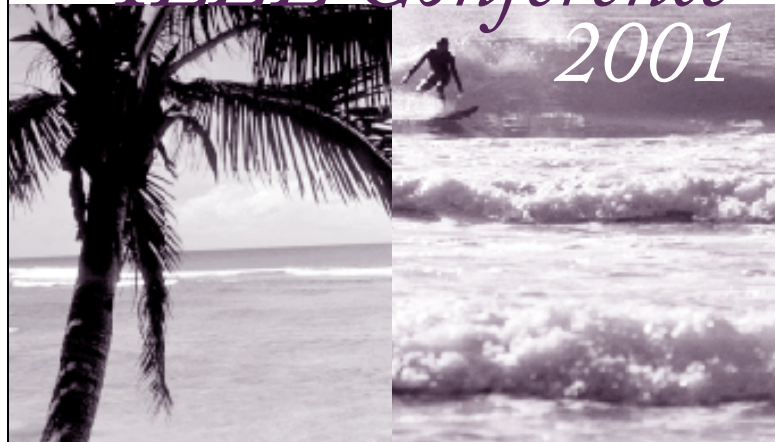NUCLEAR SCIENCE SYMPOSIUM

MEDICAL IMAGING CONFERENCE

SYMPOSIUM ON NUCLEAR POWER SYSTEMS

12TH INTERNATIONAL WORKSHOP ON ROOM-TEMPERATURE

SEMICONDUCTOR X- AND GAMMA-RAY DETECTORS

NOVEMBER 4–10

IEEE Conference
2001

TOWN & COUNTRY HOTEL/CONVENTION CENTER • SAN DIEGO, CA

TABLE OF CONTENTS

CONFERENCE SCHEDULE

Dear Colleagues,

I am pleased to announce that this year, the Nuclear Science Symposium and Medical Imaging Conference will be held in San Diego, California. Being a southern California location, the weather is typically spectacular this time of the year. San Diego has a historically diverse culture and is home to the world's largest Zoo, art and science museums, an exquisitely beautiful coastline, the US Navy's 3rd and 7th Fleets, a selection of 17 excellent golf courses and every conceivable sporting, dining, and entertainment venue available. The Town and Country Resort is a 36 acre facility that includes a range of accommodations from quaint, bungalow-style rooms to modern high rise towers. The resort is adjacent to a large, new shopping mall, a completely redesigned golf course, and a light rail system that provides access to the entire San Diego area including the Mexican border, which will provide an exciting alternate destination.

This year we are expanding the program to include the semi-annual International Workshop on Room Temperature Semiconductor X- and Gamma-Ray Detectors. The topics covered by this workshop correlate directly with numerous topics of interest to both the NSS and MIC attendees, and all conference registrants will have equal access to all programs. In addition, the Symposium on Nuclear Power Systems will also be holding their annual activities in conjunction with the NSS.

To supplement the conference program activities for your companions, we are planning an exceptional tour program that will provide an exciting set of alternative activities.

We are looking forward to a technically stimulating and socially engaging experience in one of the most attractive locations in California.

Anthony Lavietes
General Chairman

1

SUNDAY, NOVEMBER 4

7:30 am–9:00 am	REGISTRATION OPEN: *Royal Palm Salon 2*
8:30 am–5:30 pm	NSS SHORT COURSE 2 — Neutron Measurements: Fundamentals and Applications: *Town & Country Room*
	NSS SHORT COURSE 3 — Pixel Detectors for Nuclear and Particle Physics: *San Diego Room*
9:00 am–3:00 pm	COMPANION PROGRAM—Tijuana,MX
12:30 pm–3:00 pm	COMPANION PROGRAM—U.S. Aircraft Carrier

MONDAY, NOVEMBER 5

7:30 am–10:00 am	REGISTRATION OPEN: *Grand Ballroom Foyer*
8:00 am–3:00 pm	COMPANION PROGRAM—San Diego Boat Trip
8:30 am–5:30 pm	NSS SHORT COURSE 1 — Integrated Circuit Front Ends for Nuclear Pulse Processing: *Royal Palm Salon 3&4*
8:30 am–10:10 am	R1 CZT Detectors: *Sunrise Room*
9:00 am–8:00 pm	COMPUTER ROOM OPEN: *Pacific Salon 4&5*
10:30 am–12:10 pm	R2 CdTe Detectors: *Sunrise Room*
1:30 pm–5:30 pm	MIC SHORT COURSE 1 — Theory and Practice of Modular Scintillation Cameras: *Royal Palm Salon 3&4*
	MIC SHORT COURSE 2 — Analytic Image Reconstruction Methods: *Royal Palm Salon 1&2*
1:45 pm–3:20 pm	R3 Imaging Applications: *Sunrise Room*
3:45 pm–6:00 pm	R4 CZT and CdTe Detectors: *Sunrise Room*
5:30 pm–8:30 pm	REGISTRATION OPEN: *Grand Ballroom Foyer*

TUESDAY, NOVEMBER 6

7:00 am–8:00 pm	COMPUTER ROOM OPEN: *Pacific Salon 4&5*
7:30 am–8:30 pm	REGISTRATION OPEN: *Grand Ballroom Foyer*
8:00 am–1:30 pm	COMPANION PROGRAM — San Diego Zoo
8:20 am–12:15 pm	MIC SHORT COURSE 3 — Principles and Recent Advancement in Emission Computed Tomography: *Royal Palm Salon 1&2*
	MIC SHORT COURSE 4 — Principles and Recent Advancement in X-Ray Computed Tomography: *Royal Palm Salon 3&4*
8:30 am–10:05 am	R5 CZT Detectors: *Sunrise Room*
9:00 am–12:00 pm	N1 NSS Plenary Session: *Town & Country Room*
9:00 am–5:30 pm	EXHIBITS: *Grand Ballroom*
	VENDOR SESSION: *Pacific Salon 6&7*
10:35 am–11:55 am	R6 Mercuric Iodide: *Sunrise Room*
12:00 pm–2:00 pm	NSS LUNCHEON: *California Room*
1:30 pm–3:15 pm	MR Joint MIC/RTSD Session: *Town & Country Room*
1:30 pm–5:30 pm	MIC SHORT COURSE 5 — Statistical Methods for Image Reconstruction: *Royal Palm Salon 1&2*
	MIC SHORT COURSE 6 — Simulation Tools: Monte Carlo Methods and Computer Phantoms: *Royal Palm Salon 3&4*
2:00 pm–3:45 pm	N2 Nuclear Physics Instrumentation: *San Diego Room*
	N3 Semiconductor Detectors 1 — Imaging: *Golden West Rm.*
3:30 pm–5:30 pm	R8 POSTER SESSION: *Grand Ballroom*
4:15 pm–6:00 pm	NM Joint NSS/MIC Session: *Town & Country Room*
	N4 Astrophysics and Space Instrumentation 1: *San Diego Rm.*
	N5 Trigger and Front-end systems: *Golden West Room*
6:30 pm–9:00 pm	EXHIBITS RECEPTION: *Grand Ballroom*

WEDNESDAY, NOVEMBER 7

7:00 am–8:00 pm	COMPUTER ROOM OPEN: *Pacific Salon 4&5*
7:30 am–8:30 pm	REGISTRATION OPEN: *Grand Ballroom Foyer*
8:20 am–10:00 am	M1 General Image Reconstruction and Processing: *Town & Country Room*
8:30 am–10:00 am	N6 Radiation Damage Effects 1: *California Room*
	N7 HEP Instrumentation 1 — New Techniques: *San Diego Room*
	N8 Scintillation Detectors 1: *Golden West Room*
8:30 am–10:15 am	R9 Simulations and Electronics: *Sunrise Room*
9:00 am–12:00 pm	TECH TRANSFER WORKSHOP: *Towne Room*
9:00 am–5:30 pm	EXHIBITS: *Grand Ballroom*
	VENDOR SESSION: *Pacific Salon 6&7*
10:30 am–12:15 pm	M2 Instrumentation I: PET Systems: *Town & Country Room*
	N9 Gaseous Detectors 1: *California Room*
	N10 Analog and Digital Circuits 1: *San Diego Room*
	N11 New Radiation Detectors: *Golden West Room*
10:40 am–12:05 pm	R10 Space Applications: *Sunrise Room*
11:00 am–4:30 pm	COMPANION PROGRAM — Wild Animal Park
12:00 pm–2:00 pm	RTSD LUNCHEON: *Le Chantclair*
1:30 pm–3:15 pm	N12 NSS Poster 1: *Grand Ballroom*
	MIC Opening Sessions/Plenary I: *Town & Country Room*
2:00 pm–3:15 pm	R11 CZT Detectors: *Sunrise Room*
3:30 pm–5:45 pm	R12 Gallium Arsenide, Thallium Bromide, and Other Materials: *Sunrise Room*
3:45 pm–5:25 pm	M3 Instrumentation II:High Resolution and Small Animal PET Systems: *Town & Country Room*
3:45 pm–5:30 pm	N13 Gaseous Micropattern Detectors 1: *California Room*
	N14 Astrophysics and Space Instrumentation 2: *San Diego Room*
	N15 Data Acquisition/Analysis Systems: *Golden West Room*
6:30 pm–9:30 pm	NSS CONFERENCE RECEPTION: *Terrace Pavilion*

THURSDAY, NOVEMBER 8

7:00 am–8:00 pm	COMPUTER ROOM OPEN: *Pacific Salon 4&5*
7:00 am–3:00 pm	COMPANION PROGRAM — San Onofre Plant
7:30 am–5:00 pm	REGISTRATION OPEN: *Grand Ballroom Foyer*
8:00 am–10:00 am	R13 Imaging Applications: *Sunrise Room*
8:20 am–10:00 am	MIC Plenary II: *Town & Country Room*
8:30 am–10:00 am	N16 Gaseous Detectors 2: *California Room*
	N17 HEP Instrumentation 2 — Tracking: *San Diego Room*
	N18 Scintillation Detectors 2: *Golden West Room*
8:30 am–3:30 pm	COMPANION PROGRAM — Balboa Park Museums
9:00 am–12:00 pm	SNPS Plenary Session — Nuclear Power Engineering Committee Activities 2001 and Related Key Papers: *Sunset Room*
9:00 am–1:00 pm	EXHIBITS: *Grand Ballroom*
9:00 am–5:30 pm	VENDOR SESSION: *Pacific Salon 6&7*
10:30 am–12:10 pm	R14 CZT and CdTe Detectors: *Sunrise Room*
10:30 am–12:15 pm	M4 Instrumentation III:Cameras and SPECT Systems: *Town & Country Room*
	N19 Radiation Damage Effects 2: *California Room*
	N20 Analog and Digital Circuits 2: *San Diego Room*
	N21 Photodetectors: *Golden West Room*
12:30 pm–2:00 pm	CIP/COUNTRY REPRESENTATIVE LUNCHEON: *Windsor Rose Room*

1:30pm–3:15pm	M5A MIC Poster I: PET Instrumentation and Techniques: *Grand Ballroom*
	M5B MIC Poster I: SPECT Instrumentation and Techniques: *Grand Ballroom*
	M5C MIC Poster I:General Image Reconstruction and Processing: *Grand Ballroom*
	N22 NSS Poster 2: *Grand Ballroom*
2:00pm–3:00pm	R15 Silicon Detectors: *Sunrise Room*
2:00pm–5:00pm	P2 Plant Modernization — Part 1: *Sunset Room*
3:30pm–4:50pm	R16 Silicon and Neutron Detectors: *Sunrise Room*
3:45pm–5:25pm	M6 PET Imaging Techniques: *Town & Country Room*
3:45pm–5:30pm	N23 Semiconductor Detectors 2: *California Room*
	N24 HEP Instrumentation 3: *San Diego Room*
3:45pm–5:45pm	CW Compton Workshop: *Golden West Room*
4:00pm–5:30pm	RITC MEETING: *Esquire Room*

FRIDAY, NOVEMBER 9

7:00am–8:00pm	COMPUTER ROOM OPEN: *Pacific Salon 4&5*
7:30am–12:00pm	REGISTRATION OPEN: *Grand Ballroom Foyer*
8:00am–1:15pm	COMPANION PROGRAM — Aquarium and La Jolla
8:10am–10:10am	R17 CZT and CdTe Detectors: *Sunrise Room*
8:20am–10:00am	M7 Radiography and X-ray CT: *Town & Country Room*
8:30am–10:00am	N25 Gaseous Micropattern Detectors 2: *California Room*
	N26 HEP Instrumentation 4/Calorimetry: *San Diego Room*
	N27 Scintillation Detectors 3: *Golden West Room*
9:00am–12:00pm	P3 Plant Modernization — Part 2: *Sunset Room*
10:30am–12:15pm	M8 SPECT Imaging Techniques: *Town & Country Room*
	NR Joint NSS/RTSD Session: *California Room*
	N28 Analog and Digital Circuits 3: *San Diego Room*
	N29 Nuclear Monitoring and Radiation Measurements: *Golden West Room*
12:00pm–2:00pm	NMISTC LUNCH: *Esquire Room*
1:30pm–3:15pm	M9A MIC Poster II:High Resolution and Animal Imaging: *Grand Ballroom*
	M9B MIC Poster II: Radiography, X-ray CT & Others: *Grand Ballroom*
	M9C MIC Poster II:Image Reconstruction Methods, X-ray, PET, & SPECT: *Grand Ballroom*
3:45pm–5:25pm	M10 Instrumentation IV: Small Animal SPECT Systems: *Town & Country Room*
6:30pm–9:30pm	MIC BANQUET: *California Room*

SATURDAY, NOVEMBER 10

7:00am–12:00pm	COMPUTER ROOM OPEN: *Pacific Salon 4&5*
7:30am–9:00am	REGISTRATION OPEN: *Grand Ballroom Foyer*
8:20am–10:00am	M11 Image Reconstruction Methods: PET & SPECT: *Town & Country Room*
10:30am–12:15pm	M12 Other Imaging Modalities: *Town & Country Room*
11:00am–3:00pm	COMPANION PROGRAM — Food and Wine at the Prado
1:30pm–3:15pm	M13A MIC Poster III: Small Systems and Data Acquisition: *Grand Ballroom*
	M13B MIC Poster III: Quantitative PET Techniques: *Grand Ballroom*
	M13C MIC Poster III: Quantitative SPECT Techniques: *Grand Ballroom*
3:45pm–5:25pm	M14 Image Evaluation & Image Quality Assessment: *Town & Country Room*

CONTACT INFORMATION

GENERAL CHAIR
ANTHONY LAVIETES
phone: 925.423.6766
email: lavietes1@llnl.gov

CONFERENCE COORDINATOR
ANN SILVA TYLER
phone: 925.423.3490
email: tyler8@llnl.gov

NSS PROGRAM CHAIR
GRAHAM SMITH
phone: 631.344.4253
email: gsmith@bnl.gov

NSS DEPUTY PROGRAM CHAIR
BO YU
phone: 631.344.5184
email: Yu@bnl.gov

MIC PROGRAM CHAIR
BENJAMIN M. W. TSUI
phone: 919.966.5659
email: tsui@bme.unc.edu

MIC DEPUTY PROGRAM CHAIR
ERIC C. FREY
phone: 919.966.6729
email: frey@bme.unc.edu

RTSD PROGRAM CHAIR
RALPH B. JAMES
phone: 631.344.8633
email: rjames@bnl.gov

RTSD DEPUTY PROGRAM CHAIR
PAUL SIFFERT
phone: 33.388106543
email: emrs@phase.c.strasbourg.fr

SHORT COURSE PROGRAM CHAIR
GARY ALLEY
phone: 865.574.5725
email: alleygt@ornl.gov

SNPS PROGRAM CHAIR
JAY FORSTER
phone: 408.925.5090
email: Jay.Forster@gene.ge.com

EXHIBITS CHAIR
RICHARD GREENE
phone: 301.468.3210
email: Richard@tainc.com

IEEE MEMBERSHIP
VERNON PRICE
phone: 408.737.0778
email: v.price@ieee.org

GUEST EDITOR
J. ANTHONY SEIBERT
phone: 916.734.0311
email: jaseibert@usdavis.edu

REGISTRATION CHAIR
JUDY SANDERS
phone: 925.423.5911
email: sanders4@llnl.gov

COMPANION PROGRAM CHAIR
LYNN BERGMAN
phone: 510.581.7367
email: zetariah@pacbell.net

FINANCIAL/ORGANIZATIONAL ADVISOR
ROGER GEARHART
phone: 209.369.6702
email: ragearhart@jps.net

OVERSEAS LIAISON
UWE BRATZER
phone: 41.227671149
email: Uwe.Bratzler@cern.ch

TREASURER
GUY ARMANTROUT
phone: 925.423.3468
email: armountrout1@llnl.gov

LOCAL ARRANGEMENTS CHAIR
ED LAMPO
phone: 510.486.6779
email: EJLampo@lbl.gov

CONFERENCE COORDINATOR
ANN SILVA TYLER

REGISTRATIONCHAIR
JUDY SANDERS

Advance registration is highly recommended in order to save both time and money and a number of methods are being made available to allow everyone to register early. Advance registration also ensures that your registration packet will be ready for you when you arrive at the conference. You may pre-register by mail using the registration form contained within this booklet, or you may register electronically through the conference website. Electronic registration is highly recommended, as it places your registration information directly in our database. When you register electronically, you may pay by credit card (VISA, MasterCard, American Express or Discover),through our secure web server, or you may call in your credit card number to our registration company (TDMG) listed below. You may also mail a check or money order, made payable to **IEEE 2001 NSS**, directly to TDMG. Checks or money orders must be drawn on or paid through U.S. banks and must be in U.S. dollars. Completed registration forms may also be mailed or faxed to TDMG with the appropriate form of payment. Additional copies of the registration form may be downloaded from the registration link on the main conference website.

NOTE: Registration and payment must be received by Oct. 5, 2001 in order to qualify for the lower registration, Short Course and luncheon/dinner fees listed below.

For electronic registration, connect to the conference website at *http://www.nss-mic.org*, click on the registration link,and follow the instructions.

For registration by mail or fax, send all registration information and payments (made payable to **IEEE 2001 NSS**) to:

REGISTRATION

IEEE 2001 NSS/MIC
c/o TDMG
110 Painters Mill Road, Suite 36
Owings Mills, MD 21117 USA
phone: 800.437.4589 or 410.363.1300
fax: 410.559.0160 (Attn: IEEE 2001 NSS/MIC)
email: IEEE@traveldest.com (questions only)

An acknowledgment will be sent upon receipt of your registration and payment. Questions regarding registration may be sent via email to *IEEE@traveldest.com* (Attn: IEEE 2001 NSS/MIC), or by calling TDMG.

REGISTRATION HOURS AT THE CONFERENCE
Registration and general information will be available during the following times at the Registration Desk located in the Grand Ballroom Foyer, unless otherwise indicated:

SUNDAY, NOVEMBER 4	7:30–9:00am, Royal Palm Salon II
MONDAY, NOVEMBER 5	7:30–10:00am, 5:30–8:30pm
TUESDAY, NOVEMBER 6	7:30am–8:30pm
WEDNESDAY, NOVEMBER 7	7:30am–8:30pm
THURSDAY, NOVEMBER 8	7:30am–5:00pm
FRIDAY, NOVEMBER 9	7:30am–12:00pm
SATURDAY, NOVEMBER 10	7:30am–9:00am

SYMPOSIUM REGISTRATION FEES

	By Oct. 5	After Oct. 5
IEEE Member*	$375	$525
non-IEEE Member	$475	$625
IEEE Student*^	$150	$250
non-IEEE Student^	$200	$300
Retired/Unemployed IEEE Member*	$100	$150
One Day Only: *specify day*	$200	$200

* IEEE member number required at registration.
^ Proof of student status required.

LUNCHEON/DINNER FEES

	By Oct. 5	After Oct. 5
NSS Luncheon (Tues., Nov. 6)	$25	$30
RTSD Wrkshp. Luncheon (Wed., Nov.7)	$25	$30
MIC Dinner (Fri., Nov. 9)	$30	$35

IEEE MEMBERSHIP
An IEEE membership desk will be located on the Grand Ballroom Foyer in proximity to the Registration area. Vern Price, IEEE Membership Chairman, will be available to answer question and explain the benefits of IEEE membership. A portion ($50) of your non-member conference registration fee (not applicable to student memberships) will be applied to your new IEEE membership. By joining IEEE during the conference, you will also receive one year's free membership in the Nuclear Plasma Sciences Society, which includes a subscription to the Transactions on Nuclear Science.

STUDENT STIPENDS
The 2001 NSS and MIC are pleased to offer several stipends to defray travel expenses for student authors of papers presented by the student or collaborator. Requests should be sent to Graham Smith for the NSS (*gsmith@bnl.gov*) and Ben Tsui for the MIC (*tsui@bme.unc.edu*). Each applicant will be required to arrange for a letter of recommendation to be sent independently by a senior colleague.

MESSAGE BOARD

A message board will be located in the Grand Ballroom Foyer adjacent to the registration area for posting of messages and notifications.

SPEAKER'S PREPARATION ROOM

A room will be designated and fully equipped for speakers to prepare for their presentations. As the goal of the conference is to use electronically formatted media (PowerPoint), LCD projectors will be available. Additional slide and viewgraph projectors will be provided in special circumstances. Please communicate any special requests in advance to Ed Lampo (*ejlampo@lbl.gov*).

WEB SITE

Information for all conference programs (NSS, MIC, SNPS, RTSD), Short Courses, and Companion Program can be found at *http://www.nss-mic.org*.

COMPUTER AVAILABILITY

We are planning to provide a complete computer facility including Internet access at the conference. A staff of very experienced personnel will be on hand to assist all attendees with the use of the computers and equipment in the facility. The facility will consist primarily of PC platforms, several printers, and additional stations allowing laptop internet connections. The facility is intended for use by attendees to perform last minute editing of papers and presentation material and to retrieve email from parent organizations. Standard word processing, spreadsheet, and presentation software will be available. Though these machines will be publicly available, you will not be able to receive messages. The computer room will open Monday (November 5) morning at 9:00 am and close promptly on Saturday (November 10) at noon. The daily hours will be 7:00 am to 8:00 pm (Tuesday — Friday) unless noted otherwise.

EXHIBITS

Once again, vendor exhibits will be an extremely important part of our conference, presenting outstanding new commercial developments to support our scientific and engineering efforts. The exhibit area is located in the Grand Ballroom. Tentative exhibit hours will be as follows:

EXHIBITS

NOVEMBER 6–8, 2001

GRAND BALLROOM

Tuesday   9:00am – 5:30pm
Wednesday 9:00am – 5:30pm
Thursday   9:00am – 1:00pm

All coffee breaks for the conference will be held in the exhibit area during the times when the exhibits are open. Additionally, an Exhibits Reception will be held Tuesday evening in the exhibits area. Also, exhibitors will be engaging in special Vendor Sessions used to provide detailed information on new products in a semi-formal format. The session room will be adjacent to the exhibit area. Further information regarding the exhibits can be obtained by contacting Richard Greene of Trade Associates, Inc. at (301) 519-1610 or by email at *tradeassociates@tainc.com*.

PUBLICATIONS

All conference attendees will receive a complimentary copy of the Conference Proceedings on cd-rom. Additionally, papers presented at the conference that contain important information of lasting value may be submitted for review and publication in the conference issue of the Transactions on Nuclear Science (TNS). The TNS is a premier peer reviewed journal (for IEEE members only) with a significant distribution within the nuclear science and medical imaging communities. Papers submitted for review and possible publication in the TNS must be submitted electronically by email or by submission to the appropriate Guest editor at the conference. The manuscripts submission format is preferably PDF (however postscript is also acceptable) and should conform to the 8.5" x 11" U. S. standard. All papers intended for the NSS Conference Issue should be submitted to John Valentine at *John.Valentine@me.gatech.edu* and those intended for the MIC Conference Issue should be submitted to Edward J. Hoffman at *ieee_ejh@mednet.ucla.edu*.

The deadline for submitting papers is the last day of the conference — Saturday, November 10, 2001. No papers will be accepted after this date without prior approval of the appropriate editor. The copyright form and author information form may be found on the conference web site and at the Guest Editor's office at the conference. These forms should be submitted directly to the appropriate conference editor. Contact information for each Guest Editor is given below:

TONY SEIBERT

**GUEST EDITOR
CONFERENCE RECORD**

UC Davis, Radiology
2421 45th Street, FOLB-II-E
Sacramento, CA 95817
phone: 916.734.0311
fax: 916.734.0316
email: jaseibert@ucdavis.edu

JOHN VALENTINE

**TSS NSS
CONFERENCE EDITOR**

Georgia Institute of Technology
NNRC, Room 122
Atlanta, Georgia 30332
phone: 404.894.3745
fax: 404.894.3733
email: John.Valentine@me.gatech.edu

EDWARD J. HOFFMAN

**TNS MIC
CONFERENCE EDITOR**

UCLA School of Medicine
10833 Le Conte Ave., B2-086 CHS
Los Angeles, CA 90095-6948
phone: 310.825.8851
fax: 310.825.4517
email: ieee_ejh@mednet.ucla.edu

HOTELS

The Town and Country Resort & Convention Center has been selected for this year's symposium. All meeting functions, technical sessions, short courses, workshops, and exhibits will be held entirely within the hotel. We have reserved an extremely large block of rooms for conference attendees. When you choose to make your lodging arrangements and reservations with the hotel, please ensure that you inform the representative that you are attending this conference to get the preferred room rates.

A San Diego landmark, the Town and Country Resort & Convention Center is spread over forty acres of immaculate grounds, landscaped by hundreds of grand arching palms. The resort offers modern accommodations with 1,000 guestrooms. Non-smoking floors and special accommodations for guests with disabilities are available all within two towers or ranch style garden bungalows that capture the feeling of a cozy retreat. The Town and Country Resort also offers photocopying and transparency production.

In a world of distinguished resorts, what makes the Town and Country Resort stand apart is their high standard of service and special amenities that will enhance your stay. Dive into one of their four swimming pools. From fine dining to casual fare, you have your choice of five distinctive restaurants while first-class

Town and Country Resort & Convention Center, San Diego, CA.

spa facilities and golf are on the property and a tennis and racquetball club is close by. Once a fertile farming valley, Mission Valley is now one of the most dynamic hot spots in all of San Diego. Adjacent to the Town and Country Resort is the 27-hole Riverwalk Golf Course, world-class shopping at Fashion Valley Shopping Center, with over 300 specialty shops, restaurants, plus and an 18 screen movie complex. In addition, access to San Diego's newly expanded light rail trolley system provides visitors with convenient transportation Downtown to the Sand Diego Convention Center and historical Gaslamp Quarter, east to Qualcomm Stadium and south to the border at Tijuana, Mexico and of course, Old Town.

Hotel rooms can also be booked through the Conference website: *www.nss-mic.org* .

HOTEL/CONVENTION

TOWN AND COUNTRY RESORT & CONVENTION CENTER
500 Hotel Circle North
San Diego, CA 92108
phone: 619.291.7131
fax: 619.291.3584
www.towncountry.com

AIRLINES/CAR RENTAL

Special discounted airfares for the IEEE Nuclear Science Symposium and Medical Imaging Conference on November 4–10, 2001 in San Diego, California have been negotiated for this meeting by IEEE Global Travel Services. Discounts are as high as 20% off the lowest published airfares. If a Saturday night stay or super-saver airfares are not applicable, zone fares are available. Special rates have also been negotiated with Avis rental car company.

Travel arrangements using the negotiated air carriers, or the carriers of your choice can be made by calling the IEEE Travel Services, toll free within the US and Canada: 1-800-TRY-IEEE (1-800-879-4333), Monday through Friday, between the hours of 8:30 am– 5:30 pm Eastern Standard Time. Outside of the US and Canada, please call (732) 562-5387.

Additionally, you can visit the on-line travel service web site at *http://www.ieeetravelonline.org*. This secure site offers simple and convenient services through which you can search, reserve, and ticket your travel anytime, anywhere. You may also fax your travel requirements to IEEE Travel Services at (732) 562-8815. When faxing, please be sure to include your travel dates, departure, and return times, and phone and fax numbers. A Travel Counselor will contact you promptly.

This year the Nuclear Science Symposium and Medical Imaging Conference is being held at the Town and Country Resort and Convention Center in San Diego, California. San Diego and its surroundings offer a broad variety of cultural, cosmopolitan, natural, and special attractions including theaters, ethnic restaurants, beaches, sports arenas, Sea World, and the world famous San Diego Zoo. The companion program offers daily trips to places of interest for everyone.

Be sure to check the departure time for the day's tour, since all of the tours do not start at the same time. The schedule is as follows:

Tijuana Shopping Excursion with Lunch
Sunday, November 4th & Saturday, November 10th
Continental Breakfast 9:00−9:50am, Terrace Pavillion
Tour Coach Departs: 10:00am, Atlas Ballroom Foyer
Lunch provided on Tour, Return: 3:00pm (5 hours)
Cost: $45

Only seventeen miles south of downtown San Diego, yet worlds apart, Tijuana sparkles with all the flavor and charm that our neighboring country to the south has to offer. A city of cosmopolitan size and tastes, Tijuana is a showcase in fascinating contrasts with sleek, new shopping plazas settled comfortably among the quaint side streets of "Old Mexico." Select from name brands like Christian Dior and Ralph Lauren or haggle over leather goods, pottery and hand wrought jewelry…and all of it duty free! Our guide will be on hand at all times to point out the best places to shop and to answer any questions. After shopping, relax over a frothy Margarita and enjoy a delicious Mexican lunch at Tijuana Tilly's.

