearest-Neighbor LOR Rebinning in Clinical 3-D PET: a New PCI Card for Fast and Accurate on-Line Axial LOR-to-Bin Mapping on the HRRT**

W. F. Jones, E. Breeding, B. Castleberry, J. Reed, *CPS Innovations, USA*

**M5-330: ML Reconstruction from Dynamic List-Mode PET Data Using Temporal Splines**

J. Verhaeghe, Y. D'Asseler, S. Vandenberghe, S. Staelens, R. Van De Walle, I. Lemahieu, *Ghent University, Belgium*

**M5-334: Affine Transformation of List Mode Data for Respiratory Motion Correction in PET**

F. Lamare, T. Cresson, J. Saveau, C. Cheze-Le Rest, A. Turzo, Y. Bizais, D. Visvikis, *Laboratoire de traitement de l'information médicale, France*

**M5-338: An Event Driven Read-Out System for a Novel PET Scanner with Compton Enhanced 3D Gamma Reconstruction**

A. Dragone, F. Corsi, C. Marzocca, *Politecnico di Bari - MICROLABEN s.r.l., Italy*; P. Losito, D. Pasqua, *MICROLABEN s.r.l., Italy*; E. Nappi, R. De Leo, *INFN, Italy*; J. Séguinot, *College de France, France*; A. Braem, E. Chesì, C. Joram, P. Weilhammer, *CERN, Switzerland*; F. Garibaldi, *Istituto Superiore di Sanità, Italy*; H. Zaidi, *Geneva University Hospital, Switzerland*

**M5-342: Quantitative and Statistical Analyses of PET Imaging Studies of Amyloid Deposition in Humans**

J. C. Price, S. K. Ziolko, L. A. Weissfeld, W. E. Klunk, J. A. Hoge, C. C. Meltzer, S. W. Davis, X. Lu, B. J. Lopresti, D. P. Holt, S. T. DeKosky, C. A. Mathis, *University of Pittsburgh, USA*

**M5-346: Dynamic Cardiac SPECT Using a Stationary SPECT Camera**

R. Clackdoyle, R. Maddula, J. A. Roberts, E. V. R. Di Bella, Z. Fu, *University of Utah, USA*

**M5-350: Quantification in SPECT: Myth or Reality? a Multi-Centric Study**

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**M5-354: Cluster Analysis for Defining Regions-of-Interest Using PET, CT, and MR Images Following Human Traumatic Brain Injury**

H.-M. Wu, M. Bergsneider, C.-L. Yu, D. Hovda, S.-C. Huang, David Geffen School of Medicine, University of California, Los Angeles, USA

**M5-358: Towards Optimal Model Based Partial Volume Effect Correction in Oncological PET**

F. Schoenahl, H. Zaidi, Geneva University Hospital, Switzerland

**M5-362: Automated Detection of Mismatch in Paired V/Q SPECT Scans Using Voxelwise Statistical Testing: Validation and Pilot Clinical Study**

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**M5-366: Comparison of Conventional and Model-Based Quantitative Planar Image Processing Methods for Organ Activity Estimation Using In-111 Agents**

B. He, E. C. Frey, B. M. W. Tsui, Johns Hopkins University, USA

**M5-370: Motion Correction of Multi-Frame PET Data**

F. Perruchot, A. Reilhac, C. Grova, A. C. Evans, A. Dagher, Montreal Neurological Institute, Canada

**M5-374: Practical Aspects of Energy Weighting in X-Ray Imaging**

D. Niederloehner, J. Karg, J. Giersch, M. Firsching, G. Anton, Physikalisches Institut, Universitaet Erlangen-Nuernberg, Germany

**M5-378: Quantitatively Accurate Image Recovery from Attenuation-Corrected PET Sinogram Data Using Filtering of Sinusoidal Trajectories**

E. Krestyannikov, U. Ruotsalainen, Tampere University of Technology, Finland

**M5-382: Restoration of Detector Scatter in Quantitative Rat-PET Studies**

M. Bentourkia, O. Sarrhini, Université de Sherbrooke, Canada

**M5-386: A Landmark-Based Approach for the Quantitation of Receptor and Transporter Binding in the Rat Using Small Animal SPECT and PET**

S. Nikolaus<sup>1</sup>, A. Wirtwar<sup>1</sup>, R. Larisch<sup>1</sup>, N. Schramm<sup>2</sup>, C. Antke<sup>1</sup>, H.-W. Müller<sup>1</sup>

<sup>1</sup>University Hospital Düsseldorf, Germany; <sup>2</sup>Research Center Jülich, Germany

**M5-390: Segmentation of Brain MR Images Using Hidden Markov Random Field Model with Weighting Neighborhood System**

T. Chen, T. S. Huang, Z.-P. Liang, University of Illinois at Urbana Champaign, USA

**M5-394: Influence of Mismatched CT Anatomy on the Accuracy of Partial Volume Compensation in Cardiac SPECT Perfusion Imaging**

P. H. Pretorius, M. A. King, P. P. Bruyant, University of Massachusetts Medical School, USA

**M5-398: An Objective Evaluation Framework for Segmentation Techniques of Functional Positron Emission Tomography Studies**

J. Kim<sup>1,2</sup>, W. Cai<sup>1</sup>, D. Feng<sup>1,2</sup>, S. Eberl<sup>1,3</sup>

<sup>1</sup>University of Sydney, Australia; <sup>2</sup>Hong Kong Polytechnic University, China; <sup>3</sup>Royal Prince Alfred Hospital, Australia

**M5-402: Simulated Annealing in Pharmacokinetic Modelling of PET Neuroreceptor Studies: Accuracy and Precision Compared with Other Optimization Algorithms**

M. Yaqub, R. Boellaard, M. A. Kropholler, M. Lubberink, A. A. Lammertsma, VU University Medical Center, the Netherlands

**M5-406: A Portable Acquisition System Based on USB Standard for the Medipix2 X-Ray Detector**

V. Fanti, R. Marzeddu, G. Piredda, P. Randaccio, Dipartimento di Fisica dell'Università di Cagliari e INFN sezione di Cagliari, Italy

**M5-410: Detector for Intravascular Beta Brachytherapy**

L. Tynes, P. L. Gueye, C. Harmon, C. Keppel, D. Kieper, C. Velasco, Hampton University, USA; P. Wong, Eastern Virginia Medical School, USA

**M5-414: Dependence of Ce Concentration on Scintillation Characteristics of LGSO Crystal**

S. Shimizu, K. Kurashige, T. Usui, N. Shimura, K. Sumiya, S. Nachimuthu, A. Gunji, M. Kamada, H. Ishibashi, Hitachi Chemical Co., Ltd., Japan

**M5-418: Silicon Pixel Array Electronics for Gamma Imaging in Medical Applications**

V. Orsolini Cencelli<sup>1</sup>, L. Colace<sup>2</sup>, G. Masini<sup>2</sup>, F. de Notaristefani<sup>1</sup>, A. Morassi<sup>2</sup>, G. Hull<sup>1</sup>, C. D'Ambrosio<sup>3</sup>

<sup>1</sup>INFN Sez. Roma III, Italy; <sup>2</sup>Università degli Studi Roma Tre, Italy; <sup>3</sup>CERN, Switzerland

**M5-422: Preparation of Nanocrystalline Scintillating Powders Based on Oxides of Rare Earth Metals for Improved Medical Imaging**

N. V. Klassen<sup>1</sup>, S. Z. Shmurak<sup>1</sup>, G. K. Strukova<sup>1</sup>, I. M. Shmyrko<sup>1</sup>, E. A. Kudrenko<sup>1</sup>, A. P. Kiseliyov<sup>1</sup>, S. E. Derenzo<sup>2</sup>, M. J. Weber<sup>2</sup>, V. V. Kedrov<sup>1</sup>

<sup>1</sup>Institute of Solid State Physics, Russian Academy of Sciences, Russia;

<sup>2</sup>Lawrence Berkeley National Laboratory, USA

**M5-426: Parallelised Geant4 Monte Carlo Simulation of IMRT Treatments**

S. Chauvie<sup>1,2</sup>, G. Scielzo<sup>3</sup>

<sup>1</sup>ASO S. Croce e Carle, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>Ordine Mauriziano, Italy

**M5-430: A Novel Phantom for Experimental Determination of the Correlation Between Induced PET-Activity and Total Absorbed Dose**

L. M. Persson<sup>1,2</sup>, L. Johansson<sup>1</sup>, A. Sanchez-Crespo<sup>1,2</sup>, S. A. Larsson<sup>1,2</sup>, C. Jonsson<sup>1,2</sup>

<sup>1</sup>Karolinska University Hospital, Sweden; <sup>2</sup>Karolinska Institute, Sweden

#### **M5-434: A High Speed Functional MicroCT Detector for Small Animal Studies**

V. V. Nagarkar<sup>1</sup>, S. V. Tipnis<sup>1</sup>, I. Shestakova<sup>1</sup>, V. Gaysinskiy<sup>1</sup>, B. Singh<sup>1</sup>, M. J. Paulus<sup>2</sup>, G. Entine<sup>1</sup>

<sup>1</sup>RMD Inc., USA; <sup>2</sup>Imtek Inc., USA

#### **M5-438: Characterization of a Dual Energy Angiography System Based on CCD+FOS Detector**

G. Baldazzi<sup>1,2</sup>, D. Bollini<sup>1,2</sup>, M. Gambaccini<sup>3</sup>, M. Gombia<sup>1</sup>, G. Pancaldi<sup>2</sup>, L. Roma<sup>1</sup>, P. L. Rossi<sup>1</sup>, A. Sarnelli<sup>3</sup>, A. Taibi<sup>3</sup>, A. Tuffanelli<sup>3</sup>, M. Zuffa<sup>2</sup>

<sup>1</sup>University of Bologna, Italy; <sup>2</sup>I.N.F.N., Italy; <sup>3</sup>University of Ferrara, Italy

#### **M5-442: Reconstruction Algorithm for Tilted Helical Volumetric CT**

J. Hsieh, X. Tang, *GE Healthcare, USA*

#### **M5-446: A New Automatic Method for Colon Segmentation in CT-Colonography CAD**

A. Bert, I. Dmitriev, S. Agliozzo, N. Pietrosevoli, *Institute for Scientific Interchange Foundation, Italy*; M. Ferraro, *Università degli Studi di Torino, Italy*; M. Mandelkern, *University of California, Irvine, USA*; D. Regge, *Institute for Cancer Research and Treatment, Italy*

#### **M5-450: Evaluation of Weighted FDK Algorithms Applied to Four-Dimensional CT (4D-CT)**

S. Mori, M. Endo, T. Tsunoo, *National Institute of Radiological Sciences, Japan*

#### **M5-454: Streak-like Artifact Reduction Control in CT Reconstruction**

G. Naveh, G. Shechter, *Philips Medical Systems Technologies Ltd, Israel*

#### **M5-458: Application of Asymmetric Cone-Beam CT in Radiotherapy**

L. Yu<sup>1</sup>, C. A. Pelizzari<sup>1</sup>, X. Pan<sup>1</sup>, H. Riem<sup>2</sup>, P. Munro<sup>3</sup>, W. Kaissl<sup>2</sup>

<sup>1</sup>The University of Chicago, USA; <sup>2</sup>Varian Medical Systems, Switzerland; <sup>3</sup>Varian Medical Systems, USA

#### **M5-462: Experimental Validation of a Rapid Monte Carlo Based Micro-CT Simulator**

W. Zbijewski<sup>1</sup>, A.-P. Colijn<sup>1</sup>, A. Sasov<sup>2</sup>, F. J. Beekman<sup>1</sup>

<sup>1</sup>UMC Utrecht, the Netherlands; <sup>2</sup>SkyScan, Belgium

#### **M5-466: Framework for Iterative Cone-Beam Micro-CT Reconstruction**

T. M. Benson, J. Gregor, *University of Tennessee, USA*

#### **M5-470: Age Dependent Variation of Cerebral Perfusion Assessed by Magnetic Resonance Continuous Arterial Spin Labelling Technique**

L. Biagi<sup>1,2</sup>, M. Tosetti<sup>1</sup>, A. Abbruzzese<sup>3</sup>, M. C. Bianchi<sup>3</sup>, D. Alsop<sup>4</sup>, A. Del Guerra<sup>2</sup>

<sup>1</sup>Stella Maris Scientific Institute, Italy; <sup>2</sup>University of Pisa, Italy; <sup>3</sup>S. Chiara Hospital, Italy; <sup>4</sup>Beth Israel Deaconess Medical Center and Harvard Medical School, USA

#### **M5-474: Precise Multi-Spectral Dermatological Imaging**

D. D. Gómez, B. K. Ersboll, J. M. Carstensen, *Informatics and Mathematical Modelling, DTU, Denmark*

#### **M5-478: High-Speed Synchrotron Radiation Imaging of Coronary Microcirculation in Isolated Perfused Rat Heart**

K. Umetani, *Japan Synchrotron Radiation Research Institute, Japan*; K. Fukushima, K. Sugimura, *Kobe University School of Medicine, Japan*

#### **M5-482: Images of Bone, Bone Phantom and Rat Lumber Vertebra Using Diffraction-Enhanced Imaging Technique**

D. V. Rao, *Sir.C.R.R.Autonomous College, India*; T. Akatsuka, T. Yuasa, *Yamagata University, Japan*; Z. Zhong, *Brookhaven National Laboratory, USA*

#### **M5-486: High Resolution Ca/P Maps of Bone Architecture**

M. Tzaphlidou, *Medical School, Ioannina University, Greece*; R. Speller, G. Royle, J. Griffiths, *University College London, UK*

#### **M5-490: Imaging Small Animals with Prompt Gamma Rays**

L. Xu, R. P. Gardner, *North Carolina State University, USA*

### **M6 Multimodality Imaging**

Thursday, October 21 14:00-15:30, Leptis Magna 1&2

Session Chairs: Paul Marsden, *King's College London*  
Bruce Hasegawa, *UC San Francisco*

#### **M6-1: (14:00) Design and Development of an MR Compatible PET Scanner for Imaging Small Animals**

J. E. Mackewn<sup>1</sup>, D. Strul<sup>1</sup>, W. A. Hallett<sup>1</sup>, P. Halsted<sup>1</sup>, T. A. Page<sup>1</sup>, S. F. Keevil<sup>1</sup>, S. C. Williams<sup>2</sup>, S. R. Cherry<sup>3</sup>, P. K. Marsden<sup>1</sup>

<sup>1</sup>Guy's, King's and St Thomas' School of Medicine, King's College London, UK; <sup>2</sup>Institute of Psychiatry, King's College London, UK; <sup>3</sup>University of California, USA

#### **M6-2: (14:15) Development and Evaluation of a LSO-APD Block-Detector for Simultaneous PET-MR Imaging**

B. J. Pichler<sup>1</sup>, M. S. Judenhofer<sup>1</sup>, J. H. Walton<sup>1</sup>, R. E. Nutt<sup>2</sup>, S. B. Siegel<sup>2</sup>, S. R. Cherry<sup>1</sup>

<sup>1</sup>University of California, USA; <sup>2</sup>Concorde Microsystems, USA

#### **M6-3: (14:30) Micro-SPECT Combined with 3D Optical Imaging**

E. N. Tsyganov, P. P. Antich, P. V. Kulkarni, R. P. Mason, R. W. Parkey, S. Y. Seliounine, J. W. Shay, T. C. Soesbe, A. I. Zinchenko, *The University of Texas Southwestern Medical Center at Dalls, USA*

#### **M6-4: (14:45) Design and Performance of a Prototype Whole-Body PET/CT Scanner with Fiber-Optic Readout**

W. Worstell, S. Adler, P. Domigan, O. Johnson, H. Kudrolli, D. Lazuka, P. Monteverde, J. Nevin, R. Rohatgi, L. Romanov, S. Starsja, *PhotoDetection Systems, Inc., USA*

#### **M6-5: (15:00) Quantitative Attenuation Correction for PET/CT Using Iterative Reconstruction of Low-Dose Dual-Energy CT**

P. E. Kinahan<sup>1</sup>, J. Fessler<sup>2</sup>, A. Alessio<sup>1</sup>, T. K. Lewellen<sup>1</sup>

<sup>1</sup>University of Washington, USA; <sup>2</sup>University of Michigan, USA

#### **M6-6: (15:15) Model-Based Registration of X-Ray Mammograms and MR Images of the Female Breast**

N. V. Ruiter, R. Stotzka, T. O. Mueller, H. Gemmeke, *Forschungszentrum Karlsruhe, Germany*

## M7 X-ray Imaging

Thursday, October 21 16:00-18:00, Leptis Magna 1&2

Session Chairs: **Pierre Grangeat**, *CEA - DRT-LETI*

**Rolf Clackdoyle**, *University of Utah*

### M7-1: (16:00) Method for Flow Reconstruction from Dynamic X-Ray Projection Measurements

**T. Koehler**<sup>1</sup>, H. Schmitt<sup>2</sup>, S. Heiland<sup>3</sup>, M. Grass<sup>1</sup>

<sup>1</sup>Philips Research Laboratories, Germany; <sup>2</sup>Philips Medical Systems, the Netherlands; <sup>3</sup>University of Heidelberg, Germany

### M7-2: (16:15) Exact Filtered Backprojection Reconstruction for Dynamic Pitch Helical Cone Beam CT

**A. Katsevich**, *University of Central Florida, USA*; **S. Basu**, *General Electric Global Research Center, USA*; **J. Hsieh**, *GE Medical Systems, USA*

### M7-3: (16:30) Accurate Image Reconstruction from Minimum Data in Helical Cone-Beam CT and Inversion of the Finite Hilbert Transform

**E. Y. Sidky**, **Y. Zou**, **X. Pan**, *University of Chicago, USA*

### M7-4: (16:45) Penalized-Likelihood Sinogram Restoration for CT Artifact Correction

**P. J. La Riviere**, **D. M. Billmire**, *The University of Chicago, USA*

### M7-5: (17:00) Single-Seeded Coronary Artery Tracking in CT Angiography

**G. Lavi**<sup>1</sup>, **J. Lessick**<sup>1,2</sup>, **P. C. Johnson**<sup>3</sup>, **D. Khullar**<sup>3</sup>

<sup>1</sup>Philips Medical Systems Technologies Ltd., Israel; <sup>2</sup>Rambam Medical Center, Israel; <sup>3</sup>Philips Medical Systems, USA

### M7-6: (17:15) Phase Contrast X-Ray Radiography and Tomography Based on a Grating Interferometer

**C. David**, **T. Weitkamp**, **A. Diaz**, **F. Pfeiffer**, **M. Stamparoni**, **F. van der Veen**, *Paul Scherrer Institute, Switzerland*

### M7-7: (17:30) High Resolution X-Ray Analysis of a Proximal Human Femur with Synchrotron Radiation and an Innovative Linear Detector

**M. Bettuzzi**<sup>1</sup>, **R. Brancaccio**<sup>1</sup>, **F. Casali**<sup>1</sup>, **S. Cornacchia**<sup>1</sup>, **N. Lanconelli**<sup>1</sup>, **L. Mancini**<sup>2</sup>, **M. P. Morigi**<sup>1</sup>, **E. Di Nicola**<sup>1</sup>, **A. Pasini**<sup>1</sup>, **D. Romani**<sup>1</sup>, **A. Rossi**<sup>1</sup>

<sup>1</sup>University of Bologna, Italy; <sup>2</sup>Sincrotrone Trieste, Italy

### M7-8: (17:45) Fluorescence Tomography Using a Multiwire Induction Drift Chamber

**A. H. Walenta**<sup>1</sup>, **I. Balescu**<sup>1</sup>, **H.-J. Besch**<sup>1</sup>, **A. Ching**<sup>1</sup>, **M. Costin**<sup>1</sup>, **R. Erbel**<sup>2</sup>, **S. Fiedler**<sup>3</sup>, **O. Kalthoff**<sup>4</sup>, **J. Mielebacher**<sup>4</sup>, **S. Möhlenkamp**<sup>2</sup>, **M. Moisa**<sup>1</sup>, **C. Venanzi**<sup>5</sup>

<sup>1</sup>University of Siegen, Germany; <sup>2</sup>University of Essen, Germany; <sup>3</sup>EMBL, Germany; <sup>4</sup>University of Applied Science, Germany; <sup>5</sup>University of Trieste, Italy

## M8 High Resolution and Animal Imaging

Friday, October 22 08:30-10:30, Leptis Magna 1&2

Session Chairs: **Freek Beekman**, *University Medical Center Utrecht*

**Simon Cherry**, *UC Davis*

### M8-1: (08:30) System Integration of the MiCES Small Animal PET Scanner

**T. K. Lewellen**, **M. K. Janes**, **R. S. Miyaoka**, **S. G. Gillispie**, **B. E. Park**, **K. Lee**, **P. Kinahan**, *University of Washington, USA*

### M8-2: (08:45) Performance Evaluation of a Four-Layer LSO Detector for a Small Animal DOI PET Scanner: jPET-RD

**T. Tsuda**<sup>1,2</sup>, **H. Murayama**<sup>2</sup>, **K. Kitamura**<sup>2,3</sup>, **N. Inadama**<sup>2</sup>, **T. Yamaya**<sup>2</sup>, **E. Yoshida**<sup>2</sup>, **F. Nishikido**<sup>2,4</sup>, **M. Hamamoto**<sup>2,4</sup>, **H. Kawai**<sup>1</sup>, **Y. Ono**<sup>1,2</sup>

<sup>1</sup>Chiba University, Japan; <sup>2</sup>National Institute of Radiological Sciences, Japan; <sup>3</sup>Shimadzu Corporation, Japan; <sup>4</sup>Waseda University, Japan

### M8-3: (09:00) Singles List-Mode Data Processing for MADPET-II

**D. P. McElroy**<sup>1</sup>, **M. Rafecas**<sup>1</sup>, **M. Huisman**<sup>1</sup>, **V. Spanoudaki**<sup>1</sup>, **T. Schueler**<sup>2</sup>, **S. I. Ziegler**<sup>1</sup>

<sup>1</sup>Technische Universität München, Germany; <sup>2</sup>Mixed-Mode GmbH, Germany

### M8-4: (09:15) Cardiovascular Transit Times in Mice by High Temporal Resolution microPET

**M. C. Kreissl**<sup>1</sup>, **H.-M. Wu**<sup>1</sup>, **D. Stout**<sup>2</sup>, **W. Ladno**<sup>2</sup>, **J. Edwards**<sup>3</sup>, **J. O. Prior**<sup>1</sup>, **A. F. Chatzioannou**<sup>2</sup>, **S.-C. Huang**<sup>1</sup>, **H. R. Schelbert**<sup>1</sup>

<sup>1</sup>UCLA, USA; <sup>2</sup>Crump Institute for Molecular Imaging, USA

### M8-5: (09:30) Simultaneous Cardiac and Respiratory Gated Imaging of the Mouse on the microPET II Scanner

**Y. Yang**<sup>1</sup>, **S. Rendig**<sup>1</sup>, **S. Siegel**<sup>2</sup>, **D. F. Newport**<sup>2</sup>, **S. R. Cherry**<sup>1</sup>

<sup>1</sup>UC Davis, USA; <sup>2</sup>Concorde Microsystems Inc., USA

### M8-6: (09:45) Thick Microcolumnar CsI(Tl) Films for Small Animal SPECT

**V. V. Nagarkar**<sup>1</sup>, **V. Gaysinskiy**<sup>1</sup>, **I. Shestakova**<sup>1</sup>, **S. Taylor**<sup>2</sup>, **H. Barrett**<sup>2</sup>, **G. Entine**<sup>1</sup>

<sup>1</sup>RMD Inc., USA; <sup>2</sup>University of Arizona, USA

### M8-7: (10:00) Real-Time, High-Accuracy 3D Tracking of Small Animals for Motion-Corrected SPECT Imaging

**S. S. Gleason**, **J. S. Goddard**, **M. J. Paulus**, **J. S. Baba**, *Oak Ridge National Laboratory, USA*; **S. Majewski**, **M. F. Smith**, **A. G. Weisenberger**, **B. Welch**, **R. Wojcik**, *Jefferson Lab, USA*

### M8-8: (10:15) Attenuation Correction of Small Animal SPECT Images Acquired with 125I-Iodotrotenone

**A. B. Hwang**<sup>1,2</sup>, **C. C. Taylor**<sup>1,2</sup>, **H. F. VanBrocklin**<sup>3</sup>, **M. W. Dae**<sup>2</sup>, **B. H. Hasegawa**<sup>1,2,4</sup>

<sup>1</sup>UC Berkeley / UCSF, USA; <sup>2</sup>University of California at San Francisco, USA; <sup>3</sup>E.O. Lawrence Berkeley National Laboratory, USA; <sup>4</sup>University of California at Berkeley, USA



## M9 MIC Poster III

Friday, October 22 11:00-12:30, Poster Area, Upper & Lower Level  
Session Chair: **Steven Meikle**, *University of Sidney*

### M9-3: Experimental Validation of a PET Monte-Carlo Simulator

L. Le Meunier, F. Mathy, *CEA-LETI, France*; D. Fagret, *Centre Hospitalier Universitaire, France*

### M9-7: Characteristics of PET-CT Images of the ACR PET Phantom

J. J. Hamill, M. E. Casey, V. Rappoport, C. C. Watson, *CPS Innovations, USA*

### M9-11: Effects of Lead Shielding of Background Organ Activity in Pinhole SPECT Breast Tumor Imaging

T. Lee, K. Braun, R. Jaszczak, J. Bowsher, K. Bobkov, *Duke University, USA*

### M9-15: Optimizing Sequential Dual Tracer PET Studies Using a Combined 2D/3D Imaging Protocol

J. W. Wilson<sup>1</sup>, T. G. Turkington<sup>1</sup>, J. G. Colsher<sup>2</sup>, S. Borges-Neto<sup>1</sup>, R. E. Coleman<sup>1</sup>, R. E. Reiman<sup>1</sup>

<sup>1</sup>Duke University Medical Center, USA; <sup>2</sup>G. E. Healthcare Technologies, USA

