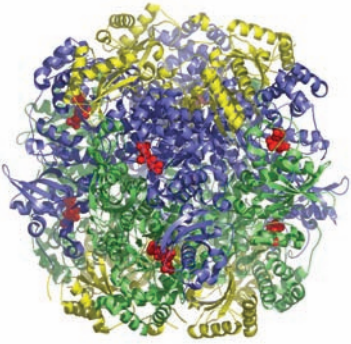
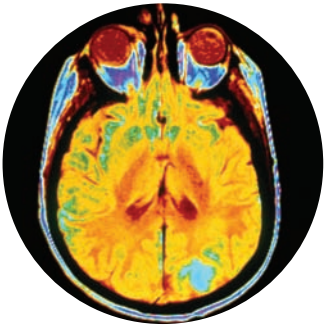
Nuclear Science Symposium
Medical Imaging Conference



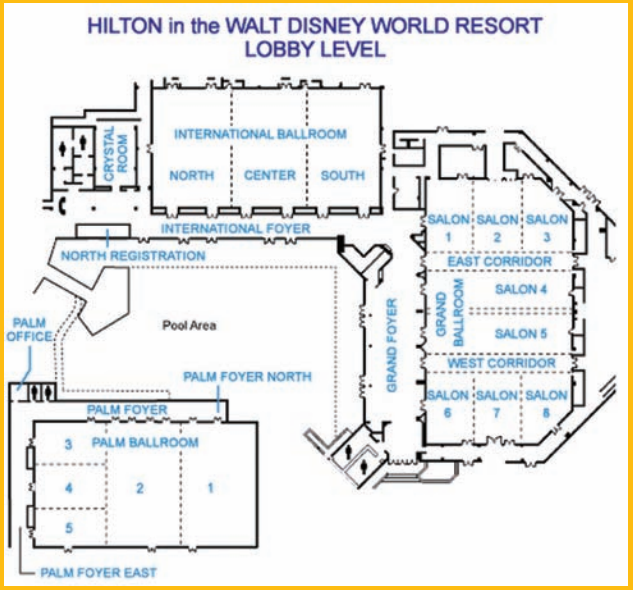





HILTON DISNEY WORLD, ORLANDO, FLORIDA

www.nss-mic.org/2009

25-31 October 2009



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WELCOME FROM THE GENERAL CHAIR

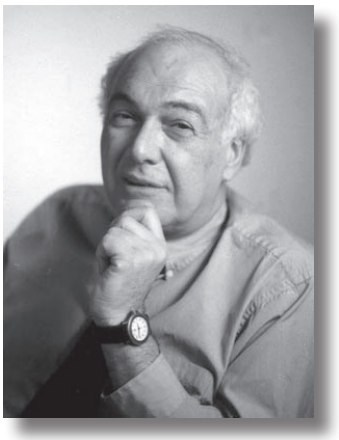
Dear Colleagues and Friends,

I would like to personally invite you to attend the 2009 IEEE Nuclear Science Symposium and Medical Imaging Conference, to be held from October 25 – 31 in Orlando, Florida at the beautiful Hilton Hotel in the Walt Disney World Resort. This meeting offers a great opportunity to exchange new knowledge and ideas in nuclear science and medical imaging with friends and colleagues from across the world. It had its origins more than 60 years ago, when the first Scintillation Symposium was held to explore the then new technology of scintillators and photomultipliers and, since has grown to the point where has become the single conference with the broadest range of coverage of the field of radiation instrumentation and applications.

The Organizing Committee is focused on creating a truly joint, integrated conference to facilitate and encourage attendees to expand their knowledge in related topical areas and participate in all aspects of the meeting. Even if your interests lean towards one area, I would strongly encourage you to explore the entirety of the meeting if possible. We are planning a strong program of relevant short courses before the meeting that address topics of particular interest in these fields and which are meant to be self-contained tutorials. There is also an integrated program of workshops and special sessions to acquaint attendees with the current state-of-the-art in new and emerging technologies. Self-contained sessions will include subjects such as Computing Beyond the LHC, Nuclear Forensics, Nuclear Techniques in the Well-logging industry, and the use of graphics processors for high speed computing and imaging. In addition, we will again be running the Special Session on Women in Engineering which was so successful in Dresden. Check the conference web site regularly for further information as these workshops, short courses, and sessions evolve.

The location of the conference gives us the opportunity to offer an exciting and unique Companion Program that will include tours to many exciting locations in the Orlando area and a visit to the NASA Space Center at Cape Kennedy. Of course, there is also the entire DisneyWorld site for both individual and organized exploration. The Hilton is conveniently located to provide easy access to all of their facilities. In addition to being an excellent venue for our professional meeting, this location is ideal for attendees who are able to bring their families.

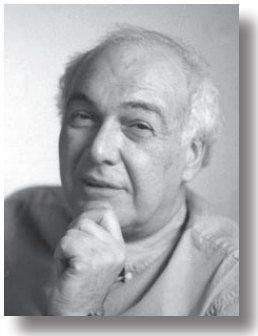
On behalf of the Organizing Committee and the IEEE Nuclear and Plasma Sciences Society, I encourage you to make plans now to attend this year's Nuclear Science Symposium and Medical Imaging Conference and look forward to welcoming you to Orlando.



Richard C. Lanza
2009 IEEE NSS/MIC General Chair

Welcome

CONTACT INFORMATION



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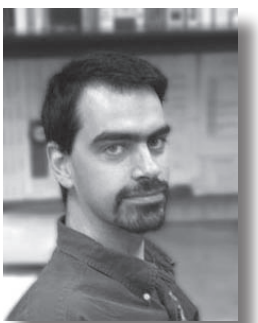

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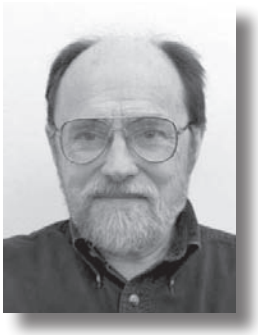

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REGISTRATION INFORMATION

Christina Sanders
Registration Chair

Pre-registration is advisable to save time and money, and to ensure your registration package will be available for collection when you arrive. The preferred registration method is through the conference web site, as it places your details directly into our database, and where you can pay by Visa, MasterCard, American Express or Discover through our secure web server. You may also pre-register by mail or fax by sending the form at the end of this booklet directly to Travel Destinations Management Group, Inc. (TDMG), with a check, money order or credit card information. Checks or money orders must be drawn on or paid through a U.S. bank and be in U.S. dollars. Wire transfers will be accepted only under special circumstances, and will be charged a $25 service fee. For wire transfer information please contact TDMG (see below). Additional copies of the registration form can be downloaded from the registration link on the conference web site. NOTE: Registration and payment must be received by October 9, 2009 to qualify for reduced registration, lunch, dinner and short course fees. Registration by paper form WILL NOT be accepted after October 9. Subsequent registration must be made through the registration website.

Electronic Registration (preferred):

Click on the Conference Registration link at:
http://www.nss-mic.org/2009 and follow the instructions.

On-site Registration Procedure

To alleviate long lines and minimize hand-written registration forms, all on-site registration will be done via the online registration page. If you choose to register on-site, you must first register yourself online, then proceed to the "On-site Registration" booth of the Registration desk with your printed receipt, where you will obtain your nametag, conference bag and any tickets you may have purchased. A nametag is required to attend all conference events, so you must visit the Registration desk after you have electronically registered.

By Mail or Fax:

Send form and payment (made out to IEEE 2009 NSS/MIC) to:

IEEE 2009 NSS/MIC
c/o TDMG Meetings Dept.
110 Painters Mill Road, Suite 36
Owings Mills, MD 21117 USA
Tel: 1 800 437 4589 (US and Canada only)
+1 410 363 1300 (08:30-17:30 ET)
Fax: +1 410 559 0160 (attn: IEEE 2009 NSS/MIC)

Registration by mail or fax WILL NOT be accepted after October 9. Subsequent registration must be made through the registration website. An acknowledgement of your registration will be sent upon its receipt and payment. Please address any questions via e-mail to IEEE@traveldest.com (Attn: IEEE 2009 NSS/MIC) or by phone.

Registration Hours at the Conference

Registration and general information will be available during the following times at the IEEE Registration Desk located in the entrance to the International Foyer (in front of the Crystal Room).

Friday,	October 23	17:00 - 20:00
Saturday,	October 24	07:00 - 09:30 15:30 - 18:30
Sunday,	October 25	07:00 - 09:30 15:30 - 18:30
Monday,	October 26	07:30 - 17:00
Tuesday,	October 27	07:30 - 19:00
Wednesday,	October 28	07:30 - 18:00
Thursday,	October 29	07:30 - 17:00
Friday,	October 30	07:30 - 12:00 15:00 - 17:00
Saturday,	October 31	07:30 - 09:00

Symposium Registration Fees

	By Oct. 9	On Site
IEEE Member[1]	$500	$600
Non-IEEE Member	$650	$750
IEEE Student[1,2]	$200	$250
Non-IEEE Student[2]	$300	$350
One Day Only[3]	$200	$200
IEEE Retired/Unemployed[1]	$200	$250
IEEE Life Member[1]	No Charge	
Continuing Education Program Only	No Charge	
Exhibits Only	No Charge	

1. IEEE member number required at registration.

2. Proof of student status required at registration.

3. Valid for one occurrence only – if more than one day, full registration will be charged.

Luncheon/Dinner Fees

	By Oct. 9	On Site
NSS Luncheon (Tues., Oct. 27)	$40	$50
MIC Dinner (Fri., Oct. 30)	$70	$85

Cancellation and Refund Policy

You are not officially registered until we receive your completed registration form and payment. If your payment is not received by the October 9 deadline, your registration will be cancelled. In order to process refunds, cancellations must be received in writing by October 16, 2009 (less a $50 cancellation fee). No refunds will be issued thereafter.

GENERAL INFORMATION

Conference Hotel Information

Hilton at DisneyWorld
1751 Hotel Plaza Boulevard
Lake Buena Vista, Florida 32830
USA
Tel: +1-407-827-4000
Fax: +1-407-827-3890

Online Hotel Reservation Web Site:

http://www.hilton.com/en/hi/groups/personalized/ORLDWHH-IEE-20091024/index.jhtml?Button1=Make+Hotel+Reservation

A block of rooms have been reserved for October 24, 2009 - October 31, 2009.

Booking a reservation from our site is simple. To begin the process, visit the web site to receive our group's preferred rate.

Conference rate: From $175/night + local tax for up to two individuals per room. Each additional adult per room requires an additional $20/night. Each room includes complementary internet and coffee. For those who wish to use the hotel health club and have up to 60 minutes of complementary local telephone calls, there is an optional $8 resort fee. The hotel will charge your credit card for one night of your stay at the time you make the reservation.

The rooms include:

- The Hilton Serenity Bed™, Pacific Coast Touch of Down® pillows, European-style 250-thread count linens
- La Source® luxury bath products created exclusively for Hilton by Crabtree & Evelyn®
- In-room coffee system that features world-renowned Lavazza® coffee from Italy and Cuisinart® dual cup, single-brew coffeemaker
- 27-inch flat-screen television; Executive Level rooms and Suites feature a 32-inch flat-screen television
- High-speed Internet access (wired and wireless)
- Complimentary in-room oversized safe

For the family, the hotel offers:

- Disney Character breakfast
- 24-hour Gourmet Marketplace
- Two outdoor heated swimming pools
- Children's spray pool
- Tropical outdoor spa
- 24-hour Hilton Fitness by PRECOR® Center
- Multi-lingual staff
- Avis Car Rental Desk
- Onsite Disney Store and Golf Shop
- Safety Deposit Box

Overflow Hotel Information

A second hotel is now available for conference attendees. The hotel is the Doubletree Guest Suites located at 2305 Hotel Plaza Blvd. (about a 10 minute walk to the conference hotel) and is setup for families with one and two bedroom suites.

Full link to the hotel web site:
http://doubletree1.hilton.com/en_US/dt/hotel/MCOFHDT-Doubletree-Guest-Suites-in-the-WALT-DISNEY-WORLD-Resort-Florida/index.do.

Rates: Standard rooms and suites $172 + sales and Orlando room tax (currently 12.5%)

For reservations, call 1 800 222 8733 and refer to the IEEE Nuclear Science Symposium and Medical Imaging Conference.

Reservations must be placed before 29 September 2009.

The hotel rooms are one and two bedroom suites and include

Sweet Dreams® cozy beds
High-speed Internet access
Two LCD flat panel televisions
Wet bar
Refrigerator, microwave and coffee/tea maker
Hairdryer

IEEE Membership

An IEEE membership desk will be located close to the Registration Desk. Staff will be available to answer questions concerning the benefits of membership. By joining during the conference, non-member will receive a $50 deduction from new IEEE membership, plus one year's free membership in the Nuclear and Plasma Sciences Society. Students joining at the conference will receive a year's free membership if they provide a statement from their mentor that they are full-time students. It is more advantageous for students to join prior to coming to the conference, in order to qualify for reduced student registration rate. New memberships obtained on-site will not qualify you for discounted registration at this conference. To qualify for the reduced member-only rates you must become a member prior to registering and prior to the start of the conference (and provide proof of your membership).

Message Board

A message board near the Information desk will announce all alterations in the scientific program and other important information for participants.

Computer Access

The Blossom and Narcissus rooms will be setup with computers, printers, and technical support. The facility is intended for use by all attendees to carry out final editing of their presentations and papers and to retrieve e-mail. Microsoft Office 2003 will be loaded on all computers. In addition, wireless hotspots will be available in certain areas.

Conference Web Site

Information for all up-to-date conference programs (NSS, MIC, and Special Focus Workshops), short courses, and tours can be found at: http://www.nss-mic.org/2009.

Transportation

From Orlando International Airport (MCO):

Distance from hotel: 15 mi.
Drive time: 25 min.
Directions: Take Beachline Expressway West (528) to I-4 West to Exit 68. Make a right and then at the first light, take a left onto Hotel Plaza Blvd. Hilton is the 4th Hotel on the left side.

Transportation to and from the Airport (Typical Minimum Charges)

Bus Service:	$19.00
Limousine:	$130.00
Taxi:	$50.00

From Orlando Municipal Airport:

Distance from hotel: 10 mi.
Drive time: 15 min.

From Executive Airport (ORL):

Distance from hotel: 19 mi.
Drive time: 25 min.
Directions: Take I-4 West to Lake Buena Vista Exit, and then turn left at the light onto Hotel Plaza Blvd.

Get turn by turn directions and maps by visiting the hotel website:

http://www1.hilton.com/en_us/hi/hotel/ORLDWHH-Hilton-located-in-the-WALT-DISNEY-WORLD-Resort-Florida/directions.do

Parking

Self Parking	$10/day	(first hour complementary)
Valet Parking	$16/day	

All parking charges are taxable at 6.5%.

Smoking Policy

The conference site has adopted a strict no-smoking policy in all of the conference and exhibit areas.

INDUSTRIAL PROGRAM

Ron Keyser
Industrial Program Chair

The IEEE NSS/MIC Industrial Program provides our conference attendees with ample opportunities to meet the different exhibitors on Tuesday, Wednesday, and Thursday, 27 to 29 October. The opening hours will follow the hours of the conference. More than 40 companies from all around the world will be present to meet conference attendees and to demonstrate their latest products. These represent state-of-the-art in detectors, pulse processing instrumentation, imaging, software, and other associated areas. The exhibition area is located in the Palm Ballroom. The poster sessions will also be in the Palm Ballroom. The exhibits will remain open until 6 PM on Thursday to provide extra time for the MIC attendees to visit.

The three-day exhibition is complemented by a series of seminars and technical presentations on Tuesday, Wednesday, and Thursday in the Azalea Room, which will allow an in-depth exchange of information between attendees and exhibitors on existing products, future developments and needs. The Azalea Room is located above the Hotel Main Lobby on the mezzanine. The detailed schedule will be posted at the entrance to the exhibit area.

The morning and afternoon coffee breaks will be held in the exhibit area. On Tuesday evening from 7:00 PM to 9:00 PM, the exhibiting companies will host the Exhibitor Reception.

The Exhibition opening hours are as follows:

Tue., Oct. 27	12:00 – 21:00, with the Exhibitor Reception starting at 19:00
Wed., Oct. 28	09:00 – 18:00
Thu., Oct. 29	09:00 – 18:00

Check our website: http://www.nss-mic.org/2009 for up-to-date information. An Exhibitor Program brochure will be available at the meeting with full details of the exhibitors and the seminar program. Companies interested in participating should contact Ronald Keyser, Exhibits Chairman, at ronkeyser@ieee.org.

List of Exhibitors (as of August 21, 2009)

Acrorad Co., Ltd.
Alpha Spectra, Inc.
AMPTEK INC.
AXINT
Berkeley Nucleonics
Berthold Technologies GmbH & Co. KG
Bridgeport Instruments
CAEN Technologies
Canberra
Chemetall GmbH
Clear-Pulse Co., Ltd.
CMCAMAC/SPARROW
CRC Press-Taylor & Francis Group LLC
Creative Electron, Inc.
Crystalux Inc
Diamond Detectors Ltd.
Electron Tubes
Eljen Technology
Fibercryst
Furukawa Co., Ltd.
GE Energy
Hamamatsu Corporation
Hilger Crystals
Kromek
Mediso Medical Imaging
Micron Semiconductor
Milabs BV
Moxtek, Inc.
NIBIB
OptoElectronic Components
ORTEC
Philips Digital Photon Counting
Quik-Pak
Saint-Gobain Crystals
ScintiTech/AMCRYS
Scionix
SensL Technologies Ltd.
Shanghai SICCAS Crystal
Siemens Medical Solutions USA
SII NanoTechnology
SINTEF
Struck Innovative Systeme Gmbh/drivesoft
Tungsten Heavy Powder, Inc
Wiener, Plein & Baus, Ltd.
XIA LLC

Industrial Presentation Schedule

Location: Azalea & Begonia

Tuesday, October 27, 2009		
13:00	Development of CdTe Radiation Detectors	Acrorad
14:00	Crystalux, Inc.	
Wednesday, October 28, 2009		
10:00	The Latest Technical Advances in Radiation Detection Systems and HPGe Detectors from ORTEC	ORTEC
11:00	Boron-10 technology for radiation measurement	GE Energy
13:00	Recent advances of the scintillator BrilLanCeTM380 [LaBr3(Ce)] products	Saint Gobain Crystals
14:00	Silicon photomultipliers for large area detection	SensL Technologies
15:00	Waveform Digitizers and Digital Pulse Processing for Physics Applications	CAEN Technologies
16:00	Clinical and Pre-Clinical Molecular Imaging Solutions	Mediso Medical Imaging Systems
Thursday, October 29, 2009		
10:00	Digital Colour Imaging for X-Rays	Kromek

PUBLICATIONS

Conference Record

The *Conference Record* (CR) is the official repository for manuscripts presented at the 2009 Nuclear Science Symposium and Medical Imaging Conference. The Conference Record will be published on CD-ROM, complimentary to all registered conference attendees. All Conference Record manuscripts will be made available online at http://www.nss-mic.org/2009/ConferenceRecord before the CD-ROMs are mailed out.

The approved word processor templates, available in PDF, MS Word and LaTeX format can be downloaded from http://www.nss-mic.org/2009/publications/templates.htm.

All manuscripts submitted to the IEEE must be in IEEE Xplore-compatible PDF format. To assist authors in meeting this requirement, IEEE has established a web based service called "PDF eXpress." It converts most common word processor files into Xplore compatible PDF files. We strongly suggest that you use this service to create your PDF files. Manuscripts that are not IEEE Xplore-compatible will not be accepted in the Conference Record.

In order to ensure a timely release of the CD-ROM, please follow this procedure for the Conference Record manuscript submission:

1. Produce IEEE Xplore-compatible PDF file using PDF eXpress

The IEEE PDF eXpress service (www.pdf-express.org) will be available for the NSS-MIC authors between Oct. 12 and Nov. 13 2009. The required Conference ID for logging in to the web site is **nssmic09x.** Detailed instructions are available at: http://www.nss-mic.org/2009/publications/PDFeXpress.html

PDF eXpress is NOT the final destination for your manuscript. After generating your PDF file you must then submit your manuscript to the Guest Editor through the next step.

2. Submit the Xplore-compatible PDF file and the IEEE Copyright Form

Log on to the conference web site and follow the menu "My Submissions" to the abstract submission page. You will see both links for uploading your manuscript and submitting the copyright form electronically. Your PDF file will be checked for Xplore-compatibility. Non-Xplore-compatible files will not be included in the CD-ROM.

If you are not authorized to submit the IEEE Copyright Form, please start the approval process well before the submission deadline.

The deadline for the Conference Record manuscript submission is November 13th, 2009.

All manuscripts submitted through the conference web site will be made available immediately at the "Conference Record" web link. However only those that meet the following requirements will be included in the CD-ROM:

- The paper (oral or poster) has been presented at the conference;
- The manuscript conforms to the page layout requirements specified in the online templates;
- The PDF file is IEEE Xplore-compatible;
- The PDF file and the electronic copyright form are received no later than the November 13th deadline.

Guest Editor

Bo Yu
Brookhaven National Laboratory
Phone: +1-631 344 5184
Email: yu@bnl.gov

The Guest Editor will be available in the Edelweiss Room during the coffee breaks on Wednesday and Thursday to discuss any issues related to the Conference Record.

Transactions on Nuclear Science (TNS)

Additionally, papers presented at the conference that contain important information of lasting value may be submitted for review and publication in 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. TNS is not the conference record and only those papers that pass the review process and are in the fields of interest to TNS will be published. Prospective authors should consult the TNS page at www.ieee.org for a description of the publication. TNS discourages the submission of progress reports and manuscripts that are more suitable for distribution as an institution's internal document. We expect each manuscript to be cast in the context of the state of the art of its field (including appropriate motivation for the work), present a complete description of the work performed, and to present a set of conclusions supported by the measured and/or calculated data. The paper should be sufficiently complete that others with comparable equipment could repeat the work.

Authors submitting to TNS should expect to be solicited to serve as reviewers of other papers. Please accept as many solicitations as you are able to handle and remember to return your reviews in a timely fashion. TNS tries to find at least two reviewers for each paper and the speed of the review process ultimately depends on your cooperation. TNS relies on this most important professional service you, the authors, provide to the community.

TNS is published throughout the year, and you can submit your manuscript to TNS at any time. For instructions on TNS manuscript submissions, please visit the IEEE's on-line peer review system Manuscript Central™ (http://mc.manuscriptcentral.com/tns-ieee). TNS suggests that authors limit their papers to 8 pages, but that limit is quite flexible and exceptions can be made.

For further information regarding the Transactions on Nuclear Science, contact:

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Transactions on Medical Imaging (TMI)

Authors of medical imaging papers may alternatively choose to submit their manuscripts to the IEEE Transactions on Medical Imaging through Manuscript Central™ (http://mc.manuscriptcentral.com/tmi-ieee).

For further information regarding the IEEE Transactions on Medical Imaging, contact:

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Comparison of Requirements

The value of the Conference Record is increased 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. 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. The CR and TNS are two separate publications. Submission to one does not imply submission to the other.

	Conference Record (CR)	Transactions on Nuclear Science (TNS)
Page layout	Same as TNS, but without running headers and footers	Standard IEEE Transactions and Journal format
Copyright form	Required, electronic submission	Required, electronic submission
Deadline	Nov. 13, 2009	None
Peer reviewed	No	Yes
Use of color	Free and encouraged	Free for online version; at author's expense for print version
Page Limit	8 (suggested)	8 (suggested)
Availability	Online immediately, CD out before end of 2009 to all attendees	Published throughout the year

COMPANION PROGRAM

Welcome to Orlando!

There are many wonderful things to see and do here. We have taken advantage of the meeting location to setup special tours that are specific to the Disney Facilities in addition to more traditional Orlando area sites and sounds. The companion program provides a daily selection of trips to places of interest and popular tours.

Barbara Lewellen
barblewe@u.washington.edu

All tours will depart from and return to the Companion Program Meeting Area. The one exception is the last tour "Behind the Seeds". This tour includes an all day pass to Epcot, so your return will be on your own. Please use the Disney Transportation System. There is no charge for the use of the Disney Transportation System.

Sylvia Lanza
slanza@mit.edu

This is an exciting program and we look forward to seeing you in Orlando. Please contact any of us for more information.

Carolyn Hoffman
carolyn.hoffman@verizon.net

Please note:

- Individual tours are subject to cancellation and refund of tour fees if an insufficient preregistration is achieved prior to September 21, 2009.
- The fees in the table below are for advance registration by October 9. Limited on-site registration may be available for an additional $15 fee.
- Lunches are included only with the "Truffles & Trifles Cooking Class" and the "Dolphins, Manatees and Gators, Oh My!" tour.
- Tour programs and hours may be modified due to last minute logistics issues.
- Please notify us of participants with special needs.
- All activities involve walking. Participants are encouraged to wear comfortable shoes and dress for the weather.
- Due to heightened security, the following items are not permitted into Kennedy Space Center: coolers, luggage or large bags, wrapped items, firearms, ammunition, pepper/mace spray, knives and other sharp objects. Backpacks are not permitted on launch days. Detailed searches will be conducted on all bags and purses. All electronic devices must be in working condition. No outside food items are permitted on property.

Tour Name	Date	By Oct 9
1. Shopping in Orlando	Sun., Oct. 25	$30.00
2. Truffles & Trifles Cooking Class	Mon., Oct. 26	$75.00
3. Disney by Design (Disney program)	Mon., Oct. 26	$70.00
4. Kennedy Space Center	Tue., Oct. 27	$75.00
5. Historic Bok Sanctuary	Tue., Oct. 27	$70.00
6. Innovation In Actions (Disney program)	Wed., Oct 28	$70.00
7. Winter Park Cultural Tour	Wed., Oct 28	$70.00
8. Dolphins, Manatees and Gators, Oh My!	Thur., Oct. 29	$80.00
9. Hidden Treasures of the World Showcase (Disney program)	Thur., Oct. 29	$45.00
10. Kennedy Space Center (same as #4)	Fri., Oct. 30	$75.00
11. Gardens of the World (Disney program)	Fri., Oct. 30	$45.00
12. Shopping in Orlando (same as #1)	Sat., Oct 31	$30.00
13. Behind the Seeds - This includes an all day ticket for the park (Epcot) (Disney program)	Sat., Oct 31	$70.00

Tour #1 Shopping in Orlando

Sunday, October 25, 13:00 to 17:00

You will be transferred via motor coach from the Hilton to Prime Outlets International shopping mall. This shopping complex has recently been completely reconstructed and features a new Mediterranean look. To see the index of stores, special offers and promotions, refer to the mall's web site.

http://www.primeoutlets.com/locations/international-orlando.aspx

There are over 110 outlet stores to shop in. You will have from 1:30 PM to 4:30 PM to shop and then the bus will return you back to the Hilton.

This tour will be offered again at the end of the conference, tour # 12.

Tour #2 Truffles & Trifles Cooking Class

Monday, October 26, 09:00 to 13:00

Marci offers a variety of menus to satisfy anyone's appetite in a way that everyone can discover the joy of cooking. The class will teach the joy and relaxing experience of creating a wonderful meal. A cooking class by chef Marci Arthur of Truffles and Trifles Inc. will cover appetizer, salad, vegetable, starch, entrée, bread and dessert. The class will be split into teams of four participants and each team will cook two recipes. You will enjoy a delicious meal from all the prepared recipes. The Food Network has rated this school one of the top five cooking schools in the nation.

Tour #3 Disney by Design (A tour within Walt Disney World)

Monday, October 26, 13:00 to 16:00

Discover the techniques and "tricks of the trade" used by Disney artists, designers, and landscapers to turn resorts, Theme Parks, and office buildings at the Walt Disney World® Resort into masterpieces of illusion. Traveling across the property, your group visits the following locations for a close-up look at "archithemeing:" (3 hours). This three hour adventure makes you privy to the inside story of how Disney uses architecture, color, landscaping, furnishings and an acute attention to detail to evoke a variety of themes.

Tour #4 Kennedy Space Center

Tuesday, October 27, 08:30 to 16:30

Kennedy Space Center is NASA's launch headquarters. Tour NASA's launch and landing facilities, experience live shows and jaw-dropping encounters with massive rockets as well as have the opportunity to meet a real member of NASA's Astronaut Corps. It's all what you can expect during an inspiring day at Kennedy Space Center.

Your exploration of Kennedy Space Center starts with one of their world-renowned bus tours where you see many NASA landmarks, including the massive launch pads, the gigantic Vehicle Assembly Building, the awe-inspiring Apollo/Saturn V Center and the International Space Station Center. There is also much to see and do at the Visitor Complex; from live action theatrical shows to an educational Astronaut Encounter briefing. View 10-story high rockets from all eras of space exploration in the Rocket Garden, walk through a full-size Space Shuttle mock-up, enjoy IMAX Theater space films on gigantic five-story screens and see an actual Gemini program capsule on display. Shopping and food concessions are also available here for your enjoyment.

For a more in-depth look at Kennedy Space Center, you will participate in NASA Up Close. This two hour guided bus tour by a trained space expert, gives you an insider's view of the space program from launch preparation to liftoff. You are treated to close up views of Space Shuttle Launch Pads; the Operations and Checkout Building, home to the astronauts preparing for their flights; and the NASA Causeway with views of the non-manned mission launch pads located in Cape Canaveral. The Shuttle Landing Facility and the massive Crawler-Transporter, which transports the Shuttle from the VAB to its launch pad, are also featured. Receive a special VIP kit at the end of the program when you disembark for a self-guided tour of the Apollo/Saturn V Center.

This tour is also offered later in the conference, tour # 10.

Tour #5 Historic Bok Sanctuary

Tuesday, October 27, 12:30 to 17:00

The tour begins with the Chalet Suzanne, an enchanting 100-acre estate. Experience Chalet's charm and uniqueness during a guided tour of the grounds and famous soup cannery.

The Tour moves on to visit Historic Bok Sanctuary, one of Florida's most famous landmarks. Its historic bell tower is the centerpiece of a magnificent garden and houses one of the world's great carillons. The meandering garden is one of the greatest achievements of famed

landscape architect Frederick Law Olmsted, Jr. Tranquil resting places, shady recesses, picturesque vistas and expansive splashes of color create a contemplative setting for your personal renewal and enjoyment. The acres of ferns, palms, oaks and pines create a year-round backdrop of 1,000 shades of green for the seasonal bursts of azaleas, camellias and magnolia blooms that form an ever-changing work of art.

Tour #6 Innovation In Action (A tour within Walt Disney World)

Wednesday, October 28, 08:30 to 11:30

From the first "talking" cartoon in 1928 to his bold vision of an Experimental Prototype Community of Tomorrow, Walt Disney always pushed the limits of technology. His innovative ideas inspired the creation of the Walt Disney World® Resort. During this 3-hour behind-the-scenes adventure, you will hear stories about the early days of Walt's career and take your attendees to a variety of locations for an up-close look at innovation.

Tour #7 Winter Park Cultural Tour

Wednesday, October 28, 12:00 to 16:30

Downtown Winter Park's charm is magnified in its details: hidden gardens and side streets that are home to unique stores, a farmer's market that attracts both locals and visitors alike each Saturday morning and festive parades that make the seasons. Running through the heart of Winter Park is Park Avenue. Bordered by a shady park that plays host to concerts and art festivals, Park Avenue is home to one-of-a-kind boutiques and well-known shops, sidewalk cafés, as well as world-renowned art collections in the area's museums. Often called "Little Europe," Park Avenue is a year-round destination that is sure to charm visitors of all ages.

Take the Scenic Boat Tour that cruises through three of the city's lakes that border the area's most prestigious homes. The relaxing, narrated, one hour, 12 mile cruise through the lakes and canals is really the only way to see the true beauty of Winter Park which includes Rollins College, Kraft Azalea Gardens, Isle of Sicily, tropical birds, plants, flowers and magnificent mansions.

Following the boat tour, enjoy a leisurely stroll down Park Avenue to The Charles Hosmer Morse Museum of American Art. The Morse Museum houses the most comprehensive collection of Louis Comfort Tiffany's works found anywhere, major holdings of American art pottery and representative collections of late-19th and early-20th century American paintings, graphics and decorative arts. Spend the remainder of your day shopping on Park Avenue.

Tour #8 Dolphins, Manatees and Gators, Oh My!

Thursday, October 29, 08:30 to 15:00

This tour begins en route, as an Eco-Guide narrates the significance of the Banana River, a backwater estuary and a wilderness waterway that was used by the indigenous Ais Indians. The river is considered a sanctuary for the endangered West Indian Manatees and Bottled Nose Dolphins. Explore and cruise the smooth, inland waters around the lagoon's uninhabited islands, aboard a shallow-draft, 50-passenger pontoon boat, in safety and comfort. The captain and guide narrate this two-hour cruise tour while you enjoy a soft drink and the sights and sounds of the river's wildlife.

Travel 15 minutes west to a 100 year old outpost in the Central Florida Everglades to a turn of the century fish camp. Here you will board airboats to explore an American Heritage River, the St. Johns, and its abundant wildlife in 15-passenger airboats. Each airboat has a flat bottom and large driving propeller at the stern enabling the airboats to skim the surface of the shallow waters and traverse this fascinating "Sea of Grass," a name the Indians gave to the river. The 30-minute airboat expedition has its own guide and Coast Guard licensed boat captain who will take you deep into the fresh water swamp habitat of the Florida Alligator and a wonderful assortment of creatures that call the "glades" home. This is an easy adventure without the dirt or danger. The ambiance of the fish camp, the amazing animals and the natural beauty of Florida will make this outing memorable.

Tour #9 Hidden Treasures of the World Showcase (A tour within Walt Disney World)

Thursday, October 29, 13:00 to 16:30

Epcot® is home to a family of nations, standing side by side along the shores of the World Showcase Lagoon. This showcase of nations features an extraordinary collection of art, architecture and costumes. Join us in Hidden Treasures for a study of Disney's international community and the Disney magic that brings it to life!

The facilitator for this three and one half hour tour reveals to you the attention to detail within each nation's pavilion, turning fact into fascination. Come sample the history of China, the romance of Old Europe, the pioneer heritage of North America and the exotic flair of Morocco. See how the special Disney touch adds to the authenticity of this international community.

Tour #10 Kennedy Space Center

Friday, October 30, 08:30 to 16:30

Kennedy Space Center is NASA's launch headquarters Tour NASA's launch and landing facilities, experience live shows and jaw-dropping encounters with massive rockets as well as have the opportunity to meet a real member of NASA's Astronaut Corps. It's all what you can expect during an inspiring day at Kennedy Space Center.

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preparation to liftoff. You are treated to close up views of Space Shuttle Launch Pads; the Operations and Checkout Building, home to the astronauts preparing for their flights; and the NASA Causeway with views of the non-manned mission launch pads located in Cape Canaveral. The Shuttle Landing Facility and the massive Crawler-Transporter, which transports the Shuttle from the VAB to its launch pad, are also featured. Receive a special VIP kit at the end of the program when you disembark for a self-guided tour of the Apollo/Saturn V Center.

This tour is also offered in the middle of the conference, tour # 4.

Tour #11 Gardens of the World (A tour within Walt Disney World)

Friday, October 30, 13:00 to 16:00

Everywhere you look at the Walt Disney World Resort, the trees, shrubs and flowers play a vital role in setting the stage for recreation, entertainment and beauty. Disney landscaping has become a recognized show in itself, providing color and enjoyment throughout the year. This fascination three-hour program gives you the change to study the various gardens of Epcot World Showcase with one of the experts responsible for helping maintain the horticultural "show".

Your horticulture instructor turns Epcot into a living classroom, using facilities "on stage" to describe the basic process of plant design and how it is incorporated in the landscape for the World Showcase pavilions.

Tour #12 Shopping in Orlando

Saturday, October 31, 13:00 to 17:00

You will be transferred via motor coach from the Hilton to Prime Outlets International shopping mall. This shopping complex has recently been completely reconstructed and features a new Mediterranean look. To see the index of stores, special offers and promotions, refer to the mall's web site.

http://www.primeoutlets.com/locations/international-orlando.aspx

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This tour is also offered at the start of the conference, tour #1.

Tour #13 Behind the Seeds (Epcot Tours)

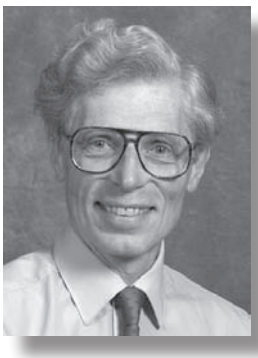
Saturday, October 31, 09:00 to when you are done

Discover these secrets and more on this special backstage tour in the Land Pavilions at Epcot. Go alligator gazing, release ladybugs in the green house and explore hydroponic crops form around the world. Then sprout seeds in your pocket to plant your own Disney Magic at home.

All day admission to Epcot Center included. The way back is on your own, use the Disney Transportation.

SHORT COURSE 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 imaging technology. All courses are one day in length. Coffee and pastries will be available for participants of the short courses at 08:00, before the first lecture which will begin at 08:30. Lunch, refreshments, lecture notes, and a certification of completion are also provided as part of the short course registration fee.



Stephen E Derenzo

NSS Short Course Program Chair

Jennifer Huber

MIC Short Course Program Chair

Short Course Fee Schedule

$250 each (early registration)

$300 each (late or on-site registration)

IEEE Members receive a $25 discount

Short Course Schedule and Location

Short Course	Date	Location
SC1. Integrated Circuit Front Ends for Nuclear Pulse Processing	Sat. 24 Oct.	Lily/Kahili
SC2. Nuclear Science for Security Applications	Sat. 24 Oct.	Azalea/Begonia
SC3. Nuclear Power and Other Environmentally Clean Alternatives	Sun. 25 Oct.	GrandBallroom, Salon 1
SC4. Medical Imaging Fundamentals	Sun. 25 Oct.	GrandBallroom, Salon 2
SC5. Physics and Design of Detectors for SPECT and PET	Sun. 25 Oct.	GrandBallroom, Salon 3
SC6. Statistical Methods for Image Reconstruction	Mon. 26 Oct.	GrandBallroom, Salon 2
SC7. Programming and Medical Applications Using Graphics Hardware	Mon. 26 Oct.	GrandBallroom, Salon 3

SC1: Integrated Circuit Front Ends for Nuclear Pulse Processing

Saturday, October 24, 08:30 – 17:00

Location: Lily & Kahili

Organizer: Paul O'Connor, Brookhaven National Lab, USA

Instructors:

Paul O'Connor, Brookhaven National Lab, USA
Veljko Radeka, Brookhaven National Lab, USA

This one-day course is intended to introduce physicists and detector specialists to the fundamentals of integrated circuit front end design. The class begins with a discussion of low-noise signal processing and semiconductor devices and then delves into the details of implementing practical circuits in modern CMOS technology. A basic knowledge of detectors and electronics is assumed.

Course Outline

1. Pulse Processing Fundamentals
   - Noise and gain mechanisms
   - Signal formation in detectors
   - Pulse processing for amplitude and timing extraction
2. Semiconductor Technology for Integrated Circuit Front Ends
   - Operation and characteristics of MOS and bipolar transistors
   - Sub-micron CMOS and BICMOS technology
   - Feature size scaling
   - Radiation effects and reliability
   - •Mixed-signal circuits
3. Analog circuit design
   - The IC design process and CAD tools
   - Foundry access, multiproject services
   - Building blocks for the analog channel: charge-sensitive and pulse-shaping amplifiers, baseline stabilizers, peak detectors, track/hold, multiplexers, output stages
   - Analog-to-digital and time-to-digital converters (ADC and TDC)
4. Packaging and Interconnect
5. Application examples

PAUL O'CONNOR is associate Head of the Instrumentation Division at Brookhaven National Laboratory. After receiving the Ph.D. degree in solid-state physics from Brown University he worked from 1980-1990 at AT&T Bell Laboratories prior to joining BNL. His research interests are in the field of instrumentation systems for radiation detection, particularly low noise analog CMOS front-end circuits. He is author and co-author of about 70 publications and has been an IEEE member since 1980.

VELJKO RADEKA is Senior Scientist and Head of Instrumentation Division at Brookhaven National laboratory. His interests have been in scientific instruments, radiation detectors, noise and signal processing, and low noise electronics. He authored or co-authored about 170 publications. He is a Life Fellow of IEEE, a Fellow of APS, and recipient of the 2009 Howard Wheeler Award from the IEEE.

SC2: Nuclear Science for Security Applications

Saturday, October 24, 08:30 – 17:00

Location: Azalea/Begonia

Organizer: Eric Smith, Pacific Northwest National Lab., USA

Instructors:

Eric Smith, Pacific Northwest Nat. Lab., USA
Anthony Peurrung, Pacific Northwest Nat. Lab., USA
Glen Warren, Pacific Northwest Nat. Lab., US

This one-day course will cover the application of nuclear science, most prominently radiation measurement and analysis methods, in the area of nuclear security. The 2009 course is an evolution of previous IEEE short courses of similar title, and maintains an emphasis on border security for the interdiction of illicit nuclear material trafficking. Prospective students with a general physics or engineering background, but little preparation in the area of radiation detection instrumentation are welcome but are strongly encouraged to study the book Radiation Detection and Measurement (Knoll) prior to the course.

To begin, the scope of "nuclear security" will be defined as it pertains to this course. A discussion of the operational environments typically encountered, along with specific examples, will follow. The role of systems-level evaluations as a means to assess technology's role and define investment priorities will be summarized to provide high-level context for technology developers. A generic discussion of threat classes and their signatures will be complemented by an overview of "backgrounds" in nuclear security environs (e.g., ambient background sources, naturally occurring radioactive materials in cargo). The course will then cover the basic classes of "passive" gamma-ray and neutron detection instrumentation (including imaging techniques) and discuss how decisions are made with respect to their deployment in the field. Modeling and analysis approaches will be surveyed, with a focus on how algorithms support decision-making by law enforcement officers. Next, the expanding field of "active" interrogation techniques will be discussed, including neutron- and photon-interrogation, nuclear resonance fluorescence, and radiography. Metrics for assessing the efficacy of nuclear science technologies, along with an example case study, will be covered. Finally, the course will provide an overview of enabling and exploratory technologies that could result in key advancements for nuclear security applications in the future.

Dr. ERIC SMITH is a staff scientist at Pacific Northwest National Laboratory, working in the area of applied radiation detection. His primary research areas of interest are modeling and simulation of homeland/national security scenarios, signatures to detect proliferation of nuclear threats, and the safeguarding of nuclear fuel cycles and materials. Eric is active in Department of Homeland Security R&D and assessment programs, and serves as a technical advisor to the US Customs and Border Protection's Radiation Portal Monitor program. He currently leads a multi-organization team evaluating DHS's Advanced Spectroscopic Portal monitor, using a combination of field measurements and simulation. Eric has also served as PNNL's representative to DOE's Nonproliferation Research and Engineering Radiation Detection Panel. Prior to joining PNNL in 2001, he was a staff member at Argonne National Laboratory and led projects in nondestructive assay and waste characterization. Eric received a B.S. in Nuclear Engineering from Oregon State University,

and his M.S. and Ph.D. in Nuclear and Radiological Sciences from the University of Michigan.

Dr. ANTHONY PEURRUNG is Director of the Physical and Chemical Sciences Division within the National Security Directorate at Pacific Northwest National Laboratory. He has contributed to a variety of fields within fundamental and applied physics including fluid mechanics, plasma physics, medical physics, separations science, environmental remediation, nuclear physics, and radiation detection methods and applications. His current research interests are centered on detection and characterization of special nuclear material, particularly problems where strong links to fundamental science capability are important. Tony has held leadership roles in both the DOE Radiation Detection Panel and the DHS radiological and nuclear countermeasures program. At PNNL Anthony managed an internal capability-building investment, "Radiation Detection Material Discovery" which held the goal of improving understanding of radiation detection material performance to enable the discovery of new and improved materials. Dr. Peurrung received his BS in Electrical Engineering from Rice University and a Ph.D. in Physics from the University of California, Berkeley.

Dr. GLEN WARREN is a staff scientist at Pacific Northwest National Laboratory, working in the areas of active interrogation and applied radiation detection. His primary research interest is the application of nuclear resonance fluorescence and other active interrogation techniques to a variety of national and homeland security applications. In addition, Glen specializes in the modeling of complex radiation detectors and the analyses of the data resulting from these systems. Before joining PNNL in 2003, Glen's research was focused on the electromagnetic structure of the neutron by conducting experiments at electron scattering facilities such as the Thomas Jefferson National Accelerator Facility. Glen received a B.S. in Physics and Mathematics from the College of William and Mary, and his Ph.D. in Nuclear Physics from the Massachusetts Institute of Technology.

SC3: Nuclear Power and Other Environmentally Clean Alternatives

Sunday, October 25, 08:30 – 17:00

Location: Grand Ballroom, Salon 1

Organizer: John Engdahl, Bradley University, USA

Instructors:

John Engdahl, Bradley University, USA
Robert Scott, Bradley University, USA

This 1-day course reviews the status and potential of nuclear power and other electrical generating alternatives both in terms of technology and economics. Alternatives discussed will include solar photovoltaics, wind turbine generators, and "clean" coal generation. First, the US and World energy pictures are reviewed to examine the magnitude of generation requirements, future growth, and the dependence of GNP on energy. Second, an overview of current nuclear power capacity and proposed new technologies (nuclear, solar, wind, and clean coal) are presented. Next, a discussion of the economics of energy will address not just the financial, but also the issues of providing energy and considering the complete lifecycle of alternatives. Issues include environmental and societal risks and benefits. This course will describe some of the scenarios and analyses for generating systems that have been developed by teams

of engineering and MBA students in a course that has been taught for the past three years. Significant discussion is anticipated.

JOHN ENGDAHL is the Donald V. Fites Chair and Professor, College of Engineering and Technology, at Bradley University and Adjunct Professor of Radiology at the University of Illinois College of Medicine at Peoria. He earned his doctorate in Nuclear Engineering at the University of Michigan. He spent 26 years working in industry, most recently as Director of Advanced Research at Siemens Molecular Imaging, before joining Bradley University. He has authored or co-authored 19 patents, 2 pending patents, 11 journal articles, one book chapter. He and his co-instructor, Dr. Robert Scott, have developed and taught a unique course entitled the Economics and Technology of Energy, which teams engineering and MBA students to analyze competitive means and scenarios for electricity production.

ROBERT SCOTT is Professor and Chair of Economics at Bradley University. His degrees are in Mathematics, Statistics, and Economics. He is author or co-author of over 60 publications, a patent, and has a patent applied for. He has served as consultant to industrial and governmental organizations. He is the Executive Director of Bradley University's Global Innovation Networks Institute which works to bring convergence of business and engineering analysis.

SC4: Medical Imaging Fundamentals

Sunday, October 25, 08:30 – 17:00

Location: Grand Ballroom, Salon 2

Organizer: Todd Peterson, Vanderbilt University, USA

Instructors:

Todd Peterson, Vanderbilt University, USA
Jiang Hsieh, GE Healthcare, USA
Robert Miyaoka, University of Washington, USA
Tom Yankeelov, Vanderbilt University, USA

This full-day course is intended to introduce the fundamentals of medical imaging to engineers and physicists that have no experience in this field. The class begins with a brief overview of the various technologies used to obtain medical images. The focus then shifts to in-depth descriptions of individual techniques. Beginning with the fundamentals of tomographic reconstruction, this presentation is followed by one-hour discussions of the medical imaging modalities of X-ray CT, single-photon emission computed tomography (SPECT), positron emission mammography (PET), and nuclear magnetic resonance imaging (MRI). Emphasis will be placed on the underlying physical principles, instrument design, factors affecting performance, and applications in both the clinical and preclinical realms.

No prior knowledge of medical imaging techniques or computed tomography is assumed. However, the course does assume an understanding of physics, elementary radiation detection and measurement techniques, and a basic understanding of Fourier analysis.

TODD PETERSON is an Assistant Professor in the Department of Radiology and Radiological Sciences and the Department of Physics at Vanderbilt University and serves as the Director of Nuclear Imaging for the Vanderbilt University Institute of Imaging Science. After receiving

his Ph.D. from Indiana University in the field of experimental nuclear physics, he conducted postdoctoral research under the supervision of Dr. Harrison Barrett at the Center for Gamma-Ray Imaging at the University of Arizona. A major focus of his research has been the application of semiconductor detectors to small-animal SPECT. His current research also includes preclinical imaging studies using PET, SPECT, and CT in a variety of areas including oncology and diabetes.

JIANG HSIEH is a Chief Scientist of GE Healthcare Technologies. He has over 26 years of experience on medical imaging, including 20 years in x-ray computed tomography. His primary research interests include pre-processing, image reconstruction, post-processing, and advanced clinical applications of x-ray CT. His research interests also cover various aspects of SPECT and PET imaging.

ROBERT MIYAOKA is a Research Associate Professor in the Department of Radiology and an Adjunct Associate Professor in the Department of Electrical Engineering at the University of Washington. He serves as Director of the Small Animal PET Imaging Resource at the University of Washington. He has over 20 years of experience in nuclear medicine instrumentation research. His primary research focus is high resolution PET detectors including designs that provide depth of interaction positioning and support multi-modality imaging. His research interests also include preclinical PET imaging.

THOMAS YANKEELOV is an Assistant Professor of Radiology, Physics, Biomedical Engineering, and Cancer Biology at Vanderbilt University. He received an M.A. in Applied Mathematics and an M.S. in Physics from Indiana University in 1998 and 2000, respectively. His doctorate is from SUNY at Stony Brook where he completed his Dissertation at Brookhaven National Laboratory in 2003. He has since authored or co- authored 25 peer reviewed journal papers, over 50 conference proceedings, and given nearly 40 seminars on quantitative imaging of cancer. Dr. Yankeelov has been teaching graduate courses in Imaging Science (including a special topics course on Cancer Imaging) for the past four years while at Vanderbilt University. He and his colleagues have developed and extensively used many of the techniques described in this course.

SC5: Physics and Design of Detectors for SPECT and PET

Sunday, October 25, 08:30 – 17:00

Location: Grand Ballroom, Salon 3

Organizer: Lars Furenlid, University of Arizona, USA

Instructors:

Lars Furenlid, University of Arizona, USA
Harrison Barrett, Univ. of Arizona, USA
Tom Lewellen, Univ. of Washington, USA

This course will survey the state of the art in gamma-ray detectors for PET and SPECT, with a discussion of emerging technologies as well as traditional semiconductor and scintillator devices. The course will begin with a discussion of detector physics, cover signal generation, analog and digital pulse processing techniques, triggering, and acquisition strategies. Considerable emphasis will be placed on statistical characterization of the detectors and on optimal estimation methods that take the statistical properties into account. Lecture topics will include:

- Survey of technologies for gamma-ray detectionDetector requirements for SPECT and PET
- State of the art in scintillation detectors
- State of the art in semiconductor detectors
- Statistical modeling and estimation methods
- Event triggering and coincidence techniques
- Data acquisition systems
- Real-time maximum-likelihood estimation methods
- Examples of applications

Dr. LARS FURENLID was educated at the University of Arizona and the Georgia Institute of Technology. He is currently a Professor at the University of Arizona and associate director of the Center for Gamma-ray Imaging, with appointments in the Department of Radiology and the College of Optical Sciences. He was a staff scientist at the National Synchrotron Light Source at Brookhaven National Laboratory. His major research area is the development and application of detectors, electronics, and systems for biomedical imaging.

Dr. HARRISON BARRETT was educated at Virginia Polytechnic Institute, MIT and Harvard. He is currently a Regents Professor at the University of Arizona, with appointments in the College of Optical Sciences, the Dept. of Radiology and the programs in Applied Mathematics and Biomedical Engineering. He is director of the Center for Gamma-ray Imaging and a fellow of the IEEE. In collaboration with Kyle J. Myers, he has written a book entitled Foundations of Image Science, which in 2006 was awarded the First Biennial J. W. Goodman Book Writing Award from OSA and SPIE.

Dr. TOM LEWELLEN was educated at Occidental College and the University of Washington. He is currently a Professor at the University of Washington, with appointments in the Department of Radiology (School of Medicine) and Electrical Engineering. He is director of the Nuclear Medicine Physics Group and a senior member of the IEEE. His major research is in the development of electronics and detector systems for SPECT and PET.

SC6: Statistical Methods for Image Reconstruction

Monday, October 26, 08:30 – 17:00

Location: Grand Ballroom, Salon 2

Organizer: Jinyi Qi, Univ. of California, Davis, USA

Instructors:

Jinyi Qi, Univ. of California, Davis, USA
Bruno De Man, GE Global Research Center, USA

Statistical methods for image reconstruction has attracted growing interest with the advances in instrumentation, computer technologies, fast reconstruction algorithms, and emerging biomedical applications demanding for high-resolution images. Commercial adoption of iterative algorithms on clinical and animal PET/SPECT scanners also facilities its wide spread. This course will provide an orderly overview of statistical reconstruction methods with applications to PET, SPECT, and X-ray CT. The course will start with fundamental issues of statistical reconstruction, including the choice of objective functions, regularization, and optimization algorithms, and their effects on image quality.

It will then discuss specific topics in modeling photon transport in PET, SPECT, X-ray CT and the compensation of the imperfectness in different imaging systems.

Prerequisite knowledge includes basics knowledge of the physics of emission and transmission imaging systems, statistics, and elementary linear algebra.

JINYI QI is an Associate Professor in the Department of Biomedical Engineering at University of California, Davis, and a Faculty Scientist in the Department of Functional Imaging at Lawrence Berkeley National Laboratory. He received his Ph.D. degree in Electrical Engineering from the University of Southern California in 1998. He is an Associate Editor for IEEE Transaction of Medical Imaging. His research interests include statistical image reconstruction, image quality evaluation, system modeling and optimization.

BRUNO DE MAN, Ph.D., is a researcher in the CT and X-ray Laboratory at the GE Global Research Center in Niskayuna, NY. He obtained his Ph.D. degree in Electrical Engineering from the University of Leuven. His research interests include CT iterative reconstruction and novel CT architectures.

SC7: Programming and Medical Applications Using Graphics Hardware

Monday, October 26, 08:30 – 17:00

Location: Grand Ballroom, Salon 3

Organizer: Arkadiusz Sitek, Brigham and Women's Hospital, USA

Instructors:

Arkadiusz Sitek, Brigham and Women's Hospital, USA
Marc Kachelrieß, Friedrich-Alexander-University, Germany
Klaus Mueller, Stony Brook University, USA

This course is an introduction to programming and applications of graphics processing unit (GPU) in medical imaging. Driven by the computer game industry, the development of graphics hardware experienced tremendous growth in recent years. Due to parallel computational architecture as well as availability of GPU hardware, the GPUs offer readily available fast computational resources that can be used in medical imaging applications. The course will introduce computational model of the GPU followed by an introduction to programming using Compute Unified Device Architecture (CUDA). In the second part of the course advanced topics including implementations of the tomographic reconstructions of the X-Ray computed tomography and list-mode emission tomography data will be presented. Applications of the GPU for fast analytical calculations of Compton scatter fraction in emission tomography will be discussed. An alternative to GPU, high performance computing devices will also be discussed. Basic knowledge of C programming language is recommended.

ARKADIUSZ SITEK is a physicist at the Brigham and Women's Hospital in Boston and an Assistant Professor of Radiology at the Harvard Medical School. He received his Ph.D. in Physics from the University of British Columbia in Vancouver, Canada in 1998. His main research interests are focused on alternative three-dimensional medical image representations and visualizations in nuclear medicine and CT. Dr. Sitek is an expert C/C++ programmer with experience in programming of the GPU for medical applications.

MARC KACHELRIEß was born in 1969 in Nürnberg, Germany. In 1989 he began to study physics with a focus on theoretical particle physics. He received his diploma at the Friedrich-Alexander-University of Erlangen-Nürnberg in 1995 Physics and in 2005 he was appointed W2-Professor of Medical Imaging at the Friedrich-Alexander-University Erlangen-Nürnberg, Germany. He focuses on cardiac imaging and extended the approaches to future scanner generations. His research covers image reconstruction of cone-beam CT data, iterative image reconstruction, image reconstruction algorithms in general, and high performance implementations. He is involved in developing algorithms for automatic exposure control (AEC) for CT, methods to reduce CT artifacts and patient dose reduction techniques. His work also includes the design and development of micro-CT scanner hardware and software, micro-CT pre- and postprocessing software and image quality optimization techniques. Marc Kachelrieß is author or coauthor of more than 250 publications.