NOTE: All U.S. and Canadian citizens should carry identification such as a photo I.D. Guardians for minors without identification are recommended to bring either a birth certificate or at minimum a family picture. All non-U.S. citizens must have a Passport, I-94, Multi-Entry Visa or Resident Alien Card to re-enter the United States. Identification will be checked prior to boarding our tour coach.

SAN DIEGO CVB

United States Aircraft Carrier
Sunday, November 4th
Tour Coach Departs: 12:30pm, Atlas Ballroom Foyer
Lunch not provided, Return: 3:00pm (2.5 hours)
Cost: $35

"…to protect against all enemies, foreign and domestic." These words have been spoken by the fine ladies and gentlemen that make up our United States Navy. Join these brave men and women as they *show off* where they work: an Aircraft Carrier. An informative Navy Officer who will explain the "ins and outs" of life at sea will give this exclusive tour. The main attraction of course is the flight deck where aircraft is catapulted into the sky ready for combat.

NOTE: Participants must be over 8 years of age. Additionally, if the tour is cancelled (at the discretion of the Navy), tour fees will be refunded. All participants must be able to walk up and down stairs on their own accord. Walkers & wheelchairs are not permissible. It is strongly recommended that women wear pants as the tour involves climbing up and down ladders.

San Diego Harbor Excursion and City Tour
Monday November 5th
Continental Breakfast 8:00−8:50am, Terrace Pavillion
Tour Coach Departs: 9:00am, Atlas Ballroom Foyer
Lunch not provided, Return: 3:00pm (6 hours)
Cost: $45

See the highlights of "America's Finest City" by land and sea on your San Diego city tour. We will visit San Diego's bustling center city with its financial districts and historic Gaslamp District, La Jolla, Old Town, and Cabrillo Monument.

Welcome aboard. Get ready to cast off as we embark on an exciting one-hour boat tour of one of the World's greatest natural harbors. As we navigate the peaceful blue harbor waters of San Diego, you'll see many famous sights on both land and sea. We will begin the cruise by gliding underneath the Coronado Bridge to view the awesome power of the U.S. 11th Naval Fleet. Then on past North Island we sail to manmade Harbor and Shelter Islands. We will complete our circle by sailing past the embarcadero with its historic ships including the Star of India, the oldest merchant ship afloat.

Next Stop is Seaport Village where you will have an hour and 45 minutes to explore a variety of shops and eat lunch at your choice of over a dozen restaurants. Finally, visit the site of the first Upper California Mission in Old Town, where San Diego began more than 200 years ago. Then on through Balboa Park we go; the cultural center of San Diego and the site of two world-class expositions in 1915−16 and 1935−36 that put San Diego on the map.

Behind the Scenes at the San Diego Zoo
Tuesday, November 6th
Continental Breakfast 8:00-8:50am, Terrace Pavillion
Tour Coach Departs:9:00am, Atlas Ballroom Foyer
Lunch not provided, Return: 1:30pm (4.5 hours)
Cost: $55

Welcome to the world famous San Diego Zoo! Among its 100 acres and 5,000 species of exotic plants covering the expanse of the park, you will find the world's most rare collection of mammals,birds and reptiles.The zoo has been the gem of the city of San Diego for more than 80 years now. It was founded by a respected San Diego physician, Dr. Harry Wegeforth, who rescued animals from a roadside zoo that had been part of the 1915–1916 Panama Pacific Exposition in Balboa Park. From those meager beginnings and the roar of one lonely lion the San Diego Zoo now enjoys world-renowned stature as a conservation institution,botanical garden and family attraction.The Zoo is proud of its prestigious accreditation's by the American Museum Association and the American Zoo Association.

Through special arrangements, we'll take you on the other side of at least two enclosures — to areas closed off to the general public. Your private bus will be waiting for you, inside the park,for your exclusive behind the scenes tour. You'll learn more about the zoo's breeding efforts with endangered species, find out what the animals eat and how they are treated for ailments. It's a fascinating way to see how the world's most famous zoo operates on a day-to-day basis.

ZOOLOGICAL SOCIETY OF SAN DIEGO/SAN DIEGO CVB

During free time guests may choose to explore the Tiger River, Gorilla Tropics, Hippo Beach, Polar Bear Plunge or the newest addition, the Panda Research Station, which is home to a rare pair of giant pandas from China. You will have an hour and a half to explore the zoo, shop, and eat.The zoo has five different restaurants ranging from casual to fine dining at Albert's Located in the Treehouse complex next to Gorilla Tropics (call 619.685.3200 for reservations). The gift shops have an impressive variety of items from inexpensive to upscale and unique.

NOTE: Comfortable walking shoes, hats and/or sunscreen are recommended.

Behind the Scenes at the Wild Animal Park
Wednesday, November 7th
Tour Coach Departs:11:00am, Atlas Ballroom Foyer
Sack Lunch provided on bus, Return: 4:30pm (5.5 hours)
Cost: $65

It's only 30 miles north of San Diego, but you'll swear you're on another continent when you join us for a safari to the San Diego Wild Animal Park! Recognized the world over for its wildlife conservation efforts, this 1,800 acre sanctuary simulates the wild sweeping plains and savannas of Africa and Asia habitats that are called home by over 2,200 untamed animals that roam freely throughout the preserve. Our adventure begins with a sack lunch as we enjoy a Narrated Tour en route to the Wild Animal Park. We will go behind the scenes on a two and one half hour private tour of the 17-acre Nairobi Village, an up-close encounter with an exotic animal and a chat with its trainer, hand-on activities and the five mile guided safari aboard the Wgasa Bush Line Monorail. Afterward enjoy the singing parrots and free-flying birds of prey perform at the Bird Show. Many unusual birds, cats and dogs perform in the amusing Animal Antics Show. There's plenty to see and do during a day you'll never forget. This trip includes an hour and half of free time to explore, and shop for souvenirs.

NOTE: Comfortable walking shoes,hats and/or sunscreen are recommended. Dress in layers. It is usually warmer here than our coastal location at the hotel.

SACK LUNCH: Please indicate sandwich preference or special dietary needs when registering.

Italian: Lean ham, salami, 3 cheeses, mustard,olives,lettuce, tomato and onion
Turkey: Smoked turkey breast, light mayo, lettuce and tomato on sourdough
Cheese: Cheddar, parmesan, and mozzarella cheese, lettuce, tomato, onion, mustard, and marinated black olives on sourdough

Balboa Park Museums
Thursday, November 8th
Continental Breakfast 8:30-9:20am, Terrace Pavillion
Tour Coach Departs: 9:30am, Atlas Ballroom Foyer
Picnic Lunch provided, Return:3:30pm (6 hours)
Cost: $45

Your day will begin in Balboa Park, one of the largest inter-city parks in the world! A bus tour of the park is followed by a docent tour of The San Diego Museum Of Art. The museum houses priceless world-renowned collections of Italian Renaissance, Dutch and Spanish Baroque Old Masters, and comprehensive examples of American art, 20th century paintings and sculptures. During this time the museum will feature "Frederick Carl Frieseke: An American Impressionist." This retrospective exhibition presents Frieseke's characteristic subjects within the context of his development as an artist.

Relax on the grounds of Balboa Park as you enjoy an informal picnic lunch. You may wish to utilize your lunchtime to visit the Timkin Art Gallery. The Timkin Museum of Art exhibits the

Putnam Foundation's collection of European and American paintings and Russian Icons. Admission is free.

Next enjoy a docent tour of the Mingei Museum. The Mingei is an architecturally designed state-of-the-art museum, opened in August 1996 and displays art of unsurpassed beauty from all cultures of the world including a permanent collection from Mexico. Wood, fiber, leather, clay, glass, metal, bone, stone and other materials are transformed into anything from textiles to sculpture. This museum opens a window to a broad and intimate view of the creative potential of all people. There will be a special exhibit: *Venini: Glass and Design in a World Perspective*. Centered on the work of the Venini factory in Venice, as well as art glass by contemporary artists including Dale Chihuly, San Diego's Italo Scanga, Louis Comfort Tiffany, and examples of ancient Egyptian, pre-Roman, Roman and Islamic glass.

The second part of this day will be spent discovering fine works of art in the David Zapf Gallery, Pratt Gallery, and Brushworks located in Little Italy.

NOTE: Comfortable walking shoes are recommended.

PICNIC LUNCH: Please indicate sandwich preference or special dietary needs when registering.

Vegetarian: Swiss cheese, sliced cucumber, tomato, onion, lettuce, olives and ranch dressing
Ham & Swiss: Shaved lean ham and swiss cheese with mustard, onion, lettuce and sliced tomato
Garlic Roasted Chicken: Chicken breast on a toasted sourdough bun with light mayo, lettuce, tomato, and dill pickle slices

San Onofre Nuclear Power Plant
Thursday, November 8th
Continental Breakfast 7:00-7:50 am, Terrace Pavilion
Tour Coach Departs: 8:00am, Atlas Ballroom Foyer
Lunch not provided, Return: 3:00pm (7 hours)
Cost: $35

The San Onofre Nuclear Generating Station (SONGS) is a jointly owned enterprise between SCE (75% ownership), San Diego Gas & Electric (20%), and the cities of Riverside and Anaheim. Today, SONGS provides nearly 20 percent of the power to more than 15 million people in Southern California — enough power to serve 2.75 million households. Join us for an on site visit of the facility that will include customized presentation that will include, an overview of the plant, video of the challenge of San Onofre Construction, and emergency facility tour. Then break for lunch in the exciting facility cafeteria where you will be able to sample the finest cafeteria cuisine. After lunch enjoy a plant tour. There will be plenty of time for questions and answers.

NOTE: Participants must have photo ID on the day of the tour. The following information is required for each participant. Please submit no later than Oct 1, 2001 by email to TDMG.

Information Required: NAME, DATE OF BIRTH, SSN OR PASSPORT NUMBER, SEX (M/F), CITZENSHIP, EMPLOYER, AND ADDRESS OF EMPLOYER

Stephen Birch Aquarium and La Jolla Excursion
Friday, November 9th
Continental Breakfast 8:00-8:50am, Terrace Pavillion
Tour Coach Departs: 9:00am, Atlas Ballroom Foyer
Snack Provided, Return: 1:15pm (4.25 hours)
Cost: Aquarium Tour including Beach Walk — $45
      Aquarium Tour including Museum/Shopping — $40

Our day begins with a narration on the way to Stephen Birch Aquarium, which is located on a bluff offering breath-taking views of La Jolla or "The Jewel." The Stephen Birch Aquarium and Museum were opened by the renowned Scripps Institute of Oceanography in order to educate the public in ocean science and conservation as well as interpret Scripps research. Stroll through the exhibit hall that leads from the cold waters of the Pacific Northwest through the temperate waters of California to the tropical waters of Mexico and the Indo-Pacific. Thirty

three tanks of various sizes and shapes will portray a variety of habitats: rocky reefs, coral reefs, mangroves and submarine canyons, to name a few. Along the way you will encounter a myriad of animals ranging from the pretty but venomous lion fish, to the scary but docile moray eels and from the giant Pacific octopus to tiny nudibranchs. And of course, there will be sharks. You will also experience a wave making machine and a 70,000-gallon kelp forest.

After exploring the Stephen Birch Aquarium you will have two options: 1) *Naturalist Guided Beach Walk:* Join us on a narrated walking tour along the beach. Follow paved and dirt paths that provide some of the loveliest ocean views in southern California. Learn about La Jolla's history and natural attractions

including coves, caves and "seal rock" where these local marine mammals are often seen "catching some rays". After the walk you will have a half hour of free time before the bus returns back to the hotel.

Or option 2) *Museum of Contemporary Art & Shopping:* After visiting the aquarium you will have two hours of free time to explore La Jolla, you can walk along the beach, visit the museum, shop, or any combination of the above. Admission to the museum and a docent tour are included in this tour option. The Museum of Contemporary Art San Diego is a celebration of new ideas containing over 3,400 works representing every major art movement since 1950. As well as the galleries, there is a gourmet museum café and gift shop. Spend your time on a docent tour or at your leisure in the museum. Downtown La Jolla is world-renowned for its shopping. In addition to the ocean-view restaurants and sandwich shops, the streets are lined with small specialty shops, boutiques, antique emporiums and art galleries including national chains and department stores. Our guide will provide you with information help you find your way to exciting shopping discoveries.

Food and Wine at the Prado
Saturday, November 10th
Tour Coach Departs: 11:00am, Atlas Ballroom Foyer
Lunch Provided, Return: around 3:00pm (approx. 3 hours)
Cost: $50

Set in the rich landscape of landmark buildings and finely manicured gardens, the Prado Restaurant is located at the historic House of Hospitality in the center of San Diego's famous Balboa Park. Join us for a food and wine pairing adventure at the Balboa Park Food & Wine School inside the Prado Restaurant. Dine on gourmet dishes paired with luscious wines. Cooking demonstrations and printed recipes will help you to prepare some of these treats in your own kitchen.

Four gourmet dishes will be expertly paired with luscious California wines. Learn how to prepare grilled Portobello mushroom salad with field greens in a sherry-shallot vinaigrette, drizzled with sweet red pepper gastrique; chicken empanadas fried in a pastry shell, with avocado-serrano chile salsa, chipotle cream & corn, black bean jicama slaw; a trio of skewers — grilled skirt steak with chipotle-honey glaze, chicken breast with a cashew curry sauce and a large grilled prawn with mango-ginger, hot mustard sauce, and Asian slaw; sautéed cilantro rock shrimp chile relleno crusted with red corn tortillas on black bean mole and avocado-Serrano salsa.

For dessert you will witness the construction of a breath taking citrus cheesecake tower with almond-orange Florentine cookie. A souvenir of printed recipes will enable you to prepare these wonderful dishes in your own kitchen.

NOTE: Space is limited to 16. If there is enough interest, an additional class will be provided on another day.

S hort Course Program is offering courses on the following subjects in nuclear science and medical imaging. The courses are all scheduled to occur November 4–6 to minimize conflicts with the scientific program schedules.

SHORTCOURSE PROGRAMCHAIR
GARY ALLEY

MIC SHORT COURSE 1
THEORY AND PRACTICE OF MODULAR SCINTILLATION CAMERAS
Monday, November 5   1:00–5:30pm
Organizer: HARRISON H. BARRETT, *University of Arizona, Dept. of Radiology and Optical Sciences Center, Center for Gamma-ray Imaging*
Instructors:
JOHN SAIN, LARS FURENLID
University of Arizona, Dept. of Radiology and Optical Sciences Center, Center for Gamma-ray Imaging

Small, modular scintillation cameras are flexible detectors for planar or SPECT imaging in nuclear medicine. A single modular camera is effective for spot imaging of small organs such as the thyroid gland and lymph nodes, and it can be used with a rotating stage to make a low-cost SPECT system for small animals. SPECT systems using 4–24 modular cameras have also been built, providing high sensitivity since a large detector area can be placed in close proximity to the object. When used with pinhole apertures, these systems can provide excellent spatial resolution, especially for small animals.

The purpose of this course is to review recent advances in position estimation, optical modeling and acquisition electronics for modular cameras. H.H. Barrett will review the principles of maximum-likelihood estimation of photon position and energy and describe some algorithms for implementing these estimates. John Sain will discuss the optical properties of modular cameras and show how the camera properties can be optimized. Lars Furenlid will describe new list-mode acquisition systems and their implementation in field-programmable gate arrays.

MIC SHORT COURSE 2
ANALYTIC IMAGE RECONSTRUCTION METHODS
Monday, November 5   1:00–5:30pm
Organizer: PIERRE GRANGEAT, *LETI, CEA-DTA, Grenoble, Fr*
Instructors:
FRÉDÉRIC NOO, *Université Montéfiore, Liège, Belgium*
MICHEL DEFRISE, *V-rije Universiteit Brussel, Belgium*

Analytical reconstruction methods are widely used on tomographic devices such as X-ray CT, SPECT and PET. Their principle is to describe both the image to reconstruct and the measurement as continuous functions and to model the acquisi-

tion process by an analytic transform operator. Then, the image reconstruction algorithms are based on the explicit inversion formula of the inverse transform. This direct computation defines faster reconstruction process than iterative algorithms linked to discrete reconstruction methods. In this short course session, we will start from basic principles and then continue with an overview on the most recent fully 3D reconstruction algorithms.

This course will be divided into the following 3 lectures.

1. PARALLEL BEAM IMAGE RECONSTRUCTION AND FULLY 3D PET
  MICHEL DEFRISE, *Vrije Universiteit Brussel, Belgium*

After a discussion on the general mathematical properties of the 3D X-ray transform, two classes of algorithms will be described: the 3D filtered-backprojection methods, and the rebinning techniques for fully 3D PET which separate 3D reconstruction into a set of 2D reconstructions for a stack of parallel 2D slices.

2. FAN-BEAM, CONE-BEAM AND SPIRAL X-RAY CT
  PIERRE GRANGEAT, *LETI, CEA-Direction des Technologies Avancées, Grenoble, France*

We first introduce 2D fan beam reconstruction using either direct inversion or parallel rebinning. Then we consider the extension of those approaches to one-row detector spiral CT, and to multi-row detector using either circular or spiral CT. Then, we introduce indirect cone-beam approaches via the 3D Radon domain for large area detector CT or for 3D radiology.

3. SPIRAL CONE-BEAM CT: THE LONG OBJECT PROBLEM
  FRÉDÉRIC NOO, *Université Montéfiore, Liège, Belgium*

We will give an overview on recent researches dedicated to spiral cone-beam tomography when the object extends axially out of the X-ray projections, the so-called long object problem. The issue is to reconstruct a given region of interest (ROI) from axially truncated projections, using a finite path covering only slightly more than the ROI. We will describe both direct and indirect inversion methods.

PRINCIPLES AND RECENT ADVANCEMENT IN EMISSION COMPUTED TOMOGRAPHY
Tuesday, November 6   8:00am–12:30pm
Organizer: ERIC C. FREY, *University of North Carolina*
Instructors:
    DALE BAILEY, *Guy's and St. Thomas' Hospital, London*
    TIMOTHY TURKINGTON, *Duke University*

Recently there has been explosive growth in the clinical use of emission computed tomography (ECT). The goal of this course is to first provide an overview of the principles of ECT and to describe recent advances. Discussions of both positron emission tomography (PET) and single-photon emission computed tomography (SPECT) will be included. The course is targeted at newcomers to the field or people needing to update their knowledge due to recent advances. For both modalities, the course will start with a discussion of the basic principles including instrumentation, image degrading factors, and image reconstruction.

This will be followed by a discussion of recent advances including improvements in detectors, electronics, scanner geometries, transmission scanning systems, reconstruction algorithms and development of combined ECT and X-ray computed tomography systems. These advances promise further improvements in image quality and have the potential to result in an increase in the number of clinical applications.

PRINCIPLES AND RECENT ADVANCEMENT IN X-RAY COMPUTED TOMOGRAPHY
Tuesday, November 6   8:00am–12:30pm
Organizer: JIANG HSIEH, *GE Medical Systems*
Instructor:
    STEFAN SCHALLER, *Siemens Medical Systems*

In recent years, the technology of computed tomography (CT) has experienced tremendous growth, with the introduction of multi-slice CT, helical or spiral CT, and sub-second scanning. These techniques inspire many new clinical applications, such as cardiac, perfusion, angiography, fluoroscopy, and lung cancer screening. They have also brought new challenges to the tomographic reconstruction and image artifacts.

In this lecture, we first present the fundamental principles of CT. We will cover the fundamental physics as well as the mathematical foundations of CT image formation. Extensive discussions are presented on key system performance parameters and the causes of different image artifacts and compensation schemes. These phenomena include aliasing, beam hardening, off-focal radiation, patient motion, metal artifacts, detector non-ideal response, non-ideal x-ray tube, projection truncation, and 3D artifacts.

In the second part of the lecture, we focus on the recent advancement in CT. We first discuss the basic principle and inherent issues associated with the helical or spiral CT. This discussion will be followed by detailed examination of various reconstruction and compensation schemes. Next, principles of multi-slice CT are presented. We will outline different reconstruction approaches to combat artifacts associated with cone beam and helical interpolation. Finally, we discuss applications of these technologies in a clinical environment. In specific, we present various approaches to freeze motion artifacts in cardiac imaging. We present different approaches in achieving "real time" imaging in fluoroscopy applications. We also discuss the impact of data acquisition parameters and reconstruction techniques to applications such as computer-aided-diagnosis (CAD) and perfusion.

OUTLINE:

Principles of Computed Tomography
    Fundamental physics of CT
    Image reconstruction
Key Performance Parameters
    Spatial and temporal resolution
    Low contrast detectability
    Coverage and speed
    Dose
Image Artifacts and Corrections
    Aliasing
    Partial volume

Scatter
Off-focal radiation
X-ray tube arcing and rotor wobble
Detector offset, hysteresis,afterglow, z-axis non-uniformity
Mechanical misalignment
Patient motion,beam hardening, metal,and projection truncation
3D volume artifacts
Recent Advancement in CT technology
Helical or spiral CT
Multi-slice CT
Recent Advancement in CT Applications
Cardiac CT
Fluoroscopy
Perfusion

STATISTICAL METHODS FOR IMAGE RECONSTRUCTION

Tuesday, November 6   1:00 – 5:30pm

Organizer: JEFF FESSLER, Associate Professor

University of Michigan,
Department of Electrical Engineering and Computer Science,
Department of Biomedical Imaging Nuclear Medicine,
Division of Department of Radiology

Jeff Fessler earned a Ph.D. in electrical engineering in 1990 from Stanford University. He has since worked at the University of Michigan, first as a DoE Alexander Hollaender post-doctoral fellow and then as an Assistant Professor in the Division of Nuclear Medicine. Since 1995 he has been with the EECS Department,where he is an Associate Professor.

   The recent commercial introduction of iterative algorithms for tomographic image reconstruction, and the increasing interest in scanners with nonstandard imaging geometries, has brought new relevance and timeliness to the topic of statistical methods for image reconstruction. This course will provide an orderly overview of the potpourri of statistical reconstruction methods that have been proposed recently. Rather than advocating any particular method, this course will emphasize the fundamental issues that one must consider when choosing between different reconstruction approaches. The intended audience is anyone who would like to reconstruct "better" images from photon-limited measurements, and who wants to make informed choices between the various methods. Recent advances in convergent forms of "ordered subsets" algorithms will be given particular attention, since these algorithms can be both practical for routine use, while also having desirable theoretical properties. Both emission tomography and transmission tomography algorithms will be discussed.

   Attendees should be familiar with photon-counting imaging systems at the level presented in the Medical Imaging short course offered in previous years.

NOTE: The registration fee includes refreshments,lunch, a copy of the lecture notes and a certificate of completion.

OUTLINE (TENTATIVE):

A.Introduction
      Overview
      The Poisson statistical model
      Mathematical statement of the reconstruction problem
B. The Statistical Framework
      Image parameterization

            Bases
      System physical modeling
            general
            line/strip integrals
            detector response etc.
            projector/backprojector cautions
      Statistical modeling of measurements
            Poisson
            Gaussian (data-weighted least squares)
            Reweighted least squares
            Deviations,e.g. deadtime
            Shifted Poisson (precorrected random coincidences)
            Emission vs Transmission scans
      Objective functions
            Contrast with "algebraic" methods
            Bayesian estimation:Maximum a posteriori (MAP) methods
            Data-fit terms
                  likelihood
                  quadratic
                  robust
            Regularization
                  none
                  separable
                  quadratic
                  convex
                  nonconvex,entropy, ...
            Object constraints
C.Iterative algorithms for statistical image reconstruction
      EM based
            (EM,GEM,SAGE,OSEM)
      Direct optimization
            (Coordinate Descent,Conjugate Gradient, Surrogate Functions)
      Considerations
            nonnegativity
            parallelizability
            simultaneous vs sequential
            convergence rate
            monotonicity
            global convergence
      Optimization transfer / surrogate functions
D. Additional topics
      Ordered subsets / block iterative algorithms
            acceleration properties interpreted geometrically
            convergence issues
      Properties
            Spatial resolution properties / modified penalty functions
            Noise properties
      Applications to real PET and SPECT data
            (and associated practical issues)
            Model mismatch
            Precorrected data
             Comparisons to FBP
            Pseudo-3D PET reconstruction from Fourier rebinned data

SIMULATION TOOLS:

MONTE CARLO METHODS AND COMPUTER PHANTOMS

Tuesday, November 6   1:00 – 5:30pm

Organizer: BENJAMIN M. W. TSUI, *University of North Carolina*

Instructors:

      ROBERT HARRISON, *University of Washington*
      ERIC C. FREY, W. PAUL SEGARS, *University of North Carolina*
      JOERG PETER, *German Cancer Research Center, Heidelberg*

Simulation techniques are important in the development and evaluation of instrumentation, image processing and reconstruction methods. Significant advances in simulations techniques have been made in recent years.Also, their applications to model clinical imaging studies are gaining recognition. The goal of the short course is to provide attendees with up-to-date reviews of two important tools, Monte Carlo methods and computer-generated phantoms, that are essential to simulation studies.

Specifically, attendees will learn about different Monte Carlo software codes that are currently available for PET and SPECT simulation studies and computer-generated phantoms that realistically model human anatomies and physiological functions. The short course is particular useful for investigators who are using simulation techniques in their studies or considering using them in their future research.

NEUTRON MEASUREMENTS: FUNDAMENTALS AND APPLICATIONS

Sunday, November 4   8:30am–5:00pm
Organizer: **JOHN MIHALCZO**, *Oak Ridge National Laboratory*
Instructor:
> **LARRY MILLER**, *Nuclear Engineering Department,
> University of Tennessee, Knoxville*

This course provides an overview of theory and applications for the use of neutrons in several areas relative to medical imaging and to general areas of engineering science, with an emphasis on developments during the past ten years. The theory portion covers the physics of neutron interactions with mater for high, low, and very low energy neutrons. Description of methods for detection and characterization of neutrons with energies that range from thermal to about 10 MeV include charged particle recoil, scintillation, solid state, neutron moderation in conjunction low energy neutron absorption, pulse shape discrimination, and time of flight techniques. Each of these approaches have advantages for dosimetry, imaging, and basic science measurements. Analysis of neutron scattering and absorption events enables accurate characterization of strategic materials and equipment. Absorption reactions permit one to obtain information on composition of materials, and scattering reactions reveal details on structure, density, and composition. Very low energy neutrons can be used to characterize molecular structure of biological systems and of advanced materials. Methods that use neutrons to treat disease through direct irradiation and through absorption in pharmaceuticals are also presented. Several applications that utilize neutrons to probe material structure and composition are described. These include investigations of structure and composition of biological systems, treatment of disease, forensics analyses, explosive detection, and treaty verification.

OUTLINE:

Mechanisms of Interaction With Matter:
> Low energy neutron scattering
> Thermal and epithermal reactions
> High energy elastic and inelastic scattering

Methods for Neutron Detection and Characterization:
> Charged particle recoil
> Scintillation
> Absorption of thermal neutrons
> Spectrum measurements
> Pulse shape discrimination
> Time of flight measurements

Applications:
> Mine detection
> Neutron imaging
> Forensics
> Cancer treatment
> Molecular structure
> Treaty verification

PIXEL DETECTORS FOR NUCLEAR AND PARTICLE PHYSICS

Sunday, November 4   8:30am–5:00pm
Organizer: **JEFFREY A. APPEL**, Head,
> *Radiation Hard Vertex Detector R&D Group, FNAL*
Instructors:
> **SALLY SEIDEL**, Associate Professor of Physics,
> *University of New Mexico*
> **LAURENT BLANQUART**, Electronics Engineer,
> *Lawrence Berkeley National Laboratory*
> **SERGIO ZIMMERMANN**, Associate Head
> *Electronic System Engineering Department,FNAL*

This one-day course will cover pixel tracking detectors as they are being developed for nuclear and particle physics experiments. The focus will be on the requirements of these high radiation environments and the solutions being used for workable sensors, readout electronics, and interconnections.

This course is targeted at two types of attendees. The first is the engineer/physicist who desires an understanding of the basic concepts of pixel use in experiments and of the technologies required to produce devices which meet the stringent experiment requirements. Second, the course will cover details through the broad range of topics related to these pixel detectors. Thus, those working in one area may become familiar with the issues important in the others.

The morning session will include a review of the motivations for pixel detectors in general, and of the experiments using and planning to use pixel detectors, and their varied requirements. In addition, sensor developments and methods of attaching the sensors to the readout electronics will be covered in detail.

The afternoon session will include material on the ASIC readout designs and implementation technologies, as well as interconnections among readout units.

NOTE: Fee includes refreshments, lunch, a copy of the lecture notes, additional reading and a certificate of completion.

INTEGRATED CIRCUIT FRONT ENDS FOR NUCLEAR PULSE PROCESSING

Monday, November 5   8:30am–5:00pm
Organizer: **CHUCK BRITTON**, *Oak Ridge National Laboratory*
Instructors:
> **VELJKO RADEKA**, *Brookhaven National Laboratory*
> **PAUL O'CONNOR**, *Brookhaven National Laboratory*
> **ALAN WINTENBERG**, *Oak Ridge National Laboratory*

This one-day course will cover integrated circuits developed for nuclear pulse processing applications with an emphasis on charge measurement. We will discuss bipolar and MOS transistor operation, signal processing for pulse measurements, charge-sensitive preamplifiers, photomultiplier preamplifiers, pulse-shaping circuits, sample/holds, and analog/digital converters.

This course has been targeted to three types of attendees. The first is the engineer/physicist who desires understanding of the

basics of integrated circuits and pulse-shaping networks in order to begin creating circuits for systems. The second is the engineer/physicist/manager who needs to be able to understand the basics of these technologies and their achievable performance in order to manage or work with a development team utilizing these technologies. The third type is one who desires an overview for personal technical development.