### M9-19: Evaluation of the Single Scatter Simulation Algorithm Implemented in the STIR Library

C. Tsoumpas<sup>1,2</sup>, P. Aguiar<sup>3</sup>, K. S. Nikita<sup>2</sup>, D. Ros<sup>3</sup>, K. Thielemans<sup>1</sup>

<sup>1</sup>Hammersmith Imanet Limited, UK; <sup>2</sup>National and Technical University of Athens, Greece; <sup>3</sup>University of Barcelona, Spain

### M9-23: Development of a 1-Dimensional Sharing Block Detector Using Dual PMTs for PET

S. Yamamoto, *Kobe City College of Technology, Japan*; N. Shimura, H. Ishibashi, *Hitachi Chemical, Japan*

### M9-27: Characterization of the LBNL PEM Camera

G.-C. Wang<sup>1,2</sup>, J. S. Huber<sup>1</sup>, W. W. Moses<sup>1</sup>, J. Qi<sup>1</sup>, W.-S. Choong<sup>1</sup>

<sup>1</sup>Lawrence Berkeley National Lab, USA; <sup>2</sup>University of California, Berkeley, USA

### M9-31: Investigation of the Block Detectors

N. Tomic, S. St.James, C. J. Thompson, *Montreal Neurological Institute, McGill University, Canada*

### M9-35: Rate-Dependence of the Key Performance Parameters in an Anger Logic Based PET Detector

A. Thon, K. Fiedler, T. Frach, W. Rütten, T. Solf, *Philips Research Laboratories, Germany*

### M9-39: A Weighted Least Squares PET Image Reconstruction Method Using Iterative Coordinate Descent Algorithms

H. Zhu, H. Shu, J. Zhou, L. Luo, *Southeast University, China*

### M9-43: High Resolution GSO Block Detectors Using PMT-Quadrant-Sharing Design for Small Animal PET

S. Kim, W.-H. Wong, S. Xie, R. Ramirez, Y. Liu, H. Li, T. Xing, Y. Wang, J. Uribe, H. Baghaei, Y. Zhang, *The University of Texas M. D. Anderson Cancer Center, USA*

### M9-47: A New PET System for Small-Animal Imaging

D. W. Wilson, L. R. Furenlid, Y. C. Chen, H. H. Barrett, *University of Arizona, USA*

### M9-51: Optimal Design of High-Energy Collimators

A. R. Formiconi<sup>1</sup>, D. L. Gunter<sup>2</sup>, E. Vanzi<sup>1</sup>, F. Di Martino<sup>3</sup>, D. Volterrani<sup>3</sup>

<sup>1</sup>University of Florence, Italy; <sup>2</sup>Vanderbilt University, USA; <sup>3</sup>Azienda Ospedaliera Universitaria Pisana, Italy

### M9-55: Fast CT/SPECT Derived Monte Carlo Dose Computations for I-131 Internal Emitter Therapy

S. J. Wilderman, Y. K. Dewaraja, *University of Michigan, USA*

### M9-59: Performance Assessment of Pixelated LaBr<sub>3</sub> Detector Modules for TOF PET

A. Kuhn, S. Surti, J. S. Karp, F. M. Newcomer, R. VanBerg, *University of Pennsylvania, USA*; G. Muehllehner, *Philips Medical Systems, USA*

### M9-63: An Improved Quadrant-Sharing BGO Detector for Small Animal PET

W.-H. Wong, S. Xie, R. A. Ramirez, S. Kim, H. Li, Y. Zhang, J. Uribe, Y. Wang, H. Baghaei, *University of Texas M.D. Anderson Cancer Center, USA*

### M9-67: Assaying and PET Imaging of Yttrium-90 : 1>>34ppm>>0

R. J. Nickles, A. D. Roberts, J. A. Nye, A. K. Converse, T. E. Barnhart, M. A. Avila-Rodriguez, C. B. Dallas, R. Sundaresan, D. W. Dick, R. J. Hammes, B. R. Thomadsen, *University of Wisconsin Madison, USA*

### M9-71: Analysis of Interaction of Gamma Rays in Crystals with 256ch Parallel Readout FP-PMT

F. Nishikido, J. Kikuchi, *Waseda University, Japan*; H. Murayama, N. Inadama, *National Institute of Radiological Sciences, Japan*; T. Hasegawa, *Kitasato University, Japan*

### M9-75: Development of a Simultaneous PET/MRI Scanner

D. J. Schlyer, C. Woody, W. Rooney, P. Vaska, S. Stoll, *Brookhaven National Laboratory, USA*

### M9-79: Misalignment Between Emission Scan and X-Ray CT Derived Attenuation Maps Causes Artificial Defects in Attenuation Corrected Myocardial Perfusion SPECT

H. Fricke, E. Fricke, R. Weise, A. Kammeier, O. Lindner, W. Burchert, *Herz- und Diabeteszentrum NRW, Germany*

### M9-83: Development of a MicroCT/PET System for in Vivo Small Animal Imaging

H. Liang, Y. Yang, S. Cherry, *University of California, Davis, USA*

### M9-87: Accurate SUV Determination for Small Solitary Pulmonary Nodules Using CT-Based Lesion Volume Estimates

N. C. Hall, J. Carney, J. T. Yap, G. T. Smith, D. W. Townsend, *University of Tennessee Medical Center, USA*

### M9-91: Comparative Study of microPET® FOCUS and ECAT HRRT PET Systems for Small Rodents Imaging

S. Jan, C. Comtat, R. Boisgard, R. Trébossen, *CEA - Service Hospitalier Frédéric Joliot, France*

**M9-95:** Fully 3D System Model Estimation of OPET by Monte Carlo Simulation

E. R. Rannou, A. F. Chatzioannou, *Crump Institute for Molecular Imaging, UCLA, USA*

**M9-99:** Possible Use of Linear Arrays of Scintillators in 3D-PET Imaging

G. Di Domenico, N. Cesca, E. Moretti, D. Moro, N. Sabba, G. Zavattini, *Dipartimento di Fisica and INFN - Sezione di Ferrara, Italy*

**M9-103:** Rat Cardiac Imaging Using X-SPECT

J. Li, T. Vandehei, K. Iwata, B. E. Patt, G. Caravaglia, J. S. Iwanczyk, *Gamma Medica, Inc., USA*; B. Hasegawa, *University of California San Francisco, USA*; B. M. W. Tsui, *Johns Hopkins University, USA*

**M9-107:** Performance Characteristics of the ARGUS-drT Small Animal PET Scanner: Preliminary Results

J. J. Vaquero<sup>1</sup>, J. Pascau<sup>1</sup>, A. Molins<sup>1</sup>, J. M. Arco<sup>2</sup>, M. Desco<sup>1</sup>

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N. Tamda, A. Bakkali, M. Parmentier, J. Chavanelle, A. Pousse, B. Kastler, *Laboratoire d'Imagerie et d'ingenierie pour la santé, France*

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A. Ruangma, R. Laforest, *Mallinckrodt Institute of Radiology, USA*; B. Bai, R. Leahy, *Signal and Image Processing Institute, USA*

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T. Y. Song, Y. Choi, Y. H. Chung, J. H. Jung, M. H. Jeong, B. J. Min, K. J. Hong, Y. S. Choe, K.-H. Lee, B.-T. Kim, *Samsung Medical Center, Sungkyunkwan University School of Medicine, South Korea*

**M9-131:** An Improved Anger Detector Approach for PET with High Resolution and Sensitivity

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C.-M. Kao, C.-T. Chen, *The University of Chicago, USA*

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M.-L. Camborde<sup>1</sup>, A. Rahmim<sup>2</sup>, D. F. Newport<sup>3</sup>, S. Siegel<sup>3</sup>, K. R. Buckley<sup>4</sup>, E. Vandervoort<sup>2</sup>, T. J. Ruth<sup>4</sup>, V. Sossi<sup>2</sup>

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**M9-143:** A Triple Modality Device for Simultaneous Small Animal CT and PET-SPECT Imaging

D. Moro, N. Cesca, G. Di Domenico, M. Gambaccini, N. Sabba, *University of Ferrara, Italy*; G. Zavattini, *INFN of Ferrara, Italy*

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B. K. Kundu, A. V. Stolin, M. B. Williams, *University of Virginia, USA*

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C. C. Heath, T. E. Peterson, *Vanderbilt University, USA*

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A. V. Bronnikov, *Bronnikov Algorithms, the Netherlands*

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C. D. Comtat<sup>1</sup>, F. Bataille<sup>1</sup>, C. Michel<sup>2</sup>, J. Jones<sup>2</sup>, M. Sibomana<sup>2</sup>, L. Janeiro<sup>1,3</sup>, R. Trébossen<sup>1</sup>

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R. Manzke, P. Koken, M. Grass, *Philips Research Laboratories, Germany*

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A. Krol<sup>1</sup>, D. H. Feiglin<sup>1</sup>, W. Lee<sup>1</sup>, V. R. Kunniyur<sup>2</sup>, K. R. Gangal<sup>2</sup>, I. L. Coman<sup>3</sup>, E. D. Lipson<sup>2</sup>, D. A. Karczewski<sup>1</sup>, F. D. Thomas<sup>1</sup>

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X. Sun, T. Ma, Y. Jin, *Tsinghua Univ., China*

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R. Brancaccio, M. Bettuzzi, F. Casali, S. Cornacchia, M. Morigi, A. Pasini, D. Romani, *University, Italy*

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L. M. Popescu, *University of Pennsylvania, USA*

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M. Li, H. Kudo, *University of Tsukuba, Japan*

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G. T. Gullberg, *E.O.Lawrence Berkeley National Laboratory, USA*; G. L. Zeng, Q. Tang, *University of Utah, USA*

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I. M. Blevis, A. Reznik, *General Electric Healthcare, Israel*; D. Kopelman, *Afula Medical Center, Israel*; M. Hashmonai, *Technion University, Israel*

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F. Liu<sup>1,2</sup>, J. R. Saffer<sup>2</sup>, G. M. Mayers<sup>2</sup>, W. Kononenko<sup>2</sup>, F. M. Newcomer<sup>2</sup>, R. Van Berg<sup>2</sup>, J. S. Karp<sup>2</sup>

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J. E. Lees, D. J. Bassford, G. W. Fraser, *University of Leicester, UK*; D. Monk, M. Early, *Leicester Royal Infirmary, UK*; R. J. Ott, *Institute of Cancer Research & Royal Marsden Hospital, UK*; I. Moody, *e2v Technologies Ltd, UK*

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S. D. Metzler, N. H. Patil, *Duke University Medical Center, USA*; R. Accorsi, *The Children's Hospital of Philadelphia, USA*

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S. G. Staelens<sup>1</sup>, S. Vandenberghe<sup>1</sup>, S. J. Glick<sup>2</sup>, Y. D'Asseler<sup>1</sup>, I. Lemahieu<sup>1</sup>, R. Van De Walle<sup>1</sup>

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M. Ljungberg, *Lund University, Sweden*; A. Larsson, L. Johansson, *Umeå University, Sweden*

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M. Hoheisel, L. Bätz, T. Mertelmeier, *Siemens AG Medical Solutions, Germany*; J. Giersch, A. Korn, *University Erlangen-Nürnberg, Germany*

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T. Ma, Y. Jin, *Tsinghua University, China*

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E. Catanzariti<sup>1,2</sup>, G. Forni<sup>1,2</sup>, A. Lauria<sup>3,2</sup>, R. Prevete<sup>1,2</sup>, M. Santoro<sup>1,2</sup>

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I. Frosio, N. A. Borghese, *University of Milano, Italy*

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R. E. Schmitz<sup>1</sup>, P. E. Kinahan<sup>1</sup>, R. L. Harrison<sup>1</sup>, J. S. Karp<sup>2</sup>, S. Surti<sup>2</sup>, C. W. Stearns<sup>3</sup>, R. D. Badawi<sup>4</sup>, T. K. Lewellen<sup>1</sup>

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E. J. Soares, *College of the Holy Cross, USA*; S. Vandenberghe, S. J. Glick, *University of Massachusetts Medical School, USA*

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A. Ishikawa, K. Ogawa, *Graduate School of Engineering, Hosei University, Japan*

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P. P. Mondal, K. Rajan, *Indian Institute of Science, India*

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K. L. Gilland, B. M. W. Tsui, Y. Qi, *Johns Hopkins University, USA*; G. T. Gullberg, *E. O. Lawrence Berkeley National Laboratory, USA*

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J. Qi, *Lawrence Berkeley National Laboratory, USA*

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A. Ishikawa, K. Kitamura, T. Mizuta, K. Tanaka, M. Amano, *Shimadzu Corporation, Japan*

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M. Dahlbom, C. Schiepers, J. Czernin, *UCLA School of Medicine, USA*

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K. L. Dixon, E. J. Vandervoort, *University of British Columbia, Canada*; S. Blinder, A. Fung, A. Celler, *Vancouver Coastal Health, Canada*

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D. Stsepankou, K. Kornmesser, J. Hesser, R. Männer, *University of Mannheim, Germany*

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M. J. More<sup>1</sup>, P. J. Goodale<sup>1</sup>, S. Majewski<sup>2</sup>, M. B. Williams<sup>1</sup>

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H.-D. Lin<sup>1,2</sup>, B.-H. Yang<sup>3</sup>, C.-H. Chen<sup>3</sup>, L.-C. Wu<sup>3</sup>, R.-S. Liu<sup>3</sup>, K.-P. Lin<sup>1</sup>

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**M9-327: Advanced Hardware Architecture for on-Line Data Acquisition in Clinical 3-D PET: Smart DRAM PCI Card for 14 M Event/sec Histogramming Across Terabytes of DRAM Memory**

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J.-B. Michaud, R. Fontaine, R. Lecomte, *University of Sherbrooke, Canada*

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S. C. Moore<sup>1,2</sup>, M.-A. Park<sup>1,2</sup>, G. El Fakhri<sup>1,2</sup>, V. H. Gerbaudo<sup>1,2</sup>, R. E. Zimmerman<sup>1,2</sup>

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Y. Bentoutou, *Centre National Des Techniques Spatiales, Algeria*; N. Taleb, *University of Djilali Liabes, Algeria*

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M. Lynch, O. Ghita, P. F. Whelan, *Dublin City University, Ireland*



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K. Suzawa, K. Ogawa, *Graduate School of Engineering, Hosei University, Japan*

**M9-363: Multiband Magnetic Resonance Image Segmentation Using Ensemble Classifiers**

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**M9-367: Dual-Energy Imaging with the Scatter Correction Using a Flat Panel Detector**

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**M9-371: A Database of Simulated PET Volumes with Anatomical Variability**

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M. Bentourkia, O. Sarrhini, *Université de Sherbrooke, Canada*

**M9-387: Software Package for Integrated Data Processing for Internal Dose Assessment in Nuclear Medicine**

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**M9-391: Transmission Imaging with Axially Overlapping Cone-Beams**

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**M9-403: Quantitative Accuracy of Dynamic Brain Studies with the HRRT: a Phantom Study**

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**M9-407: X-ray Color Scanner with Multi Energy Capability**

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**M9-411: In-Vitro 3D Dose Distribution Measurements for Prostate Brachytherapy**

C. Velasco, P. L. Gueye, C. Harmon, C. Keppel, D. Kieper, *Hampton University, USA;* P. Wong, *Eastern Virginia Medical School, USA*

**M9-415: Non Linear Diffusion and Wavelets in 3D PET Reconstruction**

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**M9-419: A CdZnTe Pixel Array Detector for Dual-Energy Bone Densitometry**

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**M9-423: Growth of Scintillating Fibers from the Melt for Position Sensitive Radiation Detectors**

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**M9-427: Novel Semiconductor Photon Detectors for PET**

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**M9-431: Hematoporphyrin Mediated Laser Induced Fluorescence In Vivo Imaging of Tumor and Organs Structure in Small Animals**

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**M9-435: Improvement of High Light Output for PWO Crystal by Doping**

G. Ren, *Shanghai Institute of Ceramics, China*

**M9-439: Diagnostic Mammographics X-Ray Spectra Analysis with CZT and CdTe Solid State Detectors**

U. Bottigli<sup>1,2</sup>, B. Golosio<sup>1,2</sup>, P. Oliva<sup>1,2</sup>, S. Stumbo<sup>1,2</sup>, P. Delogu<sup>3,4</sup>, M. E. Fantacci<sup>3,4</sup>, L. Abbene<sup>3</sup>, G. Raso<sup>3</sup>, F. Fauci<sup>3</sup>

<sup>1</sup>Università di Sassari, Italy; <sup>2</sup>INFN Sezione di Cagliari, Italy;

<sup>3</sup>Università di Pisa, Italy; <sup>4</sup>INFN Sezione di Pisa, Italy; <sup>5</sup>Università di Palermo, Italy

**M9-443: Imaging Characteristics Comparison of Compact Pixelated Detectors for Scintimammography**

R. Pani<sup>1</sup>, P. Bennati<sup>1</sup>, M. N. Cinti<sup>1</sup>, R. Pellegrini<sup>1</sup>, S. Ridolfi<sup>1</sup>, N. Lanconelli<sup>2</sup>, A. Karimian<sup>1</sup>, F. Garibaldi<sup>3</sup>, F. Cusanno<sup>3</sup>, M. Marini<sup>1</sup>, F. de Notaristefani<sup>4</sup>

<sup>1</sup>Università La Sapienza, Italy; <sup>2</sup>University of Bologna, Italy; <sup>3</sup>ISS, Italy;

<sup>4</sup>University Roma III, Italy

**M9-447: Development of a New Experimental Dual Energy Contrast-Enhanced Scanning Mammograph Based on the K-Edge Absorption**

G. Baldazzi<sup>1,2</sup>, D. Bollini<sup>1,2</sup>, M. Gambaccini<sup>3</sup>, M. Gombia<sup>1</sup>, G. Pancaldi<sup>2</sup>, L. Roma<sup>1</sup>, P. L. Rossi<sup>1</sup>, A. Sarnelli<sup>3</sup>, A. Taibi<sup>3</sup>, A. Tuffanelli<sup>3</sup>, M. Zuffa<sup>2</sup>

<sup>1</sup>University of Bologna, Italy; <sup>2</sup>I.N.F.N., Italy; <sup>3</sup>University of Ferrara, Italy

**M9-451: Three-Gamma Annihilations as a New Modality in PET**

K. Kacperski, N. M. Spyrou, *University of Surrey, UK*

**M9-455: An Adaptive Filtering Algorithm for Cardiac CT with EKG-Modulated Tube Current**

J. Li, J. Hsieh, *GE Healthcare, USA*

**M9-459: Flying Focal Spot (FFS) in Cone-Beam CT**

M. Kachelriess, M. Knaup, C. Pensel, W. Kalender, *Institute of Medical Physics (IMP), Germany*

**M9-463: Measurement of Electron Density and Effective Atomic Number Using Dual-Energy X-Ray CT**

T. Tsunoo, M. Torikoshi, Y. Ohno, M. Endo, *National Institute of Radiological Sciences, Japan*; M. Natsuhori, T. Kakizaki, N. Yamada, N. Itho, *Kitasato University, Japan*; N. Yagi, K. Uesugi, *Japan Synchrotron Radiation Research Institute, Japan*

**M9-467: Isotropic High-Resolution in Multi-Slice Spiral CT**

G. Shechter, A. Altman, *Philips Medical Systems Technologies, Ltd., Israel*

**M9-471: Exact Image Reconstruction for Selected ROIs in Helical Cone-Beam CT**

X. Pan, Y. Zou, D. Xia, E. Sidky, *The University of Chicago, USA*

**M9-475: Fuzziness and PDE Based Models for the Segmentation of Medical Images**

G. Bueno, A. Martínez, P. Cosías, *Universidad of Castilla-La Mancha, Spain*

**M9-479: Cone-Beam CT with Sources Sparsely Distributed on a Surface**

R. Bouchko, *University of Wisconsin - Madison, USA*

**M9-483: Improving Temporal Resolution of MRI for Evaluating Aortic Pulse Wave Velocity**

A. J. Bentow<sup>1</sup>, Y. Wang<sup>1,2</sup>, S. T. Mathew<sup>2</sup>, N. Reichek<sup>1,2</sup>

<sup>1</sup>SUNY Stony Brook, USA; <sup>2</sup>St. Francis Hospital, USA

**M10 MIC Poster IV**

Friday, October 22 14:00-15:30, Poster Area, Upper & Lower Level

Session Chair: Hideo Murayama, *National Institute of Radiological Sciences, Japan*

**M10-4: Proposal of Cherenkov TOFPET with Silica Aerogel**

T. Ooba, T. Fukushima, H. Kawai, M. Konishi, H. Nakayama, M. Tabata, *Chiba University, Japan*; I. Adachi, S. Nishida, *KEK, Japan*; H. Kishimoto, H. Yokogawa, *Matsushita Electric Works, Japan*

**M10-8: The NEC Dependence of Different Scintillators for Positron Emission Tomography**

L. Eriksson<sup>1,2</sup>, D. Townsend<sup>3</sup>, M. Eriksson<sup>1,2</sup>, M. Casey<sup>1</sup>, M. Conti<sup>1</sup>, B. Bendriem<sup>1</sup>, R. Nutt<sup>4</sup>

<sup>1</sup>CPS Innovations, USA; <sup>2</sup>Karolinska Institute, Sweden; <sup>3</sup>University of Tennessee Medical Center, USA; <sup>4</sup>CTI Molecular Imaging, USA

**M10-12: Comparison of Cone Beam and Parallel Beam Collimation with the Heart on the Axis of Rotation for Human Cardiac Spect Imaging**

N. H. Patil, R. J. Jaszczak, S. D. Metzler, J. E. Bowsher, *Duke University, USA*

**M10-16: Method of Fan-beam Imaging Calibration**

M. Wilk, L. Tsukerman, *GE Healthcare, Israel*

**M10-20: Architecture and First Prototype Tests of the Clear-PEM Electronics Systems**

J. Varela<sup>1,2</sup>, P. Bento<sup>3</sup>, F. Gonçalves<sup>3,2</sup>, C. Leong<sup>3</sup>, I. C. Teixeira<sup>3,2</sup>, J. P. Teixeira<sup>3,2</sup>, J. Nobre<sup>4</sup>, J. Rego<sup>4</sup>, P. Relvas<sup>4</sup>, L. Silva<sup>4</sup>, P. Rodrigues<sup>1</sup>, A. Trindade<sup>1</sup>

<sup>1</sup>LIP-Lisboa, Portugal; <sup>2</sup>Instituto Superior Técnico, Portugal; <sup>3</sup>INESC-ID, Portugal; <sup>4</sup>INOV, Portugal

**M10-24: Development of a Flexible End-Shield Using Tungsten Curtains for 3D PET**

S. Yamamoto, *Kobe City College of Technology, Japan*; S. Sakamoto, K. Matsumoto, M. Senda, *Institute of Biomedical Research and Innovation, Japan*

**M10-28: Design and Evaluation of the Clear-PEM Detector for Positron Emission Mammography**

A. I. Santos<sup>1</sup>, P. Almeida<sup>2</sup>, M. V. Martins<sup>2</sup>, N. Matela<sup>2</sup>, N. Oliveira<sup>2</sup>, N. C. Ferreira<sup>3</sup>, J. D. Aguiar<sup>4</sup>, F. G. Almeida<sup>4,5</sup>, F. Lopes<sup>4</sup>, J. Sampaio<sup>4</sup>, P. Bento<sup>6</sup>, F. Gonçalves<sup>6</sup>, C. Leong<sup>6</sup>, L. Silva<sup>6</sup>, I. C. Teixeira<sup>6</sup>, J. P. Teixeira<sup>6</sup>, M. C. Abreu<sup>7</sup>, B. Carriço<sup>7</sup>, P. R. Mendes<sup>7</sup>, R. Moura<sup>8</sup>, C. Ortigão<sup>8</sup>, L. Peralta<sup>8,9</sup>, R. Ribeiro<sup>8,5</sup>, P. Rodrigues<sup>8</sup>, A. Trindade<sup>8</sup>, J. Varela<sup>8,10</sup>

<sup>1</sup>Hospital Garcia de Orta, Portugal; <sup>2</sup>IBEB, Faculdade de Ciências da Universidade de Lisboa, Portugal; <sup>3</sup>IBILI, Faculdade de Medicina da Universidade de Coimbra, Portugal; <sup>4</sup>INEGI, Portugal; <sup>5</sup>Faculdade de Engenharia da Universidade do Porto, Portugal; <sup>6</sup>INEGI-ID and INOV, Portugal; <sup>7</sup>LIP-Algarve, Faculdade de Ciências e Tecnológica, Universidade do Algarve, Portugal; <sup>8</sup>LIP-Lisboa, Portugal; <sup>9</sup>Faculdade

de Ciências da Universidade de Lisboa, Portugal; <sup>10</sup>Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal

**M10-32: Design and Construction of a Multi-Slice, Depth-of-Interaction MR-Compatible PET**

S. Takamatsu<sup>1</sup>, S. Yamamoto<sup>2</sup>, H. Murayama<sup>3</sup>, K. Minato<sup>1</sup>

<sup>1</sup>Nara Institute of Science and Technology, Japan; <sup>2</sup>Kobe City College of Technology, Japan; <sup>3</sup>National Institute of Radiological Sciences, Japan

**M10-36: Diversity Combining Signal Processing and NEC in List-Mode PET**

R. Rohatgi, L. V. Romanov, W. A. Worstell, *PhotoDetection Systems, Inc., USA*

**M10-40: Evaluation of the Cylindrical SPECT Camera**

A. Bousselham, P. Stenstrom, C. Bohm, *Stockholm university, Sweden*; S. A. Larsson, *Karolinska Institute/Hospital, Sweden*

**M10-44: Three-Dimensional Image Reconstruction for jPET-D4 Using Suitable Histogramming Method to DOI Detector**

T. Obi<sup>1</sup>, T. Yamaya<sup>2</sup>, M. Yamaguchi<sup>1</sup>, N. Ohyama<sup>1</sup>, K. Kitamura<sup>3</sup>, H. Haneishi<sup>4</sup>, E. Yoshida<sup>2</sup>, N. Inadama<sup>2</sup>, H. Murayama<sup>2</sup>, N. Hagiwara<sup>1</sup>