KLAUS MUELLER received an MS degree in biomedical engineering and a PhD degree in computer science, both from The Ohio State University. He is currently an associate professor in the Computer Science Department at Stony Brook University, where he also holds co-appointments in the Biomedical Engineering and Radiology Departments. His current research interests are medical imaging, high performance computing, computer graphics, visualization, visual analytics and computer vision. He won the US National Science Foundation CAREER award in 2001 and has served as a co-chair at various conferences, such IEEE Visualization, Volume Graphics Symposium, and the Fully 3D Workshop on High-Performance Image Reconstruction. He has authored and co-authored more than 100 journal and conference papers, and he has participated in 15 tutorials at international conferences on various topics in medical imaging and visualization. He is a senior member of the IEEE and the IEEE Computer Society. For more information, see http://www.cs.sunysb.edu/?mueller.

JOINT NSS-MIC PROGRAM

J01 Instrumentation for Medical and Biological Research I: Radionuclide Imaging

Tuesday, Oct. 27 08:00-10:00 International Ballroom North

Session Chairs: **Douglas J. Wagenaar**, Gamma Medica-Ideas, Inc., USA
Yuan-Chuan Tai, Washington University in St. Louis, USA

J01-1 A Stationary SPECT Camera for Simultaneous SPECT/MRI
D. Meier, D. J. Wagenaar, G. E. Maehlum, B. M. Sundal, B. E. Patt, *Gamma Medica - Ideas, Norway/Canada/USA*; M. J. Hamamura, W. W. Roeck, S.-H. Ha, O. Nalcioglu, *University of California, United States*; S. Chen, J. Xu, B. M. W. Tsui, *Johns Hopkins University, United States*

J01-2 Calibration and Performances of a Multichannel DAQ System for Silicon Photomultiplier (SiPM) Matrices in PET Applications.
S. Marcatili[1,2], M. G. Bisogni[1,2], G. Llosa[1], G. Magazzu[2], F. Morsani[2], A. Del Guerra[1,2]
[1]University of Pisa, Italy; [2]INFN, Italy

J01-3 Positron Emission Tomography Detector Development for Plant Biology
A. G. Weisenberger, B. Kross, J. E. Mckisson, A. Stolin, C. Zorn, *Thomas Jefferson National Accelerator Facility, USA*; C. R. Howell, A. S. Crowell, C. D. Reid, *Duke University, USA*; S. Majewski, *West Virginia University, USA*; M. F. Smith, *University of Maryland, USA*

J01-4 Ultra Precise Timing with SiPM-Based TOF PET Scintillation Detectors
S. Seifert[1], R. Vinke[2], H. T. van Dam[1], H. Loehner[2], P. G. Dendooven[2], F. J. Beekman[1,3], D. R. Schaart[1]
[1]Delft University of Technology, The Netherlands; [2]University of Groningen, The Netherlands; [3]University Medical Centre Utrecht, The Netherlands

J01-5 Design Studies of a Front-End Readout for Position Sensitive Avalanche Photo Diode
K. A. Lan, X. Sun, Y. Shao, *UT MD anderson cancer center, USA*; P. A. Dokhale, R. Farrell, K. S. Shah, *Radiation Monitor Devices, Inc., USA*

J01-6 Radiotracer Medical Imaging Technologies Applied to Environmental Remediation Systems
R. Boutchko, B. W. Reutter, T. F. Budinger, W. W. Moses, G. T. Gullberg
Lawrence Berkeley National Lab, CA

J01-7 Feasibility Study of Using Detection of Direct Positrons in Plant Imaging Research
A. V. Stolin, A. G. Weisenberger, J. E. McKisson, *Thomas Jefferson National Accelerator Facility, USA*; S. Majewski, *West Virginia University, USA*

J02 Instrumentation for Medical and Biological Research II: X-ray Imaging and Radiotherapy Applications

Tuesday, Oct. 27 10:30-12:30 International Ballroom North

Session Chairs: **Youngho Seo**, University of California, San Francisco, United States
Vivek V. Nagarkar, RMD, Inc., United States

J02-1 Performance Assessment of a High Resolution X-Ray Scatter Imaging System with Multi-Momentum Transfer Capability
C. Ozkan[1,2], A. Castoldi[2,3], C. Guazzoni[2,3], A. Bjeoumikhov[4], R. Hartmann[5,6], L. Strueder[7,5,8], G. Royle[9]
[1]Universita' degli Studi di Milano, Italy; [2]INFN sez. Milano, Italy; [3]Politecnico di Milano, Italy; [4]IfG -Institute for Scientific Instruments GmbH, Germany; [5]Max Planck Institut HalbleiterLabor, Germany; [6]PNSensor GmbH, Germany; [7]Max Planck Institut fur Extraterrestriche Physik, Germany; [8]Universitat Siegen, Germany; [9]University College London, United Kingdom

J02-2 An Automated Portable Instrument for Rapid Screening for Zinc Deficiency Using Non-Destructive X-Ray Fluorescence
J. J. Kehayias, E. A. Gruber, C. E. Kehayias
Tufts University, USA

J02-3 Attenuation-Refraction-Scattering Computed Tomographic Experimental System with a Conventional X-Ray Tube
Z. Huang, L. Zhang, K. Kang, *Tsinghua Univ., China*

J02-4 Comparison of SOI Microdosimeter and Tissue Equivalent Proportional Counter Measurements at the CERF Facility
D. A. Prokopovich, M. I. Reinhard, *Australian Nuclear Science and Technology Organisation, Australia*; G. C. Taylor, *National Physical Laboratory, UK*; A. Hands, *QinetiQ, UK*; A. B. Rosenfeld, *University of Wollongong, Australia*

J02-5 Measurement of the Thermal Neutron Distribution in a Water Phantom Using a Cyclotron Based Neutron Source for Boron Neutron Capture Therapy
H. Tanaka[1], Y. Sakurai[1], M. Suzuki[1], S. Masunaga[1], T. Mitsumoto[2], S. Yajima[2], H. Tsutsui[2], T. Sato[2], T. Asano[3], G. Kashino[1], Y. Kinashi[1], Y. Liu[1], K. Ono[1], A. Maruhashi[1]
[1]Kyoto University, Japan; [2]Sumitomo Heavy Industries, Japan; [3]Stella Pharma Corporation, Japan

J02-6 Room Temperature Non-Polar Liquid Dosimetry for High Precision Radiotherapy
D. M. Gonzalez-Castano, F. Gomez, *University of Santiago de Compostela, Spain*; L. Brualla, J. Rosello, *ERESA, Spain*

J02-7 PIN Diodes for Measuring Out-of-Field Neutron Dose in Active Beam Proton Therapy
A. L. Ziebell[1], S. J. Dowdell[1], M. I. Reinhard[2], D. A. Prokopovich[2], M. Petasecca[1], M. L. Lerch[1], B. J. Clasie[3,4], A. J. Wroe[5], R. W. Schulte[5], V. Perevertaylo[6], I. E. Anokhin[7], A. B. Rosenfeld[1]
[1]University of Wollongong, Australia; [2]Australian Nuclear Science and Technology Organisation, Australia; [3]Massachusetts General Hospital, USA; [4]Harvard Medical School, USA; [5]Loma Linda University Medical Center, USA; [6]SPO BIT, Ukraine; [7]Institute for Nuclear Research, Ukraine

J03 Joint NSS/MIC 3

Tuesday, Oct. 27 13:30-15:30 International Ballroom North

Session Chair: **Justin S. Baba**, Oak Ridge National Laboratory, United States

J03-1 Silicon Photomultiplier Response Model
H. T. van Dam[1], S. Seifert[1], R. Vinke[2], H. L&oumlhner[2], P. Dendooven[2], F. J. Beekman[1], D. R. Schaart[1]
[1]Delft University of Technology, The Netherlands; [2]KVI - University of Groningen, The Netherlands

J03-2 Simulation Study of Muon Scattering for Tomography Reconstruction
D. Mitra, S. White, R. Hoch, M. Hohlmann, K. Gnanvo
Florida Institute of Technology, USA

J03-3 Photoelectron Anticorrelations and Sub-Poisson Statistics in Scintillation Detectors
A. Bousselham, H. H. Barrett, *University of Arizona, USA*; K. Shah, *Radiation Monitoring Devices, Inc., USA*

J03-4 Thick Monolithic Pixelated Scintillator Array for Megavoltage Imaging in Radiation Therapy
J. S. Maltz[1], J. Hartmann[1], A. Dubouloz[1], A. Paidi[1], B. Gangadharan[1], G. Hoerauf[2], A. R. Bani-Hashemi[1]
[1]Siemens Medical Solutions, USA, Inc., USA; [2]Siemens AG Healthcare, Germany

J03-5 Massively Parallel Image Reconstruction for the BNL Breast Scanner PET Tomograph Using CUDA
M. L. Purschke, *Brookhaven National Lab, USA*; B. Ravindranath, S. S. Southekal, *Stony Brook University, USA*

J03-6 An 8x8 Row-Column Summing Readout Electronics for Preclinical Positron Emission Tomography Scanners
Y.-C. Shih, F. W. Sun, L. R. MacDonald, B. P. Otis, R. S. Miyaoka, W. McDougald, T. K. Lewellen
Univerisity of Washington, USA

J03-7 Effect of Pixel Dimensions and Thickness on Energy Resolution and Sensitivity of CZT Detectors Used in Nuclear Medicine Applications
M. E. Myronakis, D. G. Darambara
Institute of Cancer Research & Royal Marsden NHS Foundation Trust, UK

J04 Joint NSS/MIC 4

Tuesday, Oct. 27 16:00-18:00 International Ballroom North

Session Chair: **William W. Moses**, Lawrence Berkeley National Laboratory, United States

J04-1 The Digital Silicon Photomultiplier - A Novel Sensor for the Detection of Scintillation Light
C. Degenhardt, G. Prescher, T. Frach, R. de Gruyter, A. Schmitz, R. Ballizany
Philips Corporate Technologies, Germany

J04-2 Bright Semiconductor Scintillator for High Resolution X-Ray Imaging
V. V. Nagarkar, V. Gaysinskiy, O. Ovechkina, S. Miller, B. Singh, *RMD, Inc., USA*; L. Guo, T. Irving, *Illinois Institute of Technology, USA*

J04-3 Implement X-Ray Refraction Effect in Geant4 for Phase Contrast Imaging
Z. Wang[1,2], Z. Huang[1,2], L. Zhang[1,2], Z. Chen[1,2], K. Kang[1,2]
[1]Tsinghua Univercity, China; [2]Ministry of Education, China

J04-4 Compensation of Scintillation Sensor Gain Variation During Temperature Transient Conditions Using Signal Processing Techniques
A. Manor[1], A. Osovizky[1], E. Dolev[2], E. Marcus[2], D. Ginzburg[1], V. Pushkarsky[1], Y. Kadmon[2], Y. Cohen[2]
[1]Rotem Industries Ltd, Israel; [2]Nuclear Research Center - Negev, Israel

J04-5 Influence of Secondary Particles to Detectors for in-Beam OpenPET in Heavy Ion Therapy
F. Nishikido[1], Y. Yazaki[2], H. Osada[2], N. Inadama[1], T. Inaniwa[1], S. Satoh[1], K. Shibuya[3], E. Yoshida[1], T. Yamaya[1], H. Murayama[1]
[1]National Institute of Radiological Sciences, Japan; [2]Chiba University, Japan; [3]Tokyo University, Japan

J04-6 Photoluminescence Characterization of Scintillators for Phoswich Detectors
M. Zhuravleva[1], C. L. Melcher[1], L. Eriksson[1,2,3,4]
[1]University of Tennessee, USA; [2]Siemens Medical Solutions Molecular Imaging, USA; [3]University of Stockholm, Sweden; [4]Karolinska Institute, Sweden

J04-7 Small Field of View Quantum Computed Tomography System Based on a MPGD
L. F. Carramate[1], C. A. Santos[1], C. A. Oliveira[1], A. L. Silva[1], M. Peres[1], A. M. da Silva[1], J. M. dos Santos[2], J. F. Veloso[1]
[1]University of Aveiro, Portugal; [2]University of Coimbra, Portugal

J05 NSS/MIC Joint Posters

Wednesday, Oct. 28 10:30-12:00 Palm 3, 4 & 5

Session Chair: **Stefaan Vandenberghe**, Ghent University, Belgium

J05-1 Nuclear Spectroscopy with a Novel LaBr3:Ce Scintillator and SiPM Detector
O. J. Roberts, D. G. Jenkins, P. Joshi, *University of York, UK*; O. Dorvaux, M. Rousseau, *Institut Pluridisciplinaire Hubert CURIEN (IPHC), France*

J05-2 A New Micro-Pattern Gas Detectors Used for Medical Imaging
N. Kahlaoui, *National Center for Nuclear Sciences and Technology, Tunisia*
On behalf of the RD51 Collaboration

J05-3 Determination of Incident X-Ray Spectra Using the Medipix3 Detector
P. Takoukam Talla, P. Bartl, J. Durst, T. Michel, G. Anton
University of Erlangen Nuremberg, Germany

J05-4 Characterization of Highly Pixellated CZT Detectors for Sub-Millimeter PET Imaging
Y. Yin[1,2], S. Komarov[1], H. Wu[1,2], Q. Li[1], A. Garson III[1], D. Paul[1], G. Simburger[1], H. Krawczynski[1], Y.-C. Tai[1]
[1]Washington University in St. Louis, US; [2]Lanzhou University, China

J05-5 Effects of Impurities and Secondary Phases on the Performance of CdZnTe Radiation Detectors
S. K. Swain, *Center for Materials Research, Washington State University, USA*

J05-6 From Imaging to Dosimetry: GEANT4-Based Study on the Application of Medipix to Neutron Personnel Dosimetry and Experimental Application
M. A. R. Othman[1], D. G. Marinaro[2], S. Guatelli[1], M. Petasecca[1], M. L. F. Lerch[1], D. Cutajar[1], M. Reinhard[3], D. Prokopovich[3], J. Jakubek[4], S. Pospisil[4], A. B. Rosenfeld[1]
[1]University of Wollongong, Northfield Ave 2522, Australia; [2]Defence Science and Technology Organisation, 506 Lorimer St, Fishermans Bend 3207, Australia; [3]Australian Nuclear Science and Technology Organisation, Lucas Heights, Australia; [4]Czech Technical University in Prague,12800 Prague 2, Czech Republic

J05-7 Prototype X-Ray Detectors Based on CVD Diamond
S. P. Lansley[1,2], G. T. Betzel[1], F. Baluti[1,3], L. Reinisch[4], J. Meyer[1]
[1]University of Canterbury, New Zealand; [2]MacDiarmid Institute for Advanced Materials & Nanotechnology, New Zealand; [3]Christchurch Hospital, New Zealand; [4]Jacksonville State University, USA

J05-8 A Technique to Locate Stored Iron in the Liver Using Attenuation Correction for Neutron Stimulated Emission Computed Tomography
G. A. Agasthya, A. J. Kapadia, *Duke University, USA*

J05-9 Optical Scattering and Absorption in $LaBr_3:Ce^{3+}$
H. T. van Dam[1], W. Drozdowski[2], S. Seifert[1], P. Dorenbos[1], D. R. Schaart[1]
[1]Delft University of Technology, The Netherlands; [2]Institute of Physics, Nicolaus Copernicus University, Poland

J05-10 Development and Test of TAB Bonded Silicon Pad Detectors and Microcables for the Construction of Silicon Probes for Imaging Devices
V. Linhart[1], V. Borshchov[2], D. Burdette[3], E. Chesi[3], V. Cindro[4], N. H. Clinthorne[5], E. Cochran[3], B. Grosicar[4], K. Honscheid[3], H. Kagan[3], C. Lacasta[1], O. Listratenko[2], G. Llosa[1], M. Mikuz[4], M. Protsenko[2], V. Stankova[1], A. Studen[4], I. Tymchuk[2], P. Weilhammer[3], D. Zontar[4]
[1]IFIC/CSIC-UVEG, Spain; [2]SE SRTIIE, Ukraine; [3]Ohio State University, USA; [4]Joef Stefan Institute, Slovenia; [5]University of Michigan, USA

J05-11 Fast High Lutetium Content Scintillators as Phoswich Candidates for Depth-of-Interaction (DOI) PET Detectors
C. M. Pepin[1], M. Bergeron[1], S. Shimizu[2], N. Viscogliosi[1], R. Fontaine[1], R. Lecomte[1]
[1]Universite de Sherbrooke, Canada; [2]Hitachi Chemical Co., Ltd.,, Canada

J05-12 Distributed Online Coincidence Detection Using IP Multicast for the miniPET-II Detector
J. Imrek, G. Hegyesi, G. Kalinka, J. Molnar, D. Novak, I. Valastyan, *Institute of Nuclear Research of the Hungarian Academy of Sciences, Hungary*; L. Balkay, M. Emri, G. Opposits, S. A. Kis, L. Tron, *University Medical School of Debrecen, Hungary*

J05-13 Study on the Use of Electron-Tracking Compton Gamma-Ray Camera to Monitor the Therapeutic Proton Dose Distribution in Real Time
S. Kabuki[1], K. Ueno[1], S. Kurosawa[1], S. Iwaki[1], H. Kubo[1], K. Miuchi[1], Y. Fujii[2], D. Kim[3], J. Kim[4], R. Kohara[5], O. Miyazaki[5], T. Sakae[6], T. Shirahata[5], T. Takayanagi[2], T. Terunuma[6], Y. Tsukahara[7], E. Yamamoto[5], K. Yasuoka[6], T. Tanimori[1]
[1]kyoto university, Japan; [2]Hitachi, Ltd, Japan; [3]Seoul National University, Korea; [4]National Cancer Center, Korea; [5]Hitachi Medical Corporation, Japan; [6]University of Tsukuba, Japan; [7]Chiba University, Japan

J05-14 Fabrication of ZnSe:Te by Hot Pressing Techniques
S. Cool[1], S. Miller[1], C. Brecher[2], H. Lingertat[2], V. Sarin[3], V. V. Nagarkar[1]
[1]RMD, Inc., USA; [2]ALEM Associates, USA; [3]Boston University, USA

J05-15 Investigation of Lu1.8Gd0.2SiO5:Ce (LGSO) Scintillators with APD Readout for Medical Imaging Applications
S. Shimizu, *Hitachi Chemical, Japan*; C. M. Pepin, R. Lecomte, *Universite de Sherbrooke, Canada*

J05-16 Development of the ProSPECTus Semiconductor Compton Camera for Medical Imaging
L. J. Harkness, A. J. Boston, H. C. Boston, J. R. Cresswell, A. N. Grint, M. Jones, D. S. Judson, P. J. Nolan, D. C. Oxley, D. P. Scraggs, *University of Liverpool, UK*; I. H. Lazarus, J. Simpson, *STFC Daresbury Laboratory, UK*

J05-17 Characterization of Poly-Si TFTs for the Development of Large Area Active Pixel X-Ray Imagers
M. Koniczek, L. E. Antonuk, Y. El-Mohri, Q. Zhao
University of Michigan, USA

J05-18 The Optical Characteristics of the Sample Based Liquid Crystal for Using Radiation Detector.
M.-S. Yun[1], Y.-B. Kim[1], M.-W. Kim[1], S.-H. Jung[1], G.-W. Jang[2], S.-H. Nam[1]
[1]Inje University, South Korea; [2]KIMI, South Korea

J05-19 Simulation and Measurements of the Internal Electric Field of a CZT Detector under High X-Ray Flux for Medical Imaging
O. Alirol, F. Glasser, E. Gros dAillon, J. Tabary
CEA LETI, FRANCE

J05-20 Diffraction Enhanced Imaging with Pulsed Terahertz Radiation
Y. Wang, Z. Zhao, Z. Chen, L. Zhang, K. Kang
Tsinghua University, China

J05-21 Transparent LuAG:Ce and LuAG:Pr Ceramic Scintillator for PET
Y. Wang[1], G. Baldoni[1], J. Glodo[1], E. V. Loef[1], W. H. Rhodes[2], C. Brecher[2], K. S. Shah[1]
[1]Radiation Monitoring Devices, Inc., USA; [2]ALEM Associates, USA

J05-22 An Engineering Validation of the Semi-Classical Trigger Approach for PET Coincidence Finding
J. Wu, *Fermilab, USA*

J05-23 A Fast Data Acquisition System with a Global Reset Scheme for Multi Channel Solid-State Detectors
Y. Kim[1], J. Joung[2], K. Park[1], J. Lee[3], K. Lee[1], Y. Ahn[3], K. Yoon[3], Y. Choi[4]
[1]Korea University, Korea; [2]Siemens Medical Solutions, USA; [3]Osteosys, Korea; [4]Samsung Medical Center, Korea

NUCLEAR SCIENCE SYMPOSIUM (NSS)

Welcome to the 2009 IEEE Nuclear Science Symposium and to Orlando, Florida. Our program for this year has been restructured slightly to better accommodate the wide variety of topics our meeting is so well known for. You may have noticed the introduction of new topics such as Gamma-ray Imaging and New Detectors Concepts and Instrumentation, and the transformation of well-known topics such as Photodetectors and Radiation Imaging, Scintillators and Scintillation Detectors and New Solid State Detectors into the broader topics Semiconductor Detectors and Photodetectors and Scintillation Detectors. This was done in order to reflect the most current interests in our field, confirmed by the large amount of submissions we received: 874 in NSS alone, despite an anticipated 30% reduction in the attendance for this year's NSS's meeting due to the worldwide economic downturn. We want to thank our attendees for the interest and commitment they demonstrate towards the Conference, year after year.

The technical program would not be complete without being complemented by special interest sessions. This year, we have workshops covering topics such as nuclear technology in the oil well industry, nuclear techniques applied to cultural heritage, data intensive computing, and new technologies in hadron therapy: these workshops provide a truly multidisciplinary complement to our outstanding technical program.

For our attendees who are interested in pursuing further education, the Conference offers a wide variety of short courses.

The technical program will commence with some very interesting plenary talks; also do not forget the special treat that will be offered during the NSS luncheon: Dr. Philippe Walter, head of the Laboratoire du Centre de Recherche et de Restauration des Musées de France will entertain the luncheon audience with a special talk on how nuclear techniques help solve cultural heritage challenges.

We are also honored to host the special event "Women in Engineering", a great opportunity for participants to exchange ideas on important topics concerning women in science, technology, engineering and mathematics.

The proximity of the conference site to the world renowned attractions of the Orlando area makes it possible to have some family time as well. The City of Orlando offers special discounts, accessible from our website, for conference attendees to join their family after the conference at the most popular attractions.

We would like to extend a special thanks to our topic conveners and the reviewers who helped us so much in assembling our technical program. They generated a total in excess of 2400 reviews in order to construct a program that we trust you will enjoy. Special thanks also to those who accepted to serve as session chairs at the meeting, and to our highly competent and tireless staff. We could not put together such a diverse and interesting conference without the help of all of these volunteers.

We hope you will enjoy the meeting and we are looking forward to seeing you all in Orlando.

Lorenzo Fabris
NSS Program Chair

Bill Craig
NSS Deputy Program Chair

NSS PLENARY TALKS

NP-1: The U.S. Nuclear Renaissance and the Challenges It Presents

William E. Burchill
President of the American Nuclear Society

Monday, October 26, 09:00 – 10:00, International Ballroom

Dr. Burchill will discuss the factors that are producing the renaissance of nuclear power in the United States, the current status of that renaissance, and the challenges that it presents. These challenges include re-establishing the United States nuclear infrastructure, addressing political issues, building public confidence, licensing the Yucca Mountain High Level Waste Repository, and closing the nuclear fuel cycle.

William E. Burchill is President of the American Nuclear Society. He is also Adjunct Professor and Retired Head of the Nuclear Engineering Department at Texas A&M University. His career highlights are: 4 years with Texas A&M University as Department Head, Nuclear Engineering and HTRI Professor; 5 years with Commonwealth Edison/Exelon as Director, Risk Management responsible for risk management at 17 Nuclear Power Plants at 10 sites; 3 years with Pennsylvania Power & Light as Manager, Assessment Services responsible for QA, QC, OE, CAP, ISEG, ECP, Assessment; and 25 years with Combustion Engineering where he managed C-E response to the TMI accident, formed and managed the C-E Owners Group, and served in his most recent position as Director, Operations and Field Engineering Services. His career professional focus has been nuclear safety. He earned a B.S. in Metallurgical Engineering (Nuclear Option) from the Missouri School of Mines & Metallurgy, an M.S. and a Ph.D. in Nuclear Engineering from the University of Illinois, and an M.S. in Management from the Hartford Graduate Center of Rensselaer Polytechnic Institute.

NP-2: he Intelligence Advanced Research Projects Activity (IARPA) -- What It Is and Why You Should Care

Lisa J. Porter
IARPA Director, Office of the Director of National Intelligence

Monday, October 26,10:00 – 11:00, International Ballroom

Dr. Porter will give an overview of the newly created Intelligence Advanced Research Project Activity (IARPA). She will describe its mission, why it was established, what hard problems it is focused on solving, and how researchers can engage with IARPA to help solve those problems.

Dr. Lisa Porter joined the Office of the Director of National Intelligence as the first director of the Intelligence Advanced Research Projects Activity (IARPA) on February 4, 2008.

Dr. Porter comes to IARPA following service as the NASA associate administrator for the Aeronautics Research Mission Directorate. In this position, she managed the agency's aeronautics research portfolio and guided its strategic direction. Dr. Porter also co-chaired the National Science & Technology Council's Aeronautics Science & Technology Subcommittee and helped to lead the development of the nation's first Presidential Aeronautics R&D Policy.

Prior to her time at NASA, Dr. Porter served as a senior scientist in the Advanced Technology Office of the Defense Advanced Research Projects Agency (DARPA). While there, she created and managed programs in diverse technical areas ranging from fundamental scientific research to multi-disciplinary systems-level development and integration efforts.

Dr. Porter has a bachelor's degree in nuclear engineering from the Massachusetts Institute of Technology and a doctorate in applied physics from Stanford University. She has authored more than 25 publications in a broad range of technical disciplines including nuclear engineering, solar physics, plasma physics, computational materials modeling, explosives detection, and vibration control of flexible structures.

Dr. Porter received the Office of the Secretary of Defense Medal for Exceptional Public Service in 2005 and the NASA Outstanding Leadership Medal in 2008.

NSS LUNCHEON SPEAKER

Multiscale Scientific Imaging of Cultural Heritage Artifacts

Philippe Walter
Centre de recherche et de restauration
des musées de France (CR2MF)
CNRS - UMR171, Palais du Louvre, Paris, France

The study of Cultural Heritage materials requires advanced techniques to shed new lights on ancient technologies and help in their preservation. The implementation of new analytical tools, including large or medium scale facilities such as synchrotron radiation, charge particle accelerators, neutron sources, etc. permits a deep insight on the archaeological and artistic materials, from the millimeter to the nanometer scales. During this lecture, current applications and potential needs of multiscale imaging techniques will be presented to show the major role played by analytical techniques based on particles and X-rays. Examples will deal first with early uses of nanotechnology in ancient hair dyeing formula or to produce lustred ceramic production during the medieval and Renaissance periods. Then we will show how a recent morphological and compositional study of Leonardo da Vinci paintings gives new information on this master's practices.

Dr. Philippe Walter is research director at the Center for research and restoration of the museums of France (C2RMF-CNRS), located in the Louvre museum in Paris. He is developing new analytical tools adapted to the study of ancient materials, with the ion bean analysis facility AGLAE in his laboratory, but also with synchrotron radiation and home-made portable instruments using X-rays. His main research interests are focused on the use of analytical chemistry to understand the development of chemistry for health and beauty during Antiquity or the elaboration of new painting materials, for instance during the Renaissance period. He received a MS degree in physics at the Ecole Normale supérieure de Lyon and a PhD degree in geochemistry from Paul Sabatier University, Toulouse, France in 1993. He organized exhibitions in Cairo (2002) and Paris (2008) to show to the general public the applications of his works for the understanding of the history of body care and cosmetics. He belongs to the CNRS since 1995 and he has received in 2008 the silver medal of this French research organization.

NP NSS Plenary

Monday, Oct. 26 08:30-12:00 International Ballroom Center

Session Chairs: **Lorenzo Fabris**, ORNL, USA
William Craig, UC Berkeley, USA

NP-1 The U.S. Nuclear Renaissance and the Challenges It Presents
W. E. Burchill, *American Nuclear Society, La Grange Park, IL, USA*

NP-2 The Intelligence Advanced Research Projects Activity (IARPA) – What It Is and Why You Should Care
L. J. Porter, *Office of the Director of National Intelligence, College Park, MD, USA*

NP-3 (TBD)

N01 Photodetectors and Scintillation Detectors I

Monday, Oct. 26 13:30-15:30 International Ballroom North

Session Chairs: **Henric S. Krawczynski**, Washington University in St. Louis, USA
Nerine Cherepy, LLNL, USA

N01-1 (invited) Recent Developments in Strontium Iodide Detectors
A. Burger, P. Battacharya, M. Groza, *Fisk University, USA*; N. Cherepy, S. Payne, B. Sturm, O. Drury, *Lawrence Livermore National Laboratory, USA*; E. van Loef, R. Howrami, W. Higgins, K. Shah, *Radiation Monitoring Devices, USA*; J. Ramey, L. Boatner, *Oak Ridge National Laboratory, USA*

N01-2 Luminescence Centers in Ca Co-Doped LSO:Ce Single Crystals
K. Yang, C. L. Melcher, *University of Tennessee, USA*

N01-3 A Technique for Measuring the Energy Resolution of Low-Z Scintillators
K. Roemer, G. Pausch, C.-M. Herbach, Y. Kong, R. Lentering, C. Plettner, J. Stein, *ICx Technologies GmbH, Germany*; M. Moszyński, L. Swiderski, T. Szczęśniak, *Soltan Institute for Nuclear Studies, Poland*

N01-4 Concentration Dependence of Nonproportionality of LaBr3(Ce), SrI2(Eu), and Other Scintillator Crystals
S. Payne, L. Ahle, S. Sheets, N. Cherepy, *LLNL, USA*; W. Moses, G. Bizarri, W.-S. Choong, *LBNL, USA*

N01-5 Scintillation Properties of Cs2LiLaCl6
J. Glodo, E. V. D. van Loef, A. Churilov, W. M. Higgins, R. Hawrami, K. S. Shah
Radiation Monitoring Devices, Inc., USA

N01-6 Fabrication and Characterization of Transparent Ceramic Garnet Scintillators for Gamma Ray Spectroscopy
N. Cherepy[1], J. Kuntz[1], J. Roberts[1], T. Tillotson[1], S. Fisher[1], R. Sanner[1], W. Ralph[1], R. Gaume[2], O. Drury[1], S. Payne[1]
[1]Lawrence Livermore National Laboratory, USA; [2]Stanford University, USA

N01-7 **(invited) Characterization of Scintillators by Modern Photomultipliers - a New Source of Errors**
M. Moszynski[1], T. Szczesniak[1], M. Kapusta[2], M. Szawlowski[1], J. Iwanowska[1], M. Gierlik[1], A. Syntfeld-Kazuch[1], L. Swiderski[1], C. Melcher[3], L. Eriksson[4]
[1]Soltan Institute for Nuclear Studies, Poland; [2]Photonis, France; [3]University of Tennessee, USA; [4]Siemens Medical Solutions, USA

N02 Semiconductor Detectors I: Silicon Detectors and Applications

Monday, Oct. 26 13:30-15:30 International Ballroom Center

Session Chairs: **Marco Battaglia**, LBNL and UC Berkeley, USA
Giovanni Calderini, INFN Pisa, Italy

N02-1 **(invited) The LHCb Silicon Tracker Commissioning and First Data**
A. Büchler, *Physik-Institut, Universität Zürich, Switzerland*
On behalf of the on behalf of the Silicon Tracker group

N02-2 **A 1 cm² Multi-Linear Silicon Drift Detector for 2D X-Ray Spectroscopic Imaging and Compton Scattering**
A. Castoldi, C. Guazzoni, *Politecnico di Milano and INFN, Italy*; R. Hartmann, *PNSensor GmbH and MPI Halbleiterlabor, Germany*; L. Strueder, *Max Planck Institut fur Extraterrestriche Physik and Halbleiterlabor and Universitat Siegen, Germany*

N02-3 **Pixel Sensors Based on High Density Microelectronic Technologies for the Layer 0 of the SuperB Silicon Vertex Tracker**
V. Re, *University of Bergamo, Italy*
On behalf of the VIPIX Collaboration

N02-4 **Characterization of 3D-DDTC Detectors on P-Type Substrates**
G.-F. Dalla Betta[1,2], M. Boscardin[3], L. Bosisio[4,5], P. Gabos[1,2], M. Koehler[6], U. Parzefall[6], C. Piemonte[3], S. Ronchin[3], L. A. M. Wiik[6], A. Zoboli[1,2], N. Zorzi[3]
[1]Universita' di Trento, Italy; [2]INFN, Sezione di Padova, Italy; [3]Fondazione Bruno Kessler (FBK-irst), Italy; [4]Universita' di Trieste, Italy; [5]INFN, Sezione di Trieste, Italy; [6]University of Freiburg, Germany

N02-5 **A High-Performance Charged-Particle CMOS Image Sensor with Per-Column Analog to Digital Conversion**
S. Kleinfelder, L. Jin, S. Li, X. Nguyen-Hu
University of California, USA

N02-6 **Si Based Pillar Structured Thermal Neutron Detectors**
A. M. Conway, L. F. Voss, C. E. Reinhardt, R. T. Graff, T. F. Wang, R. J. Nikolic, *Lawrence Livermore National Laboratory, USA*; N. Deo, C. L. Cheung, *University of Nebraska, USA*

N02-7 **Diamond, 3D-, and Planar-Silicon Pixel Detectors for Super Large Hadron Collider**
F. Huegging, J.-W. Tsung, N. Wermes
University of Bonn, Germany

N03 Analog and Digital Circuits I

Monday, Oct. 26 13:30-15:30 Grand Ballroom 7

Session Chair: **Carlo Fiorini**, Politecnico di Milano, Italy

N03-1 **Silicon Photomultiplier Integrated Readout Chip (SPIROC) for the ILC: Measurements and Possible Further Development**
S. Callier[1], F. Dulucq[1], R. Fabbri[2], C. de La Taille[1], B. Lutz[2], G. Martin-Chassard[1], L. Raux[1], W. Shen[3]
[1]Laboratoire de l'Accelerateur Lineaire, France; [2]DESY, Germany; [3]University of Heidelberg, Germany

N03-2 **A 12-Bit 35MS/s Pipelined ADC with a Dynamic Element Matching Correction for ILC / CALICE Integrated Readout**
F. Rarbi, *LPSC - IN2P3, France*
On behalf of the CALICE collaboration

N03-3 **Radiation-Hard ASICS for SLHC Optical Data Transmission**
K. K. Gan, *The Ohio State University, USA*

N03-4 **A Pixel Front-End ASIC in 0.13 µm CMOS for the NA62 Experiment with on Pixel 100ps Time-to-Digital Conversion**
S. Martoiu[1], G. Dellacasa[1], S. Garbolino[1], F. Marchetto[1], G. Mazza[1], A. Rivetti[1], P. Jarron[2], A. Ceccucci[2], J. Kaplon[2], P. Riedler[2], M. Noy[2], S. Tiuraniemi[2], M. Fiorini[1], A. Cotta Ramusino[1], E. Martin Albarran[3]
[1]INFN, Italy; [2]CERN, Switzerland; [3]Universite' Catholique de Louvain, Belgium

N03-5 **Charge Signal Processors in Sparse Readout CMOS MAPS and Hybrid Pixel Sensors for the SuperB Layer0**
G. Traversi[1,2], L. Gaioni[2,3], M. Manghisoni[1,2], L. Ratti[2,3], V. Re[1,2]
[1]University of Bergamo, Italy; [2]INFN Pavia, Italy; [3]University of Pavia, Italy

N03-6 **PATARA III: a 64-Channel Solid-State Neutron Detector Readout System with Integrated Analog and Digital Processing for the SNS**
A. G. Antonacci, J. L. Britton, *Texas Instruments, Inc., USA*; S. C. Bunch, *Ametek, Inc., USA*; C. L. Britton, M. N. Ericson, *Oak Ridge National Laboratory, USA*; B. J. Blalock, R. Chun, R. Greenwell, *The University of Tennessee, USA*; D. S. McGregor, *Kansas State University, USA*; L. Crow, *The Spallation Neutron Source, USA*

N03-7 **FPHX: a New Silicon Strip Readout Chip for the Phenix Experiment at RHIC**
J. R. Hoff, T. Zimmerman, R. Yarema, *Fermilab, USA*; J. Kapustinsky, M. Brooks, *Los Alamos National Laboratory, USA*

N04 Nuclear Measurements and Monitoring Techniques

Monday, Oct. 26 13:30-15:30 Grand Ballroom 8

Session Chair: **Kareem Kazkaz**, LLNL,

N04-1 **Water Cherenkov Based Neutron Detection**
M. Sweany[1], A. Bernstein[2], N. Bowden[2], S. Dazeley[2], S. Ouedraogo[2], R. Svoboda[1]
[1]University of California, Davis, USA; [2]Lawrence Livermore National Laboratory, USA

N04-2 **Experimental Observation of the Background in Nuclear Resonance Fluorescence**
A. Haefer, G. A. Warren, *Pacific Northwest National Laboratory, USA*; W. Bertozzi, R. D. Hasty, A. V. Klimenko, S. E. Korbly, R. J. Ledoux, W. H. Park, *Passport Systems, Inc, USA*

N04-3 Pulsed Photonuclear Time Correlation Measurements of Shielded HEU Oxide Fuel Pins and DU Metal
S. McConchie, P. Hausladen, J. Mihalczo, *Oak Ridge National Laboratory, USA*; J. Jones, S. Watson, *Idaho National Laboratory, USA*; B. Blackburn, *Raytheon Technical Services, USA*

N04-4 Application of a Laser-Wakefield Driven Monochromatic X-Ray Source to Nuclear Resonance Fluorescence
W. J. Walsh, S. D. Clarke, S. A. Pozzi, *University of Michigan, USA*; N. Cunningham, S. Banerjee, D. Umstadter, *University of Nebraska, USA*

N04-5 Behaviour of Various Types of LiF Detectors at High-Energy Mixed Fields
B. Obryk[1], P. Bilski[1], M. Fuerstner[2], M. Glaser[2], P. Olko[1]
[1]Institute of Nuclear Physics PAN (IFJ), Poland; [2]CERN (European Organization for Nuclear Research), Switzerland

N04-6 Digital Detector on a Chip for Radiation Monitoring and Personnel Dosimetry
C. J. Stapels[1], E. B. Johnson[1], E. Chapman[1], S. Mukhopadhyay[1], F. L. Augustine[2], M. R. Squillante[1], J. F. Christian[1]
[1]Radiaiton Monitoring Devices, USA; [2]Augustine Engineering, USA

N04-7 Sodium Fast Reactor Power Monitoring and Clad Failure Detection using Adonis System
R. Coulon[1], S. Normand[1], G. Ban[2], H.-P. Brau[3], V. Dumarcher[3], J.-L. Portier[3], T. Montagu[1], T. Dautremer[1], E. Barat[1], L. Barbot[1], T. Domenech[1], K. Boudergui[1], V. Kondrasovs[1], P. Jousset[1], J.-M. Bourbotte[1]
[1]CEA, LIST,Laboratoire Capteurs et Architectures Electroniques, France; [2]ENSICAEN, France; [3]CEA, Marcoule,, France

N05 New Detector Concepts and Instrumentation I

Monday, Oct. 26 16:00-18:00 International Ballroom North

Session Chairs: **Jim Lund**, Sandia National Laboratories, USA
Charles Hailey, Columbia University, USA

N05-1 Graphene Based Sensors for Detecting Ionizing Radiation
R. Jalilian, I. Childres, M. Foxe, G. Lopez, I. Jovanovic, Y. P. Chen
Purdue University, USA

N05-2 A Focusing Disc DIRC for PID for the PANDA Experiment at FAIR/GSI
T. Keri, *University of Glasgow, United Kingdom*

N05-3 Development of a Semi-Digital Hadronic Calorimeter Using GRPCs for Future Linear Collider Experiments
I. Laktineh, *IPNL-UCBL-IN2P3, France*
On behalf of the CALICE collaboration

N05-4 Development of Mini Strips Resistive Plate Chamber Prototype
S. A. Tupputi[1], G. De Robertis[2], G. Iaselli[2,3], F. Loddo[2], G. Pugliese[2,3], Y. Shinde[2]
[1]Universita' degli Studi di Bari, Italia; [2]INFN Sezione di Bari, Italia; [3]Politecnico di Bari, Italia

N05-5 Photo-Patterned Silicone Bump Bonds for Sensors Interconnects
M. Christophersen, B. F. Phlips, *U.S. Naval Research Laboratory, USA*; H. F. F-W. Sadrozinski, V. Fadeyev, *University of California Santa Cruz, USA*

N05-6 A Novel Personal Radiation Detection and Identification Device
A. Manor[1], C. Micou[2], A. Osovizky[3], F. Schulcz[2], E. Marcus[3], D. Ginzburg[1], V. Pushkarsky[1], R. Seif[3], Y. Kadmon[3], Y. Cohen[3]
[1]Rotem Industries Ltd, Israel; [2]Mirion Technologies, France; [3]Nuclear Research Center - Negev, Israel

N05-7 Study of the Characteristics of a Piezoelectric PZT Radiation Detector Using a Pulsed Xe Source
T. Miyachi, M. Fujii, N. Hasebe, O. Okudaira, *Advanced Research Institute for Science and Engineering, Waseda University, Japan*; S. Takechi, A. Kurozumi, S. Morinaga; M. Kobayashi, *Planetary Exploration Research Center, Chiba Institute of Technology, Japan*

N06 Instrumentation for Homeland Security I

Monday, Oct. 26 16:00-18:00 International Ballroom Center

Session Chair: **Sara Pozzi**, University of Michigan, USA

N06-1 The SORDS Tri-Modal Imager: Imaging and Source Identification at Standoff Distances
S. R. Tornga, M. C. Galassi, A. S. Hoover, M. Mocko, D. Palmer, L. J. Schultz, M. S. Wallace, *Los Alamos National Laboratory, US*; B. Harris, M. V. Hynes, J. McElroy, M. Toolin, *Raytheon Integrated Defense Systems, US*; D. Wakeford, *Bubble Technology Industries, CA*; R. Lanza, *Massachusets Institute of Technology, US*; D. Wehe, *University of Michigan, US*

N06-2 Mobil Imaging and Spectroscopic Treat Identification (MISTI): Field Trials
L. J. Mitchell[1], B. F. Phlips[1], E. A. Wulf[1], W. N. Johnson[1], A. L. Hutcheson[1], C. J. Lister[2], K. D. Bynum[1], B. E. Leas[1], G. Guadagno[1]
[1]Naval Research Laboratory, USA; [2]Argonne National Laboratory, USA

N06-3 Performance of the Roadside Tracker Portalless Portal Monitor
K. P. Ziock, E. C. Bradley, A. Cheriyadat, M. F. Cunningham, L. Fabris, J. S. Goddard, D. E. Hornback, T. P. Karnowski, R. A. Kerekes
Oak Ridge National Laboratory, USA

N06-4 Boron Coated Straw Detectors as a Replacement for 3He
J. L. Lacy, A. Athanasiades, L. Sun, C. S. Martin, G. J. Vazquez-Flores
Proportional Technologies, Inc, U. S. A.

N06-5 Accurate Modeling of the Terrestrial Gamma-Ray Background for Homeland Security Applications
G. A. Sandness, J. E. Schweppe, W. K. Hensley
Pacific Northwest National Laboratory, USA

N06-6 Shielding of Skyshine Interference with Radiation Detection Systems
R. T. Kouzes, K. E. Conlin, W. J. Kernan, E. K. Mace, E. R. Siciliano, M. L. Woodring
PNNL, USA

N06-7 Data Fusion with Distributed Nuclear Detection Arrays
S. E. Labov, G. Clark, T. Edmunds, M. Gokhale, L. Hiller, G. Johannesson, K. Nelson, D. Slone, R. Wheeler, Y. Yao, *Lawrence Livermore National Laboratory, USA*; K. M. Chandy, A. Liu, R. McLean, M. Wu, *California Institute of Technology, USA*; J. G. Jernigan, *University of California, USA*; A. Ganem, *Zontrak Inc., USA*

N07 Data Acquisition and Analysis Systems I

Monday, Oct. 26 16:00-18:00 Grand Ballroom 7

Session Chair: **Stanley Mrowka**, Sandia National Labs, USA

N07-1 The Read-Out and Control System for the Dark Energy Survey
K. Honscheid, *Ohio State University, USA*
On behalf of the DES Collaboration

N07-2 A Time and Frequency Distribution System for Reactor Neutrino Experiment
G. Gong, X. Tao, Z. Feng, S. Chen
Tsinghua Univ. Beijing, China

N07-3 A Dead-Time Correction Method for Multiple Gamma-Ray Detection
A. Kimura[1], K. Furutaka[1], S. Goko[1], H. Harada[1], M. Igashira[2], T. Kamiyama[3], T. Katabuchi[2], T. Kin[1], K. Kino[3], F. Kitatani[1], Y. Kiyanagi[3], M. Koizumi[1], M. Mizumoto[2], S. Nakamura[1], M. Ohta[1], M. Oshima[1], Y. Toh[1]
[1]Japan Atomic Energy Agency, Japan; [2]Tokyo Institute of Technology, Japan; [3]Hokkaido University, Japan

N07-4 A Digital Filter with Common Mode Noise Rejection for ALICE Silicon Drift Detector
L. Toscano[1], D. Falchieri[2], F. Prino[3], A. Rivetti[3], S. Zannoli[2]
[1]CERN, Switzerland; [2]INFN Sezione di Bologna and University of Bologna, Italy; [3]INFN Sezione di Torino, Italy

N07-5 Evaluation of a FADC with DPP for Applications of Gamma-Ray Detection in Nuclear Medicine Imaging
X. Sun[1], C. Tintori[2], K. A. Lan[1], M. J. Kibilko[3], Y. Shao[1]
[1]University of Texas MD Anderson Cancer Center, United States; [2]CAEN S.p.A., Italy; [3]SE Technical Sales, Inc, United States

N07-6 Bayesian Muon Tomography Using Fused Priors
G. Wang, J. Qi, *University of California, Davis, USA*

N07-7 Advantages of Digitally Sampling Scintillation Pulses in Pileup Processing in PET
X. Wang[1,2], Y. Chen[1], Q. Yin[1], S. Zeng[1,2], Q. Xie[1,2]
[1]Huazhong University of Science and Technology, China; [2]Wuhan National Laboratory for Optoelectronics, China

N08 Radiation Damage Effects I: Semiconductor Devices

Monday, Oct. 26 16:00-18:00 Grand Ballroom 8

Session Chair: **Gianluca Traversi**, University of Bergamo, Italy

N08-1 (invited) Charge Collection Studies of Heavily Irradiated 3D Double-Sided Sensors
R. L. Bates, *Physics and Astronomy, The University of Glasgow, UK*
On behalf of the RD50 Collaboration

N08-2 Measurement of the Interstrip Resistance and Capacitance of Irradiated P-Type Silicon Strip Detectors
S. Lindgren, C. Betancourt, N. M. Dawson, G. Bredeson, H. F. -W. Sadrozinski, M. Gerling, S. Sattari
UC Santa Cruz, USA

N08-3 Radiation Damage Studies for the D0 Silicon Microstrip Tracker at the Tevatron
Z. Ye, *Fermi National Accelerator Laboratory, USA*
On behalf of the D0 Collaboration

N08-4 Annealing of the Charge Collection Efficiency in Irradiated Silicon Detectors
C. Betancourt, B. Colby, G. Bredeson, N. Dawson, V. Fadeyev, M. Gerling, R. F. Hurley, S. Lindgren, P. Maddock, H. F.-W. Sadrozisnki, J. von Wilpert
University of California Santa Cruz, USA

N08-5 Thermally Stimulated Current Separation of Hole and Acceptor Trap Density in 4H-SiC Epitaxial MOS Devices Using Co-60 Irradiation
M. J. Tadjer[1], K. D. Hobart[2], R. E. Stahlbush[2], P. J. McMarr[3], H. L. Hughes[2], F. J. Kub[2], S. K. Haney[4]
[1]University of Maryland, College Park, USA; [2]Naval Research Laboratory, USA; [3]GSG, Inc., USA; [4]Cree, Inc., USA

N08-6 Polarization Effects in Radiation Damaged scCVD Diamond Detectors
S. Schuwalow, *DESY, Germany*
On behalf of the FCAL Collaboration

J01 Instrumentation for Medical and Biological Research I: Radionuclide Imaging

Tuesday, Oct. 27 08:00-10:00 International Ballroom North

See page 32.

N09 Computing and Software for Experiments I: Simulation

Tuesday, Oct. 27 08:00-10:00 Grand Ballroom 2

Session Chairs: **Marcia Begalli**, State University of Rio de Janeiro (UERJ), Brazil
Alberto Ribon, CERN, Switzerland

N09-1 MCNPX 2.7.X New Features Being Developed
G. W. McKinney, M. R. James
Los Alamos National Laboratory, USA

N09-2 Geant4-Related R&D for New Particle Transport Methods
M. G. Pia, *INFN Genova, Italy, Italy*
On behalf of the Geant4-Nano5 Team

N09-3 Research in Geant4 Electromagnetic Physics Design, and Its Effects on Computational Performance and Quality Assurance
M. G. Pia, P. Saracco, M. Sudhakar, *INFN Genova, Italy, Italy*; A. Zoglauer, *University of California at Berkeley, USA*; M. Augelli, *CNES, France*; E. Gargioni, *University Medical Center Hamburg-Eppendorf, Germany*; C. H. Kim, *Hanyang University, Korea*; L. Quintieri, *INFN LNF, Italy*; P. Queiroz, D. de Souza Santos, *IRD, Brazil*; R. Schulte, A. Wroe, *Loma Linda University, USA*; G. Weidenspointner, *MPE-MPI, Germany*; B. Grosswendt, *PTB, Germany*; M. Begalli, *State University of Rio de Janeiro, Brazil*

N09-4 Efficient Transport Simulations of Difficult Detection Problems Using ADVANTG
S. W. Mosher, T. M. Evans, T. M. Miller, J. C. Wagner
Oak Ridge National Laboratory, USA

N09-5 Validation of Fluorescence Transition Probability Calculations
M. G. Pia, P. Saracco, M. Sudhakar
INFN Genova, Italy

N09-6 **A Lewis-Theory for Landau/Vavilov Energy Straggling**
A. K. Prinja, P. H. Smith, *University of New Mexico, USA*

N09-7 **Geant4 in Scientific Literature**
M. G. Pia, *INFN Genova, Italy, Italy*; T. Basaglia, *CERN, Switzerland*; Z. W. Bell, *ORNL, USA*; P. V. Dressendorfer, A. Larkin, *IEEE, USA*

N10 Trigger and Front-End Systems I

Tuesday, Oct. 27 08:00-10:00 Grand Ballroom 3

Session Chairs: **Chikara Fukunaga**, Tokyo Metropolitan University, Japan
Yasuo Arai, KEK, High Energy Accelerator Research Organization, Japan

N10-1 **A New Paradigm Using GPUs for Fast Triggering and Pattern Matching at the CERN Experiment NA62**
G. Lamanna, G. Collazuol, G. Ruggiero, *Scuola Normale Superiore & INFN, Italy*; M. Sozzi, *University & INFN, Italy*

N10-2 **Field Tests of a New High-Speed Pattern Recognition Trigger for Ground-Based Gamma-Ray Telescope Arrays**
J. T. Anderson[1], K. Byrum[1], G. Drake[1], A. Kreps[1], F. Krennrich[2], M. Schroedter[2], A. W. Smith[1]
[1]Argonne National Laboratory, USA; [2]Iowa State University, USA

N10-3 **An FPGA-Based Trigger for the Search of Mu -> E + Gamma Decay in the MEG Experiment**
L. Galli, *Pisa University and INFN of Pisa, Italy*
On behalf of the MEG Collaboration

N10-4 **Feature-Extraction Algorithms for the PANDA Elctromagnetic Calorimeter**
M. Kavatsyuk, *KVI/University of Groningen, The Netherlands*
On behalf of the PANDA collaboration

N10-5 **Results from the ATLAS Barrel Level-1 Muon Trigger Timing Studies Using Combined Trigger and Offline Tracking**
G. Salamanna, *Nikhef, Nederland*
On behalf of the ATLAS Collaboration

N10-6 **Operational Experience of the ATLAS High Level Trigger with Single-Beam and Cosmic Rays**
I. Aracena, *SLAC, USA*
On behalf of the ATLAS Collaboration

N10-7 **The ATLAS Tau Trigger**
S. Tsuno, *KEK, High Energy Accelerator Research Organization, Japan*
On behalf of the ATLAS T/DAQ Collaboration

N11 Gaseous Detectors I: Development of Techniques

Tuesday, Oct. 27 08:00-10:00 Grand Ballroom 7

Session Chairs: **Christoph J. Ilgner**, Technical University of Dortmund, Switzerland
Bernd Surrow, MIT, USA

N11-1 **Spherical GEMs for Parallax-Free X-Ray Imaging**
S. Duarte Pinto[1,2], I. Brock[2], E. David[1], L. Ropelewski[1], M. van Stenis[1], H. Taureg[1], R. de Oliveira[1]
[1]CERN, Switzerland; [2]Physikalisches Institut der Universitt Bonn, Germany

N11-2 **Study of New Materials for Bakelite Resistive Plate Chamber Operation in Avalanche and Streamer Modes**
A. Sharma, *CERN, Switzerland*

N11-3 **The Performance of GridPix Detectors**
M. Fransen, *Nikhef, Netherlands*

N11-4 **Electroluminescence Assessment in Micropattern Gaseous Avalanche Detectors**
C. A. B. Oliveira, J. J. F. C. A. Veloso, A. L. Ferreira, *University of Aveiro, Portugal*; S. Biagi, *University of Liverpool, UK*; R. Veenhof, *CERN, Switzerland*; J. M. F. dos Santos, C. M. B. Monteiro, *University of Coimbra, Portugal*

N11-5 **Progress of Fine-Pitch GEM Development in Japan Using a Laser Etching Technique**
T. Tamagawa[1,2], A. Hayato[1,2], T. Iwahashi[1,2], S. Konami[1,2], F. Asami[1,2], H. Hamagaki[3], Y. L. Yamaguchi[3], K. Makishima[4,1]
[1]RIKEN, Japan; [2]Tokyo University of Science, Japan; [3]CNS, University of Tokyo, Japan; [4]University of Tokyo, Japan

N11-6 **Long-Term Study of the Operation of LHC Resistive Plate Chambers in an Optimized Closed-Loop Gas System**
M. Capeans, I. Glushkov, R. Guida, F. Hahn, S. Haider
CERN, Switzerland

N11-7 **A Low Pressure, Soft X-Ray Detector Using Gas Electron Multipliers**
G. C. Smith, N. A. Schaknowski, B. Yu, *Brookhaven National Laboratory, USA*; D. A. Fischer, *National Institute of Standards and Technology, USA*

N12 High Energy Physics Instrumentation I

Tuesday, Oct. 27 08:00-10:00 Grand Ballroom 8

Session Chairs: **Marc M. Weber**, Rutherford Appleton Laboratory, United Kingdom
Marco Battaglia, LBNL and UC Berkeley, USA

N12-1 **(invited) The Challenges and Possible Implementations of Super-LHC Detector Upgrades**
S. Stapnes, *Univ. of Oslo, Norway*

N12-2 **ATLAS Silicon Microstrip Tracker Operation**
Z. Dolezal, *Charles University Prague, Czech Republic*
On behalf of the ATLAS SCT

N12-3 **Results from the Commissioning of the ATLAS Pixel Detector with Cosmics Data.**
C. Troncon, *INFN - Milano, Italy*
On behalf of the ATLAS Pixel Detector Collaboration

N12-4 **Commissioning the CMS Pixel Detector with Cosmic Rays**
M. E. Dinardo, *University of Colorado, USA*
On behalf of the CMS pixel collaboration

N12-5 **FE-I4: the New ATLAS Pixel Chip for Upgraded LHC Luminosities**
M. Barbero[1], D. Arutinov[1], R. Beccherle[2], G. Darbo[2], S. Dube[3], D. Elledge[3], D. Fougeron[4], M. Garcia-Sciveres[3], D. Gnani[3], V. Gromov[5], T. Hemperek[1], M. Karagounis[1], R. Kluit[5], A. Kruth[1], A. Mekkaoui[3], M. Menouni[4], J. D. Schipper[5], N. Wermes[1]
[1]University of Bonn, Germany; [2]University of Genova, Italy; [3]LBNL, USA; [4]CPPM Aix-Marseille University, France; [5]NIKHEF, The Netherlands

N12-6 **Longevity Studies in the CDF Silicon Detectors**
S. Behari, *The Johns Hopkins University, USA*
On behalf of the CDF II Silicon group

J02 Instrumentation for Medical and Biological Research II: X-ray Imaging and Radiotherapy Applications

Tuesday, Oct. 27 10:30-12:30 International Ballroom North

See page 33.