The morning session will be an overview of the theory of pulse processing from a theoretical viewpoint. It will cover noise sources and pile up and their effect on resolution. Charge-sensitive preamplifiers and their design in integrated circuit processes will be covered with an emphasis on implementation.

The afternoon session will cover integrated circuits for photo-multiplier tube readout and associated circuits for the system aspects such as variations of gain and timing. Analog/digital converters and their associated circuitry (sample/hold and peak stretchers) will be discussed. In all cases, numerous examples will presented of the present state-of-the-art.

NOTE: The registration fee includes refreshments, lunch, a copy of the lecture notes, a textbook, and a certificate of completion.

A view of San Diego, Califonia from Point Loma. Nestled between the mountains on the east and the Pacific Ocean on the west, San Diego's modern skyline is an imposing contrast to its surroundings.

The Nuclear Science Symposium provides an annual forum where acquaintances, young and old, new and established, can meet to learn new techniques and results, and to discuss diverse ideas. Every year, we both look forward to this scientific "bash" and we have striven hard to ensure that this year's meeting will provide the same stimulating environment.

We received well over three hundred submissions, providing a formidable scheduling task. Some attendees will inevitably encounter conflicting choices in the parallel oral presentations, but we have followed the recent practice of scheduling no other NSS sessions during the formal poster presentations. To help bridge the communities' interests, there are joint sessions between NSS, MIC and the International Workshop.

We would like to thank very much the one hundred reviewers who contributed their time in assessing the submissions, and the nine Assistant Chairs who helped formulate the oral and poster selections in their respective fields of expertise.

Most important of all, we thank the authors and attendees for their contributions to what we sincerely hope will be an informative and enjoyable symposium.

Graham Smith, NSS Program Chair
Bo Yu, NSS Program Deputy Chair

**NSS PROGRAM CHAIR
GRAHAM SMITH**

**NSS PROGRAMCHAIR
DEPUTY, BO YU**

NOVEMBER 7, 2001

NSS CONFERENCE RECEPTION

TERRACE PAVILION
Wednesday, 6:30 pm – 9:30 pm

NSS LUNCHEON AND SPEAKER

CALIFORNIA ROOM
Tuesday, 12:00 pm – 2:00 pm
Speaker: Troy W. Barbee, Jr.
Subject: Corps of Discovery

This phrase — Corps of Discovery — is descriptive in that we are almost never alone in our discoveries as science is a communal activity. In a very general sense science is a profession in which "we keep doing it over until we get it right". Thus, we as creators stand on ground created by those who preceded us. What I will present to you is a synopsis of my experience as a member of this Corps with a focus on the impact of my area of nano science and technology — multilayer or nano-laminate materials.

NSS LUNCHEON SPEAKER
TROY W. BARBEE, JR.

These new materials are synthetic "man-made" layered structures containing up to 100,000 layers each of two materials which range in thickness from one and several thousand atomic diameters. They may be manufactured with perfection that can only be described as single crystal. This has enabled the development of optics for spectral ranges previously inaccessible and thus created new science and technology. New and exciting images of the Solar Corona enabled by multilayers have led to major advances in our understanding of the Solar Corona. These results have only indicated the potential of this approach to our understanding of our STAR — the SUN. Additionally, the application of the imaging capabilities demonstrated in the Solar Corona observations resulted in a major program to develop the next generation lithography technology for integrated circuit manufacture. This multilayer based Extreme Ultra Violet projection lithography technology is currently the leading competitor for the technology to reach the limits of silicon device scale.

Results in the areas outlined above as well as currently developing areas of nano technology accessed by multilayer materials will be presented and their implications to our personal existence explored.

TROY W. BARBEE, JR.
Materials Science and Technology Division,
Chemistry and Materials Science Department
Lawrence Livermore National Laboratory

His research interests extend to atomic engineering: multilayer x-ray/neutron optic elements: multilayer x-ray optics instrumentation: micro-metrology: micro-analytical techniques: thin and thick film growth processes and technologies: nano-engineered multilayer structures "synthesis" properties relationships: interface science: and efficient processes for alloy development.

NSS PROGRAM

All oral presentations in the NSS program are 15 plus 3 minutes, except plenary talks (40 plus 5 minutes) and featured talks (30 plus 5 minutes).

N1 — NSS PLENARY SESSION
Tuesday 9:00 am – 12:00 pm Town and Country Room
Session Chair:
GRAHAM SMITH, *Brookhaven National Laboratory*

N1–1 Solar Neutrino Results from SNO
G. McGregor
Oxford University

N1–2 Shining a Light on the World with Synchrotron Radiation
P. D. Johnson
Brookhaven National Laboratory

N1–3 Neutrons are Beautiful!
C. Carlile
Institute Laue Langevin

N2 — NUCLEAR PHYSICS INSTRUMENTATION
Tuesday 2:00 – 3:45 pm San Diego Room
Session Chair:
HOWARD WIEMAN, *Lawrence Berkeley National Laboratory*

N2-1 Operation and Performance of the PHENIX Experiment at RHIC (Featured Talk)
E.J. O'Brien
Brookhaven National Laboratory

N2-2 A Fast and Accurate Position Sensitive Timing Detector for Charged Particles
D. Shapira, T.A. Lewis
Oak Ridge National Laboratory

N2-3 Dynamically Reconfigurable Architectures for On-Line Digital Pulse Analysis
A. Di Odoardo, A. Geraci, G. Ripamonti
Politecnico Of Milan

N2-4 Tagging of Isobars Using Energy Loss and Time-Of-Flight Measurements
D. Shapira, T.A. Lewis, P.E.Mueller
Oak Ridge National Laboratory

N3 — SEMICONDUCTOR DETECTORS 1: IMAGING
Tuesday 2:00 – 3:45 pm Golden West Room
Session Chair:
STURE PETERSSON, *Royal Institute of Technology*

N3-1 Active Pixel Sensor for X-Ray Imaging Spectroscopy (Featured Talk)
P. Lechner[1], P. Holl[1], P. Klein[1], J. Kollmer[1], G. Lutz[1], L. Strüder[1], P. Fischer[2], J. Ulrici[2], N. Wermes[2]
[1]*MPI Halbleiterlabor*
[2]*University of Bonn*

N3-2 Gamma-Ray Imaging with Low Fold Segmented Semiconductor Detectors

L. Mihailescu, W. Gast, R. Lieder
Forschungszentrum Juelich

N3-3 A Monolithic Array of Silicon Drift Detectors for High-Resolution Gamma-Ray Imaging

C. Fiorini[1], A. Longoni[1], F. Perotti[2], C. Labanti[3], E. Rossi[3], P. Lechner[4], H. Soltau[4], L. Strueder[5]
[1]*Politecnico di Milano,Italy*
[2]*Istituto di Fisica Cosmica,C.N.R.,Milano,Italy*
[3]*TESRE, C.N.R.,Bologna,Italy*
[4]*KETEK GmbH, Italy*
[5]*MPI Halbleiterlabor, Munich,Germany*

N3-4 High Resolution and High Speed CMOS PANEL SENSORS for X-Ray

H. Mori, R. Kyuushima,K. Fujita, M.Honda
Hamamatsu Photonics

NM — JOINT NSS/MIC SESSION
Tuesday 4:15–6:00pm Town and Country Room
Session Chair:
ALBERTO DEL GUERRA, *University Pisa*

NM-1 Mini-Strip Ionisation Chamber for Gamma-Ray Imaging

V. Solovov, V. Chepel,M.I. Lopes, R. Ferreira Marques, A.J.P.L. Policarpo
LIP — Coimbra and Dep. de Fisica,Univ. de Coimbra, Portugal

NM-2 New Inorganic Scintilation Materials Development for Medical Imaging

P. R. Lecoq, *CERN*
M. Korzhik, *Institute of Nuclear Problems,Minsk,Belarus*

NM-3 APD Designs for X-Ray and Gamma Ray Imaging

K.S. Shah[1], R. Farrell[1], R.F. Grazioso[1], E. Karplus[2]
[1]*Radiation Monitoring Devices*
[2]*Science Wares*

NM-4 Feasibility Studies with PET Detector Modules Based on an APD Array and LSO

S. Léonard[1], A. Fremout[1], D. Wisniewski[1], P. Bruyndonckx[1], S. Tavernier[1], Y. Wang[2], A.Fyodorov[3],
[1]*Vrije Universiteit Brussel,Brussels,Belgium*
[2]*Univ. of Science and Techn.of China (USTC), Hefei–Anhui,China*
[3]*Institute for Nuclear Problems,Minsk,Belarus; Crystal Clear Collaboration*

NM-5 High Resolution and High Sensitivity Scintillation Crystal Array with Nearly Perfect Light Collection

C.S. Levin
UCSD School of Medicine and San Diego VA Medical Center

NM-6 Performance of a Dual-Layer Positron-Sensitive Surgical Probe

F. Liu[1], J.R. Saffer[2], F.M. Newcomer[3,] N.S. Lockyer[3], J.S. Karp[2], W. Kononenko[3]
[1]*Dept. of Physics & Radiology, University of Pennsylvania*
[2]*Dept. of Radiology, University of Pennsylvania*
[3]*Dept. of Physics,University of Pennsylvania*

N4 — ASTROPHYSICS AND SPACE INSTRUMENTATION 1
Tuesday 4:15–6:00pm San Diego Room
Session Chair:
BERNARD PHLIPS, *Naval Research Laboratory*

N4-1 X-Ray Polarimetry with a Micropattern Gas Detector with Pixel Read-Out

R. Bellazzini[1], L. Baldini[1], A.Brez[1], N. Lumb[1], G. Spandre[1], E. Costa[2], P. Soffitta[2]
[1]*INFN Pisa*
[2]*IAS-CNR Rome*

N4-2 Three Dimensional Readout System for Germanium Strip Detectors

E.A. Wulf[1,2], W.N.Johnson[2], R.A.Kroeger[2], J.D. Kurfess[2], B.F. Phlips[2], J. Ampe[3],
[1]*NRC*
[2]*Naval Research Lab*
[3]*Praxis,Inc.*

N4-3 CdZnTe Gamma Ray Spectrometer for Orbital Planetary Missions

T.H. Prettyman[1], W.C. Feldman[1], K.R. Fuller[1], S.A. Storms[1], D.J. Lawrence[1], M.C. Browne[1], K.D. Ianakiev[1], C.E. Moss[1], S.A. Soldner[2]
[1]*Los Alamos National Laboratory*
[2]*eV Products*

N4-4 Three-Compton Telescope: Theory, Simulations, and Performance

R.A.Kroeger, W. Neil Johnson, J.D. Kurfess, B.F. Phlips, E.A. Wulf
Naval Research Laboratory

N4-5 Proton Radiation Damage in P-Channel CCD's Fabricated on High-Resistivity Silicon

C.Bebek, B. Frye, D. Groom, S. Holland,A. Karcher, B. Kolbe, J. Lee, M. Levi,N. Palaio, B. Turko, M. Uslenghi,G. Wang
Lawrence Berkeley National Laboratory

N4-6 SONTRAC — a Scintillating Plastic Fiber Tracking Detector for Neutron and Proton Imaging and Spectroscopy

R.S. Miller[1], J.R. Macri[1], M.L. McConnell[1], J.M. Ryan[1], E. Flueckiger[2], L.Desorgher[2]
[1]*University of New Hampshire*
[2]*University of Bern*

N5-1 Front-End Electronics for the Silicon Partition of the Phobos Detector at RHIC
M. Plesko, J. Fitch, C. Gomes, D. Ross, P. Kulinich, H. Pernegger, P. Sarin, B. Wadsworth
Massachusetts Institute of Technology

N5-2 DAQ System with RACEway™ Switch for Phobos Experiment at RHIC
A. Sukhanov[1], P. Kulinich[2], P. Sarin[2]
[1]*Brookhaven National Laboratory*
[2]*Massachusets Institute of Technology*

N5-3 Performance of the CDF Online Silicon Vertex Tracker
R. Carosi[1], A.Bardi[1], A.Cerri[1], G.Chlachidze[1], M.Dell'Orso[1], S. Donati[1], S. Galeotti[1], P. Giannetti[1], V. Glagolev[1], F. Morsani[1], D. Passuello[1], G. Punzi[1], L.Ristori[1], A. Semenov[1], F. Spinella[1], W. Ashmanskas[2], J. Berryhill[2], M.Bogdan[2], R. Culberston[2], H. Frisch[2], T. Nakaya[2], H. Sanders[2], M. Shochet[2], U.K. Yang[2], A.Barchiesi[3], M.Rescigno[3], S. Sarkar, L. Zanello[3], M.Bari[4], S. Belforte[4], A.Maria Zanetti[4], L.Moneta[5], T. Speer[5], X. Wu[5]
[1]*INFN Pisa*
[2]*University of Chicago*
[3]*INFN Roma*
[4]*INFN Trieste*
[5]*DPNC Geneve*

N5-4 Development of a Readout Technique for the High Data Rate BTev Pixel Detector at Fermilab
B. Hall, G. Cardoso, D. Christian, J. Hoff, A. Mekkaoui, R. Yarema, S. Zimmermann
Fermi National Accelerator Laboratory

N5-5 Commissioning of a Very Fast Track Finder
M. Bruinsma[1], J. Flammer[2], H. Fleckenstein[2], A. Michetti[2], M. Noerenberg[2], D. Ressing[2], I.Riu[2], A. Somov[2], J. Glaess[3], A. Groepl[3], C. Haehnel[3], R. Maenner[3], A. Wurz[3], R. Pernack[4], B. Schwingenheuer[5], U. Uwer[6]
[1]*NIKHEF, Amsterdam*
[2]*DESY*
[3]*Computer Science V, University of Mannheim, Germany*
[4]*Fachbereich Physik, University of Rostock*
[5]*Max-Planck-Institut für Kernphysik*
[6]*Physikalisches Institut, University of Heidelberg*

N5-6 The Trigger Control System for the COMPASS Experiment
I.Konorov, H. Angerer, B. Grube, W. Liebl, S. Paul, L.Schmitt
Technical University of Munich

N6-1 Radiation Hardness Study of an APS CMOS Particle Tracker
W. Dulinski[1], J.L.Riester[1], G.Deptuch[2], Y. Gornushkin[2], M. Winter[2]
[1]*LEPSI, ULP/IN2P3, Strasbourg, France*
[2]*IReS, Strasbourg, France*

N6-2 Plastic Scintillators Under N and Gamma Irradiation
B. Bodmann, U. Holm
University of Hamburg

N6-3 Anomalous Structural Changes in Non-Equilibrium Condensed Matter Under the Action of an Ultraweak Thermalized Neutron Field
A.G. Lipson[1], G.H. Miley[1], V.A. Kuznetsov[2], E.I. Saunin[2]
[1]*University of Illinois at Urbana-Champaign;*
[2]*Institute of Physical Chemistry, RAS*

N6-4 Ionization Damage on Atlas-SCT Front-End Electronics Considering Low Dose Rate Effects
M. Ullan[1], D. Dorfan[1], T. Dubbs[1], A.A. Grillo[1], E. Spencer[1], A. Seiden[1], G.Gilchriese[2], H. Spieler[2], M. Lozano[3]
[1]*University of California at Santa Cruz*
[2]*Lawrence Berkeley National Laboratory*
[3]*Centro Nacional de Microelectronica*

N6-5 Radiation Tolerant Optical Links for the ATLAS Inner Detector
I.M.Gregor
University of Wuppertal

N7-1 Spectral and Time Structure Analyses of Electron-Induced Radiation in Multi-Mode Optical Silica Fibers
N. Akchurin, G. Lambright, R. Thomas, M.T. Zeyrek
Texas Tech University, Physics Department

N7-2 Diamond Pixel Detector Development
R. Stone, S. Schnetzer, L. Perera, T. Koeth, J. Doroshenko,
Rutgers University

N7-3 Applications of a Novel Photosensitive Gaseous Detector for Scintillation Light in Dense Noble Gases
L. Periale[1], P. Carlson[2], T. Francke[2], V. Peskov[2], P. Pavlopoulos[3], F. Pietropaolo[3], P. Picchi[4]
[1]*Istituto di Cosmogeofisica, Torino, Italy*
[2]*Royal Institute of Technology, Sweden*
[3]*CERN*
[4]*Torino University, Italy*

N7-4 Results on Particle Identification with Aerogel for the LHC-B RICH Detector

A. Braem[1], E. Chesi[1], C. Joram[1], D. Liko[1], N. Neufeld[1], J. Seguinot1, D. Voillat[1], S. Wotton[2],T. Bellunato[3], M. Calvi[3], C. Matteuzzi[3], P. Negri[3], M. Paganoni[3], T. Duane[4], S. Jolly[4], A.R. Buzykaev[5], E.A. Kravchenko[5], A.P. Onuchin[5], A.F. Danilyuk[6]

[1]CERN
[2]University of Cambridge
[3]Dipartimento di Fisica,Università di Milano-Bicocca and INFN,Milano
[4]Imperial College, London,UK
[5]Budker Institute of Nuclear Physics, Novosibirsk
[6]Boreskov Institute of Catalysis, Novosibirsk

N7-5 Studies of Electron Avalanche Behavior in Liquid Argon

S. Dardin[1], R.W. Kadel[1], J. Kadyk[1], J.G. Kim[1], W. Wenzel[1], K.Jackson[2], V. Peskov[3]

[1]Physics Division,Lawrence Berkeley National Laboratory
[2]Material Sciences Div., Lawrence Berkeley National Laboratory
[3]Dept.of Physics,Royal Institute of Technology, Stockholm,Sweden

N8-1 Temperature-Dependent Studies of the Ultra-Fast Band-Edge Scintillation of CuI and PbI_2

S.E.Derenzo[1], M.K. Klintenberg[1], W.W. Moses[1], M.J. Weber[1], M.K. Klintenberg[2], K. Shah[3]

[1]Lawrence Berkeley National Laboratory
[2]University of Uppsala,Sweden; ,
[3]RMD, Inc.

N8-2 Comparison of LSO, LGSO and MLS Scintillators

C. Michelle Pepin, R. Lecomte
Universite de Sherbrooke

N8-3 A Study on Yttrium Doping in Lead Tungstate Crystals

D. Shen[1], J. Liao[1], Z. Yin[1], X. Qu[2], L.Zhang[2], R.Y. Zhu[2]
[1]Shanghai Institute of Ceramics;
[2]California Institute of Technology.

N8-4 Transparent Ceramic Routes to Scintillators

V. S. Venkataramani[1], S.M. Loureiro[1], M. Rane[1], S.J. Duclos[1], C.W. Stearns[2], DL Mcdaniel[2],
[1]General Electric Corporate R&D
[2]GE Medical Systems

N9-1 Summary and Results of the International Workshop on Aging Phenomena in Gaseous Detectors (DESY, October 2001) Featured Talk

M. Hohlmann[1], N. Tesch[1], C. Padilla[2], M. Titov[3]
[1]DESY
[2]CERN
[3]ITEP Moscow

N9-2 Large-Scale Production and Test of the Precision Drift Tube Chambers for the ATLAS Muon Spectrometer

H. Kroha[1], F. Bauer[1], W. Blum[1], S. Horvath[1], A.Manz[1], R. Richter[1], O. Kortner[2], F. Rauscher[2], D. Schaile[2], A. Staude[2], R. Stroehmer[2], T. Trefzger[2], G.A.Chelkov[3], D.V. Dedovitch[3], P.G. Evtoukhovitch[3], A.L. Gongadze[3], M.I.Gostkine[3], D.V. Khartchenko[3], I.N. Potrap[3], E.V. Rogalev[3], E.G. Tskhadadze[3], V.V. Zhuravlov[3]
[1]Max–Planck–Institut fuer Physik, Munich,Germany
[2]Ludwig-Maximilians University, Munich,Germany
[3]Joint Institute for Nuclear Research, Dubna, Russia

N9-3 High Pressure Xenon Detector for Measurement of Planetary Gamma-Rays

V.V. Dmitrenko[1], I.V. Chernyshova[1], O.B. Batkov[1], V.M. Grachev[1], D.V. Sokolov[1], S.E. Ulin[1], Z.M. Uteshev[1], K.F. Vlasik[1], N. Hasebe[2], S. Kobayashi[2], T. Miyachi[2]
[1]Moscow State Engineering Physics Institute (Technical Univ.)
[2]Advanced Research Institute for Science and Engineering, Waseda University.

N9-4 A Hemispherical High-Pressure Xenon Gamma Radiation Spectrometer

G. Tepper, R. Kessick
Virginia Commonwealth University

N9-5 High Pressure Xenon Ionization Chambers: New Solutions to Improve Performances

S. Ottini-Hustache[1], X.Bourgeois[1], S. Haan[1], C. Monsanglant[1], I.Chernysheva[2], V. Dmitrenko[2], V. Grachev[2], D. Sokolov[2], K. Stolyarov[2], S. Ulin[2], Z. Uteshev[2], K.Vlasik[2], T. Dautremer[3], F. de Dieuleveult[3], J. Lefèvre[3], J.C. Trama[3]
[1]CEA/DRT/LIST/DIMRI/SIAR/LTD
[2]Moscow State Engineering and Physics Institute;
[3]CEA/DRT/LIST/DIMRI/SIAR/LETS

N10-1 RX64 — A Fully Integrated 64-Channel IC for Readout of Silicon Strip Detectors Used for X-Ray Position Sensitive Measurements

W. Dabrowski, P. Grybos, K. Swientek
Faculty of Physics and Nuclear Techniques,University of Mining and Metallurgy

N10-2 Analogue Ring Sampler: An ASIC for the ANTARES Telescope's Front End Electronic.

F. Druillole[1], E.Delagnes[1], D. Lachartre[2], F. Feinstein[3], H. Lafoux[4], C. Hadamache[4]
[1]*CEA-Saclay DAPNIA/SEI*
[2]*CEA-Grenoble*
[3]*CPPM Marseille*
[4]*CEA-Saclay DAPNIA/SPP*

N10-3 Multi-Channel Implementation of ROTOR Amplifier for the Readout of Silicon Drift Detectors Arrays

C. Fiorini[1], A. Longoni[1], W. Buttler[2]
[1]*Politecnico di Milano;*
[2]*Werner Buttler Ingenieur–Büro*

N10-4 Analog Peak Detector and Derandomizer for High Rate Spectroscopy

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

N10-5 A 10-Mcps, 0.5-μm CMOS Constant-Fraction Discriminator Having Built-In Pulse Tail Cancellation

D.M. Binkley[1], B.S. Puckett[2], B.K. Swann[2], J.M. Rochelle[2], M.E. Musrock[3]
[1]*Univ. of North Carolina at Charlotte*
[2]*Concorde Microsystems, Inc.*
[3]*CTI PET Systems, Inc.*

N11 — NEW RADIATION DETECTORS
Wednesday 10:30am–12:15pm Golden West Room
Session Chair:
KALSUSHI ARISAKA, *UCLA*

N11-1 Room Temperature 2-D X-Ray Imaging with the Controlled-Drift Detector: First Experimental Results
(Featured Talk)

A. Castoldi[1], G.Cattaneo[1], A. Galimberti[1], C. Guazzoni[1], P. Rehak[2], L. Strüder[3]
[1]*Politecnico di Milano and INFN*
[2]*Brookhaven National Laboratory*
[3]*Max Planck Institut Halbleiterlabor*

N11-2 Characterization of Unirradiated and Heavily Irradiated CVD Diamond Dosimeters

M. Bruzzi[1], S. Pini[1], S. Sciortino[1], M. Bucciolini[2], S. Russo[3]
[1]*Dipartimento di Energetica, Italy*
[2]*Dipartimento di Fisiopatologia Clinica, Firenze, Italy*
[3]*Servizio Fisica Sanitaria, A.O. Careggi, Firenze*

N11-3 High Speed X-Ray Imaging Camera for Time Resolved Diffraction Studies

V.V. Nagarkar, S.V. Tipnis, V.B. Gaysinskiy, S.R. Miller, Y. Klugerman, P.J. O'Dougherty
Radiation Monitoring Devices, Inc.

N11-4 Development of Low Temperature High-Resolution Gamma-Ray Spectrometers

A. Loshak, D.T. Chow, M.F. Cunningham, O. Drury, M.L. van den Berg, J.N. Ullom, T.W. Barbee Jr. , M. Frank, S.E. Labov
Lawrence Livermore National Laboratory

N11-5 Performance of Liquid Xenon Scintillation Detector for New Experiment to Search for μ→eγ Decays

W. Ootani[1], T. Ishida[1], T. Mashimo[1], S. Mihara[1], T. Mitsuhashi[1], T. Mori[1], H. Nishiguchi[1], K. Ozone[1], S. Orito[2], T. Doke[3], R. Sawada[3], S. Suzuki[3], K. Terasawa[3], M. Yamashita[3], T. Yoshimura[3], T. Haruyama[4], A.Maki[4], J. Yashima[4]
[1]*International Center for Elementary Particle Physics, Univ. of Tokyo*
[2]*Department of Physics, School of Science, University of Tokyo*
[3]*Advanced Research Inst. for Science and Engineering, Waseda Univ.*
[4]*High Energy Accelerator Research Organization (KEK)*

N12 — NSS POSTER SESSION 1
Wednesday 1:30pm–3:15pm Grand Ballroom
Session Chair:
CARLOS CONDE, *University of Coimbra*

SEMICONDUCTOR DETECTORS

N12-1 Electrical Characterization of Silicon Pixel Detectors with the n+/n/p+ and Single-Sided Guard Ring Structure for High Radiation Tolerance

H.S. Cho, *Yonsei University*
C.Y. Chien, X.B. Xie, G.W. Liang, *Johns Hopkins University*
Z. Li, *Brookhaven National Laboratory*

N12-2 Direct and Indirect Silicon Detectors for Electron Microscopy

A.R. Faruqi, D.M.Cattermole
MRC Laboratory of Molecular Biology

N12-3 Development of a Dual Detector System Based on a-Si:H Arrays and Multi-Element Silicon Detectors for Diffraction Enhanced Breast Imaging

D.G. Darambara, R.D. Speller, *University College London*
P. Sellin, *University of Surrey*

N12-4 Performance Improvement of Si(Li) Peltier Cooled Detectors

A.D. Sokolov, V.V. Gostilo, A.V. Loupilov, V.A. Zalinkevich, *Baltic Scientific Instruments*

N12-6 Performance of Large Area Silicon Strip Sensors for GLAST

S. Yoshida, T. Ohsugi, Y. Fukazawa, K. Yamanaka, H. Masuda, *Hiroshima University*; H.F.W. Sadrozinski, *SCIPP, UCSC*; T. Handa, A. Kavelaars, *SLAC*; A. Brez, *INFN Pisa*; K. Yamamura, K. Yamamoto, K. Sato, *Hamamatsu Photonics.*

N12-7 Development of a Fabrication Technology for Silicon Microstrip Detectors with Integrated Electronics

G.F. DallaBetta, M. Boscardin, P. Gregori, N. Zorzi, *ITC - irst*; G.Umberto Pignatel, *Universita' di Trento*; G. Batignani, *INFN–Pisa and Universita' di Pisa*; L. Bosisio, *INFN–Trieste and Universita' di Trieste*; V. Re, *Universita' di Bergamo*; V. Speziali, *INFN–Pavia and Universita' di Pavia*

N12-8 Radiation Effects on Standard and Oxygenated Silicon Diodes

D. Bisello, N. Bacchetta, A. Candelori, A. Kaminski, D. Pantano, R. Rando, I. Stavitski, *Istituto Nazionale di Fisica Nucleare e Dipartimento di Fisica, via Marzolo 8, I-35100, Padova, Italy*; J. Wyss, *Facolta' di Ingegneria, Universita' di Cassino, via DiBiasio 43, I-03043, Cassino (FR), Italy*

N12-9 Production and Test of Exceptionally High Breakdown Silicon Detectors
L. Borrello, J. Bernardini, R. Dell'Orso, S. Dutta, S. Gennai, A. Messineo, G. Segneri, A. Starodumov, G. Tonelli, P.G. Verdini, *Universita` di Pisa and INFN Pisa*; O. Militaru, L. Teodorescu, *on leave from University of Bucharest, Romania*; P.G. Fallica, G. Valvo, *STMicroelectronics srl, Italy*

N12-10 Study of Thermal Cycling and Radiation Effects on Indium and Fluxless Solder Bump-Bonding Devices
S. Kwan, S. Cihangir, *Fermilab*; C.N. Newsom, *Univ. of Iowa*

N12-11 Electrical and TCT Characterization of Edgeless Si Detectors Diced with Different Methods
Z. Li, W. Zhang, *Brookhaven National Laboratory*; V. Eremin, E. Verbitskaya, *Ioffe Physico-Technical Institute, St. Petersburg*; T.O. Niinikoski, *CERN*

N12-12 Development of Thick Intrinsic Silicon Detectors for Hard X-Ray and Gamma Ray Detection
B.F. Phlips, W.N. Johnson, R.A.Kroeger, J.D. Kurfess *Naval Research Laboratory.*

N12-13 Hybrid Gas Counter with CdTe Active Wall for C-14 Dating System
L. Zhang, H. Takahashi, N. Hinamoto, M. Nakazawa, K. Yoshida, *The University of Tokyo*

N12-14 Influence of Design and Process Parameters on Properties of Edge-On Silicon Strip Detector
D. Vrtacnik, D. Resnik, U. Aljancic, M. Mozek, S. Amon, *Faculty of Electrical Engineering*

N12-15 PIN Diode and Integrated JFET on High Resistivity Silicon: a New Test Structure
A. Fazzi, *Politecnico di Milano*
G.Dalla Betta, M.Boscardin, P. Gregori, N. Zorzi, *ITC-IRST*
G.U. Pignatel, *Universita' di Trento*

N12-16 Monte Carlo Simulations of the Imaging Properties of a Scintillator Coated Partially Depleted SOI NMOSFET X-Ray Detector
E. Dubaric, H.E. Nilsson, C. Fröjdh
Dept. of Information Technology and Media, Mid-Sweden Univ.