<sup>1</sup>Tokyo Institute of Technology, Japan; <sup>2</sup>National Institute of Radiological Sciences, Japan; <sup>3</sup>Shimadzu Corporation, Japan; <sup>4</sup>Chiba University, Japan

**M10-48: Whole Body PET Based on an RPC System**

F. Turcu, *University of Bucharest, Romania*; F. Constantin, *National Institute for Physics and Nuclear Engineering Horia Hulubei, Romania*

**M10-52: Mathematical-Physical Characterization of the Response Function of a Clinical Positron Emission Tomography**

A. Bartoli, A. Passeri, *University of Florence, Italy*

**M10-56: Complete Tomographic Data for Compton Imaging Probes**

L. Zhang, W. L. Rogers, N. H. Clinthorne, *University of Michigan, USA*

**M10-60: Compton Camera Coincidences in the Silicon Drift Detector**

T. Conka Nurdan<sup>1</sup>, K. Nurdan<sup>1</sup>, L. Strüder<sup>1,2</sup>, A. H. Walenta<sup>1</sup>

<sup>1</sup>University of Siegen, Germany; <sup>2</sup>Max-Planck-Institute, Germany

**M10-64: Characteristics of 40,000 Quadrant-Sharing BGO Detectors Made By the Slab-Sandwich-Slice Technique**

R. Ramirez, W.-H. Wong, J. Uribe, H. Li, T. Xing, Y. Wang, Y. Liu, H. Baghaei, S. Xie, S. Kim, Y. Zhang, *University of Texas M.D. Anderson Cancer Center, USA*

**M10-68: Modelling the Readout Performance of a New Silicon Photodetector for Use in PET**

M. L. F. Lerch<sup>1</sup>, R. D. Ward<sup>1</sup>, P. E. Simmonds<sup>1</sup>, G. J. Takacs<sup>1</sup>, V. Pervetaylo<sup>2</sup>, S. R. Meikle<sup>3</sup>, A. B. Rosenfeld<sup>1</sup>

<sup>1</sup>University of Wollongong, Australia; <sup>2</sup>SPO-BIT, Ukraine; <sup>3</sup>Royal Prince Alfred Hospital, Australia

**M10-72: High Resolution Insert for Clinical Whole-Body PET Scanners: Design and Optimization**

M. Janacek, H. Wu, Y.-C. Tai, *Washington University in St. Louis, USA*

**M10-76: X-Ray Tube Voltage Dependent Attenuation Correction Scheme for PET/CT Scanners**

V. Rappoport, *CPS Innovations, USA*; J. Carney, D. W. Townsend, *University of Tennessee, USA*

**M10-80: A “Z” Phantom for Hybrid Camera Fusion Validation : Application to PET-CT**

G. Bonniaud<sup>1</sup>, P. Cossmann<sup>1,2</sup>, F. Lavielle<sup>1</sup>, D. Lefkopoulou<sup>1</sup>, M. Ricard<sup>1</sup>

<sup>1</sup>Institut Gustave-Roussy, France; <sup>2</sup>Hirslanden-Klinik Aarau, Switzerland

**M10-84: Small Field-of-View Gamma Camera for Stereotactic Breast Biopsy**

B. L. Welch, B. Kross, V. Popov, R. Wojcik, S. Majewski, *Thomas Jefferson National Accelerator Facility, USA*; R. F. Brem, *George Washington University, USA*

**M10-88: Monte Carlo Simulation of Combined microPET/CT Dose Delivered to Mice**

H. Liang, S. Cherry, *University of California, Davis, USA*

**M10-92: Tri-Modality Small Animal Imaging System**

L. A. Baumgart<sup>1</sup>, B. K. Kundu<sup>1</sup>, S. Majewski<sup>2</sup>, C. Zorn<sup>2</sup>, V. Popov<sup>2</sup>, M. B. Williams<sup>1</sup>

<sup>1</sup>University of Virginia, USA; <sup>2</sup>Thomas Jefferson National Lab, USA

**M10-96: Development of a High Resolution SPECT System Dedicated to Small Animal Imaging**

D. Brasse, I. Piqueras, J.-L. Guyonnet, *CNRS/IN2P3 et ULP, France*

**M10-100: Dental Implant Imaging with Pixel Detectors**

C. Granja, J. Jakubek, V. Linhart, *Czech Technical University, Czech Republic*; M. Cevallos, *Charles University, Czech Republic*; J. Krug, *Stomatological Center D.C.M., Czech Republic*

**M10-104: Heart and Respiratory Gating of Cardiac microPET/CT Studies in Mice**

M. C. Kreissl<sup>1</sup>, D. Stout<sup>2</sup>, R. W. Silverman<sup>2</sup>, H.-M. Wu<sup>1</sup>, A. F. Chatzioannou<sup>2</sup>, S.-C. Huang<sup>1</sup>, H. R. Schelbert<sup>1</sup>

<sup>1</sup>UCLA, USA; <sup>2</sup>Crump Institute for Molecular Imaging, USA

**M10-108: Depth-of-Interaction Encoding Small-Animal PET Detector with Sub-Nanosecond Timing Resolution**

K. C. Burr, A. Ivan, D. Castleberry, R. A. Thompson, J. W. LeBlanc, *GE Research, USA*; K. S. Shah, R. Farrell, *Radiation Monitoring Devices, Inc, USA*

**M10-112: Detector Optimization of a Small Animal PET Camera Based on Continuous LSO Crystals and a Flat Panel PSPMTs**

N. Gimenez, J. M. Benlloch, F. Sánchez, M. Giménez, C. W. Lerche, N. Pavon, F. Maria, *IFIC-Instituto de Fisica Corpuscular, Spain*; A. Sebastià, J. D. Martínez, J. Cerdà, *Universidad Politècnica de Valencia, Spain*

**M10-116: Design Parameters of High Performance Multi-Pinhole SPECT**

B. M. W. Tsui, Y. Wang, S. P. Mok, W. P. Segars, *Johns Hopkins Medical Institutions, USA*

**M10-120: Gamma-Ray Focusing Optics for Small Animal Imaging**

M. J. Pivovarov<sup>1</sup>, W. C. Barber<sup>2</sup>, W. C. Craig<sup>1</sup>, B. H. Hasegawa<sup>2</sup>, B. D. Ramsey<sup>3</sup>, C. Taylor<sup>2</sup>

<sup>1</sup>Lawrence Livermore National Laboratory, USA; <sup>2</sup>Univ. of California, San Francisco, USA; <sup>3</sup>NASA Marshall Space Flight Center, USA

**M10-124: Derivation of the Input Function from Dynamic PET Images with the HRRT**

S. Baudrexel, R. Graf, C. Knoess, S. Vollmar, K. Wienhard, *MPI for neurological research, Germany*

**M10-128: On the Development of a High-Resolution Multi-Pinhole SPECT / CT**

C. Lackas, N. U. Schramm, J. W. Hoppin, H. Halling, *Research Center Jülich, Germany*

**M10-132: Preliminary Design Studies of a High Sensitivity Small Animal DOI-PET Scanner: iPET-RD**

K. Kitamura<sup>1,2</sup>, T. Yamaya<sup>2</sup>, E. Yoshida<sup>2</sup>, T. Tsuda<sup>2</sup>, N. Inadama<sup>2</sup>, H. Murayama<sup>2</sup>

<sup>1</sup>Shimadzu Corporation, Japan; <sup>2</sup>National Institute of Radiological Sciences, Japan

**M10-136: Statistical 3D Image Reconstruction for the RatCAP PET Tomograph Using a Physically Accurate, Monte Carlo Based System Matrix**

S. Shokouhi<sup>1</sup>, P. Vaska<sup>2</sup>, D. Schlyer<sup>2</sup>, M. Purschke<sup>2</sup>, C. Woody<sup>2</sup>, S. Stoll<sup>2</sup>, S. Southekal<sup>1</sup>, A. Villanueva<sup>2</sup>

<sup>1</sup>Stony Brook University (SUNYSB), USA; <sup>2</sup>BNL, USA

**M10-140: Characterisation of a Silicon Photodiode Array Module for PET**

J. B. Culpepper, G. N. Taylor, *The University of Melbourne, Australia*; M. L. F. Lerch, A. B. Rosenfeld, *The University of Wollongong, Australia*

**M10-144: Observations Regarding Scatter Fraction and NEC Measurements for Small Animal PET**

Y. Yang, S. R. Cherry, *UC Davis, USA*

**M10-148: Tests and Measurements for Characteristics Optimization of Photomultiplier Tubes Used in a Positron Emission Tomography System Ystem**

M. Nikolaou<sup>1,2</sup>, D. Drakoulakos<sup>1</sup>, D. Karamitos<sup>1</sup>, G. Kontaxakis<sup>1</sup>, E. Logaras<sup>1</sup>, G. Panayotakis<sup>2</sup>, S. Pavlopoulos<sup>3</sup>, M. Skiadas<sup>1</sup>, G. Spyrou<sup>1,2</sup>, T. Thireou<sup>3</sup>, G. S. Tzanakos<sup>1</sup>, D. Vamvakas<sup>1</sup>

<sup>1</sup>University of Athens, Greece; <sup>2</sup>University of Patras, Greece; <sup>3</sup>National Technical University of Athens, Greece

**M10-152: Improvement of Noise Equivalent Count Rate Using Compton Kinematics in a Compton PET**

S.-J. Park, W. L. Rogers, N. H. Clinthorne, *Univ. of Michigan, USA*

**M10-156: Iodine 125 Imaging in Mice Using NaI(Tl)/Flat Panel PMT Integral Assembly**

M. N. Cinti<sup>1</sup>, S. Majewski<sup>2</sup>, M. B. Williams<sup>3</sup>, C. Bachmann<sup>3</sup>, B. K. Kundu<sup>3</sup>, A. Stolin<sup>3</sup>, V. Popov<sup>2</sup>, B. L. Welch<sup>2</sup>, G. De Vincentis<sup>1</sup>, R. Pani<sup>1</sup>

<sup>1</sup>University of Rome, Italy; <sup>2</sup>Thomas Jefferson National Facility, USA;

<sup>3</sup>University of Virginia, USA

**M10-160: Analog Processing Board for the MiCE Small Animal PET Scanner**

B. K. Park, T. K. Lewellen, R. S. Miyaoka, M. Janes, P. E. Kinahan, *University of Washington, USA*

**M10-164: Performance of a PET Prototype Demonstrator Based on Non-Pixelated Scintillators**

P. Bruyndonckx<sup>1</sup>, C. Lemaître<sup>1</sup>, S. Léonard<sup>1</sup>, D. R. Schaart<sup>2</sup>, D. J. van der Laan<sup>2</sup>, M. C. Maas<sup>2</sup>, Y. Wu<sup>1</sup>, M. Krieguer<sup>1</sup>, S. Tavernier<sup>1</sup>, O. Devroede<sup>1</sup>

<sup>1</sup>Vrije Universiteit Brussel, Belgium; <sup>2</sup>Delft University of Technology, the Netherlands

**M10-168: A Fast Convergent Ordered Subset Bayesian Reconstruction for Emission Tomography**

I.-T. Hsiao, *Chang Gung University, Taiwan*; A. Rangarajan, *University of Florida, USA*; P. Khurd, G. Gindi, *SUNY at Stony Brook, USA*

**M10-172: A General Fan-Beam Reconstruction Formula for Free-Form Trajectories**

L. Li, Z. Chen, Y. Xing, *Tsinghua University, China*

**M10-176: A Study of Noise and Spatial Resolution for 2D and 3D Filtered Backprojection Reconstruction**

B. De Man, S. Basu, *GE Global Research, USA*

**M10-180: Acceleration of Iterative X-Ray CT Image Reconstruction Using Floating Point Precision Graphics Hardware**

J. S. Kole, F. J. Beekman, *Image Sciences Institute, UMCU, the Netherlands*

**M10-184: Compression of a Monte-Carlo Based System Matrix for Iterative Reconstruction of PET Images**

N. S. Rehfeld, M. Alber, M. Fippel, F. Nuesslin, *Institute for Radiooncology - University of Tuebingen, Germany*

**M10-188: Improved Noise Characteristics in OSEM Reconstruction of Fan Beam SPECT Using a Rotating/Warping Projector/Backprojector with a Distance Dependent Summing Kernel**

M. J. Stumpf, E. C. Frey, B. M. W. Tsui, *Johns Hopkins University, USA*; G. T. Gullberg, *Lawrence Berkeley Lab, USA*

**M10-192: Direct List Mode Reconstruction for Motion Compensation**

R. H. Huesman, J. Qi, *Lawrence Berkeley National Laboratory, USA*; D. Samaras, Y. Wang, L. Yang, W. Zhang, *SUNY at Stony Brook, USA*; R. Ferrieri, P. Vaska, D. Schlyer, *Brookhaven National Laboratory, USA*

**M10-196: Software Architecture of the MOLAR-HRRT Reconstruction Engine**

C. A. Johnson<sup>1</sup>, S. Thada<sup>2</sup>, Y. Zhao<sup>1,3</sup>, A. R. Iano-Fletcher<sup>1</sup>, J.-S. Liow<sup>4</sup>, W. C. Barker<sup>1</sup>, R. L. Martino<sup>1</sup>, R. E. Carson<sup>1</sup>

<sup>1</sup>National Institutes of Health, USA; <sup>2</sup>CPS Innovations, Inc., USA;

<sup>3</sup>Contractor, Macrosys Research and Technology, USA; <sup>4</sup>National Institute of Mental Health, USA

**M10-200: A Projection Access Scheme for Iterative Reconstruction Based on the Golden Section**

T. Koehler, *Philips Research Laboratories, Germany*



**M10-204: A Fast and Accurate Tomosynthesis Simulation Model**S. Yoon<sup>1</sup>, A. R. Pineda<sup>1</sup>, E. G. Solomon<sup>2</sup>, J. Starlack<sup>2</sup>, R. Fahrig<sup>1</sup><sup>1</sup>Stanford University, USA; <sup>2</sup>NexRay, Inc., USA**M10-208: Application of Ordered Subsets Expectation Maximization (OSEM) Algorithm to Cone-Beam SPECT for Accelerated 3D Reconstruction**A. Krol<sup>1</sup>, D. H. Feiglin<sup>1</sup>, W. Lee<sup>1</sup>, V. R. Kunniyur<sup>2</sup>, R. B. Salgado<sup>3</sup>, I. L. Coman<sup>4</sup>, E. D. Lipson<sup>2</sup>, D. A. Karczewski<sup>1</sup>, F. D. Thomas<sup>1</sup><sup>1</sup>SUNY Upstate Medical University, USA; <sup>2</sup>Syracuse University, USA;<sup>3</sup>Dillard University, USA; <sup>4</sup>Ithaca College, USA**M10-212: Dynamic GMRF Priors for MAP Reconstructions**Y. Xing<sup>1</sup>, H. Lu<sup>2</sup>, L. Zhang<sup>1</sup><sup>1</sup>Tsinghua Univ., China; <sup>2</sup>The Fourth Military Medical Univ., China**M10-216: Study of a Convergent Subsetized List-Mode EM Reconstruction Algorithm**A. Rahmim<sup>1</sup>, T. J. Ruth<sup>2</sup>, V. Sossi<sup>1</sup><sup>1</sup>University of British Columbia, Canada; <sup>2</sup>UBC/Triumf, Canada**M10-220: Ray Tracing Through a Grid of Blobs**

L. M. Popescu, R. M. Lewitt, University of Pennsylvania, USA

**M10-224: Accurate and Efficient Image Reconstruction for Spatio-Temporal CT**

Y. Chen, H. Kudo, University of Tsukuba, Japan; F. Noo, University of Utah, USA; M. Defrise, Vrije Universiteit Brussels, Belgium

**M10-228: Modeling and Incorporation of System Response Functions in 3D Whole Body PET**

A. M. Alessio, P. E. Kinahan, T. K. Lewellen, University of Washington, USA

**M10-232: ROI Cone-Beam CT on a Circular Orbit for Geometric Magnification Using Reprojection**

G. Tisson, Visionlab-University of Antwerp, Belgium

On behalf of the Visionlab

**M10-236: New Imaging Probe with Crystals Integrated in Square Holed Collimator**R. Massari<sup>1,2</sup>, C. Trotta<sup>1,2</sup>, L. Montani<sup>3</sup>, G. Iurlaro<sup>3</sup>, A. Santagata<sup>3</sup>, N. Burgio<sup>3</sup>, F. Santandrea<sup>4</sup>, F. Scopinaro<sup>1,5</sup>, R. Scafé<sup>3</sup>, A. Soluri<sup>1,2</sup><sup>1</sup>Institute of Biomedical Engineering - CNR, Italy; <sup>2</sup>Li-tech S.r.l., Italy;<sup>3</sup>ENEA, C.R. Casaccia, Italy; <sup>4</sup>Labor S.r.l., Italy; <sup>5</sup>Nuclear Medicine University, Italy**M10-240: Characterization of Performance of a Miniature, High Sensitivity Gamma Ray Camera**

P. D. Olcott, F. Habte, C. S. Levin, A. M. Foudray, Stanford University, USA

**M10-244: Creating Consistent 3D Multi-Modality Data Sets from Autoradiographic and Histological Images of the Rat Brain**U. K. Pietrzyk<sup>1,2</sup>, D. Bauer<sup>1</sup>, A. Bauer<sup>1</sup>, K.-J. Langen<sup>1</sup>, K. Zilles<sup>1,3</sup><sup>1</sup>Institute of Medicine - FZ Juelich, Germany; <sup>2</sup>University of Wuppertal, Germany; <sup>3</sup>University of Duesseldorf, Germany**M10-248: DISIS - a Computer Simulation Code for Discrete Scintillation Imagers**

R. Scafé, G. Iurlaro, L. Montani, A. Santagata, N. Burgio, ENEA, C.R. Casaccia, Italy

**M10-252: Simulation Studies of Image Quality with Time-of-Flight PET Capability**

Y. Shao, R. M. Manjeshwar, F. P. Jansen, Global Research Center, General Electric, USA

**M10-256: Application of Monte Carlo Calculation for the Virtual Calibration of a Low-Energy in Vivo Counting System**N. Pierrat<sup>1</sup>, L. de Carlan<sup>1</sup>, D. Cavadore<sup>2</sup>, D. Franck<sup>1</sup><sup>1</sup>Institute of Radiological Protection and Nuclear Safety, France;<sup>2</sup>COGEMA, France**M10-260: Monte Carlo Simulation of X-Ray Multiple Refractive Scattering from Fine Structure Objects in the DEI Technique**A. Khromova<sup>1,2</sup>, L. Rigon<sup>3</sup>, F. Arfelli<sup>3</sup>, R. H. Menk<sup>4</sup>, H. J. Besch<sup>2</sup>, H. Plothow-Besch<sup>2</sup><sup>1</sup>National Kyiv University 'Kyiv-Mohyla Academy', Ukraine; <sup>2</sup>University of Siegen, Germany; <sup>3</sup>University of Trieste, Italy; <sup>4</sup>Sincrotrone Trieste, Italy**M10-264: Simulation and Measurement of Gamma Ray and Annihilation Photon Imaging Detectors**F. Habte<sup>1</sup>, P. D. Olcott<sup>1</sup>, A. M. K. Foudray<sup>1,2</sup>, C. S. Levin<sup>1</sup><sup>1</sup>Stanford University, USA; <sup>2</sup>University of California at San Diego, USA**M10-268: Validation of GATE Monte Carlo Simulations for Indium 111 Imaging**K. Assie<sup>1,2</sup>, I. Gardin<sup>2</sup>, P. Vera<sup>2</sup>, I. Buvar<sup>1</sup><sup>1</sup>U494 INSERM, France; <sup>2</sup>Laboratoire Universitaire QUANT.I.F., France**M10-272: Modelling of High-Energy Contamination in SPECT Imaging Using Monte Carlo Simulation**A. Cot<sup>1</sup>, E. Jané<sup>2</sup>, J. Sempau<sup>1</sup>, C. Falcon<sup>2</sup>, S. Bullich<sup>2</sup>, J. Pavia<sup>3,4</sup>, F. Calviño<sup>1</sup>, D. Ros<sup>2,4</sup><sup>1</sup>Universitat Politècnica de Catalunya, Spain; <sup>2</sup>University of Barcelona, Spain; <sup>3</sup>Hospital Clínic, Spain; <sup>4</sup>IDIBAPS, Spain**M10-276: Investigation of Image Quality and NEC in a TOF Capable PET Scanner**

S. Surti, J. S. Karp, M. E. Daube-Witherspoon, M. E. Werner, University of Pennsylvania, USA

**M10-280: Cascaded Linear System Model for a Semiconductor Hybrid Pixel Detector**L. del Risco Norrild<sup>1</sup>, F. Edling<sup>1</sup>, K. Fransson<sup>2</sup>, R. Brenner<sup>1</sup>, C. Rönqvist<sup>3</sup>, N. Bingerfors<sup>1</sup>, L. Gustafsson<sup>1</sup><sup>1</sup>Uppsala University, Sweden; <sup>2</sup>The Svedberg Laboratory, Sweden; <sup>3</sup>IBA Scanditronix Wellhöfer, Sweden**M10-284: LSO PET/CT Pico Performance Improvements with Ultra Hi-Rez Option**

Y. Bercier, M. Casey, J. Young, T. Wheelock, T. Gremillion, CPS Innovations, USA

**M10-288: An Evaluation of Various Analytic Reconstruction Algorithms and Implementations for 2D and 3D PET**K. P. Dinelle<sup>1</sup>, K. Thielemans<sup>1</sup>, C. Tsoumpas<sup>1,2</sup>, T. J. Spinks<sup>1</sup><sup>1</sup>Hammersmith Imanet Ltd., UK; <sup>2</sup>National and Technical University of Athens, Greece

**M10-292:** The Evaluation of Imaging Performance of the a-Se Based Direct X-Ray Detector System

J. Y. Choi, D. W. Suk, J. K. Park, B. Y. Cha, S. H. Nam, *Inje University, South Korea*

**M10-296:** Optimization of the Reconstruction and Post-Reconstruction Processing Parameters in Simultaneous Rest Tl-201 and Stress Tc-99m Dual-Isotope Myocardial Perfusion SPECT

X. Song, E. C. Frey, X. He, W. P. Segars, B. M. W. Tsui, *Johns Hopkins University, USA*

**M10-300:** PET-SORTEO: a Platform for Simulating Realistic PET Studies

A. Reilhac<sup>1</sup>, G. Batan<sup>1</sup>, C. Michel<sup>2</sup>, N. Costes<sup>3</sup>, A. C. Evans<sup>1</sup>

<sup>1</sup>Montreal Neurological Institute, Canada; <sup>2</sup>CPS Innovations, USA;

<sup>3</sup>CERMER, France

**M10-304:** Image Quality Assessment of Pixelated Systems

A. Goedicke, H. Wiecek, H. Botterweck, W. Eckenbach, *Philips Research Laboratories, Germany*; L. Shao, M. Petrillo, J. Ye, J. Vesel, *Philips Medical Systems, USA*

**M10-308:** Evaluation of Rotating Slant Hole SPECT Mammography with Respect to Planar Scintimammography Using Monte Carlo Simulation Methods

C. Liu<sup>1</sup>, B. M. W. Tsui<sup>1</sup>, W. H. Baird<sup>2</sup>, Y. Wang<sup>1</sup>, E. C. Frey<sup>1</sup>

<sup>1</sup>The Johns Hopkins Medical Institutions, USA; <sup>2</sup>College of Charleston, USA

**M10-312:** Evaluation of Multiclass Model Observers in PET LROC Studies

H. C. Gifford<sup>1</sup>, P. E. Kinahan<sup>2</sup>, C. Lartizien<sup>3</sup>, M. A. King<sup>1</sup>

<sup>1</sup>Univ of Massachusetts Medical School, USA; <sup>2</sup>Univ of Washington, USA; <sup>3</sup>Univ Claude Bernard, France

**M10-316:** PET/CT: Testing for Effects of Attenuation Outside the CT Field-of-View

B. C. Penney, C.-M. Kao, X. Pan, H.-T. Chen, *University of Chicago, USA*

**M10-320:** Human and Numerical Observers Studies of Lesion Detection in Ga-67 Images Obtained with MAP-EM Reconstructions and Anatomical Priors

P. P. Bruyant<sup>1</sup>, H. C. Gifford<sup>1</sup>, G. Gindi<sup>2</sup>, M. A. King<sup>1</sup>

<sup>1</sup>University of Massachusetts, USA; <sup>2</sup>State University of New-York, USA

**M10-324:** Evaluation of PET Standard Uptake Values Dependence on Imaging Protocols for Dual Time Point Imaging

M. Ivanovic<sup>1</sup>, S. Loncaric<sup>2</sup>, W. McCartney<sup>1</sup>, A. Khandani<sup>1</sup>

<sup>1</sup>University of North Carolina, Chapel Hill, USA; <sup>2</sup>University of Zagreb, Croatia

**M10-328:** Simulating Time-of-Flight Positron Emission Tomography

R. L. Harrison, P. E. Kinahan, A. M. Alessio, T. K. Lewellen, *University of Washington, USA*

**M10-332:** A Pulse Shape Restore Method for Event Localization and Pileup Correction in PET Scintillation Detectors

N. Zhang, N. Doshi, M. Aykac, R. Grazioso, M. Loope, J. Corbeil, L. Eriksson, J. Young, M. Schmand, *CPS Innovations, Inc., USA*

**M10-336:** Impact of Motion Correction on Parametric Images in PET Neuroreceptor Studies

H. Herzog<sup>1</sup>, R. Fulton<sup>2</sup>, L. Tellmann<sup>1</sup>, I. Stangier<sup>1</sup>, D. Alvarez-Lopez<sup>1</sup>, U. Pietrzyk<sup>1</sup>