N13 Posters I

Tuesday, Oct. 27 10:30-12:00 Grand Ballroom 4&5

Session Chair: **Ralf Engels**, Forschungszentrum Juelich GmbH, Germany

Accelerators and Beam Line Instrumentation

N13-1 **TMRS MK III Engineering Analysis**
K. A. Woloshun, G. G. Walthers-Ellis, R. A. Valicenti, J. A. O'Toole
Los Alamos National Laboratory, NM

N13-2 **TMRS MK III Engineering Design**
J. A. O'toole, R. A. Valicenti, K. A. Woloshun
Los Alamos National Laboratory, USA

N13-3 **TMRS MK III Fabrication**
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N13-4 **Controlling Coupled-Bunch Instabilities at the Australian Synchrotron**
D. J. Peake[1], M. J. Boland[1,2], G. S. LeBlanc[2], G. J. O'Keefe[1,3], R. P. Rassool[1]
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N13-5 **Design, Construction and Diagnostic Methods of a Real-Time Fill Pattern Monitor at the Australian Synchrotron**
D. J. Peake[1], M. J. Boland[1,2], G. S. LeBlanc[1,2], G. J. O'Keefe[1,3], R. P. Rassool[1]
[1]The University of Melbourne, Australia; [2]The Australian Synchrotron, Australia; [3]The Austin Hospital, Australia

N13-6 **Design and Development of Laser-RF Synchronization System for Thomson-Scattering X-ray Source at Tsinghua University**
Q. Du, J. Li, C. Tang, W. Huang, Y. Du, L. Yan
Tsinghua University, China

N13-7 **GEM-TPC Prototype for Beam Diagnostics of Super-FRS in NUSTAR Experiment of FAIR Facility**
F. Garcia, M. Kalliokoski, E. Tuominen, *Helsinki Institute of Physics and Department of Physcal Sciences, University of Helsinki, Finland*; R. Rudolf Janik, M. Pikna, B. Sitar, P. Strmen, I. Szarka, *Comenius University, Slovakia*

N13-8 **A Study of Proton Radiography Through Comparison Between Ultraintense Laser and Tandem Accelerator**
C. I. Choi, B. H. Kang, Y. K. Kim, *Hanyang University, Korea*; I. W. Choi, D. K. Ko, J. M. Lee, *Gwangju Institute of Science Technology, Korea*; G. D. Kim, *Korea Institute of Geoscience and Mineral Resources, Korea*

N13-9 **IP Beam Size Measurement During Collisions at Super-KEKB**
M. Iwasaki, *University of Tokyo, Japan*; T. Tauchi, T. Tsuboyama, *KEK, Japan*

N13-10 **Design and Application of Beam Loss Monitoring System for SSRF Storage Ring**
H. Gong, L. Hou, M. Zeng, B. Shao, *Tsinghua University, China*; Y. Li, *University of Science and Technology of China, China*; J. Cai, *Chinese Academy of Sciences, China*

N13-11 **Focused Ion Beam Production Using a Pyroelectric Crystal and a Resistive Glass Tube**
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N13-12 **Development of a Photodiode-Based X-Ray Beam-Position Monitor with High-Spatial Resolution for Use on NSLS-II Beamlines**
P. S. Yoon, D. P. Siddons
Brookhaven National Laboratory, USA

N13-13 **The Luminosity Monitoring System for the Large Hadron Collider (LHC)**
A. Ratti[1], J.-F. Beche[1], J. Byrd[1], P. Denes[1], L. Doolittle[1], P. F. Manfredi[1], H. Matis[1], M. Monroy[1], M. Placidi[1], T. Stezelberger[1], W. Turner[1], H. Yaver[1], E. Bravin[2], A. Dress[3], J. Stiller[4], K. Chow[1]
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Analog and Digital Circuits

N13-14 **A High-Precision Time-to-Digital Converter in a FPGA Device**
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N13-15 **The GSI Event-Driven TDC with 4 Channels GET4**
H. Deppe, H. Flemming
GSI Helmholtzzentrum für Schwerionenforschung GmbH, Germany

N13-16 **An FPGA TDC for Time-of-Flight Applications**
J. Wu, *Fermilab, USA*

N13-17 **WaveDREAM - a DRS4 Based 5 GS/s 12 Bit Digitizer with GBit Ethernet Readout**
S. Ritt, R. Dinapoli, U. Hartmann
Paul Scherrer Institute, Switzerland

N13-18 **Interleaved Dual Slope ADC for a Diamond Dosimeter ASIC**
F. Petulla'[1], F. de Notaristefani[1], V. Orsolini Cencelli[1], E. D'Abramo[1], A. Fabbri[1], M. Marinelli[2], G. Verona Rinati[2]
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N13-19 **A Peak Detect and Hold Circuit Using Ramp Sampling Approach**
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National Tsing Hua University, Taiwan

N13-20 A Fast Single Slope ADC with Vernier Delay Line Techniques
W. F. Lin, H. P. Chou
National Tsing Hua University, Taiwan

N13-21 IDEF-X SX0: a LOW POWER CMOS ASIC for the READOUT of CD(ZN)TE DETECTORS
O. Gevin, F. Lugiez, E. Delagnes, O. Limousin, A. Meuris
CEA, France

N13-22 A High-Speed 2nV/Hz1/2 16-Channel Current Amplifier IC for PET
J.-P. Rostaing, A. Peizerat, O. Billoint, G. Montemont, O. Monnet
CEA, LETI, MINATEC, France

N13-23 CLOSY: a Very Precise Clock Generation for Timing Measurements and Synchronization of the CBM ToF Wall
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N13-24 INTEGRATED ELECTRONIC for a CdTe BASED PET SYSTEM
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N13-25 High Performance Analog Front-End for Digital Spectroscopy
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N13-26 Multi-Channel Data Acquisition System for Nuclear Pulse Processing
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N13-27 Digital Readout Electronics for Microcalorimeters
H. Tan, J. Collins, W. Hennig, M. Walby, P. Grudberg, W. K. Warburton
XIA LLC, USA

N13-28 The Readout Electronics of GEM Detector
Y. Zhao
Institute of High Energy Physics, Chinese Academy of Sciences, China

N13-29 Development of a Counting Strip Detector Readout Chip for Precision Compton Polarimetry
M. Karagounis, G. Ahluwalia, M. Gronewald, M. Koch, H. Krueger, N. Wermes
University of Bonn, Germany

N13-30 Design and Performance of a 0.18-µm CMOS Charge Sensitive Preamplifier for the LabPET II, a Novel 64-Channel APD-Based Detector for PET/CT
K. M. C. Koua, J.-F. Pratte, A.-A. I. Assane, N. Viscogliosi, C. Pepin, R. Lecomte, R. Fontaine
Universite de Sherbrooke, Canada

N13-31 Noise Optimization of CMOS CSA in Weak and Moderate Inversion Regions
Y. Li, Z. Deng, Y. Liu, *Tsinghua University, China*

N13-32 Fast Low-Impedance Output Stage for CMOS Charge Preamplifiers Able to Work at Cryogenic Temperatures
A. Pullia[1,2], F. Zocca[2]
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N13-33 FPGA Based Readout Electronics for Multi Anode PSPMT
A. Fabbri[1,2], V. Orsolini Cencelli[1,2], F. de Notaristefani[1,2], E. D'Abramo[1,2], F. Petulla'[1,2], R. Pani[3,2], G. Moschini[4,2], F. Navarria[5,2]
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N13-34 The P4DI ASIC Architecture and Measurement Results
C. P. Lambropoulos, E. G. Zervakis, A. Nikologiannis, G. Theodoratos, D. S. Hatzistratis
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N13-35 A Clustering Engine for Data Rate Reduction in the Belle II Pixel Detector
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N13-36 Current Mode Constant Fraction Discriminator for PET Using SiPM(MPPC)
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N13-37 Setup of Cryogenic Front-End Electronic Systems for Germanium Detectors Read-Out
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N13-38 Low Noise 64-Channel ASIC for Si, GaAs and CdTe Strip Detectors
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N13-39 Design and Performance of the ABCN-25 Readout Chip for the ATLAS Inner Detector Upgrade
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N13-40 A Front End Chip for the INNOTEP Project Including a 8 Bits 100 MS/s ADC
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N13-41 The 5ns Peaking Time Transimpedance Front End Amplifier for the Silicon Pixel Detector in the NA62 Experiment
J. Kaplon, A. Ceccucci, P. Jarron, A. Kluge, M. Noy, S. Tiuraniemi, *CERN, Switzerland*; M. E. Martin Albarran, *Universit catholique de Louvain, Louvain-la-Neuve, Belgium*; F. Marchetto, G. Mazza, A. Rivetti, S. Martoiu, G. Dellacasa, *INFN, Italy*

N13-42 The Preamplifier for CUORE, an Array of Large Mass Bolometers
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N13-43 Spectroscopic Performances of the GERDA Cryogenic Charge Sensitive Amplifier Based on JFET-CMOS ASIC Coupled to Germanium Detectors
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N13-44 PADI-2,-3 and -4: The Second Iteration of the Fast Preamplifier Discriminator ASIC for Time-of-Flight Measurements at CBM
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N13-45 Diamond Start Detectors
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N13-46 GAS II: a Versatile Wire Chamber Readout ASIC
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University of Pennsylvania, USA

N13-47 ASIC for High-Rate 3D Position Sensitive Detectors
G. De Geronimo, E. Vernon, K. Ackley, J. Fried, *Brookhaven National Laboratory, USA*; Z. He, C. Herman, F. Zhang, *University of Michigan, USA*

N13-48 SiGBiT: a Dedicated SiGe and CMOS Device Test ASIC
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N13-49 Application of Time Over Threshold Method for Micro Strip Gas Counter
B. Shi, K. Shimazoe, T. Fujiwara, H. Takahashi
The University of Tokyo, Japan

N13-50 Advanced Waveform Digitization with Programmable Windowed Real-Time Trigger Capability
W. Huang, S.-H. W. Chiang, S. Kleinfelder
University of California, USA

N13-51 Timing Generator Using Dual Delay-Locked Loop
C.-S. Hwang, K.-H. Chen, *National Yunlin University of Science and Technology, Taiwan*; H.-W. Tsao, *National Taiwan University, Taiwan*

Astrophysics and Space Instrumentation

N13-52 CCD Base Line Subtraction Algorithms
I. V. Kotov, A. Kotov, J. Frank, P. O'Connor, V. Perevoztchikov, P. Takacs
Brookhaven National Laboratory, USA

N13-53 Development Status of ECLAIRs, a Gamma Ray Burst Observatory for the SVOM Mission
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N13-54 ASPIC : LSST Camera Readout Chip
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IN2P3, France

N13-55 High-Resolving Electrostatic Energy Analyzer for Space Measurements
A. M. Ilyin, *Kazakh National University, Kazakhstan*; I. A. Ilyina, *TRIO, Russia*

N13-56 First Detection of Extensive Air Shower with the EEE Experiment
C. Gustavino, *INFN, Italy*
On behalf of the the EEE Collaboration

N13-57 Efficiency and Polarimetric Calibrations of the Nuclear Compton Telescope
E. C. Bellm[1], J.-L. Chiu[2], J.-S. Liang[2], D. Perez-Becker[1], S. E. Boggs[1], M. Amman[3], M. S. Bandstra[1], H.-K. Chang[2], Y.-H. Chang[4], M. A. Huang[5], W.-C. Hung[4], P. Jean[6], C.-H. Lin[7], Z.-K. Liu[4], P. N. Luke[3], C. B. Wunderer[1], A. Zoglauer[1]
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N13-58 PoGOLite - a Balloon-Borne Soft Gamma-Ray Polarimeter
M. Pearce, *The Royal Institute of Technology, KTH, Sweden*
On behalf of the PoGOLite Collaboration

N13-59 On-Orbit Calibration and Performance of the CsI Crystal Calorimeter of the FERMI Large Area Telescope
A. Chekhtman[1,2], *[1]Naval Research Laboratory, USA; [2]George Mason University, USA*
On behalf of the FERMI LAT collaboration

N13-60 Performance Evaluation of Low Complexity EDAC Systems for Application on-Board the Algerian Satellites
Y. Bentoutou, *Centre des Techniques Spatiales, Algeria*

N13-61 Fine-Pitch Semiconductor Detector for FOXSI Mission
S.-N. Ishikawa, S. Watanabe, H. Odaka, S. Sugimoto, S. Saito, T. Fukuyama, M. Kokubun, T. Takahashi, *ISAS/JAXA, Japan*; H. Tajima, T. Tanaka, *SLAC, USA*; Y. Terada, *Saitama University, Japan*; S. Krucker, S. Christe, S. McBride, L. Glesener, *University of Calofornia, Berkeley, USA*

N13-62 Effective Pixel Area Measurements on CZT Detectors in 3D
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N13-63 Impact of Space Protons and Electrons Scattering Through the IXO Telescope Mirrors
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N13-64 eROSITA Focal Plane Instrumentation Design
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N13-65 Polarimetry Study with a CdZnTe Focal Plane Detector
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N13-66 Data Calibration Using Geant4 for the Radiation Monitor Onboard the Akebono Satellite
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N13-67 Photon Detector Developments for the Next Generation Cherenkov Telescope Array AGIS
A. N. Otte, *University of California in Santa Cruz, USA*
On behalf of the AGIS collaboration

N13-68 Basic Performance of the Polarimeter for Gamma-Ray Bursts Using MAPMTs and Segmented Scintillators
S. Gunji, *Yamagata University, Japan*
On behalf of the PHENEX Collaboration

N13-69 LAGO (Large Aperture GRB Observatory) in Peru
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N13-70 Energy, Depth Calibration, and Imaging Capability of Nuclear Compton Telescope
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Computing and Software for Experiments

N13-71 A 4D Monte Carlo Compton Scattering Code
C. Sun, Y. K. Wu, *Duke University, USA*

N13-72 CyberSar: a Lambda Grid Computing Infrastructure for Advanced Applications
A. Masoni, *INFN Sezione di Cagliari, Italy*; M. Carpinelli, *University of Sassari, Italy*; G. Fenu, A. Bosin, *University of Cagliari, Italy*; D. Mura, *Consorzio Cybersar, Italy*; I. Porceddu, *INAF, Italy*; G. Zanetti, *CRS4, Italy*

N13-73 The Architecture of BESIII Offline Database
Y. Chu, *Institute of High Energy Physics, P.R.China*

N13-74 A 3-D Simulation Tool for Design and Data Correction of X-Ray Scatter Imaging Experiments
A. Castoldi, C. Guazzoni, *Politecnico di Milano and INFN, Italy*; C. Ozkan, *Universita' degli Studi and INFN sez. Milano, Italy*

N13-75 ATLASeditor3D, 3D Database Editor for the ATLAS Experiment
J. Molina-Perez, K. Pommes, *CERN, Switzerland*

N13-76 Parameterized Simulation of the CMS Calorimeter Using GFlash
D. Jang, *Carnegie Mellon University, USA*
On behalf of the CMS Collaboration

N13-77 CVMFS-Based Easy-to-Install Linux to Distribute Large Computing Software to End Users
Y. Yao, *Lawrence Berkeley National Laboratory, USA*
On behalf of the ATLAS Collaboration

N13-78 A New Specialized Data Format for Commissioning of the ATLAS Experiment and Physics Analysis
K. Koeneke, *DESY, Germany*
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N13-79 Inter-Comparison and Validation of Geant4 Photon Interaction Models
M. G. Pia[1], M. Augelli[2], M. Begalli[3], L. Quintieri[4], P. Saracco[1], M. Sudhakar[1], G. Weidenspointner[5], A. Zoglauer[6]
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N13-80 Prototype for Mutable Compton Scattering Simulation with Geant4
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N13-81 Synthetic Gamma-Ray Spectra for Homeland Security Radio-Nuclides Analysis
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N13-82 Electronic Components' Dose Mapping for the SIXS Sensor Unit of the BepiColombo Mission
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N13-83 Development of GUI-based Compton Imaging Simulator with Timing Characteristics of Compton Camera
H. Seo, J. H. Park, C. H. Kim, *Hanyang University, Korea*; S. H. Lee, *Asan Medical Center, Korea*; J. H. Lee, C. S. Lee, *Chung-Ang University, Korea*; J. S. Lee, *Seoul National University, Korea*

N13-84 Condition Data for the CMS Silicon Strip Tracker Reconstruction
M. De Mattia, *INFN and University of Padova, Italy*
On behalf of the CMS Collaboration

N13-85 Use of Late-Binding Technology for Workload Management System in CMS
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N13-86 Activities and Performance Optimization of the Italian Computing Centers Supporting the ATLAS Experiment
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N13-87 Evaluation of AMGA as a Data-Handling Tool for a New HEP Experiment
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N13-88 Muon Reconstruction and Identification in CMS
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On behalf of the CMS Collaboration

N13-89 Transition Between Hadronic Models in Geant4
A. Ribon, J. Apostolakis, G. Folger, V. Grichine, V. Ivanchenko, M. Kosov, V. Uzhinskiy, *CERN, Switzerland*; D. Wright, *SLAC, U.S.A.*

N13-90 Neural Online Filtering Based on Preprocessed Calorimeter Data
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N13-91 Anthropomorphic Phantoms and Geant4-Based Implementations for Dose Calculations
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N13-92 openEyA Tool for Medical Webcasting
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N13-93 Influence of Shielding Composition on Transmission Curves Determination for Diagnostic Radiology: a Monte Carlo Study Using the GEANT4 Code
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N13-94 Explicit Buffer Networking: a New Approach to High Throughput Data Transfer
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N13-95 Simulation of an Ir-192 Brachytherapy Source Using Geant4 Code
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N13-96 The LHCb Muon Detector Alignment
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N13-97 GATE Simulations on Multiprocessor Architectures
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N13-98 Real-Time Multispeckle XPCS Data Reduction via a Field Programmable Gate Array and High Performance Computing
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N13-99 Electronics for Monolithic Scintillator PET Detector Modules Based on Neural Network Position Estimators
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N13-100 The Research of the Embedded Data Acquisition and SCADA System of the Gamma Camera Based on ARM
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N13-101 Digital Configurable Processor for Acquisition and Elaboration of Data from Detector Arrays
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N13-102 Non-Linear Least-Mean-Squares Fitting in FPGA Devices for Digital Spectroscopy
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N13-103 Adaptive Digital Trigger Architecture in FPGA
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N13-104 Studies of Data Transmission on Long Kapton Cables
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N13-105 Scalable Multi-Channel Acquisition System for Radiation Imaging Applications and Nuclear Physics Instrumentation
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N13-106 Acquisition and Control Hardware and Software for an Advanced Enrichment Monitor
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N13-107 Performance Analysis of a DWDM Optical Transmission System
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N13-108 Wiener Filter-Based Crystal Identification Applied to Dual and Triple Layers Phoswich Detectors
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N13-109 Developments for the Readout of the PANDA Micro Vertex Detector
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N13-110 A Telescope Using CMS PSI46 Pixels and the CAPTAN for Acquisition and Control over Gigabit Ethernet
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N13-111 The Muon Conditions Data Management: Database Architecture and Software Infrastructure
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N13-112 High Resolution Digital Spectroscopy Based on Multiple Interleaved ADCs
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N13-113 The ATLAS TileCal Read-Out Drivers Signal Reconstruction with Commissioning Data
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N13-114 Gigabit High Speed TCP Data Transmission for Positron Emission Tomography
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N13-115 The CMS Tracker Data Quality Monitoring Expert GUI
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On behalf of the CMS Collaboration

N13-116 On-Line Data Reduction on the ALICE SDD Data Concentrator Card CARLOSrx
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N13-117 The ARGO-YBJ DAQ Monitoring System
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On behalf of the ARGO-YBJ Collaboration

N13-118 Data Quality Monitoring of the CMS Tracker
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On behalf of the CMS Tracker DQM group

N13-119 Development of 500 MHz Multi-Channel Readout Electronics for Fast Radiation Detectors
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N13-120 Readout Electronics for the FVTX Detector at PHENIX
S. A. Butsyk, *University of New Mexico, US*
On behalf of the PHENIX Collaboration

N13-121 Integrating Security into an Accelerator Control Systems Web Interface
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N13-122 A Modular High Speed Data Acquisition System for PHENIX TEC/TRD Front End Electronics
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On behalf of the PHENIX TEC/TRD group

N13-123 Online Monitoring System for Double Chooz Experiment
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N13-124 The Configuration System of the ATLAS Trigger
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N13-125 A Novel Approach Using Speech Technology to Enhance Isotope ID and Classification
L. M. D. Owsley, J. J. McLaughlin, L. Cazzanti, *University of Washington, 98105*; S. Salaymeh, *Savannah River National Laboratory, 29808*

Gamma-ray Imaging

N13-126 Benefits of Position-Sensitive Detectors for Source Detection with Known Background
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N13-127 A Compact Compton Camera Using Scintillators for the Investigation of Nuclear Materials
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N13-128 Employing Neural Networks to Determine the Position of Interaction of Medium-High Energy Gamma Rays
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N13-129 The Development of a Compton Camera for the Imaging of Illicit Substances.
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N13-130 Statistical Methods for Chemical Compound Identification from Neutron-Induced Gamma-Ray Spectra
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N13-131 Optimized Software for a Compact Gamma Camera
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N13-132 Imaging Results with a $LaBr_3$-Based Rotational Modulator
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N13-133 Defeating IEDs, SNM and Contraband Secreting via Long Range Gamma-Ray Imaging of Neutron Interrogated Materials
B. T. Wells, R. C. Stevenson, J. Noh, S. Ramadoss, M. Joseph, *Galt Research LLC, USA*; M. D. Hammig, *University of Michigan, USA*

N13-134 Directional Isotope Identification Using 3-D Semiconductor Gamma-Ray-Imaging Spectrometers
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N13-135 Implementation of Signal Decomposition for Compton Imaging Using High-Purity Germanium Detectors
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N13-136 Triggered Readout for CCD Imaging of Compton Electron Tracks
K. L. Macdonald, D. H. Chivers, *UC Berkeley, USA*

N13-137 Electron Tracking Measurements for Advanced Compton Imaging
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N13-138 Development of Two-Dimensional Micro-pixel Gas Chamber Capable of Individual Line Readout for Neutron Measurement
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N13-139 Determination of 68Ge-Trace Activities in 68Ga Eluates from a 68Ge/68Ga Generator Using X-Ray Spectrometry with a Gas Proportional Counter
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N13-140 Beam Test Results of Two Kinds of High Rate Multi-Gap Resistive Plate Chambers
Y. Wang, J. Wang, X. Zhu, Y. Li, J. Cheng, *Tsinghua University, China*; N. Herrmann, I. Deppner, Y. Zhang, P. Loizeau, *University Heidelberg, Germany*; D. G. Diaz, *Gesellschaft fur schwerionenforschung, Germany*

N13-141 A New Detector for Fragment Charges Particles from Proton to the Uranium
P. Legou, M. P. Combet, F. Nizery, *CEA Saclay, FRANCE*; R. De Oliveira, *CERN, Switzerland*

N13-142 The Study of Saturation Effect of GEM Detector for X-ray Imaging
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N13-143 Mcromegas with Resistive Anode
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N13-144 A Novel Detector for 2D Ion Detection in Low-Pressure Gas and Its Applications
V. A. Bashkirov, R. F. Hurley, R. W. Schulte, J. M. Slater
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N13-145 Performance of the BESIII Drift Chamber
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N13-146 W-values for Heavy Ions in Gases
S. Sasaki, T. Sanami, K. Saito, K. Iijima, H. Tawara, T. Murakami
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N13-147 An Investigation of the Dependence of CMS Resistive Plate Chamber Operation on Environmental Parameters
L. Benussi, *INFN, Italy*
On behalf of the CMS RPC Collaboration

N13-148 A Cylindrical High-Pressure Xenon Chamber with Shielding Mesh Manufactured by Using an Etching Method
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N13-149 Present Status of Position-Sensitive Tissue Equivalent Proportional Chamber (PS-TEPC) for Space Dosimetry
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N13-150 A Study of ^{3}He Detectors for Active Interrogation
E. H. Seabury, D. L. Chichester
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N13-151 A New Technique for Gaseous Gamma Ray Detectors: the Multigrid High Pressure Xenon Gas Proportional Scintillation Counter
F. I. G. M. Borges, S. J. C. do Carmo, J. C. R. Mariquito, A. M. F. Trindade, C. A. N. Conde
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N13-152 Measurement of the Drift Velocities of Positive Ions in Ar-CH4 Mixtures
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N13-153 Systematic Study of the Calibration of the Drift Tubes for Muon Tracking in the ATLAS Experiment at LHC and Possible Use of Fast Gas Mixtures for SLHC
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N13-154 Implementation of Automatically Sorting Events with the Hough Transformation for the DCBA Experiment
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N13-155 Another Method to Produce Laser Calibration Beams in Gaseous Detectors
A. N. Lebedev, *Brookhaven National Laboratory, USA*

N13-156 A New Transparent MSGC for Both Charge and Optical Position Readout
T. Fujiwara, H. Takahashi, B. Shi, N. Iyomoto, *The University of Tokyo, JAPAN*; K. Fujita, *Japan Atomic Energy Agency, JAPAN*

N13-157 A Study of the Scintillation Yield and Fluctuations in Xe Doped with CF_4 or CH_4: the Role of Electron Cooling and Attachment
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N13-158 Mapping Study of Hole Diameters and Gain of Japanese GEMs
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N13-159 A New Technique for Charge Dependent Corrections to the Time Response of the Drift Tubes of the ATLAS Experiment
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N13-160 2D-Sensitive HpXe Gas Proportional Scintillation Counter
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N13-161 CsI Photoelectron Extraction Efficiency in HpXe Medium
C. D. Azevedo[1], A. L. Gouvea[1], C. A. Santos[1], J. M. dos Santos[2], J. F. Veloso[1]
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N13-162 Improving the PHENIX Muon Trigger Using Resistive Plate Chambers
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High Energy Physics Instrumentation

N13-163 Dose and Dose Rate Dependency of Emission in Quartz Fibers with High-OH Group Content
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N13-164 Crosstalk on Silicon Particle Sensors with Unbiased and Segmented Guard-Rings
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On behalf of the CALICE collaboration

N13-165 Operational Experience with the CDF Run II Silicon Detector
S. R. Jindariani, *FNAL, 60510*
On behalf of the CDF II Silicon group

N13-166 Studies on Charge Collection of P-Type Silicon Detectors under Neutron Irradiation Expected for Super LHC
M. Minano, C. Garcia, C. Lacasta, R. Marco-Hernandez, S. Marti i Garcia, U. Soldevila
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N13-167 A New Data Concentrator Card for the Hadron Calorimeter in CMS
E. S. Hazen, J. Rohlf, A. Heister, J. StJohn, S. Wu, P. Lawson
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N13-168 A Layer Correlation Technique for ATLAS Calorimetry Calibration at the 2004 ATLAS Combined Beam Test
K.-J. Grahn, *Royal Institute of Technology (KTH), Sweden*
On behalf of the The ATLAS Liquid Argon Calorimeter Group

N13-169 Upgrade of the Cold Electronics of the ATLAS HEC Calorimeter for sLHC: Generic Studies on Radiation Hardness and Temperature Dependence.
H. G. Oberlack, *Max-Planck-Institut fuer Physik, Germany*
On behalf of the ATLAS Liquid Argon Calorimeter HECPAS Collaboration

N13-170 Conceptual Design, Development and Preliminary Tests of a Compact Neutron Spectrometer for the JET Experiment
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N13-171 Operation of the ATLAS End-Cap Calorimeters at sLHC Luminosities: an Experimental Study.
A. Savine, *University of Arizona, USA*
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N13-172 The L1 Track Trigger and High Data Rate Acquisition System for the SLIM5 Beam Test
M. Villa, *Universita' di Bologna, Italy*
On behalf of the Slim5 Collaboration

N13-173 The Expected Performance of the ATLAS Inner Detector
R. B. Nickerson, *Oxford University, UK*
On behalf of the ATLAS Collaboration

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N13-174 Performance of Low-Mass and High Thermal Conductivity Hybrid for High Track Density Environment
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N13-175 The Upgrade of the CMS Tracker for the Super-LHC
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On behalf of the CMS Collaboration

N13-176 A Muon Detector Based on Extruded Scintillators, WLS Fibers and GM-APD Readout for a Super B Factory
G. Cibinetto, R. Calabrese, *University of Ferrara and INFN, Italy*; W. Baldini, *INFN Ferrara, Italy*

N13-177 The CMS All Silicon Tracker Simulation
V. Cuplov, *Rice University, USA*
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N13-178 CMS RPC Trigger and Detector Performance During the Cosmic Run at Four Tesla (CRAFT)
R. Trentadue, *Università degli Studi di Bari, Italy*
On behalf of the CMS Collaboration / RPC group

N13-179 Digital Architecture of the New ATLAS Pixel Chip FE-I4
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N13-180 Performance of the MWPC of the First Station of the LHCb Muon System
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N13-181 The Stress Analysis on the Acrylic Vessels in Dayabay Experiment
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N13-182 First Results of the Engineering Prototype of the CALICE Tile Hadron Calorimeter
M. Reinecke, *DESY, Germany*
On behalf of the CALICE collaboration

N13-183 The Effects of Water Injection on MDT Gas Performance
N. Amram[1], D. S. Levin[2], Y. Benhammou[2], T. Dai[2], E. Diehl[2], E. Etzion[1], J. Gregory[2], J. Hindes[2], C. Ferretti[2], R. Thun[2], C. Weaverdyck[2], A. Wilson[2], B. Zhou[2]
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N13-184 Commissioning of CMS with Beam and Cosmic Ray: Strategy and Performance Results
P. Paolucci, *INFN of Napoli, ITALY*
On behalf of the CMS collaboration board

N13-185 The CMS Tracker Calibration, Methods and Experience with Cosmic Ray Data
G. Kaussen, *Institut fuer Experimentalphysik, Germany*
On behalf of the CMS Collaboration

N13-186 Front End Electronics for Compact Silicon-Tungsten Calorimeter FOCAL
A. Y. Sukhanov, *Brookhaven National Laboratory, USA*
On behalf of the PHENIX Forward Upgrade Group

N13-187 A Method for Designing Cable Equalizers
M. E. Johnson, M. J. Utes
Ferm National Accelerator Laboratory, USA

N13-188 The EUDET High Resolution Beam Telescope - the Final Digital Readout
E. P. Corrin, *University of Geneva, Switzerland*
On behalf of the EUDET Collaboration

N13-189 Performance of the ATLAS Hadronic Tile Calorimeter at the LHC Startup
C. Solans Sanchez, *IFIC (Universitat de Valencia - CSIC), Spain*
On behalf of the ATLAS Collaboration

N13-190 Tile AHCAL Test Beam Analysis: Positron and Hadron Studies
R. Fabbri, *DESY, Germany*
On behalf of the CALICE collaboration

N13-191 The Upgrade R&D of the CMS HCAL HE and HF for Super-LHC
Y. Onel, *University of Iowa, USA*
On behalf of the CMS Collaboration

N13-192 Clusterless Data Analysis for Position Sensitive Detector Characterization
T. Maenpaa, M. J. Kortelainen, T. Lampen
Helsinki Institute of Physics, Finland

N13-193 Comparison of Simulated and Measured Charge Transfer Inefficiencies in a CCD with High-Speed Column Parallel Readout
A. Sopczak, *Lancaster University, UK*
On behalf of the LCFI Collaboration

N13-194 Construction of a Large Scale Prototype for a SiW Electromagnetic Calorimeter for the ILC - EUDET Module
Calice Collaboration

N13-195 The Status of the Precursor Prototype for the PANDA-TPC and the PANDA GEM-Trackers
B. Voss, *GSI Helmholtzzentrum fuer Schwerionenforschung GmbH, Germany*
On behalf of the JointGEM Collaboration

N13-196 Development of a Fast Readout System for DEPFET Pixel Sensors
M. T. Koch[1], P. Fischer[2], S. Furletov[1], H. Krueger[1], C. Kreidl[2], I. Peric[2], N. Wermes[1]
[1]University of Bonn, Germany; [2]University of Heidelberg, Germany

N13-197 Tests of a Digital Hadron Calorimeter
B. Bilki[1], J. Butler[2], G. Drake[3], E. Hazen[2], J. Hoff[4], G. Mavromanolakis[4,5], E. May[3], E. Norbeck[1], J. Repond[3], D. Underwood[3], L. Xia[3], Q. Zhang[3,6]
[1]University of Iowa, USA; [2]Boston University, USA; [3]Argonne National Laboratory, USA; [4]Fermi National Accelerator Laboratory, USA; [5]University of Cambridge, UK; [6]Institute of High Energy Physics, PRC

N13-198 **Data Readout Concept and Test Results for the BCM1F Adn BSC Sub-Detectors of CMS**
E. Castro, *DESY, Germany*; A. J. Bell, *CERN, Switzerland*

N13-199 **Studies of Scintillation Plates with Waveshifter Fiber and SiPM Read Out**
J. Marchant, B. Baumbaugh, M. Kirzeder, S. Mathews, E. Fidler, R. Ruchti, E. Shearer, M. Vigneault, T. Williamson
University of Notre Dame, USA

N13-200 **The Sea Bed Power and Data Transmission Network for the KM3NeT Neutrino Telescope**
R. Papaleo, *Istituto Nazionale di Fisica Nucleare - INFN, Italy*
On behalf of the KM3NeT Consortium

N13-201 **Progress in Development of the TOF Detector with a New ASIC-Based Waveform Digitizing Electronics**
J. Va'vra, D. Leith, B. Ratcliff, *SLAC, USA*; K. Nishimura, L. Ruckman, G. Varner, *University of Hawaii, USA*

N13-202 **Thermal-Mechanical Mimic of the ATLAS Read-Out Chip**
J. Hasi, S. Watts, R. Thompson, S. Kolya, C. Da Via, *University of Manchester, UK*; C. J. Kenney, *SLAC National Accelerator Laboratory, USA*; S. I. Parker, *University of Hawaii, USA*; E. Westbrook, *Molecular Biology Consortium, USA*

N13-203 **The ATLAS Planar Pixel Sensor R&D Project**
D. Muenstermann, *TU Dortmund, Germany*
On behalf of the ATLAS Planar Pixel R&D collaboration

N13-204 **Performance of the CMS Silicon Strip Tracker Local Reconstruction**
N. A. Cripps, *Imperial College London, United Kingdom*
On behalf of the CMS Collaboration

N13-205 **The Design, Construction and Testing of a 2.1m Long Straw Detector Prototype Operated in Vacuum for the NA62 Experiment**
H. Danielsson, *CERN, Switzerland*
On behalf of the NA62 Collaboration

Instrumentation for Homeland Security

N13-206 **Designing an in-Field Diffraction System for Illicit Drug Detection Using X-Ray Diffraction**
M. Koutalonis[1], E. Cook[2], J. Griffiths[2], J. Horrocks[1], C. Gent[3], S. Pani[1,4], L. George[3], S. Hardwick[3], R. Speller[2]
[1]Bart's and the London NHS trust, London, UK, United Kingdom; [2]University College London, United Kingdom; [3]Home Office Scientific Development Branch, United Kingdom; [4]University of Surrey, United Kingdom

N13-207 **Isotope Identification in the GammaTracker Handheld Radioisotope Identifier**
C. E. Seifert, M. T. Batdorf, W. K. Hensley, D. S. Barnett, B. J. Burghard, L. J. Kirihara, S. J. Morris, M. J. Myjak
Pacific Northwest National Laboratory, USA

N13-208 **Low Count Spectral Anomaly Detection Algorithm for Search Applications**
B. D. Milbrath, D. M. Pfund, K. D. Jarman
Pacific Northwest National Laboratory, USA

N13-209 **Materials Identification by X-Ray and Photoneutron Transmission**
Y. Yang, B. Wu, Y. Li, T. Li
Tsinghua University, P.R.China

N13-210 **Explosives Detection Using Dual Energy X-Ray Imaging and Photoneutron Analysis**
Y. Yang, T. Li, *Tsinghua University, P.R.China*

N13-211 **Feasibility Study: Low-Cost Dual Energy CT for Security Inspection**
Y. Liu, J. Cheng, Z. Chen, Y. Xing
Key Laboratory of Particle & Radiation Imaging (Tsinghua University), Ministry of Education, China

N13-212 **Selection of Fast Neutron Full Energy Deposition Using Segmentation**
P. A. Marleau[1], N. Bowden[2], S. Mrowka[1], J. Steele[1]
[1]Sandia National Laboratories, USA; [2]Lawrence Livermore National Laboratories, USA

N13-213 **Large Area Scintillation Array (LASA)**
E. A. Wulf[1], B. F. Phlips[1], A. Hutcheson[2], W. N. Johnson[1], E. I. Novikova[1]
[1]Naval Research Laboratory, USA; [2]National Research Council/Naval Research Laboratory, DC

N13-214 **An Electrostatic Field Desorption Ion Source for Active Neutron Interrogation**
K. L. Hertz, *Sandia National Laboratories/CA, USA*; D. L. Chichester, *Idaho National Laboratory, USA*; C. E. Holland, *SRI International, USA*; P. J. Resnick, *Sandia National Laboratories/NM, USA*; P. R. Schwoebel, B. B. Johnson, B. Reichenbach, I. Solano, *University of New Mexico, USA*

N13-215 **Development of the Neutron Interrogation System for Underwater Threat Detection and Identification**
I. Novikov, A. Barzilov, *Western Kentucky University, USA*

N13-216 **Real-Time Visualize the 3D Reconstruction Procedure Using CUDA**
W. Bi, Z. Chen, L. Zhang, Y. Xing, *Tsinghua University, China*; Y. Wang, *Nuctech Co., Ltd., China*

N13-217 **Performance Predictions for the High Efficiency Multimode Imager**
C. B. Wunderer[1], M. Galloway[2], A. Zoglauer[1], M. Amman[3], P. N. Luke[3], J. S. Lee[3], L. Mihailescu[3], K. Vetter[2]
[1]Space Sciences Laboratory, UC Berkeley, USA; [2]University of California, Berkeley, USA; [3]Lawrence Berkeley National Laboratory, USA

N13-218 **The Comparison and Combination of Delayed and Prompt Neutron Signatures for the Detection of Fissionable Materials**
A. W. Hunt[1], H. A. Seipel[1], S. J. Thompson[1], E. S. Cardenas[1], E. T. E. Reedy[1], B. H. Failor[2], M. T. Kinlaw[3]
[1]Idaho State University, USA; [2]L-3 Communications, USA; [3]Idaho National Laboratory, USA

N13-219 **Performance Evaluation of Mobile Radiation Detection System Against Nuclear Terrorism**
S. W. Kwak, H.-S. Yoo, S. S. Jang, J.-S. Kim, W.-K. Yoon
Korea Institue of Nuclear Non-proliferation and Control, South Korea

N13-220 Comparison of Neutron Detection Efficiency Using a He-3 Counter and a Boron-10 Loaded Liquid Scintillator EJ309B5
L. Swiderski, M. Moszynski, D. Wolski, T. Szczesniak, T. Batsch, J. Iwanowska, J. Szabelski, *Soltan Institute for Nuclear Studies, Poland*; G. Pausch, J. Stein, C. Plettner, *ICx Radiation, GmbH, Germany*; P. Schotanus, *SCIONIX Holland B.V., The Netherlands*; C. Hurlbut, *Eljen Technology, USA*

N13-221 Preliminary Simulation Studies of a Multilayer Cd(Zn)Te Detector (COCAE) Used for Security Purposes
K. Karafasoulis[1], C. Lambropoulos[2], D. Loukas[3], C. Potiriadis[1], K. Zachariadou[3]
[1]Greek Atomic Energy Commision, Greece; [2]Technological Educational Institute of Chalkida (TEI of Chalkida), Greece; [3]National Center for Scientific Research Demokritos, Greece

N13-222 Detection of Concealed Special Nuclear Materials Using Nuclear Resonance Fluorescence Technique
H. Yang, D. K. Wehe, *University of Michigan, USA*

N13-223 Metal Artifact Reduction in Dual Energy CT by Sinogram Segmentation Based on Active Contours Model and Sinogram TV Inpainting
H. Xue
Department of Engineering Physics, Tsinghua University, China

N13-224 Concept Study of a Two-Plane Compton Camera Designed for Location and Nuclide Identification of Remote Radiation Sources
C.-M. Herbach[1], A. Gueorguiev[2], Y. Kong[1], R. Lentering[1], G. Pausch[1], C. Plettner[1], J. Stein[1]
[1]ICx Techologies GmbH, Germany; [2]ICx Radiation Inc., USA

N13-225 Identifying Fissionable Materials Through the Detection of Delayed γ-Rays Using High-Efficiency $Bi_4Ge_3O_{12}$ Detectors
E. S. Cardenas[1,2], E. T. E. Reedy[1,2], H. A. Seipel[1,2], B. H. Failor[3], A. W. Hunt[2,1]
[1]Idaho State University, USA; [2]Idaho Accelerator Center, USA; [3]L-3 Communications, USA

N13-226 An Integrated Approach for Multipurpose Fast Deployment Environmental Radiation Monitoring System
E. Vax[1], B. Sarusi[1], M. Sheinfeld[1], S. Levinson[1], I. Brandys[1], E. Marcus[1], A. Osovizky[2], Y. Kadmon[1], Y. Cohen[1]
[1]Nuclear Research Center Negev, Israel; [2]Rotem Industries Ltd., Israel

N13-227 Analysis and Classification of Liquids Using Ultra-Low Field MR Relaxation Imaging
P. L. Volegov, C. Carr, C. J. Hanson, R. H. Kraus, A. N. Matlashov, J. C. Mosher, T. Owens, H. Sandin, L. J. Schultz, A. V. Urbaitis, V. S. Zotev, M. A. Espy
Los Alamos National Laboratory, USA

N13-228 First Experimental Results Using X-Ray Phase Contrast Imaging with Coded Apertures for Homeland Security
K. Ignatyev, P. Munro, R. Speller, A. Olivo
University College London, UK

N13-229 Simulation and Modeling of the Tri-Modal Imager (TMI) for the Stand-off Radiation Detection System (SORDS) Using GEANT4
A. S. Hoover, M. C. Galassi, R. M. Kippen, M. Mocko, D. M. Palmer, L. J. Schultz, S. R. Tornga, M. S. Wallace, *Los Alamos National Laboratory, USA*; M. V. Hynes, M. J. Toolin, B. Harris, J. E. McElroy, *Raytheon Integraed Defense Systems, USA*; D. Wakeford, *Bubble Technology Industries, Canada*; R. C. Lanza, B. K. P. Horn, *Massachussetts Institute of Technology, USA*; D. K. Wehe, *University of Michigan, USA*

N13-230 Improving the Detecting Performances of Radiation Portal Monitors Using Matched Filter Algorithm and Generalized Likelihood Ratio Test
M. Ghelman[1], E. Vax[1], A. Osovizky[2], E. Marcus[1], D. Ginzburg[2], E. Gonen[1], R. Seif[1], U. Wengrowicz[1], Y. Kadmon[1], Y. Cohen[1]
[1]NRCN, israel; [2]Rotem Industries Ltd, Israel

N13-231 Calibration and Simulation of a Coded Aperture Neutron Imaging System
J. Brennan, E. Brubaker, P. Marleau, J. Steele
Sandia National Laboratories, CA, USA

N13-232 Comparison of Passive Measurements on Well-Described Mixed-Oxide Fuel Pins for Nuclear Safeguards Applications
J. L. Dolan, M. Flaska, S. A. Pozzi, *University of Michigan, U.S.*; D. L. Chichester, *Idaho National Laboratory, U.S.*

N13-233 Directional Stand-off Detection of Fast Neutrons and Gammas Using Angular Scattering Distributions
P. E. Vanier, I. Dioszegi, C. Salwen, *Brookhaven National Laboratory, USA*; L. Forman, *Ion Focus Technology, USA*

N13-234 Detecting Special Nuclear Materials Inside Cargo Containers Using Photofission
M. Agelou[1], F. Carrel[1], D. Dore[2], E. Dupont[2], M. Gmar[1], F. Laine[1], B. Poumarede[1]
[1]CEA LIST, France; [2]CEA IRFU, France

N13-235 Measurements of Continuous-in-Energy Neutron Sources Using the BC-523A Capture-Gated Liquid Scintilator
M. Flaska, S. A. Pozzi, *University of Michigan, USA*

N13-236 A Field Portable Fast Neutron Imager for SNM Detection
N. Mascarenhas, J. Brennan, C. Greenberg, P. Marleau, S. Mrowka
Sandia National Laboratories, California, USA

N13-237 Improved Solid-State Neutron Detection Devices
S. Mukhopadhyay[1], C. J. Stapels[1], E. B. Johnson[1], E. Chapman[1], P. Linsay[1], T. Prettyman[2], J. F. Christian[1]
[1]Radiation Monitoring Devices, Inc., USA; [2]Planetary Science Institut, USA

N13-238 Cryogenic Microcalorimeter Detectors for Ultra-High-Resolution Alpha-Particle Spectrometry
M. K. Bacrania, *Los Alamos National Laboratory, USA*
On behalf of the LANL/NIST/Star Cryoelectronics Microcalorimeter Collaboration

N13-239 Charged Particle Energy Loss Radiography for Homeland Security Applications
K. N. Borozdin, C. Morris, A. M. Fraser, J. A. Green, F. G. Mariam, L. J. Schultz, L. Cuellar, N. W. Hengartner, A. Saunders, P. L. Walstrom
Los Alamos National Laboratory, U.S.A.

N13-240 Fast Detection of 3D Planes by a Single Slice Detector Helical CT
W. Bi, Z. Chen, L. Zhang, Y. Xing
Tsinghua University, China

N13-241 Characterization of an anti-Compton spectrometer based on a CsI(Tl) scintillator and silicon photomultipliers
M. Petasecca[1], M. L. F. Lerch[1], C. J. Jackson[2], A. F. Gektin[3], A. B. Rosenfeld[1]
[1]University of Wollongong, Australia; [2]SensL, Ireland; [3]AMCRYS-H, Ukraine

N13-242 Addressing Different Active Neutron Interrogation Signatures from Fissionable Material
D. L. Chichester, E. H. Seabury
Idaho National Laboratory, USA

N13-243 Measurement of Fast Neutron/Gamma-Ray Cross-Correlation Functions with Cf-252 and Pu-Be Neutron Sources
M. Flaska[1], A. Enqvist[2], S. A. Pozzi[1]
[1]University of Michigan, USA; [2]Chalmers University of Technology, Sweden

N13-244 Monte Carlo Investigation of a High-Sensitivity Two-Plane Compton Camera for Long-Range Detection of SNM
B. A. Maestas, A. Poitrasson-Rivire, P. R. Stanfield, S. D. Clarke, M. Flaska, S. A. Pozzi, *University of Michigan, USA*; A. Guergueiev, G. Pausch, C.-M. Herbach, J. Stein, *ICx Radiation Inc., USA*

N13-245 Soft Cosmic Ray Tomography for Detection of Explosives
N. W. Hengartner, L. Cuellar, K. Borozdin, A. Green, L. Schultz
Los Alamos National Laboratory, USA

N13-246 Design and Construction of a First Prototype Muon Tomography System with GEM Detectors for the Detection of Nuclear Contraband
M. Hohlmann, K. Gnanvo, L. Grasso, J. B. Locke, A. Quintero-Segovia, D. Mitra
Florida Institute of Technology, USA

N13-247 Contextually Aware Nuclear Evaluation System
M. Pivovaroff, S. Labov, K. Nelson, Y. Yao, *Lawrence Livermore National Laboratory, USA*; D. Cohen, I. Shokair, *Sandia National Laboratory, USA*; A. Dubrawski, J. Ostlund, S. Ray, *Carnegie Mellon University, USA*

N13-248 Detailed Photofission Physics Library for Monte-Carlo Radiation Transport Codes
J. M. Verbeke, D. M. Wright
Lawrence Livermore National Laboratory, USA

N13-249 Modeling and Measurements for Mitigating Interference from Skyshine
W. J. Kernan, E. K. Mace, E. R. Siciliano, K. E. Conlin, E. L. Flumerfelt, R. T. Kouzes, M. L. Woodring
Pacific Northwest National Laboratory, U.S.A.

J03 Joint NSS/MIC 3

Tuesday, Oct. 27 13:30-15:30 International Ballroom North

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N14 Instrumentation for Homeland Security II

Tuesday, Oct. 27 13:30-15:30 Grand Ballroom 2

Session Chair: **Klaus P. Ziock**, Oak Ridge National Laboratory, USA

N14-1 First Light for the GammaTracker Handheld Radioisotope Identifier
C. E. Seifert, M. J. Myjak, D. S. Barnett, M. T. Batdorf, B. J. Burghard, W. K. Hensley, L. J. Kirihara, S. J. Morris
Pacific Northwest National Laboratory, USA

N14-2 Detector Module Development for the High Efficiency Multimode Imager
M. Amman[1], P. N. Luke[1], J. S. Lee[1], L. Mihailescu[1], C. B. Wunderer[2], A. Zoglauer[2], K. Vetter[1,3], M. Galloway[3], H. Chen[4], P. Marthandam[4], S. Awadalla[4], S. Taherion[4], G. Bindley[4]
[1]Lawrence Berkeley National Laboratory, USA; [2]University of California, Space Sciences Laboratory, USA; [3]University of California, USA; [4]Redlen Technologies, Canada

N14-3 ULIS: An Unattended Luggage Inspection System
C. J. Groiselle, J.-L. Dumont, J.-S. Lacroix, M.-J. Lopez-Jimenez, F. Moutrousteguy, F. Thebault, I. Lefesvre, E. Poirrier, P. Paul, M. Mangeard, C. Dardennes, B. Vernet, K. Soudani, P. Le Tourneur
EADS - SODERN, France

N14-4 Variant Designs and Characteristics of Improved Microstructured Solid-State Neutron Detectors
S. L. Bellinger, W. J. McNeil, D. S. McGregor
Kansas State University, USA

N14-5 Event Reconstruction for Pixelated CdZnTe Detectors
R. McLean, F. Harrison, W. R. Cook, H. Miyasaka, S. Kaye
California Institute of Technology, USA

N14-6 Semi-Empirical Approach for Performance Evaluation of Radionuclide Identifiers
M. Mayorov, R. Arlt, *International Atomic Energy Agency, Austria*; J. Blackadar, D. Blumenthal, *US Department of Homeland Security, USA*; K. Frame, *Los Alamos National Laboratory, USA*; E. Mark, *US Department of Energy, USA*; M. Milovidov, *Nuclear Physics Researches Center, Russia*; R. York, *Oak Ridge National Laboratory, USA*

N14-7 Tracking of Weak Radioactive Sources in Crowded Venues
R. B. Vilim, *argonne national laboratory, usa*

N15 Nuclear Physics Instrumentation I

Tuesday, Oct. 27 13:30-15:30 Grand Ballroom 3

Session Chair: **Sergey A. Butsyk**, University of New Mexico, USA

N15-1 Initial Performance of the PHENIX Hadron Blind Detector at RHIC
C. Woody[1], B. Azmoun[1], C.-Y. Chi[2], Z. Citron[3], M. Durham[3], T. Hemmick[3], A. Iordanova[4], J. Kamin[3], A. Milov[5], M. Naglis[5], R. Pisani[1], M. Proissl[3], I. Ravinovich[5], S. Rolnick[4], T. Sakaguchi[1], D. Sharma[5], S. Stoll[1], I. Tserruya[5]
[1]Brookhaven National Lab, USA; [2]Columbia University, USA; [3]Stony Brook University, USA; [4]University of California Riverside, USA; [5]Weizmann Institut of Science, Israel

N15-2 A GEM-Based TPC Prototype for PANDA
M. Vandenbroucke, *Technische Universistt Mnchen, Germany*
On behalf of the GEM-TPC collaboration

N15-3 The Straw Tube Tracker of the PANDA Experiment
L. Benussi[1], A. Braghieri[2], G. Boca[2,3], S. Costanza[2,3], P. Genova[2,3], P. Gianotti[1], L. Lavezzi[2,3], V. Lucherini[1], P. Montagna[2,3],

D. Orecchini[1], D. Pierluigi[1], J. Ritman[4], M. Roeder[4], A. Rotondi[2,3], A. Russo[1], P. Wintz[4]
[1]INFN Laboratori Nazionali di Frascati, Italy; [2]INFN Sezione di Pavia, Italy; [3]University of Pavia, Italy; [4]IKP Forschungszentrum Jülich, Germany

N15-4 **Design and Optimization of the CBM Time of Flight Wall**
D. Gonzalez-Diaz, *GSI, Germany*
On behalf of the CBM collaboration

N15-5 **Performance of the Fine Grained Detector Built for T2K Neutrino Experiment**
J. Zalipska, *University of British Columbia, Canada*
On behalf of the T2K/FGD Collaboration

N15-6 **The Photon Veto System for the NA62 Rare Kaon Decay Experiment**
P. Valente, *INFN Roma, Italy*
On behalf of the NA62 Collaboration

N15-7 **Design and Performance of the Compact W-Si Forward Calorimeters for the PHENIX Experiment at RHIC**
E. P. Kistenev, *Brookhaven National Laboratory, USA*
On behalf of the PHENIX Forward Upgrade Collaboration

N16 Gaseous Detectors II: Varied Applications in Astrophysics and Particle Physics

Tuesday, Oct. 27 13:30-15:30 Grand Ballroom 6

Session Chairs: **Gilles W. P. De Lentdecker**, Universite Libre de Bruxelles, Belgium
Archana Sharma, CERN, Switzerland

N16-1 **Systematic Study of the Calibration and Resolution of Drift Tubes for Muon Tracking in the ATLAS Experiment at the LHC**
S. Di Luise, *Roma University INFN, Italy*
On behalf of the ATLAS Muon Collaboration

N16-2 **DMTPC: a TPC with Optical Readout for Directional Detection of Dark Matter**
G. Sciolla, *MIT, USA*
On behalf of the DMTPC collaboration

N16-3 **The Luminosity Monitor of the ATLAS Experiment**
M. Villa, *Universita' di Bologna, Italy*
On behalf of the ATLAS Luminosity and Forward Physics working group

N16-4 **NEXT: Neutrinoless Double Beta Decay Experiment with a Gaseous Xenon TPC**
M. Ball, *Instituto di Fisica Corpuscolar (IFIC), Spain*
On behalf of the NEXT

N16-5 **Streamlined Calibration of the ATLAS Muon Spectrometer Precision Chambers**
D. S. Levin, *University of Michigan, USA*
On behalf of the ATLAS Muon Collaboration

N16-6 **Glass RPC Detector R&D for a Mega Neutrino Detector**
S. Bheesette, *Tata Institute of Fundamental Research, INDIA*
On behalf of the INO Collaboration

N16-7 **Neutron Calibration of the 3He Proportional Counters of the Sudbury Neutrino Observatory**
K. Boudjemline, *Carleton University, Canada*
On behalf of the SNO Collaboration

N17 Computing and Software for Experiments II: New Computing Technologies

Tuesday, Oct. 27 13:30-15:30 Grand Ballroom 7

Session Chairs: **Paolo Calafiura**, Lawrence Berkeley National Laboratory, USA
Georg Weidenspointner, MPI Halbleiterlabor, Germany

N17-1 **Simulations of Distributed Systems in a Computing Centre**
E. Ronchieri, D. Dongiovanni, L. Dell'Agnello, T. Ferrari
INFN CNAF, Italy

N17-2 **Hadoop Distributed File System for the Grid**
H. Pi, *University of California, San Diego, USA*
On behalf of the Open Science Grid

N17-3 **Using the "Java Platform, Enterprise Edition" for Data Handling, Transfer and Storage.**
S. Patton, *Lawrence Berkeley National Laboratory, USA*
On behalf of the Daya Bay Reactor Neutrino Collaboration

N17-4 **Virtualization for Physics Analysis in ATLAS**
Y. Yao, *Lawrence Berkeley National Laboratory, USA*
On behalf of the ATLAS Collaboration

N17-5 **Ganga - a Single, User Friendly Grid Job Toolkit Across Multiple Disciplines**
B. H. Samset, *University of Oslo, Norway*
On behalf of the ganga team

N17-6 **Software Quality Engineering by Parts**
T. M. Evans, *Oak Ridge National Laboratory, USA*

N17-7 **Optimizations in Python-based Analysis**
W. T. L. P. Lavrijsen, *LBNL, USA*

J04 Joint NSS/MIC 4

Tuesday, Oct. 27 16:00-18:00 International Ballroom North

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N18 Gamma-ray Imaging I: Compton Imaging

Tuesday, Oct. 27 16:00-18:00 Grand Ballroom 2

Session Chairs: **Klaus P. Ziock**, Oak Ridge National Laboratory, USA
Morgan T. Burks, Lawrence Livermore National Laboratory, USA

N18-1 **Image Reconstruction for Compton Telescopes Based on a Partially-Binned List-Mode Approach**
A. Zoglauer, S. E. Boggs, *University of California at Berkeley, USA*; R. M. Kippen, *Los Alamos National Laboratory, USA*

N18-2 Computer-Aided Design Integrated Gamma-Ray Imaging
L. Mihailescu[1], J. Rohel[1], K. Vetter[1,2], J. Maltz[1], D. Chivers[2], M. Amman[1], G. Gullberg[1]
[1]Lawrence Berkeley National Laboratory, USA; [2]UC Berkeley, USA

N18-3 Application of the Energy-Imaging Integrated Deconvolution Algorithm for Source Characterization
W. Wang, C. G. Wahl, J. M. Jaworski, Z. He
University of Michigan, USA

N18-4 Point-Source Detection Using Energy and Imaging Information from 3D-Position-Sensitive Semiconductor Detectors
C. G. Wahl, Z. He, *University of Michigan, United States*

N18-5 Joint Spatio-spectral Compton Camera Reconstruction Algorithm for Arbitrary Detector Geometries
J. S. Maltz[1], L. Mihailescu[1], G. T. Gullberg[1], D. H. Chivers[1,2], J. Rohel[1,2], K. Vetter[1,2]
[1]Lawrence Berkeley National Lab, USA; [2]University of California at Berkeley, USA

N18-6 The Power of Gamma-Ray Imaging to Detect Special Nuclear Material
D. Wright, L. Hiller, K. Nelson, K. Kazkaz
Lawrence Livermore National Laboratory, USA

N18-7 Compton Gamma-Ray Camera Using an Electron-Tracking Gaseous TPC and a Scintillation Camera
H. Kubo[1], K. Hattori[1], N. Higashi[1], C. Ida[1], S. Iwaki[1], S. Kabuki[1], S. Kurosawa[1], K. Miuchi[1], K. Nakamura[1], H. Nishimura[1], J. D. Parker[1], T. Sawano[1], A. Takada[2], M. Takahashi[1], T. Tanimori[1], K. Taniue[1], K. Ueno[1]
[1]Kyoto University, Japan; [2]ISAS/JAXA, Japan

N19 Analog and Digital Circuits II

Tuesday, Oct. 27 16:00-18:00 Grand Ballroom 3

Session Chairs: **Chuck L. Britton**, Oak Ridge National Lab, USA
Chiara Guazzoni, Politecnico di Milano and INFN, Italy

N19-1 PARISROC, a Photomultiplier Array Readout Chip
S. Conforti, C. de La Taille, G. Martin-Chassard, F. Dulucq, *Laboratoire de l Accelerateur lineaire, France*; W. Wei, *IHEP, China*

N19-2 BASIC: an 8-Channel Front-End ASIC for Silicon Photomultiplier Detectors
C. Marzocca, *DEE- Politecnico di Bari, ITALY*
On behalf of the INFN-DASiPM2 collaboration

N19-3 ASIC for SDD-Based X-Ray Spectrometers
G. De Geronimo, G. Carini, W. Chen, J. Fried, J. Keister, Z. Li, D. A. Pinelli, P. Rehak, D. P. Siddons, E. Vernon, *Brookhaven National Laboratory, USA*; J. A. Gaskin, B. D. Ramsey, *Marshall Space Flight Center, USA*

N19-4 64-Channel ASTEROID ASIC: Experimental Performance and Measurements with Macro Pixel Arrays for X-Ray Astronomy
G. De Vita[1,2], S. Herrman[1,2], T. Lauf[1,2], M. Porro[1,2], J. Treis[1,2], A. Wassatsch[2,3], L. Bombelli[4,5], C. Fiorini[4,5]
[1]Max Planck Institut fuer extraterrestrische Physik, Germany; [2]MPI HLL, Germany; [3]Max Planck Institut fuer Physik, Germany; [4]Politecnico di Milano, Italy; [5]INFN, Italy

N19-5 A Frontend LSI for Large-Area Gamma-Ray Imaging Detectors with Gas Electron Multipliers
T. Fusayasu[1], S. Koshimuta[2], H. Hamagaki[3], Y. Tanaka[1], M. Inuzuka[4]
[1]Nagasaki Institute of Applied Science, Japan; [2]SciEnergy Co., Ltd., Japan; [3]University of Tokyo, Japan; [4]National Research Institute for Cultural Properties, Japan

N19-6 A Pixel Readout Chip Designed in 90nm CMOS Process for High Count Rate Imaging Systems
R. Szczygiel, P. Grybos, P. Maj
AGH University of Science and Technology, Poland

N19-7 Characterization of the Medipix3 Pixel Readout Chip
R. Ballabriga[1], M. Campbell[1], E. H. M. Heijne[1], J. Jakubek[2], X. Llopart[1], S. Pospisil[2], L. Tlustos[1], Z. Vykydal[2]
[1]CERN, Switzerland; [2]Institute of Experimental and Applied Physics, Czech Technical University, Czech Republic

N20 Neutron Imaging and Detectors for Neutron Imaging

Tuesday, Oct. 27 16:00-18:00 Grand Ballroom 6

Session Chair: **Philip R. Bingham**, Oak Ridge National Laboratory, USA

N20-1 Development of a Neutron Imaging Detector Based on the μ-PIC Micro-Pixel Gaseous Chamber
J. D. Parker, K. Hattori, C. Ida, S. Iwaki, S. Kabuki, H. Kubo, S. Kurosawa, K. Miuchi, H. Nishimura, M. Takahashi, T. Tanimori, K. Ueno
Kyoto University, Japan

N20-2 Position Sensitive Detection of Fast Neutrons with High Spatial Resolution Using the Timepix Pixel Detector
J. Jakubek, *Institute of Experimental and Applied Physics of the Czech Technical University, Czech Republic*; J. Uher, *CSIRO Minerals, Australia*

N20-3 One Meter Square High Rate Neutron Imaging Panel Based on Boron Straws
J. L. Lacy, L. Sun, C. S. Martin, A. Athanasiades, T. Lyons
Proportional Technologies, Inc, U. S. A.