N12-17 The Development of a CCD Vertex Detector for the Future Linear Collider
D.A. Milstead, *University of Liverpool*; *on behalf of the Linear Collider Flavour Identification Collaboration*

N12-18 A Germanium Gamma Ray Imager with 3-D Position Sensitivity
M.T. Burks, M. Amman, E.L. Hull, P.N. Luke, N.W. Madden, *Lawrence Berkeley National Laboratory*;
K.P. Ziock, *Lawrence Livermore National Laboratory*

N12-21 Laboratory Tests of 3D Positioning in Cross-Strip Ge Detectors
G. Holland, S. Amrose, S.E. Boggs, R.P. Lin, D.M. Smith, *Space Sciences Laboratory, University of California, Berkeley*

N12-22 Numerical Simulations of 3D Positioning in Cross-Strip Ge Detectors
S. Amrose, S.E. Boggs, G. Holland, R.P. Lin, D.M. Smith, *Space Sciences Laboratory, University of California, Berkeley*

RADIATION DAMAGE EFFECTS

N12-23 What are These Border Traps: Introduced by Radiation and Seen by Charge Pumping Technique?
B. Djezzar, *Microelectronics Laboratory, CDTA*

N12-24 Radiation Hardness of High Gain Avalanche Photodiodes
R.F. Grazioso, R. Farrell, K. Shah, *Radiation Monitoring Devices, Inc.*; S. Reucroft, J. Swain, *Northeastern University.*

N12-25 Comparative Study on Radiation Damage of a-Si: H p-i-n Diodes Made by PECVD and Ion Shower Method
H.J. Kim, G.Cho, T. Hoon Lee, *Korea Advanced Institute of Science and Technology*

N12-26 Molecular Dynamics Simulation of Fast Ion Impact on Cluster Atoms
F. Sato, T. Kagawa, S. Sakabe, T. Iida, *Osaka University*; K. Imasaki, *Institute for Laser Technology*

N12-27 Radiation Damage of Silicate Based Tb3+(Eu3+) Activated Glasses
S. Baccaro, A. Cecilia, M. Montecchi, *ENEA-Technological Services, Irradiation Technologies Laboratory, Italy*; M. Nikl, *Inst. of Physics, AS CR, Prague, Czech Republic*; P. Polato, *Stazione Sperimentale Vetro, Murano Italy*; R. Zannoni, G. Zanella, *INFN & Dept of Physics, Univ. Padova, Italy*

N12-28 Modeling the Electrical Parameters of Hadron Irradiated Silicon Detectors
S. Saramad, A.Moussavi-Zarandi, *Amir Kabir University*

GAS DETECTORS

N12-29 Asymmetric Multiwire Proportional Counters for Rate Capability Improvement
H.S. Cho, *Dept.of Medical Engineering/College of Health Science/Yonsei Univ.*; K.S. Joo, J.G. Kim, *Dept. of Physics/Myong Ji Univ.*; H.K. Kim, *Dept. of Nuclear Engineering/KAIST*

N12-30 Gas Proportional Scintillation Counters for the μp-Lamb Shift Experiment
J.A. Matias Lopes, *Instituto Superior de Engenharia de Coimbra, Portugal*; J.F.C.A. Veloso, E.D.C. Freitas, J.M.F. dos Santos, *C.A.N.Conde, Departamento de Fisica, Universidade de Coimbra, Portugal*; C.Donche-Gay, O. Huot, P. Knowles, F. Mulhauser, *Institut de Physique de l'Universite, Switzerland*; F. Kottmann, *Institut für Teilchenphysik, ETHZ, Switzerland*; D. Taqqu, *Paul Sherrer Institute, Switzerland*

N12-31 Performance of Gas Electron Multipliers Coupled with a Micro-Channel Plate
S.M. Kang, D.K. Hong, H.S. Cho, *Dept.of Medical Engineering/College of Health Science/Yonsei Univ.*; M.S. Moon, S.H. Han, Y.K.Kim, J.Y. Kim, *Korea Atomic Energy Research Institute*

N12-32 Opitical Observation of 3D Streamer in Resistive Plate Counter
T. Takahashi, K.Onodera, K. Kumagai, N. Takahashi, *Tohoku Gakuin University Dept.of Applied Physics*;
K. Neichi, *Tohoku Gakuin University Dept.of Commerce*;
K. Abe, S. Handa, K.Higuchi, H. Mikami, T. Nagamine, A. Yamaguchi, *Tohoku University Dept.of Physics*;
S. Narita, *Iwate University Dept.of Engineering*;
T. Kawamura, H. Yuta, *Aomori University Dept.of Engineering*

N12-33 A Study of a Combination MICROMEGAS+GEM Chamber in Ar-CO2 gas
S. Kane, J. May, J. Miyamoto, I. Shipsey, *Purdue University*

N12-34 Development of ^{3}He MSGC for Neutron Scattering Experiment
K. Yano, K. Yokoi, M. Nakazawa, *Faculty of Engeineering, The University of Tokyo*; H. Takahashi, *Research into Artifacts, Center for Engineering, The University of Tokyo*; M. Furusaka, T. Ino, S. Kishimoto, *High Energy Accelerator Research Organization*; Y. Yonezawa, *Tsukuba College of Technology*

N12-35 Optimization of Design for X-ray Polarimeter Using MSGC
T. Suzuki, H. Sakurai, S. Gunji, F. Tokanai, *Yamagata University*

N12-36 The Role of Molecular Impurities in Quenching the Xe Scintillation in Gas Proportional-Scintillation Counters
F.P Santos, T.T Dias, P. M Rachinhas, C.N Conde, *Departamento de Física, Universidade de Coimbra, Portugal*; L.N Tavora, *Instituto Politécnico de Leiria, Portugal*; A.D Stauffer, *Dept. of Physics and Astronomy, York Univ., Canada*

N12-37 Backscattering Effects in the Photoemission from CsI into Noble Gases and Their Mixtures
P.J.B.M. Rachinhas, T.H.V.T. Dias, F.P. Santos, C.A.N. Conde, *Departamento de Física, Universidade de Coimbra*, ; J.A.M. Lopes, *Instituto Superior de Engenharia de Coimbra*; L.M.N.Távora, *Instituto Politécnico de Leiria, ESTG, Portugal*; A.D. Stauffer, *Dept. of Physics and Astronomy, York Univ., Canada*

N12-38 A Complete Simulation of Triple-GEM Detectors
D. Pinci, A. Cardini, W. Bonivento, *INFN Cagliari*

N12-39 The Double Cone Chamber (DCC)
S.H. Han, H.D. Kang, *Dept. of Physics, Kyungpook National University, South Korea*; Y.K.Kim, B.S. Moon, C.E. Chung, S.B. Hong, *Korea Atomic Energy Research Institute, South Korea*; H.S. Cho, *Dept. of Medical Engineering, Yonsei University, South Korea*; T.H. Lee, *Korea Advanced Institute of Science and Tech.*

N12-40 Reflective and Semi-transparent CsI Photocathodes in Microstrip Plate Gas Chamber Photosensors for Gas Proportional Scintillation Counters: A Comparative Study
J.F.C.A.Veloso, D.S.A.P. Freitas, J.M.F. dos Santos, C.A.N.Conde, *Physics Department, University of Coimbra*

N12-41 The Performance of the Ar-Xe filled GPSC/MGC Hybrid Detector with Argon-Xenon Gas Mixtures
C.M.B. Monteiro, J.F.C.A. Veloso, J.M.F. dos Santos, C.A.N.Conde, *Physics Department, University of Coimbra*

N12-42 A Simple Approach to X-ray Spectrometry with Driftless Gas Proportional Scintillation Counters
P.C.P.S. Simões, D.S. Covita, C.M.B. Monteiro, J.M.F. dos Santos, *Physics Department, University of Coimbra*; R.E.Morgado, *Los Alamos Nacional Laboratory*

N12-43 The Energy Resolution of Xe-Ne Filled Gas Proportional-scintillation Counters for X-Rays Below 2 keV
F.I.G.M. Borges, F.P. Santos, T.H.V.T. Dias, P.J.B.M. Rachinhas, C.A.N.Conde, *Departamento de Física, Universidade de Coimbra, Portugal*; A.D. Stauffer, *Dept. of Physics and Astronomy, York Univ., Canada*

N12-44 Test Results of an Ionization Chamber Shower Detector for a LHC Luminosity Monitor
P. Datte, P. Manfredi, J. Millaud, W. Turner, *Lawrence Berkeley National Laboratory*; P. Manfredi, L. Ratti, V. Speziali, T. Traversi, *Univ. of Pavia – INFN Pavia; M.Placidi, CERN*

N12-45 Development of an X-Ray Imaging Detector of Double Capillary Plates
T. Maeda, H. Sakurai, S. Gunji, F. Tokanai, N.Ujiie, N. Saitoh, *Yamagata University*

N12-46 Study of the Performance of ALICE Slat Chambers in the Dimuon Tracking System
E. Siddi, M. Arba, C.Cicalo, A. De Falco, M.P. Macciotta, D. Marras, A. Masoni, G. Puddu, S. Serci, L. Serra, G. Usai, L. Tocco, M. Tuveri, *Univ. and I.N.F.N. Sezione di Cagliari*; H. Carduner, J.P. Cussonneau, M. Dialinas, L. Luquin, *Ecole de Mines de Nantes (SUBATECH)*; P. Ageron, A. Baldisseri, H. Borel, P. De Girolamo, J. Gosset, D. Jourde, J.C. Lugol, F. Orsini, S. Salasca, *DAPNIA/SPhN, CEA Saclay*

N12-47 A High Luminosity Position Sensitive Neutron Detector for Residual Stress Measurements
M.K. Moon, C.H. Lee, V.T. Em, *Korea Atomic Energy Research Institute*; H.D. Kang, *Kyungpook National University*; A. Gabriel, *European Molecular Biology Laboratory*

N12-48 Studies of the Gain Properties of Gas Microstrip Detectors Relevant to their Application as X-Ray and Electron Detectors
J.A.Mir, J.E. Bateman, J.F. Connolly, G.E. Derbyshire, D.M. Duxbury, J. Lipp, J.E. Simmons, E.J. Spill, R. Stephenson, *RAL*

N12-97 Imaging Brain Tumours Using a Multi-Wire Gamma Camera and Thallium-201
A. Barr, G. Charpak, J. Lewiner, *Ecole Superieure de Physique et de Chimie Industrielles, Paris, France*; G. Carugno, S.Centro, *Istituto Nazionale di Fisica Nucleare, Padova, Italy*; G. Cruickshank, *Department of Neurosurgery, University of Birmingham U.K.*

SCINTILLATION DETECTORS

N12-49 X-ray Scintillation Detectors Based on Polycrystalline Activated p-terphenyl
L.A. Andryushenko, S.V. Budakovsky, N.Z.Galunov, L.S. Gordienko, B.V. Grinyov, O.V. Zelenskaya, T.S. Teplytska, *Institute for Single Crystals, NAS of Ukraine*

N12-50 Optimization of Operation Characteristics of the Detection Systems Based on Inorganic Scintillation Crystal Coupled with a Photomultiplier by a Lightguide
M. Ratner, M. Globus, *Inst. for Single Crystals of National Academy of Sciences of Ukraine*
T. Hrynyova, *Stanford Linear Accelerator Center*

N12-51 A Direction Sensitive Detector
B.V. Grinyov, V.I.Melnik, V.Y. Pedash
Institute of Single Crystals

N12-52 Processing CsI (Tl) 2 D-Matrices by Means of Neural Networks and Markov Random Fields
M. Alderighi, M. Bartolucci, R. Baruzzi, P. Guazzoni, G.Manfredi, S. Russo, G.R. Sechi, L. Zetta, *Istituto Nazionale di Fisica Nucleare, Milano, Italy*; A. Anzalone, S. Cavallaro, F. Porto, *Laboratorio Nazionale del Sud, Catania, Italy*; G. Cardella, E. De Filippo, E. Geraci, F. Giustolisi, G. Lanzalone, G. Lanzanò, S. LoNigro, A. Pagano, M. Papa, S. Pirrone, G. Politi, L. Sperduto, *Istituto Nazionale di Fisica Nucleare, Catania, Italy*

N12-53 Characterization of Room Temperature Detectors using the Proposed IEEE Standard
R.M.Keyser, *ORTEC, PerkinElmer Instruments*; E. Fairstein

N12-54 Construction of a Position-Sensitive Scintillation Detectors System to View Laser Cooled Ortho-Positronium
N. Nath Mondal, *Tokyo Metropolitan University*

N12-55 A Research for the Relation Between the Gas Scintillation Light Yield and the Gas Pressure in the Wavelength Range from Visible to Infrared
S. Hohara, K. Ikeda, T. Kin, F. Saiho, Y. Uozumi, M. Matoba, *Kyushu University*

N12-56 Radiation Damage in Scintillator Detector Chemical Compounds. A New Approach Using PPO-Toluene Liquid Scintillator Solution as a Model
C.H. Mesquita, J.M. Fernandes Neto, C.L. Duarte, P.R. Rela, M.M. Hamada, *Instituto de Pesquisas Energeticas e Nucleares*

N12-57 Absolute Number of Scintillation Photons Emitted by Alpha-Particles in Rare Gases
K. Saito, *The Graduate University for Advanced Studies*
S. Sasaki, H. Tawara, *High Energy Accelerator Research Org*
E. Shibamura, *College of Health Science, Saitama Prefectrual Univ.*

N12-58 Neutron Scintillation Detectors in Comparison with ^{3}He Proportional Counter for the Spallation Neutron Source
R. Engels, G.Kemmerling, H. Rongen, J. Schelten, *Forschungszentrum Juelich GmbH*
R. Cooper, *Argonne National Laboratory*

N12-59 Luminescence and Scintillation Properties of YAG:Pr
M. Wisniewska[1,2], D. Wisniewski[1], S. Tavernier[1], A.J. Wojtowicz[2], T. Lukasiewicz[3], Z. Frukacz[3], Z.Galazka[3], M.Malinowski[4]
[1]*Vrije Univ. of Brussels, Inter-Univ. Inst. For High Energies*
[2]*Inst. of Phys., N.Copernicus Univ.*
[3]*Inst. of Electronic Materials Technology*
[4]*Inst. of Micro- and Optoelectronics, Warsaw Univ. of Technology*

N12-60 Extreme High Vacuum Applications of Fast Inorganic Scintillators
W. Klamra, B. Cederwall, A. Kerek, L.O. Norlin, D. Novak, S. Westman, *Royal Institute of Technology*
A. Kallberg, *Manne Siegbahn Laboratory*

N12-61 Improved Energy-Resolution in Arrays of Small Scintillation Crystals
D.J. Herbert, L. Jian Meng, D. Ramsden
University of Southampton

N12-62 VUV Scintillation of LuPO$_4$:Nd and γPO$_4$:Nd
D. Wisniewski[1], S. Tavernier[1], P. Bruyndonckx[1], A.J. Wojtowicz[2], M. Wisniewska[1,2], P. Dorenbos[3], E. van Loef[3], C.W.E.van Eijk[3], L.Boatner[4]
[1]*Vrije Univ. of Brussels, Inter-Univ. Inst. For High Energies*
[2]*Inst. of Phys., N.Copernicus Univ.*
[3]*Delft Univ. of Tech., Faculty of Applied Physics*
[4]*Oak Ridge National Laboratory.*

N12-63 Electron and Photon Responses of Gd$_2$SiO$_5$(Ce^{3+}) and BaF2
W. Mengesha, J. Valentine
Georgia Institute of Technology

N12-64 Results from a Nuclear Microprobe Analysis of Selected Rare Earth Fluor Materials
W.A. Hollerman, E. Gates, G.A. Glass
University of Louisiana at Lafayette

N12-65 SIREN: Development of a 10% Gadolinium Loaded Liquid Scintillator for a Real-Time, Low-Threshold, Spectroscopic Solar Neutrino Detector
P.K.Lightfoot, V. Kudryavtsev, N.J.C. Spooner
Physics and Astronomy Department, Sheffield University, UK.

N12-66 Thin Inorganic Films for Radiation Control
V.M. Zuber, V.A. Tarasov, Y.T. Viday, A.A. Ananenko, V.P. Gavrylyuk, *ISC AHD*

N12-67 Polystyrene Scintillators for Detector System of High Energy Physics
B.V. Grinyov, V.G. Senchishin, V.N. Lebedev, A.Yu. Borisenko, N.P. Khlapova, *Institute of Single Crystals*

N12-68 Measurement of Light Output and Timing Response as a Function of Temperature for BaF$_2$
D. Koltick, J.C. Cooper, *Purdue University Physics Dept.*

N12-69 An Exhaustive and Systematic Search for Optimal PET Scintillator Crystals
P.J. Shlichta, *Crystal Research*

ENVIRONMENTAL HEALTH AND SAFETY INSTRUMENTATION

N12-70 Cherenkov Detector for Measuring the Sr-90 Activity Using Silica Aerogel
R. Pestotnik, M. Staric, *Institut Jozef Stefan, Ljubljana, Slovenia*; P. Krizan, *Faculty of Mathematics and Physics, University of Ljubljana, Slovenia*; S. Korpar, M.Bracko, *Faculty of Chemistry and Chemical Engineering, University of Maribor, Slovenia*; A. Stanovnik, *Faculty of Electrical Engeneering, University of Ljubljana, Slovenia*

N12-71 Development of a Flow-Through Alpha Detector Utilizing CsI:Tl Flow-Cell and Silicon PIN-Photodiode
H. Tan, T.A. DeVol, *Clemson University*

N12-72 Devices for Environmental Monitoring on Basis of Large Volume CsI(Tl) Scintillation Counters
V.M.Chirkin, V.N. Potapov, O.P. Ivanov, V.E. Stepanov, S.M.Ignatov, *Division for Development of Detecting Systems, Kurchatov Institute, Moscow*; L.J. Meng, *Dept. of Physics and Astronomy, Univ. of Southampton*

NUCLEAR MEASUREMENTS AND MONITORING TECHNIQUES

N12-73 Evaluation of Monte Carlo Code Based on Concurrent Programming Using Benchmark Data of Multi-Energy Gamma-Ray Penetration Through Stratified Shielding Slabs
G.C. Bakos, *Democritus University of Thrace*

N12-74 Handheld Device for Simultaneous Monitoring Fast Neutrons and Gamma Rays
R. Aryaeinejad, E.L. Reber, D.F. Spencer, *INEEL*

N12-75 Detection of Low Activities: New Materials, Improvement of Design and the Optimal Way of Processing the Spectrum of Scintillation Signals

M. Ratner, M. Globus, B. Grinyov, V. Tarasov
Inst. for Single Crystals of National Academy of Sciences of Ukraine;
Y. Zorenko, *Institute of Applied Physics of the Lviv State Univ.*

N12-76 Validity and Limitations of the Three Plane Compton Imaging Technique via Simulations.

M.W. Rawool-Sullivan, J.P. Sullivan, J.E. Koster, B.D. Rooney,
Los Alamos National Laboratory

N12-77 Portable Spectrometer Based on Segmented HPGe Detector with Background Suppression

V.V. Kondrashov, A.D. Sokolov, *Baltic Scientific Instruments*;
A. Benoist, A.Gatot-Garbe, P. Lubczynski, *Eurisys Mesures, ZA de l'Observatoire*

N12-78 On-Line Burnup Monitoring Of Pebble Bed Reactor Fuel Using Gamma-Ray Spectrometry

A.I. Hawari, J. Chen, B. Su, Z.Zhao, R.P. Wood, A. Toma,
University of Cincinnati

N12-79 Choice the Safest Ways of Decontamination Work Using the Data Received by Devices for Remote Mapping of Radioactive Contamination

A.V. Stepanov, *Moscow Institute ofPhysics and Technology*

N12-80 Measurement of Varying Sub-Critical Reactivity with Digital Time-Series Data Acquisition System Using Difference Filter Technique

G. Wakabayashi, Y. Yonemura, H.Heguri, M. Matoba, *Kyushu University*; K. Hashimoto, T. Horiguchi, *Kinki University*

N12-81 Measurements of Th,U and K Concentrations Using A Large Volume CsI Detector and Gamma-ray Spectroscopy

L.J. Meng, D. Ramsden, *Department of Physics and Astronomy, University of Southampton,UK*; W. Gilboy, *School of Physics and Chemistry, University of Surrey, UK*

N12-82 A Portable Landmine Detector Based on the Combination of Electromagnetic Induction and Neutron Backscattering

C.P. Datema V.R. Bom, L.A. van der Schoor, C.W.E. van Eijk
Delft University of Technology

N12-83 Effect of Sample Parameters on Gamma-Ray Yield in PGNAA Analysia of Cement Raw Material

A.A. Naqvi, R. Nassar, *Center for Applied Physical Sciences, King Fahd University of Petroleum and Minerals, Dhahran*;
M.M. Nagadi, K.ur Rehman, S.D. Kidwai, *Dept. of Physics, King Fahd University of Petroleum and Minerals,Dhahran*

N12-84 PAC Probe to Nuclear Medicine Techniques

S.S Ghumman, *SLIET, Longowal, Punjab, India*;
K. Ravinder, *DTE & IT Dept.,Plot No.-1, Secor 36,Chandigarh (India)*

N12-85 Quasi-Elastic Neutron Scattering and NMR Investigation of the Molecular Dynamics in Bitumen Compounds

V. Tripadus, R. Grosescu, L.Craciun, O. Muresan, *NIPNE*;
M. Peticila, *CESTRIN*

ASTROPHYSICS AND SPACE INSTRUMENTATION

N12-86 A Large Area Gas Proportional Scintillation Counter for Solar X-ray Spectrometry with a Balloon Born Experiment

H.N. da Luz, J.F.C.A. Veloso, J.M.F. dos Santos,
C.A.N. Conde, R.M.C. da Silva, *Physics Department, University of Coimbra*; H.R. Pan, Z.Y. Li, H.A.Lin, *Center for Space Science and Applied Research,Chinese Academy of Sciences*

N12-87 A Xe detector for WIMP Search

Y. Seo, D.B. Cline, F. Sergiampietri,H. Wang
University of California, Los Angeles

N12-88 Detection of Ultra Fast Micro Particles by Piezoceramic Elements

G. Wakabayashi, Y. Yonemura, H. Heguri,M. Matoba,
T. Miyachi, N.Hasebe, H. Ito, T. Masumura,H. Okada,
H. Yoshioka, *Advanced Research Institute for Science and Engineering, Waseda University*; K.I. Nogami, *Department of Physics,Dokkyo University School of Medicine*; Y. Hamabe,
S. Sasaki, S. Sugita, *Department of Earth and Planetary Science, The University of Tokyo*; H. Shibata, T. Iwai, *Research Center for Nuclear Science and Technology, The University of Tokyo*;
A. Fujiwara, S. Hasegawa, H. Yano, *Research Division for Planetary Science, Institute of Space and Astronautical Science*;
M. Sato, Y. Honda, *R&D Division, Honda Electronics Co.,Ltd.*

N12-89 Development of Beam Current-Monitor and Gas Pressure Control for the study of Astrophysical ^{3}He-^{3}He Solar Reaction Rates

N. Kudomi, T. Itahashi, K. Kume, K. Takahisa, S. Yoshida,
H. Ohsumi,H. Toki, Y. Nagai, *RCNP, Osaka Univ*;
M. Komori, *Dept of Physics,Osaka Univ.*

N12-90 The Digital Front-End Electronics for the Space-Borne INTEGRAL-SPI Experiment:ASIC Design, Design for Test Strategies and Self-Test Facilities

B. Cordier, M. Donati, R. Duc, J. L. Fallou, T. Larqué,
F. Louis, M. Mur, S. Schanne, E. Zonca, *CEA Saclay*

N12-91 The Optical Calibration of the MAGIC Telescope Camera

T. P. Schweizer, A.Ostankov, M. Martinez, D. Paneque,
Institut de Fisica d'Altes Energies,Spain;
E. Lorenz, *Max-Planck-Institut fuer Physik,Germany*

N12-93 Geant4 Based Cosmic Ray Background Simulator for Balloon Experiments

T. Mizuno, Y. Fukazawa, K.Hirano, H. Mizushima, S. Ogata,
Dept. of Physics, Hiroshima Univ.,Japan; T. Handa, T. Kamae,
T. Linder, M. Sjogren, P. Valtersson, *Stanford Linear Accelerator Center*; M. Ozaki, I*nst. of Space and Aeronautical Sciences,Japan*

N12-94 High Resolution Hybrid Silicon and CdZnTe Pixel Detectors for High Energy X-ray Astronomy Missions

T.O. Tumer, J. Zweerink, G.Mohanty, *Univ. of California, Riverside*; K.Hurley, *University of California,Space Sciences Lab.*;
M.H. Finger, *Marshall Space Flight Center and USRA;*
H.Ogelman, R.J. Paulos, *Univ. of Wisconsin,Dept. of Physics & Space Science and Engineering Center*; W.J. Hamilton,
E.E. Gordon, *Raytheon Infrared Operations, Santa Barbara Research Center*

N12-95 Gamma-Ray Large Area Space Telescope Balloon Flight Data Handling Overview

E. do Couto e Silva, R. Dubois, D. Flath, Y. Fukazawa, I. Gable, B. Giebels, G.Godfrey, T. Handa,G. Haller, K.Hirano, T. Kamae, A. Kavelaars, T. Lindner, T. Mizuno, H.Mizushima, S. Ogata,M. Ozaki, P. Valtersson, L. Rochester, J. J. Russell, T. Usher, K. Young, A.P. Waite, *Stanford Linear Accelerator Center*; H. Kelly, A. Moiseev, R. Schaefer, D. J. Thompson, *NASA Goddard Space Flight Center*; S.M. Williams, D. Lauben, J. Wallace, *Stanford University*; A. Chekhtman, J.E.Grove, B. Phlips, D. Wood, *Naval Research Laboratory*; M. Hirayama, W. Kroger, *University of California, Santa Cruz*; T.H. Burnett, *University of Washington*

N12-96 The Gamma-Ray Large Area Space Telescope Balloon Flight Engineering Model:Instrumentation

D. Lauben, J. Wallace, S. Williams, P. Nolan, P. Michelson, *Stanford University*; G. Godfrey, E.d.C.e Silva, B. Geibels, G.Haller, T. Handa, T. Kamae, J.J. Russell, T. Usher, A.P. Waite, *Stanford Linear Accelerator Center*; D.J. Thompson, H. Kelly, A.Moiseev, J.F. Ormes, R. Schaefer, D. Sheppard, S. Singh, *NASA Goddard Space Flight Center*; T. Mizuno, K.Hirano, T. Kamae, H.Mizushima, S. Ogata, *Hiroshima University*; J.E. Grove, J. Ampe, N.Johnson, M. Lovellette, B. Phlips, D. Wood, *Naval Research Laboratory*; W. Kroger, M. Hirayama, R.P. Johnson,G. Paliaga, W.A.Rowe, H.F.-W. Sadrozinski, A. Webster, *UC, Santa Cruz*

LEGOLAND California, the first LEGOLAND theme park in North America.It features six distinctive play areas,each with rides,astonishing LEGO models and opportunities to build with LEGO bricks.The park is located in San Diego's North Country.