<sup>1</sup>Forschungszentrum Juelich, Germany; <sup>2</sup>Royal Prince Alfred Hospital, Australia

**M10-340:** Osteoarthritis Detection in X-Ray Images Using CNN Algorithms

S. - Banerjee, K. V. Chaitanya, D. - Banerjee, *Indian Institute of Information Technology-Calcutta (under WBUT), India*

**M10-344:** Spatiotemporal Scatter Models for Dynamic SPECT

B. W. Reutter, G. T. Gullberg, R. H. Huesman, *Lawrence Berkeley National Laboratory, USA*

**M10-348:** Renal Kinetic Parameters Estimation from Fast Activity Curves Sampling with a Three-Headed SPECT System

E. Vanzi, A. R. Formiconi, G. La Cava, A. Pupi, *University of Florence, Italy*

**M10-352:** Exploring Physiological Differences in Time-Frequency Domain to Improve Tumor Detectability for Dynamic PET

Z. Li, X. Yu, *University of Southern California, USA*

**M10-356:** Volumetric Partial Volume Quantification via a Statistical Model of 3D Voxel Gradient Magnitude

J. P. Chiverton, K. Wells, *Centre for Vision, Speech and Signal Processing, University of Surrey, UK*

**M10-360:** Connectivity Analysis in Very Large 3D Microtomographic Images

L. Apostol<sup>1,2</sup>, F. Peyrin<sup>1,2</sup>

<sup>1</sup>CREATIS, France; <sup>2</sup>ESRF, France

**M10-364:** A Method for Stoichiometric Reconstruction with Spectroscopic X-Ray Pixel Detectors

M. Firsching, J. Giersch, D. Niederlöhner, G. Anton, *Friedrich-Alexander-Universität, Germany*

**M10-368:** Determination of Tracer Arrival Delay with Spectral Analysis

R. Hinz<sup>1</sup>, F. E. Turkheimer<sup>1,2</sup>

<sup>1</sup>Hammersmith Imanet Ltd., UK; <sup>2</sup>Imperial College, UK

**M10-372:** Correction of Partial Volume Effects for PET Imaging: a Comparison Study

E. Rota Kops, *Institute of Medicine, Research Center Juelich, Germany*; A. Reilhac, *McConnell Brain Imaging Centre, Canada*

**M10-376:** Mixed Wavelet-Watershed Method for Nodule Detection in High Resolution Scintigraphy

A. Pousse, J. Chavanelle, L. Pastor, M. Parmentier, B. Kastler, *Lab Imagerie Ingénierie pour la Santé, France*

**M10-380:** Evaluation of Partial Volume Correction for FDG PET and Perfusion SPECT Data

C. Grova<sup>1,2</sup>, B. Aubert-Broche<sup>2</sup>, A. Reilhac<sup>3</sup>, B. Gibaud<sup>2</sup>

<sup>1</sup>Montreal Neurological Institute - McGill University, Canada;

<sup>2</sup>Laboratoire IDM, France; <sup>3</sup>McConnell Brain Imaging Center - Montreal Neurological Institute - McGill University, Canada

**M10-384: A Unifying Framework for Inhomogeneity Correction and Partial Volume Segmentation of MR Brain Images**

L. Li<sup>1,2</sup>, X. Li<sup>3</sup>, X. Wei<sup>2</sup>, Z. Liang<sup>1</sup>

<sup>1</sup>State University of New York at Stony Brook, USA; <sup>2</sup>City University of New York, USA; <sup>3</sup>Columbia University, USA

**M10-388: Detection and Classification of Microcalcifications Clusters in Digital Mammograms**

C. S. Cheran<sup>1,2</sup>, R. Cataldo<sup>3,4</sup>, P. Cerello<sup>2</sup>, F. De Carlo<sup>5,6</sup>, F. Fauci<sup>7,8</sup>, G. Forni<sup>9,10</sup>, B. Golosio<sup>11,12</sup>, A. Lauria<sup>9,12</sup>, E. Lopez Torres<sup>13</sup>, D. Martello<sup>4,3</sup>, G. Masala<sup>11,12</sup>, G. Raso<sup>7,8</sup>, A. Retico<sup>14,15</sup>, A. Tata<sup>14,15</sup>

<sup>1</sup>Universita Degli Studi di Torino, Italy; <sup>2</sup>INFN - Sezione di Torino, Italy; <sup>3</sup>Universita di Lecce, Italy; <sup>4</sup>INFN - Sezione di Lecce, Italy; <sup>5</sup>Universita di Bari, Italy; <sup>6</sup>INFN - Sezione di Bari, Italy; <sup>7</sup>Universita di Palermo, Italy; <sup>8</sup>INFN - Sezione di Catania, Italy; <sup>9</sup>INFN - Sezione di Napoli, Italy; <sup>10</sup>Universita di Napoli, Italy; <sup>11</sup>INFN - Sezione di Cagliari, Italy; <sup>12</sup>Universita di Sassari, Italy; <sup>13</sup>CEADEN, Cuba; <sup>14</sup>Universita di Pisa, Italy; <sup>15</sup>INFN - Sezione di Pisa, Italy

**M10-392: Locally Constrained Mixture Representation of Dynamic Imaging Data from PET and MR Studies**

F. O'Sullivan<sup>1,2</sup>, J. O'Sullivan<sup>1</sup>, M. Muzi<sup>2</sup>, A. Spence<sup>2</sup>, J. Caldwell<sup>2</sup>, G. Newman<sup>3</sup>

<sup>1</sup>University College, Ireland; <sup>2</sup>University of Washington, USA; <sup>3</sup>University of Wisconsin, USA

**M10-396: The Effect of Patient, Acquisition and Reconstruction Variables in Myocardial Wall Thickness as Measured from Myocardial Perfusion SPECT Studies**

K. L. Dixon, University of British Columbia, Canada; A. Fung, A. Celler, Vancouver Coastal Health, Canada

**M10-400: An Adaptive Neural Network Approach to Decomposition of Patient Stereo-Infrared Tracking Motion Data During Cardiac SPECT Imaging Using Asymmetric Median Filters**

R. D. Beach<sup>1</sup>, H. Depold<sup>1</sup>, G. Boening<sup>1</sup>, P. P. Bruyant<sup>1</sup>, B. Feng<sup>1</sup>, H. C. Gifford<sup>1</sup>, M. A. Gennert<sup>2</sup>, S. Nadella<sup>2</sup>, M. A. King<sup>1</sup>

<sup>1</sup>University of Massachusetts Medical School, USA; <sup>2</sup>Worcester Polytechnic Institute, USA

**M10-404: Comparison of Region-of-Interest Analysis and Human Observers in the Diagnosis of Parkinson's Disease Using [Tc-99m]TRODAT-1 and SPECT**

P. D. Acton, A. Newberg, K. Plössl, University of Pennsylvania, USA; D. Mozley, Eli Lilly, USA

**M10-408: Considerations in Analysis of microPET FDG Data in Awake Rhesus**

T. R. Oakes, A. S. Fox, A. K. Converse, T. E. Barnhart, S. E. Shelton, N. H. Kalin, University of Wisconsin-Madison, USA

**M10-412: Evaluation of (Generalised) Linear Least Squares and Basis Function Methods for Calculating CBF, OEF and CMRO Using [0-15] Oxygen and PET**

R. Boellaard, A. A. Lammertsma, VU University Medical Centre, the Netherlands

**M10-416: Depth of Interaction Effect on Timing Resolution in PET Block Detectors**

A. Ivan, K. C. Burr, Y. Shao, J. W. LeBlanc, GE Research, USA

**M10-420: Medical X-Ray Imaging Device Using Silicon Strip Detectors**

S. Yoshida, T. Ohsugi, Hiroshima University, Japan

**M10-424: Electronics for a Compact Photon-Counting Gamma Camera based on an Electron-multiplying CCD**

G. de Vree<sup>1</sup>, B. Westra<sup>2</sup>, I. Moody<sup>3</sup>, K. Ligtrvoet<sup>2</sup>, F. Beekman<sup>1</sup>

<sup>1</sup>Image Sciences Institute and Rudolf Magnus Institute of Neuroscience, University Medical Center Utrecht, the Netherlands; <sup>2</sup>University Medical Center, the Netherlands; <sup>3</sup>E2V Technologies, UK

**M10-428: Optical and Scintillation Characteristics of Bridgman LuAP Single Crystals for Positron Emission Tomography**

A. G. Petrosyan<sup>1</sup>, M. Derdzian<sup>1</sup>, P. Lecoq<sup>2</sup>, E. Auffray<sup>2</sup>, C. Pedrini<sup>3</sup>, C. Dujardin<sup>3</sup>, C. Kuntner<sup>2</sup>, P. Sempere<sup>2</sup>, K. Ovanesyan<sup>1</sup>, I. Kamenskikh<sup>4</sup>

<sup>1</sup>Institute for Physical Research, Armenia; <sup>2</sup>CERN, Switzerland; <sup>3</sup>University Claude Bernard Lyon1 & UMR 5620 CNRS, France; <sup>4</sup>M.V.Lomonosov Moscow State University, Russia

**M10-432: Development of a Pre-Clinical Compton Probe Prototype for Prostate Imaging**

G. Llosa<sup>1</sup>, J. Bernabeu<sup>1</sup>, E. Chesi<sup>2</sup>, V. Cindro<sup>3</sup>, N. H. Clinthorne<sup>4</sup>, Y. Dewaraja<sup>4</sup>, K. Honscheid<sup>2</sup>, H. Kagan<sup>2</sup>, C. Lacasta<sup>1</sup>, N. Malakhov<sup>2</sup>, M. Mikuz<sup>3</sup>, P. Modesto<sup>1</sup>, W. L. Rogers<sup>3</sup>, S. Roe<sup>3</sup>, A. Studen<sup>3</sup>, P. Weilhammer<sup>6</sup>, L. Zhang<sup>4</sup>, D. Zontar<sup>3</sup>

<sup>1</sup>Instituto de Fisica Corpuscular (IFIC), Spain; <sup>2</sup>Ohio State University, USA; <sup>3</sup>Jozef Stefan Institut - University of Ljubljana, Slovenia; <sup>4</sup>University of Michigan, USA; <sup>5</sup>CERN, Switzerland; <sup>6</sup>INFN-University of Perugia, Italy

**M10-436: Energy spectra and their calibration of four-layer DOI detector for brain PET scanner: jPET-D4**

E. Yoshida<sup>1</sup>, K. Kitamura<sup>2,1</sup>, T. Tsuda<sup>3,1</sup>, N. Inadama<sup>1</sup>, H. Murayama<sup>1</sup>

<sup>1</sup>National Institute of Radiological Sciences, Japan; <sup>2</sup>Shimadzu Corporation, Japan; <sup>3</sup>Chiba University, Japan

**M10-440: Assessment of Photodiodes as a Light Detector for PET Scanners**

T. Frach<sup>1</sup>, W. Rütten<sup>1</sup>, K. Fiedler<sup>1</sup>, G. Maehlum<sup>2</sup>, T. Solf<sup>1</sup>, A. Thon<sup>1</sup>

<sup>1</sup>Philips Research Labs, Germany; <sup>2</sup>IDEAS ASA, Norway

**M10-444: A New Flat-Panel Detector for Low Dose Digital X-Ray Imaging**

W. Zhao, SUNY at Stony Brook, USA; K. Tanioka, NHK Research and Technical Laboratory, Japan; D. C. Hunt, J. A. Rowlands, Sunnybrook & Women's College Health Sciences Center, Canada

**M10-448: A Penalized Likelihood Approach to Estimation of Kinetic Models for PET 1-[C-11] Glucose and FDG Studies**

M. L. Byrtek, F. O'Sullivan, University College Cork, Ireland; M. Muzi, A. M. Spence, University of Washington, USA

**M10-452: Analog Tests of the New ISPA-Tube Readout System**

P. Sousa<sup>1,2</sup>, M. C. Abreu<sup>1,2</sup>, V. Cencelli<sup>3</sup>, F. Cindolo<sup>3</sup>, E. D'Abramo<sup>3</sup>, C. D'Ambrosio<sup>4</sup>, F. De Notaristefani<sup>3</sup>, G. Hull<sup>3</sup>, H. Leutz<sup>4</sup>, C. Ortigão<sup>2</sup>, L. Peralta<sup>2</sup>, P. Rato Mendes<sup>2</sup>, E. Rosso<sup>4</sup>

<sup>1</sup>University of Algarve, FCT, Portugal; <sup>2</sup>Laboratório de Instrumentação e Física Experimental de Partículas, Portugal; <sup>3</sup>Istituto Nazionale di Fisica Nucleare, Italy; <sup>4</sup>CERN, Switzerland

#### **M10-456: First Results of Scintillator Readout with Silicon Photomultiplier Detectors**

D. J. Herbert<sup>1</sup>, V. Saveliev<sup>2</sup>, N. Belcar<sup>1</sup>, N. D'Ascenzo<sup>1</sup>, A. Del Guerra<sup>1</sup>, A. Golovin<sup>2</sup>

<sup>1</sup>University of Pisa, Italy; <sup>2</sup>Obninsk State University of Nuclear Engineering, Russia

#### **M10-460: Comparative Assessment of Different Computational Models for Generation of X-Ray Spectra in Diagnostic Radiology and Mammography**

M. R. Ay<sup>1,2</sup>, S. Sarkar<sup>3</sup>, M. Shahriari<sup>4</sup>, D. Sardari<sup>2</sup>, H. Zaidi<sup>1</sup>

<sup>1</sup>Geneva University Hospital, Switzerland; <sup>2</sup>Amirkabir University of Technology, Iran; <sup>3</sup>Tehran University of Medical science, Iran; <sup>4</sup>Shahid Beheshti University, Iran

#### **M10-464: Analysis of Time Resolution in Dynamic Computed Tomography for Perfusion Studies**

P. Montes, *Interdisciplinary Center for Scientific Computing, Germany*; G. Lauritsch, *Siemens Medical Solutions, Germany*

#### **M10-468: Back Illuminated Photodiodes for Multislice CT Beyond 50 Slices**

R. Luhta, R. Mattson, *Philips Medical Systems, USA*

#### **M10-472: Imaging Radiation Sensitive Gels Using X-Ray Micro-Tomography**

P. M. Jenneson, E. C. Atkinson, S. J. Doran, *School of Electronics and Physical Sciences, University of Surrey, UK*

#### **M10-476: Exact Image Reconstruction in a Helical Cone-Beam Scan with a Variable Pitch**

Y. Zou, X. Pan, D. Xia, *The University of Chicago, USA*; G. Wang, *University of Iowa, USA*

#### **M10-480: Motion Estimation and Compensation in Dynamic Spiral CT Reconstruction**

J. A. Kimdon, *University of California at Berkeley, USA*; P. Grangeat, A. Koenig, S. Bonnet, *CEA-LETI, France*

#### **M10-484: Basis Functions for Estimating Intravoxel Structure in Diffusion MRI**

A. Ramirez-Manzanares, M. Rivera, *Centro de Investigacion en Matematicas, Mexico*

#### **M10-488: Quantitation of PET Studies with Limited Blood Sampling**

J. Kirrane<sup>1</sup>, F. O'Sullivan<sup>1,2</sup>, M. Byrtek<sup>1</sup>, M. Muzi<sup>2</sup>, A. Spence<sup>2</sup>

<sup>1</sup>University College, Ireland; <sup>2</sup>University of Washington, USA

#### **M10-492: Real-Time Speckle Reduction and Coherence Enhancement of Ultrasound Images Based on Mixture of Anisotropic Savitzky-Golay Filters**

C. Chinrungrueng, P. Toonkum, *Chulalongkorn University, Thailand*

### **M11 Modelling and Quantitative Processing**

Friday, October 22 16:00-18:15, Leptis Magna 1&2

Session Chairs: Anna Celler, *Vancouver Hospital and Health Sciences Centre*

Hidehiro Iida, *National Cardio-Vascular Center, Japan*

#### **M11-1: (16:00) Blind Deconvolution in Tracer Kinetic Models with Explicit Input Function Constraints**

J. S. Maltz, *Berkeley Lab, University of California, USA*

#### **M11-2: (16:15) A Generalized Approach to Ensuring Unique Solutions in Factor Analysis of Dynamic Sequences**

A. Sitek, *Harvard Medical School and Beth Israel Deaconess Medical Center, USA*; G. El Fakhri, *Harvard Medical School and Brigham & Women's Hospital, USA*

#### **M11-3: (16:30) Theoretical Comparison of Uniform Resolution Penalized Likelihood Dynamic PET Images with Multiframe Penalized Likelihood Static PET Images**

E. Asma, R. M. Leahy, *University of Southern California, USA*

#### **M11-4: (16:45) Reproducibility of SUV Estimates in FDG PET: a Monte Carlo Study**

J. Feuardent<sup>1</sup>, M. Soret<sup>1,2</sup>, I. Buvat<sup>1</sup>

<sup>1</sup>U494 INSERM, France; <sup>2</sup>HIA Val de Grace, France

#### **M11-5: (17:00) Accuracy of Motion Correction Methods for PET Brain Imaging**

R. R. Fulton<sup>1</sup>, L. Tellmann<sup>2</sup>, U. Pietrzyk<sup>2</sup>, O. Winz<sup>2</sup>, I. Stangier<sup>2</sup>, I. Nickel<sup>2</sup>, A. Schmid<sup>2</sup>, S. Meikle<sup>1</sup>, H. Herzog<sup>2</sup>

<sup>1</sup>Royal Prince Alfred Hospital, Australia; <sup>2</sup>Research Center Juelich, Germany

#### **M11-6: (17:15) Physiologically Realistic LV Models to Produce Normal and Infarcted Image and Phantom Data**

A. I. Veress<sup>1</sup>, W. P. Segars<sup>2</sup>, B. M. W. Tsui<sup>2</sup>, J. A. Weiss<sup>1</sup>, G. T. Gullberg<sup>3</sup>

<sup>1</sup>University of Utah, USA; <sup>2</sup>Johns Hopkins University, USA; <sup>3</sup>Lawrence Berkeley Laboratory, USA

#### **M11-7: (17:30) Effect of Uncorrected Patient Movement in Conventional and Stationary SPECT**

R. Clackdoyle, Z. Fu, J. A. Roberts, R. Maddula, *University of Utah, USA*

#### **M11-8: (17:45) An Investigation of Iterative Reconstruction Strategies for Lung Lesion Detection in SPECT**

H. C. Gifford<sup>1</sup>, X. M. Zheng<sup>2</sup>, G. Boening<sup>1</sup>, P. P. Bruyant<sup>1</sup>, M. A. King<sup>1</sup>

<sup>1</sup>Univ Massachusetts Medical School, USA; <sup>2</sup>Charles Sturt University, Australia

#### **M11-9: (18:00) MIC Closing Session**



It is our great pleasure to welcome you at the 14<sup>th</sup> International Workshop on Room-Temperature Semiconductor X-Ray and Gamma-Ray Detectors. This conference represents the largest forum of scientists and engineers working to develop new solid-state radiation detectors and imaging arrays.

For those of you who have attended the past workshops, welcome back! As Chairs of the workshop, we are particularly delighted to make the acquaintance of new contributors, as there are many challenges that lie ahead, some of which will be solved by those who are relatively new to the subject area.

It is our sincere hope that this conference will facilitate cross-fertilization of research and spawn creative ideas, and that these ideas will be incarnated into knowledge, lending to new directions and thrusts. We urge you to take time at this meeting to build on the commonality of your work with colleagues within the RTSD, NSS and MIC conferences, and to share your data, energy and experience, and explore ways to enhance cooperation and collaboration with others.

We have chosen to hold this meeting in conjunction with the IEEE NSS and MIC meetings for the purpose of encouraging information exchange between a much larger body of scientists and engineers who have an in-depth knowledge of detectors, instrumentation, nuclear science and technology, and medical imaging. A joint session with MIC has been planned to help bring people together with common interests and offer the right environment for the creation of new and fruitful associations.

This year the RTSD luncheon will be held on Thursday, October 21<sup>st</sup> in Sala Ristorante "Le Quattro Stagioni", at the Hotel Ergife. You are encouraged to purchase your ticket(s) when you pre-register as seating is limited.

We would like to thank the speakers and attendees for their contributions, and express our gratitude to the session chairs and members of the Workshop Program Committee, who have offered their time to enlist the involvement of most researchers in the field.

Eugenio Perillo, RTSD Program Co-Chair  
Ralph B. James, RTSD Program Co-Chair



RTSD Program Co-Chair  
Eugenio Perillo



RTSD Program Co-Chair  
Ralph B. James

## R1 Opening and Overviews

Monday, October 18 14:00-15:15, Orange 1  
Session Chair: **Ralph James, BNL**

### R1-1, invited: (14:00) Performance Characteristics of Frisch-Grid CdZnTe Detectors

A. E. Bolornikov, G. S. Camarda, G. A. Carini, R. B. James, G. W. Wright, *Brookhaven National Laboratory, USA*; D. S. McGregor, W. McNeil, *Kansas State University, USA*; M. Fiederle, *Albert-Ludwigs-Universitaet Freiburg, Germany*

### R1-2, invited: (14:20) Compensation Processes in Cd-Based Compounds

A. Cavallini, B. Fraboni, *University of Bologna and INFN, Italy*; W. Dusi, *CNR, Italy*

### R1-3, invited: (14:40) Development of Nuclear Radiation Detectors with Energy Discrimination Capabilities Based on Thick CdTe Layers Grown by Metalorganic Vapor Phase Epitaxy

K. Yasuda, M. Niraula, H. Kusama, Y. Yamamoto, M. Tominaga, K. Takagi, Y. Agata, *Nagoya Institute of Technology, Japan*; K. Suzuki, *Hokkaido Institute of Technology, Japan*

### R1-4: (15:00) Performance of a Large Area Mercuric Iodide Lung Counter

M. W. Mallett, M. E. Ennis, *Los Alamos National Laboratory, USA*; A. E. Proctor, L. van den Berg, J. W. Hintenach, *Constellation Technology Corp., USA*

## R2 CZT and CdTe Growth and Characterization I

Monday, October 18 16:00-18:00, Orange 1  
Session Chair: **Csaba Szeles, eV PRODUCTS**

### R2-1, invited: (16:00) Characterization of Indium Doped (Cd,Zn)Te

M. Fiederle, A. Fauler, V. Babentsov, *Albert-Ludwigs-Universitaet Freiburg, Germany*; G. Wright, A. Bolotnikov, R. B. James, *Brookhaven National Laboratory, USA*

### R2-2, invited: (16:20) Optical Monitoring of Partial Vapor Pressures in CdZnTe System: a New Tool for Material Technology Development

A. Zappettini, F. Bissoli, R. Waldner, M. Zha, L. Zanotti, *IMEM-CNR, Italy*

### R2-3: (16:40) Bulk Resistivity and Surface Leakage of CdZnTe Radiation Detectors

M. Prokesch, C. Szeles, *eV PRODUCTS, a division of II-VI Incorporated, USA*

### R2-4: (16:55) Structural and Electronic Properties of Hydrogen-Transport VPE Grown CdTe Single-Crystal Layers

N. Lovergine<sup>1,2</sup>, P. Prete<sup>2</sup>, A. Mancini<sup>1,2</sup>, L. Tapfer<sup>3</sup>, K. Jarasunas<sup>4</sup>, E. Gaubas<sup>4</sup>

<sup>1</sup>Università di Lecce, Italy; <sup>2</sup>Sez. di Lecce, Italy; <sup>3</sup>Centro Ricerche di Brindisi, Italy; <sup>4</sup>University of Vilnius, Lithuania

## **R2-5: (17:10) Synchrotron Radiation Response Characterization of Coplanar Grid CZT Detectors**

G. A. Carini<sup>1,2</sup>, A. E. Bolotnikov<sup>1</sup>, G. S. Camarda<sup>1</sup>, G. W. Wright<sup>1</sup>, G. De Geronimo<sup>1</sup>, D. P. Siddons<sup>1</sup>, R. B. James<sup>1</sup>

<sup>1</sup>Brookhaven National Laboratory, USA; <sup>2</sup>University of Palermo, Italy

## **R2-6: (17:25) Charge Transients Locally Induced by Laser Pulses in CdTe Multi-Strip Detectors**

L. Farella<sup>1</sup>, A. Cola<sup>1</sup>, E. Caroli<sup>2,3</sup>, A. Donati<sup>2,3</sup>, W. Dusi<sup>2,3</sup>, G. Ventura<sup>2,3</sup>, E. Perillo<sup>4,5</sup>

<sup>1</sup>Istituto per la Microelettronica e Microsistemi IMM/CNR-Sezione di Lecce, Italy; <sup>2</sup>IASF/CNR-Sezione di Bologna, Italy; <sup>3</sup>INFN-Sezione di Bologna, Italy; <sup>4</sup>Università di Napoli, Italy; <sup>5</sup>INFN-Sezione di Napoli, Italy

## **R2-7: (17:40) Laser-Induced Formation of p-n Junctions in CdTe Crystals for Nuclear Radiation Detectors**

V. A. Gnatyuk<sup>1</sup>, T. Aoki<sup>2</sup>, Y. Hatanaka<sup>3</sup>, O. I. Vlasenko<sup>1</sup>

<sup>1</sup>V.E. Lashkaryov Institute of Semiconductor Physics of National Academy of Sciences of Ukraine, Ukraine; <sup>2</sup>Research Institute of Electronics, Shizuoka University, Japan; <sup>3</sup>Aichi University of Technology, Japan

## **R3 Other Semiconductor Materials for Detectors**

Tuesday, October 19 08:30-10:30, Orange 1

Session Chair: Lodewijk Van den Berg, Constellation Technology

### **R3-1, invited: (08:30) Ternary Chalcopyrites as a New Class of Semi-Insulators for Room-Temperature Radiation Detectors**

A. Burger, U. N. Roy, M. Groza, Fisk University, USA; Z. W. Bell, Oak Ridge National Lab, USA; D. A. Carpenter, Y-12 National Security Complex, USA