N20-4 A Neutron Imaging Detector from Bundled Lithium Silicate Glass Fibers
V. V. Nagarkar[1], V. Gaysinskiy[1], Z. Bell[2], M. Bliss[3], S. Miller[1], K. J. Riley[1]
[1]Radiation Monitoring Devices, Inc., USA; [2]Oak Ridge National Laboratory, USA; [3]Pacific Northwest National Laboratory, USA

N20-5 Performance of the Neutron Imaging Camera
S. D. Hunter, G. A. de Nolfo, S. Son, J. T. Link, *Goddard Space Flight Center, USA*; N. A. Guardala, *Carderock, USA*

N20-6 A Liquid Scintillator Fast Neutron Double-Scatter Imager
A. L. Hutcheson, B. F. Phlips
U.S. Naval Research Laboratory, USA

N20-7 Thermal Neutron Imaging with a Rotationally Modulated Collimator
N. O. Boyce, B. R. Kowash, *Air Force Institute of Technology, USA*; D. Wehe, *The University of Michigan, USA*

N21 Trigger and Front-End Systems II

Wednesday, Oct. 28 08:00-10:00 Grand Ballroom 1

Session Chairs: **Richard Van Berg**, University of Pennsylvania, USA
Yasuo Arai, KEK, High Energy Accelerator Research Organization, Japan

N21-1 SiGe Front-End Prototype for the Upgraded ATLAS LAr Calorimeter
S. Rescia, *Brookhaven National Laboratory, USA*
On behalf of the The ATLAS Liquid Argon Calorimeter Group

N21-2 The TDC Based Integrated Trigger System of the NA62 Experiment at CERN
R. Fantechi, *INFN - Sezione di Pisa, Italy*
On behalf of the NA62 Collaboration

N21-3 The GigaFitter: a Next Generation Track Fitter to Enhance Online Tracking Performances at CDF
S. Amerio[1], A. Annovi[2], M. Basile[3], M. Bettini[4], M. Bucciantonio[3], P. Catastini[5], J. Cenni[3], F. Crescioli[3], M. Dell'Orso[3], P. Giannetti[6], E. Giuliani[3], D. Lucchesi[1], M. Nicoletto[4], M. Piendibene[3], N. Rafanelli[3], G. Volpi[3]
[1]University of Padova & INFN, Italy; [2]INFN Laboratori Nazionali di Frascati, Italy; [3]University of Pisa & INFN, Italy; [4]INFN Padova, Italy; [5]University of Siena & INFN, Italy; [6]INFN Pisa, Italy

N21-4 Fast Control and Timing Distribution based on FPGA-Embedded Serial Transceivers
A. Aloisio, R. Giordano, V. Izzo
Universitdi Napoli Federico II and INFN, Italy

N21-5 The Calorimeter ReadOut Card (CROC) a System of LHCb Experiment
O. Duarte, *CNRS / IN2P3 Laboratoire de l'accelerateur Lineaire, France*
On behalf of the LHCb collaboration

N21-6 All Data-Out Readout Electronics for the ATLAS LAr Calorimeter at Super-LHC
H. Ma, *Brookhaven National Laboratory, USA*
On behalf of the ATLAS Liquid Argon Calorimeter Group

N21-7 An on-Chip Fast Readout Sparsification for a 256-Pixel 3D Device
A. Gabrielli, *INFN, Italy*
On behalf of the VIPIX Collaboration

N22 Semiconductor Detectors II: Silicon Devices

Wednesday, Oct. 28 08:00-10:00 Grand Ballroom 2

Session Chairs: **Ingrid-Maria Gregor**, DESY, Germany
Pavel Rehak, Brookhaven National Laboratory, USA

N22-1 (invited) The First Measurements on an Avalanche Diode Array with Bulk Integrated Quench Resistors for Single Photon Detection
J. Ninkovic[1], L. Andricek[1], G. Liemann[1], G. Lutz[2], H. G. Moser[1], R. H. Richter[1]
[1]Max Plancl Institute for Physics, Germany; [2]PN Sensor GmbH, Germany

N22-2 New Techniques in SOI Pixel Detector
Y. Arai, T. Miyoshi, Y. Unno, T. Tsuboyama, S. Terada, Y. Ikegami, T. Kohriki, K. Tauchi, Y. Ikemoto, R. Ichimiya, Y. Fujita, *KEK, High Energy Accelerator Research Organization, JAPAN*; H. Ikeda, *JAXA, JAPAN*; K. Hara, H. Miyake, M. Kochiyama, T. Sega, *Univ. of Tsukuba, JAPAN*; K. Hanagaki, *Osaka Univ., JAPAN*

N22-3 Sensor/ROIC Integration Using Oxide Bonding
Z. Ye, *Fermi National Accelerator Laboratory, USA*
On behalf of the Fermilab Pixel R@D Group

N22-4 Backside Passivation of CMOS Sensor Study for Low Energy Charge Particle Tracking
R. Cluzel, R. Barbier
CNRS/IN2P3 Institut de Physique Nucleaire de Lyon - Universite Lyon 1, France

N22-5 Thin, Fully Depleted Monolithic Active Pixel Sensor with Binary Readout based on 3D Integration of Heterogeneous CMOS Layers
W. Dulinski[1], G. Bertolone[1], C. Colledani[1], Y. Degerli[2], A. Dorokhov[1], C. Hu[1], F. Morel[1], L. Ratti[3], V. Re[4], X. Wei[1], M. Winter[1]
[1]IPHC/IN2P3/CNRS, France; [2]CEA/IRFU/SEDI, France; [3]University of Pavia, Italy; [4]University of Bergamo, Italy

N22-6 First Test Results of MIMOSA-26, a Fast CMOS Sensor With Integrated Zero Suppression and Digitized Output
J. Baudot[1], G. Bertolone[1], A. Brogna[1], G. Claus[1], C. Colledani[1], Y. Degerli[2], R. De Masi[1], A. Dorokhov[1], G. Doziere[1], W. Dulinski[1], M. Gelin[2], M. Goffe[1], A. Himmi[1], C. Hu[1], K. Jaaskelainen[1], M. Koziel[1], F. Morel[1], F. Orsini[1], M. Specht[1], I. Valin[1], G. Voutsinas[1], M. Winter[1]
[1]IN2P3/CNRS - Universite de Strasbourg, France; [2]IRFU - CEA Saclay, France

N22-7 Fast Analog and Binary Monolithic Pixels in Deep-Submicron SOI Technology
M. Battaglia[1,2], D. Bisello[3,4], D. Contarato[2], P. Denes[2], P. Giubilato[2,3,4], R. M. Yee[2], S. Mattiazzo[3,4], D. Pantano[3,4], N. Pozzobon[3,4], C. Q. Vu[2]
[1]University of California at Berkeley, USA; [2]Lawrence Berkeley National Laboratory, USA; [3]University of Padova, Italy; [4]INFN Sezione di Padova, Italy

N23 Computing and Software for Experiments III: High Energy Physics Computing

Wednesday, Oct. 28 08:00-10:00 Grand Ballroom 3

Session Chairs: **Maria Grazia Pia**, INFN Genova, Italy, Italy
Wim T. L. P. Lavrijsen, LBNL, USA

N23-1 Study of a Distributed Computing Model for the SuperB Experiment
A. Fella, *INFN - CNAF, Italy*; E. Luppi, L. Tomassetti, *Universita' di Ferrara and INFN, Italy*

N23-2 Commissioning of the ATLAS Reconstruction Software with First Data
J. T. Boyd, *CERN, Switzerland*
On behalf of the ATLAS Collaboration

N23-3 Data Certification Workflow and Tools in CMS Data Quality Monitoring
V. Rapsevicius, *University of Florida, USA*; A. Meyer, I. Segoni, *CERN, Switzerland*

N23-4 Alignment of the ATLAS Inner Detector Tracking System
G. Cortiana, *Max-Planck-Institut fuer Physik, Germany*
On behalf of the ATLAS Collaboration

N23-5 First Alignment of the Complete CMS Silicon Tracker
M. Weber, *RWTH Aachen University, Germany*
On behalf of the CMS Collaboration

N23-6 The Challenge of Mass Storage System for the Experiments at LHC: the Solution Developed at INFN-CNAF
L. dell'Agnello, A. Cavalli, E. Ronchieri, B. Martelli, P. Ricci, V. Sapunenko, S. dalPra, A. Prosperini, D. Gregori
INFN, Italy

N23-7 Statistical Software in ROOT
L. Moneta, D. Gonzalez Maline, *CERN, Switzerland*

N24 New Detector Concepts and Instrumentation II

Wednesday, Oct. 28 08:00-10:00 Grand Ballroom 7

Session Chairs: **Scott Kiff**, Sandia National Laboratories, USA
Kai Vetter, UC Berkeley, USA

N24-1 Low-Noise Low-Mass Front-End Electronics for Low-Background Experiments Using Germanium Detectors
P. N. Luke, C. S. Tindall, K. Vetter, Y.-D. Chan
Lawrence Berkeley National Laboratory, USA

N24-2 Development of a 4π Germanium Spectrometer for Nuclear Data Measurements at J-PARC
T. Kin[1], K. Furutaka[1], S. Goko[1], H. Harada[1], M. Igashira[2], T. Kamiyama[3], T. Katabuchi[2], A. Kimura[1], K. Kino[3], F. Kitatani[1], Y. Kiyanagi[3], M. Koizumi[1], M. Mizumoto[2], S. Nakamura[1], M. Ohta[1], M. Oshima[1], Y. Toh[1]
[1]Japan Atomic Energy Agency, Japan; [2]Tokyo Institute of Technology, Japan; [3]Hokkaido University, Japan

N24-3 Segmented P-Type Point Contact Germanium Detector
M. Amman, P. N. Luke, Y. D. Chan, K. T. Lesko
Lawrence Berkeley National Laboratory, USA

N24-4 Exploiting a Latchup Circuit via Commercial CMOS Technologies
A. Gabrielli, *INFN & University of Bologna, Italy*; D. Demarchi, *Politecnico of Turin, Italy*; E. G. Villani, *Rutherford Appleton Laboratory, UK*

N24-5 Performance and Spectroscopic Behaviour of DePFET Macropixels
T. Lauf[1], F. Aschauer[1], S. Herrmann[1], M. Hilchenbach[2], M. Krumrey[3], P. Lechner[4], G. Lutz[4], P. Majewski[4], M. Porro[1], R. H. Richter[5], F. Scholze[3], L. Strueder[1], J. Treis[1], G. de Vita[1]
[1]Max-Planck-Institut fuer Extraterrestrische Physik, Germany; [2]Max-Planck-Institut fuer Sonnensystemforschung, Germany; [3]Physikalisch-Technische Bundesanstalt, Germany; [4]PNSensor GmbH, Germany; [5]Max-Planck-Institut fuer Physik, Germany

N24-6 Power Studies for the CMS Pixel Tracker
M. A. Turqueti, R. Rivera, A. Prosser, S. Kwan
Fermilab, USA

N24-7 Time Based Readout of Silicon Photomultiplier (SiPM) for Time of Flight PET Tomography
P. P. Jarron, E. E. Auffray, S. S. Brunner, H. H. Hillemanns, A. A. Kluge, P. P. Lecoq, M. M. Morel, T. T. Meyer, F. F. Powolony, *CERN, Switzerland*; M. C. S. C. Williams, *University of Bologna, Italy*; M. M. Despeisse, *EPFL, Switzerland*

J05 NSS/MIC Joint Posters

Wednesday, Oct. 28 10:30-12:00 Palm 3, 4 & 5

See page 35.

N25 Posters II

Wednesday, Oct. 28 10:30-12:00 Palm 3, 4 & 5

Session Chair: **Donald E. Hornback**, ORNL, USA

Instrumentation for Medical and Biological Research

N25-1 Respiratory Motion Correction Utilizing Geometric Sensitivity in 3D PET: A Simulation Study
J. He[1], G. O'Keefe[2], T. Ackerly[3], S. Gong[2], M. Geso[4]
[1]Kunming University of Science & Technology, China; [2]Austin Hospital, Australia; [3]Alfred Hospital, Australia; [4]RMIT University, Australia

N25-2 Polycapillary Parallel Collimators for X-Ray Imaging: Experimental Characterization of the Energy and Angular Response Function
A. Castoldi, C. Guazzoni, *Politecnico di Milano and INFN sez. Milano, Italy*; C. Ozkan, *Universita' degli Studi and INFN sez. Milano, Italy*

N25-3 Simulation of a Medical Linac with Evaluation of Dose Profiles Behind an Electron Applicator
I. Muenster, B. Kreisler, J. Durst, T. Michel, G. Anton
University of Erlangen, Germany

N25-4 Test of the ΔE/E Silicon Microdosimeter at the CATANA Facility
A. Fazzi, S. Agosteo, A. Pola, V. M. Introini, V. Varoli
Politecnico di Milano, Italy

N25-5 The Investigation of Ge-Doped Silica Optical Fibres for Radiation Therapy Micro Dosimetry System
A. T. Abdul Rahman[1], D. A. Bradley[1], A. Nisbet[2,1], R. Thomas[3,2]
[1]University of Surrey, United Kingdom; [2]The Royal Surrey County Hospital (RSCH) NHS Trust, United Kingdom; [3]National Physical Laboratory, United Kingdom

N25-6 A Novel Cell Irradiation System Using Backscattering Technique
I.-C. Cho, C.-H. Chen, H. Niu, C.-H. Hsu
National Tsing Hua University, Taiwan, Republic of China

N25-7 Silicon Neutron Detectors for Individual Dosimetry in Radiotherapy LINAC Rooms
C. Guardiola, C. Fleta, M. Lozano, G. Pellegrini, *Instituto de Microelectronica de Barcelona (IMB-CNM, CSIC), Spain*; F. Teixidor, C. Vinas, *Instituto de Ciencia de Materiales de Barcelona (ICMAB, CSIC), Spain*

N25-8 **A Dedicated Processor for Monte Carlo Computation in Radiotherapy**
V. Fanti, R. Marzeddu, C. Pili, P. Randaccio, S. Siddhanta, J. Spiga, A. Szostak
University and INFN of Cagliari, Italy

N25-9 **A Large CdTe Hybrid Pixel Detector Based on the Technology Used for the PILATUS Detectors**
C. Broennimann, M. Schneebeli, *DECTRIS AG, Switzerland*; A. Fauler, M. Fiederle, *Albert-Ludwigs-Univ. Freiburg, Germany*; B. Henrich, *Paul Scherrer Institut, Switzerland*

N25-10 **An Innovative Instrumentation System for Measuring the Computed Tomography Dose Index**
L. A. P. Santos, *CNEN, Brazil*; C. M. S. Magalhaes, M. C. Sobrinho, D. N. Souza, A. M. Figueiredo, *Universidade Federal de Sergipe, Brazil*

N25-11 **Scaling and Design of a 16 M-Pixel Charged-Particle Image Sensor**
S. Kleinfelder, S.-H. W. Chiang
University of California, USA

N25-12 **Fast Ethernet Readout for Medipix Arrays with MARS-CT**
R. M. N. Doesburg[1], M. N. Clyne[2], D. A. van Leeuwen[1], N. J. Cook[3], P. H. Butler[1,4], A. P. Butler[1,4,5]
[1]University of Canterbury, New Zealand; [2]ILR Ltd, New Zealand; [3]Canterbury District Health Board, New Zealand; [4]CERN, Switzerland; [5]University of Otago, New Zealand

N25-13 **Molecular Imaging for Plant Physiology - Imaging of Carbon Translocation to Sink Organs with Positron Emitting Tracer Imaging System (PETIS)**
N. Kawachi[1], N. Suzui[1], S. Ishii[1], S. Ito[1], N. S. Ishioka[1], K. Kikuchi[2], T. Tsukamoto[3], T. Kusakawa[3], S. Fujimaki[1]
[1]Japan Atomic Energy Agency, JAPAN; [2]National Agriculture and Food Research Organization, Japan; [3]Chiba Prefectural Agriculture and Forestry Research Center, Japan

N25-14 **Performance Evaluation of Gd2SiO5(Ce) Detector Applications for Blood Radio-Activity Measurement**
J. G. Kim, K. M. Kim, J. S. K. Kim, S. K. Woo, J. A. Park, C. W. Choi, S. M. Lim, G. J. Cheon
Korea Instiute of Radiological and Medical Sciences, Republic of Korea

Neutron Imaging and Radiography

N25-15 **Parameters Research of Gadolinium or Boron Coated MCP Thermal Neutron Collimator**
Y. Yang, N. Lu, *Tsinghua University, P.R.China*

N25-16 **Micro Capillary Technology for Fast Neutron Detection and Imaging**
M. A. Grohman, M. S. Derzon, R. F. Renzi
Sandia National Labs, USA

N25-17 **Combination of Neutronography and Radiography for Characterising of Light Material Distribution in Dense Material Matrix**
D. Vavrik, *Institute of Theoretical and Applied Mechanics, Czech Republic*; J. Jakubek, *Institute of Experimental and Applied Physics, Czech Republic*

N25-18 **Quantitative Epithermal Neutron Tomography with Compact Pulsed Neutron Source**
T. Kamiyama[1], N. Miyamoto[2], S. Tomioka[1], T. Kozaki[1]
[1]Graduate School of Engineering, Hokkaido University, Japan; [2]Graduate School of Medicine, Hokkaido University, Japan

N25-19 **High-Spatial-Resolution Neuron Image Detector Based on Wavelength-Shifting Fiber Read Out for Time of Flight Measurements**
T. Nakamura, R. Yasuda, M. Katagiri, K. Toh, K. Sakasai, A. Birumachi, M. Ebine, K. Soyama
Japan Atomic Energy Agency, Japan

N25-20 **Exploring Neutron Scatter Camera Performance Using MCNP-PoliMi**
C. Greenberg, J. Brennan, P. Marleau, N. Mascarenhas, S. Mrowka
Sandia National Laboratories, California, USA

N25-21 **Monte-Carlo Simulation of Fast Neutron Detection with Timepix**
J. Uher, *CSIRO Minerals, Australia*; J. Jakubek, *IEAP-CTU, Czech Republic*

N25-22 **Development of the Real-Time Portable Neutron Spectroscope (NSPECT) for Detection and Identification of Special Nuclear Materials**
J. M. Ryan[1], C. Bancroft[1], P. F. Bloser[1], U. Bravar[1], D. Fourguette[2], C. Frost[1], J. S. Legere[1], L. Larocque[2], G. Ritter[2], J. Wood[1], R. S. Woolf[1]
[1]University of New Hampshire, USA; [2]Michigan Aerospace Corporation, USA

N25-23 **A Neutron Imaging Facility Based on a RFQ Accelerator**
Z. Guo, Y. Lu, Y. Zou, S. Peng, K. Zhu
Peking University, China

N25-24 **Phase Contrast Neutron Imaging at a Medium Intensity Neutron Source**
K. K. Mishra, A. I. Hawari
North Carolina State University, USA

N25-25 **Investigation of Coded Source Neutron Imaging at the North Carolina State University PULSTAR Reactor**
Z. Ziao, K. K. Mishra, A. I. Hawari, *North Carolina State University, USA*; H. Z. Bilheux, P. R. Bingham, K. W. Tobin, *Oak Ridge National Laboratory, USA*

New Detector Concepts and Instrumentation

N25-26 **A Linear Position Sensitive Neutron Detector Module Design for the ORNL Spallation Neutron Source**
L. L. Funk, *Oak Ridge National Laboratory, United States*
On behalf of the Detector Group and Data Acquisition Systems Group

N25-27 **Application of Hetero Junction Organic Photodiode to Radiation Measurement**
E. Takada, A. Inoue, *Toyama National College of Technology, Japan*; H. Okada, S. Naka, *University of Toyama, Japan*; J. Kawarabayashi, *Nagoya University, Japan*

N25-28 Power Distribution with Custom DC-DC Converters for SLHC Trackers
C. Fuentes[1,2], B. Allongue[2], S. Buso[3], G. Blanchot[2], F. Faccio[2], S. Michelis[2,4], S. Orlandi[2], G. Spiazzi[3]
[1]UTFSM, Chile; [2]CERN, Switzerland; [3]Padova University, Italy; [4]EPFL, Switzerland

N25-29 Characteristics of a Silicon on Insulator Neutron Detector
M. Subramanian, *George Mason University, 22030*; B. Phlips, F. Kub, *Naval Research Laboratory, 20375*

N25-30 The Characterization of CsI-Based Reduced-Hydroscopicity Nanocomposite Scintillators
J. M. Cook, B. L. Bennett, M. W. Blair, L. O. Brown, R. D. Gilbertson, A. Li, E. A. McKigney, R. E. Muenchausen, R. E. Del Sesto, N. A. Smith, S. C. Tornga, D. A. Wrobleski
Los Alamos National Laboratory, USA

N25-31 A Low Noise Pixel Architecture for Scientific CMOS Monolithic Active Pixel Sensors
R. Coath, J. Crooks, A. Godbeer, Z. Zhang, M. Stanitzki, M. Tyndel, R. Turchetta
STFC - Rutherford Appleton Laboratory, UK

N25-32 Development of Lead Chalcogenide Nanocrystalline (NC) Semiconductor Detectors
G. Kim, M. D. Hammig, *University of Michigan, USA*

N25-33 A Plasma Panel Sensor Detector for SLHC-ATLAS Muon Spectrometer Upgrade
D. S. Levin[1], P. S. Friedman[2], R. W. Ball[1], J. W. Chapman[1], C. Weaverdyck[1], B. Zhou[1], E. Etzion[3]
[1]University of Michigan, USA; [2]Integrated Sensors,LLC, USA; [3]Tel Aviv University, Israel

N25-34 Innovative, Reworkable, and Robust Packaging of Semiconductor Detectors
B. Cardoso, M. Wrosch, A. Soriano
Creative Electron, INC, USA

N25-35 U3DTHIN - Ultra Thin 3D Silicon Detector for Plasma Diagnostics at ITER Tokamak
F. Garcia[1], G. Pellegrini[2], M. Lozano[2], J. Balbuena[2], R. Orava[1], M. Ullan[2]
[1]Helsinki Institute of Physics and Department of Physcal Sciences, University of Helsinki, Finland; [2]Centro Nacional de Microelectronica, Spain

N25-36 Gas Typed X-Ray Image Sensor Using Plasma Display Panel (PDP) Structure
K. S. Song[1], S. Jeon[1], B. Kim[1], D. H. Lee[1], Y. G. Hwang[1], H. Cho[2], S. H. Nam[3], Y. Huh[1]
[1]Korea Electrotechnology Research Institute, Korea; [2]Younsei University, Korea; [3]Inje University, Korea

N25-37 Monolithic Active Pixel Sensors on-Pixel Sparsification Architecture with Pulse Amplitude Information Storing.
E. Spiriti, *INFN, Italy*; J. Mlynarczyk, *AGH, Poland*

N25-38 Scintillation Detection with a Gaseous Photomultiplier for Compton Imaging with Liquid Xenon
S. Duval, T. Oger, E. Morteau, H. Carduner, P. Leray, J.-S. Stutzmann, J.-P. Cussonneau, J. Lamblin, D. Thers, *Subatech, France*; A. Breskin, *The Weizmann Institute of Sciences, Israel*

N25-39 The Barrel DIRC of the PANDA Experiment at FAIR
J. Schwiening, *GSI Helmholtzzentrum fr Schwerionenforschung GmbH, Germany*
On behalf of the PANDA-DIRC Group

N25-40 X-Ray Microscopy with 100nm Resolution for Tomographic Applications Using a MicroCT SEM Attachment
P. Bruyndonckx, A. Sasov, B. Pauwels, X. Liu
SkyScan, Belgium

N25-41 Syntheses and X-Ray Excited Luminescence Properties of Europium Doped $Ba_3P_2O_8$, $Ba_3P_4O_{13}$, $Ba_2P_2O_7$ and BaP_2O_6
R. B. Borade, E. D. Bourret-Courchesne, M. J. Weber, S. E. Derenzo
Lawrence Berkeley National Laboratory, USA

N25-42 A 256 Pixel Array of Superconducting Gamma-Ray Microcalorimeters with Improved Readout Circuitry
D. A. Bennett, J. N. Ullom, W. B. Doriese, J. A. Beall, G. C. Hilton, R. D. Horansky, K. D. Irwin, V. Kotsubo, L. R. Vale, *National Institute of Standards and Technology, USA*; M. K. Bacrania, A. S. Hoover, N. J. Hoteling, P. J. Karpius, M. W. Rabin, C. R. Rudy, D. T. Vo, *Los Alamos National Laboratory, USA*

N25-43 Framework and Strategies for Quality Assurance and Risk Assessment in the KM3NeT Neutrino Telescope Project
C. Sollima, *INFN - Universita' di Pisa, Italy*
On behalf of the KM3NeT Consortium

Nuclear Measurements and Monitoring Techniques

N25-44 The Thermoluminescence Response of K2GdF5 Crystals Doped with Dy3+ Trivalent Ions to X, Gamma and Neutron Radiation Fields
E. C. Silva[1], N. N. M. Khaidukov[2], E. Vilela[3], L. O. D. Faria[1]
[1]Centro de Desenvolvimento da Tecnologia Nuclear - CDTN, Brazil; [2]Institute of General and Inorganic Chemistry, Russia; [3]Centro Regional de Cincias Nucleares do Centro Oeste - CRCN-CO, Brazil

N25-45 A Digital Coincidence Measurement System Using FPGA Techniques
S. C. Hsieh, H. P. Chou
National Tsing Hua University, Taiwan

N25-46 Computation of Neutron Multiplicity Statistics Using Deterministic Transport
J. K. Mattingly, *Sandia National Laboratories, USA*

N25-47 Studies on the Effect of Heat Treatment on Reusability of the CaSO4:Dy Teflon Disc TL Dosimeters
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N25-48 Monte Carlo Simulation of In-situ CZT Spectrometer in Seawater
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N25-49 Development of 2.5MeV Neutron Spectrometer for Helical DD Plasma Experiment
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N25-50 Development of Multiple Activation Counter Using Liquid Light-guide for Pulsed Neutron Dosimetry
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N25-51 Development of a Large-Angle Pinhole Gamma Camera Using Depth-of-Interaction Detector for Nuclear Survey
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N25-52 TeO2 Thin Film Based Real-Time Gamma Dosimeters for High Doses
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N25-53 New Sensitive Technique for Measurement of Krypton-85 Based on Absorption in Polycarbonates and Liquid Scintillation Counting
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N25-54 Performance Optimization of Cosmic-Ray Charged Particle Detector Using Wavelength Shifter Fiber
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N25-55 Sequential Probability Ratio Test Using Scaled Time-Intervals for Environmental Radiation Monitoring
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N25-56 Isotopic Abundance Analysis Using MGA on Spectra Generated by Monte Carlo Simulation
H. Yang, W. Russ, R. Venkataraman, A. Bosko
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N25-57 Plutonium Sphere Multiplicity Simulations with MCNP-PoliMi
E. C. Miller, S. D. Clarke, S. A. Pozzi, *University of Michigan, USA*; J. K. Mattingly, *Sandia National Laboratories, USA*

N25-58 New Measurements and Lessons Learned with High-Resolution Microcalorimeter Detector Arrays
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N25-59 Assessing the Lower Bound on Uncertainty in Ultra-High Resolution Microcalorimeter Isotopic Ratio Measurements
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N25-60 Radioxenon Measurements in South Africa
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N25-61 Upgrade of Mini-DDL Applied in the Radiation Field Measurement
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N25-62 Stability of X-Ray Tube-Based Transmission Source for UF6 Gas Enrichment Monitoring Technology
K. D. Ianakiev, J. M. Goda, T. R. Hill, C. W. McCluskey, C. E. Moss, H. Nguyen, R. F. Parker, M. T. Swinhoe
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N25-63 Development of a Model of an X-Ray Tube Transmission Source
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N25-64 A Hybrid Pulse Shape Discrimination Technique with Enhanced Performance at Neutron Energies below 500 keV
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Nuclear Physics Instrumentation

N25-65 Digital Signal Processing Applied to the Position Start Detector of the MAGNEX Spectrometer
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N25-66 CHIMERA Silicon Detectors in Reverse Mode: Preliminary Tests
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N25-67 A New Detector for Track Reconstruction and Identification of Charged Fragments particles from the Proton to Uranium
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N25-68 On the Behaviour of HPGe Detectors Immersed in Magnetic Fields up to 2.5 T
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N25-69 Investigation of the Properties of Large Volume LaBr3:Ce Scintillators with High Energy Gamma Rays
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N25-70 Position Sensitivity of Large Volume LaBr3:Ce Detectors
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N25-71 Characterization of a HPGe Segmented Detector Position Response Using Pulse Shape Comparison Techniques
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N25-72 A GHz 8-Channel Trigger/DAQ Module with Real-Time Digital Neutron-Gamma Discrimination.
J. P. Martin, C. Mercier, N. Starinsky, *University of Montreal, Canada*; P. Garrett, *University of Guelph, Canada*

N25-73 Optimization of Fast/Slow Neutron Yield for a PGNAA Moderator
A. A. Naqvi, F. Z. Khiari, M. I. Al-Jarallah, A. H. Isab, K. U. Rehman, M. Raashid, A. U. Islam
King Fahd University of Petrol, Saudi Arabia

N25-74 Further Characterization of a Low-Background, Internal-Source Proportional Counter
A. Seifert, C. E. Aalseth, A. R. Day, E. W. Hoppe, T. W. Hossbach, B. J. Hyronimus, M. E. Keillor, K. E. Litke, E. E. Mintzer, J. L. Orrell, G. A. Warren
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N25-75 Thermal Neutron Depth Profiling
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Nuclear Power

N25-76 (invited) Advancements in Nuclear Instrumentation, Measurement Methods and Their Applications
A. Chabre, A. Lyoussi, *CEA, FRANCE*; M. Giot, *SCK-CEN, BELGIUM*

N25-77 Experimental Orthogonal Functions and Principal Oscillation Patterns of an Unstable Event in a BWR Nuclear Power Reactor
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N25-78 Characterizing the Ultra-High Energy Resolution TES Array Gamma-Spectrometer Response Function for Isotopic Analysis
O. B. Drury, M. Velazquez, J. G. Dreyer, S. Friedrich
Lawrence Livermore National Laboratory, USA

Photodetectors and Scintillation Detectors

N25-79 Silicon Photomultiplier Fabricated from Spin-on Dopants, Rapid Thermal Processing, and Indium Tin Oxide
P. J. Barton, D. K. Wehe, *University of Michigan, USA*

N25-80 Impact of Ce Concentration and Co-Doping on the Scintillation Properties of Lu2xGd2(1-x)SiO5:Ce (LGSO, X=0.2) Single Crystals
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N25-81 Cerium Bromide - Methanol Adduct, CeBr3(CH3OH)4: A Novel Lanthanide Halide Complex as Inorganic Scintillator
E. V. Van Loef, J. Glodo, W. M. Higgins, K. S. Shah
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N25-82 Cross-Strip Anodes for High-Rate Single-Photon Imaging
L. C. Stonehill, J. S. Salacka, I. J. Owens, M. W. Rabin, R. Shirey, *Los Alamos National Laboratory, USA*; O. H. W. Siegmund, A. S. Tremsin, J. V. Vallerga, *Space Sciences Laboratory, UC Berkeley, USA*

N25-83 Storage Characteristics of KCl:Eu2+ Phosphors with Radiators by Irradiation of Fast Neutrons
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Japan Atomic Energy Agency, Japan

N25-84 Proton-Induced Fluorescence and Long Lasting Emission of $Sr_4Al_{14}O_{25}:Eu^{2+},Dy^{3+}$
K. Toh, K. Sakasai, T. Nakamura, K. Soyama, *Japan Atomic Energy Agency, Japan*; S. Nagata, B. Tsuchiya, T. Shikama, *Tohoku University, Japan*

N25-85 Beta/Gamma Coincidence Measurements of Radioxenon Using a Triple-Layer Phoswich Detector
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N25-86 Characterization of CMOS Position Sensitive Solid-State Photomultipliers
M. McClish, P. Dokhale, J. Christian, C. Stapels, E. Johnson, R. Robertson, K. S. Shah
Radiation Monitoring Devices, Inc., USA

N25-87 Scintillating Setup for High Accessibility Detection of Low Activity Ionizing Radiations
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N25-88 Development of a New Beta Emitter Detector: a Mini-Invasive Setup for Radiotracer Study in Geological Clay Layer
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N25-89 Streak Measurements of Luminescence Mechanisms of Scintillators
A. O. Li[1,2], B. L. Bennett[1], M. K. Bacrania[1], J. M. Cook[1], M. P. Croce[1], D. C. Gautier[1], E. A. McKigney[1], R. E. Muenchausen[1]
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N25-90 Composite Scintillators as Detectors for Fast Neutrons and Gamma-Radiation Detection in the Border Monitoring
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N25-91 Scintillation Properties of Eu - and Tl, Eu - Doped NaI Crystals
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N25-92 Energy Resolution of Compton Electrons in Scintillators
L. Swiderski, M. Moszynski, W. Czarnacki, T. Szczesniak, R. Marcinkowski, A. Syntfeld-Kazuch, *Soltan Institute for Nuclear Studies, Poland*; G. Pausch, K. Roemer, *ICx Radiation, GmbH, Germany*

N25-93 A Study on the Light Response Uniformity of LSO/LYSO Crystals Measured by PMT and APD
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California Institute of Technology, USA

N25-94 Rectangularly Shaped LAAPDs for PANDA
A. Wilms, *GSI Darmstadt, Germany*
On behalf of the PANDA EMC group

N25-95 Development of Gd2O3 Based Dense Scintillating Glass
Y. Zhang[1], Y. Zhang[2], H. Xia[1], Z. Xu[2], X. Wang[2], Y. Wang[3], Y. Heng[3], T. Zhao[4]
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N25-96 Growth and Scintillation Properties of Nd Doped LiCaAlF6 Scintilltor
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N25-97 Comparative Study of Ga, In, and Mg Doped ZnO Thin-Film Scintillator with Geiger Mode APD
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N25-98 Large Size Single Crystal Growth of Pr:Lu3Al5O12 and Their Uniformity of Scintillation Properties.
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N25-99 A New Neutron Scintillator Based on ^{6}Li Metal Sheet and ZnS(Ag) Phosphor Layer
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N25-100 On the Optimal Design of Flat-Panel Image Detector Based CsI(Tl) for C-Arm Fluoroscopy System
D. H. Lee, Y. Huh, S. Jeon, B. Kim, Y. G. Hwang, K. S. Song, *Korea Electrotechnology research institute, Korea*; Y. K. Kim, *Hanyang University, Korea*

N25-101 Evaluation of a 1024 Anodes Micro-Channel Plate PMT for Preclinical PET Imaging
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N25-102 A Time Efficient Optical Model for GATE Simulation of a LYSO Scintillation Matrix Used in PET Applications
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N25-103 Performance of CsI(Na) Scintillators in Gamma-Ray Spectrometry
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N25-104 Light Pulse Shapes in Liquid Scintillators Originating from Gamma-Rays and Neutrons
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N25-105 Characterization of LAAPD and CsI(Tl) crystals: application to the R3B Calorimeter CALIFA
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N25-106 Investigation of Spark Plasma Sintering Techniques for Fabricating ZnO-Based Polycrystalline Ceramic Scintillators
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N25-107 Glass Scintillators for Ultra Cold Neutrons
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N25-108 Hydrothermal Synthesis and Characterization of Nano Gd2O3(Eu) Scintillator for High Resolution X-Ray Imaging Application
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N25-109 Performance of the LaBr3(Ce) Scintillator for Nuclear Resonance Fluorescence Experiment
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N25-110 Study of Crystal Growth and Scintillation Properties as a Neutron Detector of 2-Inch Diameter Eu Doped $LiCaAlF_6$ Single Crystal
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N25-111 Probability Distribution and Noise Factor of Solid State Photomultiplier Signals with Cross-Talk and Afterpulsing
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N25-112 Improvement of Energy Resolution via Correction on Non-Uniform Light Collection in Large Scintillation Detectors
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Canberra Industries, USA

N25-113 Crystal Growth and Scintillation Properties of NdF_3 Single Crystal
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N25-114 Crystal Growth and Scintillation Properties of Nd Doped CaF_2 Single Crystal
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N25-115 Development of Nanocomposite Scintillators for Neutron Capture Measurements
S. Stange, E. I. Esch, A. J. Couture, R. E. Del Sesto, R. D. Gilbertson, T. M. McCleskey, E. A. McKigney, R. E. Muenchausen, *Los Alamos National Laboratory, USA*; R. Reifarth, *Gesellschaft für Schwerionenforschung, Germany*

N25-116 Scintillation Properties of Large Area Composite Stilbene Crystal for Neutron Detection
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N25-117 Cross Talk Study to the Single Photon Response of a Flat Panel PMT for the RICH Upgrade at LHCb
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N25-118 Tests of Silicon Photomultiplier PET Modules
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N25-119 Scintillation Mechanism in Helium Mixed with Xenon
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N25-120 Measurement of Light Yield Proportionality in Scintillator Samples Through a Coincidence Technique
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N25-121 Functional Possibilities of Inorganic-Organic Hybrid Scintillator; Pr: LuAG Scintillator Covered with Plastic Scintillator.
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N25-122 Non-Proportionality in Alkali Halide Scintillators: Relationship to Energy Resolution Degradation
G. A. Bizarri, W.-S. Choong, W. W. Moses, *LBNL, USA*; L. Ahle, N. Cherepi, S. A. Payne, S. Sheets, *LLNL, USA*

N25-123 LUSIPHER : a New Large-Scale Ultra-Fast SIngle PHoto-Electron Recorder
A. Dominjon, E. Chabanat, P. Depasse, R. Barbier, *IPNL / University of Lyon & CNRS-IN2P3, France*; J. Baudot, W. Dulinski, A. Dorokhov, *IPHC / University of Strasbourg & CNRS-IN2P3, France*

N25-124 Tertiary Scintillation Gas Proportional Scintillation Counter (TS-GPSC): First Experimental Results
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University of Coimbra, Portugal

N25-125 Empirical Estimation of Band Gaps, and Ce3+ and Eu2+ 4f-5d Absorption Energies for New Radiation Detector Materials
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N25-126 Evaluation of Hamamatsu H8500 New Series MAPMTs for Readout of High-Resolution LaBr3:Ce Scintillation Crystal
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N25-127 Properties of Gd2O3:Eu3+ Nanoparticles and SiO2/ Gd2O3:Eu3+Core/Shell Nanoparticles for Scintillation Detectors
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N25-128 Rare-Earth Activated Lutetium Aluminum Garnet Powders Synthesized via a Citrate-Nitrate Method
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N25-129 Empirical Estimation of the Gamma-Ray Full-Energy Detection Efficiency of Cylinders and Slabs of Thickness 2.5 cm and Greater from 0.14 to 2 MeV
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N25-130 A Thermal Neutron Detector Based on Corrugated Scintillator and Wavelength Shifting Fiber for Large Area Coverage
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N25-131 Recent Developments for CMOS Solid-State Photomultipliers with Integrated Signal Processing
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N25-132 Neutron Scintillator Detectors Based on Light Emitting Polymers
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N25-133 Advanced Study of Novel Radiation Detector Based on Silicon Photomultiplier
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N25-134 PVT Scintillators with Very-High Fluorescent Dye Concentrations
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N25-135 New Scintillators for Combined Gamma-Ray/Fast Neutron Detection: Single-Crystal LaBr3(CH3OH)4:Ce and CeCl3(CH3OH)4
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N25-136 Time-of-Flight with BURLE/Photonis Multi-Channel MCP-PMT Using MCP-Out Signal
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N25-137 Fast, Large Area CMOS Solid-State Photomultiplier for Radiation Detection
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N25-138 Properties of CdWO4 and ZnWO4 at Liquid Nitrogen Temperature
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N25-139 Studies of Silicon Photo-Multipliers at Cryogenic Temperatures
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N25-140 Growth and Scintillation Properties of Eu Activated BaXY (X,Y=Br,Cl,I)
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N25-141 Time Resolving Characterization of HPK and FBK Silicon Photomultipliers for TOF and PET Applications
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N25-142 Detection of Ionizing Radiation in Coherent Plates of Scintillating Optical Fibers
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N25-143 Scintillation Properties of Eu2+-Activated Barium Fluoroiodide
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N25-144 Long-Term Stability Analysis of Yttrium Aluminum Perovskite (YAP)
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N25-145 Absolute Measurements of Intrinsic Scintillation Light Yield
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N25-146 Low Energy Measurements Using the CsI(Tl) Crystal Coupled to a Photodiodes Linear Array in Coincidence-Sum Circuitry.
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N25-147 Positron Annihilation Lifetime Spectrometry (PALS) of the Positronic Dodecaborate Anion
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N25-148 8x4 SiPM Array Based Gamma Detectors for a PET/MR Fusion Imaging Application
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N25-149 Garnet Scintillator-Based Devices for Gamma-Ray Spectroscopy
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N25-150 First-Principles Calculations for Ce/Li Co-Doped Ba Silicates and Experimental Validation
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N25-151 Investigation of Timing Resolution and Energy Resolution for SiPM/PET Detectors Using the Silicon Flexible Optical Material
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N25-152 Evaluation of the Impact of Dark Counts in Silicon Photomultiplier Multi-Readout Applications
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N25-153 Test in Liquid Argon of the Light Readout System for the ArDM Experiment.
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On behalf of the ArDM Collaboration

Radiation Damage Effects

N25-154 Highly-Scaled SRAM Immunity to MUN Based on Analysis of an Induced Parasitic Bipolar Effect
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Beijing Microelectronics Technology Institute, China

N25-155 Contributions of Electrons and Holes to Total Collected Charge in Heavily Irradiated Si Pad and Strip/Pixel Detectors: a Comparison Simulation Study
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N25-156 Space Charge Analysis in Irradiated Silicon Detectors Using Admittance Spectroscopy
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N25-157 The Effect of Silicon Nitride Passivation on the Electrical Properties of Neutron and Electron Radiated AlGaN/GaN HFETs
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N25-158 Annealing of Charge Collection Efficiency and Depletion Voltage in Proton Irradiated Silicon Detectors
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N25-159 Strixel Sensor Design for Large Radii of a New CMS Tracker for SLHC
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N25-160 Restored Thermoluminescence in Oxide Crystals
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N25-161 Thermoluminescent Properties of LSO:Ce Crystal
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Semiconductor Detectors

N25-162 Characteristics of a Si PIN-Type Radiation Detector for Industrial Applications
H. S. Kim, S. H. Park, J. H. Ha, *Korea Atomic Energy Research Institute, Korea*; S. Y. Cho, D. H. Kim, S. H. Kim, J. P. Park, M. G. B. G. B. N. L. Yoo, *Yonsei University, Korea*

N25-163 A CCD-based Pixel Detector with Micron Spatial Resolution for Ultra Cold Neutrons
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N25-164 High Aspect Ratio Deep RIE for Novel 3D Radiation Sensors in High Energy Physics Applications
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N25-165 Calculation of Electron Cloud Distribution in 3-D Position Sensitive CdZnTe Detectors Using MLEM Method
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N25-166 Thoeretical Energy Calibration of Multiple-Pixel Events in a Wide Band-Gap Semiconductor Detector with Pixilated Electrodes
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N25-167 A Vertically Integrated (3D) Rolling Shutter Mode MAPS with in-Pixel Digital Memory and Delayed Readout
Y. Degerli[1], G. Bertolone[2], W. Dulinski[2], F. Guilloux[1], F. Morel[2], F. Orsini[1], X. Wei[2]
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N25-168 Simple Solutions for Spectroscopic, Photon Counting X-Ray Imaging Detectors
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N25-169 Common-Grid Pixellated CdZnTe Detector System Modeling
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N25-170 Pulse Height Linearity of CdZnTe
P. B. Ugorowski, A. Kargar, D. S. McGregor
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N25-171 Modelling the Weighting Potential Cross-Talk in CZT Radiation Detectors
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N25-172 Photoluminescence Analysis of TlBr Crystals for Radiation Detector Applications
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N25-173 Theoretical Modelling of a Novel Hybrid-Pixel Detector
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N25-174 Evaluation of the Energy Resolution of a Prototype Sensor for the PILATUS Detector.
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N25-175 200 mm Silicon Wafer Processing for Large Area Strip Detectors
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N25-176 CZT Sub-Surface Damage Assessment Using Electrical Leakage Measurements
J. Cui, K. Andreini, G. Nitin, S. R. Hayashi, W. Zhang, M. Yamada, *General Electric Research, USA*; H. Jiang, G. Schweinert, *General Electric Healthcare, USA*; H. Chen, G. Bindley, *Redlen Technologies, Canada*

N25-177 Electron Mobility and Lifetime Mapping of CZT with Known Crystalline Defects by Pulsed Laser Excitation
W. Li, J. E. Tkaczyk, J. Cui, K. Andreini, Y. Z. Williams, K. G. Harding, *General Electric Research, USA*; H. Chen, G. Bindley, *Redlen Technologies, Canada*; R. Matyi, *State University of New York, USA*

N25-178 Cross-Talk Effects in CZT Pixilated Detectors
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N25-179 Fabrication and Signal Acquisition of the Silicon-Based Delay-Line Radiation Detector
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N25-180 Silicon Drift Detectors for Specialized X-Ray Applications
S. Barkan, V. D. Saveliev, L. Feng, M. Takahashi, E. Damron, C. R. Tull, *SIINT USA, USA*; N. J. Zaluzec, *Argonne National Lab, USA*

N25-181 Improving Pixel Detectors: Active Area Optimization and High Temperature Annealing
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N25-182 Testing of Multi-Electrode Sensors via Active Edges and Temporary Conductors
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N25-183 Tilted CMOS Active Pixel Sensors for Particle Tracking Reconstruction
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N25-184 Time Resolved Measurement of a Pulsed X-Ray Source with the Timepix Detector
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N25-185 Induced Signals in X-Ray Detectors with Steering Grid Geometry
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N25-186 Theoretical Characterization of a Surface Barrier Neutron Spectrometer
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N25-187 The Silicon Tracker of the CBM Experiment at FAIR: Detector Developments and First in-Beam Characterizations.
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N25-188 Development of Bismuth Tri-Iodide Radiation Detectors
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N25-189 Material Recognition in Micro Imaging Based on X-Ray Beam Hardening Correction Method
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N25-190 Fabrication and Performance of a Self-Powered 4H-SiC Schottky-Type Neutron Detector.
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N25-191 Investigation of a CdTe Sensor Concerning Different Pixel- and Electrode Sizes
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N25-192 TRAPPISTe Pixel Sensor with 2um SOI Technology
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N25-193 CZT Quasi-Hemispherical Detectors with Improved Spectrometric Characteristics
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N25-194 Performance Evaluation of Low-Noise Analog Front-End for Semiconductor Detectors
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N25-195 Energy Resolved X-Ray Imaging as a Tool for Characterization of Paper Coating Quality
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N25-196 Cross-Talk Limits of Highly Segmented Semiconductor Detectors
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N25-197 Development of Radiation Hard Silicon Sensors for the CBM Silicon Tracking System Using Simulation Approach
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N25-198 3D DNW MAPS for High Resolution, Highly Efficient, Sparse Readout CMOS Detectors
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N25-199 Development of Thin Sensors and a Novel Interconnection Technology for the Upgrade of the ATLAS Pixel System at SLHC
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N25-200 Novel Fabrication Process for Edgeless Detectors on 6" SOI-Wafers
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N25-201 Silicon Detectors for the sLHC - Recent RD50 Results
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N25-202 Development of the Silicon Photo-Strip Sensor
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N25-203 Radiation Tolerance Study of a Digital Chip Sensor for the EUDET-JRA1 Project
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N25-204 X-Ray and Gamma-Ray CZT Detector Development: Anode Design and Insulating Materials
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N25-205 Development of Active Pixel Detector with CDS in FD-SOI Technology
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On behalf of the SOIPIX Collaboration

N25-206 Charge Collection Properties of Heavily Irradiated Silicon Micro-Strip Detectors Studied by Edge Transient Current Technique (E-TCT)
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N25-207 Contactless Resistance Evaluation of Pre-Processed High-Resistivity CdZnTe Wafers Using Two Layer Model
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N25-208 Comparison of Simulated and Measured Energy Response Spectra for a Medipix2 Detector Using CdTe as Sensor Material
J. R. Durst, E. Guni, T. Michel, G. Anton
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N25-209 Investigations of Internal Electric Field in Cadmium Zinc Telluride (CZT) Detectors
G. Yang, A. Bolotnikov, G. Camarda, Y. Cui, A. Hossain, K. H. Kim, R. James
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N25-210 Simulation of Radiation Damage Effects on Planar Pixel Guard Ring Structure for ATLAS Inner Detector Upgrade
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On behalf of the ATLAS planar pixel upgrade group

N25-211 Spectrometric Performances of CdTe and CdZnTe Spectrometric Semiconductor Detector Arrays at High X-Ray Flux
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N25-212 Production Chain of Isotopically Modified Ge-Diodes for the 2b0n-Search with Gerda
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On behalf of the GERDA Collaboration

N25-213 Characterization of Broad Energy Germanium Detector (BEGe) as a Candidate for the GERDA Experiment
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N25-214 Depth Reconstruction Validation in Pixelated Semiconductor Detectors
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N25-215 Recent Developments and Novelties on Segmented HPGe and Si(Li) Semiconductors
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N25-216 Modeling Pixel-to-Pixel Capacitance in CZT-Based Imaging Systems
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N25-217 Materials Availabilty Considerations in the Design of New Gamma Detectors
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N25-218 Array of Hexagonal SDDs as X-Ray Spectrometer
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N25-219 Performance of CdZnTe Pixellated Radiation Detectors Assembled by a New Attachment Method
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N25-220 Modified Vertical Bridgman Growth of Cd(1-x)Zn(x)Te Detector Grade Crystal in a 4" EDG Furnace
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N25-221 Recent Results on Development of CdMnTe Gamma-Ray Detectors
Y. Cui, A. Hossain, A. Bolotnikov, G. Camarda, G. Yang, K. H. Kim, R. B. James, *Brookhaven National Laboratory, USA*; A. Mycielski, D. Kochanowska, M. Witkowska-Baran, *Institute of Physics, PAS, Poland*

N25-222 *Ab Initio* Investigation of Layered Materials for Semiconductor Radiation Detectors
C. R. Leao, V. Lordi, *Lawrence Livermore National Lab, USA*

N25-223 Characteristics of Large-Volume Redlen CdZnTe Detectors
Z. He, F. Zhang, Y. F. Zhu, W. Kaye, Y. Boucher, C. Herman
The University of Michigan, USA

N25-224 Comparison of Two Different Methods to Produce Thin-Window Silicon Drift Detectors
W. Chen[1], G. A. Carini[1], G. De Geronimo[1], J. A. Gaskin[2], J. Keister[1], Z. Li[1], B. D. Ramsey[2], P. Rehak[1], D. P. Siddons[1]
[1]Brookhaven National Lab, USA; [2]a. NASA/MSFC/National Space Science and Technology Center, USA

N25-225 Space Charge Effects of Charge Clouds in Large HPGe Planar Double-Sided Strip Detectors
D. H. Chivers[1,2], L. Mihailescu[2], S. G. Prussin[1], K. Vetter[1,2]
[1]University of California, Berkeley, USA; [2]Lawrence Berkeley National Laboratory, USA

N25-226 Pulse Shape Analysis Method for Estimating Charge Mobility in Large Planar HPGe Double-Sided Strip Detectors
D. H. Chivers[1,2], L. Mihailescu[2], S. G. Prussin[1], K. Vetter[1,2]
[1]University of California, Berkeley, USA; [2]Lawrence Berkeley National Laboratory, USA

N25-227 CZT Detector for Remote Nuclear Material Measurement
S.-H. Park, Y. H. Cho, J. H. Lee, H. S. Kim, J. H. Ha
KAERI, Korea

N25-228 Material Uniformity of Doped CZT Crystals
Y. H. Cho[1], S.-H. Park[1], J. H. Lee[1], H. S. Kim[1], Y.-K. Kim[2], J. H. Ha[1]
[1]KAERI, Korea; [2]Hanyang University, Korea

N25-229 Amorphous Semiconductor Blocking Contacts on CdTe Gamma Detectors
L. F. Voss, A. M. Conway, B. W. Sturm, R. T. Graff, R. J. Nikolic, A. J. Nelson, S. A. Payne
Lawrence Livermore National Laboratory, USA

N25-230 Thallium Bromide and Thallium Bromoiodide Gamma-Ray Spectrometer Development
H. Kim[1], A. Churilov[1], G. Ciampi[1], L. Cirignano[1], W. Higgins[1], F. Olschner[2], K. Shah[1]
[1]Radiation Monitoring Devices Inc., USA; [2]Cremat Inc., USA

N25-231 Vapour Phase Growth of 100 mm Diameter Cadmium Telluride Boules on GaAs Seeds
S. A. Sakwe, J. T. Mullins, B. J. Cantwell, A. T. G. Pym, A. Basu
Kromek, U.K.