JOANNE DEJONG/SAN DIEGO CVB

N13-1 Performance of Triple GEM Detectors in the COMPASS Tracker (Featured Talk)

B. Ketzer[1], S. Kappler[1], A. Placci[1], L.Ropelewski[1], F. Sauli[1], J. Friedrich[2], I. Konorov[2], S. Paul[2], F. Simon[2]
[1]*CERN*
[2]*Technische Universitaet Muenchen*

N13-2 High Pressure Operation of the GEM in ^{3}He Based Mixtures for Thermal Neutron Detection

T.L. van Vuure[1], C.W.E.van Eijk[1], R.W. Hollander[1], R. Kreuger[1], F. Fraga[2], L.Margato[2]
[1]*Radiation Technology Group, Interfaculty Research Institute, Delft University of Technology*
[2]*LIP Coimbra,Department of Physics,University of Coimbra*

N13-3 A Fast Multi-GEM Based Detector for High-Rate Charged-Particle Triggering

W. Bonivento[1], A.Cardini[1], C. Deplano[1], A. Lai[1], D. Pinci[1], D. Raspino[1], B. Saitta[1], G.Bencivenni[2], P. De Simone[2], G. Felici[2], F. Murtas[2], M. Palutan[2], M. Poli Lener[2], C. Bosio[3]
[1]*INFN Cagliari,Italy*
[2]*INFN,Lab. Di Frascati,Italy*
[3]*INFN Roma,Italy*

N13-4 GEM Type Gas Filled Detectors Made by the LIGA Method: Fabrication and Measurements

S.K. Ahn[1], J.G. Kim[1], V. Perez-Mendez[1], J. Kadyk[1], W. Wenzel[1], K. Jackson[2], G.Cho[3],
[1]*Physics Division,Lawrence Berkeley National Laboratory*
[2]*Material Science Div.,Lawrence Berkeley National Laboratory*
[3]*Dept. of Nuclear Engineering,Korea Advanced Institute of Science and Technology*

N13-5 The Micro-Hole and Strip Plate Gas Detector: Experimental Results

J.M. Maia[1], J.F.C.A. Veloso[1], J.M.F. dos Santos[1], C.A.N.Conde[1], R.E. Morgado[2]
[1]*Departamento de Física da Universidade de Coimbra*
[2]*Los Alamos National Laboratory*

N14-1 The Space-Borne INTEGRAL-SPI Experiment : Integration, Test and Calibration Result (Featured Talk)

S. Schanne[1], B. Cordier[1], M.Mur[1], J. Knödlseder[2], P. Mandrou[2], P. Paul[2], J-P. Roques[2], G. Vedrenne[2], Y. André[3], M.A. Clair[3], P. Clauss[3], R. Georgii[4], G. Lichti[4], A. von Kienlin[4], P. Dubath[5]
[1]*CEA Saclay*
[2]*CESR Toulouse*
[3]*CNES Toulouse*
[4]*MPE Garching*
[5]*ISDC Geneva*

N14-2 Achievements of the ASTRO-E Hard X-Ray Detector Development
M. Tashiro, *Saitama University*; K.Makishima, M. Kokubun, Y. Ezoe, N. Isobe, J. Kotoku, Y. Matsumoto, Y. Okada, M. Sugiho, I. Takahashi, H. Takahashi, T. Tamura, Y. Terada, *University of Tokyo*; T. Murakami, T. Takahashi, K. Nakazawa, N.Iyomoto, J. Kataoka, M.Kouda, S. Kubo, A. Kubota, N. Ota, H. Ozawa, G. Sato, M. Sugizaki, C. Tanihata, Y. Uchiyama, S. Watanabe, D. Yonetoku, *Institute of Space and Astronautical Science*; T. Kamae, Y. Fukazawa, T. Mizuno, *Hiroshima University*; M. Nomachi, *Osaka University*; A. Yoshida, K. Yamaoka, *Inst.of Physical and Chemical Research*

N14-3 Gamma Ray Large Area Space Telescope Balloon Flight Engineering Model: Overview
D.J. Thompson, H.Kelly, A. Moiseev, J.F. Ormes, S. Ritz, R. Schaefer, D. Sheppard, S. Singh,; *NASA Goddard Space Flight Center* ; G.Godfrey, E.do Couto e Silva, R. Dubois, B. Giebels, G. Haller, T. Handa, T. Kamae, A. Kavelaars, T. Linder, M. Ozaki, L. Rochester, J.J. Russell, M. Sjogren, T. Usher, P. Valtersson, A.P. Waite, *Stanford Linear Accelerator Center* ; S.M. Williams, D. Lauben, P. Michelson, P.L. Nolan, J. Wallace, *Stanford University* ; T. Mizuno, Y. Fukazawa, K.Hirano, H. Mizushima, S. Ogata, *Hiroshima University* J.E. Grove, J. Ampe, W.N.Johnson, M. Lovellette, B. Phlips, D. Wood, *Naval Research Laboratory* ; H.F.-W. Sadrozinski, M. Hirayama, R.P. Johnson, W. Kroger, G. Paliaga, W.A. Rowe, A. Webster, *UC, Santa Cruz*

N14-4 Development of Large Size Sapphire Crystals for LIGO
B.C.Barish, J. Camp, W.P. Kells, G.H. Sanders, S.E. Whitcomb, L.Zhang, R.Y. Zhu, *California Institute of Technology*; P. Deng, J. Xu,G. Zhou, Y. Zhou, *Shanghai Institute of Optics and Fine Mechanics*

N14-5 The Nuclear Compton Telescope, a Balloon-Borne Soft Gamma-Ray Spectrometer, Polarimeter and Imager
S.E. Boggs, *University of California,Berkeley*

N15 — DATA ACQUISITION/ANALYSIS SYSTEMS
Wednesday 3:45–5:30pm Golden West Room
Session Chair:
ED O'BRIEN, *Brookhaven National Laboratory*

N15-1 Radiation Discrimination in LiBaF₃ Scintillator Using Digital Signal Processing Techniques
C.E. Aalseth, S.M. Bowyer, P.L.Reeder
Pacific Northwest National Laboratory

N15-2 A Listmode Data Acquisition System for Gamma-Ray Detectors
L.R. Furenlid, H.H. Barrett
Center for Gamma-ray Imaging, University of Arizona
P.J. Pietraski, *Brookhaven National Laboratory*

N15-3 IGP, a New Plutonium Isotopic Analysis Software
A. Pluquet, R. Junca, J. Morel, A.C. Simon
CEA DIMRI/SIAR

N15-4 A Plug & Play Approach to Data Acquisition
H.Muller, A. Guirao, F. Bal, J. Buytaert, *CERN Geneva,*

Switzerland ; J. Toledo, *Universidad Politecnica de Valencia, Spain*
A. David, D. Dominguez, *CFIF, IST, Universidade Tecnica de Lisboa, Portugal*; M. Floris, *INFN Calgari, Dipartimento di Fisica,Italy*

N15-5 Process Management inside ATLAS DAQ
R. Jones, *CERN*; M. Nassiakou, *CERN, NTUA, Athens Greece*

N15-6 Redundant Arrays of IDE Drives
D.A. Sanders, L.M.Cremaldi, V. Eschenberg, C.N. Lawrence, C. Riley, D.J. Summers, *University of Mississippi*; D.L. Petravick, *Fermilab*

N16 — GASEOUS DETECTORS 2
Thursday 8:30–10:00am California Room
Session Chair:
VLADIMIR PESKOV, *Royal Institute of Technology*

N16-1 Applications and New Developments in Resistive Plate Chambers (Featured Talk)
P. Fonte, *LIP/ISEC,Coimbra, Portugal*

N16-2 Resistive Plate Chamber Performance in the BaBar IFR System
D.Strom, *Univ. of Oregon,for the BaBar IFR Group*

N16-3 Study and Optimization of RPC's for High-Rate Applications
P. Carlson, T. Francke, V. Peskov, *Royal Institute of Tech.,Sweden*
P. Cwetanski, A. Sharma, *CERN*
P. Fonte, *ISEC and LIP, Portugal*

N16-4 Sporadic Electron Jets from Cathodes — the Main Breakdown Triggering Mechanism in Gaseous Detectors
C. Iacobaeus, *Karolinska Institutet*
P. Fonte, *ISEC and LIP*
J. Ostling, *Stockholm University*
V. Peskov, *Royal Institute of Technology*

N17 — HEP INSTRUMENTATION 2: TRACKING
Thursday 8:30–10:00am San Diego Room
Session Chair:
HARTMUT SADROZINSKI, *UC Santa Cruz*

N17-1 A Diamond Telescope for Charged Particle Tracking
D. Meier[1], W. Adam[2], M. Friedl[2], J. Hrubec[2], M.Krammer[2], R. Wedenig[2], E.Berdermann[3], H. Stelzer[3], P. Bergonzo[4], A. Brambilla[4], L.Rousseau[4], F. Bogani[5], E.Borchi[6], M.Bruzzi[6], D. Menichelli[6], S. Sciortino[6]
[1]*for the RD42 Collaboration,CERN*
[2]*HEPHY, Vienna, Austria*
[3]*GSI, Darmstadt*
[4]*LETI/DEIN/SPE/CEA Saclay, France*
[5]*LENS, Florence, Italy*   [6]*University of Florence, Italy*

N17-2 Development of Hybrid Structure for the Barrel Module of the ATLAS Silicon Microstrip Tracker
T. Kohriki[1], Y. Ikegami[1], S. Terada[1], T. Kondo[1], N. Ujiie[1], Y. Unno[1], K.Hara[2], Hirokazu Kobayashi[2], T. Akimoto[2], S. Shinma[2], Y. Kato[2]
[1]*KEK, Nat. High Energy Accelerator Research Org.* [2]*Tsukuba Univ.*

N17-3 The BaBar Silicon Vertex Tracker: Performances, Running Experience and Radiation Damage Studies
G.Calderini, *Stanford Linear Accelerator Center*

N17-4 Test of Silicon Hybrid Pixel Detector Telescope in 15 GeV Electron Beam
W. Caskey, G.P. Grim, R.L. Lander, D.E. Pellett, J.R. Smith, T.D. Wilkes, *Physics Department, UC Davis*

N17-5 A Self-Triggering Silicon Tracking Telescope for Spectator Proton Detection
R. Schleichert[1], A.Mussgiller[1], D. Protic[1], T. Krings[1], S. Merzliakov[2]
[1]*Institut fuer Kernphysik, Forschungszentrum Juelich, Germany*
[2]*Lab. of Nuclear Problems, Joint Institute for Nuclear Research, Dubna, Russia*

N18-1 Charged Particle Detection with Fast Scintillators
R.W. Novotny[1], W. Döring[1], M. Hoek[1], V. Metag[1], V. Hejny[2], H.Löhner[3]
[1]*2nd Physics Institute, University Giessen, Germany*
[2]*Research Center Jülich, Germany*
[3]*KVI, Groningen, The Netherlands*

N18-2 A Scintillating Fiber Tracker with High Time Resolution for High-Rate Experiments
S. Horikawa, I. Daito, N. Doshita, N. Horikawa, T. Iwata, K. Kondo, Y. Miyachi, N. Takabayashi, T. Toeda, S. Torimitsu, *Nagoya University, Japan*
A. Gorin, I. Manuilov, A. Riazantsev, *IHEP, Protvino, Russia*
T. Hasegawa, T. Matsuda, *Miyazaki University, Japan*
K.I. Kuroda, *Waseda University, Japan*

N18-3 "Scintisphere," the Shape of Things to Come in Gamma-Ray Spectroscopy
L.J. Meng, D. Ramsden, *Dept. of Physics and Astronomy, University of Southampton*
V.M.Chirkin, V.N. Potapov, O.P. Ivanov, S.M.Ignatov, *Kurchatov Institute, Moscow*

N18-4 Mineral Oil Scintillation and Attenuation Tests for the BooNE Detector
J.L. Raaf, *University of Cincinnati; BooNE Collaboration*

N18-5 Sol-Gel Scintillators on the Base on the Alkali Halides
V.P. Gavrilyuk, A.V. Gektin, N.V. Pogorelova, N.V. Shiran, E.P. Sysoeva, *Institute for Single Crystals*

N19-1 PICTS Analysis of Extended Defects in Heavily Irradiated Silicon
D. Menichelli, M.Bruzzi, E.Borchi, *Dipartimento di Energetica, Italy*; Z. Li, *Brookhaven National Laboratory*

N19-2 Radiation Hard Strip Detectors on Oxygenated Silicon
L. Andricek, G. Lutz, H.G. Moser, R.H. Richter
MPI Munich, Halbleiterlabor

N19-3 Characterization of Prototype BTeV Silicon Pixel Sensors Before and After Irradiation
R. Coluccia, S. Kwan, *Fermilab*

N19-4 Low-Energy Protons Scanning of Intentionally Partially Damaged Silicon MESA Radiation Detectors
A.Houdayer, C. Leroy, *Physics Dept., University of Montreal*; V. Linhart, S. Pospisil, *Czech Technical University in Prague, FNSPE*; B. Sopko, *Czech Technical University in Prague, FME*

N19-5 Inter-Defect Charge Exchange in Silicon Particle Detectors at Cryogenic Temperatures
B.C. MacEvoy, A. Santocchia, G. Hall, *High Energy Physics Group, Imperial College*; F. Moscatelli, D. Passeri, *DIEI e INFN di Perugia, Universita di Perugia*; G.M. Bilei, *INFN Perugia*

N19-6 Heavy Ion Irradiation on Silicon Strip Sensors for GLAST
K. Yamanaka, S. Yoshida, T. Mizuno, T. Ohsugi, Y. Fukazawa, H. Masuda, *Hiroshima University*; Y. Iwata, K. Murakami, *NIRS*; H. F. W. Sadrozinski, *SCIPP, UCSC*; K. Yamamura, K. Yamamoto, K. Sato, *Hamamatsu Photnics*

N20-1 Digital Column Readout Architecture for the ATLAS Pixel 0.25μm Front End IC
E. Mandelli[1], L. Blanquart[1], P. Denes[1], K. Einsweiler[1], R. Marchesini[1], G. Meddeler[1], M. Ackers[2], P. Fisher[2], G.Comes[2], I. Peric[2],
[1]*Lawrence Berkely National Laboratory*;
[2]*Physikalishes Institut der Universitatt Bonn*

N20-2 The Coincidence Matrix ASIC of the Level-1 Muon Barrel Trigger of the ATLAS Experiment
V. Bocci, E. Petrolo, A. Salamon, R. Vari, S. Veneziano
INFN, Rome

N20-3 Front-End Electronics for the PHENIX Time Expansion Chamber
X.H. Li, *for the PHENIX Time Expansion Chamber Group*

N20-4 Analog Front-End Cell Designed in a Commercial 0.25μm Process for the ATLAS Pixel Detector at LHC
L. Blanquart[1], P. Denes[1], K.Einsweiler[1], E. Mandelli[1], G.Meddeler[1], J. Richardson[1], P. Fischer[2], M. Ackers[2,] G. Comes[2], I. Peric[2],
[1]*Lawrence Berkeley National Laboratory*;
[2]*Physikalishes Institut der Universitat Bonn*

N20-5 A Novel Time to Voltage Converter
N.K Rao, *Corporate Research and Development, GE*

N20-6 Measurement of Time of Flight (TOF) of Adjacent Pulses
E. Kim, H. Lim, D. Choi, J. Park
Seoul National University

Thursday 10:30 am−12:15pm Golden West Room
Session Chair:
RACHEL CHECHIK, *Weizmann Institute*

N21-1 Problems and Solutions in High-Rate Multichannel HPD Design:the CMS Experience (Featured Talk)
P. B. Cushman, *University of Minnesota*

N21-2 Challenges of Photodetection in the CMS Lead Tungstate (PbWO₄) Crystal Electromagnetic Calorimeter: Status of Avalanche Photodiodes and Vacuum Phototriodes
S. M. Gascon-Shotkin, *for the CMS Collaboration, CERN*

N21-3 Evaluation of LAAPD Arrays for High-Resolution Scintillator Matrices Readout
M. Kapusta[1], M. Moszynski[1], D. Wolski[1], Andrzej Soltan[1]
P. Crespo[2], M. Szawlowski[3], B.L. Zhou[3]
[1]*Institute for Nuclear Studies*
[2]*GSI − Biophysik*
[3]*Advanced Photonix, Inc.*

N21-4 Performances of Large Area Avalanche Photodiodes at Liquid Nitrogen Temperature
M. Moszynski[1], W. Czarnacki[1], M. Kapusta[1], D. Wolski[1],
M. Szawlowski[2], B.L. Zhou[2], P. Schotanus[3]
[1]*Soltan Institute for Nuclear Studies*
[2]*Advanced Photonix,Inc*
[3]*SCIONIX Holland B. V.*

N21-5 Position-Sensitive Hybrid Gaseous Photomultipliers
T. Francke[1], V. Peskov[1], I.Rodionov[2], T. Sokolova[3]
[1]*Royal Institute of Technology*
[2]*Reagent Research and Development Center*
[3]*University of Friendship between the Nations*

Thursday 1:30−3:15pm Grand Ballroom
Session Chair:
UWE BRATZLER, *CERN*

HIGH ENERGY PHYSICS INSTRUMENTATION

N22-1 Design and Performance of the Front End Electronics for a Time of Flight Detector in CDF
C. Chen, M.Jones, J. Kroll,G.M. Mayers, F.M. Newcomer,
R. Oldeman, D. Usynin, R. Van Berg
Dept. of Physics and Astronomy, University of Pennsylvania

N22-2 Radiation Hardness Studies of Quartz Fibers Irradiated with 500 MeV Electrons at CERN
N.Akchurin, M.T. Zeyrek, *Texas Tech Univ.,Lubbock,USA;*
U. Akgun,A.S. Ayan, P. Brucken, J-P. Merlo, Y. Onel,
I.Schmidt, *Univ. of Iowa,Iowa City, USA*; I. Dumanoglu,
E. Eskut,A. Kayis, N. Koca, G. Onengut,A. Polatoz,
Cukurova University, Adana, Turkey; A. Fenyvesi, K. Makonyi,
D. Novak, *ATOMKI,Debrecen, Hungary*; M. Serin, *Middle East Technical Univ.*

N22-3 A Simple Method to Increase Effective PMT Gain by Amplifier Circuit Powered from a Voltage Divider
V. Popov, S. Majewski, B. Wojtsekhovski, *Thomas Jefferson Accelerator Facility, Newport News,USA*; D. Guerin, *Photonis, Brive, France*

N22-4 Beam Test of Non-irradiated and Irradiated ATLAS SCT Microstrip Modules at KEK
Y. Unno, Y. Ikegami, T. Kohriki, T. Kondo, S. Terada,
N. Ujiie, *KEK*; T. Matuo, T. Hashizaki, T. Koshino, I. Nakano,
K. Norimatsu, R. Tanaka, N. Tanimoto, T. Yamashita, *Okayama Univ.*; Y. Iwata, T. Masuda, T. Ohsugi,K. Yamanaka,
R. Takashima, T. Akimoto, K.Hara, Y. Kato, H. Kobayashi,
S. Shinma, *Hiroshima & Kyoto Edu. & Tsukuba Univ.*;
G.Moorhead, *Univ. of Melbourne*; L.Eklund, J. Bernabeu,
M. Vos, *Uppsala & Valencia Univ.*

N22-5 Elimination Beam-Hardening Artifacts in High-Energy Industrial Computed Tomography by an Efficient Reconstruction Algorithm
Z. Ziran, C.Zhiqiang, Z. Li, *Tsinghua University*

N22-6 Design and Test of the Track-Sorter-Slave ASIC for the CMS Drift Tubes Chambers
A. Montanari, G. Marco Dallavalle, F. Odorici, R. Travaglini,
I*NFN and University, Bologna,Italy*

N22-7 Construction and Test of Moniterd Drift Tube for the Muon Spectrometer of ATLAS Experiment
A. Aprile, A. Campagna, E. Lamanna, L. La Rotonda,
F. Pellegrino, V. Romano, M. Schioppa,G. Susinno, R. Vena,
University of Calabria, Italy

N22-8 A Mixed Analogue-Digital Integrated Circuit for Calorimetry in Space
V. Chambert-Hermel, N. Fouque, R. Hermel,G. Coignet,
D. Fougeron, R. Kossakowski, L.Massonet, S. Rosier-Lees,
J.P. Vialle, *Laboratoire d'Annecy-le-Vieux de Physique des Particules*

N22-9 Tests of a Prototype Radiation-Hard Pixel Readout Chip for BTeV
D.C. Christian, J.A. Appel, G. Chiodini, B. Hall, J. Hoff,
S. Kwan,A.Mekkaoui, R. Yarema, W. Wester, S. Zimmermann,
Fermilab

N22-10 ASIC Wafer Test System for the ATLAS Semiconductor Tracker Front-End Chip
A. Ciocio, V. Fadeyev, C. Flacco, M. Gilchriese, C. Haber,
C. Vu,H. Yaver, H. Spieler, F. Zetti, *LBNL*; A. Grillo,
D. Cosgrove, M. Wilder, SCIPP, *UC Santa Cruz*;
F. Anghinolfi, W. Bialas, J. Kaplon, *CERN*; C. Lacasta,
Instituto de Fisica Corpuscular, *IFIC, Valencia, Spain*;
N. Busek,H. Niggli, *Formerly at LBNL*

N22-11 Optimization of Signal Extraction and Front-End Design in a Fast,Multigap Ionization Chamber
P. Datte, J. Millaud, W. Turner, *Lawrence Berkeley National Laboratory*; P. Manfredi, L. Ratti, V. Speziali, G. Traversi,
University of Pavia - INFN Pavia; M. Placidi, *CERN*

N22-12 Performance of the CDF Cherenkov Luminosity Counters
S.M. Wang, D. Acosta, S. Klimenko, J. Konigsberg, A. Korytov,
G. Mitselmakher, A. Nomerotski,A. Safonov, A. Sukhanov,
D. Tsybychev, *University of Florida*; M. Wong, *Fermi National Laboratory*

N22-13 Gas System for the D0 Forward Angle Muon Tracking Detector
T. Zhao, H. J. Lubatti, *Dept. of Physics,Univ. of Washington*;
D. Denisov, R. Rucinski, *Fermi Natioanl Accelerator Laboratory*;
V. Abazov, V. Malyshev, E. Komissarov, A. Kalinin,G. Alexeev,
B. Sabirov, *Joint Institute for Nuclear Research*

N22-14 Test of a Proximity Focusing RICH with Aerogel as Radiator
S. Korpar, M.Bracko, F*aculty of Chemistry and Chemical Engineering, University of Maribor, Slovenia*; A. Gorisek, R. Pestotnik,M. Staric, *Institut Jozef Stefan, Ljubljana, Slovenia*; A. Stanovnik, *Faculty of Electrical Engineering, University of Ljubljana,Slovenia*; P. Krizan, *Faculty of Mathematics and Physics,University of Ljubljana,Slovenia*; T. Iijima, *High Energy Accelerator Research Organization (KEK), Japan*; M. Iwamoto, *Chiba University, Chiba,Japan*

N22-15 A Quality Assurance and Quality Control (QA_QC) Procedure of the Monitored Drift Tubes (MDT) for the BIS-Chambers of the ATLAS Muon Spectrometer
E.N.Gazis, T. Alexopoulos, R. Avramidou,M. Dris, T.A. Filippas,E.C. Katsoufis, S. Maltezos, P. Savva, G. Stavropoulos,G. Tsipolitis, *National Technical Univ. of Athens*

N22-16 Overview of the Shower Maximum Front End Electronics for the CDF Upgrade
K.Byrum, G. Drake, J.W. Dawson, W.N. Haberichter, S. Kuhlmann, L. Nodulman, J. Proudfoot, J. Schlereth, *Argonne National Laboratory*; A.Byon-Wagner, C. Drennan, G.W. Foster, J. Hoff, J.Y. Wu, *Fermi National Accelerator Laboratory*; M. Lindgren, *UCLA*

N22-17 The CDF Time of Flight Clock Distribution System
C. Cerri, F. Spinella, C.Magazzu, S. Galeotti, *INFN*

N22-18 A Cf Neutron Irradiator for Testing Electronic Components for the Large Hadron Collider
I.Kronkvist, J. De La Cova, M. Graham, J. Kilgore, R. Rusack, J. Sielaff, T. Vidnovic, *University of Minnesota*; R. Schwienhorst, *Michigan State University*

N22-19 Helicity-Correlated Systematics for SLAC Experiment E158
P. Mastromarino, *for the E158 Collaboration*

DATA ACQUISITION AND ANALYSIS SYSTEMS

N22-21 The Front End Readout Electronics for the CMS Hadron Calorimeter
T.M. Shaw, A. Baumbaugh,A.Boubekeur, J.E. Elias, S. Hansen, S. Holm, S. Los, C.Rivetta, A.Rohnzin, J. Whitmore, T. Zimmerman, R.J. Yarema, *Fermi National Accelerator*; R. Ruchti, D. Karmgard, *Notre Dame*

N22-23 Automatic Ion Beam Adjustment System Based on SIMPLEX Method
T. Tanaka, F. Sato, T. Iida, *Osaka University*

N22-24 A High-Speed Image Acquisition System Based on State Machines and Fast ADCs
H.P Lima Jr, A.F. Barbosa, G.P. Guedes, L.M. de Andrade Filho, *Centro Brasileiro de Pesquisas Físicas*; P.C.M.A. Farias, *Universidade Estadual de Feira de Santana*

N22-25 CZT Spectra Improvement Using Digital Pulse Processing Techniques
J.M.Cardoso, J. Basílio Simões, T. Menezes, C.M.B.A.Correia, *Electronic and Instrumentation Group, Physics Department of the University of Coimbra — Portugal*

N22-26 High-Speed Nuclear Quality Pulse Height Analyzer for Synchrotron-Based Applications
J.F. Beche, J.J. Bucher, L. Fabris, V. J. Riot, *Lawrence Berkeley National Laboratory*

N22-27 A PET System Based on Data Processing of Free-Running Sampled Pulses
M. Streun,G. Brandenburg, H. Larue, E. Zimmermann, K. Ziemons, H.Halling, *Forschungszentrum Juelich*

N22-28 The VME-Based Data Acquisition System for Testing Silicon Detectors
G. Claus,G. Deptuch, W. Dulinski, *LEPSI,Strasbourg France*

N22-29 Preliminary Test Results on the New Electronic Read Out of the YAPPET Small Animal Scanner
C. Damiani, A.Cotta Ramusino, R. Malaguti, *INFN – Sezione di Ferrara*; A.Del Guerra, *Dipartimento di Fisica – Universita` di Pisa*; G.Di Domenico, G. Zavattini, *Dipartimento di Fisica – Universita` di Ferrara*

N22-30 Analysis of Pulse-Shape Discrimination Techniques for BC501A Using GHz Digital Signal Processing
B.D. Rooney, D.R. Dinwiddie, M.A. Nelson, M. Rawool-Sullivan, *Los Alamos National Laboratory*

N22-31 PILE-UP Free Parameter Estimation & Digital Online Peak Localization Algorithms for Gamma Ray Spectroscopy
M.W Raad, *King Fahd University Of Petroleum & Minerals*; J. M. Noras, *University Of Bradford–UK*

N22-32 Low-Cost Modular Multichannel Acquisition System for High Resolution X-Ray Spectroscopy Radiation Detectors
C. Guazzoni, S. Buzzetti, A. Longoni, *Politecnico di Milano*; C. Arnaboldi, *INFN Sezione di Milano*

N22-33 KONOE;An Object-Oriented/Network-Distributed Online Environment
H. Sakamoto, K. Mizouchi, S. Nishida, K. Uchida, *Kyoto University*; M.Asai, G. Hosoi,A. Izumoto, Y. Nagasaka, *Hiroshima Institute of Technology*; S. Enomoto, *Tohoku University*; G. Iwai, Y. Sakamoto, N. Tamura, *Niigata University*; S. Kawabata, H*igh Energy Accelerator Research Organization (KEK)*; I. Nakano, Y. Shimizu, *Okayama Univ.*

N22-34 The MERGER Board of the CDF Silicon Vertex Tracker
M. Bari, A.M. Zanetti, *INFN, Trieste*; S. Belforte, A. Cerri, M. Dell'Orso, S. Donati, S. Galeotti, P. Giannetti, F. Morsani, G. Punzi,L. Ristori, F. Spinella, *INFN,Pisa*

N22-35 Method for Three-Dimensional Activation Analysis
A. G. Serikov, *Nuclear Fusion Institute, Russian Research Center Kurchatov Institute*

N22-36 Portable System for Imaging of Alpha,Beta, and X-Rays Sources with Silicon Pixel Detectors and Medipix1 Read Out
E. Bertolucci,M. Maiorino, G.Mettivier, M.C. Montesi, P. Russo, *University and INFN of Naples*; D. Calvet, J.L. Visschers, *NIKHEF, Amsterdam*

N22-37 Medisoft 4:A Software Procedure for the Control of Medipix 2 Readout Chip
E. Bertolucci, M. Maiorino, G.Mettivier, M. C. Montesi, P. Russo, *Federico II University and INFN*

N22-38 Ultrafast FADC Multiplexer
R. Mirzoyan, J. Cortina, E. Lorenz, *Max-Planck-Institute for Physics*; M. Martinez, S. Ostankov, *Institut de Fisica d'Altes Energies,Spain*

N22-39 A Complete and Versatile High-Speed Data Acquisition System
V.G. Zavarzin, *A&D Precision Co., Newton,Mass., USA*; A.G. Chertovskih, A.A. Nikiforov, *Budker Institute of Nuclear Physics, RUSSIA*; V.V. Serebryansky, *Novosibirsk State University, RUSSIA*

N22-40 A Preferred Event Weighting Scheme for the Energy Subtraction Compton Scatter Camera
M. Khamzin, J. Valentine, J. Li, *Georgia Institute of Technology*

N22-41 Distributed Modular RT-Systems for DAQ and Control Applications
V.I. Vinogradov, *INR RAS, Moscow, RF*

N22-42 Analysis of Long-lived Isotopes in the Presence of Short-lived Isotopes Using Zero Dead Time Correction
R. Sillanpää, *Teollisuuden Voima Oy*; T.R. Twomey, R.M. Keyser, D.L. Upp, *PerkinElmer Instruments,Inc.*

N22-43 Geant4 Simulation of Low Energy Hadrons/ Ions Transport
V.N. Ivanchenko, *CERN and Budker Institute for Nuclear Physics*; S. Chauvie, *University of Torino and INFN Sezione di Torino,Italy*; P. Nieminen, *ESA-ESTEC, Noordwijk,The Netherlands*; M.G. Pia, *INFN Sezione di Genova,Italy*

NUCLEAR PHYSICS INSTRUMENTATION

N22-44 Beta and X-Ray Spectrometer for Monitoring of Beta-Radiating Nuclides
A.D. Sokolov, A.B. Pchelintsev, A.V. Loupilov, V.A. Zalinkevich, *Baltic Scientific Instruments*; A. Lapenas, *Radiation Metrology and Testing Center*

N22-45 Two-Point Position Measurements with Multi-Element Detectors:Resistor or Capacitance Division?
A. Pullia, *University of Milan*; W. Mueller, *GSI*; C.Boiano, R. Bassini, *INFN of Milan*

N22-46 Array of Low-Noise Charge Preamplifiers for Novel Spectroscopy System
T. Menezes, J.B. Simões,C.M.B.A. Correia, *Univ. of Coimbra*

N22-47 Developments in Beam Diagnostic and Ion Tracking at HRIBF
D. Shapira, T.A. Lewis, J.R. Beene, *Oak Ridge Nat.Laboratory*