### **R3-2, invited: (08:50) Silicon Carbide for Alpha, Beta, Proton and Soft X-Ray High Performance Detectors**

F. Nava, Modena and Reggio Emilia University, Italy

On behalf of the MIUR cofin 2001 project

### **R3-3: (09:10) Analysis of Lead Oxide (PbO) Layers for Direct Conversion X-Ray Detection**

M. Simon<sup>1</sup>, R. A. Ford<sup>2</sup>, A. R. Franklin<sup>2</sup>, S. P. Grabowski<sup>1</sup>, B. Menser<sup>1</sup>, G. Much<sup>1</sup>, A. Nascetti<sup>1</sup>, M. Overdick<sup>1</sup>, M. J. Powell<sup>2</sup>, D. U. Wiechert<sup>1</sup>

<sup>1</sup>Philips Research Labs, Germany; <sup>2</sup>Philips Research Labs, UK

### **R3-4: (09:25) Progress on Epitaxial GaAs Detectors**

F. Quarati, A. Al-Ajili, V. O'Shea, K. M. Smith, University of Glasgow, UK; G. C. Sun, Université Pierre et Marie Curie (Paris-6), France; J. C. Bourgoin, GESEC R&D, France

### **R3-5: (09:40) Characterization of CdTe and GaAs Pixel Arrays, Readout by the Medipix PCC**

A. Zwerger, Freiburg University, Germany

On behalf of the Medipix CdTe Group

### **R3-6: (09:55) The Role of Irradiation-Induced Defects in the Compensation of Semi-Insulating GaAs for Particle Detector Applications**

A. Cavallini, L. Polenta, University of Bologna, Italy

## **R3-7: (10:10) Portable Digital X-Ray Scanner for Quantum Imaging Based on Bulk Semi-Insulating GaAs Monolithic Line Detectors**

E. Dubecký<sup>1</sup>, P. Štěpko<sup>2</sup>, V. Nečas<sup>3</sup>, B. Zaťko<sup>1</sup>, V. Sekerka<sup>2</sup>, M. Sekáčová<sup>1</sup>, M. Hudec<sup>2</sup>, J. Huran<sup>1</sup>, P. Boháček<sup>1</sup>

<sup>1</sup>Inst. of Electrical Engineering, Slovak Academy of Sciences, Slovak Republic; <sup>2</sup>T&N System, Ltd., Slovak Republic; <sup>3</sup>Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Slovak Republic

## **R4 Scintillator and Semiconductor Devices**

Tuesday, October 19 11:00-12:30, Orange 1

Session Chair: Lothar Strueder, MPI Munich

### **R4-1, invited: (11:00) LaBr3:Ce Scintillators for High Energy Resolution Spectroscopy**

K. S. Shah, J. Glodo, E. van Loef, M. Klugerman, W. Higgins, R. Farrell, RMD, USA

### **R4-2: (11:20) Dynamic Gamma-Ray Channeling in Crystal Structures**

D. M. Tournear, R. Epstein, R. M. Kippen, Los Alamos National Laboratory, USA

### **R4-3: (11:35) Si/CdTe Semiconductor Compton Camera**

S. Watanabe<sup>1</sup>, T. Tanaka<sup>1,2</sup>, K. Nakazawa<sup>1</sup>, T. Mitani<sup>1,2</sup>, K. Kousuke<sup>1,2</sup>, T. Takahashi<sup>1,2</sup>, T. Takashima<sup>1</sup>, H. Tajima<sup>3</sup>, Y. Fukazawa<sup>4</sup>, M. Nomachi<sup>5</sup>, S. Kubo<sup>6</sup>, M. Onishi<sup>7</sup>, Y. Kuroda<sup>7</sup>

<sup>1</sup>Japan Aerospace Exploration Agency, Japan; <sup>2</sup>University of Tokyo, Japan; <sup>3</sup>Stanford Linear Accelerator Center, USA; <sup>4</sup>Hiroshima University, Japan; <sup>5</sup>Osaka University, Japan; <sup>6</sup>Clear Pulse Ltd., Japan; <sup>7</sup>Mitsubishi Heavy Industries, Ltd., Japan

### **R4-4: (11:50) Looking for New Possibilities to Improve Properties of Two-Energy Detectors of "Scintillator-Photodiode" Type for Inspection Systems of International Security**

V. D. Ryzhikov, S. V. Naydenov, O. D. Opolonin, O. K. Lysetska, V. L. Danylenko, STC Institute Single for Crystals, Ukraine

### **R4-5: (12:05) Spectral Gamma Detectors for Hand-Held Radioisotope Identification Devices (RIDs)**

R. Arlt<sup>1</sup>, M. Swoboda<sup>1</sup>, J. Brutscher<sup>2</sup>, V. Gostilo<sup>3</sup>, R. Gunnink<sup>4</sup>, A. Loupilov<sup>3</sup>, V. Ivanov<sup>3</sup>, M. Majorov<sup>6</sup>, M. Moszynski<sup>7</sup>, A. Syntfeld<sup>7</sup>, J. Stein<sup>8</sup>

<sup>1</sup>International Atomic Energy Agency, Austria; <sup>2</sup>GBS Elektronik, Germany; <sup>3</sup>Baltic Scientific Instruments, Latvia; <sup>4</sup>Gamma Ray, USA; <sup>5</sup>RITEC, Latvia; <sup>6</sup>Scientific Engineering Center, Nuclear Physics Researches, Russia; <sup>7</sup>Soltan Institute for Nuclear Studies, Poland; <sup>8</sup>target Systemelectronic GmbH, Germany

## **R5 Systems for Safeguards, Monitoring and International Security**

Tuesday, October 19 14:00-15:30, Orange 1

Session Chair: Rolf Arlt, IAEA

### **R5-1, invited: (14:00) Pocket-Size CdZnTe Gamma-Ray Spectrometer**

P. N. Luke, M. Amman, J. S. Lee, C. Q. Vu, Lawrence Berkeley National Laboratory, USA

**R5-2**, invited: (14:20) Gamma-Ray Imaging with 3-D Position Sensitive CZT Spectrometers

Z. He, D. Xu, F. Zhang, *The University of Michigan, USA*

**R5-3**: (14:40) Los Alamos Material Basis Set Performance with Hand-Held CZT Spectrometers

W. S. Murray, B. A. Sapp, R. J. Estep, M. W. Brener, M. E. Martinez, *Los Alamos National Laboratory, USA*

**R5-4**: (14:55) A Digital Pulse Processing System Dedicated to CdZnTe Detectors

G. Montémont, C. Moulin, L. Verger, *CEA-LETI, France*

**R5-5**: (15:10) Current State-of-the-Art in Portable X-Ray and Gamma Analyzers for Industrial and Security Applications

S. Piorek, A. Niemela, L. Grodzins, *Niton, LLC, USA*

## R6 CZT and CdTe Growth and Characterization II

Tuesday, October 19 16:00-18:00, Orange 1

Session Chair: Eugenio Perillo, *INFN Napoli-Italy*

**R6-1**, invited: (16:00) Growth and Characterization of Semi-Insulating CdZnTe Crystals for Semiconductor Detectors

C. Szeles, *eV PRODUCTS, a division of II-VI Incorporated, USA*

**R6-2**, invited: (16:20) Recovery of Radiation Damage in CdTe and CdZnTe Detectors

B. Fraboni, A. Cavallini, *University of Bologna, Italy*; N. Auricchio, W. Dusi, *IASF-CNR, Italy*; M. Zanarini, *SOFTEC s.a.s., Italy*; P. Siffert, *Eurorad, France*

**R6-3**: (16:40) Photoconductivity Spectroscopy of Deep Levels in CdTe

J. Franc<sup>1</sup>, P. Hlíděk<sup>1</sup>, E. Belas<sup>1</sup>, V. Linhart<sup>2</sup>, S. Pospíšil<sup>2</sup>, R. Grill<sup>1</sup>, P. Höschl<sup>1</sup>

<sup>1</sup>*Institute of Physics, Charles University, Czech Republic*; <sup>2</sup>*Institute of Experimental and Applied Physics, Czech Technical University, Czech Republic*

**R6-4**: (16:55) Uniformity of Deep Level Traps in Single Crystal Cadmium Zinc Telluride

D. A. Prokopovich, *University of Wollongong, Australia*; D. Alexiev, *Australian Nuclear Science and Technology Organisation, Australia*

**R6-5**: (17:10) Semi-Insulating CdTe with a Minimum Deep Level Doping

R. Grill, J. Franc, E. Belas, P. Höschl, P. Moravec, *Institute of Physics, Charles University, Czech Republic*

**R6-6**: (17:25) Charge Transport and Mobility Mapping in CdTe

P. J. Sellin<sup>1</sup>, A. W. Davies<sup>1</sup>, A. Lohstroh<sup>1</sup>, M. E. Ozsan<sup>1</sup>, P. Siffert<sup>2</sup>, M. Sowinska<sup>2</sup>, A. Simon<sup>1,3</sup>

<sup>1</sup>*University of Surrey, UK*; <sup>2</sup>*Eurorad, France*; <sup>3</sup>*Hungarian Academy of Sciences, Hungary*

**R6-7**: (17:40) Correlation Between Structural and Optical Characterization of Undoped CdTe Crystals

N. Armani, C. Ferrari, G. Salvati, A. Zappettini, M. Z. Zha, F. Bissoli, L. Zanotti, *CNR-IMEM Institute, Italy*

## R7 HgI2 and Other Materials

Wednesday, October 20 08:30-10:30, Orange 1

Session Chair: Arnold Burger, *Fisk University*

**R7-1**, invited: (08:30) Review on Polycrystalline HgI2 Nuclear Radiation Detectors

M. M. Schieber, A. Zuck, O. Khakhan, *Hebrew University of Jerusalem, Israel, Israel*; Z. Burshtein, *Ben-Gurion University of the Negev, Israel*

**R7-2**, invited: (08:50) Recent Advances in the Development of Mercuric Iodide Radiation Detectors

L. van den Berg, K. R. Pohl, *Constellation Technology Corporation, USA*

**R7-3**: (09:10) Mercuric Iodide Polycrystalline Films on Cylindrical Substrates

N. E. Hartsough, J. S. Iwanczyk, N. Skinner, L. A. Franks, *Photon Imaging Inc, USA*; B. E. Patt, *Gamma Medica Inc, USA*

**R7-4**: (09:25) Feasibility of HgBrI as Photoconductor for Direct X-Ray Imaging

L. Fornaro, H. Espinosa, A. Cuña, I. Aguiar, A. L. Noguera, M. Pérez, *Compound Semiconductors Group, Uruguay*

**R7-5**: (09:40) Structural Homogeneity and Electrical Conductivity of CdTe:Bi Crystals

E. A. Saucedo<sup>1,2</sup>, N. V. Sochinskii<sup>3</sup>, O. Sacristán<sup>4</sup>, L. R. Fornaro<sup>2</sup>, L. F. Sanz<sup>4</sup>, E. Diéguez<sup>1</sup>

<sup>1</sup>*Universidad Autónoma de Madrid, Spain*; <sup>2</sup>*Universidad de la República, Uruguay*; <sup>3</sup>*CSIC, Spain*; <sup>4</sup>*Universidad de Valladolid, Spain*

**R7-6**: (09:55) Impact of Surface Leakage Current on Pixilated Detector

M. Chmeissani<sup>1</sup>, M. Maiorino<sup>1</sup>, G. Blanchot<sup>1</sup>, J. Garcia<sup>2</sup>, M. Lozano<sup>2</sup>, R. Martinez<sup>2</sup>, G. Pellegrini<sup>2</sup>, C. Puigdengoles<sup>1</sup>, M. Ullan<sup>2</sup>

<sup>1</sup>*IFAE (Institut de Física d'Altes Energies), Spain*; <sup>2</sup>*CNM (Centro Nacional de Microelectrónica), Spain*

**R7-7**: (10:10) Technology of Semi-Insulating InP Monolithic Radiation Detectors Array: Electrodes Separation Using Wet Etching

P. G. Pelfer<sup>1</sup>, F. Dubecký<sup>2</sup>, B. Zátka<sup>2</sup>, E. Gombia<sup>3</sup>, R. Fornari<sup>4</sup>, M. Sekáčová<sup>2</sup>, P. Boháček<sup>2</sup>, V. Šmatko<sup>2</sup>

<sup>1</sup>*University of Florence and INFN, Italy*; <sup>2</sup>*Inst. of Electrical Engineering, Slovak Academy of Sciences, Slovak Republic*; <sup>3</sup>*IMEM CNR, Italy*; <sup>4</sup>*Institute of Crystal Growth, Germany*

## R8 Detector/ASIC Hybridization and Interconnects

Wednesday, October 20 11:00-12:30, Orange 1

Session Chair: Pier Francesco Manfredi, *LBL*

**R8-1**, invited: (11:00) Challenges in the Design of Front-End Electronics for Semiconductor Radiation Detectors

G. Bertuccio, *Politecnico di Milano, Italy*

**R8-2, invited: (11:20) Integrated Readout Electronics: Enabling Advanced Applications of Position-Sensitive Solid-State Radiation Detectors**

V. B. Cajipe, T. O. Tümer, M. Clajus, S. Yin, S. Hayakawa, R. Calderwood, *NOVA R&D, Inc., USA*

**R8-3: (11:40) Test Chip for Bump Bond Yield Evaluation in High Density Flip Chip Technologies**

M. Ullan<sup>1</sup>, M. Lozano<sup>1</sup>, M. Chmeissani<sup>2</sup>, G. Blanchot<sup>2</sup>, E. Cabruja<sup>1</sup>, J. Garcia<sup>1</sup>, M. Maiorino<sup>2</sup>, R. Martinez<sup>1</sup>, G. Pellegrini<sup>2</sup>, C. Puigdemonges<sup>2</sup>

<sup>1</sup>Centro Nacional de Microelectronica (CNM-CSIC), Spain; <sup>2</sup>Instituto de Fisica de Altas Energias (IFAE), Spain

**R8-4: (11:55) Front-End ASIC for Co-Planar Grid Sensors**

G. De Geronimo<sup>1</sup>, G. Carini<sup>1,2</sup>, W. S. Murray<sup>3</sup>, P. O'Connor<sup>1</sup>

<sup>1</sup>Brookhaven National Laboratory, USA; <sup>2</sup>University of Palermo, Italy; <sup>3</sup>Los Alamos National Laboratory, USA

**R8-5: (12:10) 3D Position Sensitive CdZnTe Spectrometer Performance Using Third Generation VAS/TAT Readout Electronics**

F. Zhang, Z. He, G. F. Knoll, D. K. Wehe, J. E. Berry, *University of Michigan, USA*

**JRM1 MIC-RTSD Joint Session**

Wednesday, October 20 14:00-15:40, Leptis Magna 1&2

Session Chairs: Paul Siffert, *EMRS Headquarters*

Jennifer Huber, *Lawrence Berkeley National Laboratory*

**JRM1-1, invited: (14:00) New Perspectives in Gamma-Ray Imaging with CdZnTe/CdTe**

L. Verger, A. Drezet, E. Gros d'aillon, O. Monnet, G. Montemont, B. Pelliciani, O. Peyret, *CEA-LETI, France*

**JRM1-2, invited: (14:20) New Progress in Large-Size CZT (Zn=10%) Single Crystal Growth Using MVB Technique for Room Temperature Radiation Detectors**

L. Li<sup>1</sup>, Y. Zhou<sup>1</sup>, F. Lu<sup>1</sup>, M. Black<sup>1</sup>, R. James<sup>2</sup>, V. Gostilo<sup>3</sup>, R. Olsen<sup>1</sup>

<sup>1</sup>Ynnel Tech, Inc., USA; <sup>2</sup>Brookhaven National Lab, USA; <sup>3</sup>Baltic Scientific Instruments, Latvia

**JRM1-3: (14:40) A Silicon Microstrip System Equipped with the RX64DTH ASIC for Dual Energy Mammography**

L. Ramello<sup>1</sup>, G. Baldazzi<sup>2</sup>, D. Bollini<sup>2</sup>, A. E. Cabal Rodriguez<sup>3</sup>, C. Ceballos Sanchez<sup>3</sup>, W. Dabrowski<sup>4</sup>, A. Diaz Garcia<sup>3</sup>, M. Gambaccini<sup>5</sup>, P. Giubellino<sup>6</sup>, P. Grybos<sup>4</sup>, J. Lopez Gaitan<sup>7</sup>, A. Marzari-Chiesa<sup>8</sup>, F. Prino<sup>6</sup>, A. Sarnelli<sup>5</sup>, K. Swientek<sup>4</sup>, A. Taibi<sup>5</sup>, A. Tuffanelli<sup>5</sup>, P. Van Espen<sup>9</sup>, P. Wiacek<sup>4</sup>, M. Gombia<sup>2</sup>, P. Rossi<sup>10</sup>

<sup>1</sup>Università del Piemonte Orientale, Italy; <sup>2</sup>Università di Bologna e INFN, Italy; <sup>3</sup>CEADEN, Cuba; <sup>4</sup>AGH University of Science and Technology, Poland; <sup>5</sup>Università di Ferrara e INFN, Italy; <sup>6</sup>INFN, Italy; <sup>7</sup>Universidad de los Andes, Colombia; <sup>8</sup>Università di Torino, Italy; <sup>9</sup>University of Antwerp, Belgium; <sup>10</sup>Università di Bologna, Italy

**JRM1-4: (14:55) Imaging Performance of Polycrystalline Mercuric Iodide on Large-Area TFT Arrays**

N. E. Hartsough, J. S. Iwanczyk, N. Skinner, L. A. Franks, *Photon Imaging Inc, USA*; B. E. Patt, *Gamma Medica Inc, USA*

**JRM1-5: (15:10) Investigation of a-Se Detector for Imaging in Radiotherapy**

G. Y. Fang<sup>1</sup>, D. Pearson<sup>1</sup>, B. Harper<sup>1</sup>, D. Spence<sup>1</sup>, R. Schmidt<sup>1</sup>, R. Mackie<sup>1,2</sup>, G. Olivera<sup>1,2</sup>, R. Jeri<sup>2</sup>, J. Rowlands<sup>3</sup>

<sup>1</sup>TomoTherapy Incorporated, USA; <sup>2</sup>University of Wisconsin, USA; <sup>3</sup>Sunnybrook and Women's College Health Science Center, Canada

**JRM1-6: (15:25) The RatCAP Concious Small Animal PET Tomograph**

C. Woody<sup>1</sup>, R. Fontaine<sup>2</sup>, S. Junnagar<sup>1</sup>, A. Kandasamy<sup>1</sup>, A. Kriplani<sup>3</sup>, S. Krishnamoorthy<sup>3</sup>, R. Lecomte<sup>2</sup>, P. O'Connor<sup>1</sup>, C. Page<sup>3</sup>, J.-F. Pratte<sup>1</sup>, M. Purschke<sup>1</sup>, V. Radeka<sup>1</sup>, I. Rampil<sup>3</sup>, D. Schlyer<sup>1</sup>, S. Shokouhi<sup>3</sup>, S. Southekal<sup>3</sup>, S. Stoll<sup>1</sup>, P. Vaska<sup>1</sup>, A. Villaneuva<sup>1</sup>, B. Yu<sup>1</sup>

<sup>1</sup>Brookhaven National Lab, USA; <sup>2</sup>Sherbrooke University, Canada; <sup>3</sup>Stony Brook University, USA

**R9 Detector Arrays**

Wednesday, October 20 16:00-17:30, Orange 1

Session Chair: Michael Fiederle, *University of Freiburg*

**R9-1, invited: (16:00) Silicon Detectors for Room Temperature Imaging X-Ray Spectroscopy**

L. W. J. Strueder, *MPI - Semiconductor Lab, Germany*

On behalf of the MPI Semiconductor Laboratory and Politecnico di Milano

**R9-2: (16:20) A Pixilated CZT Drift Detector**

I. Kuvvetli, C. Budtz-Jørgensen, *Danish Space Research Institute, Denmark*

**R9-3: (16:35) Image Quality and Spectroscopic Characteristics of Different Silicon Pixel Imaging Systems**

V. Rosso<sup>1,2</sup>, M. G. Bisogni<sup>1,2</sup>, D. Bulajic<sup>1,2,3</sup>, M. Boscardin<sup>4</sup>, G. Dalla Betta<sup>4,5</sup>, P. Delogu<sup>1,2</sup>, M. E. Fantacci<sup>1,2</sup>, M. Novelli<sup>1,2</sup>, C. Piemonte<sup>4</sup>, M. Quattrocchi<sup>1,2</sup>, A. Stefanini<sup>1,2</sup>, N. Zorzi<sup>4</sup>

<sup>1</sup>Università di Pisa, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>International Centre for Theoretical Physics (ICTP), Italy; <sup>4</sup>Centro per la Ricerca Scientifica e Tecnologica (ITC-IRST), Italy; <sup>5</sup>Università di Trento, Italy

**R9-4: (16:50) Spectroscopy for Compton Interactions in Pixelated CdZnTe Detectors**

A. Shor, Y. Eisen, I. Mardor, *Soreq NRC, Israel*

**R9-5: (17:05) Test Results of a CdZnTe Pixel Detector Read Out by RENA-2 IC**

T. O. Tümer, V. B. Cajipe, M. Clajus, S. Hayakawa, *NOVA R&D, Inc., USA*



## R10 Space Applications

Thursday, October 21 08:30-10:30, Orange 1

Session Chair: **Anna Cavallini**, *University of Bologna*

### **R10-1**, invited: (08:30) THE ISGRI CdTe GAMMA CAMERA: in FLIGHT BEHAVIOUR

F. Lebrun, *CEA-Saclay, France*

### **R10-2**: (08:50) 512-Pixel CdTe Liner Imaging Device for Energy Discrimination X-Ray Imaging

T. Aoki<sup>1</sup>, Y. Ishida<sup>1</sup>, D. Sakashita<sup>1</sup>, V. Gnatyuk<sup>2</sup>, Y. Tomita<sup>3</sup>, Y. Hatanaka<sup>4</sup>, J. Temmyo<sup>1</sup>

<sup>1</sup>Shizuoka University, Japan; <sup>2</sup>National Academy of Sciences of Ukraine, Ukraine; <sup>3</sup>Hamamatsu Photonics K.K., Japan; <sup>4</sup>Aichi University of Technology, Japan

### **R10-3**: (09:05) The PAMELA Experiment

P. Picozza, *INFN Roma 2, Italy*

On behalf of the Pamela Collaboration

### **R10-4**: (09:20) Characterization of a CdTe Microstrip Detector as a Hard X Ray Focal Plane Prototype

E. Caroli, N. Auricchio, A. Donati, F. Schiavone, J. B. Stephen, G. Ventura, S. del Sordo, *IASF/CNR - Sezione di Bologna, Italy*; G. Agnetta, F. Russo, M. Strazzeri, *IASF/CNR - Sezione di Palermo, Italy*; G. Bertuccio, S. Caccia, M. Sampietro, *Politecnico di Milano, Italy*; E. Gombia, *IMEM/CNR - Parma, Italy*; G. Parschi, *INAF, Italy*

### **R10-5**: (09:35) CZT Detectors as MeV Gamma-Ray Calorimeters with Excellent Position and Energy Resolution

I. Jung, A. Garson, H. Krawczynski, J. S. Perkins, L. Sobotka, S. Komorov, *Washington University in St. Louis, USA*

### **R10-6**: (09:50) Pixel Detectors : a Multi Elements Assembly for X-Ray Synchrotron Radiation

J. F. Berar<sup>1</sup>, N. Boudet<sup>1</sup>, P. Breugnot<sup>2</sup>, B. Caillot<sup>1</sup>, J.-C. Clemens<sup>2</sup>, P. Delpierre<sup>2</sup>, I. Koudobine<sup>2</sup>, C. Mouget<sup>1</sup>, P. Pangaud<sup>2</sup>, R. Potheau<sup>2</sup>, E. Vigeolas<sup>2</sup>

<sup>1</sup>CRG-D2AM, France; <sup>2</sup>CPPM, France

### **R10-7**: (10:05) High Resolution Fourier Synthesis Hard X-Ray Imaging Based on CdTe Strip Detectors

R. Miyawaki<sup>1</sup>, H. Niko<sup>1</sup>, Y. Okada<sup>1</sup>, M. Kokubun<sup>1</sup>, K. Makishima<sup>1,2</sup>, H. Negoro<sup>3</sup>, J. Kotoku<sup>4</sup>, Y. Terada<sup>2</sup>, T. Tanaka<sup>5</sup>, T. Mitani<sup>5</sup>, K. Nakazawa<sup>5</sup>, T. Takahashi<sup>5</sup>, R. Ohno<sup>6</sup>, M. Funaki<sup>6</sup>, Y. Kuroda<sup>7</sup>, K. Genba<sup>7</sup>, M. Onishi<sup>7</sup>

<sup>1</sup>University of Tokyo, Japan; <sup>2</sup>Institute of Physical and Chemical Reserch(RIKEN), Japan; <sup>3</sup>Nihon University, Japan; <sup>4</sup>Tokyo Institute of Technology, Japan; <sup>5</sup>Institute for Space and Astronautical Science(ISAS/JAXA), Japan; <sup>6</sup>ACRORAD, Japan; <sup>7</sup>Mitsubishi Heavy Industry LTD, Japan

## R11 RTSD Poster Session

Thursday, October 21 11:00-12:30, Pola

Session Chair: **Waldes Dusi**, *IASF/CNR Bologna*

### **Wide Band-gap Semiconductor Materials for Radiation Detection**

#### **R11-1**: Electrical and Spectrometric Response of Large Volume CdZnTe Coplanar Detectors

R. Gonzalez, O. Vela, E. de Burgos, J. M. Perez, *CIEMAT, Spain*; V. Gostillo, *BSI, Latvia*

#### **R11-2**: Investigation of CZT Devices with Capacitive Frisch Grids

H. Kim, L. Cirignano, M. Klugerman, P. Wong, K. Shah, *Radiation Monitoring Devices Inc., USA*

#### **R11-3**: Influence of Crystalline Surfaces on the TlBr Radiation Detector Application

I. B. Oliveira, F. E. Costa, M. M. Hamada, *Instituto de Pesquisas Energéticas e Nucleares- CNEN/SP, Brazil*

#### **R11-4**: The Potential for Actinide Oxides to Be Used as Active Semiconductor Devices

T. T. Meek, *University of Tennessee, USA*; B. von Roedern, *NREL, USA*

#### **R11-5**: Growth of Thick CdTe Films by Close-Space-Sublimation Technique

H. Nagayoshi, *Tokyo National College of Technology, Japan*; K. Suzuki, *Hokkaido Institute of Technology, Japan*

#### **R11-6**: Correlation Between Quality of CZT Crystals and Spectrometric Performance of Hemispherical Radiation Detectors