N25-232 Study and Characterisation of Guarded Small Pixel Contact Geometries on CdTe
M. Ayoub, P. D. Scott, F. Dierre, I. Radley, A. Basu
Kromek, U.K.

N25-233 Growth of Thick CdTe:Cl Layers of Large Diameter on ZnTe Buffered Ge Seeds for Room Temperature Radiation Detection
F. Dierre, A. T. G. Pym, M. Ayoub, M. J. Winter, S. A. Sakwe, I. Radley, A. Basu
Kromek, U.K.

N25-234 New Approach to Deposition of W and Mo on CdTe via the Electroless Method
F. Dierre[1], M. Ayoub[1], R. L. Thompson[2], A. T. G. Pym[1], I. Radley[1], A. Basu[1]
[1]Kromek, U.K.; [2]University of Durham, U.K.

N25-235 Bridging the Price / Performance Gap Between Silicon Drift and Silicon PIN Diode Detectors
D. Hullinger, K. Decker, J. Smith, C. Carter
Moxtek, Inc., USA

Synchrotron Radiation Instrumentation

N25-236 Positron Analysis Based on High Energy X-Ray Source
Y. Yang, T. Li, Y. Zhang, P. Yang
Tsinghua University, P.R.China

N25-237 Kodak CCD-Based Detector for Small Angle X-Ray Scattering
H.-L. Lee, T. Madden, P. Fernandaz, B. Lee, S. Seifert, J. Weizeorick, M. Molitsky
Argonne National Laboratory, USA

N25-238 The Electronics in the Detector Head of the AGIPD-Detector -- a 1M Pixel, 5 MHz Camera for the European XFEL
P. Goettlicher, *Deutsches Elektronen-Synchrotron, Germany*
On behalf of the AGIPD-consortia

N25-239 The Adaptive Gain Integrating Pixel Detector (AGIPD): a Detector for the European XFEL. Development and Status.
U. Trunk[1], J. Becker[2], P. Goettlicher[1], H. Graafsma[1], B. Henrich[3], H. Hirsemann[1], S. Jack[1], M. Karagounis[4], R. Klanner[2], H. Krueger[4], A. Mozzanica[3], H. Perrey[2], J. Pintilie[2], G. Potdevin[1], B. Schmitt[3],

J. Schwandt[2], A. K. Srivastava[2], C. Youngman[1], X. Shi[3], I. Sheviakov[1], M. Zimmer[1]
[1]DESY Deutsches Elektronen-Synchrotron, Germany; [2]Universitaet Hamburg, Germany; [3]PSI Paul Scherrer Institut, Switzerland; [4]Universitaet Bonn, Germany

Trigger and Front-End Systems

N25-240 **Front-End Electronic System of PMT Readout for Daya Bay Reactor Neutrino Experiment**
Q. Li, *Institute of High Energy Physics, Chinese Academy of Sciences, China*
On behalf of the Dayabay Collaboration

N25-241 **FPGA Remote Configuration Through VME**
H. T. Dong, C. Cuevas, E. Jastrzembski, J. Wilson
Jefferson Lab, USA

N25-242 **An Ultra-High-Speed Front-End Intelligent Digital Transmission System for High-Intensity Pulsed Radiation Field Diagnosis**
X. Cheng[1], X. Tian[2], R. Fan[1,2], M. Zeng[1]
[1]Tsinghua Univ., China; [2]Northwest Institute of Nuclear Technology, China

N25-243 **FF-LYNX: integrated Control, Trigger and Readout in Future High Energy Physics Experiments**
G. Bianchi[1,2], R. Castaldi[1], L. Fanucci[2], G. Magazzu'[1], S. Saponara[2], C. Tongiani[1,2], P. G. Verdini[1]
[1]INFN - Sezione di Pisa, Italy; [2]University of Pisa - Diparimento di Ingegneria dell'Informazione (DII-EIT), Italy

N25-244 **Track Reconstruction in the ATLAS High Level Trigger Using Cosmic Ray Muons**
S. Ask, J. L. Lane, J. Masik
The University of Manchester, United Kingdom

N25-245 **The Control and Monitor Interface of the Trigger Board for the Daya Bay Neutrino Experiment**
X. Wang[1,2], H. Gong[1], Y. C. Lin[1], G. H. Gong[1], S. M. Chen[1], B. B. Shao[1]
[1]Tsinghua University, China; [2]National University of Defense Technology, China

N25-246 **The ATLAS RPC ROD for Super LHC**
V. Izzo[1], A. Aloisio[1,2], L. Capasso[1,2], F. Cevenini[1,2], M. Della Pietra[3], R. Giordano[1,2]
[1]Istituto Nazionale di Fisica Nucleare, Italy; [2]Universita' di Napoli FEDERICO II, Italy; [3]Universita' di Napoli PARTHENOPE, Italy

N25-247 **A Multi-Channel Digital Acquisition System for Nuclear Spectroscopy Experiments**
S. Riboldi, A. Pullia, F. Camera, *Universita' degli Studi di Milano, Italy*; F. Zocca, *INFN - Milano, Italy*; C. Ur, R. Isocrate, D. Bazzacco, *INFN - Padova, Italy*

N25-248 **A Receiver System for the TileCal Muon Signals**
T. Ciodaro Xavier, *COPPE/UFRJ, Brazil*
On behalf of the ATLAS Tile calorimeter system

N25-249 **SODA: Time Ditrsibution System for the PANDA Experiment**
I. V. Konorov, H. Angerer, A. Mann, S. Paul
Technical University of Munich, Germany

N25-250 **Associative Memory Design for Fast Tracker at LHC**
L. Sartori, *INFN, Italy*

N25-251 **A Compact PET Detector Readout Using Charge-to-Time Conversion**
M. Streun, H. Larue, C. Parl, K. Ziemons
Forschungszentrum Julich, Germany

N25-252 **An Advanced FPGA Based Phase-Lock-Loop System as an Alternative Solution for the XFEL Timing System**
A. Hidvegi[1], P. Gessler[2], K. Rehlich[2], C. Bohm[1]
[1]Stockholm University, Sweden; [2]Deutsches Elektronen-Synchrotron (DESY), Germany

N25-253 **Performance of the Next Timing and Triggering System Prototype for the XFEL Project**
A. Hidvegi[1], P. Gessler[2], K. Rehlich[2], C. Bohm[1]
[1]Stockholm University, Sweden; [2]Deutsches Elektronen-Synchrotron, Germany

N25-254 **A Fast Hardware Tracker for the ATLAS Trigger System**
M. Neubauer, *University of Illinois at Urbana-Champaign, USA*
On behalf of the ATLAS Collaboration

N26 Gamma-Ray Imaging II

Wednesday, Oct. 28 13:30-15:30 Grand Ballroom 2

Session Chairs: **Peter E. Vanier**, Brookhaven National Laboratory, USA
Paul A. Hausladen, Oak Ridge National Laboratory, USA

N26-1 **Factors Influencing Time Resolution of Scintillators and Ways to Improve Them**
P. R. Lecoq, *CERN, Switzerland*

N26-2 **A Gamma Camera with the Useful Field of View Coincident with the Crystal Area**
V. Orsolini Cencelli, F. de Notaristefani, A. Fabbri, F. Petulla', E. D'Abramo, R. Pani, M. N. Cinti, P. Bennati, P. Boccaccio, G. Moschini, N. Lanconelli, F. Navarria
INFN, Italy

N26-3 **First Results of the HICAM Anger Camera**
C. Fiorini[1,2], P. Busca[1], A. Gola[1,2], R. Peloso[1,2], A. Longoni[1,2], P. Lechner[3], B. Hutton[4], P. Van Mullekom[5], A. Pedretti[6], G. Poli[7], G. Lucignani[8]
[1]Politecnico di Milano, Italy; [2]INFN, Italy; [3]MPI, Italy; [4]UCL, UK; [5]Nuclear Fields Holland, Netherlands; [6]L'ACN, Italy; [7]Ospedali Riuniti di Bergamo, Italy; [8]Universita' degli Studi di Milano, Italy

N26-4 **Three Dimensional Imaging of Hidden Objects Using Positron Emission Backscatter**
D. Lee, L. C. Stonehill, M. S. Wallace, Q. Looker, M. Cowee, M. Galassi, E. Fenimore, W. V. McNeil
Los Alamos National Laboratory, USA

N26-5 **Interpretation of Pixel-by-Pixel Spectra for Gamma-Ray Imaging Systems**
M. A. Blackston, D. E. Hornback, J. A. Mullens, K.-P. Ziock
Oak Ridge National Laboratory, USA

N26-6 Extended Source Imaging Using a Single Rotating Modulation Collimator
B. R. Kowash, *Air Force Institute of Technology, USA*; D. K. Wehe, *University of Michigan, USA*

N26-7 Experimental Demonstration of 4π Coded Aperture Imaging with 3-D Position-Sensitive CdZnTe Detectors
S. Joshi Kaye, W. R. Kaye, Z. He
University of Michigan, USA

N27 Analog and Digital Circuits III

Wednesday, Oct. 28 13:30-15:30 Grand Ballroom 3

Session Chairs: **Lorenzo Fabris**, ORNL, USA
Gian-Franco Dalla Betta, University of Trento, Italy

N27-1 Vertically Integrated Circuits at Fermilab
G. W. Deptuch, J. Hoff, A. Shenai, M. Trimpl, R. Yarema, T. Zimmerman
Fermi National Accelerator Laboratory, USA

N27-2 A New Dynamic Time over Threshold Method
K. Shimazoe, H. Takahashi, T. Fujiwara, *The University of Tokyo, Japan*; T. Furumiya, J. Ohi, Y. Kumazawa, *Shimadzu Corporation, Japan*

N27-3 Extending the Dynamic Range of a Charge-Preamplifier Far Beyond Its Saturation Limit: a 0.35µm CMOS Preamplifier for Germanium Detectors
A. Pullia[1,2], F. Zocca[2]
[1]University of Milano, Italy; [2]INFN-Milano, Italy

N27-4 AIDA : a 16-Channel Amplifier ASIC to Read Out the Advanced Implantation Detector Array for Experiments in Nuclear Decay Spectroscopy
D. Braga, S. Thomas
STFC Rutherford Appleton Laboratory, UK

N27-5 A 40 GS/s Sampler Chip in 130nm CMOS Technology
J.-F. C. Genat, M. Bogdan, H. J. Frisch, M. Heintz, F. Tang, *University of Chicago, USA*; G. S. Varner, *University of Hawaii, USA*; H. Grabas, *Ecole Superieure d'Electricite, France*

N27-6 Effect of Wire Resistance on Readout Noise for Large Liquid Argon Time Projection Chambers
S. Rescia, V. Radeka, *Brookhaven National Laboratory, USA*

N27-7 FREDA: a Programmable Mixed Signal ASIC for Gas Micro-Strip Detectors Having a Wide Range of Input Capacitance
F. F. Khalid, L. L. Jones, Q. R. Morrissey, M. L. Prydderch, J. Lipp, R. Stephenson
Rutherford Appleton Laboratory, STFC, United Kingdom

N28 Photodetectors and Scintillation Detectors II

Wednesday, Oct. 28 13:30-15:30 Grand Ballroom 7

Session Chairs: **Nerine Cherepy**, Lawrence Livermore National Laboratory, USA
Henric S. Krawczynski, Washington University in St. Louis, USA

N28-1 SiPM Performance in PET Applications: an Experimental and Theoretical Analysis
D. Henseler, *Siemens AG, Germany*; R. Grazioso, N. Zhang, M. Schmand, *Siemens Medical Solutions, USA*

N28-2 Pr:Lu3Al5O12 (LuAG) Scintillator Read-Out Using UV-Enhanced Avalanche Photodiode.
K. Kamada[1], T. Yanagida[2], J. Kataoka[3], A. Yoshikawa[2], H. Takahashi[4], K. Tsutsumi[1], T. Endo[1], Y. Usuki[1]
[1]Furukawa Co., Ltd., Japan; [2]Tohoku University, Japan; [3]Waseda University, Japan; [4]Tokyo University, Japan

N28-3 Efficiency of Solid State Photomultipliers in Photon Number Resolution
S. Vinogradov, T. Vinogradova, V. Shubin, D. Shushakov, K. Sitarsky
Amplification Technologies, USA

N28-4 Production of Large Area Silicon Photomultipliers for a PET/MR Scanner
C. Piemonte, M. Melchiorri, A. Piazza, A. Tarolli, N. Zorzi, *FBK, Italy*; V. Schulz, T. Solf, *Philips Research, Germany*; P. Fischer, *University of Heidelberg, Germany*

N28-5 The Digital Silicon Photomultiplier - Principle of Operation and Intrinsic Detector Performance
T. Frach, G. Prescher, C. Degenhardt, R. de Gruyter, A. Schmitz, R. Ballizany
Philips Corporate Technologies, Germany

N28-6 The Vacuum Silicon Photomultiplier Tube (VSiPMT): a New Concept of Photon Detector. First Feasibility Results.
S. Russo, G. Barbarino, *Universita' Federico II di Napoli, Italy*; R. de Asmundis, G. De Rosa, *INFN sez. di Napoli, Italy*

N28-7 Squaraine-Based Organic Photodetector Coupled to a CsI(Tl) Scintillator for Gamma-Ray Detection
M. Binda[1], C. Fiorini[1,2], D. Natali[1], R. Peloso[1,2], M. Sampietro[1], L. Beverina[3], G. Pagani[3]
[1]Politecnico di Milano, Italy; [2]INFN, Italy; [3]Universita' degli Studi Milano Bicocca, Italy

N29 New Detector Concepts and Instrumentation III

Wednesday, Oct. 28 16:00-18:00 Grand Ballroom 1

Session Chairs: **Robert Runkle**, DOE NA-22, USA
Nathaniel Bowden, LLNL, USA

N29-1 Active Coded Aperture Neutron Imaging
P. A. Marleau, J. Brennan, E. Brubaker, J. Steele
Sandia National Laboratories, USA

N29-2 Novel Fast Neutron Counting Technology for Efficient Detection of Special Nuclear Materials
N. T. Sullivan, D. R. Beaulieu, D. Gorelikov, H. Klotzsch, P. de Rouffignac, K. Saadatmand, K. Stenton, A. Tremsin
arradiance inc, usa

N29-3 Nano-Fission Detector Program at LANL
E. Esch, S. Stange, F. Tovesson, R. Muenchausen, R. Del Sesto, F. Taw
LANL, USA

N29-4 Neutron Detection Using Gd-Doped HfO2/Silicon Heterojunctions
J. W. McClory, B. D. Blasy, D. Schultz, J. C. Petrosky, *Air Force Institute of Technology, USA*; J. Tang, Z. Wang, *University of Wyoming-Laramie, USA*; J. I. Brand, P. A. Dowben, *University of Nebraska-Lincoln, USA*

N29-5 Lithium Tantalate Crystals for a Solid State Thermal Neutron Detectors
K. D. Ianakiev[1], J. R. Lashley[1], M. R. Swinhoe[1], R. M. Flemming[2], A. Armstrong[2], P. B. Littlewood[3], L. L. Smith[1], C. P. Opeil[4]
[1]Los Alamos National Laboratory, USA; [2]Sandia National Laboratory, USA; [3]Cambridge Univercity, UK; [4]Boston College, USA

N29-6 New Neutron Detectors Based on Inorganic Scintillators Using Inelastic Scattering
V. D. Ryzhikov, G. M. Onishchenko, L. A. Piven, B. V. Grinyov, S. M. Galkin, E. F. Voronkin, O. K. Lysetska, L. L. Nagornay, *Institute of Scintillation Materials of STC "Institute for Single Crystals", NAS of Ukraine, Ukraine*; T. Pochet, *2International Atomic Energy Agency, Austria*; C. F. Smith, *3Lawrence Livermore National Laboratory, USA*

N29-7 Gd-Bearing Composite Scintillators as the New Thermal Neutron Detectors
N. Z. Galunov, B. V. Grinyov, N. L. Karavaeva, Y. V. Gerasymov, O. T. Sidletskiy, O. A. Tarasenko
Institute for Scintillation Materials, National Ac.Science of Ukraine, Ukraine

N30 Accelerators and Beam Line Instrumentation

Wednesday, Oct. 28 16:00-18:00 Grand Ballroom 2

Session Chairs: **Christoph Ilgner**, CERN, Switzerland
Stephan Friedrich, Lawrence Livermore National Laboratory, USA

N30-1 D-D Nuclear Fusion Using Different Sized Pyroelectric Crystals
A. M. Kovanen, D. J. Gillich, Y. Danon
Rensselaer Polytechnic Institute, USA

N30-2 Beam Loss Monitors for FEL Using Optical Fiber
F. Wulf[1], M. Koerfer[2], H.-J. Grabosch[2], W. Goettmann[1]
[1]Helmholtz-Zentrum Berlin fuer Materialien und Energie, Germany; [2]DESY, Germany

N30-3 Monte Carlo Characterization of a Pulsed Laser-Wakefield Driven Monochromatic X-Ray Source
S. D. Clarke, S. A. Pozzi, *University of Michigan, USA*; N. Cunningham, S. Banerjee, D. Umstadter, *University of Nebraska, USA*

N30-4 First Total Energy Measurements at the LCLS Free Electron X-Ray Laser with a Cryogenic Manganite Bolometer
S. Friedrich[1], O. B. Drury[1], M. A. McKernan[1], C. S. Gardner[1], E. Ables[1], K. W. Fong[1], G. J. Yong[2], R. M. Kolagani[2], R. M. Bionta[1]
[1]Lawrence Livermore National Laboratory, USA; [2]Towson University, USA

N30-5 Baseline Design of the Hall D Polarized Photon Beam
J. Stewart, *BNL, USA*
On behalf of the GlueX Collaboration

N30-6 1024-Channel Solid State 1-D Pixel Array for Small Angle Neutron Scattering
W. J. McNeil[1], S. L. Bellinger[1], B. J. Blalock[2], C. L. Britton[2], W. L. Dunn[1], C. M. Henderson[1], T. J. Sobering[3], D. S. McGregor[1]
[1]Kansas State University, S.M.A.R.T. Lab, USA; [2]University of Tennessee, USA; [3]Kansas State University, Electronic Design Laboratory, USA

N30-7 The ATLAS Beam Diagnostic Systems
M. Mikuz, *Univ. Ljubljana / Jozef Stefan Institute, Slovenia*
On behalf of the ATLAS Beam Conditions Monitor

N31 Semiconductor Detectors III: CZT Detectors

Wednesday, Oct. 28 16:00-18:00 Grand Ballroom 3

Session Chairs: **Robert D. McLaren**, Consultant, USA
Martine C. Duff, Savannah River National Lab,

N31-1 (invited) Performance of Cadmium Zinc Telluride Pixel Detectors Developed for the NuSTAR Mission
F. A. Harrison, W. R. Cook, H. Miyasaka, R. McLean, V. Rana, V. Bhalereo
Caltech, USA

N31-2 Systematic Study of the Energy Resolution and Detection Efficiency of Thick CZT Detectors as a Function of Substrate Thickness and Pixel Pitch
Q. Li[1], A. I. Garson[1], M. Beilicke[1], K. Lee[1], P. Dowkontt[1], J. Martin[1], I. Jung[2], M. Groza[3], A. Burger[3], G. D. Geronimo[4], H. Krawczynski[1]
[1]Washington University in St. Louis, usa; [2]Universitt Erlangen-Nrnberg, Germany; [3]Fisk University, usa; [4]Brookhaven National Laboratory, usa

N31-3 Performance of 3-D Position Sensitive CdZnTe Detectors at Gammay-Ray Energies Higher than 1.0 MeV
F. Zhang, Z. He, W. R. Kaye
The University of Michigan, USA

N31-4 CdZnTe Material and Detectors Characterization Using Synchrotron Radiation
G. S. Camarda[1], A. E. Bolotnikov[1], Y. Cui[1], A. Hossain[1], K. Kim[1], R. Gul[1], G. Yang[1], S. Awadalla[2], J. McKenzie[2], H. Chen[2], R. B. James[1]
[1]Brookhaven National Lab, USA; [2]Redlen Technologies, Canada

N31-5 Investigation of Polarisation Phenomena in CdZnTe Materials to Be Used as X-Ray Radiation Detectors by Direct Implementation of the Electric Field Distribution Profiles at Low Temperature and under in Situ X-Ray Irradiation.
G. Prekas, P. Veeramani, A. Lohstroh, P. J. Sellin
UNIVERSITY OF SURREY, UK

N31-6 Effect of Crystal Length on Frisch Collar Device Performance
A. Kargar, *Kansas State University, USA*
On behalf of the S.M.A.R.T. Laboratory, Kansas State University

N31-7 Optimization of Large CZT Ring Detectors
V. V. Gostilo[1], A. Kozorezov[2], V. Ivanov[3], A. Bulycheva[1], A. Owens[4]
[1]Bruker Baltic, Latvia; [2]University of Lancaster, UK; [3]RITEC, Latvia; [4]ESA/ESTEC, Netherlands

N32 Radiation Damage Effects II: Scintillators

Wednesday, Oct. 28 16:00-18:00 Grand Ballroom 7

Session Chair: **Ren-yuan Zhu**, California Institute of Technology, USA

N32-1 The Radiation Hardness Test on CsI(Tl)
T. Hu, *Institute of High Energy Physics, China*
On behalf of the BESIII Collaboration

N32-2 **Limitations of the Performance of PWO-II Crystals Due to Radiation Damage**
R. W. Novotny[1], W. M. Doering[1], D. Valery[1], A. Hofstaetter[1], M. Korjik[2], T. Kuske[1], S. Lugert[1], O. Missevitch[2]
[1]University Giessen, Germany; [2]Belarus State University, Belarus

N32-3 **Studies of Cerium Fluoride, LYSO and Lead Tungstate Crystals Exposed to High Hadron Fluences**
F. Nessi-Tedaldi, G. Dissertori, P. Lecomte, D. Luckey, F. Pauss
ETH Zurich, Switzerland

N32-4 **Neutron Induced Radiation Damage Effect in Various Crystal Scintillators of Large Size**
L. Zhang, R. Mao, R.-Y. Zhu
California Institute of Technology, USA

N32-5 **Gamma Ray Induced Radiation Damages in LSO/LYSO and PWO**
R. Mao, L. Zhang, R.-Y. Zhu
California Institute of Technology, USA

N32-6 **Measurement of Radiation Hardness of PET Components**
F. Fiedler[1], H. Braess[2], W. Enghardt[1,3]
[1]Forschungszentrum Dresden-Rossendorf, Germany; [2]Siemens Medical Solutions, Germany; [3]TU Dresden, Germany

N33 Computing and Software for Experiments IV: Software for Experimental Applications

Thursday, Oct. 29 08:00-10:00 Grand Ballroom 1

Session Chairs: **Gabriela Hoff**, Pontifical Catholic University in Rio Grande do Sul, Brazil
Maria Grazia Pia, INFN Genova, Italy, Italy

N33-1 **LUXSim: a Component-Centric Approach to Event Generation and Recording for Low-Background Simulations**
K. Kazkaz, *LLNL, USA*
On behalf of the LUX Collaboration

N33-2 **COSIMA - a Simulation Tool for Hard X-Ray and Gamma-Ray Telescopes Based on Geant4**
A. Zoglauer[1], G. Weidenspointner[2,3], C. B. Wunderer[1], S. E. Boggs[1], M. G. Pia[4]
[1]University of California at Berkeley, USA; [2]Max-Planck-Institut fuer extraterrestrische Physik, Germany; [3]MPI Halbleiterlabor, Germany; [4]INFN Genova, Italy

N33-3 **Progress with Geant4-based Radioactive Decay Simulation Using the Example of Simbol-X and the IXO WFI and HTRS**
S. Hauf[1], M. Kuster[1], M. G. Pia[2,3], L. Strueder[4,5], G. Weidenspointner[4], A. Zoglauer[6], E. Kendziorra[7], C. Tenzer[7], R. Chipaux[8], L. Philippe[8], V. Fioretti[6], U. Briel[5]
[1]TU Darmstadt, Germany; [2]European Organization for Nuclear Research (CERN), Switzerland; [3]INFN, Sezione di Genova, Italy; [4]MPI, Germany; [5]Max-Planck-Institut fr extraterrestrische Physik, Germany; [6]Instituto di Astrofisica Spaziale e Fisica Cosmica -- IASF, INAF, Italy; [7]Institut f\, Germany; [8]CEA/DSM/IRFU, Centre de Saclay, France

N33-4 **Recent Developments on PIXE Simulation with Geant4**
M. G. Pia[1], G. Weidenspointner[2], M. Augelli[3], L. Quintieri[4], P. Saracco[1], M. Sudhakar[1], A. Zoglauer[5]
[1]INFN Genova, Italy, Italy; [2]MPI-MPE, Germany; [3]CNES, France; [4]INFN LNF, Italy; [5]University of California at Berkeley, USA

N33-5 **Modelling the Generation and Dynamics of Signal Electrons in Pixellized Si X-Ray Detectors**
G. Weidenspointner, N. Kimmel, R. Andritschke, N. Meidinger, L. Strueder, *MPI Halbleiterlabor, Germany*; R. Hartmann, *PNSensor GmBH, Germany*; R. Richter, *MPI for Physics, Germany*; A. Zoglauer, *UC Berkeley, USA*

N33-6 **Feasibility Study of a Neutron Source at the Dafne Beam Test Facility Using Monte Carlo Codes**
L. Quintieri, R. Bedogni, B. Buonomo, A. Esposito, G. Mazzitelli, *Istituto Nazionale di Fisica Nucleare- LNF, Italy*; P. Valente, *INFN Roma Universit la Sapienza, Italy*

N33-7 **Design and Implementation of a Radiation Portal Monitor Multi-Lane Simulator**
A. D. McKinnon, R. B. Bass, M. S. Elder, M. L. Johnson
Pacific Northwest National Laboratory, USA

N34 High Energy Physics Instrumentation II

Thursday, Oct. 29 08:00-10:00 Grand Ballroom 2

Session Chairs: **Archana Sharma**, CERN, Switzerland
Chris Kenney, SLAC National Accelerator Laboratory, USA

N34-1 **The TOTEM Detector at LHC**
E. Radermacher, *CERN, Switzerland*
On behalf of the TOTEM Collaboration

N34-2 **Beam Tests of DEPFET Active Pixel Detector Prototypes**
M. A. Vos, *IFIC Valencia (centre mixte U. Valencia/CSIC), Spain*
On behalf of the DEPFET collaboration

N34-3 **Serial Powering for Silicon Tracking at the Super-LHC**
M. M. Weber, *Rutherford Appleton Laboratory, UK*

N34-4 **Development of Serial Powering for the Upgrade of the ATLAS Pixel Detector**
F. Huegging, D. Arutinov, M. Barbero, A. Eyring, L. Gonella, M. Karagounis, H. Krueger, N. Wermes
University of Bonn, Germany

N34-5 **Commercial-off-the-Shelf DC-DC Converters for High Energy Physics Detectors for the sLHC Upgrade**
S. K. Dhawan[1], O. K. Baker[1], H. Chen[2], R. Ramesh[3], J. Kierstead[2], F. Lanni[2], D. Lynn[2], A. Mincer[4], C. Musso[4], S. Rescia[2], H. Smith[1], P. L. Tipton[1]
[1]Yale University, United States; [2]Brookhaven National Laboratory, United States; [3]National Semiconductor Corp, United States; [4]New York University, United States

N34-6 **Diamond Detectors for Radiation and Luminosity Measurements in CMS**
M. S. Hollingsworth, *University of Tennessee - Knoxville, USA*
On behalf of the CMS BRM collaboration

N34-7 **The ATLAS Muon Spectrometer**
J. Dubbert, *Max-Planck-Institut fuer Physik, Germany*
On behalf of the ATLAS Muon Collaboration

N35 Astrophysics and Space Instrumentation I: Component development

Thursday, Oct. 29 08:00-10:00 Grand Ballroom 3

Session Chair: **Mark Pearce**, Kungl Tekniska Högskolan, KTH, Sweden

N35-1 Performance of the Hybrid Photon Detector Cluster for MAGIC-II
R. Orito, *Max Planck Institute, Germany*
On behalf of the MAGIC collaboration

N35-2 A Novel G-APD Based Camera for Imaging Air Cherenkov Telescopes: Concept, Realization and First Tests
M. Rissi, *ETH Institute for Particle Physics, Switzerland*
On behalf of the FACT collaboration

N35-3 The Direct Measurement of the Signal Charge Behavior beyond 10keV in CCDs with Subpixel Resolution
J. S. Hiraga, *RIKEN, Japan*; S. Nakamura, K. Miyamoto, H. Katakura, Y. Katada, H. Kawano, Y. Torigoe, K. Fujii, *Yokohama National University, Japan*; H. Tawara, *High Energy Accelerator Research Organizatio, Japan*

N35-4 Performance of the DEPFET Macropixel Based Focal Plane Detectors for the MIXS Instrument on BepiColombo
J. Treis[1], P. Lechner[2], L. Andricek[3], F. Aschauer[4], K. Heinzinger[2], S. Herrmann[4], T. Lauf[4], P. Majewski[2], G. Lutz[2], R. H. Richter[3], M. Porro[4], G. Schaller[4], M. Schnecke[3], F. Schopper[4], H. Soltau[2], L. Strder[4], G. deVita[4]
[1]Max-Planck-Institute for Solar System Research, Germany; [2]pnSensor GmbH, Germany; [3]Max-Planck-Institute for Physics, Germany; [4]Max-Planck-Institute for Extraterrestrial Physics, Germany

N35-5 Solar Intensity X-Ray Spectrometer (SIXS) ASIC Onboard the ESA BepiColombo Mission to Mercury
F. F. Khalid[1], M. L. Prydderch[1], Q. R. Morrissey[1], P. Seller[1], E. Valtonen[2,3], J. Peltonen[2], M. Syrjsuo[4], R. Vainio[5], J. Huovelin[5]
[1]Rutherford Appleton Laboratory, STFC, United Kingdom; [2]Aboa Space Research Oy, Finland; [3]University of Turku, Finland; [4]Finnish Meteorological Institute, Finland; [5]University of Helsinki, Finland

N35-6 Development of the ECLAIRs Camera, a 6400 CdTe Array for X/Gamma detection
K. Lacombe[1], N. Remoue[1], C. Amoros[1], D. Barret[1], O. Gevin[2], O. Godet[1], J. Lande[1], E. Lecomte[1], O. Limousin[2], F. Lugiez[2], P. Mandrou[1], J. Narbonne[1], R. Pons[1], D. Rambaud[1], P. Ramon[1], G. Rouaix[1]
[1]CNRS-CESR, FRANCE; [2]CEA-IRFU, FRANCE

N35-7 Study on a Phoswich Detector Consisting of Li-Composed Crystal Scintillator and BGO for Neutron Measurement
H. Takahashi, M. Matsuoka, T. Mizuno, Y. Fukazawa, *Hiroshima University, Japan*; T. Yanagida, Y. Yokota, A. Yoshikawa, *IMRAM, Tohoku University, Japan*; N. Kawaguchi, S. Ishizu, K. Fukuda, *Tokuyama Corporation, Japan*

N36 Nuclear Physics Instrumentation II

Thursday, Oct. 29 08:00-10:00 Grand Ballroom 7

Session Chair: **Craig L. Woody**, Brookhaven National Lab, USA

N36-1 Characteristics of CMOS Avalanche Photodiodes at Cryogenic Temperatures
E. B. Johnson[1], R. Miskimen[2], C. J. Stapels[1], S. Mukhopadhyay[1], J. F. Christian[1]
[1]Radiation Monitoring Devices, Inc., USA; [2]Univ. of Massachusetts, USA

N36-2 Angular Correlation Measurements with Novel, Position-Sensitive Alpha and Gamma Detectors
S. Lakshmi[1], P. Chowdhury[1], C. J. Lister[2], S. K. Tandel[1], S. Gros[2], R. Farell[3], M. McClish[3], K. S. Shah[3]
[1]University of Massachusetts Lowell, USA; [2]Argonne National Laboratory, USA; [3]Radiation Monitoring Devices, Inc., USA

N36-3 A Low Background Frame-Store PN-CCD Detector for CAST
M. Kuster[1,2], R. Hartmann[3], D. H. H. Hoffmann[1], P. Lang[1], H. Braeuninger[2], H. Fischer[4], I. Irastorza[5], K. Koenigsmann[4], R. Kotthaus[6], G. Lutz[3], J. Morales[5], A. Nordt[7], J.-F. Poncet[7], B. Riffaud[7], J. Ruz[5], L. Strueder[8,2], J. Vogel[4], H. Gorke[9]
[1]TU Darmstadt, Germany; [2]Max-Planck-Institut fuer extraterrestrische Physik, Germany; [3]PNSensor GmbH, Germany; [4]Universitaet Freiburg, Germany; [5]Universidad de Zaragoza, Spain; [6]Max-Planck-Institut fuer Physik, Germany; [7]European Organization for Nuclear Research (CERN), Switzerland; [8]MPI Halbleiterlabor, Germany; [9]Forschungszentrum Juelich, Germany

N36-4 Efficiency Calibration of a 4π Sum-Spin Spectrometer Using GEANT4
A. K. Gourishetty, I. Mazumdar, D. A. Gothe
Tata Institute of Fundamental Research, India

N36-5 Improvement of HPGe Detectors Timing Using Pulse Shape Analysis
F. C. L. Crespi[1], V. Vandone[1], S. Brambilla[2], F. Camera[1], B. Million[2], S. Riboldi[1], M. Sassi[2], O. Wieland[2]
[1]Universityof Milan / INFN Milan, Italy; [2]INFN sez. of Milan, Italy

N36-6 Electronics for the MINERvA Experiment
P. Rubinov, *Fermi National Accelerator Laboratory, USA*
On behalf of the Minerva Collaboration

N36-7 Features and Final Test Results of the EXPADES Apparatus
M. Romoli, *Istituto Nazionale Fisica Nucleare, Italy*
On behalf of the EXOTIC Collaboration

N37 Astrophysics and Space Instrumentation II: Instruments

Thursday, Oct. 29 10:30-12:00 Grand Ballroom 1

Session Chair: **William Craig**, UC Berkeley, USA

N37-1 (invited) The Dark Energy Camera - a New Instrument for the Dark Energy Survey
K. Honscheid, *Ohio State University, USA*
On behalf of the DES Collaboration

N37-2 Precision Studies of Cosmic Rays with the PAMELA Satellite Experiment.
M. Pearce, *The Royal Institute of Technology, KTH, Sweden*
On behalf of the PAMELA Collaboration

N37-3 The Spring 2009 Balloon Flight of the Nuclear Compton Telescope
M. S. Bandstra, E. C. Bellm, S. E. Boggs, D. Perez-Becker, C. B. Wunderer, A. Zoglauer, *UC Berkeley Space Sciences Laboratory,*

USA; M. Amman, P. N. Luke, *Lawrence Berkeley National Laboratory, USA*; H.-K. Chang, J.-L. Chiu, J.-S. Liang, *National Tsing Hua University, Taiwan*; Y.-H. Chang, W.-C. Hung, Z.-K. Liu, *National Central University, Taiwan*; C.-H. Lin, *National Space Organization (NSPO), Taiwan*; M. A. Huang, *National United University, Taiwan*; P. Jean, *Centre d'Etude Spatiale des Rayonnements, France*

N37-4 The Soft Gamma-Ray Detector for the ASTRO-H Mission

T. Tanaka[1], Y. Fukazawa[2], J. Kataoka[3], M. Kokubun[4], G. Madejski[1], K. Makishima[5], T. Mizuno[2], K. Nakazawa[5], R. Sato[4], H. Tajima[1], T. Takahashi[4], M. Tashiro[6], Y. Terada[6], S. Watanabe[4], K. Yamaoka[7]
[1]Stanford University, USA; [2]Hiroshima University, Japan; [3]Waseda University, Japan; [4]ISAS/JAXA, Japan; [5]University of Tokyo, Japan; [6]Saitama University, Japan; [7]Aoyama Gakuin University, Japan

N37-5 The Advanced Gamma-Ray Imaging System (AGIS)

A. N. Otte, *University of California in Santa Cruz, USA*
On behalf of the AGIS collaboration

N38 Synchrotron Radiation Instrumentation

Thursday, Oct. 29 10:30-12:00 Grand Ballroom 2

Session Chairs: **Paul O'Connor**, BNL, USA
Chris Kenney, SLAC, USA

N38-1 A High Frame Rate X-Ray Camera for Synchrotron Applications

C. J. Kenney[1], A. C. Thompson[2], J. Hasi[3], D. Gnani[4], S. I. Parker[5], E. Mandelli[4], G. Meddeler[4], E. Westbrook[2]
[1]SLAC National Accelerator Laboratory, USA; [2]Molecular Biology Consortium, USA; [3]Manchester University, UK; [4]Lawrence Berkely National Laboratory, USA; [5]University of Hawaii, USA

N38-2 Synchrotron Tests of 3D Medipix2 and TimePix X-Ray Detectors

R. L. Bates[1], D. Pennicard[1], J. Marchal[2], C. Fleta[3], G. Pellegrini[3], M. Lozano[3], C. Parkes[1], N. Tartoni[2], D. Barnett[2], I. Dolbny[2], K. Sawhney[2], V. O'Shea[1], A. MacRaighne[1], D. Maneuski[1], V. Wright[4]
[1]Physics and Astronomy, The University of Glasgow, UK; [2]Diamond Light Source Ltd,, UK; [3]Instituto de Microelectronica de Barcelona, Spain; [4]Science and Technology Facilities Council, UK

N38-3 The Dynamic Capabilities of the Pilatus II Hybrid Pixel Detector

R. P. Rassool, B. Sobott, D. Peake, V. Lee, A. Schubert, *University of Melbourne, Australia*; M. J. Boland, N. Kirby, A. Hawley, *Australian Synchrotron, Australia*

N38-4 The XAMPS Detector for the XPP Instrument at LCLS

G. A. Carini[1], A. Dragone[2], W. Chen[1], J. Fried[1], A. Kuczewski[1], Z. Li[1], J. Mead[1], P. O'Connor[1], P. Rehak[1], K. Wolniewicz[1], D. P. Siddons[1], J.-F. Pratte[3]
[1]Brookhaven National Laboratory, USA; [2]SLAC National Accelerator Center, USA; [3]Universite' de Shrerbrooke, Canada

N38-5 Charge Collection and Propagation in Diamond X-Ray Detectors

J. W. Keister, J. Smedley, T. Rao, E. Muller, E. Wang, X. Chang, Q. Wu, I. Ben-Zvi, *Brookhaven National Lab, USA*; J. Distel, *Los Alamos National Lab, USA*; D. Dimitrov, R. Busby, *Tech-X, USA*

N39 Computing and Software for Experiments V: Bio-medical Software

Thursday, Oct. 29 10:30-12:30 Grand Ballroom 3

Session Chairs: **Lina Quintieri**, INFN- LNF, Italy
Maria Grazia Pia, INFN Genova, Italy

N39-1 The MAGIC-5 CAD for Nodule Detection in Low Dose and Thin Slice Lung CT

P. Cerello[1], F. Bagagli[1,2], R. Bellotti[3,1], L. Bolanos[1,4], P. Bosco[1,5], N. Camarlinghi[1,2], C. Carpentieri[1,2], R. Cataldo[6,1], E. Catanzariti[7,1], S. C. Cheran[1], A. Chincarini[1], F. De Carlo[3,1], I. De Mitri[6,1], G. De Nunzio[6,1], M. E. Fantacci[1,2], E. Fiorina[5], G. Gargano[3,1], G. Gemme[1], I. Gori[2,8], E. Lopez Torres[4], A. Massafra[6,1], R. Megna[3,1], M. Quarta[6,1], A. Retico[1], S. Tangaro[1]
[1]INFN, Italy; [2]University of Pisa, Italy; [3]University of Bari, Italy; [4]CEADEN, Cuba; [5]Univeristy of Torino, Italy; [6]University of Salento, Italy; [7]University of Napoli, Italy; [8]BRACCO Imaging, Italy

N39-2 Visualization for Volume Data Scored by Geant4 Simulation

A. Kimura, *Ashikaga Institute of Technology, Japan*; S. Tanaka, K. Hasegawa, *Ritsumeikan University, Japan*; T. Sasaki, *High Energy Accelerator Research Organization, Japan*

N39-3 Monte Carlo Study of Glandular Dose Distribution on Radiological Procedures for Woman Who has Breast Silicone Implant

V. F. Cassola, *Federal University of Pernambuco, Brazil*; G. Hoff, *Pontifical Catholic University in Rio Grande do Sul, Brazil*

N39-4 Pencil Beam Algorithm on the Geant4 Based Simulation Framework and Verification of the Dose Distributions for Proton Therapy

T. Aso, *Toyama National College of Maritime Technology, Japan*; T. Yamashita, T. Akagi, *Hyogo Ion Beam Medical Center, Japan*; T. Sasaki, *High Energy Accelerator Research Organization, Japan*

N39-5 Optimization of Electron Dose Kernels in Heterogeneous Voxelized Phantoms

M. Huang[1], G. E. Sjoden[1], A. K. Al-Basheer[2], M. Ghita[1], W. Bolch[1]
[1]University of Florida, U.S.A.; [2]Medical College of Georgia, U.S.A.

N39-6 The Effect of Beam Polarization in Microbeam Radiation Therapy (MRT): Monte Carlo Simulations Using Geant4

J. Spiga[1,2,3], Y. Prezado[1], E. Bruer-Krisch[1], V. Fanti[2], P. Randaccio[2], A. Bravin[1]
[1]European Synchrotron Radiation Facility (ESRF), France; [2]University and INFN of Cagliari, Italy; [3]University of East Anglia, United Kingdom

N39-7 Re-Engineering a Nanodosimetry Monte Carlo Code into Geant4: Software Design and First Results

M. G. Pia, *INFN Genova, Italy, Italy*; E. Gargioni, *University Medical Center Hamburg-Eppendorf, Germany*; B. Grosswendt, *PTB, Germany*; R. Schulte, A. Wroe, *Loma Linda University, USA*; M. Begalli, *State University, Brazil*; P. Queiroz, D. de Souza Santos, *IRD, Brazil*

N40 Photodetectors and Scintillation Detectors III

Thursday, Oct. 29 13:30-15:30 Grand Ballroom 1

Session Chairs: **Henric S. Krawczynski**, Washington University in St. Louis, USA
Nerine Cherepy, LLNL, USA

N40-1 Tha NA62 RICH Detector
M. Lenti, *INFN - Sezione di Firenze, Italy*
On behalf of the NA62 Collaboration

N40-2 Search for Scintillation in Doped Lead Fluoride Crystal
R. Mao, L. Zhang, R.-Y. Zhu
California Institute of Technology, USA

N40-3 (invited) Development of Large Aperture Hybrid Avalanche Photo-Detector
T. Abe, H. Aihara, *University of Tokyo, Japan*; M. Tanaka, *High Energy Accelerator Research Organization, Japan*; Y. Kawai, H. Kyushima, M. Suyama, *Hamamatsu Photonics K.K., Japan*

N40-4 An 18 Element Strip of 1-mm2 G-APDs for CMS HCAL Upgrade in a CERN Test Beam
A. H. Heering, *Boston University, US*
On behalf of the CMS HCAL collaboration

N40-5 Advanced PMTs for the CTA Project
R. Mirzoyan, *Max-Planck-Institute for Physics, Germany*
On behalf of the Focal Plane Instrumentation WP of the CTA Consortium

N40-6 MPPC Response Simulation and High Speed Readout Optimization
F. Retiere, *TRIUMF, Canada*

N40-7 Evaluation of Silicon Photomultiplier Arrays for the GlueX Barrel Calorimeter
C. Zorn, *Jefferson Laboratory, USA*
On behalf of the GlueX Collaboration

N41 Semiconductor Detectors IV: CdTe and other Wide Band Gap Materials

Thursday, Oct. 29 13:30-15:30 Grand Ballroom 2

Session Chairs: **Thomas H. Prettyman**, Planetary Science Institute, USA
Larry Franks, Consultant, USA

N41-1 (invited) High-Resolution Alpha Spectrometry with a Thin-Window Silicon Carbide Semiconductor Detector
F. H. Ruddy, *Ruddy Consulting, USA*; J. G. Seidel, *Westinghouse Electric Company, USA*; P. J. Sellin, *University of Surrey, UK*

N41-2 CdTe Semiconductors: Development and Evaluation of Pixel Detectors
M. Fiederle, A. Fauler, A. Zwerger, D. Greiffenberg, *Freiburger Materialforschungszentrum, Germany*; P. Siffert, *Eurorad SA, France*

N41-3 Recent Results of CdTe Diode Double-Sided Strip Detectors
S. Watanabe[1,2], S.-N. Ishikawa[1,2], H. Odaka[1,2], S. Saito[1,2], T. Fukuyama[1,2], S. Sugimoto[1,2], G. Sato[1], M. Kokubun[1], T. Takahashi[1,2]
[1]Japan Aerospace Exploration Agency (JAXA), Japan; [2]University of Tokyo, Japan

N41-4 Polarisation Effects in Thallium Bromide X-Ray Detectors
A. G. Kozorezov, *Lancaster University, UK*; A. Owens, F. Quarati, *European Space Agency, The Netherlands*; A. Webb, *DESY, Germany*

N41-5 Development of a Novel Energy-Resolved Photon-Counting Detector for Gamma Ray Imaging Applications
L.-J. Meng, J. W. Tan, *University of Illinois at Urbana-Champaign, USA*; K. Spartiotis, T. Schulman, *Oy AJAT Ltd, FINLAND*

N41-6 Development of Hybrid CdTe Pixel Detectors with Low-Noise Front-End ASICs
G. Sato[1], T. Kishishita[1,2], H. Ikeda[1], T. Sakumura[3], T. Takahashi[1,2]
[1]ISAS / JAXA, Japan; [2]University of Tokyo, Japan; [3]RIGAKU Co., Ltd., Japan

N41-7 Preliminary Results on the Growth of Mercuric Iodide Epitaxial Crystals for Use as Radiation Detectors
M. R. Saleno, L. van den Berg, R. D. Vigil, J. L. Baker
Constellation Technology Corp, USA

N42 Data Acquisition and Analysis Systems II

Thursday, Oct. 29 13:30-15:30 Grand Ballroom 3

Session Chairs: **John Steele**, Sandia, Livermore, USA
David Reyna, Sandia, USA

N42-1 Neutron Scattering Data Acquisition and Control Upgrades at the Lujan Center
P. S. Lewis, D. S. Barr, G. M. Cooper, K. L. Knickerbocker, A. H. Shapiro, F. R. Trouw
Los Alamos National Laboratory, USA

N42-2 GANDALF - Design of a High Resolution Transient Recorder for High Energy Physics
F. Herrmann, *University of Freiburg, Germany*
On behalf of the COMPASS Collaboration (CERN)

N42-3 The Current Performance and Upgrade Plans for the PHENIX Data Acquisition System
M. L. Purschke, *Brookhaven National Lab, USA*
On behalf of the PHENIX Collaboration

N42-4 The Universal Sampling ADC Readout System of the COMPASS Experiment
A. B. Mann, H. Angerer, I. Konorov, M. Kraemer, S. Huber, B. Grube, J. Friedrich, S. Paul
TU Muenchen, Germany

N42-5 A Simple Method to Measure and Improve Linearity of Flash ADCs Used in Integrated VME ADC Modules
K. Furutaka, A. Kimura, M. Koizumi, Y. Toh, T. Kin, S. Nakamura, M. Oshima
Japan Atomic Energy Agency, Japan

N42-6 Ethernet Data Acquisition System for the Time Projection Chamber
V. J. Riot, M. D. Heffner
Lawrence Livermore National Laboratory, USA

N42-7 The New CALICE Data Acquisition System
M. Wing, *University College London, UK*
On behalf of the CALICE-UK DAQ groups

N43 High Energy Physics Instrumentation III

Thursday, Oct. 29 13:30-15:30 Grand Ballroom 7

Session Chairs: **Francesca Nessi-Tedaldi**, ETH Zurich, Switzerland
Jerry Va'vra, SLAC, USA

N43-1 (invited) Crystal Calorimeters in the Next Decade
R.-Y. Zhu, *California Institute of Technology, USA*

N43-2 LuAG material for Dual readout calorimetry in future high energy detectors
E. Auffray, D. Abler, P. Lecoq, G. Mavromanolakis
CERN, Switzerland

N43-3 A Forward LYSO Crystal Calorimeter for the SuperB Project.
C. Cecchi, *University of Perugia and INFN Perugia, Italy*

N43-4 Commissioning and Operation of the CMS Electromagnetic Calorimeter
D. A. Petyt, *University of Minnesota, USA*
On behalf of the CMS Collaboration

N43-5 Commissioning of the ATLAS Liquid Argon Calorimeter
H. Ma, *Brookhaven National Laboratory, USA*
On behalf of the ATLAS Liquid Argon Calorimeter Group

N43-6 Commissioning of the CMS ECAL Calibration with Muons from Cosmic Rays and Beam Dumps
T. Tabarelli De Fatis, *Universita' di Milano Bicocca and INFN Milano, Italy*
On behalf of the CMS Collaboration

N44 Gaseous Detectors III: GEM Applications in Particle Physics

Thursday, Oct. 29 16:00-18:00 Grand Ballroom 3

Session Chairs: **Mar Capeans**, CERN, Switzerland
Harry van der Graaf, NIKHEF, Netherlands

N44-1 Status of the Cylindrical-GEM Project for the KLOE-2 Inner Tracker
G. Bencivenni, D. Domenici, M. Pistilli, S. Cerioni, E. De Lucia, G. Felici, M. Gatta, M. Jacewicz, *laboratori nazionali di frascati - INFN - Italy*; F. Loddo, G. De Robertis, A. Ranieri, *INFN Bari, Italy*; G. Morello, M. Schioppa, *INFN Cosenza, LNF, Italy*

N44-2 The STAR Forward GEM Tracker
B. Surrow, *MIT, USA*
On behalf of the STAR Collaboration

N44-3 Simulations of Space-Charge Effects and Event Deconvolution for the PANDA TPC
F. V. Boehmer, S. Neubert, S. Dorheim, C. Hoeppner, B. Ketzer, I. Konorov, S. Paul, M. Vandenbroucke, X. Zhang
Technichal University of Munich, Germany

N44-4 First Test Results for the TOTEM T2 Telescope
S. Lami, *INFN Pisa, Italy*
On behalf of the TOTEM T2 Group

N44-5 A Large TPC Prototype for an ILC Detector
G. W. P. De Lentdecker, *Universite Libre de Bruxelles, Belgium*
On behalf of the LCTPC Collaboration

N44-6 Performance of a Neutron Beam Monitor with a GEM for the High-Intensity Total Diffractometer at J-PARC
H. Ohshita[1], S. Uno[1], T. Otomo[1], T. Koike[2], T. Murakami[1], M. Sekimoto[1], T. Uchida[1]
[1]High Energy Accelerator Research Organization (KEK), Japan; [2]Tokyo University of Science, Japan

N45 High Energy Physics Instrumentation IV

Thursday, Oct. 29 16:00-18:00 Grand Ballroom 7

Session Chairs: **David A. Petyt**, University of Minnesota, USA
Ren-yuan Zhu, California Institute of Technology, USA

N45-1 The Status of BESIII Experiment
T. Hu, *Institute of High Energy Physics, China*
On behalf of the BESIII Collaboration

N45-2 The EUDET Infrastructures for Detector R&D
I. M. Gregor, *DESY, Germany*
On behalf of the EUDET Consortium

N45-3 Energy Reconstruction of Hadron Showers in the CALICE Calorimeters
F. Simon[1,2], *[1]Max-Planck-Institut fuer Physik, Germany; [2]Excellence Cluster Universe, TU Munich, Germany*
On behalf of the CALICE collaboration

N45-4 Test Beam Performance of the CALICE SiW Electromagnetic Calorimeter Physics Prototype
C. Calice, *LAL Orsay, France*

N45-5 Jet Energy Corrections at CMS
A. Santocchia, *INFN and Perugia University, Italy*
On behalf of the CMS Collaboration

N45-6 Development of the GEM Digital Hadron Calorimeter for the International Linear Collider
J. Yu[1], A. P. White[1], S. Park[1], C. Hahn[2], W. Kim[2], K. Hong[3], S. Kim[4], J. R. Smith[1]
[1]Univrsiy of Texas at Arlington, USA; [2]Changwon National University, South Korea; [3]Korean Atomic Energy Research Institute, South Korea; [4]Korean National University of Education, South Korea

N45-7 Progress in Development of the Focusing DIRC with a New ASIC-Based Waveform Digitizing Electronics
J. Va'vra, D. Aston, D. Leith, B. Ratcliff, *SLAC, USA*; L. Ruckman, G. Varner, K. Nishimura, *University of Hawaii, USA*

MEDICAL IMAGING CONFERENCE (MIC)

We warmly welcome you to the 2009 IEEE Medical Imaging Conference (MIC) in Orlando! Thanks to your abstract submissions and reviews, and to your participation, it promises to be yet another outstanding meeting.

Before we start, we would like to offer some recognition to the large number of people who have volunteered their time to make this meeting happen. In particular, we would like to thank the General Chair, Dick Lanza, who has guided us through the three-year planning process. Perhaps even more critical has been the contribution of Tom Lewellen, who as Local Arrangements Chair has done much to shield us from the nitty-gritty details of organizing this conference. Special thanks are also due to the Deputy General Chair Tony Lavietes, who kept us all on track, and to Bo Yu, who managed the conference web-site. We would also like to thank all the sponsors for providing support for trainees to attend this meeting, as well as the companies listed at the back of the brochure for their generous support.

This year there were 581 submissions to the MIC, of which 514 were accepted. The program includes 84 orals selected from these submissions. In response to attendees' preferences, we have done our best to minimize the number of parallel sessions, but to give adequate exposure to the large number of very high quality submissions, we have re-introduced the concept of the Premium Poster. Close to 50 Premium Posters will be presented, and these have additional space in the poster halls to allow for greater interaction with the attendees and greater detail in their scientific content.

Two of our plenary talks have a retrospective flavor this year. Dr. Gerd Muehllehner will talk about the extraordinary longevity of the Gamma Camera, while Dr Chuck Melcher will discuss the 20-year development of LSO:Ce. Please join us in thanking them for their additional contribution to the MIC this year. In addition we welcome Dr Kitch Wilson from Stanford University, who will be helping us to look forward to the challenges and potential solutions for imaging transplanted stem cells in future clinical therapies.