N22-48 Digital Gamma-Ray Tracking Algorithms in Segmented Germanium Detectors
C.J. Pearson, E. Morton, P.H. Regan, P. Sellin, J. Valiente, *Department of Physics,University of Surrey, UK*; P. Nolan, A. Boston,M. Descovich, J. Thornhill, J. Cresswell, *Oliver Lodge Laboratory, University of Liverpool,UK*; I. Lazarus, J. Simpson, *CCLRC Daresbury Laboratory, UK*

N22-49 Design and Performance of an ASIC Developed for APD-Based Small Animal PET
M.L. Woodring, K.S. Shah, M.R. Squillante, J.F. Christian, A.I. Kogan, *Radiation Monitoring Devices,Inc.*; S.R. Cherry, Y. Shao, *Crump Institute for Biological Imaging, UCLA*; F.L. Augustine, *Augustine Engineering,Inc.*

N22-50 Monte Carlo Simulation of Leksell Gamma Knife.
V. Moskvin,C. DesRosiers, L. Papiez, *Indiana University, Dept. Radiation Oncology*

N22-51 A Compact Radiographic Source for Remote Flash Radiography
W.J. DeHope, D.A. Goerz, T.J. Ferriera, D.J. Mayhall, *Lawrence Livermore National Laboratory*; G.Cooperstein, R. Allen, R. Boller, R.J. Commisso, D. Mosher, F.C. Young, *Naval Research Laboratory*; C.A.Brooksby, W. Skarda, *Bechtel Nevada*

ANALOG AND DIGITAL CIRCUITS

N22-52 A 16 Channel Analog Integrated Circuit for PMT Pulses Processing
L.Gallin-Martel, J. Pouxe, O. Rossetto, M. Yamouni, *Institut des sciences nucleaires*

N22-53 Using the Cockroft-Walton Voltage Multiplier Design in Handheld Device
D.F. Spencer, R. Aryaeinejad, E.L.Reber, *INEEL*

N22-54 A Time-Of-Flight System on a Chip Suitable for Space Instrumentation
N.P. Paschalidis, *The Johns Hopkins University, Applied Physics Laboratory (JHU/APL)*; N. Stamatopoulos,K. Karadamoglou, G.Kottaras, V. Paschalidis, E. Sarris, *Demokritos University of Thrace and JHU/APL*; B. Andrews, R. McEntire, S. Jaskulek, R. McNutt, D. Mitchell, *The Johns Hopkins University, Applied Physics Laboratory*

N22-55 Development of a New TDC LSI and a VME Module
Y. Arai, M. Ikeno, *KEK, National High Energy Accelerator Research Org.*; S. Iri, M. Sagara,M. Ohta, *AMSC Co.,Ltd.*

N22-56 Network-Controlled High Voltage Power Supplies Operating in Magnetic Field
M. Imori, H.Matsumoto, *ICEPP, University of Tokyo*; Y. Shikaze, H. Fuke, *Faculty of Science, University of Tokyo*; T. Taniguchi, *National Laboratory for High Energy Physics(KEK)*

N22-57 A Monolithic CMOS Energy Dispersive Mixed Signal Radiation Detector
C. Kapnistis, K.Misiakos, N. Haralabidis,E. Kyriakis-Bitzaros, *Institute of Microelectronics,NSCR "Demokritos"*

N22-58 A CMOS Signal Processing Circuit for Silicon Photodiode Detectors
Y.C.Chen, Y.M. Chung, H.P. Chou,C.I. Hsu, *National Tsing Hua University, Taiwan*

N22-59 Low Frequency Noise Characterization of a Very Large Value Resistors
C. Arnaboldi, C.Bucci, C.Brofferio, O. Cremonesi, A. Fascilla, A.Giuliani, *INFN — Dip. Di Fisica, Universita'di Milano-Bicocca*

N22-60 The Programmable Front-End Readout System for Cuoricino, an Array of Large Mass Bolometers
C. Arnaboldi, C.Bucci, C.Brofferio, O. Cremonesi, A. Fascilla, A.Giuliani, *INFN — Dip. Di Fisica, Universita' di Milano-Bicocca*

N22-61 Minimum-Noise Centroid-Finding Filters in the Presence of Coloured Noise and Time-Domain Constraints
A. Pullia, *University of Milan*; E.Gatti, *Politecnico of Milan*

N22-62 Single Electron Transistor for Cryogenic Detector Read-out
J. Kawarabayashi, T. Kadoi, K.I. Watanabe, A. Uritani, T. Iguchi, *Department of Nuclear Engineering, Nagoya Univ.*

N22-63 The CSI Chip — A CMOS Charge Integrator for the Telescope Array Project
Y. Tanaka, M. Fukutomi, M. Sakai, *Nagasaki Institute of Applied Science*; M. Sasaki, T. Aoki, *ICRR, University of Tokyo*; Y. Arai, *KEK, High Energy Accelerator Research Organization*

N22-64 Analysis of 1/f Noise in CMOS Preamplifier with CDS Circuit
T.H. Lee, G. Cho, H.J. Kim, S.W. Lee, W. Lee, *Korea Advanced Institute of Science and Technology*; S.H. Han, *Dept. of Physics, Kyungpook National University, South Korea*

N22-65 KPIX:Current Amplifier and Digitiser for Pixel Detector Matrix Readout
S. Cadeddu, A. Lai, *Istituto Nazionale Fisica Nucleare Sezione di Cagliari*; M. Caria, *Dipartimento di Fisica Universita di Cagliari*

N22-66 Fast 32-Channel Readout Chip with Counters for GEMs, APDs and MGCs.
R.W. Hollander, C.W.E. van Eijk, J. Huizenga, *Delft University of Technology, IRI*; G.W. Lubking, D. de Gans, J.B.J. Schelen, *Delft University of Technology, DTO*

N22-67 The Detector Control Unit:an ASIC for Environmental Monitoring in the CMS Central Tracker
G. Magazzu, *INFN - Sezione di Pisa*; A. Marchioro, P. Moreira, *CERN*

N22-68 Time Pick-off for Multi-gap Resistive Plate Chamber (MRPC)
H. Lim, E. Kim, D. Choi, J. Park, *Seoul National University*

N22-69 A Sliding Scale Method to Reduce the Differential Non Linearity of A Time Digitizer
R. Sumner, *Cheesecote Mountain Camac*

N22-70 A Prototype ASIC for APD Array Readout of Scintillating Fibers
J.R. Macri, M.L.McConnell, M. Widholm, *Space Science Center, University of New Hampshire*; A. Wintenberg, U. Jagadish, S. Frank, *Oak Ridge National Laboratory*

N22-71 Design of a Fast Shaping Amplifier for PET/CT APD Detectors with Depth-of-Interaction
J-F. Pratte, J. Mouine, *Department of Electrical and Computer Engineering, University of Sherbrooke*; C.M. Pepin, D. Rouleau, R. Lecomte, *Department of Nuclear Medicine and Radiobiology, University of Sherbrooke*

N22-72 Study of Preamplifiers for Multi-Gap Resistive Plate Chamber (MRPC)
H. Lim, E. Kim, D. Choi, J. Park, *Seoul National University*

N22-73 Radiation-Hard ASICs for Optical Data Transmission in the ATLAS Pixel Detector
K.E. Arms, K.K. Gan, M. Johnson, H. Kagan, R. Kass, C. Rush, S. Smith, M. Zoeller, *Department of Physics, Ohio State University*; J. Hausmann, M. Holder, M. Kraemer, A. Niculae, M. Ziolkowski, *Department of Physics, University of Siegen*

N22-74 A Correlated Double Sampler Chip for the Supernovae Acceleration Probe Experiment
C.J Bebek, C.Grace, M.E Levi, H.van der Lippe, *Lawrence Berkeley National Laboratory*; J.F.C Genat, R. Sefri, *LPNHE Universites Paris 6 et 7*

N22-95 Digital Pulse Shape Algorithms for Scintillation-Based Neutron Detectors
P.J. Sellin, S. Jastaniah, *Department of Physics, Univ. of Surrey*

N22-96 DFX:A Semiconductor Detector ASIC for X-Ray Diffractometers
R. Turchetta, S. Manolopoulos, A. Neviani, A.T. Clark, G.Derbyshire, M. French, *R.A.L.*

N22-97 New NMOS Layout Structure for Radiation Tolerance
W. Snoeys, G. Anelli, T. Apostol, *CERN*

NEW RADIATION DETECTORS

N22-75 Online Gamma Flux Measurements by Means of a Self Powered Gamma Detector
R. Van Nieuwenhove, L. Vermeeren, P. de Almeida, *SCK·CEN*

N22-76 New Theoretical Concepts for Centroid Finding of Distributed Phenomena.
F. Javanmardi[1,2], G. Wakabayashi[2], N. Ikeda[2], M. Matoba[2], A. Zolfaghari[1], M.Minoochehr[1],
[1]*Beheshti University*
[2]*Kyushu University*

N22-77 Development of Novel Gamma Camera Using Imaging Plate and Multi-Pinhole Collimator
A. Uritani, *Metrology Institute of Japan/National Institute of Advanced Industrial Science and Technology*; K.Hashimoto, A. Tabuchi, J. Kawarabayashi, K. Watanabe, T. Iguchi, *Department of Nuclear Engineering/Nagoya University*

N22-78 A Double Side Silicon Pixel Detector for Low Energy Radiation Detection
M. Caria, *Dipartimento di Fisica Universita di Cagliari*; S. Cadeddu, A. Lai, I*stituto Naziona di Fisica Nucleare Sezione di Cagliari*

N22-79 Development of Acoustic Detectors
T. Matsuyama, F. Hinode, O. Konno, M. Oyamada, *Laboratory of Nuclear Science, Tohoku University*; N.Chubachi, M.Higuchi, T. Saito, *Tohoku Gakuin University*; N.Hasebe, T. Masumura, A. Misaki, T. Miyachi, *Advanced Institute for Science and Engineering, Waseda University*; I. Nakamura, *Saitama Univ.*; R. Kikuchi, Y. Tazawa, *Kyoto University*; S. Goto, M. Sato, *Honda-Electronics Co., LTD*

N22-80 Electron Velocity Enhancement in Silicon Drift Detectors by Means of Deep n-implants
A. Castoldi, C. Guazzoni, *Politecnico di Milano and INFN*; L. Strüder, *MPI Halbleiterlabor*

N22-81 Characterization of Very Large Mass Room-Temperature Superheated Droplet Detectors
R.S. Gornea, I. Boussaroque, M. Di Marco, L. Lessard, J.P. Martin, V. Zacek, *University of Montreal*; R.A. Noulty, *B.T.I, Chalk River, Ontario, Canada*

N22-82 Multiple Hit Read-Out of Microchannel Plate Detectors with a Three-Layer Delay-Line Anode
O. Jagutzki, A. Czasch, R. Doerner, M. Hattass, V. Mergel, U. Spillmann, K. Ullmann-Pfleger, T. Weber, H. Schmidt-Boecking, *Institut für Kernphysik, Universität Frankfurt*; A. Cerezo, M. Huang, *Department of Materials, Oxford Univ.*

N22-83 Single Photon Read-Out of a Novel Image Intensifier with Delay-Line Technique: A Tool for Position and Time Sensitive Neutron and X-Ray Detection
U. Spillmann, O. Jagutzki, K. Ullmann-Pfleger, H. Schmidt-Böcking, *IKF, Universität Frankfurt*; V. Dangendorf, *Physikalisch Technische Bundesanstalt (PTB)*

N22-84 Position Resolution Studies with MSU 32-fold Segmented HPGe
C.E. Lehner, *University of Michigan*; K. Vetter, A. Kuhn, *Lawrence Berkeley National Laboratory*; D.A. Beckedahl, J.E. Kammeraad, G.J. Schmid, *Lawrence Livermore National Laboratory*; J.J. Blair, *Bechtel Nevada*; T. Glasmacher, *Michigan State University*

N22-85 A Germanium-Based, Coded Aperture Imager
K.P. Ziock, W. Craig, A. Lavietes, N. Madden, E. Hull, C. Cork, *Lawrence Livermore National Laboratory*

PHOTODETECTORS

N22-86 Large Area Mercuric Iodide Photodetectors
J.D. Richards, R. Vigil, G. Grovatski, J. Baker, R. DeVito, *Constellation Technology Corporation*

N22-87 Development of the ReFerence Photosensor Prototype and the Novel Color-Sensitive Single-Photon Photosensor
D. Ferenc, *UC Davis*

N22-88 Digital Processing of Large-Area Avalanche Photodiode Signals for X-Ray Spectrometry Applications
P.C. P.S. Simões, L.M.P. Fernandes, J.M.F. dos Santos, P*hysics Department, University of Coimbra*; R.E. Morgado, *Los Alamos National Laboratory*

N22-89 Evaluation of Different Types of Avalanche Photo Diodes from Hamamatsu and Perkin Elmer
J. Liu, A. Fremout, P. Bruyndonckx, S. Tavernier, *Vrije Universiteit Brussel, Belgium*; J-F. Loude, C. Morel, *Université de Lausanne, PET Instrumentation Laboratory*; *C. Clear Collaboration*

N22-90 Degradation of CCD's Due to Low and High Energy Protons
A.J.F. den Boggende, C.P. deVries, *SRON*

N22-91 Assessment of Reflective Separator Films for Small Crystal Arrays
C. Michelle Pepin, M. Lefebvre, R. Lecomte, *Universite de Sherbrooke*

N22-92 Photomultiplier Tube Testing and Analysis for the BooNE Detector
B.T. Fleming, *Columbia University*; *BooNE Collaboration*

N22-93 Evaluation of a LSO/Planar Deep Diffused-APD Combination to Measure Depth of Interaction
E. Gramsch, J. Ferrer, *Universidad de Santiago*; R.E. Avila, *Comisión Nacional de Energía Nuclear*; P. Bui, *UDT Sensors*

N22-94 Photon Background in DIRC Fused Silica Bars
K. Yarittu, S. Spanier, J. Va'vra, *SLAC*

N23-1 A New XRF Spectrometer Based on a Ring-Shaped Multi-Element Silicon Drift Detector and on X-Ray Capillary Optics
A. Longoni[1], C. Fiorini[1], C. Guazzoni[1], A. Gianoncelli[1], L. Strüder[2], H. Soltau[3], P. Lechner[3], N. Langhoff[4], R. Wedell[4], A. Bjeoumikhov[4], J. Schmalz[4], V. Kolarik[5]
[1]*Politecnico di Milano*
[2]*MPI Halbleiterlabor*
[3]*KETEK GmbH*
[4]*IfG – Institut für Gerätebau GmbH*
[5]*Delong Instruments*

N23-2 Large Surface X-Ray Pixel Detector
P. Delpierre[1], L. Blanquart[1], P. Breugnon[1], J.C. Clemens[1], I. Valin[1], J.F. Berar[2], B. Caillot[2], C. Mouget[2]
[1]*CPPM–IN2P3, Marseille, France*
[2]*CNRS Grenoble & D2am CRG beamline, Grenoble, France*

N23-3 An "All-P-Type" Termination Structure for Silicon Microstrip Detectors
G.F. DallaBetta[1], M. Boscardin[1], P. Gregori[1], N. Zorzi[1], L. Bosisio[2], S. Dittongo[2], I. Rachevskaia[2], G. Verzellesi[3]
[1]*ITC – irst*
[2]*INFN-Trieste and Universita'di Trieste*
[3]*INFM and Universita' di Modena e Reggio Emilia*

N23-4 Radiation Tolerance of P-Spray Isolation
R. Wunstorf[1], A. Borowski[1], F. Huegging[1], J. Wuestenfeld[1], G. Lutz[2], R.H. Richter[2], T. Rohe[2]
[1]*Universitaet Dortmund*
[2]*Max-Planck-Institut fuer Physik, Muenchen*

N23-5 Influence of Trapping on Silicon Microstrip Detector Design and Performance
G. Kramberger, V. Cindro, I. Mandic, M. Miku, M. Zavrtanik, *Jozef Stefan Institute*

N23-6 Silicon Carbide for Radiation Spectroscopy
G. Bertuccio[1], R. Casiraghi[1], E. Gatti[1], A. Pullia[2], C. Canali[3], F. Nava[3], C. Lanzieri[4]
[1]*Politecnico di Milano*
[2]*University of Milano*
[3]*University of Modena*
[4]*Alenia Marconi Systems*

N24-1 A High Precision X-Ray Tomograph for Quality Control of the ATLAS Muon Monitored Drift Tube Chambers
S. Schuh, R. Avramidou, Z. Banhidi, J. Berbiers, C. Fabjan, S. Rangod, F. Rohrbach, E. Sbrissa, Y. Sedykh, Y. Smirnov, M. Woudstra
CERN

N24-2 Implementation of a Fast Algorithm to Find Data Cluster

Q. Xu[1], M. Martin[2],
[1]*The University of Michigan*
[2]*NICADD*

N24-3 Online Track Processor for the CDF Upgrade

C.Ciobanu[1], J. Chung[1], J. Gerstenslager[1], J. Hoftiezer[1],
R. Hughes[1], P. Koehn[1], C. Neu[1], C. Sanchez[1], E.Thomson[1],
B.L. Winer[1], J. Dittmann[2], J. Freeman[2], S. Holm[2], J.D. Lewis[2],
T. Shaw[2], T. Wesson[2], K.Bloom[3], D. Gerdes[3], N.Goldschmidt[3],
J.W. Dawson[4], W.N. Haberichter[4]
[1]*Ohio State University*
[2]*Fermi National Accelerator Laboratory*
[3]*University of Michigan*
[4]*Argonne National Laboratory*

N24-4 A Time-Of-Flight Detector for CDF

S. Dececco[1], D. Depedis[1], C. Dionisi[1], S. Giagu[1], M.Rescigno[1],
L. Zanello[1], C.Chen[2], M. Jones[2], W. Kononenko[2], J. Kroll[2],
G.M. Mayers[2], M. Newcomer[2], D. Usynin[2], R. VanBerg[2],
K. Anikeev[3], G. Bauer[3], I.K. Furic[3], A. Korn[3], I.Kravchenko[3],
M. Mulhearn[3], C. Paus[3], K. Sumorok[3], C. Grozis[4], R. Kephart[4],
R. Stanek[4], S. Cabrera[5], J. Fernandez[5], J. Piedra[5], T. Rodrigo[5],
A. Ruiz[5], I. Vila[5], A. Kazama[6], S.H.Kim[6], H.Matsunaga[6],
S. Motohashi[6], K. Sato[6], K. Takikawa[6], F. Ukegawa[6]
[1]*University of Rome "La Sapienza"and INFN Rome1*
[2]*University of Pennsylvania*
[3]*Massachusetts Institute of Technology*
[4]*Fermi National Accelerator Laboratory*
[5]*Instituto de Fisica Cantabria*
[6]*Universityof Tsukuba*

N24-5 DIRC,the Particle Identification System for BABAR

J. Schwiening, *SLAC*

N24-6 Design and Performances of Fast Front-End Electronics for COMPASS MWPCs

M. Colantoni[1], O. Denisov[1], A. Ferrero[1], V. Frolov[1], A. Grasso[1],
S. Heinz[1], A. Maggiora[1], M. Maggiora[1], D. Panzieri[1],
O. Denisov[2], V. Frolov[2], A.Korentchenko[2], A. Popov[2],
V. Tchalyshev[2],
[1]*Dipartimento di Fisica Generale "A. Avogadro"
 and INFN – Torino*
[2]*JINR LNP - Dubna*

CW — COMPTON WORKSHOP
Thursday 3:45–5:45pm Golden West Room
Session Chair:
TUMAY TUMER, *UC Riverside*

CW-1 What We Have Learned from COMPTEL
(Overview Talk, 30 min.)

V. Schönfelder
Max-Planck-Institut für extraterrestrische Physik,Germany

**CW-2 Compton Cameras for Nuclear Medicine:
Report from a Cloudy Crystal Ball** (Overview Talk, 30 min.)

W. Leslie Rogers
University of Michigan

CW-3 The First Prototype Compton-Scattering Gamma-Ray Imager Using Two 3-Dimensional Position-Sensitive Cdznte Spectrometers

Z.He, Yan F. Du, David K. Wehe, *University of Michigan*

CW-4 Design and Optimization of a Compton Camera for Nuclear Medicine Applications

S. Chelikani, *Yale University*

CW-5 Development of the TIGRE Compton Telescope for Intermediate-Energy Gamma-Ray Astronomy

T.J. O'Neill[1], D. Bhattacharya[1], C. Minor[1], M. Polsen[1],
T. Miyagi[1], V. Kong[1], J. Metelsky[1], A.D. Zych[1], J. Samimi[2],
A. Akyüz[3],
[1]*University of California, Riverside*
[2]*Sharif University of Technology, Tehran, Iran*
[3]*University of Cukurova,Adana, Turkey*

CW-6 Development of High-Pressure Gas Electroluminescence Detectors for Compton SPECT

A. I.Bolozdynya
Constellation Technology Corporation

CW-7 Demonstration of Single-Sided Compton Scatter Tomography in Fan Beams with an HPGe Array

B.L. Evans, J.B. Martin,L.W. Burggraf, *Air Force Institute of Technology*; T.N. Hangartner, *Wright State University, BioMedical Imaging Laboratory*; M.C. Roggemann, *Michigan Technological University*

N25 — GASEOUS MICROPATTERN DETECTORS 2
Friday 8:30–10:00am California Room
Session Chair:
FABIO SAULI, *CERN*

N25-1 Micro-Capillary Plates: Promising High Granularity Gaseous Detectors of Photons and Particles

T. Francke[1], V. Peskov[1], A. Sharma[2]
[1]*Royal Institute of Technology, Stockholm,Sweden*
[2]*CERN Geneva Switzerland*

N25-2 The Bidim200,a Large Area 2-D MSGC for X-Rays and Neutrons Detection.

B. Guerard,A. Oed, *Institut Laue Langevin*

N25-3 Dependence of the Performance of CsI Covered Microstrip Plate VUV Photosensors on the Geometry: Experimental Results

D.S.A.P. Freitas, J.F.C.A. Veloso, J.M.F. dos Santos,
C.A.N.Conde, *Physics Department, University of Coimbra*

N25-4 Position-Sensitive Gaseous Detectors with Solid Photo-Cathodes

V. Peskov[1], A. Sharma[2]
[1]*Royal Institute of Technology, Stockholm,Sweden*
[2]*CERN Geneva Switzerland*

N25-5 Optimizing the Design of Gas Microstrip Detectors for Soft X-Ray Detection

J.A. Mir[1], J.E.Bateman[1], R. Barlow[1], G.E. Derbyshire[1],
R. Stephenson[1], T. Turner[2], V. Dhank[3], G. Miller[3]
[1]*RAL*
[2]*Daresbury Lab*
[3]*Liverpool University*

N26-1 The Electromagnetic Calorimeter of the CMS Experiment (Featured Talk)
M. Diemoz
INFN Sezione di Roma

N26-2 Readout of CMS Electromagnetic Calorimeter
J. Donini
for the CMS Collaboration, CERN

N26-3 Characterization of Plastic Fiber-Optics for Optical Decoding of the CMS Hadron Calorimeter
D.J. Karmgard, B. BaumBaugh, J.M. Marchant, M. McKenna, R.C. Ruchti
University of Notre Dame

N26-4 Status of the PWO Crystal Production from Russia for CMS-ECAL
E. Auffray
CERN, on behalf of ECAL-CMS Collaboration

N27-1 RbGd$_2$Br$_7$: Ce Scintillators for Thermal Neutron Detection
K.S. Shah[1], R.F. Grazioso[1], M. Klugerman[1], L.Cirignano[1], P. Bennett[1], W.W. Moses[2], M.J. Weber[2], S.E.Derenzo[2]
[1]*Radiation Monitoring Devices*
[2]*Lawrence Berkeley National Laboratory*

N27-2 Ytterbium-Based Compounds as Fast and Dense Inorganic Scintillators
R. Chipaux[1], M. Cribier[1], J. Mallet[1], J.-P. Meyer[1], C. Dujardin[2], N.Garnier[2], C.Pédrini[2], N. Guerassimova[3], A.G. Petrosyan[4]
[1]*CEA/DSM/DAPNIA, Saclay*
[2]*LPCML,Université Claude Bernard, Villeurbanne*
[3]*Synchrotron Radiation Laboratory, Moscow State Univ.,Moscow*
[4]*Institute for Physical Research, Armenian National Academy of Science, Ashtarak*

N27-3 Yb:YAG UV and IR Scintillation Properties
S. Belogurov[1], G. Carugno[1], P. Santilli[1], G. Bressi[2]
[1]*INFN,sez.di padova*
[2]*INFN sez.di Pavia*

N27-4 NaI (Tl) Electron Energy Resolution
W. Mengesha, J.D. Valentine
Georgia Institute of Technology

N27-5 Average Energy Required Per Scintillation Photon and Energy Resolution in Inorganic Scintillation Crystals for Gamma-Rays
S. Sasaki[1], H. Tawara[1], K. Saito[2], M. Miyajima[3], E. Shibamura[4]
[1]*High Energy Accelerator Research Organization (KEK)*
[2]*The Graduate University for Advanced Studies*
[3]*Fukui University*
[4]*Saitama Prefectual University*

NR-1 Active Pixel Sensors on High Resistivity Silicon and Their Read-Out
G. De Geronimo, Z.Li, P. O'Connor, V. Radeka, P. Rehak, G.C. Smith, B. Yu
Brookhaven National Laboratory

NR-2 Improved Sensitivity X-Ray Detectors for Field Applications
R. Redus, J. Pantazis, A.Huber, T. Pantazis
Amptek Inc.

NR-3 High Uniformity Direct Conversion CdZnTe Pixel Detectors for Digital X-Ray Imaging
S. Yin[1], T.O. Tümer[1], G. Visser[1], J. Mainprize[2], E.E. Gordon[3], W.J. Hamilton[3]
[1]*NOVA R&D Inc.*
[2]*University of Toronto Sunnybrook & Women's College Health Sciences Centre*
[3]*Raytheon Systems Co.*

NR-4 A Study of Charge Sharing in Pixellated Cadmium-Zinc-Telluride Detectors
D.P Sharma, B.D Ramsey
NASA/Marshall Space Flight Centre

NR-5 A Silicon Telescope for Nanodosimetry in Biomedical Applications
V. Bashkirov[1], R.W.M. Schulte[1], B. Keeney[2], R.P. Johnson[2], W. Kroeger[2], H.F.-W. Sadrozinski[2], A. Seiden[2], P. Spradlin[2]
[1]*Loma Linda University Medical Center, Dept. of Radiation Medicine*
[2]*SCIPP, University of California Santa Cruz*

N28-1 Submicron CMOS Technologies for Low-Noise Analog Front-End Circuits (Featured Talk)
V. Re[1], M. Manghisoni[2], L. Ratti[3], V. Speziali[3]
[1]*University of Bergamo, INFN Pavia*
[2]*ST Microelectronics,INFN Pavia*
[3]*University of Pavia, INFN Pavia*

N28-2 Design Rules for Optimization of Digital Spectrometers
A. Pullia, *University of Milan*

N28-3 A New Class of Optimum Filters with Complete Rejection of Periodic Noise Disturbances: Theory and Implementation
A. Geraci, E. Gatti, G. Ripamonti, *Politecnico of Milan*

N28-4 A Hybrid Low-Noise Charge Sensitive Preamplifier with Fast Discharge Mechanism
R. Bassini[1], C. Boiano[1], S. Brambilla[1], A. Pullia[2]
[1]*INFN of Milan*
[2]*University of Milan*

N28-5 Charge Sensitive Preamplifier with Continuous Reset by Means of the Gate-To-Drain Current of the JFET Integrated on the Detector
C. Fiorini, *Politecnico di Milano*; P. Lechner, *KETEK GmbH*

N29 — NUCLEAR MONITORING AND RADIATION MEASUREMENTS
Friday 10:30am–12:15pm Golden West Room
Session Chair:
W. Karl Pitts, *PNNL*

N29-1 Authentication of Radiation Measurement Systems For Non-Proliferation
R.T. Kouzes, B. Geelhood, R. Hansen, W. Karl Pitts
Pacific Northwest National Laboratory

N29-2 Detection Requirements to Curb Nuclear Smuggling
S. A.Erickson
Lawrence Livermore National Laboratory

N29-3 Fast Neutron Resonance Radiography for Elemental Imaging: Theory and Applications
G. Chen, R.C. Lanza, *Massachusetts Institute of Technology*

N29-4 Efficiency Calculation and Coincidence Summing Correction of a Germanium Detector by Monte-Carlo Simulation
Z. Wang, B. Kahn, J.D. Valentine, *Georgia Institute of Tech.*

N29-5 Calibration of an Alpha-Beta Moving Filter Particulates Monitor
A. Klett, L.DeMey, W. Erath, P. Nemecek
Berthold Technologies GmbH & Co KG

N29-6 Fission Micro-Chambers for Nuclear Waste Incineration Studies
G. Fioni[1], M. Fadil[1], C.Blandin[2], J.P. Trapp[2]
[1]*CEA/Saclay*
[2]*CEA/Cadarache*

MIC PROGRAM CHAIR
BENJAMIN M. TSUI

MIC PROGRAMCHAIR DEPUTY, ERIC C. FREY

Welcome to the 2001 Medical Imaging Conference (MIC)! At last year's MIC in Lyon, France, we saw a substantial increase in the number of paper submissions over the previous years. In order to accommodate the large number of papers within the 3–day program, the organizers experimented with a multiple–session format. After the conference, many of you have urged us to go back to the single–session format. The majority of the Program Committee agreed. This year we also saw an increase in paper submissions over last year. In order to include most of the papers without an unduly high rejection rate, we have made several adjustments to the single-session format. These include extension of the program from 3 to 4 days and shortening the time allocated to each oral presentation.