V. Ivanov, L. Alekseeva, P. Dorogov, A. Loutchanski, *RITEC Ltd., Latvia*

#### **R11-7**: Evaluation of CdZnTe Detectors Using Crystals Grown by the Modified Vertical Bridgman Technique

B. W. Sturm, Z. He, *University of Michigan, USA*

#### **R11-8**: GaAs Radiation Imaging Detector for NDT and Medical Application

A. V. Tyazhev, D. L. Budnitsky, V. A. Novikov, O. B. Koretskaya, D. Y. Mokeev, O. P. Tolbanov, *Siberian Physics Technical Institute of TSU, Russia*; G. I. Ayzenshtat, *Scientific Research Institute of Semiconductor Devices "NIIPP", Russia*; A. V. Vorobiev, *Scientific State Center "High Energy Physics Institute", Russia*

#### **R11-9**: Photoluminescence of CdTe:In Irradiated by Rube Laser Pulses of Nanosecond Duration

A. Baidullaeva<sup>1</sup>, O. I. Vlasenko<sup>1</sup>, P. O. Mozol<sup>1</sup>, B. K. Dauletmuratov<sup>2</sup>, P. V. Pobirowsky<sup>1</sup>

<sup>1</sup>Institute of Semiconductor Physics, Ukraine; <sup>2</sup>Karakalpak State University, Uzbekistan

#### **R11-10**: The Effect of Cl-Doping Concentration on the Resistivity of Polycrystalline CdZnTe:Cl Thick Film

Y. J. Park<sup>1</sup>, K. H. Kim<sup>1</sup>, Y. H. Na<sup>1</sup>, G. L. Khym<sup>1</sup>, T. R. Jung<sup>2</sup>, S. U. Kim<sup>1</sup>

<sup>1</sup>Korea University, South Korea; <sup>2</sup>DXM Co., South Korea

**R11-11: Performance of Flat Panel Polycrystalline CdZnTe X-Ray Detector**

G. L. Khym<sup>1</sup>, K. H. Kim<sup>1</sup>, Y. J. Park<sup>1</sup>, T. R. Jung<sup>2</sup>, S. U. Kim<sup>1</sup>

<sup>1</sup>Korea University, South Korea; <sup>2</sup>DXM Co., South Korea

**R11-12: Conversion Gain Fluctuations in Electron-Hole Pair Creation of Wide Band Gap X-Ray Detectors**

G. L. Khym, K. H. Kim, S. U. Kim, H. J. Yang, Korea University, South Korea

**R11-13: X-Ray Response of Polycrystalline CdZnTe Thick Films**

S. J. Park<sup>1</sup>, K. H. Kim<sup>2</sup>, Y. J. Park<sup>1</sup>, S. W. Yuk<sup>1</sup>, S. U. Kim<sup>1</sup>, Y. Yi<sup>1</sup>

<sup>1</sup>Korea University, South Korea; <sup>2</sup>DXM Co., South Korea

**R11-14: 3-D Mapping of Large Volume HgI<sub>2</sub> Detector Response Using Waveform Analysis**

L.-J. Meng, Z. He, University of Michigan, USA

**R11-15: Theoretical Investigation on the Fundamental Properties of Mercuric Iodide**

F. A. Oliveira Neto<sup>1</sup>, J. F. Justo<sup>2</sup>, W. V. M. Machado<sup>1</sup>, L. V. C. Assali<sup>1</sup>

<sup>1</sup>Instituto de Física da Universidade de São Paulo, Brazil; <sup>2</sup>Escola Politécnica da Universidade de São Paulo, Brazil

**R11-16: Modelling Optimal Characteristics of a-Si:H Semiconductor Detectors for X-ray Detection**

K. Shtejer, A. Leyva, C. Cruz, Center of Technological Applications and Nuclear Development, CEADEN, Cuba; F. J. Ramírez, National Institute of Nuclear Researches, Mexico

**R11-17: X Ray Diamond 2D Array**

G. Conte, I. Ciancaglion, M. C. Rossi, G. Mazzeo, University of Rome, Italy

**R11-18: Characterisation of a Synthetic Single Crystal Chemical Vapour Deposited (CVD) Diamond Detector**

A. Lohstroh, P. J. Sellin, S. Wang, University of Surrey, UK

**R11-19: Comparison Between the Response of Silicon and Thermoluminescence Detectors to a X-Ray Lamp**

S. Vitulli, C.R. ENEA/Brasimone, Italy; L. Ryc, IFPILM, Poland

**R11-20: Polycrystalline Diamond Detectors Compared with Solid State X Ray Dosimeters for Clinical Use**

I. Ciancaglion<sup>1</sup>, R. Consorti<sup>2</sup>, M. C. Rossi<sup>1</sup>, G. Conte<sup>1</sup>

<sup>1</sup>University of Rome - Roma Tre, Italy; <sup>2</sup>S. Filippo Neri, Italy

**R11-21: Physical and Electrical Characterisation of Silicon Carbide for Room and High Temperature Radiation Detectors**

G. Bertuccio<sup>1</sup>, S. Binetti<sup>2</sup>, S. Caccia<sup>1</sup>, R. Casiraghi<sup>1</sup>, A. Castaldini<sup>3</sup>, A. Cavallini<sup>3</sup>, C. Lanzieri<sup>4</sup>, A. Le Donne<sup>2</sup>, F. Nava<sup>5</sup>, S. Pizzini<sup>2</sup>, E. Vittone<sup>6</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>University of Milano Bicocca, Italy;

<sup>3</sup>University of Bologna, Italy; <sup>4</sup>Alenia Marconi Systems, Italy; <sup>5</sup>University of Modena, Italy; <sup>6</sup>University of Torino, Italy

**Strip, Pixel and Discrete Semiconductor Arrays**

**R11-22: Charge Collection in Active Edge Silicon Sensors**

J. Morse<sup>1</sup>, C. Kenney<sup>2</sup>, S. Parker<sup>3</sup>, E. Westbrook<sup>2</sup>, C. DaVia<sup>4</sup>, R. Barrett<sup>1</sup>, J. Hasi<sup>4</sup>

<sup>1</sup>E.S.R.F, France; <sup>2</sup>Molecular Biology Consortium, USA; <sup>3</sup>University of Hawaii, USA; <sup>4</sup>Brunel University, UK

**R11-23: Spectroscopic Performance of Pixelated Thallium Bromide Detectors**

T. Onodera, K. Hitomi, T. Shoji, Y. Hiratate, Tohoku Institute of Technology, Japan; H. Kitaguchi, Hitachi, Ltd., Japan

**R11-24: Simulation and Experimental Results on Monolithic CdZnTe Gamma-Ray Detectors**

E. Gros d'aillon, M. C. Gentet, G. Montemont, J. Rustique, L. Verger, CEA - LETI, France

**R11-25: Evaluation of Pixelated HgI<sub>2</sub> Detectors**

K. Hitomi, Tohoku Institute of Technology, Japan; L. J. Meng, Z. He, University of Michigan, USA

**R11-26: Investigation on the Performances of Multiple Microstrip CdTe Detectors**

A. Raulo<sup>1,2</sup>, N. Auricchio<sup>3</sup>, A. Cola<sup>4</sup>, A. Donati<sup>3</sup>, W. Dusi<sup>3</sup>, V. Gostilo<sup>5</sup>, G. Landini<sup>3</sup>, E. Perillo<sup>1,2</sup>, P. Siffert<sup>6</sup>, M. Sowinska<sup>7</sup>, G. Ventura<sup>3</sup>

<sup>1</sup>Dipartimento di Scienze Fisiche, Italy; <sup>2</sup>Sezione di Napoli, Italy;

<sup>3</sup>Sezione di Bologna, Italy; <sup>4</sup>Sezione di Lecce, Italy; <sup>5</sup>Baltic Scientific Instruments, Latvia; <sup>6</sup>EMRS, France; <sup>7</sup>EURORAD, France

**R11-27: Development and Testing of GaAs Strip X-Ray Detectors for Industrial Applications**

S. De Guido<sup>1</sup>, G. Melone<sup>1</sup>, L. Rizzi<sup>1</sup>, F. M. Quaranta<sup>1,2</sup>, I. Farella<sup>2</sup>, M. Panareo<sup>3,4</sup>, A. Cola<sup>2</sup>

<sup>1</sup>OPTEL InP, Italy; <sup>2</sup>IMM/CNR, Italy; <sup>3</sup>INFN, Italy; <sup>4</sup>Università di Lecce, Italy

**R11-28: Twin Shaping Filter Techniques for Compensating the Signals in CZT Multipixel Detector**

N. Auricchio<sup>1</sup>, L. Amati<sup>1</sup>, A. Basili<sup>1</sup>, E. Caroli<sup>1</sup>, A. Donati<sup>1</sup>, T. Franceschini<sup>1</sup>, F. Frontera<sup>1,2</sup>, G. Landini<sup>1</sup>, A. Roggio<sup>3</sup>, F. Schiavone<sup>1</sup>, G. Ventura<sup>1</sup>

<sup>1</sup>IASF/CNR - Sezione di Bologna, Italy; <sup>2</sup>Università di Ferrara, Italy;

<sup>3</sup>Università Cattolica del Sacro Cuore, Italy

**R11-29: Single-Sided CZT Strip Detectors**

J. R. Macri<sup>1</sup>, L.-A. Hamel<sup>2</sup>, B. Dönmez<sup>1</sup>, M. Widholm<sup>1</sup>, J. M. Ryan<sup>1</sup>, M. Julien<sup>2</sup>, T. Narita<sup>3</sup>, M. L. McConnell<sup>1</sup>

<sup>1</sup>University of New Hampshire, USA; <sup>2</sup>University of Montreal, Canada;

<sup>3</sup>College of the Holy Cross, USA

**Crystal Growth and Materials Characterization**

**R11-30: Electrical and Optical Properties of In-Doped CdTe after Cd Saturated Annealing**

E. Belas<sup>1</sup>, R. Grill<sup>1</sup>, P. Moravec<sup>1</sup>, P. Horodysky<sup>1</sup>, J. Franc<sup>1</sup>, A. L. Toth<sup>2</sup>, P. Hoschl<sup>1</sup>

<sup>1</sup>Institute of Physics, Charles University, Czech Republic; <sup>2</sup>Research Institute for Technical Physics and Materials Science, Hungary

**R11-31: Photomagnetoelectric Effect of Cd-Based Detector Materials**

K. Suzuki<sup>1</sup>, S. Seto<sup>2</sup>, T. Sawada<sup>1</sup>, K. Imai<sup>1</sup>

<sup>1</sup>Hokkaido Institute of Technology, Japan; <sup>2</sup>Ishikawa National College of Technology, Japan

**R11-32: Characterization of Transport and Charge Collection in High Resistive CdTe by Photoelectric Measurements**

J. Franc, R. Grill, P. Hlídek, E. Belas, P. Hoschl, *Institute of Physics, Charles University, Czech Republic*

**R11-33: Defect Structure Modification in High Resistivity CdTe:In after Annealing at Cd Overpressure and Cd Bath**

E. Belas, P. Horodysky, P. Hlídek, R. Grill, J. Franc, P. Moravec, P. Hoschl, *Institute of Physics, Charles University, Czech Republic*

**R11-34: Effect of a Thermal Treatment upon Optical and Mechanical Properties of ZnSe(Te) Crystals**

S. N. Galkin, V. D. Ryzhikov, E. F. Voronkin, I. A. Rybalka, A. I. Lalajants, *ISMa NTK "Institute for Single Crystals", Ukraine*

**R11-35: Semi Insulating CdTe Codoped with Ge and Yb**

N. V. Sochinskij<sup>1</sup>, E. A. Saucedo<sup>2,3</sup>, L. R. Fornaro<sup>3</sup>, C. M. Ruiz<sup>2</sup>, A. Cuña<sup>3</sup>, E. Diéguez<sup>2</sup>

<sup>1</sup>CNM-CSIC, Spain; <sup>2</sup>Universidad Autónoma de Madrid, Spain;

<sup>3</sup>Universidad de la República, Uruguay

**R11-36: A Method to Study Uniformity of Electric Properties of High-Resistance CdZnTe Crystals**

V. K. Komar, *STC 'Institute for Single Crystals', Ukraine*

**R11-37: Computational Modeling of Solidification and Experimental Validation in the High-Pressure Electro-Dynamic Gradient Furnace**

M. D. Reed, C. Szeles, J.-O. Ndap, S. E. Cameron, D. E. Covalt, *eV Products, a Division of II-VI, Inc., USA*

**R11-38: A Novel CdTe/CZT Epitaxial Technology for Large Area RT 1-100 keV X-Ray Photon Detectors: Reactor Development and Growth Results**

F. Marzo<sup>1</sup>, N. Lovergine<sup>1,2</sup>, A. Mancini<sup>1,2</sup>, P. Prete<sup>2</sup>

<sup>1</sup>Università di Lecce, Italy; <sup>2</sup>Sez. di Lecce, Italy

**Properties of Electrical Contacts and Internal Field Distributions**

**R11-39: Photopeak Efficiency Measurements of CZT Detectors**

J. S. Perkins, A. Garson, I. Jung, H. Krawczynski, *Washington University in St. Louis, USA*

**R11-40: Quantitative Evaluation of Mercuric Iodide and Selenium for X-Ray Imaging Device**

B. Y. Cha, J. W. Shin, S. S. Kang, *Radiation Image Laboratory, South Korea*; S. H. Nam, S. H. An, *Medical imaging research center, South Korea*

**R11-41: Experimental and Monte Carlo Analyses of a-Se and CsI: Na/a-Se for X-ray Imaging**

J. K. Park, J. Y. Kim, J. Y. Choi, *Radiation Image Laboratory, South Korea*; J. G. Im, J. H. Kim, *Medical imaging research center, South Korea*

**R11-42: X-Ray Response Characterization of Y2O2S:Tb-CdS layered semiconductor**

D. G. Lee, S. Y. Kim, S. H. Jo, *Radiation Image Laboratory, South Korea*; S. H. Nam, H. W. Lee, *Medical imaging research center, South Korea*

**R11-43: Synthesis and Luminescence Characterization of Fine Gadolinium Oxide Phosphors for High Resolution X-Ray Imaging**

S. S. Kang, G. W. Jang, J. K. Park, *Radiation Image Laboratory, South Korea*; S. H. Nam, C. W. Moon, *Medical imaging research center, South Korea*

**R11-44: Suppress of Leakage Current in Polycrystalline CdZnTe X-Ray Detectors**

K. H. Kim<sup>1</sup>, Y. H. Na<sup>2</sup>, Y. J. Park<sup>2</sup>, S. J. Park<sup>2</sup>, T. R. Jung<sup>1</sup>, Y. Yi<sup>2</sup>, S. U. Kim<sup>2</sup>

<sup>1</sup>DXM Co., South Korea; <sup>2</sup>Korea University, South Korea

**R11-45: Performance Study of CdZnTe Schottky Devices Fabricated by Evaporation Method**

M. A. Hossain, *Bangladesh Atomic Energy Commission, Bangladesh*; E. J. Morton, *University of Surrey, UK*

**R11-46: Study of the Thickness of the Dead Layer below Electrodes, Deposited by Electroless Technique, in CdTe Nuclear Detectors**

A. Raulo<sup>1,2</sup>, N. Auricchio<sup>3</sup>, A. Donati<sup>3</sup>, W. Dusi<sup>3</sup>, M. Hage-Ali<sup>4</sup>, E. Perillo<sup>1,2</sup>, P. Siffert<sup>5</sup>, M. Sowinska<sup>6</sup>, G. Ventura<sup>3</sup>

<sup>1</sup>University Federico II, Italy; <sup>2</sup>Sezione di Napoli, Italy; <sup>3</sup>Sezione di Bologna, Italy; <sup>4</sup>CNRS/PHASE, France; <sup>5</sup>EMRS, France; <sup>6</sup>EUROAD, France

**R11-47: Evaluation of Contact Processing and Detector Performance of CdTe and (Cd,Zn)Te Wafers**

M. Fiederle, A. Fauler, *Freiburger Materialforschungszentrum, Germany*; M. Sowinska, P. Siffert, *Euronad SAS, France*

**R11-48: Characterization of Sb2Te3 Ohmic Contacts on P-Type CdTe Single Crystals**

A. Zappettini, E. Gombia, A. Bosio, N. Romeo, *IMEM-CNR, Italy*

**R11-49: Study of Dark Current Blocking Layer for BiI3 X-Ray Detector Film**

M. Ikeda, T. Oka, K. Mori, M. Atsuta, *Corporate Research and Development Center, Toshiba Corp., Japan*

**R11-50: On the Role of Blocking Contact Technology to Performance of Radiation Detector Based on Bulk Semi-Insulating GaAs**

F. Dubecký<sup>1</sup>, B. Zaťko<sup>1</sup>, S. Franchi<sup>2</sup>, E. Gombia<sup>2</sup>, M. Sekáčová<sup>1</sup>, V. Nečas<sup>3</sup>, P. Boháček<sup>1</sup>, C. Frigeri<sup>2</sup>, J. Huran<sup>1</sup>, R. Mosca<sup>2</sup>

<sup>1</sup>Inst. of Electrical Engineering, Slovak Academy of Sciences, Slovak Republic; <sup>2</sup>IMEM CNR, Italy; <sup>3</sup>Slovak University of Technology, Slovak Republic

## Detector/ASIC Hybridization and Interconnects

### R11-51: Interconnection Techniques of GaAs Pixel Detector on Silicon ASIC Electronics

M. G. Bisogni<sup>1,2</sup>, D. Bulajic<sup>1,2,3</sup>, A. Cetronio<sup>4</sup>, P. Delogu<sup>1,2</sup>, M. E. Fantacci<sup>1,2</sup>, C. Lanzieri<sup>4</sup>, M. Novelli<sup>1,2</sup>, M. Quattrocchi<sup>1,2</sup>, V. Rosso<sup>1,2</sup>, A. Stefanini<sup>1,2</sup>, L. Venturelli<sup>4</sup>

<sup>1</sup>Università di Pisa, Italy; <sup>2</sup>Sezione di Pisa, Italy; <sup>3</sup>International Centre for Theoretical Physics (ICTP), Italy; <sup>4</sup>Alenia Marconi Systems S.p.A., Italy

### R11-52: Fine-Pitch Flip Chip Bonding Using Anisotropically Conductive Z-Bond™ Technology

D. S. Bale<sup>1</sup>, K. Khanna<sup>2</sup>, H. Smith<sup>1</sup>, F. A. Ferraro<sup>1</sup>, J. Eger<sup>1</sup>, D. E. Coval<sup>1</sup>

<sup>1</sup>eV PRODUCTS, a division of II-VI Inc., USA; <sup>2</sup>Sunray, USA

### R11-53: Development of Flip-Chip Bonding Technology for (Cd,Zn)Te

M. Fiederle<sup>1</sup>, H. Braml<sup>1</sup>, A. Fauler<sup>1</sup>, J. Giersch<sup>2</sup>, J. Ludwig<sup>1</sup>

<sup>1</sup>Freiburger Materialforschungszentrum, Germany; <sup>2</sup>Physikalisches Institut Abteilung 4, Germany

### R11-54: Development of ASIC for CdTe Pixel and Line Sensors

K. Tamura<sup>1</sup>, H. Ikeda<sup>2</sup>, H. Inoue<sup>1</sup>, T. Kiyuna<sup>3</sup>, Y. Kobayashi<sup>1</sup>, K. Nakazawa<sup>1</sup>, T. Takashima<sup>1</sup>, T. Takahashi<sup>1</sup>

<sup>1</sup>Institute for Space and Astronautical Science, Japan; <sup>2</sup>High Energy Accelerator Research Organization (KEK), Japan; <sup>3</sup>Acronad Co., Ltd., Japan

## Spectrometer Systems for Nuclear Inspections Safeguards, Portal Monitoring and International Security

### R11-55: Methods of Processing of Signals in Multidetectoring Digital Radiography Systems

V. G. Volkov, V. D. Ryzhikov, O. D. Opolonin, E. K. Lysetska, V. L. Danilenko, *STC Institute Single for Crystals, Ukraine*

### R11-56: Application of New Information Technologies in the Control of the Nuclear Materials

O. V. Maslov<sup>1</sup>, V. A. Boltenkov<sup>1</sup>, S. G. Oleynik<sup>2</sup>, M. V. Maksimov<sup>1</sup>

<sup>1</sup>Odessa National Polytechnic University, Ukraine; <sup>2</sup>Electrogorsk Research & Engineering Center, Russia

### R11-57: Study of Multi-Electrodes Structure in CdTe Nuclear Radiation Detectors

M. Niraula, Y. Agata, K. Yasuda, *Nagoya Institute of Technology, Japan*

## Imaging Systems for Medical, Astrophysics and Cargo Monitoring Applications

### R11-58: Characterisation of a CZT Focal Plane Small Prototype for Hard X-Ray Telescope

E. Caroli, N. Auricchio, A. Donati, F. Schiavone, J. B. Stephen, G. Ventura, *IASF/CNR - Sezione di Bologna, Italy*; S. Del Sordo, G. Agnetta, F. Russo, M. Strazzeri, *IASF/CNR - Sezione di Palermo, Italy*; G. Bertuccio, S. Caccia, M. Sampietro, *Politecnico di Milano, Italy*; G. Pareschi, *Osservatorio di Brera/INAF, Italy*

### R11-59: Small Scale Prototype of a CdTe Imaging System

H. Lambropoulos, *Technological Educational Institute of Chalkis, Greece*; I. Papadakis, D. Loukas, *NCSR Demokritos, Greece*; M. Zervakis, *National Technical University of Athens, Greece*

### R11-60: Monte Carlo Evaluation of Polarimetric Capabilities of a Hard X-ray CdTe focal plane

R. M. Curado da Silva<sup>1</sup>, E. Caroli<sup>2</sup>, J. B. Stephen<sup>2</sup>, N. F. C. Mendes<sup>1</sup>, F. Frontera<sup>3</sup>, G. Pareschi<sup>4</sup>, S. del Sordo<sup>2</sup>

<sup>1</sup>Universidade de Coimbra, Portugal; <sup>2</sup>Istituto di Astrofisica Spaziale e Fisica Cosmica, Italy; <sup>3</sup>Università di Ferrara, Italy; <sup>4</sup>Istituto Nazionale di Astrofisica, Italy

### R11-61: Multi-Energy X-Ray Imaging with Linear CZT Pixel Arrays and Integrated Electronics

V. B. Cajipe, R. Calderwood, M. Clajus, B. Grattan, S. Hayakawa, R. Jayaraman, T. O. Tumer, O. Yossifor, *NOVA Re&D, Inc., USA*

### R11-62: Additional Information Sources for More Efficient Muon Radiography

K. N. Borozdin, G. E. Hogan, C. Morris, L. J. Schultz, R. Schirato, W. C. Priedhorsky, *Los Alamos National Laboratory, USA*

### R11-63: Optimisation of the Design of a Prototype Large Area Microchannel Plate Detector with Amorphous Silicon Array Readout for Fast Neutron Radiography

R. M. Ambrosi<sup>1</sup>, G. W. Fraser<sup>1</sup>, R. Street<sup>2</sup>, B. Feller<sup>3</sup>, J. I. W. Watterson<sup>4</sup>, R. C. Lanza<sup>5</sup>, G. Downing<sup>3</sup>, P. White<sup>3</sup>, A. F. Abbey<sup>1</sup>

<sup>1</sup>University of Leicester, UK; <sup>2</sup>Palo Alto Research Center, USA; <sup>3</sup>Nova Scientific Inc, USA; <sup>4</sup>University of the Witwatersrand, South Africa; <sup>5</sup>MIT, USA

### R11-64: Polarimetric Performances of a Wide Field CdTe Monitor for X- and $\gamma$ -Ray Astrophysics

R. M. Curado da Silva<sup>1</sup>, E. Caroli<sup>2</sup>, J. B. Stephen<sup>2</sup>, N. F. C. Mendes<sup>1</sup>, F. Frontera<sup>3</sup>

<sup>1</sup>Universidade de Coimbra, Portugal; <sup>2</sup>Istituto di Astrofisica Spaziale e Fisica Cosmica, Italy; <sup>3</sup>Università di Ferrara, Italy

### R11-65: Investigation of Spectral Response of Monolithic CZT for Imaging

I. M. Blevis<sup>1</sup>, A. Tsigelman<sup>2</sup>, A. Pansky<sup>1</sup>, H. Altman<sup>1</sup>, J. W. Hugg<sup>1</sup>

<sup>1</sup>General Electric Healthcare, Israel; <sup>2</sup>Imarad Imaging Systems, Israel

### R11-66: Low Dark Current (0.0 l) Mercuric Iodide Thick Films for X-Ray Direct and Digital Imagers

L. Fornaro, A. Cuña, A. L. Noguera, I. Aguiar, M. Pérez, L. Mussio, A. Gancharov, *Compound Semiconductors Group, Uruguay*

### R11-67: CdZnTe Detectors for the Positron Emission Tomographic Imaging of Small Animals

A. Drezet, O. Monnet, G. Montemont, J. Rustique, L. Verger, *LETT-CEA Recherches Technologies, France*

### R11-68: Optimized Active/passive Shielding for CZT Focal Plane Detectors of Future

J. M. Poulsen<sup>1</sup>, E. Caroli<sup>2</sup>, S. Del Sordo<sup>3</sup>, G. Malaguti<sup>2</sup>, G. Palladino<sup>2</sup>, G. Pareschi<sup>4</sup>

<sup>1</sup>LABEN Spa, Italy; <sup>2</sup>IASF/CNR - Sezione di Bologna, Italy; <sup>3</sup>IASF/CNR - Sezione di Palermo, Italy; <sup>4</sup>INAF/Osservatorio Astronomico di Brera, Italy



## R12 Semiconductor Neutron Detectors

Thursday, October 21 14:30-15:35, Orange 1  
Session Chair: **Francois Lebrun**, *CEA-Saclay*

### **R12-1**, invited: (14:30) Design Optimization of Morphologically Altered Semiconductor Neutron Detectors

D. S. McGregor, J. K. Shultis, *Kansas State University, USA*

### **R12-2**: (14:50) The Fast Neutron Response of Silicon Carbide Semiconductor Radiation Detectors

E. H. Ruddy, A. R. Dulloo, J. G. Seidel, *Westinghouse Electric Company, USA*; M. K. Das, S.-H. Ryu, A. K. Agarwal, *Cree, Inc., USA*

### **R12-3**: (15:05) Monte Carlo Analysis of a Mercuric Iodide Neutron/Gamma Detector

Z. W. Bell, *Oak Ridge National Laboratory, USA*; K. R. Pohl, L. van den Berg, *Constellation Technology Corporation, USA*

### **R12-4**: (15:20) Neutron Detection with Semiconducting Boron Carbide: Structure - Performance Relationships

B. W. Robertson, C. N. Lundstedt, E. E. Day, A. D. Harken, S. Adenwalla, R. Padmanabhan, R. B. Billa, *University of Nebraska-Lincoln, USA*

## R13 CZT Devices Performance Improvements

Thursday, October 21 16:00-18:00, Orange 1  
Session Chair: **Longxia Li**, *Yinnel Technology*

### **R13-1**, invited: (16:00) Performance Improvement of Large Volume CZT Detectors

V. Gostilo, I. Lisjutin, A. Loupilov, *Baltic Scientific Instruments, Latvia*; V. Ivanov, *RITEC, Latvia*

### **R13-2**, invited: (16:20) Energy Resolution Improving by Real Non-Uniform Electric Field for Nuclear Imaging Detectors

A. Zumbiehl<sup>1</sup>, M. Hage-Ali<sup>2</sup>, C. Scheiber<sup>1</sup>

<sup>1</sup>Université Claude Bernard, France; <sup>2</sup>Laboratoire PHASE, France

### **R13-3**: (16:40) eVDSIM: an Object-Oriented Simulation Package for Semiconductor Radiation Detectors

D. S. Bale, S. A. Soldner, C. Szeles, *eV PRODUCTS, a division of II-VI Inc., USA*

### **R13-4**: (16:55) Experimental Validation of the eVDSIM CdZnTe Detector Device Simulation Package Using Alpha Particles and Gamma-Ray Spectra

S. A. Soldner, D. S. Bale, C. Szeles, *eV Products, USA*

### **R13-5**: (17:10) Cost Factors for Operational Use of Semiconductor Nuclear Detectors

R. R. Whitlock, R. A. August, *Naval Research Laboratory, USA*

### **R13-6**: (17:25) Performance Study of CdZnTe Schottky Devices Fabricated by Evaporation Method

M. A. Hossain, *Bangladesh Atomic Energy Commission, Bangladesh*; E. J. Morton, *University of Surrey, UK*

### **R13-7**: (17:40) Recent Developments with Multielement CdTe Detectors

R. H. Redus, A. Huber, J. Pantazis, T. Pantazis, *Amptek, Inc., USA*

## SYMPOSIUM ON NUCLEAR POWER SYSTEMS (SNPS)

The following technical session covers subjects of major interest to the operation of nuclear power stations and the contributors of this session are from nuclear suppliers, services, power utilities, architect engineering firms, the U.S Nuclear Regulatory Commission, and especially the Nuclear Power Engineering Committee of the IEEE.