We wish you a fruitful and interesting meeting, and hope that you leave inspired and enthused to continue your scientific endeavors in the field.

Ramsey Badawi
MIC Program Chair

Craig Levin
MIC Deputy Program Chair

MIC PLENARY TALKS

M01-1: The Long Life of the Anger Scintillation Camera and Attempts to Replace It

Gerd Muehllehner

Wednesday, Oct. 28, 2009, 08:30

The basic components of the Anger camera – parallel hole collimator, NaI(Tl) crystal and photomultipliers – have survived essentially unchanged for about 50 years. During this period is has been perfected and cost-reduced to the point where it becomes difficult for another technology to replace it.

This presentation will describe some improvements that have been made over the years and the shortcomings that remain. It will also explore the various attempts to replace it and will describe industry attempts which have never been published. Various techniques will be highlighted that in the presenter's opinion have significant merit and deserve further consideration.

Dr. Gerd Muehllehner is widely regarded as one of the leading physicist working in nuclear medicine. His contributions to nuclear medicine over more than three decades in both industry and academia are incorporated in many of the instruments we take for granted today.

Gerd was born in 1939 in Germany and came to the United States at age 17. He received undergraduate and masters degrees in physics from Georgetown University, moving on to the University of Michigan for a Ph.D. in nuclear physics. Dr. Muehllehner then joined Searle Radiographics – now Siemens Gammasonics - , a leader in development of nuclear medicine instrumentation in the 1960s and 70s. Much of that company's pioneering work was due to Dr. Muehllehner, who rose to become Searle's Chief Scientist.

In 1979 he moved on to become Associate Professor of Radiology at the University of Pennsylvania rising to the rank of Professor. In 1990 he founded UGM Medical Systems, pioneering an innovative new design for a PET tomograph.

Dr. Muehllehner has published numerous papers, many of them landmarks in nuclear medicine instrumentation. He holds more than 20 patents, beginning in 1972. He is now retired but continues a collaboration with researchers at the University of Pennsylvania under the direction of Joel Karp.

M01-2: Observations on 20 Years of LSO:Ce Scintillator Development

Charles Melcher
University of Tennessee, USA

Wednesday, Oct. 28, 2009, 09:20

Although powder synthesis and structural characterization of the rare earth oxyorthosilicates was achieved as early as the 1960's, the significance of Ce-doping for scintillation applications was not recognized until the 1980's. The evolution of Lu2SiO5:Ce (LSO:Ce) from an experimental powder phosphor synthesized in the laboratory to the large scale commercial production of single crystals implemented in Positron Emission Tomography spanned more than a decade and required solutions to numerous technical problems and commercial issues. These included

the investigation of the scintillation mechanism, the purification and cost of raw materials, the development of a practical crystal growth process, the handling of intellectual property issues via patents and trade secrets, the development of detector processing techniques, the optimization of detector design, and the integration of detectors into imaging systems. Numerous international research collaborations contributed to the ultimate success of LSO:Ce. Research and development of LSO:Ce continues even today with recent advances based on co-doping to compensate charge traps and enhance energy transfer, thus improving light output and decay time.

Dr.Chuck Melcher received a bachelor's degree in physics from Rice University and a Ph.D. in physics from Washington University in St. Louis. He was a post-doc at Caltech prior to joining Schlumberger-Doll Research. As a Senior Scientist at Schlumberger, he invented LSO:Ce scintillators and led the development of the growth process for single crystals. In 1996 he joined CTI Molecular Imaging where he led the further development of LSO:Ce from the research stage to large-scale commercial manufacturing for use in positron emission tomography (PET).

Dr. Melcher is currently the director of the Scintillation Materials Research Center at the University of Tennessee. He is also the chairman of the IEEE NPSS Radiation Instrumentation Technical Committee and Associate Editor of the Transactions on Nuclear Science.

M11-1: Challenges and Solutions for Imaging Stem Cell Transplantation

Kitch Wilson
Stanford University, USA

Friday, Oct. 30, 2009, 16:00

The discovery of human embryonic stem cells (hESCs) has dramatically increased the tools available to medical scientists interested in regenerative medicine. However, direct injection of hESCs, and cells differentiated from hESCs, into living organisms has thus far been hampered by significant cell death, tumor ("teratoma") formation, and host immune rejection. Understanding the in vivo hESC behavior after transplantation requires novel imaging techniques to longitudinally monitor hESC localization, proliferation, and viability. Molecular imaging, and specifically bioluminescent and positron emission tomography reporter gene imaging, has given investigators a high-throughput, relatively inexpensive, and sensitive means for tracking in vivo cell proliferation over days, weeks, and even months. This advancement has significantly increased the understanding of the spatio-temporal kinetics of hESC engraftment and proliferation in living subjects. In this presentation the many challenges, and solutions, for imaging stem cell transplantation, and their implications for future clinical therapies will be discussed.

Dr. Kitch Wilson researches in bioengineering at Stanford University. He has a B.S. in Mechanical Engineering from Stanford, and an M.D. from Duke. His research is focused on stem cell therapies for cardiovascular disease, including imaging of cellular transplantation in animal models of disease. Dr. Wilson was also directly involved with proposing a new method for creating stem cells from adult cells ("reprogramming") that received an NIH Director's New Innovator Award in 2008. Other interests include genetic manipulation of stem cells to drive their differentiation into adult cells such as cardio-myocytes and endothelial cells.

MIC PROGRAM

J01 Instrumentation for Medical and Biological Research I: Radionuclide Imaging

Tuesday, Oct. 27 08:00-10:00 International Ballroom North

See page 32.

J02 Instrumentation for Medical and Biological Research II: X-ray Imaging and Radiotherapy Applications

Tuesday, Oct. 27 10:30-12:30 International Ballroom North

See page 33.

J03 Joint NSS/MIC 3

Tuesday, Oct. 27 13:30-15:30 International Ballroom North

See page 34.

J04 Joint NSS/MIC 4

Tuesday, Oct. 27 16:00-18:00 International Ballroom North

See page 34.

M01 Plenary 1

Wednesday, Oct. 28 08:00-10:00 International Ballroom Center

Session Chair: **Ramsey D. Badawi**, UC Davis Medical Center, USA

M01-1 **(invited) The Long Life of the Anger Scintillation Camera and Attempts to Replace It**
G. Muehllehner

M01-2 **(invited) Observations on 20 Years of LSO:Ce Scintillator Development**
C. L. Melcher, *University of Tennessee, USA*

J05 NSS/MIC Joint Posters

Wednesday, Oct. 28 10:30-12:00 Palm 3, 4 & 5

See page 35.

M02 Image Processing and Evaluation

Wednesday, Oct. 28 14:00-15:30 International Ballroom Center

Session Chairs: **I Buvat**, IMNC UMR 8165 CNRS, Orsay, France
Arman Rahmim, Johns Hopkins University, USA

M02-1 **Effect of Reconstruction Kernel Width on Optimal Regularization for Focal Lesion Detection in PET**
D. J. Kadrmas, *University of Utah, USA*

M02-2 **Local Orientation-Dependent Noise Propagation for Anisotropic Denoising of CT-Images**
A. Borsdorf[1], S. Kappler[2], R. Raupach[2], F. Noo[3], J. Hornegger[1]
[1]Friedrich-Alexander-University Erlangen-Nuremberg, Germany; [2]Siemens Healthcare, Germany; [3]University of Utah, USA

M02-3 **Automatic Segmentation of Adipose Tissue in Magnetic Resonance Images of the Whole Body**
C. Wuerslin[1,2], B. Yang[1], F. Schick[2], J. Machann[2]
[1]University of Stuttgart, Germany; [2]University of Tuebingen, Germany

M02-4 Implementing Visual Search in Human-Model Observers for Emission Tomography
H. C. Gifford, M. A. King
University of Massachusetts Medical School, USA

M02-5 Neurological Image Classification for the Alzheimer's Disease Diagnosis Using Kernel PCA and Support Vector Machines
M. Lopez, J. Ramirez, J. M. Gorriz, D. Salas-Gonzalez, I. Alvarez, F. Segovia, R. Chaves
University of Granada, Spain

M02-6 Mass-Preserving Image Registration Using Free-Form Deformation Fields
K. Thielemans, *Hammersmith Imanet Ltd, UK*; E. Asma, R. M. Manjeshwar, *GE Research, USA*

M03 Image Reconstruction 1

Wednesday, Oct. 28 16:00-18:00 International Ballroom Center

Session Chairs: **Jinyi Qi**, University of California, Davis, USA
Anna M. Celler, Department of Radiology, University of British Columbia, Canada

M03-1 Cone-Beam Reconstruction from a Variable-Radius, Planar Source Trajectory
F. Dennerlein, H. Kunze, J. Boese
Siemens AG, Healthcare Sector, Germany

M03-2 A New Non-Monotonic Algorithm for PET Image Reconstruction
S. Sra[1], D. Kim[2], I. Dhillon[2], B. Schoelkopf[1]
[1]Max Planck Institute for Biological Cybernetics, Germany; [2]University of Texas at Austin, Texas

M03-3 Initial Evaluation of Direct 4D Parametric Reconstruction with Human PET Data
J. Yan, B. Planeta-Wilson, J.-D. Gallezot, R. E. Carson
PET center, Yale University, USA

M03-4 Exact Iterative Image Reconstruction with a Simplified System Matrix: Potentials for GPU-Accelerated Tomographic Imaging
L. Fu, J. Qi, *University of California, USA*

M03-5 PET Image Reconstruction with Incomplete Anatomical Edge Information Using Level Set Method
J. Cheng-Liao, J. Qi, *University of California, Davis, USA*

M03-6 Avoiding the Backprojection Weight in Short-Scan CT Reconstruction
F. Dennerlein, *Siemens AG, Healthcare Sector, Germany*; F. Noo, *University of Utah, USA*

M03-7 Fast kVp-Switching Dual Energy CT for PET Attenuation Correction
W. Huh, J. A. Fessler, *University of Michigan, USA*; A. M. Alessio, P. E. Kinahan, *University of Washington, USA*

M03-8 Direct 4D Parametric Image Reconstruction with Plasma Input and Reference Tissue Models in Reversible Binding Imaging
A. Rahmim, Y. Zhou, J. Tang, *Johns Hopkins University, USA*

M04 Quantitative Imaging Techniques

Thursday, Oct. 29 08:00-10:00 International Ballroom Center

Session Chairs: **Vesna Sossi**, University of British Columbia, Canada
Todd E. Peterson, Vanderbilt University, USA

M04-1 Towards Implementing an MR-Based PET Attenuation Correction for Neurological Studies
C. Catana[1], A. J. van der Kouwe[1], T. Benner[1], M. Hamm[2], C. Michel[2], B. Fischl[1], B. R. Rosen[1], A. G. Sorensen[1]
[1]Massachusetts General Hospital, USA; [2]Siemens Medical Solutions, USA

M04-2 Atlas-Based Attenuation Correction for Small Animal PET/MRI Scanners
A. J. Chaudhari[1], A. A. Joshi[2], A. W. Toga[2], R. M. Leahy[3], S. R. Cherry[1], R. D. Badawi[1]
[1]University of California, Davis, USA; [2]University of California, Los Angeles, USA; [3]University of Southern California, USA

M04-3 Quantitative I-131 SPECT Reconstruction Using CT Side Information From Hybrid Imaging
Y. K. Dewaraja, K. F. Koral, J. A. Fessler
University of Michigan, USA

M04-4 Attenuation Correction in MR-PET Scanners with Segmented T1-Weighted MR Images
E. Rota Kops[1], G. Wagenknecht[2], J. J. Scheins[1], L. Tellmann[1], H. Herzog[1]
[1]Institute of Neuroscience and Medicine, Germany; [2]Central Institute for Electronics, Germany

M04-5 Quantification Accuracy & Partial Volume Effect of the Siemens Inveon Small Animal PET Scanner
J. G. Mannheim, M. S. Judenhofer, V. Sossi, B. J. Pichler
University of Tuebingen, Germany

M04-6 A Flexible Approach to Motion Correction in Nuclear Medicine
K. Wells, B. Goswami, E. Lewis, A. Ab-Rahni, J. Jones, M. Alnowami, *University of Surrey, UK*; M. Guy, *Royal Surrey County Hospital, UK*

M04-7 Optical flow based estimation of multiple respiratory phases from a single CT for attenuation correction of PET Data: A phantom study
M. Dawood[1,2], M. Fieseler[1], F. Buther[2], M. Schafers[1,2], K. P. Schafers[1,2]
[1]University of Muenster, Germany; [2]University Hospital Muenster, Germany

M04-8 Simultaneous Measurement of Cardiac Perfusion and Permeability in Vivo with Synchrotron Radiaion Imaging
A. H. Walenta[1], B. Michael[2], B. Alberto[3], E. Francois[3], E. Raimund[4], F. Stefan[5], K. Oliver[6], M. Joerg[7], M. Stefan[4], S. Brunao[2], S. Hans-Werner[1], W. Katrin[2]
[1]University of Siegen, Germany; [2]Klinik fr innere Medizin, Germany; [3]ESRF, France; [4]University Essen Duisburg, Germany; [5]DESY, Germany; [6]University of Applied Science, Germany; [7]Mielebacher Informatiksysteme, Germany

M05 MIC Posters 1

Thursday, Oct. 29 10:30-12:30 Grand Ballroom 4&5; Palm 3,4&5

Session Chairs: **Timothy G. Turkington**, Duke University Medical Center, USA
Kris Thielemans, Senior Researcher, Hammersmith Imanet, United Kingdom

M05-1 Basic Evaluation of a C-Shaped Breast PET Scanner
M. Furuta, K. Kitamura, J. Ohi, H. Tonami, Y. Yamada, T. Furumiya, M. Satoh, T. Tsuda, M. Nakazawa, N. Hashizume, Y. Yamakawa, A. Kawashima, Y. Kumazawa
Shimadzu Corp., Japan

M05-4 Measurement of Lung Ventilation Using [13N]N2 and the High Resolution Research Tomograph: a Pilot Study in a Pig Model
M. C. Huisman, J. J. Spijkstra, L. F. van Rooij, F. H. P. van Velden, R. Boellaard, A. B. J. Groeneveld, A. A. Lammertsma
VU University Medical Center, The Netherlands

M05-7 Continuous Scintillator Slab with Microchannel Plate PMT for PET
H. Kim, C.-M. Kao, C.-T. Chen, H. Frisch, J.-F. Genat, F. Tang, E. Oberla, *University of Chicago, US*; W. W. Moses, W.-S. Choong, *Lawrence Berkeley National Laboratory, US*

M05-10 Timing Properties of a Gamma-Ray Imaging Detectors with Monolithic Scintillators
C. W. Lerche[1], N. Ferrando[1], J. M. Monzo[1], R. Gadea[1], R. J. Colom[1], F. J. Toledo[1], J. M. Benlloch[2], A. Sebastia[1]
[1]Universidad Politecnica de Valencia, Spain; [2]Instituto de Fisica Corpuscular, Spain

M05-13 Intrinsic Feature Pose Measurement for Awake Animal SPECT Imaging
J. S. Goddard, J. S. Baba, S. J. Lee, *Oak Ridge National Laboratory, USA*; A. G. Weisenberger, A. Stolin, J. McKisson, *Thomas Jefferson National Accelerator Facility, USA*; M. F. Smith, *University of Maryland, USA*

M05-16 Motion Tracking of Fully Conscious Small Animals in PET
A. Z. Kyme[1], V. W. Zhou[1], S. R. Meikle[1], K. Popovic[1], M. Akhtar[1], R. R. Fulton[1,2]
[1]University of Sydney, Australia; [2]Westmead Hospital, Australia

M05-19 A Monte Carlo Approach to Handle Data Scaling in Nuclear Medicine Imaging
C. Bai, R. L. Conwell, *Digirad Corporation, USA*

M05-22 Utilization of Two Analytic Algorithms for Image Reconstruction in Cone-Beam CT
S. Cho, D. Xia, C. A. Pelizzari, X. Pan
The University of Chicago, USA

M05-25 The Tumor Resection Camera (TReCam), a multi-pixel gamma imaging probe for radio-guided surgery
E. Netter, L. Pinot, L. Menard, M.-A. Duval, B. Janvier, F. Lefebvre, R. Siebert, Y. Charon
Imagerie en Modelisation, Neurobiologie et Cancerologie - UMR 8165 CNRS, France

M05-28 A Preclinical PET/MR Insert for a Human 3T MR Scanner
V. Schulz[1], T. Solf[1], B. Weissler[1], P. Gebhardt[1], P. Fischer[2], M. Ritzert[2], V. Mlotok[2], C. Piemonte[3], N. Zorzi[3], M. Melchiorri[3], S. Vandenberghe[4], V. Keereman[4], D. Wirtz[1], S. Renisch[1], T. Schaeffter[5], P. Marsden[5]
[1]Philips Research Europe, Germany; [2]University of Heidelberg, Germany; [3]Foundation Bruno Kessler, Italy; [4]University of Ghent, Belgium; [5]King's College London, UK

M05-31 Feasibility Study of Using Solid State Photomultiplier Array with Resistor Network Readout for SPECT Detector Development
X. Sun, Y. Shao, C. J. Bircher, K. A. Lan
University of Texas MD Anderson Cancer Center, United States

M05-34 Hierarchical Mumford-Shah Model for Dynamic microPET Image Segmentation
G. Liu[1,2], J. Liao[1], Y. Wang[2], J. Qi[1]
[1]University of California, USA; [2]Hunan University, China

M05-37 Scatter-Compensated Geometrical Components for Detector Normalization in Whole-Body PET
T. Mizuta, K. Kitamura, A. Ishikawa, A. Ohtani, K. Tanaka
Shimadzu Corporation, Japan

M05-40 Computer Generated Coronary Arterial Tree for Modeling Regional Myocardial Perfusion Defects for the Heart Model of the XCAT Phantom
G. S. K. Fung[1], W. P. Segars[2], T.-S. Lee[1], A. I. Veress[3], G. T. Gullberg[4], B. M. W. Tsui[1]
[1]Johns Hopkins University, US; [2]Duke University, US; [3]University of Washington, US; [4]E.O. Lawrence Berkeley National Laboratory, US

M05-43 Lookup Table-Based Simulation of Direct-Converting Counting X-Ray Detectors for CT
M. Balda[1], D. Niederloehner[2], B. Kreisler[1], J. Durst[1], B. J. Heismann[2]
[1]Friedrich-Alexander-University, Germany; [2]Siemens Healthcare, Germany

M05-46 A Patient Specific Respiratory Model Based on 4D CT Data and a Time of Flight Camera (TOF)
H. Fayad[1], T. Pan[2], C. Roux[1,3], C. Cheze Le Rest[1], O. Pradier[1], J. F. Clement[1], D. Visvikis[1]
[1]INSERM, LaTIM U650, France; [2]Department of Imaging Physics, M.D. Anderson Cancer Center, USA; [3]Institut Telecom - Telecom Bretagne, France

M05-49 A Phantom Comparison Study for Measuring PEM Scanner Sensitivity
W. Luo[1], M. Dahlbom[2], C. G. Matthews[1]
[1]Naviscan Inc., USA; [2]UCLA, USA

M05-52 High-resolution subsurface cross-sectional imaging of an articular cartilage using a Fourier domain common path optical coherence tomography
C. G. Song, J. H. Seo, *Chonbuk National University, Korea*; J. H. Han, J. U. Kang, *Johns Hopkins University, USA*

M05-55 High Performance SPECT Camera Design
J. Dey, *University of Massachusetts Medical School, USA*

M05-58 A Design of Pixellated Detector Module for C-SPECT
W. Chang, H. Liang, Y. Li, J. Oldendick, C. Ordonez
Rush Univ Med Ctr, USA

M05-61 Depth of Interaction Encoding Detector with Phosphor-Coated Crystals and Silicon Photomultipliers
E. Roncali, H. Du, S. Saint James, Y. Yang, Y. Wu, S. R. Cherry
University of California-Davis, USA

M05-64 Development of a High-Sensitivity Radiation Detector for Chromatography
J. S. Huber, S. M. Hanrahan, W. W. Moses, S. E. Derenzo, J. P. O'Neal, G. T. Gullberg
Lawrence Berkeley National Lab, USA

M05-67 Use of Machine Learning Algorithms for Gamma Detection in PET
M. Wedrowski, P. Bruyndonckx, S. Tavernier, C. Lematre, Z. Li, *Vrije Universiteit Brussel, Belgium*; P. Rato Mendez, J. Manuel Perez, *El Centro de Investigaciones Energticas, Medioambientalesy Tecnolgicas, CIEMAT, Spain*; K. Ziemons, *Forschungszentrum Juelich, Germany*

M05-70 Time Resolution for Scattered and Unscattered Coincidences in a TOF PET Scanner
M. Conti, H. Rothfuss, *Siemens Healthcare, USA*

M05-73 Time-of-Flight PET Detector Based on Multi-Pixel Photon Counter
C. L. Kim, *GE Global Research, USA*

M05-76 Simulation-Based Optimization of a Parallel Collimator for Scintimammography Using a New CdZnTe Gamma-Camera Architecture (HiSens)
C. Robert, V. Rebuffel, G. Montemont, L. Verger, *CEA-LETI MINATEC Grenoble, France*; I. Buvat, *IMNC-UMR 8165 CNRS, France*

M05-79 Design Study of a Lower Cost Ultrahigh Resolution High-Sensitivity PET for Neuroimaging
H. Li, W.-H. Wong, H. Baghaei, Y. Zhang, R. Ramirez, C. Wang, S. Liu, S. An
University of Texas, M.D. Anderson Cancer Center, USA

M05-82 Influence of TOF Information in OpenPET Image Reconstruction
T. Yamaya[1], E. Yoshida[1], F. Nishikido[1], N. Inadama[1], K. Shibuya[2], H. Murayama[1]
[1]National Institute of Radiological Sciences, Japan; [2]University of Tokyo, Japan

M05-85 Extraction of Photon Interaction Position in a Monolithic Scintillator Block by Modeling the Scintillation Light Distribution
Z. Li, G. Vandersteen, P. Bruyndonckx, M. Wedrowski, S. Tavernier, J. Schoukens
vrije universiteit Brussel, Belgium

M05-88 A new module-level parameter Interaction Ratio (IR) to evaluate the performance of detectors for PET
X. Kang[1,2], Y. Liu[1], Z. Gu[1], Y. Xia[1], S. Wang[1], Z. Wu[1], T. Ma[1], Y. Jin[1]
[1]Tsinghua University, China; [2]Ministry of Education, China

M05-91 Monolithic 64-Channel Silicon Photomultiplier Matrices for Small Animal PET
G. Llosa[1], N. Belcari[1,2], M. G. Bisogni[1,2], S. Marcatili[1,2], G. Collazuol[1,3], M. Melchiorri[4], C. Piemonte[4], P. Barrillon[5], S. Bondil-Blin[5], N. Dinu[5], C. de La Taille[5], A. Del Guerra[1,2]
[1]University of Pisa, Italy; [2]INFN Pisa, Italy; [3]Scuola Normale Superiore, Italy; [4]FBK-irst, Italy; [5]Linear Accelerator Laboratory, France

M05-94 Measured Temperature Dependence of Scintillation Camera Signals Read Out by GeigerMller Mode Avalanche Photodiodes
W. C. J. Hunter, R. S. Miyaoka, L. R. MacDonald, T. K. Lewellen
University of Washington, USA

M05-97 Optimal PET Acquisition Setting of I-124 with Siemens Inveon PET: Comparative Simulation Study with F-18 and microPET R4
A. R. Yu[1,2], J. S. Kim[1], K. Kim[1], Y. S. Lee[1,2], J. G. Kim[1], S. K. Woo[1], J. A. Park[1], W. H. Lee[1], H. J. Kim[2], G. J. Cheon[1]
[1]Korea Institute of Radiological & Medical Sciences, Rep. of Korea; [2]Yonsei University, Rep. of Korea

M05-100 Numerical and Measurement Evaluations of a High-Sensitivity Small-Animal PET Scanner in Lesion-Detection Tasks
Y. Dong, *Illinois Institute of Technology, USA*; C.-M. Kao, C.-T. Chen, *The University of Chicago, USA*

M05-103 Coincidence Imaging with Monolithic Detector Blocks for a Human Brain PET Scanner
I. Sarasola Martin, P. Rato Mendes, M. Canadas Castro, P. Garcia de Acilu, J. M. Perez
CIEMAT, Spain

M05-106 A Hoffman Brain Phantom Lesion Study with the Transformable HOTPET Camera
H. Baghaei, H. Li, Y. Zhang, R. A. Ramirez, S. Liu, C. Wang, S. An, W.-H. Wong
University of Texas M. D. Anderson Cancer Center, USA

M05-109 Timing in Silicon Photomultiplier Detectors for Small Animal PET Imaging
M. Safavi-Naeini[1], D. R. Franklin[1], M. Petasecca[1], M. L. F. Lerch[1], G. Moorhead[2], P. Dunn[2], R. Kirkham[2], G. De Geronimo[3], A. B. Rosenfeld[1]
[1]University of Wollongong, Australia; [2]CSIRO, Australia; [3]Brookhaven National Laboratory, usa

M05-112 Determination of the Septa-to-Crystal Position in Axial Direction for a Slit-Slat Collimator SPECT
X. Deng[1], T. Ma[2], R. Yao[1]
[1]The State Univ. of New York at Buffalo, USA; [2]Tsinghua University, China

M05-115 Multimodality Imaging Method for Identifying Metastatic Tumors in Mouse Liver Using Gated Small Animal PET/CT
S. K. Woo, K. M. Kim, T. S. Lee, J. H. Jung, Y. J. Lee, W. H. Lee, J. A. Park, J. S. Kim, J. G. Kim, G. J. Cheon
Korea Institute of Radiological and Medical Science, South Korea

M05-118 PEDRO: a Hybrid Small Animal Imaging System
M. R. Dimmock, J. E. Gillam, T. E. Beveridge, J. M. C. Brown, R. A. Lewis, C. J. Hall
Monash Centre for Synchrotron Science, Australia

M05-121 A Hybrid Rotation-Translation Scan Scheme for In Vivo Animal SPECT Imaging on a Stationary Scanner
Y. Xia, T. Ma, *Tsinghua University, P.R.China*; X. Deng, S. Murali, R. Yao, *University at Buffalo, State University of New York, USA*

M05-124 Imaging Iodine125 Labelled Nanoparticle Distribution in Mice with PILATUS II.
V. Lee[1,2], G. J. O'Keefe[3], A. Schubert[1,2], B. A. Sobott[1,2], D. Pook[4], A. Scott[3], R. P. Rassool[1]
[1]University of Melbourne, Australia; [2]CRCBID Cooperative Research Centre for Biomedical Imaging, Australia; [3]Austin Hospital, Australia; [4]Austin Health, Australia

M05-127 Initial Study of a Sub-500-Micron Resolution PET Insert Device Based on Finely-Pixilated CZT Detector
Y.-C. Tai[1], L.-J. Meng[2], H. Krawczynski[1], Y. Yin[1], S. Komarov[1], H. Wu[1], J. W. Tan[2], Q. Li[1], A. Garson III[1], J. Martin[1]
[1]Washington University in St. Louis, USA; [2]University of Illinois at Urbana-Champaign, USA

M05-130 Development of a High Resolution Image Guided Microirradiator (microIGRT)
E. W. Izaguirre, B. L. Kassebaum, J. Birch, I.-T. Su, D. Low
Washington University in Saint Louis, USA

M05-133 Component-Based Normalization for the HRRT for Sinogram-Mode Reconstruction
M. Sibomana, S. H. Keller, S. Holm, *Copenhagen Univ. Hosp., Rigshopitalet, Denmark*; P. M. Bloomfield, *Centre for Addiction & Mental Health, Canada*; S. Blinder, *Pacific Parkinson's Research Centre, Canada*; S. B. Hansen, *Aarhus University Hospital, Denmark*; C. J. Michel, *Siemens Healthcare Molecular Imaging, USA*

M05-136 Design and Feasibility Studies of a High-Resolution and Low-Cost Small Animal SPECT System
T. Dai, S. Wang, Y. Liu, Z. Wu, Y. Jin, T. Ma
Tsinghua University, P.R.China

M05-139 Phantom Construction Using a Conventional High Resolution Photo Printer
M. Peterson, A. Orbom, S.-E. Strand
Lund University, Sweden

M05-142 Acquisition-Duration Dependence of Reproducibility of Myocardial Perfusion in Rats with microSPECT
R. G. Wells[1], M. Kordos[1], J. Lockwood[1], J. Strydhorst[1], P. Fernando[2], C. Bensimon[2], T. D. Ruddy[1]
[1]University of Ottawa Heart Institute, Canada; [2]MDS Nordion, Canada

M05-145 Effects of Multiple Interaction Photon Events on Measuring Position and Arrival Time in a CZT-based High-resolution Small Animal PET System
Y. Gu, C. S. Levin, *Stanford University, USA*

M05-148 High Resolution μSPECT for Brain Activation Analysis in Small Animals
S. G. Staelens[1], T. Wyckhuys[2], S. Deleye[1], H. Hallez[1], S. Vandenberghe[1], B. Van Nieuwenhuyse[2], K. Vonck[2]
[1]Ghent University - IBBT, Belgium; [2]Ghent University Hospital, Belgium

M05-151 Comparison of NEMA NU 4-2008 Vs NEMA NU 2-2001 for the Performance Evaluation of the microPET R4 System
F. D. Popota[1,2], P. Aguiar[3], Y. Fernandez[4], C. Lois[3], D. Pareto[1,5], D. Ros[2,5,6], J. Pavia[5,6,7], J. D. Gispert[1,5]
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M05-154 A Multimodal Approach to Image-Derived Input Functions for Brain PET
E. K. Fung, B. Planeta-Wilson, T. Mulnix, R. E. Carson
Yale University, USA

M05-157 SPECT Image Classification Based on NMSE Feature Correlation Weighting and SVM
R. Chaves, J. Ramirez, J. M. Gorriz, M. Lopez, I. Alvarez, D. Salas-Gonzalez, F. Segovia
University of Granada, Spain

M05-160 Metal Artefact Reduction in Computed Tomography Using Nonequispaced Fourier Transform
B. Kratz, T. M. Buzug
Institute of Medical Engineering, Germany

M05-163 Partial Volume Correction Using an Energy Multiresolution Analysis
F. P. Figueiras[1], X. J. Gonzalez[1], D. Pareto[1,2], J. D. Gispert[1,2]
[1]Institut d'Alta Tecnologia (IAT-PRBB), Spain; [2]CIBER en Bioingeniera, Biomateriales y Nanomedicina (CIBER-BBN), Spain

M05-166 A Non-Local Post-Filtering Algorithm for PET Incorporating Anatomical Knowledge
C. Chan[1,2], S. Meikle[1], R. Fulton[1], G. Tian[2], W. Cai[1,2], D. D. Feng[1,2,3]
[1]The University of Sydney, Australia; [2]The Hong Kong Polytechnic University, China; [3]Shanghai Jiao Tong University, China

M05-169 Quantitative Dynamic Neuroimaging with the RatCAP
S. Southekal[1,2], D. Schulz[2], D. Schlyer[2], S. Junnarkar[2], S. H. Maramraju[1,2], B. Ravindranath[1,2], S. Stoll[2], M. Purschke[2], J.-F. Pratte[3], C. Woody[2], P. Vaska[2]
[1]Stony Brook University, USA; [2]Brookhaven National Laboratory, USA; [3]University of Sherbrooke, Canada

M05-172 Image Reconstruction for PETbox, a Benchtop Preclinical PET Tomograph
Q. Bao[1], F. R. Rannou[2], R. Taschereau[1], D. B. Stout[1], A. F. Chatziioannou[1]
[1]University of California, Los Angeles, USA; [2]Universidad de Santiago de Chile, Chile

M05-175 Computer Aided Diagnosis of the Alzheimer's Disease Combining SPECT-Based Feature Selection and Random Forest Classifiers
J. Ramirez, R. Chaves, J. M. Górriz, M. López, I. Álvarez, D. Salas-Gonzalez, F. Segovia
University of Granada, Spain

M05-178 Generating Anthropomorphic Numerical Phantoms Semi-Automatically from Magnetic Resonance Images
A. Sklyar, S. Gu, M. Gennert, *Worcester Polytechnic Institute, USA*; M. King, *University of Massachusetts Medical School, USA*

M05-181 Enabling Solutions for an Efficient Compression of PET-CT Datasets
A. Signoroni, S. Masneri, A. Riccardi, *University of Brescia, Italy*; I. Castiglioni, *H S Raffaele Institute, IBFM-CNR, Italy*

M05-184 Reduction of Dental Filling Metallic Artifacts in CT-Based Attenuation Correction of PET Data Using Weighted Virtual Sinograms
M. Abdoli[1], M. R. Ay[1], A. Ahmadian[1], H. Zaidi[2]
[1]Tehran University of Medical Sciences, Iran; [2]Geneva University Hospital, Switzerland

M05-187 PET-Enhanced Liver Segmentation for CT Images from Combined PET-CT Scanners
X. Wang[1], C. Li[1], M. Fulham[2], S. Eberl[2], D. Feng[1]
[1]University of Sydney, Australia; [2]Royal Prince Alfred Hospital, Australia

M05-190 Atanassov Fuzzy Model for Analyzing Selective Contrast Enhancement of Medical Images Using Multiresolution
M. Bhattacharya, *Indian Institute of Information Technology & Management, India*; A. Das, *University of Calcutta, India*

M05-193 Positron Range Correction Using Information Theoretic Anatomical Priors
S. Somayajula[1], B. Bai[2], Q. Li[1], R. M. Leahy[1]
[1]University of Southern California, USA; [2]Columbia University, USA

M05-196 System Modeling and Image Reconstruction for SiliSPECT Using Synthetic Collimation with a Large Number of Focusing Apertures
S. Shokouhi[1], D. W. Wildon[2], S. D. Metzler[3], B. S. McDonald[1], T. E. Peterson[1]
[1]Vanderbilt University Institute of Imaging Science, USA; [2]Center for Gamma-Ray Imaging, Department of Radiology, University of Arizona, USA; [3]Department of Radiology, University of Pennsylvania, USA

M05-199 Simultaneous Reconstruction of Image and Motion in Gated Positron-Emission-Tomography
M. Blume[1,2], A. Keil[1], A. Martinez-Moeller[3], N. Navab[2], M. Rafecas[1]
[1]Instituto de Fisica Corpuscular, Spain; [2]Technische Universitaet Muenchen, Germany; [3]Nuklearmedizinische Klinik im Klinikum Rechts der Isar, Germany

M05-202 Modified Subset Scheme for Attenuation Weighed Reconstruction
H. E. Rothfuss, V. Y. Panin, *Siemens Healthcare, USA*

M05-205 Comparison of Quantitative and Task-Based Optimizations of a 4D MAP-RBI-EM Image Reconstruction Method for Gated Myocardial Perfusion SPECT
T.-S. Lee, B. M. W. Tsui, *Johns Hopkins University, USA*

M05-208 An Analytical Position Correction Algorithm for γ-Camera Planar Images from Resistive Chain Readouts
D. Thanasas[1], E. Georgiou[1], N. Giokaris[1], A. Karabarbounis[1], D. Maintas[2], M. Mikeli[1], C. Papanicolas[1], L. Ragkousis[1], E. Stiliaris[1]
[1]National & Kapodistrian University of Athens, Greece; [2]Institute of Isotopic Studies, Greece

M05-211 Simulation-Based Evaluation of OSEM Reconstruction Bias on Low Activity PET Data for the HRRT Scanner
E. Dusch, C. Comtat, R. Trebossen, *SHFJ/CEA, France*

M05-214 Evaluation of Different MRI-Based Anatomical Priors for PET Brain Imaging
A. Atre[1], K. Vunckx[1], A. Reilhac[2], J. Nuyts[1]
[1]K.U.Leuven, Belgium; [2]Biospective Inc, Canada

M05-217 Fast Ordered Subset Convex Iterative Panel CT Reconstruction
Z. Burbar, I. Hong, C. Michel
Siemens Medical Solutions Molecular Imaging, USA

M05-220 Accelerated Monte Carlo Based Dual-Isotope SPECT Image Reconstruction
S. Liu, T. H. Farncombe, *McMaster University, Canada*

M05-223 A Derivative-Backprojection Algorithm for Non-Uniformly Attenuated SPECT Data
G. L. Zeng[1], F. Jing[1], Q. Huang[2], J. You[3], G. T. Gullberg[2]
[1]University of Utah, USA; [2]Lawrence Berkeley Laboratory, USA; [3]Cubic Imaging, USA

M05-226 Positron Range Effects in High Resolution 3D PET Imaging
J. Cal-Gonzalez[1], J. L. Herraiz[1], S. Espana[1], J. J. Vaquero[2], M. Desco[2], J. M. Udias[1]
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M05-229 Improved MAGIC Gel for Higher Sensitivity and Elemental Tissue Equivalent 3-D Dosimetry
X. Zhu, T. G. Reese, E. M. Crowley, G. El Fakhri
Massachusetts General Hospital, USA

M05-232 On-Board Cone-Beam Digital Tomosynthesis for Image-Guided Proton Therapy
M. K. Cho[1], S. Y. Park[2], H. K. Kim[1]
[1]Pusan National Univ., Korea; [2]National Cancer Center, Korea

M05-235 Respiratory Motion Tracking from Different Viewing Angles During Lung Cancer Treatment in Radiotherapy
L. Grezes-Besset[1,2], J. Vandemeulebroucke[1,2], P. Clarysse[1], D. Sarrut[1,2]
[1]CREATIS-LRMN, France; [2]Centre de lutte contre le cancer Leon Berard, France

M05-238 System Solution for Particle Therapy PET
G. Shakirin[1], H. Braess[2], F. Fiedler[1], D. Kunath[3], K. Laube[1], K. Parodi[4,5], M. Priegnitz[1], W. Enghardt[1,3]
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M05-241 Micro-Probe for Medical Radiation Imaging Based on Medipix2 Detector
Z. Vykydal, J. Jakubek
Czech Technical University in Prague, Czech Republic

M05-244 Solid-State Detector Stack for ToF-PET/MR
T. Solf, V. Schulz, A. Thon, *Philips Research Laboratories, Germany*; P. Fischer, M. Ritzert, V. Mlotok, *University of Heidelberg, Germany*; C. Piemonte, N. Zorzi, *Foundation Bruno Kessler, Italy*

M05-247 Simultaneous acquisition of PET/MR images of small animals at 9.4 T
S. H. Maramraju[1], S. D. Smith[2], S. Rescia[2], S. S. Junnarkar[2], B. Ravindranath[1], S. Stoll[2], M. Purschke[2], D. Schulz[2], S. S. Southekal[1], W. Lenz[2], J. F. Pratte[3], P. Vaska[2], C. L. Woody[2], D. J. Schlyer[2]
[1]Stony Brook University, USA; [2]Brookhaven National Laboratory, USA; [3]Universite de Sherbrooke, Canada

M05-250 A Prototype of the MRI-Compatible Ultra-High Resolution SPECT for in Vivo Mice Brain Imaging
J.-W. Tan, L.-J. Meng
The University of Illinois at Urbana-Champaign, USA

M05-253 Respiratory Motion Correction of PET Using Motion Parameters from MR
N. Dikaios, T. D. Fryer, *University of Cambridge, UK*

M05-256 The Effect of Bone μ -value Assignment and Segmentation on PET Attenuation Correction Accuracy
P. J. Schleyer[1], C. Tsoumpas[1], T. Schaeffter[1], V. Schulz[2], P. K. Marsden[1]
[1]King's College London, United Kingdom; [2]Philips Research Laboratories, Germany

M05-259 Clinical PET/MRI-System and Its Applications with MRI Based Attenuation Correction
A. Kolb[1], M. Hofmann[1,2,3], V. Sossi[1,4], H. F. Wehrl[1], A. Sauter[1,5], A. Schmid[1], H. P. Schlemmer[5], C. D. Claussen[5], B. J. Pichler[1]
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M05-262 A Phantom for Image Registration in Simultaneous Measurements of PET/MRI System
S. Yamamoto, *Kobe City College of Technology, Japan*; J. Hatazawa, *Osaka University Graduated School of Medicine, Japan*

M05-265 Investigation of 3D Event Positioning in a PET Detector with Continuous Scintillator and APDs
S. Krishnamoorthy, *Stony Brook University, USA*; S. Stoll, M. Purschke, C. L. Woody, P. O'Connor, D. Schlyer, P. Vaska, *Brookhaven National Laboratory, USA*

M05-268 Performance Measurements of a LYSO-SSPM Detector Module for Small Animal Positron Emission Tomography.
P. Dokhale[1], C. Staples[1], J. Christian[1], S. Cherry[2], W. Moses[3], K. Shah[1]
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M05-271 Imaging Reagents Study for Nuclear Medicine Using an Electron-Tracking Compton Gamma-Ray Camera
S. Kabuki[1], H. Kimura[1], H. Amano[1], Y. Nakamoto[1], H. Kubo[1], K. Miuchi[1], S. Kurosawa[1], M. Takahashi[1], H. Kawashima[1], M. Ueda[1], T. Okada[1], K. Ogawa[2], K. Togashi[1], H. Saji[1], T. Tanimori[1]
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M05-274 Optimized Light Sharing Module for PET Block Detectors
E. Lorincz, G. Erdei, I. Peczeli, C. Steinbach, F. Ujhelyi, *Budapest University of Technology and Economics, Hungary*; T. Bukki, *MEDISO Ltd, Hungary*

M05-277 Study of a Positron Emission Tomograph Prototype Based on Multigap Resistive Plate Counters
P. Baesso, G. Belli, G. Musitelli, R. Nard, D. Pagano, S. Ratti, A. Vicini, P. Vitulo, C. Viviani
INFN Pavia, University of Pavia, Italia

M05-280 Detectors with Dual-Ended Readout by Silicon Photomultipliers for High Resolution Positron Emission Mammography Applications
F. Taghibakhsh[1,2], S. Cuddy[1], T. Rvachov[1], A. Reznik[2,3], J. A. Rowlands[1,2]
[1]University of Toronto, Canada; [2]Thunder Bay Regional Health Sciences Centre, Canada; [3]Lakehead University, Canada

M05-283 FDOT Setting Optimization and Reconstruction Using Singular Value Analysis with Automatic Thresholding
J. Chamorro[1], J. Aguirre[1], J. Ripoll[2], J. J. Vaquero[1], M. Desco[1]
[1]Unidad de Medicina y Cirugia Experimental, Hospital General Universitario Gregorio Marañón, Madrid,, Spain; [2]FORTH, Institute of Electronic Structure Laser, Heraklion, Grece

M05-286 Estimation of Myocardium Deformation by Simultaneous Use of Tagged and Untagged Gated Cardiac MRI
J. G. Brankov, F. M. Parages, M. N. Wernick, Y. Yang, *Illinois Institute of Technology, Illinois*; T. S. Denney, *Auburn University, Alabama*

M05-289 Regularization Methods in Iterative Algorithms for Variance Reduction on Compressed Sinogram Random Coincidences
V. Y. Panin, *Siemens Healthcare, USA*

M05-292 Synthetic 82Rb PET Images for Testing an Absolute Myocardial Perfusion Quantification Application
J. P. Jones[1], X.-B. Pan[2], J. Declerck[2], M. E. Casey[1]
[1]Siemens Molecular Imaging, USA; [2]Siemens Molecular Imaging, UK

M05-295 Improvement of Myocardial Perfusion Defect Severity Quantitation in Cardiac SPECT: a Simulation Study
T. Hughes, S. Shcherbinin, A. Celler
University of British Columbia, Canada

M05-298 A Maximum-Likelihood (ML) Method for Combined Organ Activity Estimation and Volume-of-Interest (VOI) Registration from Planar Projections
N. Song, B. He, E. C. Frey
Johns Hopkins Medical Institution, USA

M05-301 Texture Characterization in Ultrasonograms of theThyroid Gland
M. E. Lyra[1], K. Skouroliakou[2], E. Vasoura[1], A. Antoniou[1]
[1]University of Athens, Greece; [2]Technological & Educational Institute of Athens, Greece

M05-304 Evaluation of an Iterative Cascade Gamma Ray Correction Algorithm for Non-Standard PET Nuclides at Various Counting Statistics in High Resolution Small Animal PET Imaging
J.-C. (. Cheng, N. Agbeko, J. O'Sullivan, R. Laforest
Washington University, USA

M05-307 Component-Based Normalization Correction for the Clear-PEM Positron Emission Mammography System
C. Guerreiro[1,2], N. C. Ferreira[2,3], R. Bugalho[4], A. Trindade[4], N. Matela[5], M. V. Martins[5], L. Mendes[2,3], P. Almeida[5], J. Varela[4]
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M05-310 Exact Reconstruction from Uniformly Attenuated Truncated SPECT Projection Data with Tiny a Proiri Knowledge
Q. Huang, G. T. Gullberg
Lawrence Berkeley National Laboratory, USA

M05-313 Segmentation-Based Regularization of Dynamic SPECT Reconstruction
T. Humphries[1], A. Saad[1], A. Celler[2], G. Hamarneh[1], T. Moeller[1], M. Trummer[1]
[1]Simon Fraser University, Canada; [2]University of British Columbia, Canada

M05-316 Evaluation of Resolution Properties of Median Priors in List-Mode Reconstruction Methods for PET
M. Ahmad, A. Todd-Pokropek, *University College London, UK*

M05-319 Bias in Iterative Reconstruction of Low-Statistics PET Data: Benefits of a Resolution Model
M. D. Walker[1], P. J. Julyan[1,2], P. S. Talbot[1], T. Jones[1], J. C. Matthews[1]
[1]The University of Manchester, UK; [2]The Christie NHS Foundation Trust, UK

M05-322 Exact Step-and-Shoot Circular Cone Beam Reconstruction with a Common Line Scan
A. A. Zamyatin, *Toshiba Medical Research Institute USA, USA*

M05-325 Experimental Evaluation of Non-Uniform Object-Space Rebinning for Single Photon Emission Microscopy Imaging
N. Li, L. J. Meng, *The University of Illinois, USA*

M05-328 Timing Shift Study of Position-Sensitive Avalanche Photodiodes
Y. Wu[1], T. Ng[2], Y. Yang[1], K. Shah[3], R. Farrell[3], S. R. Cherry[1]
[1]University of California, Davis, USA; [2]California Institute of Technology, USA; [3]Radiation Monitoring Devices Inc., USA

M05-331 A powerful readout system for high resolution and high efficiency molecular imaging studies of cardiovascular diseases in mice
P. Musico, *I.N.F.N. Genova, Italy*; E. Cisbani, F. Cusanno, F. Garibaldi, M. L. Magliozzi, S. Torrioli, G. Marano, M. Musumeci, M. Baiocchi, L. Vitelli, *I.S.S Roma, Italy*; G. De Vincentis, *Universita' La Sapienza, Italy*; S. Majewski, *West Virginia University, USA*; B. Tsui, *Johns Hopkins Univeristy, USA*

M05-334 A FPGA-Based High Speed Multi-Channel Simultaneous Signal Acquisition Method for Positron Emission Tomography
W. Hu, Y. Choi, J. Jung, K. Hong, J. Kang, B. Min, Y. Huh, S. Shin, H. Lim, *Samsung Medical Center, Sungkyunkwan University School of Medicine, Korea*; Y. Chung, *Yonsei University, Korea*

M05-337 An Inexpensive Multi-Channel Digital Acquisition System for Nuclear Medicine Applications
F. Afzal, T. H. Farncombe, *McMaster University, Canada*

M05-340 Point Cloud Photon Transport (PCPT) for Medical Imaging Applications
A. Sitek
Brigham and Women's Hospital and Harvard Medical School, USA

M05-343 Study of the Influence of Photon Energy Cuts on the PET Simulation Results
K. K. Mitev[1], A. S. Kirov[2], Y. Y. Madzhunkov[1], G. V. Gerganov[1], I. Kawrakow[3]
[1]Sofia University "St. Kliment Ohridski", Bulgaria; [2]Memorial Sloan-Kettering Cancer Center, USA; [3]National Research Council of Canada, Canada

M05-346 A Monte Carlo Study on the Spatial Resolution with Silicon-Based Detectors
J. Cabello, K. Wells, *University of Surrey, United Kingdom*

M05-349 Geant4 Evaluation of the Impact of the Spatial Resolution Improvement on Contrast Recovery in a Small Animal PET System with Collimation
A. S. Ayan[1], R. Accorsi[1,2], J. S. Karp[1], S. D. Metzler[1]
[1]University of Pennsylvania, USA; [2]Children's Hospital of Philadelphia, USA

M05-352 Coincidences Originating from a Single Photon: An Unrecognized and Potentially Significant Source of Scatter in Small Animal PET?
A. L. Goertzen, *University of Manitoba, Canada*

M05-355 A Simulation Study of the Charge Collection in Highly Pixilated CdZnTe Detector for PET Imaging
S. A. Komarov, Y. Yin, H. Wu, Y.-C. Tai
Washington University in St.Louis, USA

M05-358 A Methodology for Optimizing the Acquisition Time of a Clinical PET Scan Using GATE
N. A. Karakatsanis, K. S. Nikita
National Technical University of Athens, Greece

M05-361 Quantitative Assessment of the Effect of Anode Surface Roughness on the Diagnostic X-Ray Spectra Using Monte Carlo Simulation
A. Mehranian[1], M. R. Ay[1], N. Riahi Alam[1], H. Zaidi[2]
[1]Tehran University of Medical Sciences, Iran; [2]Geneva University Hospital, Switzerland

M05-364 Modeling of the Photon Beam from 6 MV Varian 2100C LINAC Using GATE Simulation
C.-H. Baek[1,2], S. J. An[1], S.-J. Lee[1,2], J. Y. Hwang[1,2], J. S. Kim[3], Y. H. Chung[1,2]
[1]College of Health Science,Yonsei university, South Korea; [2]Yonsei University, South Korea; [3]Samsung Medical Center, South Korea

M05-367 A Modified Statistical System Model and an Accelerated Monte Carlo Simulation for a Silicon Detector Based Compton Medical Imaging System
L. Han, N. Clinthorne, *The University of Michigan, USA*

M05-370 Synchrotron-Based DEI-CT Images of Zebrafish Eye with and Without Contrast Agents at 20, 30 and 40 keV
R. V. Donepudi, *Sir.C.R.R. (A) College, India*; S. Medasani, *SDMMC, India*; Z. Zhong, *BNL, USA*; R. Cesareo, A. Brunetti, *Universita di Sassari, Italy*; T. Yuasa, T. Akatsuka, *Yamagata University, Japan*; T. Takeda, *University of Tsukuba, Japan*; G. E. Gigante, *Universita di Roma, Italy*

M05-373 A Data Adaptive Approach to the Robust Fitting of PET Data: Application to Group and Test-Retest Analysis
F. Zanderigo[1], R. T. Ogden[1,2], C. Chang[3], S. Choy[1], A. Wong[1], R. V. Parsey[1,2]
[1]New York State Psychiatric Institute, USA; [2]Columbia University, USA; [3]New Jersey Institute of Technology, University Heights, USA

M05-376 3D Tomographic Wrist Scanner for Non-Invasive Determination of Input Function
B. Ravindranath[1], S. S. Junnarkar[2], M. L. Purschke[2], S. H. Maramraju[1], S. S. Southekal[1], S. P. Stoll[2], J. F. Pratte[3], P. Vaska[2], C. L. Woody[2], D. J. Schlyer[2]
[1]Stony Brook University, USA; [2]Brookhaven National Laboratory, USA; [3]Universite de Sherbrooke, Canada

M05-379 Kinetic Modeling of Brain FDG Data with Input Function Derived from Images by Independent Component Analysis
K. Berradja, *University of Mostaganem, Algeria*; M. Bentourkia, *Universite de Sherbrooke, Canada*

M05-382 Noise Reduction and Contrast Enhancement for Small-Dose X-Ray Images in Wavelet Domain
M. Sakata, K. Ogawa
Hosei University, Faculty of Science and Engineering, Japan

M05-385 Evaluation and Correction of Scattering in Cone-Beam Breast Computed Tomography: a Monte Carlo and Experimental Phantom Study
G. Mettivier, P. Russo, *INFN and University of Napoli, Italy*; N. Lanconelli, S. Lo Meo, *Alma Mater Studiorum - University of Bologna and INFN, Italy*

M05-388 Directionally Selective Regularization for Sliding Preserving Medical Image Registration
D. Ruan, *Stanford University, U.S.A*

M05-391 Small Animal Imaging with a Quasi-Monochromatic Multi-Energy CT
P. L. Rossi[1], S. Masetti[1], A. Turco[1], D. Falchieri[1,2], N. Lanconelli[1,2], D. Bianchini[1], L. Roma[3], A. Margotti[2], M. Zuffa[2], G. Baldazzi[1,2]
[1]University of Bologna, ITALY; [2]INFN, ITALY; [3]S.Orsola-Malpighi University Hospital, ITALY

M05-394 An Iterative Reconstruction Method for Multiple Moving Objects
X. Jin, L. Li, Z. Chen, Y. Xing, *Tsinghua University, China*

M05-397 Automated Dual-Exposure Technique to Extend the Dynamic Range of Flat-Panel Detectors Used in Small-Animal Cone-Beam Micro-CT
A. Sisniega, J. J. Vaquero, M. Abella, I. Vidal-Migallon, E. Lage, M. Desco
Unidad de Medicina Y Cirugia Experimental. Hospital General Gregorio Maranon, Spain

M05-400 Mercury(II) Iodide Flat Panel Radiation Detectors for Simultaneous Acquisition of Static and Moving Image
K. Oh, M. Kim, M. Yun, Y. Kim, S. Nam
INJE University, South Korea

M05-403 Optimization of Planar Arrangement Micro Collimators (PAMC) for Images with X-Rays.
R. G. Figueroa, E. G. Pena, *Universidad de La Frontera, Chile*; W. H. Gerber, *Universidad Austral, Chile*; J. F. C. A. Veloso, *University of Aveiro, Portugal*

M06 PET/SPECT instrumentation 1

Thursday, Oct. 29 14:00-15:30 International Ballroom Center

Session Chairs: **Suleman Surti**, University of Pennsylvania, USA
Graeme O'Keefe, Austin Health, Australia

M06-1 FPGA-Based Pulse Parameter Discovery for Positron Emission Tomography
M. D. Haselman, S. Hauck, T. K. Lewellen, R. S. Miyaoka
University of Washington, USA

M06-2 Optimization of Digital Time Pickoff Methods for LaBr3-SiPM TOF PET Detectors
R. Vinke[1], S. Seifert[2], D. R. Schaart[2], H. T. van Dam[2], F. J. Beekman[2,3], H. Loehner[1], P. Dendooven[1]
[1]KVI - University of Groningen, The Netherlands; [2]Delft University of Technology, The Netherlands; [3]University Medical Centre Utrecht, The Netherlands

M06-3 Cramer Rao Lower Bound Optimization of an EM-CCD Based Scintillation Gamma Camera
M. A. N. Korevaar[1,2], M. C. Goorden[1,2], J. W. T. Heemskerk[1,2], D. R. Schaart[2], F. J. Beekman[1,2,3]
[1]Image sciences institute, Netherlands; [2]Radiation Detection and Medical Imaging, Netherlands; [3]Molecular Imaging Labs (MILABS), Netherlands

M06-4 Preclinical and Clinical PET Detector Design Considerations Using Silicon
H. Peng, P. Olcott, C. Levin
School of Medicine, Stanford University, USA

M06-5 3D In-vivo Dosimetry for Photon Radiotherapy Based on Pair Production
T. Kormoll[1], D. Kunath[1,2], W. Enghardt[1,2]
[1]Technische Universität Dresden, Germany; [2]Forschungszentrum Dresden-Rossendorf, Germany

M06-6 Determining Block Detector Positions for PET Scanners
L. A. Pierce, R. Miyaoka, T. Lewellen, A. Alessio, P. Kinahan
University of Washington, USA

M07 Image Reconstruction 2

Thursday, Oct. 29 16:00-18:00 International Ballroom Center

Session Chairs: **Frederic Noo**, University of Utah, Dept of Radiology, USA
Margaret E. Daube-Witherspoon, University of Pennsylvania, USA

M07-1 MAP Reconstruction of Fourier-Rebinned PET Data Using Estimated Sinogram Blurring Function from Point Source Scans
M. S. Tohme, J. Qi, *University of California, Davis, USA*

M07-2 High Resolution PET Image Reconstruction for the Siemens MR/PET-Hybrid BrainPET Scanner in LOR Space
J. J. Scheins[1], L. Tellmann[1], C. Weirich[1], E. Rota Kops[1], C. Michel[2], L. G. Byars[2], M. Schmand[2], H. Herzog[1]
[1]Institute of Neuroscience and Medicine, Germany; [2]Siemens Medical Solutions USA, USA