Following tradition, we have formed two joint sessions with NSS and RTSD that include papers of common interests to both groups. To increase the visibility of posters and provide participants with an optional means to view the many posters in the poster sessions, we plan to experiment with poster tours and poster presentations. At the same time, ample time has been allocated for coffee and lunch breaks and a relaxing social program between the scientific sessions. In addition to the scientific program, six exciting MIC Short Courses are planned before the MIC sessions.

The 2001 MIC scientific program reflects the continued evolution of the field and the efforts of our members to lead in the recent advancements of medical imaging sciences. We have witnessed a surge in investigations of high resolution and small animal imaging especially using PET and SPECT techniques. An increasing number of colleagues in X-ray CT and other imaging modalities are participating in this conference. The exciting developments in 3D cone-beam and spiral CT are stimulating additions to the conference.

We are deeply indebted to the many reviewers who have contributed valuable time from their busy schedules to review the many abstracts submitted to the program and to the program committee for its valuable advice and recommendations. We are grateful to the commercial companies that have contributed funds to support student travel and participation in the meeting. We are excited to have Dr. William Strauss of Stanford University and Dr. Sam Gambhir of UCLA as speakers of our first plenary session, to inform us about the needs and future of clinical imaging and imaging of gene expression. Also, Dr. Joel Karp and Dr. Ron Jaszczak, members of our community, will

provide us with an update on recent advances in our field addressing these needs.In addition,we thank the organizers and instructors of the MIC short courses for putting together the exciting education program.

We look forward to seeing you in the 2001 MIC. With you help and support,we believe it will be a big success.

Benjamin M. W. Tsui, MIC Program Chair
Eric C. Frey, MIC Program Deputy Chair

NOVEMBER 9, 2001

MIC BANQUET
CALIFORNIA ROOM
Friday, 6:30–9:00 pm
Entertainment TBA

MIC PLENARY SESSION I
Wednesday 1:30–3:15pm Town and Country Room
Session Chair:
H. WILLIAM STRAUSS, M.D., *Stanford University*
SANJIV SAM GAMBHIR, M.D., PH.D., *University of California, LA*

MIC PLENARY SESSION II
Thursday 8:20–10:00am Town and Country Room
Session Chair:
JOEL S. KARP, *University of Pennsylvania*
RONALD J. JASZCZAK, *Duke University*

MR—JOINT MIC/RTSD SESSION
Tuesday 1:30–3:15pm Town and Country Room
Session Chair:
BILL MOSES, *Lawrence Berkeley National Laboratory*

MR-1 (1:30pm) An X-Ray Imaging System Using a Single Photon Counting CdTe Detector
H. Kruger[1], M.Lindner[1], P. Fischer[1], M. Lacker[1], S.Krimmel[1], N. Wermes[1], M. Koudag[2], G. Sato[2], T. Takahashi[2], S. Watanage[2]
[1]*Physics Department,Bonn University*
[2]*Institute of Space and Astronautical Science, Japan*

MR-2 (1:48pm) A Compact 16-Module Camera Using 64-Pixel CsI(Tl)/Si PIN Photodiode Imaging Module
W.S. Choong, G.J. Gruber, W.W. Moses, S.E. Derenzo, S.E.Holland, M. Pedrali-Noy, B. Krieger, E.Mandelli, G.Meddeler, N.W. Wang, M.H. Ho, C.S. Tindall
Lawrence Berkeley National Laboratory, Berkeley, CA

MR-3 (2:06pm) Recent Developments in CZT Gamma Cameras and Gamma-Ray Detectors
L. Verger, R. Hamelin, P. Ouvrier-Buffet,C. Mestais, O. Monnet, G. Montemont, B. Pelliciari,JP. Rostaing
LETI (CEA–Recherche Technologique), CEA/GRE, Grenoble Cedex 9, France

MR-4 (2:24pm) Performance Evaluation of a New CZT Detector for Nuclear Medicine: Solstice
J. J. Griesmer[1], B. D. Kline[1], D. Gagnon[1], J. Grosholz[2], K. Parnham[2]
[1]*Marconi Medical Systems,Inc., Cleveland, OH*
[2]*eV Products Inc., Saxonburg, PA*

MR-5 (2:42pm) NUCAM3 - A Gamma Camera Based on CdZnTe Detectors
Y. Eisen[1], I.Mardor[1], A. Shor[1], Z. Baum[1], D. Bar[1]
G. Feldman[1], H. Cohen[1], E. Izak[1], R. Haham-Zada[1], Y. Cohen[1], B. Glick[2], I.Blevis[3]
[1]*Soreq NRC,Israel*
[2]*eV Products, Saxonburg, PA*
[3]*Elgems Ltd.,Israel*

MR-6 (3:00pm) Sentinel Lymph Node Mapping in Colorectal Surgery Using a New Opto-Nuclear Probe
J. Marescaux[1], D. Mutter[1], F. Rubino[1], J. Chambron[2], P. Siffert[3], A. Kazandjian[4] and M. Sowinska[4]
[1]*IRCAD, Strasbourg Cedex*
[2]*Institut de Physique Biologique, Strasbourg Cedex*
[3]*dPHASE/CRNS,Cedex 2 Strasbourg*
[4]*EURORAD, Strasbourg Cedex 2*

NM—JOINT NSS/MIC SESSION
Tuesday 4:15–6:00pm Town and Country Room
Session Chair:
ALBERTO DEL GUERRA, *University Pisa*
See page 30 for details

M1 — GENERAL IMAGE RECONSTRUCTION AND PROCESSING

Wednesday 8:20–10:00am Town and Country Room
Session Chairs:
RICHARD LEAHY, *University of Southern California*
GENE GINDI, *SUNY Stoneybrook*

M1-1 (8:20am) Nonnegative Definite Quadratic Penalty Design for Penalized-Likelihood Reconstruction
J.W. Stayman, J.A. Fessler
University of Michigan

M1-2 (8:34am) Globally Convergent Ordered Subsets Algorithms:Application to Tomography
S. Ahn, J.A. Fessler
University of Michigan

M1-3 (8:48am) EKG-Less Cardiac Reconstruction Using Consistency Conditions
E. Cesmeli[1], J. Hsieh[2], P. M. Edic[1], M.Iatrou[1], R. Gupta[1], A.H. Pfoh[1]
[1]*GE Corporate Research & Development*
[2]*GE Medical Systems*

M1-4 (9:02am) Simultaneous Reconstruction and Motion Estimation for Gated Cardiac ECT
D.R. Gilland[1], J.E. Bowsher[2], B.A. Mair[1], J. M. Anderson[1]
[1]*University of Florida*
[2]*Duke University*

M1-5 (9:16am) Parametric Imaging and Statistical Mapping of Brain Tumor in Ga-68 EDTA Dynamic PET Studies
Y. Zhou[1], S.C. Huang[2], S. Bao[3], D.F. Wong[1]
[1]*Radiology Department, Johns Hopkins University*
[2]*Department of Molecular and Medical Pharmacology, University of California at Los Angeles*
[3]*Center for Tumor Imaging Diagnosis and Radiotherapiutic, Peking University*

M1-6 (9:30am) Preliminary Results of a Clinical Validation of the dSPECT Method for Determination of Renal Glomerular Filtration Rate (GFR)
A.M. Celler[1], J.K. Bong[1], S. Blinder[1], R. Attariwala[1], L. Hook[1], R. Harrop[1], D. Noll[2], T. Farncombe[3]
[1]*Div. of Nuclear Medicine, Vancouver Hospital and Health Sciences Centre, Vancouver, B.C., Canada*
[2]*Laboratoire MIP, Universite Paul Sabatier, Toulouse, France*
[3]*Dept. of Nuclear Medicine, University of Massachusetts Medical School, Worcester, MA,USA*

M1-7 (9:44am) Lossless Compression of List-Mode 3D PET Data
E. Asma, D.W. Shattuck, R.M. Leahy
University of Southern California

M2 — INSTRUMENTATION I: PET SYSTEMS

Wednesday 10:30am–12:10pm Town and Country Room
Session Chairs:
JOEL KARP, *University of Pennsylvania*
DAVE TOWNSEND, U*niversity of Pittsburgh*

M2-1 (10:30am) Convergent Slat Collimators for Hybrid PET
D.J. Kadrmas, S. Nagarajan
University of Utah

M2-2 (10:44am) Development of Pixelated NaI(Tl) Detectors for PET
S. Surti[1], J.S. Karp[1], G.Muehllehner[2]
[1]*University of Pennsylvania*
[2]*ADAC UGM*

M2-3 (10:58am) A Depth of Interaction Detector for PET with GSO Crystals Doped Different Amount of Ce
N. Inadama[1], H. Murayama[2], T. Omura[3], S. Yamamoto[4], H. Ishibashi[5], H. Kawai[6], K. Omi[6], T. Umehara[6], T. Kasahara[6]
[1]*Chiba University High Energy Laboratory*
[2]*National Institute of Radiological Science*
[3]*Hamamatsu Photonics K.K.*
[4]*Kobe City College of Technology*
[5]*Hitachi Chemical Co. Ltd.*
[6]*Chiba University*

M2-4 (11:12am) Using Slat Collimation with Positron Emission Mammography
T.G. Turkington[1], W.H. Sampson[1], R.E.Coleman[1], S. Majewski[2], A.G. Weisenberger[2], M.F. Smith[2], V. Popov[2]
[1]*Duke Univerity Medical Center*
[2]*Thomas Jefferson National Accelerator Facility*

M2-5 (11:26am) 4-D Geometric Sensitivity for Multi-Headed Planar Detector PET Systems
W. Wang, J.A.Kolthammer
Marconi Medical Systems,Inc.

M2-6 (11:40am) Performance Measurements for the GSO-Based Brain PET Camera (G-PET)
S. Surti[1], J.S. Karp[1], G.Muehllehner[2]
[1]*University of Pennsylvania*
[2]*ADAC UGM*

M2-7 (11:54am) Development of a Daily Check Procedure for the High Resolution Research Tomograph (HRRT) Using Natural LSO Background Radioactivity
C. Knäss[1], S. Vollmar[2], K. Wienhard[2], W.D. Heiss[2], M.E. Casey[3], L.Eriksson[3], T. Gremillion[3], M. Lenox[3], M. Schmand[3], J.T. Treffert[3], R. Nutt[3], G. Flägge[4]
[1]*MPI for Neurological Research Cologne, III.Physical Institute B RWTH Aachen*
[2]*MPI for Neurological Research Cologne*
[3]*CTI PET Systems*
[4]*III. Physical Institute B RWTH Aachen*

Wednesday 3:45–5:25pm Town and Country Room
Session Chairs:
SIMON CHERRY, *University of California at Davis*
ROBERT MIYAOKA, *University of Washington*

M3-1 (3:45pm) **Experimental Setup for Very High Resolution Animal PET Based on Solid State Detector**
S. Park[1], S.J. Wilderman[1], P. Sukovic[1], L. Han[1], A. Czermak[2], P. Jalocha[2], B. Sowicki[2], G. Maehlum[3], E. Nygard[3], K. Yoshioka[3], W. Dulinski[3], J. Fuster[4], C. Lacasta[4], S. Roe[5], J. Weilhammer[5], M. Mikuz[5], D. Meier[6], W.L. Rogers[6], N.H. Clinthorone[6]
[1]*College of Engineering, University of Michigan, Ann Arbor, U.S.A.*
[2]*Niewodniczanski Institute of Nuclear Physics, Krakow, Poland*
[3]*Ideas ASA, Oslo, Norway and LEPSI, IN2P3/CNRS-ULP, Strasbourg, France*
[4]*Inst. de Fisica Corpuscular, University de Valencia, Valencia, Spain*
[5]*CERN, Geneva, Switzerland & University of Ljubljana, Slovenia*
[6]*Division of Nuclear Medicine, Univ. of Michigan, Ann Arbor*

M3-2 (3:59pm) **Performance Characteristics of a Second Generation Micro Crystal Element (MiCE2) Detector**
R.S. Miyaoka, S.G. Kohlmyer, J. Joung, T.K. Lewellen
University of Washington

M3-3 (4:13pm) **Characterization and Processing of Inter-Crystal Scatter in a Dual Layer, High Resolution LSO-APD-PET**
M. Rafecas[1], G. Böning[2], B.J. Pichler[1], E. Lorenz[2], M. Schwaiger[1], S.I. Ziegler[1]
[1]*Nuklearmedizinische Klinik. TU München (Germany)*
[2]*Max-Planck-Institut für Physik, München (Germany)*

M3-4 (4:27pm) **Flexible Geometry for Hand-Held PET Scanners**
I.N. Weinberg[1], V. Zawarzin[1], P. Stepanov[1], R. Pani[2], G.DeVincentes[2], J. Zeng[3], L.P. Adler[4]
[1]*PEM Technologies*
[2]*University La Sapienza*
[3]*Georgetown Unviersity*
[4]*Fox Chase Cancer Center*

M3-5 (4:41pm) **cMiCE :A High Resolution Animal PET Using Continuous LSO with a Statistics Based Positioning Scheme**
J. Joung, R.S. Miyaoka, S.G. Kohlmyer, T.K. Lewellen
Univ of Washington

M3-6 (4:55pm) **3D Geometric Normalisation for the High Resolution Quad-HIDAC PET Scanner**
S.F. Kay[1], A.J. Reader[1], A.P. Jeavons[2]
[1]*Department of Instrumentation & Analytical Science, UMIST*
[2]*Oxford Positron Systems*

M3-7 (5:09pm) **Coupling of 11C-acetate and 13N-ammonia for Measurement of Myocardial Blood Flow in Normal Rats Using the Sherbrooke PET Scanner**
M.Bentourkia, É.Croteau, R. Langlois, A.Aliaga, J. Rousseau, J. Cadorette, F. Bénard, O. Lesur, R. Lecomte
University of Sherbrooke

Thursday 10:30am–12:10pm Town and Country Room
Session Chairs:
RONALD J. JASZCZAK, *Duke University*
STIG LARSSON, *Karolinska Institute, Sweden*

M4-1 (10:30am) **Position Sensing in a Cylindrical Ionization Detector Through Use of a Segmented Cathode**
A. Athanasiades[1], J.L. Lacy[1], L. Sun[2]
[1]*Proportional Technologies, Inc.*
[2]*Rice University*

M4-2 (10:44am) **Design Considerations for a New Solid-State Gamma Camera: Solstice**
D. Gagnon[1], J.J. Griesmer[1], F.C. Valentino[1], G.L. Zeng[2], J.M. Links[3]
[1]*Marconi Medical Systems Inc.*
[2]*University of Utah*
[3]*Johns Hopkins University*

M4-3 (10:58am) **First Clinical Experience with a Small Field-of-View Scinti-Mammography Camera Mounted on an Upright Mammography Gantry**
E. Itti[1], I.Khalkhali[1], L. Diggles[1], F.S. Mishkin[1], B.E. Patt[2], L.R. MacDonald[2], J.S. Iwanczyk[2], C. Tull[2], Y. Yamaguchi[2]
[1]*Division of Nuclear Medicine, Harbor-UCLA Medical Center*
[2]*Photon Imaging, Inc.*

M4-4 (11:12am) **A Novel Application Specific Emission Tomograph (ASET) for Breast Imaging**
M.P. Tornai[1], J.E.Bowsher[1], C.N. Archer[1], J. Peter[2], L.R. MacDonald[3], B.E. Patt[3], J.S. Iwanczyk[3], R.J. Jaszczak[1], R.E.Coleman[1]
[1]*Duke University Medical Center*
[2]*Ludwig-Maximilians-Universitat*
[3]*Gamma Medica, Inc.*

M4-5 (11:26am) **Coincident Compton Nuclear Medical Imager**
J. Kurfess, B. Phlips
Naval Research Laboratory

M4-6 (11:40am) **A Channelized Hotelling Trace Collimator Design Method Based on Reconstruction Rather Than Projections**
L. Zeng, G. Gullberg
University of Utah

M4-7 (11:54am) **Analytic Determination of Pinhole Collimator Point Spread Function with Penetration**
S.D. Metzler, J.E. Bowsher, R.J. Jaszczak
Duke University Medical Center

M5A — MIC POSTER I:
PET INSTRUMENTATION AND TECHNIQUES
Thursday 1:30–3:15pm Grand Ballroom
Session Chairs:
WAI-HOI (GARY) WONG, *M.D. Anderson Cancer Center*
RICHARD HICHWA, *University of Iowa*

M5A-1 Resolution Properties of Triple-Headed Coincidence Imaging
Y. D'Asseler[1], S. Vandenberghe[1], M. Koole[1], L.Bouwens[1], R.V.D. Walle[1], I. Lemahieu[1], R.A. Dierckx[2]
[1]*Ghent University*
[2]*Ghent University Hospital*

M5A-2 Randoms Distributions for Triple-Head Gamma-Camera PET Systems
J.A. Kolthammer, C.G.Matthews
Marconi Medical Systems

M5A-3 A Monte-Carlo Simulation Study to Evaluate Septal Spacing Using Triple-Head Hybrid PET Imaging
C.J. Groiselle[1], J.A. Kolthammer[2], C. Matthews[2], S.J. Glick[1]
[1]*Division of Nuclear Medicine, University of Massachusetts Medical School, Worcester, MA USA*
[2]*Marconi Medical Systems,Cleveland, OH*

M5A-4 Optimization of Septal Spacing in Hybrid PET using Estimation Task Performance
S.J. Glick[1], C.J. Groiselle[1], J.A. Kolthammer[2], R.Z. Stodilka[3]
[1]*University of Massachusetts Medical School*
[2]*Marconi Medical Systems*
[3]*Defense Research Establishment Ottawa*

M5A-5 Inexpensive Position Sensitive Detector Block for 40mm Diameter PMT using Quadrant Sharing Configuration
J. Uribe, M. Aykac, H. Baghaei, H. Li, Y. Wang, Y. Liu, T. Xing, W.H. Wong
University of Texas MD Anderson Cancer Center

M5A-6 Design and Feasibility Study of an Ultra-Fast High Resolution PET Detector
L.J. Meng, D.J. Herbert, G.J. Crossingham, D. Ramsden
Department ofPhysics and Astronomy, University of Southampton, Southampton,SO17 1BJ

M5A-7 Count Rate Analysis of PET Scanner Designs Based on a GSO Depth of Interaction Detector with a PS-PMT
K.Kitamura[1], M. Amano[1], H. Murayama[2]
[1]*Shimadzu Corporation*
[2]*National Institute of Radiological Sciences*

M5A-8 The Design of A High Resolution Transformable Wholebody PET
W.H. Wong, J. Uribe, H. Li,H. Baghaei, Y. Wang, M. Aykac, Y. Liu, T. Xing
University of Texas M.D. Anderson Cancer Center

M5A-9 A New High Resolution PET Scanner Dedicated to Brain Research
M. Watanabe, K. Shimizu, T. Omura, M. Takahashi, T. Kosugi, E. Yoshikawa, N. Sato, H. Okada, T. Yamashita
Hamamatsu Photonics K.K. ,Japan

M5A-10 Nema Evaluation of the First and Second Generation of the Exact and Exact HR Family of Scanners
L. Eriksson[1], M.Eriksson[1], K. Wienhard[2], C.Knoess[2], S. Vollmar[2], W.D. Heiss[2], M. Casey[3], T. Bruckbauer[3], T. Mulnix[3], R. Nutt[4]
[1]*CTI PET systems,USA and Karolinska Institute, Sweden*
[2]*Max-Planck-Institute for Neurological Research,Cologne, Germany*
[3]*CTI PET systems, USA*
[4]*CTI,Inc.USA*

M5A-11 The ECAT HRRT: Nema NEC Evaluation of the HRRT system,the New High Resolution Research Tomograph.
K. Wienhard[1], C.Knoess[1], W.D. Heiss[1], L. Eriksson[2], M. Eriksson[2], M.Casey[3], T. Bruckbauer[3], J. Hamill[3], M. Schmand[3], T. Gremillion[3], M. Lenox[3], R. Nutt[4]
[1]*Max-Planck Institute of Neurological Research*
[2]*CTI PET Systems and Karolinska Institute*
[3]*CTI PET Systems*
[4]*CTI,Inc.*

M5A-12 Performance Evaluation of 2D Compact PET Systems — with Applications to System Design Optimization
C.M. Kao, C.T. Chen
Department of Radiology, University of Chicago

M5A-13 Count-Rate Performance and Dead-Time Corrections for the PETRRA Positron Camera
R. Ott1, M. Flower[1], S. Meriaux[1], A. Divoli[1], N.Evans[1], K. Wells[2], K.Erlandsson[3], E. Bateman[4], R. Stephenson[4], D. Duxbury[4], E. Spill[4]
[1]*Physics Department,Institute of Cancer Research*
[2]*Physics Department,University of Surrey*
[3]*Institute of Nuclear Medicine, Middlesex Hospital*
[4]*Rutherford Appleton Laboratory*

M5A-14 Development of the LBNL Positron Emission Mammography (PEM) Camera
J.S. Huber, W.W. Moses, S.E. Derenzo, M. Pedrali-Noy, B. Krieger, E.Mandelli,G. Meddeler, M.Ho, a.M. Weng
Lawrence Berkeley National Laboratory

M5A-15 Evaluation of a High Resolution PET Scanner for Positron Emission Mammography (PEM)
L. White[1], R.J. Ott[1], P. Carnochan[1], D. Duxbury[2], P. Bruyndonckx[3], S. Travernier[3]
[1]*Institute of Cancer Research*
[2]*Rutherford Appleton Laboratory*
[3]*Vrije University, Brussels*

M5A-16 Performance of a Dedicated Breast PET Imager (BPET) Using NaI(Tl) Curve Plate Detectors
R. Freifelder, J.S. Karp
University of Pennsylvania

M5A-17 Comparison of Rectangular and Planar Positron Emission Mammography Scanners

J. Qi, R.H. Huesman, G.J. Klein, C. Kuo, W.W. Moses, B.W. Reutter

Lawrence Berkeley National Laboratory

M5A-18 Septa Design Optimization for Volumetric Imaging in Positron Emission Tomography

M. Aykac, J. Uribe, H. Baghaei, H. Li, Y. Wang, Y. Liu, T. Xing, W.H. Wong

The University of Texas, MD Anderson Cancer Center

M5A-19 Development of a GSO Detector Assembly for a Continuous Blood Sampling System

N. Kudomi, E. Choi, S. Yamamoto, H. Watabe, K.M. Kim, H. Iida

National Cardio-Vascular Center Research Institute

M5A-20 Collimation of a Cs-137 Point Source for Transmission Scanning in PET

K. Bilger, L.E. Adam, J.S. Karp

University of Pennsylvania

M5A-21 Normalisation of Emission and Transmission Data Taken with a Large Area Positron Camera, PETRRA

A. Divoli[1], R.J. Ott[1], M.A. Flower[1], N. Evans[1], M. Haddock[1], K. Erlandsson[2]

[1]*Institute of Cancer Research*
[2]*Institute of Nuclear Medicine, Middlesex Hospital*

M5A-22 A Phantom and Simulation Study on Body-Shields to Cope with Radioactivity Outside the Field of View in 3D PET

T. Hasegawa[1], H. Murayama[2], T. Yamaya[3], H. Matsuura[4]

[1]*KItasato University*
[2]*National Institute of Radiological Sciences*
[3]*National Institute of Radiological Sciences, Tokyo Institute of Tech.*
[4]*Simens-Asahi Medical Technologies Ltd.*

M5A-23 Multi-Scanner PET 2D/3D Comparison with Cerebral FDG

T.R. Oakes[1], B.T. Christian[2], A.D. Roberts[1], R.W. Pyzalski[1], J.E. Holden[1], T. Brown[3], R.J. Nickles[1], R.J. Davidson[1]

[1]*University of Wisconsin-Madison*
[2]*Kettering Medical Center*
[3]*MIICRO, Inc.*

M5A-24 Benchmarking a Monte Carlo Simulation Code on a HR+ PET Scanner

M. Conti, M.E. Casey

CTI PET Systems

M5A-25 Noninvasive Estimation of Cerebral Blood Flow Using Image-Derived Carotid Input Function in H$_2$^{15}O Dynamic PET

K.M. Kim, H. Watabe, M. Shidahara, K. Hayashida, Y. Miyake, H. Iida

National Cardiovascular Center — Research Institute

M5A-26 Addressing the Third Gamma Problem in PET

M.J. Schueller[1], T.L. Mulnix[2], B.T. Christian[3], M. Jenson[4], S. Holm[4], T.R. Oakes[5], C.C. Martin[5], A.D. Roberts[5], R.J. Nickles[5]

[1]*Brookhaven National Laboratory*
[2]*CTI Inc., Knoxville, TN*
[3]*Kettering Medical Center, Kettering OH*
[4]*Rigshospital, Copenhagen, Denmark*
[5]*University of Wisconsin, Madison, WI*

M5B — MIC POSTER I
SPECT INSTRUMENTATION AND TECHNIQUES
Thursday 1:30–3:15pm Grand Ballroom
Session Chairs:
STEPHEN MOORE, *Brigham and Women's Hospital*
DALE BAILEY, *Guy's and St. Thomas' Hospital*

M5B-1 A Gamma-Camera Based on a Large Area, Multi-Pixel HPD

D.J. Herbert, G.J. Crossingham, L.J. Meng, D. Ramsden

University of Southampton

M5B-2 Scintillator and Photodetectors Comparison for Compact Gamma Cameras

F. Garibaldi[1], F. Cusanno[1], F. Altamura[1], S.D. Giacomo[1], G.M. Urciuoli[1], E. Cisbani[1], R. Pani[1], A. Soluri[1], R. Pellegrini[2], R. Scafè[2], M.N. Cinti[2], G. Trotta[2]

[1]*Laboratory of Physics, ISS, Rome, Italy*
[2]*Department of Experimental Medicine, University of Rome La Sapienza, Italy*

M5B-3 Development of a High-Resolution Germanium Strip Gamma Camera

W.G. Schwarz[1], M.J. Kremer[1], M.E. Read[1], R.A. Kroeger[2], E.A. Wulf[2]

[1]*Physical Sciences Inc.*
[2]*Naval Research Laboratory*

M5B-4 Simulation of Depth of Interaction Effects for Pinhole SPECT

A.B. Hwang[1], K. Iwata[2], B.H. Hasegawa[2]

[1]*University of California at Berkeley and San Francisco*
[2]*University of California at San Francisco*

M5B-5 Efficient Calculation Of Resolution and Variance in 2D Circular-Orbit SPECT

Y. Xing, I.T. Hsiao, G.R. Gindi

SUNY at Stony Brook

M5B-6 A Modular Description for Collimator Geometry in EGS4 Simulation Tasks

A. Bevilacqua[1], D. Bollini[2], R. Campanini[2], N. Lanconelli[2], A. Riccardi[2], M. Gombia[3]

[1]*DEIS – University of Bologna, INFN, Bologna*
[2]*Dept. of Physics – University of Bologna, INFN, Bologna*
[3]*DIENCA – University of Bologna, INFM, Bologna*

M5B-7 Accurate Modeling of Fan-Beam Collimators in Brain SPECT Imaging Using Monte Carlo Simulation
A. Cot[1], J. Sempau[1], D. Pareto[2], S. Bullich[2], J. Pavia[3], F. Calviño[1], D. Ros[2]
[1]*Universitat Politecnica de Catalunya*
[2]*Universitat de Barcelona*
[3]*Hospital Clinic de Barcelona (IDIBAPS)*

M5B-8 MCNP–4C Simulations to Investigate Shielding of Scintillation Cameras for Conjugate Imaging of I-123 Labeled Brain Agents
D.N. Jangha[1], R.A. Mintzer[2], J.D. Valentine[1], J.N. Aarsvold[3]
[1]*Georgia Institute of Technology*
[2]*Emory University*
[3]*Veterans Affairs Medical Center, Atlanta*

M5B-9 A Comparison of Filtered Back Projection and Iterative Reconstruction Methods for Tilted-Head SPECT
B.C. Pieper, J.E. Bowsher, M.P. Tornai, R.J. Jaszczak
Duke University

M5B-10 Tumor SNR Analysis in Scintimammography by a Dedicated High Contrast Imager
M.N. Cinti[1], R. Pani[1], R. Pellegrini[1], C. Bonifazzi[2], A. Soluri[3], R. Scafè[4], G.D. Vincentis[1], G. Trotta[1], F. Garibaldi[5], F. Cusanno[5]
[1]*Dept. of Experimental Medicine and Patology, University of Rome, La Sapienza,Italy*
[2]*Dept. of Human Physiology, University of Ferrara*
[3]*Institute of Biomedical Techonologies,CNR, Rome, Italy*
[4]*ENEA TEC,CR, Casaccia – Rome, Italy*
[5]*Laboratory of Physics,ISS – Rome, Italy*

M5B-11 Evaluation of Orbits About a Pendulous Breast Using the ASET System
C.N. Archer[1], M.P. Tornai[1], J.E. Bowsher[1], S.D. Metzler[1], R.J. Jaszczak[1], L.R. MacDonald[2], B.E. Patt[2], J.S. Iwanczyk[2]
[1]*Duke University*
[2]*Gamma Medica,Inc.*

M5B-12 SPECT Breast Imaging Using Sufficient Orbits and Combined Pinhole—Parallel-Beam Collimation
J.E.Bowsher, M.P. Tornai, S.D. Metzler, J. Peter, R.J. Jaszczak
Duke University Medical Center