NOTE: The presentation period will be twenty-five minutes followed by a five-minute discussion period.

Jay Forster  
SNPS Program Chair

## SNPS Plenary Session – P1: Nuclear Plant Modernization, Part 1

Thursday, October 21 09:00 - 11:30, Spalato  
Session Chair: **N.K. Trehan**, *US NRC*

### **P1-1**: A Review of Nuclear Power Standards – 2004

J.P. Carter, *The Shaw Group*

### **P1-2**: Power Upgrades in Nuclear Power Generating Stations

N.K. Trehan, *US NRC*

### **P1-3**: Investigation of Potential Human-System Interface Operation Issues in Lungmen Nuclear Power Project

CF Chuang, *ROC AEC* and HP Chou, *National Tsing Hua University*

Coffee break

### **P1-4**: The Performance of North American Nuclear Power Plants During the Electric Power Blackout of August 14, 2003

GI Maldonado, *University of Cincinnati*

## SNPS Plenary Session – P2: Nuclear Plant Modernization, Part 2

Thursday, October 21 11:30 - 12:30, Spalato  
Session Chair: **Jay Forster**, *GE Nuclear*

### **P2-1**: Techniques and Tools for Lifecycle V&V of Safety Software in KNICS

KH Cha, YJ Lee, HS Son, SW Cheon, JY Kim, JS Lee, KC Kwon, *Korea Atomic Energy Research Institute*

### **P2-2**: Expected Consequences of Industrial Relevance from the RBMK/WWER-1000 TACIS Program

C. Parisi, F. D'Auria, *University of Pisa*

Thursday, October 21 14:30 - 15:30, Spalato  
Session Chair: Jay Forster, *GE Nuclear*

- P3-1: Optimizing LWR Cost of Margin One Fuel Pin at a Time**  
GI Maldonado, *University of Cincinnati*
- P3-2: Electric Utility Deregulation: Failure or Success**  
N.K. Trehan, *US NRC*

Thursday, October 21, *Orange 2*

Coordinators:  
Francesco Fidecaro, *University of Pisa & INFN-Pisa, Italy*  
Matteo Barsuglia, *LAL-Orsay, France*

Detection of gravitational wave signals is one of the challenges of experimental physics today. The prospect of collecting information of astrophysical and cosmological importance has been driving the development of more and more sensitive detectors. The data will complement what electromagnetic and high energy radiation are teaching us about the structure of the Universe and its components. The experimental difficulties born in the smallness of the expected effect are stimulating the ingenuity of physicists in the design of the future detectors like AIGO in Australia, CEGO in China, and LISA in space. On the other hand the interferometers GEO600, LIGO, TAMA, Virgo, are now running or being commissioned together with the Allegro, Auriga, Explorer, Nautilus and Niobe bar detectors, and first signals may show up over background. In any case significant sensitivity improvements are within reach to allow the beginning of gravitational wave astronomy.

In view of the importance that gravitational wave detection will have in fundamental physics research this Special Focus Workshop in the framework of the 2004 IEEE NSS - MIC has been organized. The emphasis is on how signal is extracted from detectors and how this signal is used to keep the instrument on the correct working point: these control systems are essential to achieve the instrument's ultimate sensitivity.

This subject involves knowledge in optics, photon detection, low noise electronics, feedback control systems. As many related problems are studied by the traditional NSS audience, including accelerator physicists and engineers, the Workshop coordinators would like to welcome a wider community than gravitational wave detector experts and establish fruitful contacts both ways.

**GW1 General talks**

Thursday, October 21 08:30-10:30, Orange 2  
Session Chair: **Francesco Fidecaro**, *Università di Pisa & INFN-Pisa*

- GW1-1: (08:30) Readout and Control of a Power-Recycled Interferometric Gravitational-Wave Antenna**  
D. Sigg, *LIGO Hanford Observatory, USA*  
On behalf of the LIGO Project
- GW1-2: (09:00) Gravitational Wave Interferometers: Where Do We Stand Today ?**  
M. Barsuglia, *LAL - CNRS, France*
- GW1-3: (09:30) Real Time Simulation as a Crucial Tool for GW Experiments**  
H. Yamamoto, *California Institute of Technology, USA*  
On behalf of the LIGO

**GW1-4:** (10:00) Automatic Mirror Alignment for Interferometric Gravitational Wave Detectors  
A. Freise, *European Gravitational Observatory, Italy*

**GW2 Feedback Lock Acquisition**

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Thursday, October 21 11:00-12:40, Orange 2  
Session Chair: **Fulvio Ricci**, *Roma La Sapienza & INFN-Roma 1*

**GW2-1:** (11:00) A Technique for Lock Acquisition in Gravitational-Wave Interferometers  
M. J. Evans, *California Institute of Technology, USA*

**GW2-2:** (11:25) Sensing and Control in Virgo Experiment  
L. Barsotti, *Pisa University, Italy*  
On behalf of the Virgo Collaboration

**GW2-3:** (11:50) Sensing and Control of an Interferometer Gravitational Wave Detector TAMA300  
K. Arai, *National Astronomical Observatory of Japan, Japan*  
On behalf of the TAMA project

**GW2-4:** (12:15) Time-Domain Model for AdvLIGO IFO  
M. Varvella, *LAL Laboratoire de l'Accelérateur Lineaire, France*

**GW3 Interferometer Suspensions**

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Thursday, October 21 14:00-15:30, Orange 2  
Session Chair: **Matt Evans**, *Caltech*

**GW3-1:** (14:00) The Control of the Mirror Suspensions in GW Interferometric Detectors  
G. Losurdo, *INFN Firenze, Italy*  
On behalf of the Virgo Collaboration

**GW3-2:** (14:30) Hybrid System for Suspension Control of Interferometers for Gravitational Waves Detection  
F. Barone<sup>1,2</sup>, R. De Rosa<sup>1,3</sup>, A. Eleuteri<sup>3,2</sup>, L. Milano<sup>3,2</sup>, S. Pardi<sup>3,2</sup>, I. Ricciardi<sup>3,2</sup>, G. Russo<sup>3,2</sup>  
<sup>1</sup>*University of Salerno, Italy*; <sup>2</sup>*INFN, Italy*; <sup>3</sup>*University of Napoli, Italy*

**GW3-3:** (15:00) The New Low Noise Control System for the VIRGO Suspensions  
A. Gennai<sup>1</sup>, D. Passuello<sup>1</sup>, F. Paoletti<sup>1,2</sup>, R. Taddei<sup>2</sup>, V. Boschi<sup>3</sup>, R. Cavalieri<sup>2</sup>, F. Fidecaro<sup>1,3</sup>, G. Ballardin<sup>2</sup>  
<sup>1</sup>*INFN, Italy*; <sup>2</sup>*E.G.O., Italy*; <sup>3</sup>*Università di Pisa, Italy*

**GW4 Future Prospects for GW Interferometric Detectors**

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Thursday, October 21 16:00-18:00, Orange 2  
Session Chair: **Matteo Barsuglia**, *LAL-Orsay*

**GW4-1:** (16:00) An Alternative Strategy for Cooling the Mirrors of the Gravitational Wave Interferometers at Low Temperature  
F. Ricci<sup>1</sup>, A. Cinelli<sup>2</sup>, P. Puppo<sup>2</sup>, P. Rapagnani<sup>1</sup>  
<sup>1</sup>*University of Rome La Sapienza, Italy*; <sup>2</sup>*INFN, Italy*

**GW4-2:** (16:30) Beyond the Standard Quantum Limit  
G. Cella, *Università di Pisa, Italy*

**GW4-3:** (17:00) Ideas for Locking Advanced Interferometers  
M. J. Evans, *California Institute of Technology, USA*

**GW4-4:** (17:20) Monolithic Folded Pendulum Accelerometers for Seismic Monitoring and Active Isolation Systems  
A. Bertolini<sup>1,2,3</sup>, R. De Salvo<sup>4</sup>, F. Fidecaro<sup>1</sup>, A. Takamori<sup>5</sup>  
<sup>1</sup>*Università di Pisa, Italy*; <sup>2</sup>*INFN, Italy*; <sup>3</sup>*Marwan Technology Srl, Italy*; <sup>4</sup>*California Institute of Technology, USA*; <sup>5</sup>*University of Tokyo, Japan*

**GW4-5:** (17:40) Ground Based Tests for LISA and LISA Pathfinder  
G. Bagni, *Università di Urbino, Italy*; R. Stanga, *Università di Firenze and INFN Sezione di Firenze, Italy*

## WORKSHOP ON SYNCHROTRON RADIATION DETECTORS

Friday, October 22, *Leptis Magna 3*

Coordinators:

Ralf Menk, *Elettra Synchrotron Light Laboratory, Trieste, Italy*  
Heinz Graafsma, *ESRF, Grenoble, France*

During the past 20 years Synchrotron Light Sources and the associated optical components developed at a fast pace providing a remarkable increase of intensity and brightness. Ever since then research with synchrotron radiation has emerged to be one of the most powerful tools in almost every field of science and technology. However, these sources can maintain their high level of competitiveness only if a new generation of x-ray and electron detectors is developed as well. Right now we are facing a situation in which it is mostly the detection device that limits the final data quality. As a result of these circumstances it is necessary to increase the research effort in this field.

Therefore the purpose of this one-day workshop is to review the aspects of recent detector development for synchrotron radiation and to develop multidisciplinary and new ideas for the next generation of detection devices. This will include knowledge transfer from high-energy physics, neutron experiments, astronomy and medical imaging. Apart from the technical effort future detector development requires also remarkable financial endeavors. Thus representatives from funding agencies will be present at the workshop to discuss future multinational funding possibilities in the field of detector development for synchrotron radiation sources and neutron sources.

This workshop is partially supported by the European Community - Research Infrastructure Action under the FP6 "Structuring the European Research Area" Programme (through the Integrated Infrastructure Initiative "Integrating Activity on Synchrotron and Free Electron Laser Science").

### SR1 SR Session I

Friday, October 22 08:30-10:30, *Leptis Magna 3*

Session Chairs: Ralf - Hendrik Menk, *Sincrotrone Trieste*  
Heinz Graafsma, *ESRF*

**SR1-1, invited: (08:30) Detector Needs for Third Generation Synchrotron Radiation Sources and Beyond**

C. Norris, *Diamond Light Source Ltd, UK*

**SR1-2, invited: (08:45) The Detector Development Programme for the Diamond Light Source**

G. E. Derbyshire, *CCLRC Rutherford Appleton Laboratory, UK*

**SR1-3: (09:00) Status of the Canadian Light Source**

E. Hallin, *Canadian Light Source, Canada*

**SR1-4, invited: (09:15) High Energy X-ray Detectors at SPring-8 and Their Future Extensions**

M. Suzuki, *H. Toyokawa, SPring-8/JASRI, Japan*

**SR1-5, invited: (09:30) Gas-Filled Detectors at Third Generation Synchrotron Sources**

M. Kocsis, *ESRF, France*

**SR1-6: (09:45) DIMEX, Detector for Dynamic Studies of an Explosions and Detonation Waves with Synchrotron Radiation**

L. Shekhtman<sup>1</sup>, V. Aulchenko<sup>1</sup>, O. Evdokov<sup>2</sup>, K. Ten<sup>3</sup>, B. Tolochko<sup>2</sup>, I. Zhogin<sup>2</sup>, V. Zhulanov<sup>1</sup>

<sup>1</sup>*Budker Institute for Nuclear Physics, Russia;* <sup>2</sup>*Institute of Solid state chemistry and mechano-chemistry, Russia;* <sup>3</sup>*Lawrentiev Institute of Hydrodynamics, Russia*

**SR1-7, invited: (10:00) Development of ultrafast Streak Cameras for Synchrotron Radiation Research**

H. Padmore, *Lawrence Berkeley National Lab, USA*

**SR1-8: (10:15) Novel Fast Scintillators for Synchrotron Radiation Detectors**

A. A. Fedorov, M. V. Korzhik, A. S. Lobko, O. V. Missevitch, *Institute for Nuclear Problems, Belarus State University, Belarus*

### SR2 SR Session II

Friday, October 22 11:00-12:30, *Leptis Magna 3*

Session Chairs: Howard Padmore, *ALS, LBL*

Gareth Derbyshire, *CCLRC Rutherford Appleton*

**SR2-1: (11:00) A Digital Detection System for Synchrotron Radiation Breast Tomography**

C. Venanzi<sup>1,2</sup>, A. Bergamaschi<sup>1,2</sup>, D. Dreossi<sup>1,2</sup>, S. Olivo<sup>1,2</sup>, S. Pani<sup>1,2</sup>, R. Longo<sup>1,2</sup>, E. Castelli<sup>1,2</sup>

<sup>1</sup>*Università di Trieste, Italy;* <sup>2</sup>*INFN-Trieste, Italy*

**SR2-2: (11:15) Silicon Detectors for High Spatial Resolution Dosimetry on Synchrotron Microbeam Radiation Therapy**

A. B. Rosenfeld, M. L. F. Lerch, *University of Wollongong, Australia;* E. Brauer-Krish, A. Bravin, *European Synchrotron Radiation Facility, France;* J. Laissue, *University of Bern, Murtenstrasse, Switzerland;* O. Parkash, *Swiss Federal Institute of Technology, Switzerland*

**SR2-3: (11:30) Synchrotron Beam Position Monitors**

C. Kenney<sup>1</sup>, J. Morse<sup>2</sup>, A. Thompson<sup>1</sup>, E. Westbrook<sup>1</sup>, S. Parker<sup>3</sup>

<sup>1</sup>*Molecular Biology Consortium, USA;* <sup>2</sup>*European Synchrotron Research Facility, France;* <sup>3</sup>*University of Hawaii, USA*

**SR2-4, invited: (11:45) A Novel High Resolution, High Frame Rate Detector Based on a Micro-Channel-Plate Read Out with the Medipix2 Counting CMOS Pixel Chip**

B. Mikulec, A. G. Clark, *University of Geneva, Switzerland;* J. Va llerra, O. H. W. Siegmund, J. McPhate, A. Tremsin, *University of California, USA*

**SR2-5: (12:00) Development of Very-High Rate and Resolution Thermal Neutron and X-Ray Detectors in DETNI**

S. S. Alimov<sup>1</sup>, S. Buzzetti<sup>2</sup>, W. Dabrowski<sup>3</sup>, T. Fiutowski<sup>3</sup>, B. Gebauer<sup>1</sup>, P. Grybos<sup>3</sup>, M. Klein<sup>4</sup>, C. Petrillo<sup>5</sup>, F. Sacchetti<sup>5</sup>, C. J. Schmidt<sup>4</sup>, C. Schulz<sup>1</sup>, K. H. Soltveit<sup>4</sup>, U. Trunk<sup>4</sup>, T. Wilpert<sup>1</sup>  
<sup>1</sup>*Hahn-Meiner-Institut Berlin, Germany;* <sup>2</sup>*INFN & Politecnico di Milano, Italy;* <sup>3</sup>*AGH University of Science and Technology, Poland;* <sup>4</sup>*Universität Heidelberg, Germany;* <sup>5</sup>*INFN & Università di Perugia, Italy*



**SR2-6:** (12:15) Solid State and Scintillation Detectors for Electron Volt Neutron Spectroscopy

C. Andreani<sup>1</sup>, A. Pietropaolo<sup>1</sup>, R. Senesi<sup>1</sup>, G. Gorini<sup>2</sup>, M. Tradocchi<sup>2</sup>, N. Rhodes<sup>3</sup>, E. M. Schooneveld<sup>3</sup>, A. D'angelo<sup>1,4</sup>

<sup>1</sup>Università degli Studi di Roma Tor Vergata, Italy; <sup>2</sup>Università degli Studi di Milano Bicocca, Italy; <sup>3</sup>Rutherford Appleton Laboratory, UK;

<sup>4</sup>Istituto Nazionale Fisica Nucleare, Italy

**SR3 SR Session III**

Friday, October 22 14:00-15:30, Leptis Magna 3

Session Chairs: Christian Broennimann, *Swiss Light Source*

Carla Andreani, *University Roma 2*

**SR3-1:** (14:00) A Selenium based Direct Conversion Detector for Protein Crystallography at Synchrotron Sources

J. Hendrix, M. Casey, T. Klatt, *marresearch GmbH, Germany*

**SR3-2:** (14:15) Fast Readout Low Noise CCD Camera for Synchrotron X-Ray Imaging Applications

J.-C. Labiche, *European Synchrotron Radiation Facilities, France*

**SR3-3:** (14:30) Development of a Mixed-Mode Pixel Array Detector for Macromolecular Crystallography

S. G. Angello<sup>1</sup>, F. Augustine<sup>2</sup>, A. Ercan<sup>3</sup>, S. M. Gruner<sup>3</sup>, R. C. Hamlin<sup>1</sup>, T. Hontz<sup>1</sup>, M. J. Renzi<sup>3</sup>, D. R. Schuette<sup>3</sup>, M. W. Tate<sup>3</sup>, W. Vernon<sup>1</sup>

<sup>1</sup>Area Detector System Corporation, USA; <sup>2</sup>Augustine Engineering, USA;

<sup>3</sup>Cornell University, USA

**SR3-4:** (14:45) High Resolution CT Imaging with a Fast Readout Low Noise (FReLoN) CCD Camera

A. Bravin, S. Fiedler, P. Coan, C. Nemoz, M. Fernandez, J. F. Adam, C. Ponchut, J. C. Labiche, *ESRF, France*

**SR3-5:** (15:00) High Sensitivity EXAFS Using the XSPRESS Detector System

B. R. Dobson, J. Headspith, R. C. Farrow, *CLRC Daresbury Laboratory, UK*

**SR3-6:** (15:15) High-Purity Germanium Strip Detectors – Possible Applications to SR Studies

T. E. Beveridge, J. E. Gillam, R. Lewis, *Monash University, Australia*

**SR4 SR Session IV**

Friday, October 22 16:00-18:00, Leptis Magna 3

Session Chairs: Fulvia Arfelli, *University Trieste, INFN Trieste*

Christopher Hall, *CCLRC Daresbury Laboratory*

**SR4-1:** (16:00) Experimental Comparison of Pixel Detector Arrays and CCD-Based Systems for X-Ray Area Detection on Synchrotron Beamlines

C. Ponchut, F. Zontone, H. Graafsma, *European Synchrotron Radiation Facility (ESRF), France*

**SR4-2:** (16:15) PILATUS 1M: A Single Photon Counting Pixel Detector for Protein Crystallography and Material Science

C. Broennimann, *Paul Scherrer Institut, Switzerland*

**SR4-3:** (16:30) Recent Analog X-Ray Pixel Array Detector (APAD) Developments

S. M. Gruner<sup>1</sup>, A. Ercan<sup>1</sup>, M. J. Renzi<sup>1</sup>, D. R. Schuette<sup>1</sup>, M. W. Tate<sup>1</sup>, T. Hontz<sup>2</sup>, W. Vernon<sup>2</sup>

<sup>1</sup>Cornell University, USA; <sup>2</sup>Area Detector Systems Corp., USA

**SR4-4:** (16:45) Multi-Element Silicon Detectors for X-Ray Spectroscopy and Diffraction

D. P. Siddons, P. O'Connor, G. De Geronimo, A. Kuczewski, *Brookhaven National Laboratory, USA*

**SR4-5:** (17:00) New Silicon Drift Detectors for Synchrotron Radiation Applications

A. Castoldi<sup>1,2</sup>, A. Galimberti<sup>1,2</sup>, C. Guazzoni<sup>1,2</sup>, L. Strüder<sup>3</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>Max Planck Institut, Germany

**SR4-6:** (17:15) A Multichannel Superconducting Tunnel Junction Detector for High-Resolution Soft X-Ray Spectroscopy

S. Friedrich, *Lawrence Livermore National Laboratory, USA*

**SR4-7:** (17:30) Synchrotrons: Medical Imaging Challenges and the New Pan-European Strategy

G. Margaritondo, *Ecole Polytechnique Federale de Lausanne, Switzerland*

**SR4-8:** (17:45) The 6th Framework Programme for Research Infrastructures and Beyond

S. Fontana, *European Commission, Belgium*

**SR5 SR Posters**

Friday, October 22 8:30-18:00, Leptis Magna 3

Session Chair: Cristian Venanzi, *University Trieste, INFN Trieste*

**SR5-1:** Direct X-Ray Detection with the S6493 Hamamatsu Photodiode Array and Its Evaluation in Energy-Dispersive EXAFS

C. Ponchut, O. Mathon, *European Synchrotron Radiation Facility (ESRF), France*

**SR5-2:** DAQ Boards for High-Rate Delay Line Detectors with 2D Position and Time Resolution

F. V. Levchanovski<sup>1</sup>, B. Gebauer<sup>2</sup>, E. I. Litvinenko<sup>1</sup>, A. S. Nikiforov<sup>1</sup>, V. I. Prikhodko<sup>1</sup>, C. Schulz<sup>2</sup>, T. Wilpert<sup>2</sup>

<sup>1</sup>Joint Institute for Nuclear Research, Russia; <sup>2</sup>Hahn-Meitner-Institut Berlin, Germany

**SR5-3:** First Trials of the Next Generation XSPRESS (X2) Digital Pulse Processing

J. Headspith, T. Nicholls, M. Siyad, D. Allan, R. Farrow, C. Mills, A. Hill, *CCLRC Daresbury Laboratory, UK*; A. Dent, S. Diaz-Moreno, G. Deryshire, *Diamond Light Source, UK*

**SR5-4:** Development of a Novel Front-End ASIC for Very High Rate Neutron Area Detectors in DETNI

S. Buzzetti<sup>1</sup>, W. Dabrowski<sup>2</sup>, T. Fiutowski<sup>2</sup>, B. Gebauer<sup>3</sup>, P. Grybos<sup>2</sup>, M. Klein<sup>4</sup>, C. Petrillo<sup>5</sup>, F. Sacchetti<sup>5</sup>, C. J. Schmidt<sup>4</sup>, K. H. Soltveit<sup>4</sup>, U. Trunk<sup>4</sup>

<sup>1</sup>INFN & Politecnico di Milano, Italy; <sup>2</sup>AGH University of Science and Technology, Poland; <sup>3</sup>Hahn-Meitner-Institut Berlin, Germany;

<sup>4</sup>Universität Heidelberg, Germany; <sup>5</sup>INFM & Università di Perugia, Italy

**SR5-5: A Floating High Voltage Power Supply System for High Stability and High Resolution Applications**

M. Cautero<sup>1</sup>, G. Passuello<sup>2</sup>, R. Tommasini<sup>1</sup>, G. Cautero<sup>1</sup>, B. Krastanov<sup>1</sup>

<sup>1</sup>Sincrotrone Trieste SpA, Italy; <sup>2</sup>C.A.E.N, Italy

**SR5-6: A High Dynamic Micro Strips Ionization Chamber Featuring Embedded Multi DSP Processing**

E. Voltolina<sup>1,2,3</sup>, <sup>1</sup>University of Trieste, Italy; <sup>2</sup>Universitaet-GH Siegen, Germany; <sup>3</sup>ELETTRA, Italy

On behalf of the SAXS Detector Collaboration

**SR5-7: High Resolution Phosphors as X-Ray Detectors for Synchrotron Radiation Experiments**

J. Y. Choi, K. J. Yoon, D. H. Kim, Radiation Image Laboratory, South Korea; S. H. Nam, H. K. Choi, Medical imaging research center, South Korea

**SR5-8: An Implanted Diode X-Ray Detector in Silicon Optical Elements**

C. J. Hall, G. Salvini, CCLRC Daresbury Laboratory, UK; R. Lewis, Monash University, Australia

**2004 WORKSHOP ON THE NUCLEAR RADIOLOGY OF BREAST CANCER**

October 22 and 23, Orange 1 and Orange 2

Organizers: Craig Levin, Stanford University, USA  
Martin Tornai, Duke University, USA  
Roberto Pani, University of Rome "La Sapienza", Italy  
Franco Garibaldi, Istituto Superiore di Sanità, Italy  
Iraj Khalkhali, Harbor-UCLA Medical Foundation, USA  
David Mankoff, University of Washington, Seattle, USA

This one-and-a-half day workshop will cover issues related to nuclear emission imaging for breast cancer evaluation. Topics will include biology and markers for breast cancer, conventional and emerging breast imaging technologies, potential roles of nuclear techniques (PET/SPECT), new breast cancer radiotracers, clinical practicality issues, new nuclear imaging instrumentation and methods designed for breast cancer, industrial perspectives, and funding opportunities.