M07-3 Stochastic Image Reconstruction Method for Compton Camera
A. Andreyev[1], A. Sitek[2], A. Celler[1]
[1]University of British Columbia, Canada; [2]Harvard Medical School and Brigham and Women's Hospital, USA

M07-4 Optimized Weighting for Fourier Rebinning of Three-Dimensional Time-of-Flight PET Data to Non-Time-of-Flight
S. Ahn[1], S. Cho[2], Q. Li[1], R. M. Leahy[1]
[1]University of Southern California, USA; [2]Massachusetts General Hospital, USA

M07-5 Attenuation Artifacts and Time-of-Flight PET
T. G. Turkington, J. M. Wilson
Duke University Medical Center, USA

M07-6 Motion-Compensated Fully 4D PET Reconstruction Using PET Data Supersets
J. Verhaeghe, P. Gravel, R. Mio, R. Fukasawa, P. Rosa-Neto, J.-P. Soucy, C. J. Thompson, A. J. Reader
McGill University, Canada

M07-7 PET Projection Data Supersets for Reconstruction with Acquisition Motion
J. Verhaeghe, A. J. Reader, *McGill University, Canada*

M07-8 Analytic Image Concept Combined to SENSE Reconstruction
J. Yankam Njiwa[1], C. Baltes[1], D. Ratering[1], M. Rudin[1,2]
[1]Institute for Biomedical Engineering, University and ETH Zurich, Switzerland; [2]Institute of Pharmacology & Toxicology, University of Zurich, Switzerland

M08 X-ray imaging 1

Friday, Oct. 30 08:00-10:00 International Ballroom Center

Session Chairs: **Paul E. Kinahan**, University of Washington, USA
Johan L. Nuyts, K.U.Leuven, Belgium, Belgium

M08-1 Improved Contrast and Spatial Resolution with Single Photon Counting (SPC) for an Area X-Ray Imager, the Newly Developed High-Resolution Micro-Angiographic Fluoroscopic (MAF) Detector
A. Jain, A. Kuhls-Gilcrist, D. R. Bednarek, S. Rudin
SUNY at Buffalo, USA

M08-2 Advanced X-Ray Phase Contrast Tomographic Imaging Using a Grating Interferometer.
M. Stampanoni[1,2], S. A. McDonald[1,3], F. Marone[1], C. David[1]
[1]Paul Scherrer Institut, Switzerland; [2]ETH Zuerich, Switzerland; [3]University of Lausanne Medical School, Switzerland

M08-3 Perfusion Estimation in the Peripheral Vasculature Using C-Arm X-Ray Systems
M. Giordano, C. Neukirchen, M. Bertram, *Philips Research Laboratories, Germany*; W. Mali, M. A. Viergever, E.-J. Vonken, *University Medical Center Utrecht, The Netherlands*

M08-4 Empirical Beam Hardening Correction for CT
Y. Kyriakou, D. Prell, W. A. Kalender, M. Kachelriess
Institute of Medical Physics, Germany

M08-5 Stationary-gantry Tomosynthesis System for Online Image Guidance in Radiation Therapy Based on a 52-Source Cold Cathode X-Ray Tube
J. S. Maltz[1], F. Sprenger[2], J. Fuerst[3], A. Paidi[1], F. Fadler[3], A. R. Bani-Hashemi[1]
[1]Siemens Medical Solutions USA, Inc., USA; [2]XinRay Systems, LLC., USA; [3]Siemens AG Healthcare, Germany

M08-6 A Novel CT Perfusion Protocol for Quantitative Contrast Material Mapping
B. J. Brendel, E. Roessl, J.-P. Schlomka, A. Thran, R. Proksa
Philips Research Europe - Hamburg, Germany

M08-7 The Price of Tomography: SNR Comparisons of Acquisition Strategies for X-Ray Fluorescence Imaging
P. J. La Riviere, *The University of Chicago, USA*; L.-J. Meng, *The University of Illinois, Urbana-Champaign, USA*

M08-8 Large Area Photon Counting X-Ray Imaging Arrays for Clinical Dual-Energy Applications
W. C. Barber[1], E. Nygard[1,2], J. S. Iwanczyk[1], T. J. Beck[3], J. C. Wessel[1,2], N. Malakhov[1,2], G. Wawrzyniak[1,2], N. E. Hartsough[1], T. Gandhi[1], K. Taguchi[3]
[1]DxRay Inc., USA; [2]Interon ASA, Norway; [3]Johns Hopkins University, USA

M09 MIC Posters 2

Friday, Oct. 30 10:30-12:30 Grand Ballroom 4&5; Palm 3,4&5

Session Chairs: **Georges El Fakhri**, Harvard Medical School and Massachusetts General Hospital, USA
Steven R. Meikle, University of Sydney, Australia

M09-2 Adaptive Image-Reconstruction Algorithms Applied to Digital Breast Tomosynthesis
E. Y. Sidky, M. Levine, X. Pan, I. S. Reiser, R. M. Nishikawa, *University of Chicago, USA*; R. H. Moore, D. B. Kopans, *Massachusetts General Hospital, USA*

M09-5 Performance of a Prototype Semiconductor Brain PET Scanner Featuring High Energy Resolution with MAP Based Reconstruction
K. Matsuzaki, W. Takeuchi, Y. Morimoto, T. Ishitsu, Y. Ueno, K. Kobashi, *Hitachi, Ltd., Japan*; N. Kubo, C. Katoh, T. Shiga, N. Tamaki, *Hokkaido University, Japan*

M09-8 Development of PET Using 4x4 Array of Large Size Geiger-Mode Avalanche Photodiodes
K. J. Hong, Y. Choi, J. H. Kang, W. Hu, J. H. Jung, B. J. Min, S. H. Shin, Y. S. Huh, H. K. Lim, *Sungkyunkwan University, Samsung Medical Center, South Korea*; Y. H. Chung, *College of Health Science, Yonsei University, South Korea*; P. Hughes, C. Jackson, *SensL, Ireland*

M09-11 An Ultrahigh Resolution SPECT System Based on a Novel Energy-Resolved Photon-Counting CdTe Detector
L.-J. Meng, J. W. Tan
University of Illinois at Urbana-Champaign, USA

M09-14 In Vivo Imaging of Lingual Cancer in a Rabbit Model Using a Hand-Held Imaging Beta Probe
B. Singh[1], B. C. Stack[2], S. Thacker[1], V. Gaysinskiy[1], S. Cool[1], G. Entine[1], V. V. Nagarkar[1]
[1]RMD, Inc., USA; [2]University of Arkansas for Medical Sciences, USA

M09-17 Evaluation of Noise Properties in PSF-Based PET Image Reconstruction
S. Tong, A. Alessio, P. Kinahan
University of Washington, USA

M09-20 Motion Compensation Requires Increased Attenuation-Correction Accuracy in Cardiac PET/CT Imaging
A. Pourmoghaddas[1,2], R. G. Wells[2]
[1]MSc candidate - Carleton University, Canada; [2]The University of Ottawa Heart Institutue, Canada

M09-23 Optimal Sampling Lattices for High-Fidelity CT Reconstruction
K. Mueller, *Computer Science, Stony Brook University, United States*; F. Xu, *Siemens Corporate Research, United States*

M09-26 CBCT-Subsystem Performance of the Multi-Modality Brightview XCT System
D. Sowards-Emmerd, K. Balakrishnan, J. Wiener, L. Shao, J. Ye
Philips Healthcare, USA

M09-29 Development of New Type Gaseous Gamma Camera with GEM
T. Koike, *Tokyo University of Science, Japan*; S. Uno, T. Murakami, M. Sekimoto, T. Uchida, *High Energy Accelerator Research Organization(KEK), Japan*

M09-32 Proposal of a 8-Layer DOI Detector Composed of Same Scintillation Crystal Elements
N. Inadama[1], H. Murayama[1], F. Nishikido[1], T. Yamaya[1], E. Yoshida[1], K. Shibuya[2], Y. Yazaki[3,1], H. Osada[3,1]
[1]National Institute of Radiological Sciences, Japan; [2]Tokyo University, Japan; [3]Chiba University, Japan

M09-35 Evaluation of Accuracy and Precision of Geometric Mean Based Activity Estimation Methods
B. He, E. C. Frey, *Johns Hopkins Medical Institutions, USA*

M09-38 Evaluation of List Mode-Driven Respiratory and Cardiac Gating in PET
F. Buether, M. Dawood, O. Schober, K. P. Schaefers
University of Muenster, Germany

M09-41 Simulation of Dynamic PET Data from Real MR Acquisitions
C. Tsoumpas[1], C. Buerger[1], A. P. King[1], V. Keereman[2], S. Vandenberghe[2], V. Schulz[3], T. Schaeffter[1], P. K. Marsden[1]
[1]King's College London, UK; [2]University of Ghent, Belgium; [3]Philips, Germany

M09-44 Kinetic Parameter Estimation for a Heterogeneous Tumor Model
Y. Lin, Q. Li, R. Leahy, *USC, United States*

M09-47 Limits of Ultra-Low Dose CT Attenuation Correction for PET/CT
T. Xia, P. E. Kinahan, *University of Washington, USA*

M09-50 BetaBox: a PSAPD Based Charged Particle Camera with a USB Data Acquisition System
N. T. Vu, R. W. Silverman, M. E. Phelps, A. F. Chatziioannou
UCLA Crump Institute for Molecular Imaging, USA

M09-53 Understanding and Compensating for Refraction Errors in Stereo-Optical Tracking During Small Animal PET / SPECT
A. Z. Kyme[1], S. R. Meikle[1], C. Baldock[1], R. R. Fulton[1,2]
[1]University of Sydney, Australia; [2]Westmead Hosptial, Australia

M09-56 Development of a Positron Probe for Multimodality Endoscopy
K. Shimazoe[1], K. Fujita[2], H. Mori[1], M. Ohno[1], H. Takahashi[1], T. Momose[1], M. Fukuda[3]
[1]The University of Tokyo, Japan; [2]Japan Atomic Energy Agency, Japan; [3]HOYA Corporation, Japan

M09-59 Development of Anthropomorphic Phantoms for Combined PET-Ultrasound Breast Imaging
J. Dang[1], P. Lasaygues[2], S. Tavernier[1], S. Mensah[2]
[1]Vrije Universiteit Brussel, Belgium; [2]CNRS, Laboratory of Mechanics and Acoustics, France

M09-62 Effect of Crystal Size on the DOI Resolution in New DOI Encoding Method Using Light Spread Within Monolayer Pixelated Crystal Array with Single-Ended Readout
M. Ito[1,2], J. S. Lee[2,3,4,5], M.-J. Park[2], K.-S. Sim[1], S. J. Hong[5,6]
[1]Department of Physics, Korea University, Korea; [2]Departments of Nuclear Medicine, Seoul National University, Korea; [3]Biomedical Sciences, Seoul National University, Korea; [4]Brain and Cognitive Sciences, Seoul National University, Korea; [5]Institute of Radiation Medicine, Seoul National University, Korea; [6]Department of Radiological Science, Eulji University, Korea

M09-65 Validation of a New Method to Measure the Energy Spectrum of Coincidence Events in PET
A. L. Goertzen, *University of Manitoba, Canada*; D. B. Stout, *University of California, Los Angeles, USA*; C. J. Thompson, *McGill University, Canada*

M09-68 Statistical versus Analytical Scintillation Detection Algorithms for CCD Based Gamma Cameras
M. A. N. Korevaar[1,2], M. C. Goorden[1,2], J. W. T. Heemskerk[1,2], R. Kreuger[2], F. J. Beekman[1,2,3]
[1]Image sciences institute, Netherlands; [2]Radiation Detection and Medical Imaging, Netherlands; [3]Molecular Imaging Labs (MILABS), Netherlands

M09-71 Analytic Derivation of Pinhole Collimator Sensitivity for General Source Distribution
Y. Li, J. Oldendick, C. E. Ordonez, W. Chang
Rush University Medical Center, USA

M09-74 First Results from the AX-PET Demonstrator
V. Fanti[1,2,3], *[1]University of Cagliari, Italy; [2]INFN, Italy; [3]CERN, Switzerland*
On behalf of the AX-PET Collaboration

M09-77 Impact on the Spatial Resolution Performance of a Monolithic Crystal PET Detector Due to Different Sensor Parameters
X. Li, C. Lockhart, T. K. Lewellen, R. S. Miyaoka
University of Washington, USA

M09-80 A Design of PET Detector Using Microchannel Plate PMT with Transmission Line Readout
H. Kim, C.-M. Kao, C.-T. Chen, H. Frisch, F. Tang, J.-F. Genat, E. Oberla, *University of Chicago, US*; W. W. Moses, W.-S. Choong, *Lawrence Berkeley National Laboratory, US*

M09-83 Performance of the MADEIRA PET Probe Prototype
A. Studen[1], D. Burdette[2], E. Chesi[2], V. Cindro[1], N. H. Clinthorne[3], E. Cochran[2], B. Grosicar[1], K. Honscheid[2], H. Kagan[2], C. Lacasta[4], G. Llosa[4], V. Linhar[4], M. Mikuz[1,5], V. Stankova[4], P. Weilhammer[2], D. Zontar[1]
[1]Josef Stefan Institute, Slovenia; [2]Ohio State University, USA; [3]University of Michigan, USA; [4]CSIC/IFIC, Spain; [5]University of Ljubljana, Slovenia

M09-86 A Miniature SPECT Using Multi-Pinhole Collimator with Vertical Septa
B. J. Min[1], Y. Choi[1], N.-Y. Lee[2], J. H. Jung[1], K. J. Hong[1], J. H. Kang[1], W. Hu[1], K. Lee[3], Y. B. Ahn[4], J. Joung[5]
[1]Samsung Medical Center, Sungkyunkwan University School of Medicine, Korea; [2]Institute of Basic Science, Inje University, Korea; [3]Korea University, Korea; [4]Konkuk University, Korea; [5]Siemens Medical Solutions USA, Inc., USA

M09-89 Towards Sub Minute PET Examination Times
L. A. Eriksson[1,2,3,4], M. Conti[1], C. L. Melcher[2], D. W. Townsend[5], M. Eriksson[3], M. E. Casey[1], B. Bendriem[1]
[1]Siemens Healthcare, USA; [2]University of Tennessee, USA; [3]Karolinska Institutet, Sweden; [4]University of Stockholm, Sweden; [5]University of Tennessee Medical Center, USA

M09-92 High Resolution and High Efficiency Open SPECT Detector for Molecular Imaging Studies of Cardiovascular Diseases on Mice
F. Garibaldi[1], M. Baiocchi[2], E. Cisbani[1,2], F. Cusanno[1], S. Colilli[1,2], R. Fratoni[1,2], F. Giuliani[1,2], M. Gricia[1,2], M. Lucentini[1,2], M. L. Magliozzi[1,2], G. Marano[2], M. Musumeci[2], F. Santavenere[1,2], L. Vitelli[2], G. De Vincentis[3], S. Majewski[4]
[1]INFN Roma gr. Coll. Sanita', Italy; [2]Istituto Superiore di Sanita', Italy; [3]University La Sapienza, Italy; [4]University of West Virginia, USA

M09-95 A Laser-Based Method and Apparatus for Precise Detector Block Positioning and Finding Misalignments of Detector Blocks in Positron Emission Tomographs
H. Sabet, K. Ishii, S. Matsuyama, K. Nakazawa
Tohoku University, Japan

M09-98 R-SPECT: a Compact Gamma Camera Based SPECT System for Small-Animal Imaging
E. Lage[1], J. L. Villena[1], G. Tapias[1], I. Vidal-Migallon[1], M. Abella[1], A. Sisniega[1], N. P. Martinez[2], D. Ros[2], M. Desco[1], J. J. Vaquero[1]
[1]Hospital G. U. Gregorio Maranon, Spain; [2]Universidad de Barcelona-IDIBAPS, Spain

M09-101 Multi-Geometric Collimation for High Sensitivity Brain SPECT
R. Ter-Antonyan[1], R. J. Jaszczak[1,2], J. E. Bowsher[1], K. L. Greer[1], S. D. Metzler[3]
[1]Duke University Medical Center, USA; [2]Duke University, USA; [3]University of Pennsylvania, USA

M09-104 A GPU-Based Architecture for Improved Online Rebinning Performance in Clinical 3-D PET
D. R. Patlolla[1,2], J. E. Breeding[2], W. F. Jones[2], J. L. Everman[2]
[1]University of Tennessee, USA; [2]Siemens Medical Solutions USA Inc., USA

M09-107 Compensation for Lost Events in LOR Rebinning Motion Correction for PET
V. W. Zhou[1], W. C. Leung[2], A. Kyme[1], S. R. Meikle[1], R. Fulton[3]
[1]Sydney University, Australia; [2]University of Wollongong, Australia; [3]Westmead Hospital, Australia

M09-110 PVE Correction from PET-CT PVE Affected Images
F. Gallivanone[1], A. Stefano[2], C. Canevari[3], C. Messa[1,3,4], M. C. Gilardi[1,3,4], I. Castiglioni[4]
[1]Universita' Milano Bicocca, Italy; [2]LATO s.r.l, Italy; [3]Scientific Institute H. San Raffaele, Italy; [4]IBFM-CNR, Italy

M09-113 Strategies to Reduce Artifacts and Improve Accuracy in Multiplexed Multi-Pinhole Small Animal SPECT
F. P. DiFilippo, S. Patel, *Cleveland Clinic, USA*

M09-116 Imaging Performance Measurements of SiliSPECT
B. S. McDonald, S. Shokouhi, T. E. Peterson
Vanderbilt University, USA

M09-119 Evaluation of a Two-Detector ΔE-E Technique to Improve Isotope Separation in Digital Autoradiography
A. Orbom, P. Golubev, V. Avdeichikov, K. Ljunggren, B. Jakobsson, S.-E. Strand
Lund University, Sweden

M09-122 Experimental Evaluation of a High Resolution CdTe-Based PET System
G. Montemont[1], C. Comtat[2], F. Mathy[1], O. Monnet[1], R. Trebossen[2]
[1]CEA-LETI, France; [2]CEA-SHFJ, France

M09-125 ZIPI: a Single Detector Insert to Locally Improve the Sensitivity and Spatial Resolution of Small Animal PET
S. St. James, J. Zhou, J. Qi, S. R. Cherry
University of California, Davis, U.S.A.

M09-128 Spatial and Energy Resolutions of a Hexagonal Animal PET Scanner Based on Single-Layer LGSO Crystal and Flat-Panel PMT
C. M. Lee[1], S. J. Hong[2], H. S. Yoon[1], M. Ito[3], S. I. Kwon[1], S. K. Park[1], K. S. Sim[3], J. S. Lee[1]
[1]Seoul National University, Korea; [2]Eulji University, Korea; [3]Korea University, Korea

M09-131 Photon Interaction Rate Studies for a Semiconductor-Based High-Resolution Small Animal PET System
Y. Gu, C. S. Levin, *Stanford University, USA*

M09-134 Effects of Reflector and Crystal Surface for Depth Encoding Small Animal PET Detectors
Y. Yang[1], Y. Wu[1], S. St. James[1], H. Du[1], J. Qi[1], R. Farrell[2], P. A. Dokhale[2], K. S. Shah[2], S. R. Cherry[1]
[1]University of California at Davis, USA; [2]Radiation Monitoring Devices Inc., USA

M09-137 The Design of a Hybrid Small Animal Imaging System
M. R. Dimmock, J. E. Gillam, T. E. Beveridge, J. M. C. Brown, R. A. Lewis, C. J. Hall
Monash Centre for Synchrotron Science, Australia

M09-140 Noise Propagation in Multipinhole SPECT Calibration
K. Vunckx, J. Nuyts, *K.U.Leuven, Belgium*

M09-143 Monte Carlo Simulation of Four-Layer DOI Detector with Relative Offset in Animal PET
J. Y. Hwang[1,2], S.-J. Lee[1,2], C.-H. Baek[1,2], M. Ito[3], S. J. Hong[4], J. S. Lee[5], Y. H. Chung[1,2]
[1]College of Health Science, Yonsei University, South Korea; [2]Yonsei University, South Korea; [3]Korea University, South Korea; [4]Eulji University, South Korea; [5]Seoul National University College of Medicine, South Korea

M09-146 Local Energy Scale Map for NanoPET/CT System (Summary)
P. Major[1], G. Hesz[2], A. Szlavecz[2], G. Nemeth[1]
[1]Mediso Ltd., Hungary; [2]Budapest Univ. of Technology and Economics, Hungary

M09-149 Detection Efficiency and Spatial Resolution for a Continuous Scintillation Crystal - Interface - Continuous Scintillation Crystal System in Positron Emission Tomography (PET)
M. Carles[1], A. Ros[1], C. W. Lerche[2], F. Sanchez[1], A. Sebastia[2], J. M. Benlloch[1]
[1]IFIC (CSIC-U.V.), SPAIN; [2]UPV, SPAIN

M09-152 Performance Test of the MiniPET-II Small Animal Scanner According to the NEMA NU-4 Standards
S. A. Kis[1], I. Lajtos[1], M. Emri[1], G. Opposits[1], T. Bukki[2], G. Hegyesi[3], J. Imrek[3], I. Valastyan[3], J. Molnar[3], D. Novak[3], L. Balkay[1]
[1]University of Debrecen, Institute of Nuclear Medicine, Hungary; [2]MEDISO Ltd., Hungary; [3]Institute of Nuclear Research of the Hungarian Academy of Sciences, Hungary

M09-155 Multivariate Approaches for Alzheimer's Disease Diagnosis Using Bayesian Classifiers
M. Lopez, J. Ramirez, J. M. Gorriz, D. Salas-Gonzalez, I. Alvarez, F. Segovia, R. Chaves
University of Granada, Spain

M09-158 Automatic Selection of ROIs Using a Model-Based Clustering Approach
F. Segovia, J. M. Gorriz, J. Ramirez, D. Salas-Gonzalez, I. A. Illan, M. Lopez, R. Chavez, C. G. Puntonet
Universidad de Granada, Espaa

M09-161 Accuracy of Head Motion Compensation for the HRRT: Comparison of Methods
X. Jin, T. Mulnix, B. Planeta-Wilson, R. E. Carson
Yale University, USA

M09-164 A New Approach in Patient Motion Correction for Cardiac SPECT: a Simulation Study
T. Hughes, S. Shcherbinin, A. Celler
University of British Columbia, Canada

M09-167 Exceptionally Fast Non-Linear 3D Image Registration Using GPUs
R. E. Ansorge, S. J. Sawiak, G. B. Williams
University of Cambridge, UK

M09-170 Impact of Partial Volume Correction in Whole-Body PET Imaging : a Computer-Aided Detection Study
C. Lartizien[1], S. Tomei[1], A. Le Pogam[2], S. Marache-Francisco[1], D. Visvikis[2]
[1]CREATIS - CNRS UMR 5220 - INSERM U630 - INSA Lyon - Lyon University, France; [2]LATIM-INSERM U650, France

M09-173 Generalization Performance Evaluation of the Internal Noise Models for CHO
J. Arjona[1], P. H. Pretorius[2], H. Gifford[2], J. G. Brankov[1]
[1]Illinois Institute of Technology, USA; [2]University of Massachusetts Medical School, USA

M09-176 Improving Lesion Detectability of a PEM System with Post-Reconstruction Filtering
W. Luo[1], M. T. Harz[2], C. G. Matthews[1]
[1]Naviscan, Inc, USA; [2]Fraunhofer MEVIS, Germany

M09-179 An Elastic Registration Technique for Reducing Patient Motion Artifacts in Digital Subtraction Angiography
Y. Bentoutou[1], N. Taleb[2], A. Bounoua[2], C. Serief[1]
[1]Centre des Techniques Spatiales, Algeria; [2]Djilali Liabes University, Algeria

M09-182 An Evaluation of Simultaneous Dual-Tracer Technique for PET Static Studies
F. P. Figueiras[1], X. J. Gonzalez[1], D. Pareto[1,2], V. Gomez[3,2], J. Llop[3,2], J. D. Gispert[1,2]
[1]Institut d'Alta Tecnologia (IAT-PRBB), Spain; [2]CIBER en Bioingeniera, Biomateriales y Nanomedicina (CIBER-BBN), Spain; [3]CIC BiomaGUNE. Unidad de Imagen, Spain

M09-185 Automatic Segmentation of Distal Radius Using Active Shape Model in DXA
S. Cho, J. Kwon, Y. Ro, *KAIST, Korea*

M09-188 Image Magnification Using FREBAS Transform
S. Ito, Y. Harada, Y. Yamada, *Utsunomiya University, Japan*

M09-191 Fast Shift-Variant Blur Compensation Within Iterative Reconstruction for Fan-Beam Collimator
J. M. Mukherjee, H. C. Gifford, M. A. King, *University of Massachusetts, USA*; L. Shao, X. Song, J. Wang, *Philips Medical Systems, USA*

M09-194 Rotational Convolution and SPECT Post Processing
G. L. Zeng, *University of Utah, USA*

M09-197 Motion-Corrected PET Reconstruction Using an External Motion Field
G. Delso, A. Martinez-Moller, R. A. Bundschuh, S. G. Nekolla, S. I. Ziegler
TU Muenchen, Germany

M09-200 Improved Motion Correction in SPECT Imaging Using a Non-Rigid Motion Model
S. Gu[1], J. E. Mcnamara[2], K. Johnson[2], H. C. Gifford[2], H. Pretorius[2], A. Sklyar[1], M. A. Gennert[1,2], M. A. King[2]
[1]Worcester Polytechnic Institute, U.S.A; [2]University of Massachusetts Medical School, U.S.A

M09-203 Cardiac-Motion Correction for Helical CT
A. A. Isola[1,2], U. van Stevendaal[1], D. Schaefer[1], W. J. Niessen[2,3], M. Grass[1]
[1]Philips Research Europe - Hamburg, Germany; [2]Erasmus MC, University Medical Center Rotterdam, The Netherlands; [3]Delft University of Technology, The Netherlands

M09-206 Normalized Metal Artifact Reduction (NMAR) in Computed Tomography
E. Meyer[1,2], F. Bergner[1], R. Raupach[2], M. Kachelriess[1]
[1]University of Erlangen-Nuernberg, Germany; [2]Siemens Healthcare, Germany

M09-209 Simultaneous Crosstalk Compensation for an ROI Activity Estimation in Dual-Isotope SPECT Imaging
S. Shcherbinin, A. Celler
The University of British Columbia, Canada

M09-212 Log-likelihood-based rule for image quality monitoring in the MLEM-based image reconstruction for PET
A. Gaitanis[1,2], G. Kontaxakis[3,4], G. Spyrou[2], G. Panayiotakis[1], G. Tzanakos[5]
[1]University of Patras, Greece; [2]Biomedical Research Foundation of Athens Academy, Greece; [3]Universidad Politcnica de Madrid, Spain; [4]Networking Research Center on Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN), Spain; [5]University of Athens, Greece

M09-215 A Fully Corrected Fan Beam OSEM Algorithm for Dirty Emitters
N. Agbeko, J. O'Sullivan, R. Laforest, J.-C. Cheng
Washington University In St. Louis, USA

M09-218 Interpolation for the Gap-Filling of the HRRT PET Sinograms by Using the Slices in the Direction of the Radial Samples
U. Tuna, S. Peltonen, U. Ruotsalainen
Tampere University of Technology, Finland

M09-221 Without a *Priori* Knowledge Solving the Interior Problem in CT Using Two Scans
L. Li, H. Hu, Z. Chen, K. Kang, L. Zhang
Tsinghua University, China

M09-224 New Attenuation Correction for the HRRT Using Transmission Scatter Correction and Total Variation Regularization
M. Sibomana[1], S. H. Keller[1], C. Svarer[1], O. V. Olesen[1,2], F. Andersen[1], S. Holm[1], L. Hoejgaard[1]
[1]Copenhagen University Hospital, Rigshospitalet, Denmark; [2]DTU, Denmark

M09-227 Weighted Image Reconstruction in Planar PET
C.-C. Liu[1], Y.-J. Tsai[1], C.-H. Hsu[2], I.-T. Hsiao[1]
[1]Chang Gung University, Taiwan; [2]National Tsing Hua University, Taiwan

M09-230 Real Time Imaging and Dose Verification for Intracavitary Breast Brachytherapy
N. Govindarajan, V. Nazaryan, C. Keppel, P. Gueye, *Hampton University, USA*; A. Weisenberger, S. Majewski, *Thomas Jefferson Laboratory, USA*

M09-233 Analysis of the signal for high resolution Digital X-ray Detector under Radiotherapy irradiation condition
J. E. Kim[1], M. W. Kim[2], Y. S. Kim[3], K. M. Oh[3], M. S. Yun[3], C. Kwon[2], K. T. Nam[4], S. H. Nam[5]
[1]Radiological Science, South of Korea; [2]Medical image and Science department, South of Korea; [3]Biomedical Engineering, South of Korea; [4]Korea Institute of Industrial Technology, South of Korea; [5]Biomedical Engineering and Medical Image Research Center, South of Korea

M09-236 Three-Dimensional Dosimetry Reconstruction in Eye Brachytherapy
M. Petasecca[1], M. L. F. Lerch[1], D. Cutajar[1], D. Franklin[1], J. Green[1], M. Weaver[1], J. Jakubek[2], M. G. Carolan[1,3], M. R. Conway[4], S. Pospisil[2], T. Kron[5], M. Zaider[6], A. B. Rosenfeld[1]
[1]University of Wollongong, Australia; [2]Czech Technical University in Prague, Czech Republic; [3]Illawarra Cancer Care Centre, Australia; [4]The University of Sydney, Australia; [5]Peter MacCallum Cancer Centre, Australia; [6]Memorial Sloan-Kettering Cancer Centre, USA

M09-239 Experimental Validation of a Monte Carlo Model to Predict EPID Images for Online Verification in Radiotherapy
D. Lazaro-Ponthus, T. Lamotte, J.-C. Garcia-Hernandez, S. Legoupil
CEA, France

M09-242 Designing the Scintillation Module of a Pixelated Gamma Camera : Ths Spatial Spreading Behaviour of Light.
E. Netter, M.-A. Duval, B. Janvier, F. Lefebvre, L. Menard, L. Pinot, R. Siebert, Y. Charon
Imagerie en Modelisation, Neurobiologie et Cancerologie, France

M09-245 Attenuation Correction of Coils and MR Bed for a Sequential PET/MR System
D. Pal, Z. Hu, N. Ojha, C. H. Tung, J. Kaste
Philips Healthcare, USA

M09-248 A Fiducial Marker Based Technique for Alignment of Simultaneously Acquired PET and MRI Images
J. E. Mackewn, G. Charles-Edwards, E. J. Somer, P. Halsted, M. Kelly, S. F. Keevil, T. Schaeffter, P. K. Marsden
Guy's, King's and St Thomas' school of medicine and dentistry, UK

M09-251 Development of an Integrated PET/MRI System for Small Animals
S. Yamamoto[1], M. Imaizumi[2], Y. Kanai[2], Y. Hasegawa[2], I. Higuchi[2], M. Takasawa[2], M. Aoki[3], E. Sugiyama[3], E. Shimosegawa[2], J. Hatazawa[2]
[1]Kobe City College of Technology, Japan; [2]Osaka Univiersity Graduated School of Medicine, Japan; [3]Hitachi Metal, Neomax Company, Japan

M09-254 Design and Construction of the ClearPET/XPAD Small Animal PET/CT Scanner
S. Nicol[1], S. Karkar[1], D. Benoit[1], F. Cassol-Brunner[1], P. Descourt[2], C. Morel[1]
[1]CPPM, Aix-Marseille Universite, CNRS/IN2P3, France; [2]LaTIM - U650 INSERM, France

M09-257 Results from Prototype II of the BNL Simultaneous PET-MRI Dedicated Breast Scanner
B. Ravindranath[1], S. S. Junnarkar[2], M. L. Purschke[2], S. H. Maramraju[1], X. Hong[3], D. Bennett[3], K. Cheng[3], D. Tomasi[2], S. S. Southekal[1], S. P. Stoll[2], J.-F. Pratte[4], P. Vaska[2], C. Woody[2], D. J. Schlyer[2]
[1]Stony Brook University, USA; [2]Brookhaven National Laboratory, USA; [3]Aurora Imaging Technology, Inc., USA; [4]Universite de Sherbrooke, Canada

M09-260 Unified Geometric Calibration and Image Registration for Detached Small Animal SPECT/CT
X. Zhang[1], F. Chen[1], Y. Li[1], Q. Wei[1], H. Zhang[2], Y. Qi[1]
[1]Shanghai Institute of Applied Physics, Chinese Academy of Sciences, China; [2]the Ohio State University, USA

M09-263 Monte-Carlo Simulations of LYSO-SiPM Modules
J. Pulko, M. Hohberg, S. Fuerst, S. I. Ziegler
Klinikum rechts der Isar der Technischen Universitaet Muenchen, Germany

M09-266 Design and Initial Performance of Photon Counting Based Detection System for Digital Mammography
S. Jeon, K. S. Song, D. H. Lee, B. Kim, Y. G. Hwang, Y. Huh, *Korea Electotechnology Research Institute, Korea*; Y. Park, *Hanwha L&C, Korea*; N. Jang, *Changwon National Univ., Korea*; C. Seo, *Soongsil Univ., Korea*

M09-269 Novel Applications of Rapid Prototyping in SPECT, PET, CT, X-Ray, and Gamma-Ray Imaging
B. W. Miller, J. W. Moore, L. R. Furenlid, H. H. Barrett, M. E. Gehm
University of Arizona, USA

M09-272 Characteristic Study of Multi-Layer Using Hybrid Method for Digital X-Ray Detector
Y.-S. Kim[1], M.-S. Kim[1], S.-H. Jung[1], K.-M. Oh[1], J.-W. Shin[2], S.-H. Nam[1,3]
[1]Inje University, Korea; [2]R&D Center of LISTEM, Korea; [3]Bio-Medical Research Center, Korea

M09-275 Investigation of Multi-Anode Microchannel Plate PMT for Time-of Flight PET
W.-S. Choong, *Lawrence Berkeley National Laboratory, U.S.A*

M09-278 A SiPM Block Detector for a Sub-Millimeter Resolution PET Insert for the Siemens Inveon Scanner
T. Y. Song[1], H. Wu[1], S. A. Komarov[1], S. B. Siegel[2], Y.-C. Tai[1]
[1]Mallinckrodt Institute of Radiology, Washington University School of Medicine, USA; [2]Siemens Preclinical Solutions, USA

M09-281 Three-Dimensional Tomographic Imaging by Semiconductor Compton Camera GREI for Multiple Molecular Simultaneous Imaging
S. Motomura[1], T. Fukuchi[1], Y. Kanayama[1], H. Haba[1], Y. Watanabe[1], S. Enomoto[1,2]
[1]RIKEN Center for Molecular Imaging Science, Japan; [2]Okayama University, Japan

M09-284 System Model for Laser-Scanning Photoacoustic Microscopy
P. J. La Riviere, *The University of Chicago, USA*; Z. Xie, H. F. Zhang, *The University of Wisconsin Milwaukee, USA*

M09-287 Knowledge-Based Segmentation of Attenuation-Relevant Regions of the Head in T1-Weighted MR Images for Attenuation Correction in MR/PET Systems
G. Wagenknecht, E. Rota Kops, L. Tellmann, H. Herzog
Research Center Juelich, Germany

M09-290 Simultaneous 3D Imaging of Bone and Vessel Microstructure in a Rat Model: Measurement of Vascular-Trabecular Interdistance
M. Langer[1,2], R. Prisby[2,3], Z. Peter[2,4], A. Guignandon[2], M.-H. Lafage-Proust[2], F. Peyrin[1,2]
[1]European Synchrotron Radiation Facility, France; [2]Universite de Lyon, France; [3]University of Texas, USA; [4]University of Paris 10, France

M09-293 Implementation and Evaluation of a Model-Based Downscatter Compensation Method for Quantitative I-131 SPECT
N. Song, D. Yong, B. He, E. C. Frey
Johns Hopkins Medical Institution, USA

M09-296 Effects of Defects on Partial Volume Compensation in Emission Computed Tomography Cardiac Imaging
Y. Du, E. C. Frey, *Johns Hopkins Medical Institutions, MD*

M09-299 Video Image Based Attenuation Correction for PETBox, a Preclinical PET Tomograph
R. Taschereau[1], Q. Bao[1], F. Rannou[2], A. Chatziioannou[1]
[1]University of California Los Angeles, USA; [2]Universidad de Santiago de Chile, Chile

M09-302 Quantification of Skeletal Involvement from Whole-Body Imaging: Validation by Monte Carlo Simulations
M. Ljungberg, *Lund University, Sweden*; K. Sjostrand, J. Richter, L. Edenbrandt, *Exini Diagnostics AB, Sweden*

M09-305 Fundamental Phantom Experiments and Simulations Aimed at Quantification of Myocardial Blood Flow Using 3-D PET
Y. Hirano, H. Watabe, K. Koshino, H. Iida
National Cardiovascular Center Research Institute, Japan

M09-308 CT-Based Attenuation Correction on the FLEX Triumph Preclinical PET/CT Scanner
R. Prasad[1], M. R. Ay[2], O. Ratib[1], H. Zaidi[1]
[1]Geneva University Hospital, Switzerland; [2]RCSTIM & Tehran University of Medical Sciences, Iran

M09-311 PET Reconstruction Using a Cooperative Coevolution Strategy
F. P. Vidal[1,2], D. Lazaro-Ponthus[2], S. Legoupil[2], J. Louchet[1,3], E. Lutton[1], J.-M. Rocchisani[1,4]
[1]INRIA Salcay -- le-de-France, France; [2]CEA Saclay, France; [3]Artenia, France; [4]Paris XIII University & Avicenne hospital, France

M09-314 Simple and Robust Energy-Based Scatter Correction from List-Mode PET Data
W. A. Worstell, L. V. Romanov, H. A. Kudrolli, P. Kulinich, J. D. Nevin, T. S. Toole, C. Worth
PhotoDetection Systems, Inc., MA

M09-317 Two-Dimensional Region-of-Interest Reconstruction: Analyzing the Difference Between Virtual Fanbeam and DBP-Hilbert Reconstructions
R. Clackdoyle[1,2], D. Ghosh Roy[1], M. Defrise[3], C. Mennessier[1], M. S. Ould Mohamed[1]
[1]Jean Monnet University, France; [2]University of Utah, USA; [3]Free University of Brussels, Belgium

M09-320 Iterative Blob-Based Super-Resolution Reconstruction with Wavelet Denoising
E. Y. T. Ho, *Nanyang Technological University, Singapore*

M09-323 An Accelerated Algebraic Reconstruction Technique Based on the Newton-Raphson Scheme
S. Angeli[1,2], E. Stiliaris[1]
[1]National & Kapodistrian University of Athens, Greece; [2]Imperial College, UK

M09-326 Selection of Point Source Positions in Small Animal PET for System Matrix Generation
J. Schirmer, S. Ziegler, *Klinikum rechts der Isar, Germany*

M09-329 Optimum Real-Time Reconstruction of High-Rate Gamma Events for Anger Cameras, with the Use of a GPGPU
S. Pedemonte[1], A. Gola[1,2], A. Abba[1], C. Fiorini[1,2]
[1]Politecnico Di Milano, Italy; [2]INFN, sez. di Milano, Italy

M09-332 A Flexible Acquisition System for Modular Dual Head PET Systems for Positron Emission Mammography
N. Belcari[1,2], F. Attanasi[1,2], G. Franchi[3], S. Moehrs[1], V. Rosso[1,2], A. Santos[4,5], F. Spinella[2], G. Sportelli[4,5], A. Del Guerra[1,2]
[1]University of Pisa, Italy; [2]INFN, Italy; [3]AGE Scientific, Italy; [4]CIBER-BBN, Spain; [5]Universidad Politecnica de Madrid, Spain

M09-335 fMRI Data Analysis Using a Novel Clustering Technique
J. M. Gorriz, *University of Granada, Spain*
On behalf of the SiPBa group

M09-338 Analysis of Dynamic SPECT-CT Measurements of the Arterial Input Function in Human Subjects
C. D. Winant[1], C. Mari Aparici[1], S. Bacharach[1], B. W. Reutter[2], A. Sitek[3], G. T. Gullberg[2]
[1]UCSF, USA; [2]LBNL, USA; [3]Brigham and Women's Hospital - Harvard Medical School, USA

M09-341 Simulation Study on the Diverging SPECT System with a Semiconductor Detector
T. Kusayanagi, K. Ogawa
Hosei University, Faculty of Science and Engineering, Japan

M09-344 Efficient Simulations of Iodine 131 SPECT Scans Using GATE
T. Carlier[1,2], P. Descourt[2], L. Maigne[3], D. Visvikis[2], M. Bardies[2], I. Buvat[3]
[1]University Hospital - Nantes Hotel Dieu, France; [2]Inserm, France; [3]CNRS, France

M09-347 Effects of geometric and motion tracking errors on awake small animal SPECT
S. J. Lee, J. S. Baba, J. S. Goddard, *Oak Ridge National Laboratory, US*; A. G. Weisenberger, S. Stolin, J. McKisson, *Thomas Jefferson National Accelerator Facility, US*; M. F. Smith, *University of Maryland, US*

M09-350 Singular Value Decomposition Analysis of a Novel Clinical Ultra-Fast Cardiac SPECT Camera
L. Volokh, Y. Grobshtein, *GE Healthcare, Israel*; H. H. Barrett, M. A. Kupinski, *The University of Arizona, AZ*

M09-353 Whole-Body Single-Bed Time-of-Flight RPC-PET: Simulation of Axial and Planar Sensitivities with NEMA and Anthropomorfic Phantoms
P. Crespo[1,2], J. Reis[1,3], M. Couceiro[1,2], N. Ferreira[4,5], R. Ferreira Marques[1,3], P. Fonte[1,2]
[1]LIP - Laboratório de Instrumentação e Física Experimental de Partículas, Portugal; [2]ISEC - Instituto Superior de Engenharia de Coimbra, Portugal; [3]Faculty of Science and Technology, Portugal; [4]Institute of Biophysics-Biomathematics, Portugal; [5]ICNAS - Instituto de Ciências Nucleares Aplicadas à Saúde, Portugal

M09-356 Validation of GATE Simulations of the 176Lu Intrinsic Activity in LSO PET Detectors
B. McIntosh, A. L. Goertzen, *University of Manitoba, Canada*

M09-359 GATE Simulations of Human and Small Animal PET for Determination of Scatter Fractions as a Function of Object Size
A. Konik, M. Madsen, J. Sunderland, *University of Iowa, USA*

M09-362 Investigation of Compton Scatter in a Clinical PET/CT Scanner with a High Resolution Half Ring PET Insert Device
S. A. Komarov, H. Wu, D. B. Keesing, J. A. O'Sullivan, Y.-C. Tai
Washington University in St.Louis, USA

M09-365 A Full-System Simulation Chain for Computed Tomography Scanners
S. Kappler, D. Niederloehner, S. Wirth, K. Stierstorfer
Siemens Healthcare, Germany

M09-368 Mathematical Modeling of a New Detector for PET on the Base of Homogeneous Scintillator
V. Y. Pedash, A. I. Ivanov
Institute for scintillation materials NAS of Ukraine, Ukraine

M09-371 Neural Computing for Quantitative Analysis of Human Bone Trabecular Structures in Synchrotron Radiation X-Ray microCT Images
A. A. M. Meneses[1,2], C. J. G. Pinheiro[3], L. M. Gambardella[2], R. Schirru[1], R. C. Barroso[3], D. Braz[1], L. F. Oliveira[3]
[1]COPPE/UFRJ, Brazil; [2]Dalle Molle Institute for Artificial Intelligence, Switzerland; [3]State University of Rio de Janeiro, Brazil

M09-374 Spectral Pharmacokinetic PET Reconstruction
A. McLennan, S. M. Brady, *University of Oxford, UK*

M09-377 Tissue Spillover Correction for Dynamic Pinhole SPECT Studies of Fatty Acid Metabolism in the Rat Heart
B. W. Reutter, R. Boutchko, R. H. Huesman, A. C. Sauve, G. T. Gullberg
Lawrence Berkeley National Laboratory, USA

M09-380 Dual Energy CT with Mismatched Rays
C. A. Maass, R. Grimmer, M. Kachelriess
University Erlangen-Nuremberg, Germany

M09-383 A Digital Line-Camera for Energy Resolved X-Ray Photon Counting
X. Wang[1], D. Meier[2], B. M. Sundal[2], P. Oya[2], G. E. Maehlum[2], D. J. Wagenaar[2], B. M. W. Tsui[1], E. Frey[1], B. E. Patt[2]
[1]Johns Hopkins University, USA; [2]Gamma Medica - Ideas, Norway/ Canada/USA

M09-386 A Preliminary Investigation of Compressive-sensing Image Reconstruction from Flying-focal-spot CT Data
D. Xia, J. Bian, X. Han, E. Sidky, X. Pan
The University of Chicago, USA

M09-389 Optimization of kVp Settings and Metal Filter for Maximum Differentiation of Kidney Stones using Dual-Source CT
G. S. K. Fung[1], J. Xu[1], K. Taguchi[1], S. Kawamoto[1], E. Fishman[1], T. G. Flohr[2], K. Stierstorfer[2], B. M. W. Tsui[1]
[1]Johns Hopkins University, US; [2]Siemens Health Care, Germany

M09-392 Distribution of Absorbed Dose in Cone-Beam Breast Computed Tomography: a Phantom Study with Radiochromic Films
P. Russo, T. Coppola, G. Mettivier, M. C. Montesi, A. Lauria
INFN and Universit di Napoli Federico II, Italy

M09-395 Development of Multimirror for the Parallel X-Ray Beam of a Laboratory Based X-Ray Source
T. Nguyen, K. Kim, I. Jeon
Chonnam National University, Republic of Korea

M09-398 Mapping Lead Distribution in Bones by Dual-Energy Computed Microtomography with Synchrotron Radiation
L. P. Nogueira[1], R. C. Barroso[2], C. J. Pinheiro[2], D. C. Braz[1], L. F. Oliveira[2], G. Tromba[3], N. Sodini[3]
[1]Federal University of Rio de Janeiro/COPPE, Brazil; [2]State University of Rio de Janeiro, Brazil; [3]Sincrotrone Trieste SCpA, Italy

M09-401 Pulmonary Motion Tracking from 4D-CT Images Using a 3D-KLT Tracker
Y. Kubota, K. Aoki, H. Nagahashi, *Tokyo Institute of Technology, Japan*; S.-I. Minohara, *National Institute of Radiological Sciences, Japan*

M09-404 Reduction of Artifacts Due to Multiple Metal Objects in Computed Tomography
K. Y. Jeong, J. B. Ra, *KAIST, South Korea*

M10 PET/SPECT instrumentation 2

Friday, Oct. 30 14:00-15:30 International Ballroom Center

Session Chairs: **Jennifer S. Huber**, Lawrence Berkeley National Lab, USA
Magnus Dahlbom, David Geffen School of Medicine at UCLA, USA

M10-1 Conceptual Design of High Resolution and Quantitative SPECT system for Imaging a Selected Small ROI of Human Brain
T. Zeniya[1], Y. Hirano[1], T. Sakimoto[2], K. Ishida[1], H. Watabe[1], N. Teramoto[1], H. Kudo[3], K. Minato[2], J. Hatazawa[4], H. Iida[1]
[1]National Cardiovascular Center Research Institute, Japan; [2]Nara Institute of Science and Technology, Japan; [3]University of Tsukuba, Japan; [4]Osaka University Graduate School of Medicine, Japan

M10-2 Design and Development of a New PET Detector with Both DoI and ToF Capabilities
V. C. Spanoudaki, C. S. Levin, *Stanford University, USA*

M10-3 Development of a Novel High-Sensitivity Dedicated Brain PET Scanner: NeuroPET
S. Adler, P. Domigan, O. Johnson, P. Juels, H. Kudrolli, P. Kulinich, D. Lazuka, P. Monteverde, J. Nevin, L. Romanov, S. Starsja, J. Taggart, T. Toole, S. Walker, B. Worstell, C. Worth
PhotoDetection Systems, Inc., USA

M10-4 Characterization of the Clear-PEM Breast Imaging Scanner Performance
J. Varela, *LIP, Portugal*
On behalf of the ClearPEM Collaboration

M10-5 OpenPET: a Flexible Electronics System for Radiotracer Imaging
W. W. Moses[1], S. Buckley[2], C. Vu[1], W.-S. Choong[1], N. Pavlov[2], Q. Peng[1], C. Jackson[2]
[1]Lawrence Berkeley National Laboratory, USA; [2]SensL, Ireland

M10-6 Performance of PET Scanner Based on Pixelated Solid-State Detector
M. Meissani, *IFAE, Spain*; M. Canadas, P. Arce, *CIEMAT, Spain*

M11 Plenary 2 / Multimodality Instrumentation and Techniques

Friday, Oct. 30 16:00-18:00 International Ballroom Center

Session Chairs: **Paul K. Marsden**, King's College London, England, United Kingdom
Paul Vaska, Brookhaven National Laboratory, USA

M11-1 (invited) Challenges and Solutions for Imaging Stem Cell Transplantation
K. Wilson, *Stanford University, USA*

M11-2 Feasibility of Small Animal Dynamic SPECT Inside MRI
S. Chen[1], D. Meier[2], J. Xu[1], J. Yu[1], D. Wagenaar[3], B. M. W. Tsui[1]
[1]Johns Hopkins Medical Institutions, United States; [2]Gamma Medical-Ideas Inc., Norway; [3]Gamma Medical-Ideas Inc., United States

M11-3 MR-Based Motion Correction in Simultaneous PET-MR
S. Cho, B. Guerin, T. Reese, J. Ouyang, C. Catana, G. El Fakhri
Mass. General Hospital and Harvard Medical School, USA

M11-4 Development of a Detector Module for Combined PET/CT or Combined Photon Counting/Standard CT Based on SiPM Technology
A. Persson, A. Khaplanov, B. Cederwall, *Royal Institute of Technology, Sweden*; C. Bohm, *Stockholm University, Sweden*

M11-5 Simultaneous in Vivo Measurements with a Combined Animal PET/MRI
M. S. Judenhofer, H. F. Wehrl, F. C. Maier, J. G. Mannheim, D. Bukala, G. Tabatabei, A. Schmidt, N. Kemmler, A. Sauter, C. Calaminnus, G. Reischel, B. J. Pichler
University of Tuebingen, Germany

M11-6 MR-Based Attenuation Correction for a Whole-Body Sequential PET/MR System
Z. Hu[1], N. Ojha[1], S. Renisch[2], V. Schulz[2], I. Torres[3], D. Pal[1], G. Muswick[1], J. Penatzer[1], T. Guo[1], P. Boernert[2], C.-H. Tung[1], J. Kaste[1], L. Shao[1], M. Morich[1], T. Havens[1], P. Maniawski[1], W. Schaefer[4], R. W. Guenther[4], G. A. Krombach[4]
[1]Philips Medical Systems, USA; [2]Philips Research, Germany; [3]RWTH Aachen University, Germany; [4]University of Technology, Germany

M12 X-ray imaging 2

Saturday, Oct. 31 08:30-10:00 International Ballroom Center

Session Chairs: **Xiaochuan Pan**, The University of Chicago, USA
Stephen J. Glick, Univ. of Massachusetts Medical School, USA

M12-1 CT Spectral Projection Imaging
J. Hsieh[1], B. Senzig[1], S. Woloschek[1], S. Aluri[1], T. Benson[2], X. Wu[2], D. Okerlund[1], B. Li[1]
[1]GE Healthcare, USA; [2]GE GRC, USA

M12-2 Radiation Dose Reduction with Voltage Modulation in Dual Energy CT
Y. Zou, *Toshiba Medical Research Institute USA, Inc., USA*

M12-3 A new Method for Cupping and Scatter Precorrection for Flat Detector CT
R. Grimmer, C. Maass, M. Kachelriess
University of Erlangen-Nuernberg, Germany

M12-4 Dynamic Iterative Beam Hardening Correction (DIBHC) for an Optimized Assessment of Cardiac Perfusion in ECG-Correlated CT
P. Stenner[1], B. Schmidt[2], R. Raupach[2], T. Allmendinger[2], T. Flohr[2], M. Kachelriess[1]
[1]University of Erlangen-Nuernberg, Germany; [2]Healthcare Sector, Germany

M12-5 Low-dose Kilo-voltage Cone-beam CT Image Reconstruction by Constrained Total-variation Minimization: Experience with Clinical Data
X. Han, J. Bian, E. Pearson, S. Cho, E. Y. Sidky, C. A. Pelizzari, X. Pan
The University of Chicago, USA

M12-6 Multi-Source Inverse-Geometry CT: from System Concept to Research Prototype
B. De Man, A. Caiafa, Y. Cao, K. Frutschy, D. Harrison, L. Inzinna, R. Longtin, V. B. Neculaes, J. Reynolds, J. Roy, J. Short, J. Uribe, W. Waters, X. Zhang, Y. Zou, *GE Global Research Center, USA*; R. Senzig, *GE Healthcare, USA*; N. Pelc, *Stanford University, USA*

M13 MIC Posters 3

Saturday, Oct. 31 10:30-12:30 Grand Ballroom 4&5; Palm 3,4&5

Session Chairs: **Andrew L. Goertzen**, University of Manitoba, Canada
Ana M. Marques da Silva, PUCRS, Brazil

M13-3 A Feasibility Study of Breast CT Imaging with Substantially Lowered Radiation Dose
J. Bian[1], X. Han[1], K. Yang[2], N. Packard[2], E. Sidky[1], J. Boone[2], X. Pan[1]
[1]The University of Chicago, USA; [2]University of California Davis, USA

M13-6 Cross-strip capacitive multiplexing and electro-optical coupling for silicon photomultiplier arrays for PET detectors
P. D. Olcott, H. Peng, C. S. Levin
Stanford University, USA

M13-9 Development of G-APD-Based PET Block Detectors
A. Kolb[1], E. Lorenz[2], D. Renker[3], R. Grazioso[4], N. Zhang[4], D. Henseler[4], B. J. Pichler[1]
[1]Laboratory for Preclinical Imaging and Imaging Technology, Germany; [2]Max Planck Institute for Physics, Germany; [3]Paul Scherer Institute, Switzerland; [4]Siemens Medical Solutions, MI, USA

M13-12 Measurements for the SiliPET Project: a Small Animal PET Scanner Based on Stacks of Silicon Detectors
N. Auricchio[1,2], G. Di Domenico[1,2], L. Milano[1,2], R. Malaguti[2], M. Ionica[3], E. Fiandrini[3,4], G. Zavattini[1,2]
[1]University of Ferrara, Italy; [2]Sezione di Ferrara, Italy; [3]Sezione di Perugia, Italy; [4]University of Perugia, Italy

M13-15 Versatile APD-based PET Modules for High Resolution, Fast Medical Imaging
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M13-18 Three-Class ROC Analysis the General Decision Theoretic Solution
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M13-21 Impact of Fully 4D Reconstruction on Kinetic Parameter Estimates
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M13-24 GPU Accelerated Statistical Image Reconstruction for Compton Cameras
V.-G. Nguyen, S.-J. Lee, M. N. Lee
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M13-27 A MR Compatible Brain PET Using Tileable GAPD Arrays
J. H. Jung, Y. Choi, K. J. Hong, J. H. Kang, W. Hu, B. J. Min, Y. S. Huh, S. H. Shin, H. K. Lim, D. S. Kim, H. B. Jin
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M13-30 Development of PET Detectors Using Monolithic Scintillation Crystals Processed with Sub-Surface Laser Engraving Technique
T. Moriya, K. Fukumitsu, T. Sakai, S. Osuka, T. Okamoto, H. Takahashi, M. Watanabe, T. Yamashita
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M13-33 Quantitative Assessment of Hypoxia Kinetic Models by a Cross-Study of Dynamic 18F-FAZA and 15O-H2O in Head and Neck Tumor
K. Shi, S. Astner, M. Souvatzoglou, I. Miederer, J. Wilkens, F. Nuesslin, M. Molls, S. Ziegler
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M13-36 A Virtual Dissection Based Registration to Model Patient Specific Respiratory Motion
J. Jones, E. Lewis, M. Guy, K. Wells
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M13-39 Adaptive SPECT Imaging with Variable System Modeling Techniques
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M13-42 Energy Dependent X-Ray Phase-Contrast Imaging Using Grating-Interferometry
P. Bartl, T. Michel, G. Anton
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M13-45 Enabling Photon Counting Clinical X-Ray CT
K. Taguchi, *Johns Hopkins University, U.S.A.*; H. Kudo, *University of Tsukuba, Japan*; W. C. Barber, *DxRay, Inc., U.S.A.*

M13-48 Correction Techniques for a Half-Ring PET Insert System to Locally Enhance the Image Resolution of a Clinical PET/CT Scanner
Y.-C. Tai, D. B. Keesing, H. Wu, T. Y. Song, S. Komarov, J. A. O'Sullivan
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M13-51 Quantification with a Dedicated Breast PET/CT Scanner
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M13-54 Evaluation of a Bedside SPECT System Based on Cardiac Phantom Defect Detection
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M13-57 A Staggered Array of Pinhole Cameras for Dedicated Breast SPECT
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M13-60 Position-Sensitive Solid State Photomultipliers for PET Imaging
E. Roncali[1], Y. Yang[1], M. McClish[2], P. Dokhale[2], C. Stapels[2], E. Johnson[2], J. Christian[2], K. S. Shah[2], S. R. Cherry[1]
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M13-63 Development of PET-Hat: Wearable PET System for Brain Research
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M13-66 Evaluation of a fully 3D, big bore TOF PET scanner with reduced scatter shields
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M13-69 A Study on the Timing Performance of PMT-Quadrant-Sharing LYSO Position-sensitive Detector Blocks for Time-of-flight PET
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M13-72 An Experimental Evaluation of Triangular Prism Shaped LSO Crystals for Large Detector Blocks
J. K. Poon, S. St. James, S. R. Cherry, *University of California, Davis, USA*; R. D. Badawi, *University of California Davis Medical Center, USA*

M13-75 Development of a Prototype Semiconductor Gamma-Camera System
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M13-78 Performance Estimation of High Resolution SPECT for the Head by Monte Carlo Simulation of Scintillation Lights
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M13-81 Evaluation of a Cardiac SPECT System Using a Common Set of Solid-State Detectors for Both Emission and Transmission Scans and a Ultras-Low Dose Lead X-Ray Transmission Line Source
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M13-84 Improved Reconstruction of Planar Scintigraphic Iimages from a Continuous Crystal with a Pad Segmented Photomultiplier Readout
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On behalf of the ECORAD collaboration

M13-87 Feasibility Study of Using Solid State Photomultiplier Array for PET Detector Development
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M13-90 A Novel Random Counts Estimation Method for PET Using a Symmetrical Delayed Window Technique and Random Single Event Acquisition
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M13-93 A Comparison of the Performance of High QE Photomultiplier Tubes to Conventional Photomultiplier Tubes
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M13-96 Optimization of Enhanced Energy Window on a Whole-Body DOI PET System
A. Ohtani, K. Tanaka, T. Mizuta, Y. Inoue, K. Kitamura, H. Tonami, J. Ohi
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M13-99 Quality Control Protocol for Frame-to-Frame PET Motion Correction
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M13-102 Feasibility Study of Entire Whole-Body PET Scanners Based on the OpenPET Geometry
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M13-105 Evaluation and Calibration of PET scanners with a Specially Designed Point-like Radioactive Source
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M13-108 A Low-Cost Coincidence System with Capability of Multiples Coincidence for High Count-Rate TOF or Non-TOF PET Cameras Using Hybrid Method Combining AND-logic and Time-mark Technology
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M13-111 Wavelet Optimization and Noise Reduction for LEGP Collimator in SPECT Simulated Images
F. Babapour Mofrad, A. Abbaspour Tehrani-Fard, B. Ebrahimi, D. Sardari, M. Pouladian, A. Ebrahimi
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M13-114 New Continuous Miniature Crystal Element (cMiCE) Detector Geometries
R. S. Miyaoka, X. Li, C. Lockhart, T. K. Lewellen
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M13-117 Preliminary Experimental Results of a Quasi-Monolithic Detector with DOI Capability for a Small Animal PET
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M13-120 A Study on PET Image Quality Using Both Strong Magnetic Fields and a ML-EM Positron Range Correction Algorithm
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M13-123 Per Ring Dead Time Correction for Preclinical PET
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M13-126 Design of a Real Time FPGA-Based Three Dimensional Positioning Algorithm
N. G. Johnson-Williams, R. S. Miyaoka, X. Li, T. K. Lewellen, S. A. Hauck
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M13-129 Theoretical Design of the High-Resolution Zoom-in Detector for Targeted PET Imaging
J. Zhou, S. St. James, S. Cherry, J. Qi
University of California, Davis, USA

M13-132 A Study on Spiral Cone Beam Scanning Mode for Preclinical Micro-CT
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M13-135 Temperature and Bias Voltage Studies of a Large Area Position Sensitive Avalanche Photodiode
A. Vandenbroucke, J. Lee, V. C. Spanoudaki, F. W. Y. Lau, P. D. Reynolds, C. S. Levin
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M13-138 Construction of a Pre-Clinical High Resolution Tomographic Scintillation Camera System
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M13-141 Searching for a Precise System Response Function for a Single Photon Emission Microscope System
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M13-144 The PIMager: a New Tool for High Sensitive Numerical Beta Autoradiography
J. Donnard[1], N. Arlicot[2], R. Berny[1], H. Carduner[1], S. Chalon[2], A. Faivre-Chauvet[2], P. Leray[1], E. Morteau[1], N. Servagent[1], D. Thers[1]
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M13-147 Mixed Isotope Effects : Image Quality in Multimodality PET/SPECT Preclinical Imaging
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M13-150 Performance Comparison of Two Compact Charge Multiplexed Readout Schemes for Multi-Anode Position Sensitive Photomultiplier Tubes
Y. Qi, C. Zhao, Q. Dai, M. Liu, *Shanghai Institute of Applied Physics, China*; H. Zhang, *The Ohio State University, USA*

M13-153 Comparison Between Parallel Hole and Rotating Slat Collimation with a Contrast Phantom Using an Analytical Method
L. Zhou, K. Vunckx, J. Nuyts, *K.U.Leuven, Belgium*

M13-156 Technique to Distinguish Signal from Statistical Noise in PET Imaging
J. Hamill, M. Conti, *Siemens Healthcare, USA*

M13-159 A New Combined Live Wire and Active Surface Approach for Volume-of-Interest Segmentation
G. Wagenknecht, A. Poll, M. Losacker, *Research Center Juelich, Germany*; I. Blockx, A. van der Linden, *University of Antwerp, Belgium*

M13-162 Improvement in Defect Size and Contrast Using Respiratory Motion Correction in Cardiac PET/CT
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M13-165 The Utah PET Lesion Detection Database
D. J. Kadrmas, *University of Utah, USA*

M13-168 Elastic Atlas Registration of Beta- Autoradiograms Using Scattered Data Interpolators
J. Cabello, A. Metaxas, A. Bailey, I. Kitchen, K. Wells
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M13-171 Implementation of a 3D Topographic Thinning Model for Assessing Aerosol Deposition of Radioactive Assays in Small-Animal CT/SPECT Imaging
H. Yu[1], J. Hoppin[2], K. Harlin[2], J. McDonald[3], P. Kuehl[3], T. Anderson[1], C. Lackas[2], B. Gershman[4], G. Candelaria[1], J. Y. Hesterman[5], J. P. Norenberg[1]
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M13-174 TOF-PET Small-Lesion Image Quality Measured over a Range of Phantom Sizes
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M13-177 Effect of Reorientation on Myocardial Blood Flow Estimation from Dynamic $^{13}NH_3$ PET Imaging
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M13-180 Image Registration for PET/CT and CT Images with Particle Swarm Optimization
H. Lee[1], K. Lee[1], Y. Kim[1], J. Joung[2], K. Moon[1], S.-K. Joo[1], K.-M. Kim[3], G.-J. Cheon[3]
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M13-183 Classification Accuracy and Robustness of Multivariate Analysis Applied to ECD SPECT Data in Alzheimer's Disease Patients
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M13-186 Multi-Tracer PET Image Fusion Using Fuzzy Logic: a Feasibility Study
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M13-189 ROC Analysis of 3D X-Ray CT Performance for Lesion Detection
C. Shi, Y. Xing, *Tsinghua University, China*

M13-192 A Physical Phantom Evaluation of an Absolute Quantitation of Simultaneous Tc-99m/In-111 SPECT
S. Shcherbinin, A. Celler
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M13-195 Anatomy Assisted MAP-EM PET Image Reconstruction Incorporating Joint Entropies of Wavelet Subband Image Pairs
J. Tang, A. Rahmim, *Johns Hopkins University, USA*

M13-198 Ultrafast Preconditioned Conjugate Gradient MAP Reconstruction for Fully 3-D microPET
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M13-201 Spatial Resolution Enhancement in CT Iterative Reconstruction
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M13-204 PET Image Reconstruction Using LOR-OSEM with a 3D Spatially Variant System Matrix
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M13-207 Cone-Beam CT Sequence Scan Reconstruction with Improved Dose Usage and Scan Coverage
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M13-210 A Comparison of 4D Cone-Beam CT Algorithms for Slowly Rotating Scanners
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M13-213 Synthetic Zooming of Tomographic Images by Combination of Lattices
N. Dixit, N. V. K. Medathati, J. Sivaswamy
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M13-216 Performance Evaluation on Reconstructions in a Stationary Multi-Pinhole SPECT
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M13-219 List-Mode Wavelet-Based Multiresolution Image Reconstruction for Compton Imaging
M. Frandes, V. Maxim, R. Prost, *University of Lyon, France*

M13-222 Linear Partial Derivative Matrix for Iterative Algorithm to Reconstruct Refractive Index from Refraction Angle Data
Z. Wang[1,2], L. Zhang[1,2], Z. Huang[1,2], Z. Chen[1,2], K. Kang[1,2]
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M13-225 Spatial Resolution of the HRRT PET Scanner Using 3D-OSEM PSF Reconstruction
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M13-228 An Investigation of Attenuation Correction with Attenuation Map Library in PET Imaging
L. Wan[1,2], Y. Zhang[1], X. Cao[1], S. Zeng[1,2], Q. Xie[1,2]
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M13-231 Determination of Absorbed Dose Measurement Between ART Phantom and CADPLAN of 10 MV X-Ray
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On behalf of the Mohd. Moktar Bin Mat Nudin@Mat Nor

M13-234 Localization of High Dose Rate Ir-192 Source During Brachytherapy Treatment Using Silicon Detectors
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M13-237 Evaluation of Radiotherapy Treatment Planning with Mega-Voltage Cone Beam CT
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M13-240 Utilization of Photon Imaging for in-Vivo Dose Verification and Localization in Proton Therapy
J. E. Baciak, *University of Florida, USA*; Y. Feng, *DCH Cancer Center, USA*; Z. Li, *University of Florida Proton Therapy Institute, USA*

M13-243 Evaluation of positron probe-guided neurosurgical resection using gel phantoms
M.-A. Park, W. Wu, S. C. Moore, A. Golby
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M13-246 Development of a Next Generation MR Compatible PET-Detector for Small Animal Imaging
K. Lankes, M. S. Judenhofer, M. Hossain, B. J. Pichler
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M13-249 Imaging Tests with Silicon Photomultipliers Made from MPPC Arrays in Magnetic Fields up to 14 Tesla
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M13-252 Scatter Effects of MR Components in PET-MR Inserts
V. Keereman, S. Vandenberghe, J. De Beenhouwer, R. Van Holen, S. Staelens, *Ghent University-IBBT-IBiTech, Belgium*; V. Schulz, T. Solf, *Philips Research Europe, Germany*

M13-255 Effect of Geometrical Constraints on PET Performance in Whole Body Simultaneous PET-MR
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M13-258 A FPGA-Based PET Data Acquisition Method for Simultaneous PET/MRI Imaging
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M13-261 Characterization of Cross-Compatibility of PET Components and MRI
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M13-264 Comparison of Scintillators for an EM-CCD-Based Gamma Camera
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M13-267 The "X'tal Cube" PET Detector: 3D Scintillation Photon Detection by a 3D Crystal Array Using MPPCs
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M13-270 Proposal of a Threshold Type Cherenkov PET Detector Without Pulse Height Measurements
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M13-273 Possibility Analysis of Si-PM Based DOI Detector Using Pulse Shape Analysis for PET
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M13-276 Improving Precision of Position Estimation by Photopeak-Index Method for a DOI Imaging Detector
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M13-279 Investigation of Depth Dependent Response of Continuous LaBr3:Ce Scintillation Crystals
R. Pani[1], P. Bennati[2], R. Pellegrini[1], M. Cinti[1], S. Nourbakhsh[1], P. Pani[1], V. Orsolini Cencelli[2], F. de Notaristefani[2], F. Navarria[3], S. Lo Meo[3], A. Perrotta[3], N. Lanconelli[3], G. Moschini[4], P. Boccaccio[4], R. Scafe'[5]
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M13-282 Cerebral Perfusion Maps from Dynamic Contrast MRI Data Utilizing Rician Statistics.
N. D. Fitzgerald, F. O'Sullivan, *University College Cork, Ireland*; G. Newman, *Albert Einstein Medical Research Institute, USA*

M13-285 Multipurpose Monte Carlo Simulator for Photon Transport in Turbid Media
P. Guerra[1], J. Aguirre[2], J. E. Ortuno[1], M. J. Ledesma[3,1], J. J. Vaquero[2], M. Desco[2], A. Santos[3,1]
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M13-288 Quantitative Analysis of First-Pass Contrast-Enhanced Myocardial Perfusion Multidetector CT Using a Patlak Plot Method and Extraction Fraction Correction During Adenosine Stress
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M13-291 Quantitative Accuracy of Slow-Rotating Dynamic SPECT Imaging
J. Zeintl[1], A. H. Vija[2], A. Yahil[3], J. Hornegger[1], T. Kuwert[1]
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M13-294 Background Correction Strategies for List-Mode Submillimetre 3D Image Reconstruction Algorithm Applied to the High Resolution quad-HIDAC PET System
L. Ortega Mynez[1], T. Kosters[2], H. J. Ochoa[1], F. Wubbeling[2], K. Sachfers[2]
[1]UACJ, Mexico; [2]University of Munster, Germany

M13-297 Towards Quantification of Dedicated Breast SPECT Using Non-Traditional Acquisition Trajectories
K. L. Perez, S. J. Cutler, P. Madhav, M. P. Tornai
Duke University, USA

M13-300 Measurement of Input Function in Rodents Using Wavelet Packets Based Sub-Band Decomposition Independent Component Analysis.
J.-S. Lee[1], K.-H. Su[1], W.-P. S. Tam[1], R.-S. Liu[2], S.-J. Wang[2], J.-C. Chen[1,3]
[1]Department of Biomedical Imaging & Radiological Sciences, National Yang-Ming University, No. 155, Taiwan; [2]No. 201, Sec. 2, Shih-Pai Road, Taiwan; [3]145 Zheng Zhou Road, Taiwan

M13-303 Quantitative Analysis of the Spine Using Curve Modeling
O. Hay, I. Hershkovitz, *Tel Aviv University, Israel*

M13-306 Evaluation of Miscellaneous ROI Placements on 18F-FDG PET/CT Quantification: 1D to 4D
J. Zhang, N. C. Hall, R. Layman, M. V. Knopp
The Ohio State University, USA

M13-309 A Multiresolution Image Reconstruction Method in X-Ray MicroCT
M. Costin[1,2], D. Lazaro Ponthus[1], S. Legoupil[1], P. Duvauchelle[2], V. Kaftandjian[2]
[1]Atomic Energy Commission, France; [2]INSA, France

M13-312 Geometric calibration and image reconstruction of a stationary MR-compatible MicroSPECT camera
J. Xu[1], S. Chen[1], J. Yu[1], D. Meier[2], D. Wagenaar[2], B. E. Patt[2], B. M. W. Tsui[1]
[1]Johns Hopkins University, USA; [2]Gamma-Medica Ideas, Inc, USA

M13-315 Count-Rate Dependent Component-Based 3D PET Normalization Using Singles Events
L. V. Romanov, H. A. Kudrolli, P. Kulinich, J. D. Nevin, T. S. Toole, W. A. Worstell, C. Worth
PhotoDetection Systems, Inc., US

M13-318 Variance-Reduced Randoms Correction for 3D PET Using Prescaled Singles Events
H. A. Kudrolli, P. Kulinich, J. D. Nevin, T. S. Toole, W. A. Worstell, C. Worth
PhotoDetection Systems, Inc., US

M13-321 Efficient Algorithm for Modeling Keel-Edge Pinhole Response
F. P. Jansen[1], D. Beque[2], H. Qian[1], G. Bal[1]
[1]GE Research, USA; [2]GE Global Research, Germany

M13-324 A Nested EM-Based Motion Detection And Correction Reconstruction Algorithm for PET Imaging
T. Koesters, M. Fieseler, M. Dawood, F. Buether, K. P. Schaefers
University of Muenster, Germany

M13-327 A Hybrid Algorithm for Randoms Variance Reduction
C. C. Watson, *Siemens Healthcare Molecular Imaging, USA*

M13-330 Out-of-Field Scatter Estimation in 3D Whole Body PET
M. Iatrou, R. Manjeshwar, *General Electric Global Research Center, USA*; S. Wollenweber, S. Ross, C. Stearns, *General Electric Healthcare Technologies, USA*

M13-333 A Computing Efficient PET Time Calibration Method Based on Pseudoinverse Matrices
A. B. Mann[1], S. Paul[1], A. Tapfer[1], V. C. Spanoudaki[2], S. I. Ziegler[1]
[1]TU Muenchen, Germany; [2]Stanford University, USA

M13-336 An Improved Simple Digital Timing Method for Positron Emission Tomography
W. Hu, Y. Choi, J. Jung, K. Hong, J. Kang, B. Min, Y. Huh, S. Shin, H. Lim, *Samsung Medical Center, Sungkyunkwan University School of Medicine, Korea*; Y. Chung, *Yonsei University, Korea*

M13-339 The Study on the Accuracy of the Random Coincidence Estimation by Delayed Window
Y. Zhang, H. Li, S. Liu, S. An, C. Wang, R. Remirez, H. Beghaei, W.-H. Wong
the Univ. of Texas, M. D. Anderson Cancer Center, USA

M13-342 Parametric Design Study of a Long Axial Field-of-View PET Scanner Using a Block-Detector Tomograph Simulation of a Cylindrical Phantom
W. C. J. Hunter, R. L. Harrison, S. B. Gillispie, L. R. McDonald, T. K. Lewellen
University of Washington, USA

M13-345 Comparison of Recent Experimental Data with Monte Carlo Tools Such as RoSi, Geant4 and Penelope
A. B. Loehr, J. R. Durst, T. Michel, G. Anton, *ECAP, Erlangen Centre for Astroparticle Physics, Germany*; P. Geithner, *Siemens Healthcare, Germany*

M13-348 Characterization of the Scatter Fraction Arising from Different Sized Objects - a Simulation Study
A. Ferrero, *KTH, The Royal Institute of Technology, Sweden*; J. K. Poon, *UC Davis, USA*; R. D. Badawi, *UC Davis Medical Center, USA*

M13-351 The Relevance of Peak-to-Valley Ratio and Signal-to-Noise Ratio for Anger-Logic-Based PET Detector Designs
H. Peng, C. Levin
School of Medicine, Stanford University, USA

M13-354 Monte Carlo Results from Neural Networks as an Alternative to Compton Photons LOR Analysis
J.-B. Michaud, S. Rechka, C.-A. Brunet, R. Lecomte, R. Fontaine
University of Sherbrooke, Canada

M13-357 LuCaS2: Efficient Monte Carlo Simulations of Serial PET Scans for Assessing Detection and Quantification Methods Used in Patient Monitoring
S. Stute, H. Necib, N. Grotus, P. Tylski, N. Rehfeld, I. Buvat
IMNC UMR 8165 IN2P3 CNRS, France

M13-360 Image Restoration in the Dual Advanced Compton Camera System
H. Ishii, K. Ogawa, *Hosei University, Faculty of Science and Engineering, Japan*; S. Kabuki, T. Tanimori, *Kyoto University, Graduate School of Science, Japan*

M13-363 A Voxel-Driven System Matrix Design for Multipinhole SPECT with Overlapping Projection
P.-C. Huang[1], I.-T. Hsiao[2], K. M. Lin[3], C.-H. Hsu[1]
[1]National Tsing Hua University, Taiwan; [2]Chang Gung University, Taiwan; [3]National Health Research Institutes, Taiwan

M13-366 Extended Field of View in Gamma Camera, Using New Approach for Position Calculation
O. Amir, M. Kogan, *GE Healthcare, Israel*

M13-369 Collimator Study of a γ-Camera System Using GATE
M. Mikeli, D. Thanasas, E. Stiliaris
National & Kapodistrian University of Athens, Greece

M13-372 Optimal Design of a New Kinetic Strategy for Extracting FDG Transport and Uptake Information in Microfluidic Multi-Chamber Cell Culture Chip Coupled with PSAPD camera
W. Sha, Z. Yu, N. Vu, A. F. Chatziioannou, H.-R. Tseng, M. E. Phelps, S.-C. Huang
University of California Los Angeles, USA

M13-375 Regional Brain Uptake of Ketone Bodies and Glucose in Elderly Humans: a 11C-Acetoacetate and 18F-FDG PET Study
M. Bentourkia, S. Tremblay, M. Fortier, E. Croteau, O. Sarrhini, E. Turcotte, S. Cunnane
Universite de Sherbrooke, Canada

M13-378 Evaluation of Two Graphical Approaches for Regional Analysis and Parametric Mapping of Dynamic [18F]FDDNP PET
K.-P. Wong, S.-C. Huang, V. Kepe, G. W. Small, J. R. Barrio
David Geffen School of Medicine at UCLA, USA

M13-381 Empirical Cupping Correction for CT Scanners with Tube Voltage Modulation (ECCU)
L. Ritschl[1], F. Bergner[1], C. Fleischmann[2], M. Kachelrieß[1]
[1]University of Erlangen-Nürnberg, Germany; [2]Ziehm Imaging GmbH, Germany

M13-384 Metal Artifact Correction Methods in CT
H. Yang, Y. Tsai, I. Hsiao, *Chang Gung University, Taiwan*

M13-387 Measurement of the MTF of a Cone-Beam Breast Computed Tomography Laboratory Scanner
G. Mettivier, M. C. Montesi, A. Lauria, P. Russo
INFN and Universit di Napoli Federico II, Italy

M13-390 An Efficient Iterative Reconstruction Algorithm for X-Ray CT
J. Hsieh, F. Dong, J. Fan, *GE Healthcare, USA*

M13-393 X-Ray Cone-Beam Breast Computed Tomography: Phantom Studies on Microcalcifications Visibility
M. C. Montesi[1,2], G. Mettivier[1,2], A. Lauria[1,2], P. Russo[1,2]
[1]Dipartimento di Scienze Fisiche, Università Federico II and INFN, Italy; [2]Istituto Nazionale di Fisica Nucleare, INFN sez. Napoli, Italy

M13-396 Automated Coronary Calcium Scoring Using Predictive Active Contour Segmentation
J. Wu, E. Lewis, K. Wells, G. Ferns, *University of Surrey, UK*; J. Giles, *Conquest Hospital, UK*

M13-399 K-Edge Imaging with a Hybrid Pixel Detector
V. Lee[1,2], G. J. O'Keefe[3], B. A. Sobott[1], D. J. Peake[1], G. Roe[2], R. P. Rassool[1]
[1]University of Melbourne, Australia; [2]CRCBID Cooperative Research Centre for Biomedical Imaging, Australia; [3]Austin Hospital, Australia

M13-402 Towards a Generic Respiratory Motion Model for 4D CT Imaging of the Thorax
H. Fayad[1], J. F. Clement[1], T. Pan[2], C. Roux[1,3], C. Cheze Le Rest[1], O. Pradier[1], D. Visvikis[1]
[1]INSERM U650, LaTIM, France; [2]Department of Imaging Physics, M.D. Anderson Cancer Center, USA; [3]Institut Telecom - Telecom Bretagne, France

M14 Simulation and Modelling of Medical Imaging Systems

Saturday, Oct. 31 14:00-15:30 International Ballroom Center

Session Chairs: **Dimitris Visvikis**, U650 INSERM, France
Stephen C. Moore, Brigham & Women's Hospital, USA

M14-1 Realistic X-Ray CT Simulation of the XCAT Phantom with SINDBAD
J. Tabary[1], S. Marache[2,3], S. Valette[2], P. W. Segars[4], C. Lartizien[2]
[1]CEA-LETI MINATEC, France; [2]CREATIS-LRMN, France; [3]Medisys, Philips healthcare, France; [4]Duke University, USA

M14-2 Imaging in Sitting Position May Reduce Liver Artifact in Myocardium Perfusion Imaging
B. Marendic[1], Y. Yang[1], M. King[2], M. N. Wernick[1], J. G. Brankov[1]
[1]Illinois Institute of Technology, USA; [2]University of Massachusetts Medical Center, USA

M14-3 LabPET Inter-Crystal Scatter Study using GATE
S. Rechka, R. Fontaine, R. Lecomte, *University of Sherbrooke, Canada*; M. Rafecas, *Universidad de Valencia/CSIC, Spain*

M14-4 Simulation of HyperSPECT: a High Resolution Small Animal SPECT System Using X-Ray Optics
S. Tibbelin, P. Nillius, B. Cederstrm, M. Danielsson
The Royal Institute of Technology, Sweden

M14-5 Investigation of Photon Depth of Interaction Issues of a PET Detector Design for Simultaneous PET-MR Brain Imaging
V. C. Spanoudaki, H. Peng, P. D. Olcott, C. S. Levin
Stanford University, USA

M14-6 An Information-Theoretical Assessment of PET System Design
C.-M. Kao, *The University of Chicago, USA*

M15 Animal Imaging Instrumentation and Techniques

Saturday, Oct. 31 16:00-18:00 International Ballroom Center

Session Chairs: **Robert S. Miyaoka**, University of Washington, Seattle, USA
Richard Laforest, Washington University, School of Medicine, USA

M15-1 Small Animal Cerenkov Luminescence Imaging
G. S. Mitchell[1], C. Li[1], R. Robertson[2], M. D. Silva[2], S. R. Cherry[1]
[1]UC Davis, USA; [2]Millennium Pharmaceuticals, Inc., USA

M15-2 Performance of a Prototype Ultra-High Resolution PET Scanner Using CZT Pixel Detectors
P. Vaska[1], D. Kim[2], S. Southekal[3], S. Krishnamoorthy[3], S. Stoll[1], J. Fried[1], D. Schulz[1], J.-F. Pratte[4], A. Dragone[5], Y.-G. Cui[1], G. DeGeronimo[1], A. Bolotnikov[1], C. L. Woody[1], P. O'Connor[1]
[1]Brookhaven National Laboratory, U.S.A.; [2]Myongji University, South Korea; [3]Stony Brook University, U.S.A.; [4]University of Sherbrooke, Canada; [5]Stanford Linear Accelerator Center, U.S.A.

M15-3 Cardiac MPI of Mice over the Complete Heart Cycle
C. Bontus[1], J. Rahmer[1], B. Gleich[1], J. Weizenecker[2], J. Borgert[1]
[1]Philips Research, Germany; [2]Univ. of Applied Sciences, Germany

M15-4 Spatial Resolution of Multi-Head Si/CdTe Compton Camera for Medical Application
Y. Mitsutaka[1,2,3], N. Kawachi[1], H. Shimada[3], S. Watanabe[2,4], S. Takeda[2,4], H. Aono[2,4], S. Ishikawa[2,4], H. Odaka[2,4], T. Takahashi[2,4], K. Arakawa[1,3], T. Nakano[3]
[1]Japan Atomic Energy Agency, JAPAN; [2]Japan Aerospace Exploration Agency, JAPAN; [3]Gunma University, JAPAN; [4]University of Tokyo, JAPAN

M15-5 System Integration of FastSPECT III, a Dedicated SPECT Rodent-Brain Imager Based on BazookaSPECT Detector Technology
B. W. Miller[1], L. R. Furenlid[1], H. H. Barrett[1], S. K. Moore[1], H. B. Barber[1], V. V. Nagarkar[2]
[1]University of Arizona, USA; [2]Radiation Monitoring Devices, Inc., USA

M15-6 3D Surface Acquisition for FMT Using High-Accuracy Fringe Projection Profilometry
J. E. Ortuno[1,2], P. Guerra[1,2], G. Kontaxakis[1,2], M. J. Ledesma-Carbayo[1,2], A. Santos[1,2]
[1]Universidad Politecnica de Madrid, Spain; [2]Networking Research Center on Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN), Spain

M15-7 Performance Evaluation of PETBox: a Low Cost Bench Top PET Scanner Dedicated to High Throughput Preclinical Imaging
H. Zhang[1], N. T. Vu[1], Q. Bao[1], R. W. Silverman[1], D. B. Stout[1], R. Taschereau[1], B. N. Berry-Pusey[1], D. A. Williams[1], D. A. Williams[1], A. Douraghy[1], F. R. Rannou[2], M. E. Phelps[1], A. F. Chatziioannou[1]
[1]UCLA Crump Institute for Molecular Imaging, USA; [2]Universidad de Santiago de Chile, Chile

M15-8 Performance Evaluation of the LabPET12, a Large Axial FOV APD-Based Digital PET Scanner
M. Bergeron[1], J. Cadorette[1,2], C. Bureau-Oxton[1], J.-F. Beaudoin[1], M.-A. Tetrault[1], M. D. Lepage[2], G. Robert[2], R. Fontaine[1], R. Lecomte[1]
[1]Universite de Sherbrooke, Canada; [2]Gamma Medica-Ideas, Canada

SPECIAL FOCUS WORKSHOPS

Seven topical Workshops highlighting state-of-the-art scientific and technological advances are intended to have a focused discussion among the experts on interdisciplinary topics. The subjects of NSS-related workshops include "Nuclear Technology in the Oil Well Logging Industry", "Nuclear Techniques Applied to Cultural Heritage", "Nuclear Forensics" and "Data Intensive Computing beyond the LHC". The MIC workshops address the topics of "High Performance Medical Imaging", "New Technologies in Hadron Therapy" and "Contrast in Neutron Imaging". The workshop program consists of invited talks with plenty of opportunities for discussion. The conference website provides detailed information on the program schedule and detailed contents of these workshops.

Maxim Titov

NSS Workshop Chair

Martin Tornai

MIC Workshop Chair

Nuclear Technology in the Oil Well Logging Industry

Sunday, October 25, 13:00 - 18:00

Location: Grand Ballroom, Salon 6

Organizing Committee:
Brad Roscoe, Schlumberger, USA
Ahmed Badruzzaman, Chevron, USA
Allen Gilchrist, Baker Hughes, USA
Jerome Truax, Halliburton, USA

The Oil Well Logging industry provides services to oil companies to help them identify and efficiently produce oil from their wells. A large part of the industry is supplying petrophysical information for an oil-well including many parameters such as: porosity of the rock, type or rock, permeability of rock, type of fluids present, characteristic of fluids, etc… To accomplish this, the industry utilizes any physical measurement that may give us information concerning these parameters of interest; for example, electromagnetic, sonic, ultrasonic, nuclear magnetic resonance, and nuclear measurements. This purpose of this workshop is to introduce this industry to the participants along with the technical challenges associated with putting nuclear technology in an oil well. The workshop will give an introduction to the how oil wells are produced, technology and measurement requirements of operating in this environment, and a description of some of the nuclear measurements that are currently employed.

Data Intensive Computing beyond the LHC

Monday, October 26, 14:00 - 18:00

Location: Grand Ballroom, Salon 6

Organizing Committee:
Paolo Calafiura and Craig Tull, Lawrence Berkeley National Laboratory, USA

The Large Hadron Collider (LHC) is the next generation of High Energy Physics (HEP) particle accelerators. Experiments at the LHC are exploring a new energy regime to investigate the fundamental physics underlying the Standard Model. Such high precision experiments require extraordinary amounts of data, growing to hundreds of Petabytes, thus pushing beyond current state of the art for data intensive computing.

While most of the High Performance Computing community has focused on optimization of CPU usage, the scientists and engineers developing LHC software and computing infrastructure are gaining unique experience in optimization of all aspects of data access (from memory usage, to disk I/O, to network bandwidth utilization). The recent introduction of commodity, multi-core processors has presented the LHC community with additional challenges of optimizing these limited resources shared by multiple cores running separate applications.

This workshop will provide an overview of these data-intensive computing challenges, an introduction to the techniques and tools being developed to address them, and an opportunity to explore new approaches which offer high energy physicists the ability to effectively collect, manage, and explore this torrent of scientific data.

Particular emphasis will be given to general-use tools and techniques which can be applied and supported for use by both LHC scientists and research scientists from other, data-intensive domains.

Nuclear Forensics - From Mutually Assured Destruction to Mutually Assured Detection

Monday, October 26, 14:00 - 18:00

Location: Dogwood & Camelia

Organizer: Michael V. Hynes, Raytheon IDS, USA

Due to the spread of nuclear power and nuclear research over the past 50 years, nuclear reactors and their associated materials and technologies are worldwide. Nuclear weapons are less widespread but are nevertheless a significant presence in our world. During the Cold War, agreements between nation states both encouraged and assisted countries to pursue nuclear energy for peaceful purposes. The desired result of these agreements was to regulate the growth of the nuclear industry while simultaneously preventing the leakage of its materials and technologies into the nuclear black market. But still, nuclear materials did leak to the Black Market. The buyers in this market place during the Cold War era, however, were nation states that sought nuclear capability as a pathway to regional nuclear hegemony. The Non-Proliferation Treaty (NPT) of 1970 focused on the relations between nuclear and non-nuclear states whereas today there exist the possibilities that non-state entities, outside of the legal strictures of NPT will seek to acquire materials. Although

influencing the motivations of the buyer's side of this market place is beyond the reach of technology, influencing the rationale of the supplier side of this market place is within our grasp. Because of the developing field of Nuclear Forensics, nuclear materials and weapons (even after they have exploded) can be traced back to the supplier. Already multi-national agreements outline the very serious negative security assurances that would befall such a supplier. The origins of the field of Nuclear Forensics and its current state of development will be presented in this session with case studies of how it has been utilized to-date and where it may go in future years.

Contrast in Neutron Imaging

Tuesday, October 27, 08:00 - 12:00

Location: Grand Ballroom, Salon 6

Organizer: Paul Hausladen, Oak Ridge National Laboratory, USA

Traditional radiography with neutrons uses the comparatively high cross section of neutrons for low-atomic-number materials and low cross section for high-atomic-number materials relative to x ray cross sections to look through heavy materials and see light materials. A number of non-traditional methods have also been developed to use neutrons to obtain image contrast in a rich variety of ways. These methods include the use of energy-resolved attenuation of fast or slow neutrons to give material or structure-specific contrast, the use of neutron phase to image edges or defects in low-contrast items, the use of induced reactions to identify particular materials, and even the use of neutron spin to image magnetic fields. This workshop explores some of the variety of means of achieving contrast using neutrons as well as the applications in disparate fields such as industry, archaeology, and homeland security.

Workshop on High Performance Medical Imaging (HPMI) 2009

Tuesday, October 27, 08:00 - 18:00

Location: Dogwood & Camelia

Organizing Committee:
Marc Kachelrieß, University of Erlangen-Nürnberg, Germany
Klaus Mueller, Stony Brook University, USA

The HPMI workshop focuses on techniques to maximize the computational performance of medical imaging algorithms and will provide insight in the latest hardware developments. Presenters from university and industry will give detailed information about CBE-based, CPU-based, FPGA-based, GPU-based and LRB-based medical image reconstruction, image restoration and image analysis techniques and discuss pros and cons of the various approaches.

The one day HPMI workshop will start with papers reviewing the current and near future hardware platforms together with a short introduction of programming techniques. The afternoon will be dedicated to scientific presentations selected from submitted scientific abstracts. Papers presented at the HPMI workshop will be published in the 2009 IEEE NSS/MIC conference proceedings.

HPMI workshop homepage: www.hpmi2009.org

Nuclear Techniques Applied to Cultural Heritage

Wednesday, October 28, 08:00 - 18:00

Location: Dogwood & Camelia

Organizing Committee:
Giancarlo Nebbia, INFN Padova, Italy
Jean-Claude Dran, C2RMF-CNRS Paris, France

Identification of artifacts according to morphological or stylistic criteria cannot be easily achieved between different production sites or origins based on visual inspection alone. A number of analytical techniques have been successfully applied with varying sensitivity to determine peculiar characteristics of different pieces of artistic or historical relevance. Coins and other metallic artifacts, stones and obsidians, pottery, wooden tiles, paintings and written documents have been subjected to instrumental fingerprinting in order to unravel provenance, age and other important parameters helping specialists to collocate pieces of art in the right historical and social framework.

Nuclear techniques play an ever important role for the study, restoration and conservation of cultural heritage helping to determine age, origin and production technology of such objects. Such methods can as well verify authenticity, identify fraud and illegal trafficking and provide composition of original materials.

This workshop will give an overview of some of the most successful techniques presently applied to such investigations and of the perspective improvements offered by emerging technologies.

New Technologies in Hadron Therapy

Thursday, October 29, 08:00 - 18:00

Location: Grand Ballroom, Salon 6

Organizing Committee:
Anatoly Rozenfeld, University of Wollongong, Australia
Patrick Le Dû, IN2P3, France
Steve Peggs, Broohkaven National Laboratory, USA

The treatment of non-operable and radio-resistant cancer tumors using particle beam like proton and light ion is becoming a medical reality. The number of clinical facilities is growing very rapidly around the world. This workshop propose to review the evolution of technological ideas and instrumentation around this emerging topic. This is a perfect illustration of a merging, accelerator and detectors experts with the medical imaging community and clinical medical physicists.

The goal of the workshop is to provide a forum for interested participants to discuss in a convivial way the progress in the field and to exchange recent experiences.

The preliminary agenda of contributions fields is the following:

- Hadrontherapy: a clinical introduction
- Survey of new facilities and projects around the world
- New accelerator machine concepts (FFAG, portable proton linac) and industry development
- Instrumentation for beam control & real time dose monitoring

- In-beam PET systems
- Proton CT imaging
- Advanced dosimetry (micro and nano dosimetry)
- Modeling of space radiation environment using therapeutic ion beam
- Simulation in hadron therapy using GEANT
- New ideas using antiprotons and neutrons.

GATE Software for Monte Carlo Simulations in SPECT, PET, CT and Radiotherapy

Thursday, October 29, 08:00 – 18:00

Location: Dogwood & Camelia

Organizing Committee:
Irène Buvat, Imaging and Modeling in Neurobiology and Cancerology-IN2P3, France
Sébastien Jan, CEA Service Hospitalier Frederic Joliot, France

GATE is an open access Monte Carlo simulation tool based on Geant4 and dedicated to emission tomography (SPECT and PET), but which can also be used for modeling CT scans, imaging-based dosimetry, and more recently radiotherapy experiments. The GATE user workshop is intended to gather all those interested in using GATE for various applications.

The workshop will give the users an overview of what GATE can achieve. The newly introduced functionalities of GATE V6, to be released beginning of October 2009, will be presented, including live demos of the extended facilities of GATE to model external radiotherapy experiments. The future functionalities of GATE will also be presented. During the workshop, the users will be given the opportunity to present their original work with GATE, and to express their needs in terms of the features they would like to be included or improved in GATE.

SPECIAL EVENTS

Women in Engineering (WIE): Fostering Better Use of the Talent Pool of Women in Science and Engineering

Wednesday, October 28, 14:00 - 18:00

Location: International Ballroom North

Co-Chairs:
Barbara Obryk, Institute of Nuclear Physics, Poland
Sara A. Pozzi, University of Michigan, USA

The time has come for an effective action to bridge the gender gap in science and engineering. Thus we are pleased to welcome you to the Woman in Engineering (WIE) Session, a special session that is meant to provide an opportunity for participants to exchange ideas and information on topics related to the Session theme. The most important issues of this Session are:

- How to prepare high school girls to make an unprejudiced choice regarding their study and careers in science and engineering and give them good background for that;
- How to seal the academic pipeline of women in order to minimize the "pipe leakage" phenomena;
- How to overcome barriers for the advancement of women already working in science and engineering, and how to combine a career with family life.

During the WIE Session, we will present encouraging examples of successful women in the various fields represented at the IEEE Conference, as they are role models for generations to come. There will be keynote presentations, followed by a panel discussion on the Session issues, which are of importance not only to the society of women in science and engineering but to the general public as well. Some great contributions of women to science in the last century will also be presented.

We hope that the WIE Session will help foster efforts to counter a worrisome trend that has been recently noticed in European countries: the more developed the country is and the richer the society is, the fewer women are in science and engineering there. We cannot afford to lose women's talents in science and engineering. We encourage all members of the IEEE NSS and MIC community to attend.

Details about the WIE Session can be found on the website: http://www.nss-mic.org/2009 under Special Focus Workshops.

Barbara Obryk

Sara Pozzi

Management and Dissemination of Intellectual Property

Wednesday, October 28, 10:30 - 12:00

Location: Grand Ballroom, Salon 8

Co-Chairs:
Bernard Denis and Hartmut Hillemanns, CERN Knowledge & Technology Transfer, Switzerland

Intellectual Property (IP) in public research is not limited to patents and to the dissemination of technologies through licenses. It has an important role in particular in multi-partner research projects where proper IP management is considered by funding agencies as a prerequisite for financing.

Today, IP is considered as an important asset of a public research organization. The value of IP as an asset strongly depends on a common understanding of its usage and on the way it is managed in public research organizations and industry. Open to scientists and researchers involved in scientific programs aiming at developing new technologies, the objective of this seminar is to raise awareness on the importance of IP, to review best practices of IP management in particular in collaborative R&D between public research organizations and industry and to present cross organizational approaches in the management and the dissemination of IP. The seminar will comprise a series of presentations from experts and will be followed by discussions with the speakers.

Bernard Denis

Hartmut Hillemanns

STIR User's Meeting: Open Source Software for Tomographic Image Reconstruction

Wednesday, October 28, 13:30 - 15:30

Location: Grand Ballroom, Salon 1

Organizing Committee:
Kris Thielemans, Hammersmith Imanet Ltd and Imperial College London, UK
Charalampos Tsoumpas, King's College London, UK

This user's meeting (open to all) focuses on STIR which is Open Source software for image reconstruction and associated data processing, currently mostly used in PET. This User's Meeting will commence with an introduction and demonstration of the current stable version 2.0. Then, we will give an overview of the additional features available in the forthcoming version 2.1 which will be released before the conference. This release will include:

- 3D scatter estimation
- Direct parametric image reconstruction using STIR
- OSSPS emission reconstruction algorithm

The meeting will close with a Q&A session.

Existing STIR users that are interested in presenting their work during the meeting should contact the Chair by the 15th of September.

STIR homepage: http://stir.sourceforge.net

ACKNOWLEDGEMENTS

Several years ago, soon after I agreed to act as General Chair for the 2009 NSS-MIC, I began to have all the worries which come with running such a large endeavor; always too many things to do and not enough time to do them. It is impossible for a single person to organize the NSS-MIC. Previous General Chairs, however, gave me the advice which makes it all possible: "Pick a good committee and they will help you." I did and I must thank the members of the 2009 Committee for all of the help and guidance which they gave during the preparation for the conference. They are all volunteers who gave generously of their time while holding down demanding full time jobs. In addition to this, we had financial support from government institutions and companies for supporting grants to students and for general support of conference activities. IEEE Headquarters and the Nuclear and Plasma Sciences Society were always an e-mail or phone call away for answering questions and for policy issues.

Finally, I would like to thank all of the authors and attendees for their contributions to this conference which have made this meeting the major international meeting for new ideas and technical developments. It is this intellectual and scientific content which have given the IEEE NSS-MIC its well deserved reputation for innovation and quality which I hope will be continued in 2009 and beyond.

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Conference Timetable (Saturday, October 24 through Tuesday, October 27)

Saturday 24 Oct.	Lily & Kahili	Azalea & Begonia
08:30-17:00	SC1: Integrated Circuit Front Ends for Nuclear Pulse Processing	SC2: Nuclear Science for Security Applications

Sunday 25 Oct.	Grand Ballroom, Salon 1	Grand Ballroom, Salon 2	Grand Ballroom, Salon 3	Grand Ballroom, Salon 6
08:30-17:00	SC3: Nuclear Power and Other Environmentally Clean Alternatives	SC4: Medical Imaging Fundamentals	SC5: Physics and Design of Detectors for SPECT and PET	WS1: Nuclear Technology in the Oil Well Logging Industry (08:30-18:00)

Monday 26 Oct.	International Ballroom Center	International Ballroom North	Grand Ballroom Salon 2	Grand Ballroom Salon 3	Grand Ballroom Salon 6	Grand Ballroom Salon 7	Grand Ballroom Salon 8	Dogwood & Camelia
08:30-12:00	NSS Plenary		SC6: Statistical Methods for Image Reconstruction (08:30-17:00)	SC7: Programming and Medical Applications Using Graphics Hardware (08:30-17:00)				
13:30-15:30	N02: Semiconductor Detectors I: Silicon Detectors and Applications	N01: Photodetectors and Scintillation Detectors I			WS2: Data Intensive Computing Beyond the LHC (14:00-18:00)	N03: Analog and Digital Circuits I	N04: Nuclear Measurements and Monitoring Techniques	WS5: Nuclear Forensics - From Mutually Assured Destruction to Mutually Assured Detection (14:00-18:00)
16:00-18:00	N06: Instrumentation for Homeland Security I	N05: New Detector Concepts and Instrumentation I				N07: Data Acquisition and Analysis Systems I	N08: Radiation Damage Effects I: Semiconductor Devices	

Tuesday 27 Oct.	International Ballroom North	Grand Ballroom Salon 2	Grand Ballroom Salon 3	Grand Ballroom Salon 4&5	Grand Ballroom Salon 6	Grand Ballroom Salon 7	Grand Ballroom Salon 8	Dogwood & Camelia
08:00-10:00	J01: Instrumentation for Medical and Biological Research I: Radionuclide Imaging	N09: Computing and Software for Experiments I: Simulation	N10: Trigger and Front-End Systems I		WS3: Contrast in Neutron Imaging	N11: Gaseous Detectors I: Development of Techniques	N12: High Energy Physics Instrumentation I	WS6: Workshop on High Performance Medical Imaging (HPMI) 2009
10:30-12:00	J02: Instrumentation for Medical and Biological Research II: X-ray Imaging and Radiotherapy Applications			N13: NSS Posters I				
11:30-13:30	NSS Luncheon (International Ballroom Center)							
13:30-15:30	J03: Joint NSS/MIC 3	N14: Instrumentation for Homeland Security II	N15: Nuclear Physics Instrumentation I		N16: Gaseous Detectors II: Varied Applications in Astrophysics and Particle Physics	N17: Computing and Software for Experiments II: New Computing Technologies		
16:00-18:00	J04: Joint NSS/MIC 4	N18: Gamma-ray Imaging I: Compton Imaging	N19: Analog and Digital Circuits II		N20: Neutron Imaging and Detectors for Neutron Imaging			
19:00-21:00	Exhibitors Reception (Palm Ballroom)							

Conference Timetable (Wednesday, October 28 through Sunday, October 31)

Wednesday, 28 Oct.	International Ballroom Center	International Ballroom North	Grand Ballroom Salon 1	Grand Ballroom Salon 2	Grand Ballroom Salon 3	Palm 3, 4 & 5	Grand Ballroom Salon 7	Grand Ballroom Salon 8	Dogwood & Camelia
08:00-10:00	M01: MIC Plenary 1		N21: Trigger and Front-End Systems II	N22: Semiconductor Detectors II: Silicon Devices	N23: Computing and Software for Experiments III: High Energy Physics Computing		N24: New Detector Concepts and Instrumentation II		WS4: Nuclear Techniques Applied to Cultural Heritage
10:30-12:00						N25: NSS Posters II J05: NSS/MIC Joint Posters		Special Session on the Management and Dissemination of Intellectual Property	
13:30-15:30	M02: Image Processing and Evaluation	Women in Engineering: Fostering better Use of the Talent Pool of Women in Science and Engineering	STIR User's Meeting: Open Source Software for Tomographic Image	N26: Gamma-Ray Imaging II	N27: Analog and Digital Circuits III		N28: Photodetectors and Scintillation Detectors II		
16:00-18:00	M03: Image Reconstruction 1		N29: New Detector Concepts and Instrumentation III	N30: Accelerators and Beam Line Instrumentation	N31: Semiconductor Detectors III: CZT Detectors		N32: Radiation Damage Effects II: Scintillators		
19:00-21:00	Conference Reception (Pool Area)								

Thursday, 29 Oct.	International Ballroom Center	Grand Ballroom Salon 1	Grand Ballroom Salon 2	Grand Ballroom Salon 3	Grand Ballroom Salon 4&5, Palm 3-5	Grand Ballroom Salon 6	Grand Ballroom Salon 7	Dogwood & Camelia
08:00-10:00	M04: Quantitative Imaging Techniques	N33: Computing and Software for Experiments IV: Software for Experimental Applications	N34: High Energy Physics Instrumentation II	N35: Astrophysics and Space Instrumentation I: Component development		WS7: New Technologies in Hadron Therapy	N36: Nuclear Physics Instrumentation II	WS8: GATE Software for Monte Carlo Simulations in SPECT, PET, CT and Radiotherapy
10:30-12:00		N37: Astrophysics and Space Instrumentation II: Instruments	N38: Synchrotron Radiation Instrumentation	N39: Computing and Software for Experiments V: Bio-medical Software (10:30-12:30)	M05: MIC Posters 1			
13:30-15:30	M06: PET/SPECT instrumentation 1	N40: Photodetectors and Scintillation Detectors III	N41: Semiconductor Detectors IV: CdTe and other Wide Band Gap Materials	N42: Data Acquisition and Analysis Systems II			N43: High Energy Physics Instrumentation III	
16:00-18:00	M07: Image Reconstruction 2			N44: Gaseous Detectors III: GEM Applications in Particle Physics			N45: High Energy Physics Instrumentation IV	

Friday, 30 Oct.	International Ballroom Center	Grand Ballroom Salon 4&5, Palm 3-5
08:00-10:00	M08: X-ray imaging 1	
10:30-12:00		M09: MIC Posters 2
13:30-15:30	M10: PET/SPECT instrumentation 2	
16:00-18:00	M11: Plenary 2 / Multimodality Instrumentation and Techniques	
19:00-21:00	MIC Dinner (American Pavilion in the World Show Case, Disney World)	

Saturday, 31 Oct.	International Ballroom Center	Grand Ballroom Salon 4&5, Palm 3-5
08:00-10:00	M12: X-ray imaging 2	
10:30-12:00		M13: MIC Posters 3
13:30-15:30	M14: Simulation and Modelling of Medical Imaging Systems	
16:00-18:00	M15: Animal Imaging Instrumentation and Techniques	

2009 IEEE NUCLEAR SCIENCE SYMPOSIUM & MEDICAL IMAGING CONFERENCE

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Friday, October 9, 2009 (After this date, **no mailed or faxed registration forms will be accepted**.)

CANCELLATION & REFUND POLICY

You are not officially registered until we receive your completed registration form and payment. If your payment is not received by the October 9th deadline, your registration will be cancelled. In order to process refunds, cancellations must be received in writing by October 16, 2009 (less $50 cancellation fee). No refunds will be issued thereafter.

FEE SUMMARY:

Please indicate appropriate fees below, using fee schedule opposite:

1. Registration $ _____
2. Luncheon/Dinner $ _____
4. Continuing Education Program $ _____
5. Tours and Companion Program $ _____

Total amount enclosed: $ _____

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FEE SCHEDULE:

1. REGISTRATION

	By Oct. 9	On-Site
❑ IEEE Member (IEEE member number required)	$500	$600
❑ Non-IEEE Member	$650	$750
❑ IEEE Student (proof of student status required)	$200	$250
❑ Non-IEEE Student	$300	$350
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❑ One Day Only (specify day:) _____	$200	$200
❑ Continuing Education Program Only	see Continuing Education fees below	

2. BANQUETS

	By Oct. 9	On-Site	Qty.	Total
NSS Luncheon (Tues., Oct. 27)	$40	$50	_____	$_____
MIC Dinner (Fri., Oct. 30)	$70	$85	_____	$_____

3. CONTINUING EDUCATION PROGRAM

Course fees are valid for registrations received by Oct. 9

	Date	IEEE Member	Non-Member
❑ Integrated Circuit Front Ends for Nuclear Pulse Proc. (1 day)	Sat. Oct. 24	$225	$250
❑ Nuclear Science for Homeland Security (1 day)	Sat. Oct. 24	$225	$250
❑ Nucl. Power & Other Environmentally Clean Alternatives (1 day)	Sun. Oct. 25	$225	$250
❑ Medical Imaging Fundamentals (1 day)	Sun. Oct. 25	$225	$250
❑ Physics and Design of Detectors for PET and SPECT (1 day)	Sun. Oct. 25	$225	$250
❑ Statistical Methods for Image Reconstruction (1 day)	Mon. Oct. 26	$225	$250
❑ Programming & Medical Apps. Using Graphics Hardware (1 day)	Mon. Oct. 26	$225	$250

Note: Add $50 per course for registration after Oct. 9.
Lunch and refreshments provided at all courses.

4. TOURS & COMPANION PROGRAM

Tour fees are valid for registrations received by Oct. 9.

	Cost/Person	Date	No. of People	Total Cost
1. Shopping in Orlando	$30	Sun., Oct. 25	_____	$_____
2. Truffles & Trifles Cooking Class	$75	Mon., Oct. 26	_____	$_____
3. Disney by Design (Disney Program)	$70	Mon., Oct. 26	_____	$_____
4. Kennedy Space Center	$75	Tues., Oct. 27	_____	$_____
5. Historic Bok Sanctuary	$70	Tues., Oct. 27	_____	$_____
6. Innovation In Actions (Disney Program)	$70	Wed., Oct. 28	_____	$_____
7. Winter Park Cultural Tour	$70	Wed., Oct. 28	_____	$_____
8. Dolphins, Manatees and Gators, Oh My!	$80	Thurs., Oct. 29	_____	$_____
9. Hidden Treasures of the World Showcase (DP)	$45	Thurs., Oct. 29	_____	$_____
10. Kennedy Space Center (same as #4)	$75	Fri., Oct. 30	_____	$_____
11. Gardens of the World (Disney Program)	$45	Fri., Oct. 30	_____	$_____
12. Shopping in Orlando (same as #1)	$30	Sat., Oct. 31	_____	$_____
13. Behind the Seeds (Disney Program)	$70	Sat., Oct. 31	_____	$_____

Note: Limited on-site registration may be available for an additional $15 fee.
If you are bringing companions, list their name(s) and a contact email address:

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Nuclear Science Symposium
Medical Imaging Conference

Dear Colleagues:

The Second NSS was held in Oak Ridge in 1955. In 1960, it was held in Gatlinburg. Now, 50 years later together with the MIC, the NSS is returning to East Tennessee. The meeting offers a great opportunity to meet old friends and colleagues, and to make new ones from all parts of the world. The technical sessions and casual meetings offer the best way to exchange knowledge and ideas in nuclear science, medical imaging, and detector development. Once again, we are fortunate to be joined by the RTSD workshop.

The Organizing Committee is planning a conference will unite the diverse science in our technical discipline(s) and further the state of- the-art by disseminating up-to-date scientific information. In addition to coordinated oral and poster presentations, there will be several short courses and workshops before the main conferences. The popular refresher courses will be held during the week to review current topics of special interest. A commercial exhibition featuring the latest products and services from a wide range of companies will take place during the middle part of the meeting.

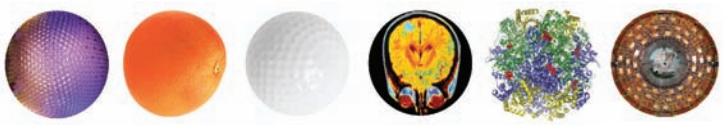
The Knoxville area is home to many institutions, laboratories, and companies that have been significant contributors to these conferences since their beginning. In addition to a modern conference facility, the Knoxville area has much to offer the attendees including the unique qualities of autumn in the Smoky Mountains. The average date of peak foliage color in the mountains is in mid-October. Within easy walking distance of the conference center are several modern hotels. All offer excellent accommodations near the “social center” of Knoxville.

This location not only provides an excellent venue for our professional meeting, but also is an ideal location for attendees to bring their families. Companion tours will include several short trips around East Tennessee. These will be both social and historic with visits to Oak Ridge and local museums. Technical tours to ORNL and local companies will also be offered.

On behalf of the organizing committee, I encourage you to make plans now to attend the 57th NSS conference of the IEEE Nuclear and Plasma Sciences Society. I look forward to welcoming you to Knoxville in October 2010 for the NSS-MIC-RTSD.

Ronald Keyser
General Chair

www.nss-mic.org/2010 October 30 - November 6, 2010



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