**DAY ONE: Friday, October 22, 2004, 12:15PM - 10:00PM (including lunch and dinner):**

12:30 Welcome Luncheon (in Room Le Quattro Stagioni)

13:45 Introduction

**Section I. Breast Cancer Oncology, Biology, and Radiology Background**

13:50 Breast Cancer 2004: Progress and Promise on the Clinical Front

Julie Gralow, University of Washington, Seattle

14:25 Breast Cancer Biology and Therapy: From Patients to Mouse Models

Lewis Chodosh, University of Pennsylvania

15:10 Mainstream Breast Cancer Radiology Perspective

Debra Ikeda, Stanford University

15:35 Coffee Break

16:05 Promising New Techniques for Breast Cancer Detection, Diagnosis and Staging using Non-ionizing Radiation Imaging Techniques

Debra Ikeda, Stanford University

**Section II. Clinical Nuclear Medicine Imaging in the Management of Breast Cancer**

16:35 Functional Characterization of Breast Cancer by Nuclear Medicine Techniques: from Metabolic Imaging to Receptor Specific Detection

Michael Hofmann, Medical School of Hannover

17:15 The Potential Roles of New Radiopharmaceuticals in Breast Cancer Imaging

David Mankoff, *University of Washington, Seattle*

17:50 Clinical experience with a high resolution breast-specific gamma camera for the improved diagnosis of breast cancer

Rachel Brem, *George Washington University*

18:15 Role of Nuclear Medicine in Early Breast Cancer from Sentinel Node to Targeted Therapy

Giovanni Paganelli, *Istituto Europeo di Oncologia*

18:40 Functional Imaging of Multi-drug Resistance in Breast Cancer

Silvana Del Vecchio, *Istituto di Biostrutture e Bioimmagini*

19:05 Panel Discussion: Clinical perspectives on the potential clinical roles of Nuclear Imaging in breast cancer management (detection, diagnosis, staging, re-staging)

19:25 Dinner

**DAY TWO: Saturday, October 23, 2004, 08:30 - 17:30 (including lunch)**

08:30 Previous day's review and overview of information about funding opportunities for breast cancer imaging research on poster boards

**Section III. Research Radionuclide Imaging Systems Dedicated to Breast Cancer (selected from abstracts submitted)**

08:40 Oral Session

10:35 Poster Session and Funding Agency Displays

12:30 Lunch

**Section IV. Commercially Available Radionuclide Imaging Systems Dedicated to Breast Cancer**

15:00 Update on Gamma Medica, Inc.'s Breast Camera(s)  
Bradley Patt (not-confirmed)

15:25 Update on Dilon Technologies, Inc.'s Breast Camera  
Douglas Kieper, *Dilon, Inc.*

15:50 Update on IS2's Breast Camera and Clinical Results  
Ian Stark, *IS2, Inc.*

16:15 Update on Navscan PET Systems, Inc.'s Dedicated Breast Camera and Clinical Results  
Irving Weinberg, *Navscan PET Systems, Inc.*

16:40 Panel Discussion: Dedicated Nuclear Breast Cameras: Successes and Forecasts

17:05 Remarks, reminders about paper submissions for special issue of *Physica Medica*

17:15 Meeting adjourns

**ACKNOWLEDGEMENTS**

When, in an oral presentation at a scientific meeting, one arrives at the last slide, that of the Acknowledgements, it means that the job is almost over, and the speaker is ready to take questions: hopefully soft questions and nice remarks, because all the authors of the paper have worked hard to obtain the best results for the scientific community and the audience.

Likewise, I hope to be challenged only with soft questions and nice remarks, when the preparation for this event is over and the conference starts in October 2004! If this is the case all the merit goes to the team of extraordinary friends and colleagues that have shared with me the burden of organizing this Conference: the Conference Committee, the NSS Session Conveners, the NSS, MIC, RTSD and SNPS Program Committees and the Conference Information and Promotion Committee members. I would also like to acknowledge the sponsoring institutions, that have helped us all through the preparation of the conference for the last three years, with their support, technical structures and above all participation of dedicated individuals. Finally, special thanks are due to the selected bunch of people from my institution who have suffered the most for my requests and advices.

Alberto Del Guerra

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(as of August 3, 2004)

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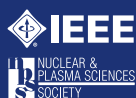
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**CONFERENCE PROGRAM TIME TABLE: WEDNESDAY, OCTOBER 20 – SATURDAY, OCTOBER 23**

|                       | Leptis Magna 1&2                                    | Leptis Magna 4                                           | Leptis Magna 3                                                  | Orange 2                                                       | Spalato                                                          | Orange 1                                              | RTSD Poster Area<br>Pola       | MIC Poster Area<br>upper & lower level | NSS Poster Area<br>upper level |  |
|-----------------------|-----------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------|--------------------------------|----------------------------------------|--------------------------------|--|
| Wednesday, October 20 |                                                     |                                                          |                                                                 |                                                                |                                                                  |                                                       |                                |                                        |                                |  |
| 08:30-10:30           | MIC-M1<br>Opening Session                           | NSS-N25<br>Gaseous Detectors II                          | NSS-N26<br>Solid State Tracking<br>Detectors II                 | NSS-N27<br>Data Acquisition and<br>Analysis Systems II         | NSS-N28<br>New Solid State Detectors<br>I                        | RTSD-R7<br>Hgl2 and Other Materials                   |                                |                                        |                                |  |
| 11:00-12:30           |                                                     | NSS-N29<br>Gaseous Detectors III                         | NSS-N30<br>Photodetectors and<br>Radiation Imaging I            | NSS-N31<br>Data Acquisition and<br>Analysis Systems III        | NSS-N32<br>New Solid State Detectors<br>II                       | RTSD-R8<br>Detector/ASIC<br>Hybridization & Intercon. |                                | MIC-M2 Poster 1                        |                                |  |
| 14:00-15:30           | JRM1<br>MIC-RTSD Joint Session                      |                                                          |                                                                 |                                                                |                                                                  |                                                       |                                |                                        | NSS-N33 Poster 2               |  |
| 16:00-18:00           | MIC-M3<br>Advances in PET and<br>SPECT              | NSS-N34<br>Gaseous Detectors IV                          | NSS-N35<br>Photodetectors and<br>Radiation Imaging II           | NSS-N36<br>Trigger and Front-End<br>Systems III                | NSS-N37<br>Radiation Damage Effects<br>I - Solid State           | RTSD-R9<br>Detector Arrays                            |                                |                                        |                                |  |
| 19:00-23:00           | Conference Dinner at Villa Miani                    |                                                          |                                                                 |                                                                |                                                                  |                                                       |                                |                                        |                                |  |
| Thursday, October 21  |                                                     |                                                          |                                                                 |                                                                |                                                                  |                                                       |                                |                                        |                                |  |
| 08:30-10:30           | MIC-M4<br>Image Reconstruction                      | NSS-N38<br>Computing and Software<br>for HEP Experiments | NSS-N39<br>Radiation Damage II -<br>Aging of Gas Detectors      | GW-GW1<br>General Talks                                        | SNPS-P1&P2<br>Nuclear Plant<br>Modernization<br>(starts @ 09:00) | RTSD-R10<br>Space Applications                        |                                |                                        |                                |  |
| 11:00-12:30           |                                                     | NSS-N40<br>Software: Enabling<br>Technologies            | NSS-N41<br>Photodetectors and<br>Radiation Imaging III          | GW-GW2<br>Feedback Lock<br>Acquisition                         |                                                                  |                                                       | RTSD-R11 Poster                | MIC-M5 Poster 2                        |                                |  |
| 12:30-14:00           | RTSD Luncheon in Room “Le Quattro Stagioni”         |                                                          |                                                                 |                                                                |                                                                  |                                                       |                                |                                        |                                |  |
| 14:00-15:30           | MIC-M6<br>Multimodality imaging                     | NSS-N42<br>Software for Bio-Medical<br>Applications      | NSS-N43<br>Instrumentation for Med.<br>& Biological Research I  | GW-GW3<br>Interferometer<br>Suspensions                        | SNPS-P3                                                          | RTSD-R12<br>Semiconductor Neutron<br>Detectors        |                                |                                        |                                |  |
| 16:00-18:00           | MIC-M7<br>X-ray Imaging                             | NSS-N44<br>Software for Space<br>Science and Detectors   | NSS-N45<br>Instrumentation for Med. &<br>Biological Research II | GW-GW4<br>Future Prospects for GW<br>Interferometric Detectors | NSS-N46<br>Beamline Instrumentation                              | RTSD-R13<br>CZT Devices Performance<br>Improvements   |                                |                                        |                                |  |
| 20:00-23:00           | MIC Dinner in Room “Le Quattro Stagioni”            |                                                          |                                                                 |                                                                |                                                                  |                                                       |                                |                                        |                                |  |
| Friday, October 22    |                                                     |                                                          |                                                                 |                                                                |                                                                  |                                                       |                                |                                        |                                |  |
| 08:30-10:30           | MIC-M8<br>High Resolution and<br>Animal Imaging     |                                                          | SR-SR1                                                          | SR-SR5<br>Posters                                              |                                                                  |                                                       |                                |                                        |                                |  |
| 11:00-12:30           |                                                     |                                                          | SR-SR2                                                          |                                                                |                                                                  |                                                       |                                |                                        | MIC-M9 Poster 3                |  |
| 14:00-15:30           |                                                     |                                                          | SR-SR3                                                          |                                                                |                                                                  |                                                       | NRBC-day 1<br>(starts @ 13:45) |                                        | MIC-M10 Poster 4               |  |
| 16:00-18:00           | MIC-M11<br>Modelling and Quantitative<br>Processing |                                                          | SR-SR4                                                          |                                                                |                                                                  |                                                       |                                |                                        |                                |  |
| Saturday, October 23  |                                                     |                                                          |                                                                 |                                                                |                                                                  |                                                       |                                |                                        |                                |  |
| 08:30-17:30           |                                                     |                                                          |                                                                 |                                                                |                                                                  | NRBC-day 2                                            |                                |                                        |                                |  |



## 2004 IEEE NSS/MIC/SNPS and RTSD

Rome, Italy • October 16 - 22, 2004 • Ergife Palace Hotel



## REGISTRATION AND

## HOTEL BOOKING FORM

This registration form must be received by EGA along with payment by **25 September 2004** in order to benefit from the reduced registration fee. It is valid for one full participant and up to two accompanying persons. For additional registration forms, please consult the Web site at [www.nss-mic.org](http://www.nss-mic.org), or contact our registration and housing bureau at (+39) 063282.1

### REGISTRANT INFORMATION (please type or print legibly)

\_\_\_\_\_  
*Last Name* (Prof/Dr/Mr/Ms)

\_\_\_\_\_  
*First Name*

\_\_\_\_\_  
*Nickname for Badge*

\_\_\_\_\_  
*Company/Organisation*

\_\_\_\_\_  
*Mailing Address*

\_\_\_\_\_  
*Postal Code* *City*

\_\_\_\_\_  
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\_\_\_\_\_  
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*Phone (Please include country and area code)* *Fax*

\_\_\_\_\_  
*E-mail*

If you would like access to the wireless system at the Conference, please indicate your MAC address \_\_\_\_:\_\_\_\_:\_\_\_\_:\_\_\_\_:\_\_\_\_:\_\_\_\_:  
Instructions how to retrieve the MAC address. If you still encounter problems in retrieving the MAC address of your portable computer, please e-mail the Conference Computer Coordinator ([surget@dapnia.cea.fr](mailto:surget@dapnia.cea.fr))

The names and affiliations of conference attendees will be posted on the conference web site.

If you DO NOT want your name posted, check this box: ☐

Primary Interest: ☐ NSS ☐ MIC ☐ SNPS ☐ RTSD ☐ Workshops

☐ Yes, I am an IEEE Member. Member No: \_\_\_\_\_

Note: To become a member, visit the IEEE membership booth at the conference.

If you are not an IEEE member, ignore next question:

☐ Yes, I am an NPSS Member

**COMPANION NAME(S)** If you are bringing companions, list their name(s)

\_\_\_\_\_  
*Last Name* *First Name*

\_\_\_\_\_  
*Last Name* *First Name*

Please repeat your name

Last Name

First Name

#### A) NSS/MIC/SNPS & RTSD REGISTRATION FEES (inclusive 20% VAT)

After 25 Sept 2004 pre-registration will NOT be processed. All attendees unregistered by this date will have to register on-site by 25 Sept. 2004 on-site

|                                                                                                          |          |          |
|----------------------------------------------------------------------------------------------------------|----------|----------|
| <input type="checkbox"/> IEEE Member <sup>1</sup>                                                        | € 498,00 | € 608,00 |
| <input type="checkbox"/> Non-IEEE Member                                                                 | € 598,00 | € 708,00 |
| <input type="checkbox"/> IEEE Student <sup>1,2</sup>                                                     | € 175,00 | € 225,00 |
| <input type="checkbox"/> Non-IEEE Student <sup>2</sup>                                                   | € 275,00 | € 325,00 |
| <input type="checkbox"/> Retired/Unemployed (IEEE only)                                                  | € 175,00 | € 225,00 |
| <input type="checkbox"/> One day Workshop only <sup>3</sup>                                              | € 120,00 | € 170,00 |
| - <input type="checkbox"/> Sensing, Control & Readout of Gravitational Wave Detectors (Thursday, 21 Oct) |          |          |
| - <input type="checkbox"/> Synchrotron Radiation Detectors (Friday, 22 Oct)                              |          |          |

☐ Attendance to Short Courses only

<sup>1</sup>IEEE member number required at registration

<sup>2</sup>Proof of student status required (registration form must be accompanied by a student ID and verification letter from a senior departmental staff member )  
The appropriate documentation must be attached to this registration form.

<sup>3</sup>Valid for 1 Workshop only – if more than 1 day, full registration is required

In case you are entitled to registration fee waiving, please check the box below:

☐ Selected Attendee after the General Chair approval

TOTAL A:

Notes:

#### B) SHORT COURSES REGISTRATION FEES (inclusive 20% VAT)

Course fees are valid for registration received by 25 September 2004. Note: Add € 50,00 per course for on-site registration.  
Lunch is provided at all full-day courses. Coffee break is provided at all courses

|                              |                          |                                                                 | IEEE Member | Non-IEEE Member |
|------------------------------|--------------------------|-----------------------------------------------------------------|-------------|-----------------|
| <b>NSS Courses</b>           |                          |                                                                 |             |                 |
| <input type="checkbox"/> SC1 | Sat. 16 October (1 day)  | Radiation Detection and Measurement                             | € 250,00    | € 300,00        |
| <input type="checkbox"/> SC2 | Sat. 16 October (½ day)  | Detectors for Astroparticle & Synchrotron Radiation Experiments | € 100,00    | € 150,00        |
| <input type="checkbox"/> SC3 | Sat. 16 October (½ day)  | Semiconductor Strip, Pixel and Voxel Arrays                     | € 170,00    | € 220,00        |
| <input type="checkbox"/> SC4 | Sun. 17 October (1 day)  | GEANT4                                                          | € 200,00    | € 250,00        |
| <b>MIC Courses</b>           |                          |                                                                 |             |                 |
| <input type="checkbox"/> SC5 | Mon. 18 October (1 day)  | Detectors for SPECT and PET                                     | € 200,00    | € 250,00        |
| <input type="checkbox"/> SC6 | Mon. 18 October (½ day)  | Biomedical Applications of Particle Detectors                   | € 100,00    | € 150,00        |
| <input type="checkbox"/> SC7 | Mon. 18 October (½ day)  | Optical Imaging                                                 | € 100,00    | € 150,00        |
| <input type="checkbox"/> SC8 | Tues. 19 October (½ day) | Statistical Methods for Image Reconstruction                    | € 100,00    | € 150,00        |

TOTAL B:

Notes:

#### C) LUNCH & DINNER PROGRAMMES

|                                                                    | by 25/09 | on-site   | Q.ty          | Total |
|--------------------------------------------------------------------|----------|-----------|---------------|-------|
| <input type="checkbox"/> NSS Luncheon (Monday, 18 October)         | € 30,00  | € 35,00 x | _____ = _____ |       |
| <input type="checkbox"/> Buffet Lunch (Tuesday, 19 October)        | € 18,00  | € 22,00 x | _____ = _____ |       |
| <input type="checkbox"/> Buffet Lunch (Wednesday, 20 October)      | € 18,00  | € 22,00 x | _____ = _____ |       |
| <input type="checkbox"/> RTSD Luncheon (Thursday, 21 October)      | € 30,00  | € 35,00 x | _____ = _____ |       |
| <input type="checkbox"/> Buffet Lunch (Friday, 22 October)         | € 18,00  | € 22,00 x | _____ = _____ |       |
| <input type="checkbox"/> Packet Lunch (all of the above 5 lunches) | € 90,00  | NA x      | _____ = _____ |       |
| <input type="checkbox"/> MIC Dinner (Thursday, 21 October)         | € 40,00  | € 45,00 x | _____ = _____ |       |

TOTAL C:

Please repeat your name

Last Name \_\_\_\_\_ First Name \_\_\_\_\_

#### D) SOCIAL EVENTS

- ☐ I (we) will attend the Exhibitor Reception on Tuesday, 19 October  
(free for registered attendees and companions\*) | \_\_\_\_\_
- ☐ I will attend the Conference Reception on Wednesday, 20 October  
(free for registered attendees\*) | \_\_\_\_\_
- \* Please confirm attendance
- ☐ Conference Reception additional tickets for companions | \_\_\_\_\_ x € 35,00

**TOTAL D:**

\_\_\_\_\_

#### E) TOURS & COMPANION PROGRAMME

Cost is per person and for registration before 25 September 2004. An additional € 5,00 will be charged per tour for on-site registration

- |                                                                                               |           | <b>Q.ty</b> | <b>Total</b> |
|-----------------------------------------------------------------------------------------------|-----------|-------------|--------------|
| <input type="checkbox"/> Tour 1 – Rome Seen from Its Belvederes (Sun. 17 Oct. afternoon)      | € 26,00 x | _____       | = _____      |
| <input type="checkbox"/> Tour 2 – The Glories of Baroque Rome (Mon. 18 Oct. morning)          | € 26,00 x | _____       | = _____      |
| <input type="checkbox"/> Tour 3 – Ostia Antica (Tues. 19 Oct. full day)                       | € 52,00 x | _____       | = _____      |
| <input type="checkbox"/> Tour 4 – Imperial Rome (Wed. 20 Oct. morning)                        | € 26,00 x | _____       | = _____      |
| <input type="checkbox"/> Tour 5 – Tivoli and Statelike Homes in Italy (Thu. 21 Oct. full day) | € 52,00 x | _____       | = _____      |
| <input type="checkbox"/> Tour 6 – Vatican Museums (Fri. 22 Oct. morning)                      | € 46,00 x | _____       | = _____      |

**TOTAL E:**

\_\_\_\_\_

#### F) HOTEL RESERVATION (Rates are in €, per room, per night, inclusive of breakfast and 10% VAT)

The total amount for the full length of your stay needs to be paid in advance

| Hotel                   | Web site                  | Double Room<br>Single Occupancy | Double Room<br>Double Occupancy |
|-------------------------|---------------------------|---------------------------------|---------------------------------|
| Ergife Palace Hotel**** | www.ergifepalacehotel.com | € 128,00                        | € 149,00                        |

Arrival \_\_\_\_\_ / October / 04      Departure \_\_\_\_\_ / October / 04

No \_\_\_\_\_ Double room(s) for single occupancy x No. of nights \_\_\_\_\_ x € 128,00 = € \_\_\_\_\_

No \_\_\_\_\_ Double room(s) for double occupancy x No. of nights \_\_\_\_\_ x € 149,00 = € \_\_\_\_\_

**TOTAL F:**

\_\_\_\_\_

Notes: \_\_\_\_\_



Please repeat your name

Last Name \_\_\_\_\_ First Name \_\_\_\_\_

### TOTAL AMOUNT

A) NSS/MIC/SNPS & RTSD Registration Fee € | \_\_\_\_\_ |  
B) Short Courses Fees € | \_\_\_\_\_ |  
C) Lunch & Dinner Programmes € | \_\_\_\_\_ |  
D) Social Events € | \_\_\_\_\_ |  
E) Tour & Companion Programme € | \_\_\_\_\_ |  
F) Hotel Reservation € | \_\_\_\_\_ |

GRAND TOTAL: | \_\_\_\_\_ |

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Expiration date | \_\_\_\_\_ | / | \_\_\_\_\_ |

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**FAX** form and payment (registration by credit card only) to: (+39)063240143

**PHONE** (+39) 0632812.1 **EMAIL** ieee2004@ega.it **WEB SITE** www.nss-mic.org

### CANCELLATION POLICIES

#### Registration Fee and Short Courses Fee

|        |                 |                                              |
|--------|-----------------|----------------------------------------------|
| before | 12 October 2004 | full refund (less administration fee of 10%) |
| after  | 12 October 2004 | no refund                                    |

#### Lunch & Dinner and Social Events

|        |                 |             |
|--------|-----------------|-------------|
| before | 12 October 2004 | full refund |
| after  | 12 October 2004 | no refund   |

#### Tour and Companion Programme

|        |                   |                                              |
|--------|-------------------|----------------------------------------------|
| before | 25 September 2004 | full refund (less administration fee of 10%) |
| after  | 25 September 2004 | no refund                                    |

#### Hotel Reservation

|        |                                   |                       |
|--------|-----------------------------------|-----------------------|
| before | 27 July 2004                      | full refund           |
| before | 12 October 2004                   | one-night penalty fee |
| after  | 12 October and in case of no-show | no refund             |

*I have read and accepted the booking/cancellation policy as stated in this registration form*

*In accordance with the Italian privacy law No. 675/96, please be informed that the personal data provided herewith will be used solely for the dissemination of information pertaining to the event mentioned in this form*

Date \_\_\_\_\_

Signature \_\_\_\_\_

Dear Colleagues,

The 2005 Nuclear Science Symposium and Medical Imaging Conference will be held in Puerto Rico. The NSS/MIC conference has provided a forum for the exchange of information and ideas between scientist and engineers from all over the world. A key component of the meeting has not only been the formal presentations of original work, but also the informal gatherings and discussions that have been an essential part of this meeting from its inception. In 2005 we plan to provide an outstanding environment for this conference by taking full advantage of the venue — the Wyndham El Conquistador hotel in Puerto Rico.



The hotel is located about 45 minutes from the airport and about 60 minutes from old San Juan on the east coast of Puerto Rico. We will have an extensive companion and family activities program available to take full advantage of the many opportunities in Puerto Rico and at the hotel itself. The rooms are large to accommodate families or shared accommodation by attendees. For those with special dietary needs, the rooms are equipped with small refrigerators and there is a shopping center not far from the hotel property.

While the venue will be relaxing and the environment spacious, the main purpose is the exchange of information in the many scientific and engineering disciplines represented by the attendees. These exchanges take the form of formal papers, poster sessions, and an environment that will facilitate informal exchanges with your colleagues from around the world. In addition the presentation of original work, the conference also provides extensive educational opportunities via short courses and special emphasis seminars before and during the conference. As in past years, the conference will be making special efforts to obtain support grants for students to attend this important meeting and take full advantage of this unique scientific and educational opportunity.

The conference will also provide an industrial exhibits area where the providers and developers of many of the technical tools and services used by our attendees will be presenting their products and the opportunity to talk to their corporate scientist and engineers. Overall, the traditional excellence of the NSS and MIC conference will be continued, and we hope enhanced in 2005. I look forward to seeing you in Puerto Rico.

Tom K. Lewellen, General Chair

E-mail: [nss2005@u.washington.edu](mailto:nss2005@u.washington.edu)

Phone: 01 206 598 6249

University of Washington Medical Center

<http://www.nss-mic.org/2005>