M5B-14 Kinetic Analysis and Parametric Imaging in Human [^{123}I]5-I-A-85380 Dynamic SPECT Studies
Y. Zhou, J.R. Brasic, A.H.Crabb, O. Gay, C. Endres, H. Kuwabara, J. Hilton,H. Fan, J.L. Musachio, D.F. Wong
Radiology Department,Johns Hopkins University

M5B-15 Effects of Temporal Modeling on the Statistical Uncertainty of Spatiotemporal Distributions Estimated Directly from Dynamic SPECT Projections
B.W. Reutter[1], G.T. Gullberg[2], R.H. Huesman[1]
[1]*Lawrence Berkeley National Laboratory*
[2]*University of Utah*

M5B-16 Parametric Cardiac Imaging with Tc-99m-teboroxime
A. Sitek[1], G.T. Gullberg[2], R.H.Huesman[3]
[1]*Lawrence Berkeley National Laboratory/Radiology Department.,*
University of Utah
[2]*Radiology Department, University of Utah*
[3]*Lawrence Berkeley National Laboratory*

M5B-17 Design of Temporal Sampling Schedules for Dynamic Cardiac FDG SPECT
H.S. Khare, E.V.R. DiBella
MIRL,Dept. of Radiology, University of Utah

M5B-18 Variations in Gastric Emptying Times of Three Stomach Regions for Simple and Complex Meals Using Scintigraphy
N.A. Hadi[1], A.Giouvanoudi1, R. Morton[2], P. Horton[2], N.M. Spyrou[1]
[1]*Department of Physics,University of Surrey, Guildford, Surrey, GU2 7XH, U.K*
[2]*Department of Medical Physics, Royal Surrey County Hospital, Guildford, Surrey, GU2 5XX, U.K*

M5B-19 Dependence of Ga-67 Imaging Performance on Choice of Energy Windows
G.ElFakhri, S.C.Moore, M.F. Kijewski
Harvard Medical School,Brigham & Women's Hospital

M5B-20 Combination of MCNP and SimSET for Monte Carlo Simulation of SPECT with Medium and High Energy Photons
Y. Du,E.C. Frey, W.T. Wang, C. Tocharoenchai, W.H.Baird, B.M.W. Tsui
UNC-CH

M5B-21 Validation of the SPECT Features of a Simulation System for Emission Tomography
R.L.Harrison, S.D. Vannoy, T.K. Lewellen
University of Washington,Seattle WA

M5B-22 Importance of Doppler Broadening in Compton Scatter Imaging Techniques
D.V. Rao
Department of Physics,Sir. C.R.R. Autonomous College, Eluru-534007., W.G.Dt.,A.P.,India

M5B-23 Modeling SPECT Acquisition and Processing of Changing Radiopharmaceutical Distributions
J. Chen[1], J.R. Galt[2], J.D. Valentine[1], T.L. Faber[2], E.V. Garcia[2]
[1]*Georgia Institute of Technology*
[2]*Emory University School of Medicine*

M5B-24 Modeling the Respiratory Motion of Solitary Pulmonary Nodules for Investigating SPECT Tumor Imaging
M.S. Smyczynski[1], M.A. King[1], M.V. Narayanan[1], P.H. Pretorius[1], H.C. Gifford[1], T.H. Farncombe[1], E.A. Hoffman[2], W.P. Segars[3], B.M.W. Tsui[3]
[1]*Division of Nuclear Medicine, University of Massachusetts Medical Center*
[2]*Department of Radiology, University of Iowa*
[3]*Department of Biomedical Engineering and Department of Radiology, University of North Carolina*

Thursday 1:30−3:15pm Grand Ballroom
Session Chairs:
XIAOCHUAN PAN, *University of Chicago*
IRENE BUVAT, *INSERM, France*

M5C-1 Fractal Image Coding for Emission Tomographic Image Compression
K.P. Wong
Royal Prince Alfred Hospital, University of Sydney

M5C-2 Clinical Evaluation of JPEG2000 Compression Algorithm for Digital Mammography
M.M. Sung[1,3], H.J. Kim[1,2,3], E.K. Kim[2], J.Y. Kwak[2], J.K. Yoo[2], H.S. Yoo[2,3]
[1]*BK21 Project for Medical Sciences, Yonsei University*
[2]*Department of Diagnostic Radiology, Yonsei University College of Medicine*
[3]*Research Institute of Radiological Science, Yonsei University*

M5C-3 Edge Detection Using Extended Convolution Masks and Active Contour Models
T. Cao-Huu[1], A.L. Brownell[1], G. Lachiver[2]
[1]*Massachusetts General Hospital / Harvard*
[2]*Universite de Sherbrooke*

M5C-4 Multiresolution Segmentation and Estimation
T. Cao-Huu, A.L. Brownell
Massachusetts General Hospital, Harvard

M5C-5 A Contextual Classifier that only Requires One Prototype Pixel for Each Class
G.Maletti, B. Ersboll, K.Conradsen
Technical University of Denmark

M5C-6 Lung Image Segmentation and Registration for Quantitative Image Analysis
H. Haneishi[1], H. Ue[1], N. Takita[1], H. Toyama[2], T. Miyamoto[2], N. Yamamoto[2], Y. Mori[3]
[1]*Chiba University, Department of Information and Image Sciences*
[2]*National Institute of Radiological Sciences*
[3]*Jikei University, School of Medicine*

M5C-7 Automated Detection of Pulmonary Nodules on CT Images Using Higher-Order Autocorrelation Features
Y. Lee[1], D.Y. Tsai[1], T. Nakagawa[2], T. Hara[2], H. Fujita[2], S. Itoh[3], T. Ishigaki[3]
[1]*Niigata University*
[2]*Gifu University*
[3]*Nagoya University*

M5C-8 An X-Ray Lung Nodule Identification Schema Based on Fusion of Gaussian Modeling Parameters of the Nodule's Micro-Surfaces (MSFs)
S.N. Raptis, *NTUA*

M5C-9 Detection of Brain Activation from PET or fMRI Images Using a Signal-Detection Approach
A.S. Lukic[1], M.N. Wernick[1], Y. Yang[1], N.P. Galatsanos[1], S. Strother[2]
[1]*Illinois Institute of Technology*
[2]*VA Medical Center and Univesity of Minnesota*

M5C-10 Parsimonious Basis Selection in Exponential Spectral Analysis
J.S. Maltz, *Lawrence Berkeley National Laboratory*

M5C-11 Hierarchical Structure for Data Transmission of Volumetric Medical Images Using Three-Dimensional Wavelet Transform
M. Hashimoto, K.Matsuo, A. Koike, Y. Nakajima
KDDI R&D Laboratories Inc.

M5C-12 Significant Noise Reduction with No Resolution Trade-Off through the Spherical Mean Value Processing
L. Li, *MMRRCC, Department of Radiology*
University of Pennsylvania

M5C-13 Radially Dependent Nonlinear Sinogram Filtering
B.I. Andia[1], K. Sauer[1], C.A. Bouman[2]
[1]*University of Notre Dame*
[2]*Purdue University*

M5C-14 Input Recovery from Noisy Output Measurements: A Monte Carlo Method
K.P. Wong[1], S.R. Meikle[2], D. Feng[3], M.J. Fulham[4]
[1]*Royal Prince Alfred Hospital, University of Sydney*
[2]*Royal Prince Alfred Hospital*
[3]*The University of Sydney, Hong Kong Polytechnic University*
[4]*The University of Sydney, Royal Prince Alfred Hospital*

M5C-15 On Estimating the Variance of Post-Smoothed MLEM Images
J. Nuyts, *K.U.Leuven, Belgium*

M5C-16 A Bootstrap Approach for Analyzing the Statistical Properties of SPECT and PET Images
I. Buvat[1], C.Riddell[2]
[1]*U494 INSERM*
[2]*U494 INSERM, GE-SMVI*

M5C-17 Improving 3D PET Imaging by Restoration: A Phantom Study
K. Knesaurek, J. Machac
The Mount Sinai Medical Center

M5C-18 Use of Cluster Extent in Subtraction SPECT
K. Baete[1], J. Nuyts[2], D. Vandermeulen[2], A.Maes[2], W.V. Paesschen[2], P. Dupont[2]
[1]*Katholieke Universiteit Leuven, Nuclear Medicine*
[2]*Katholieke Universiteit Leuven*

M5C-19 Absolute Quantitation in Simultaneous Tc-99m/ I-123 Brain SPECT Using Artificial Neural Networks: Design Optimization and Validation
G. ElFakhri[1], P. Maksud[2], R.E. Zimmerman[1], S.C. Moore[1], M.F. Kijewski[1]
[1]*Harvard Medical School, Brigham & Women's Hospital*
[2]*INSERM U494, Universite Paris XI*

M5C-20 An Algorithm to Adjust a Rigid CT-SPECT Fusion so as to Maximize Tumor Counts from CT VOI in I-131 Therapies
J. Li, K.F. Koral
University of Michigan

M5C-21 Experiments on the DCC for SPECT and CT Scanner Data Registration
R. Faghihi
TIMC-IMAG

M5C-22 Registration of CT and SPECT Volumes using CT Reprojections and Planar Transmission Images
D.J. deVries, S.C.Moore
Brigham & Women's Hospital, Harvard Medical School

M5C-23 A Computed Tomography Virtual Reality Testbed
M. Mattiuzzi, J.W. LeBlanc, S. Basu, W.R. Ross, P.M. Edic
GE Corporate R&D Center

M5C-24 Design and Analysis of Nonliner Filter for Magnetic Resonance on Wavelet-Based Method
S.C. Kang[1], S.H. Hong[2]
[1]*INCOM I&C*
[2]*Dept.of Electronic Engineering, Inha University*

M5C-25 Detectability Comparisons of Image Reconstruction Algorithms Using Channelized Hotelling Observer with Bootstrap Resampled Data
J.S. Kim, R.S. Miyaoka, R.L.Harrison, S.G.Kohlmyer, T.K. Lewellen
Imaging Research Lab, Univ. of Washington

M6 — PET IMAGING TECHNIQUES
Thursday 3:45−5:25pm Town and Country Room
Session Chairs:
MARGARET DAUBE-WITHERSPOON, *National Institute of Health*
CHRIS THOMPSON, *McGill University, Canada*

M6-1 (3:45pm) Accurate Attenuation Correction in PET Using Short Transmission Scans and Consistency Information
A. Welch[1], A. Bromiley[1], W. Hallett[2], P. Marsden[2]
[1]*The John Mallard Scottish PET Centre*
[2]*Guys & St Thomas' Clinical PET Centre*

M6-2 (3:59pm) CT Based Attenuation Correction for PET/CT Scanners
J.P.J. Carney[1], J.T. Yap[1], D.W. Townsend[1], T. Beyer[2]
[1]*University of Pittsburgh*
[2]*CTI PET Systems*

M6-3 (4:13pm) Factor Analysis for Delineation of Organ Structures and Automatic Generation of In- and Output Functions in PET Studies of Prostate Cancer
C. Schiepers[1], C. Wu[1], M. Seltzer[1], M. Phelps[1], M. Dahlbom[1], C. Hoh[2], J. Nuyts[3]

[1]*UCLA School of Medicine*
[2]*UC San Diego*
[3]*Catholic University, Leuven,Belgium*

M6-4 (4:27pm) Acquisition of Attenuation Map for Brain PET Study Using Optical Tracking System
H. Watabe[1], N. Sato[2], H.M. Deloar[1], S.i. Urayama[1], H. Oka[3], H. Iida[1]
[1]*National Cardiovascular Center Research Institute*
[2]*Nara Institute of Science and Technology*
[3]*National Cardiovascular Center Hospital*

M6-5 (4:41pm) Characterization of Single and Multiple Scatter from Matter and Activity Distributions Outside the FOV in PET
C.M. Laymon, R.L.Harrison, S.G.Kohlmyer, R.S. Miyaoka, T.K. Lewellen
University of Washington

M6-6 (4:55pm) A Simulation-Based Assessment of the Revised NEMA NU-2 70-cm Long Test Phantom for PET
R.D. Badawi[1], L.E. Adam[2], R.E. Zimmerman[3]
[1]*Dana Farber Cancer Institute; Joint Program in Nuclear Medicine, Harvard Medical School*
[2]*Department of Radiology, University of Pennsylvania*
[3]*Brigham and Womens Hospital; Joint Program in Nuclear Medicine, Harvard Medical School*

M6-7 (5:09pm) Parameterization of a Model-Based 3D Whole-Body PET Scatter Correction
S.D. Wollenweber
GE Medical Systems

M7 — RADIOGRAPHY AND X-RAY CT
Friday 8:20−10:00am Town and Country Room
Session Chairs:
JIANG HSIEH, *GE Medical Systems*
STEFAN SCHALLER, *Siemens Medical Systems*

M7-1 (8:20pm) Towards Epitaxial Lead Iodide Films for X-Ray Digital Imaging
L. Fornaro, E. Saucedo, L.Mussio, A. Gancharov, G.Ardanaz
Radiochemistry Department, Faculty of Chemistry, University of Uruguay

M7-2 (8:34pm) High-Resolution X-Ray Imaging Using Rowland-Circle Bragg Optics
U. Bergmann[1], P. Glatzel[2], M.Ivanovic[3], S.P. Cramer[1]
[1]*University of California,Davis/Lawrence Berkeley National Laboratory*
[2]*University of California, Davis*
[3]*University of North Carolina,Chapel Hill*

M7-3 (8:48) Medipix2,a 64k Pixel Readout Chip with 55 μm Square Elements Working in Single Photon Counting Mode
X. Llopart[1], M.Campbell[1], D.S. Segundo[2], E. Pernigotti[3]
[1]*CERN*
[2]*NIKHEF*
[3]*University and INFN of Pisa*

M7-4 (9:02pm) Cone-Beam Reconstruction for a C-arm CT System
X.Liu[1], M. Defrise[1], L. Desbat[2], M. Fleute[2]
[1]*Free University of Brussels,Belgium*
[2]*IMAG,University Joseph Fourier, France*

M7-5 (9:16pm) B-spline Based Weighting Functions for Helical CT
P. J.L. Riviere, X. Pan
University of Chicago

M7-6 (9:30pm) 4-Dimensional Computed Tomography (4D-CT) — Its Concepts and Preliminary Development
M.Endo[1], T. Tsunoo[1], S. Kandatsu[1], S. Tanada[1], H.Aradate[2], Y. Saito[2]
[1]*National Institute of Radiological Sciences*
[2]*Toshiba Corporation*

M7-7 (9:44pm) Lung Modeling for Nodule Analysis in HRCT
L. Pastor, A. Pousse, P. Manzoni,M. Parmentier, B. Kastler
University of Franche-Comte, Lab Imagerie Ingenierie Sante

M8 — SPECT IMAGING TECHNIQUES
Friday 10:30am–12:10pm Town and Country Room
Session Chairs:
LARRY ZENG, *University of Utah*
STEPHEN GLICK, *Univ. of Massachusetts Medical Center*

M8-1 (10:30am) Impact of Scatter Correction in the Kinetic Analysis of a D2 Receptor Ligand SPECT Study
K.M. Kim[1], H. Watabe[1], M. Shidahara[1], Y. Onishi[2], Y. Yonekura[3], H.Iida[1]
[1]*National Cardiovascular Center - Research Institute*
[2]*Nihon Medi-Physics*
[3]*Fukui Medical School*

M8-2 (10:44am) A Recursive Algorithm for Quantification of Brain Perfusion SPECT Images
M. Koole[1], R.V.D. Walle[1], K.V. Laere[2], J. Versijpt[2], Y. D'Asseler[1], S. Vandenberghe[1], I. Lemahieu[1], R. Dierckx[2]
[1]*Ghent University, ELIS,MEDISIP*
[2]*Ghent University Hospital, Division of Nuclear Medicine*

M8-3 (10:58am) Tc-99m/Tl-201 Simultaneous Dual Isotope SPECT with Monte Carlo-Basedcross-Talk Correction including Lead X-Rays
H.W. deJong[1], W.T. Wang[2], E.C. Frey[2], F.J. Beekman[1]
[1]*University Medical Center Utrecht*
[2]*University of North Carolina*

M8-4 (11:12am) Attenuation Correction Using SPECT Emission Data Only
D. Gourion[1], P. Gantet[1], J.P. Esquerré[1], D. Noll[2], A.Celler[3]
[1]*Laboratoire Traceurs et Traitement de l'Image, Toulouse*
[2]*Mathématiques pour l'Industrie et la Physique, Toulouse*
[3]*Vancouver Hospital and Health Sciences Center*

M8-5 (11:26) Attenuation Correction for Rotating Slant-Hole (RSH) SPECT using Exact Rebinning "1"
J.M. Wagner[1], F. Noo[2], R. Clackdoyle[2], G. Bal[2], P. Christian[2]
[1]*University of Liege*
[2]*University of Utah*

M8-6 (11:40am) A Study of the Influence of Local Variations in Myocardial Thickness on SPECT Perfusion Imaging
P.H. Pretorius[1], M.V. Narayanan[1], M.A. King[1], T.S. Pan[2]
[1]*University of Massachusetts Medical School*
[2]*GE Medical*

M8-7 (11:54am) Study of the Efficacy of Respiratory Gating in Myocardial SPECT Using the New 4D NCAT Phantom
W. Segars, B. Tsui
University of North Carolina

**M9 — MIC POSTER II:
HIGH RESOLUTION AND ANIMAL IMAGING**
Friday 1:30–3:15pm Grand Ballroom
Session Chairs:
PAUL ACTON, *University of Pennsylvania*
ALBERTO DEL GUERRA, *NFN/University of Pisa,Italy*

M9A-1 High Resolution Detector Modules Based on NaI(Tl) Arrays for Small Animal Imaging
A.G. Weisenberger, S. Majewski, V. Popov, R. Wojcik
Thomas Jefferson National Accelerator Facility

M9A-2 Design of a PET Tomograph for Small Animal Research
G. Tzanakos[1], D. Georgakakis[1], G.Kontaxakis[1], M. Skiadas[1], N. Apostolou[2], S. Pavlopoulos[2], T. Thireou[2], M. Nikolaou[3], G. Panayiotakis[3], G. Spyrou[3]
[1]*University of Athens, Athens 15771, Greece*
[2]*National Technical University of Athens, Athens 15773, Greece*
[3]*Univ. of Patras,Dept of Medical Physics, Patras 26500, Greece*

M9A-3 Design of IndyPET-II,a High-Resolution,High Sensitivity Dedicated Research Scanner
N.C. Rouze, K.M. Stantz, G.D. Hutchins
Indiana University School of Medicine

M9A-4 Design Studies for a Volumetric High Resolution Small Animal PET
J.A. Correia, C.A. Burnham, D. Kaufman,A.J. Fischman
Massachusetts General Hospital

M9A-5 Resolution Uniformity and Sensitivity of the NIH "ATLAS" Small Animal PET Scanner:A Simulation Study
J. Seidel, J.J. Vaquero, M.V. Green
National Institutes of Health

M9A-6 Normalisation of Listmode Data with Application to the Quad-HiDAC Small Animal PET Camera
K.Thielemans[1], C. Morel[2], J.H. Kaempf[2], S. Mustafovic[1]
[1]*Imaging Research Solutions Ltd., Hammersmith Hospital*
[2]*University of Lausanne*

M9A-7 Modeling 13N—Ammonia from Projections in Rat-PET studies
M. Bentourkia
Université de Sherbrooke

M9A-8 Imaging the Unanesthetized Rat Brain with PET: A Feasibility Study
P. Vaska, D.J. Schlyer, C.L. Woody, S.P. Stoll, V. Radeka, N. Volkow
Brookhaven National Laboratory

M9A-9 microPET Imaging Using Non-Conventional Isotopes
R. Laforest, D.J. Rowland, M.J. Welch
Washington University, Medical School

M9A-10 Quantitative PET-SPECT Small Animal Scanner: Preliminary Results
G. DiDomenico[1], G. Zavattini[1], E. Moretti[1], M. Giganti[2], A. Motta[2], N. Sabba[2], L. Uccelli[2], E. Benini[2], A. Duatti[2], A. Piffanelli[2], C. Bolzati[2], A. Boschi[2], A. DelGuerra[3]
[1]*Dipartimento di Fisica, Universita` di Ferrara*
[2]*Dipartimento di Medicina Clinica e Sperimentale–Sezione di Medicina Nucleare, Universita` di Ferrara*
[3]*Dipartimento di Fisica, Universita` di Pisa*

M9A-11 Development of a Small Animal SPECT Using Scintillation Crystal and PSPMT
H.K. Seo[1], Y. Choi[1], K.C. Im[1], S.K. Woo[1], J.S. Lee[1], T.Y. Song[1], Y.S. Choe[1], K.H. Lee[1], S.E. Kim[1], B.T. Kim[1], Y.I. Choi[2]
[1]*Department of Nuclear Medicine, Samsung Medical Center, Sungkyunkwan University*
[2]*Department of Physics, Sungkyunkwan University*

M9A-12 A Prototype Coded Aperture Detector for Small Animal SPECT
S.R. Meikle[1], S. Eberl[1], R.R. Fulton[1], M.J. Fulham[1], P. Kench[2], A.G. Weisenberger[3], R. Wojcik[3], M.F. Smith[3], S. Majewski[3], A.B. Rosenfeld[4]
[1]*Royal Prince Alfred Hospital*
[2]*University of Sydney*
[3]*Thomas Jefferson National Accelerator Facility*
[4]*University of Wollongong*

M9A-13 Development of a Multi-Pinhole Detector for High-Sensitivity SPECT Imaging
N.U. Schramm[1], A. Wirrwar[2], H. Halling[1]
[1]*Research Center Juelich, Germany*
[2]*University of Duesseldorf, Germany*

M9A-14 Performance of the Tier-SPECT: Rat Phantom Measurements
A.K. Wirrwar[1], H.W. Müller-Gärtner[1], N. Schramm[2], H. Halling[2]
[1]*Nuklearmedizinische Klinik, Universität Düsseldorf*
[2]*Zentralinstitut für Elektronik, FZ Jülich*

M9A-15 Coded Aperture Imaging for High-Resolution Planar Scintigraphy with a Conventional Anger Camera: Experimental Results
R. Accorsi, R.C. Lanza
Massachusetts Institute of Technology

M9A-16 Design of High Sensitivity, High Resolution Compact Single Photon Imaging Devices for Small Animal and Dedicated Breast Imaging
M.F. Smith[1], S. Majewski[1], S.R. Meikle[2], A.G. Weisenberger[1], V. Popov[1], R. Wojcik[1]
[1]*Thomas Jefferson National Accelerator Facility*
[2]*Royal Prince Alfred Hospital*

M9A-17 Optimizing Gold and Platinum Pinhole Collimators for Imaging of Small Volumes at Ultra-High Resolution
C.R. Tenney
Thomas Jefferson University

M9A-18 Development of A MicroCT System for Small Animal Imaging
X. Song, E.C. Frey, Y. Wang, B.M.W. Tsui
The University of North Carolina at Chapel Hill

M9A-19 Preliminary Studies of a Micro-CT for a Combined Small Animal PET/CT Scanner
M. Khodaverdi, F. Pauly, S. Weber, G. Schröder, K. Ziemons, R. Sievering, H. Halling
Forschungszentrum Juelich

M9A-20 Preliminary Results from the AROPET
M.L. Jan, H.C. Liang, S.W. Huang, J.S. Tang, C.C. Pei, C.K. Yeh
Institute of Nuclear Energy Research

M9A-21 Development of a LGSO Detector Using a Tapered Fiber for a High Resolution Animal PET
S. Yamamoto[1], H. Murayama[2]
[1]*Kobe City College of Technology*
[2]*National Institute of Radiological Sciences*

M9A-22 A Position-Sensitive Detector for Small Animal PET with Depth of Interaction Determination
A. Fedorov[1], A. Kholmetsky[1], M. Korzhik[1], A. Lobko[1], O. Missevitch[1], A. Annenkov[2], A. Tkatchov[2], P. Lecoq[3]
[1]*Institute for Nuclear Problems, Minsk, Belarus*
[2]*Bogoroditsk Technical Chemical Plant, Bogoroditsk, Russia*
[3]*CERN, Geneva, Switzerland*

M9A-23 Differential Interference Contrast for High Resolution X-Ray Imaging of Low Absorbing Specimen
B. Kaulich[1], T. Wilhein[2], E.D. Fabrizio[3], J. Susini[4]
[1]*ELETTRA, Trieste, Italy*
[2]*RheinAhrCampus Remagen, University of Applied Sciences, Remagen, Germany*
[3]*TASC-INFM at ELETTRA, Trieste, Italy*
[4]*ESRF, Grenoble, France*

Friday 1:30–3:15pm Grand Ballroom
Session Chairs:
BILL MOSES, *Lawrence Berkeley National Laboratory*
KOJI IWATA, *University of California at San Francisco*

M9B-1 Development of a Crystal Diffraction Lens for Medical Imaging
R.K. Smither[1], D.E. Roa[1], P. Caligiuri[2], R.N. Beck[3]
[1]*Advanced Photon Source, Argonne National Laboratory*
[2]*Departments of Diagnostic Radiology, Mercy, Michael Reese and the University of Illinois Hospitals*
[3]*Department of Radiology, University of Chicago*

M9B-2 First Results with a Novel X-Ray Source for Dual Energy Angiography
G. Baldazzi[1], D. Bollini[1], M. Gombia[1], M. Gambaccini[2], A. Taibi[2], A. Tuffanelli[2]
[1]*Physics Department, University of Bologna (Italy)*
[2]*Physics Department, University of Ferrara (Italy)*

M9B-3 X-Ray Laminographic Application of Lens-Coupled CMOS Detector for PCB Inspection
S.C.Jeon[1], H.K. Kim[1], S.W. Lee[1], S.W. Kwak[1], Y.S. Kim[1], G. Cho[1], T.W. Kim[2], J.S. Lee[2], Y.H. Shin[3]
[1]*Korea Advanced Institute of Science and Technology*
[2]*Korea Vatech Company*
[3]*Star V-Ray Company*

M9B-4 Towards CCD Autoradiography at Room Temperature:Methods for Minimising the Effects of Dark Current at Room Temperature
K. Wells[1], E.Kokkinou[1], M. Petrou[1], A. Ranicar[2], T. Spinks[2]
[1]*University of Surrey*
[2]*Imaging Research Solutions Ltd*

M9B-5 Experimental Study of Compton Scattering Reduction in Digital Mammographic Imaging
M.G. Bisogni, P. Delogu,M.E. Fantacci,A. Marchi, M. Novelli, P. Oliva,M. Quattrocchi, V. Rosso, A. Stefanini, S. Zucca, S.R. Amendolia
Dipartimento di Fisica,Universita'di Pisa,and Sezione INFN Pisa,Italy

M9B-6 Extraction of Mask Image for DSA Using Principal Component Analysis
Y. Nyui[1], K.Ogawa[2], E. Kunieda[3]
[1]*Tokyo Metropolitan University of Health Sciences, Tokyo,Japan*
[2]*Dept. of Electronic Informatics,College of Eng., Hosei Univ., Tokyo,Japan*
[3]*Dept. of Radiology, School of Med.,Keio Univ., Tokyo,Japan*

M9B-8 Gas scintillation Proportional Counters for Energy, Position and Time Resolved X-Ray Spectroscopy
J. Nickles[1], H. Schmidt-Böcking[1], H. Bräuning[2], A. Bräuning-Demian[3], V. Dangendorf[4], K. Rauschnabel[5]
[1]*Institut für Kernphysik,Johann Wolfgang Goethe–Universität, Frankfurt,Germany*
[2]*Institut für Kernphysik,Justus–Liebig–Universität,Giessen, Germany*
[3]*Gesellschaft für Schwerionenforschung, Darmstadt,Germany*
[4]*Physikalisch Technische Bundesanstalt, Braunschweig,Germany*
[5]*Fachhochschule Heilbronn, Germany*

M9B-9 A CT Demonstrator Using a CZT Solid State Detector
T. Claesson[1], A.Kerek[1], D. Novák[1], J. Molnár[2]
[1]*Royal Institute of Technology, Stockholm*
[2]*ATOMKI,Debrecen, Hungary*

M9B-10 A Method for Extending the Dynamic Range of Flat Panel Imagers for Use in Cone Beam Computed Tomography
P. Sukovic, N.H.Clinthorne
University of Michigan

M9B-11 Optimization of Derivative Kernels for Exact Cone-Beam ROI Reconstruction in Spiral Computed Tomography
G. Lauritsch[1], K. Sourbelle[2], K.C. Tam[3]
[1]*Siemens Medical Solutions*
[2]*Institute of Medical Physics,Univ. of Erlangen*
[3]*Siemens Corporate Research*

M9B-12 The Analysis of Noise Property in Low-Dose CT Projections and its Treatment by Scale Transformations
H. Lu[1], I.T. Hsiao[1], X. Li[1], J. Hsieh[2], Z. Liang[1]
[1]*State University of New York at Stony Brook*
[2]*GE Medical Systems*

M9B-13 Statistical Model Registration for a C-Arm CT System
M. Fleute[1], L. Desbat[1], R. Martin[1], S. Lavallee[2], M.Defrise[3], X.Liu[3], R. Taylor[4]
[1]*TIMC - IMAG Laboratory*
[2]*PRAXIM Company*
[3]*VUB, Department of Nuclear Medicine*
[4]*Computer Science Department, Johns Hopkins University*

M9B-14 Quantification of Width and Density of Bone Structures by Computed Tomography
T.N. Hangartner, D.F. Short
Wright State University

M9B-15 Micro Computed Tomography (µCT) with Unmonochromatized Synchrotron X-Rays for Cancerous Human Breast Tissue and Mouse Vertebra
H. Jung[1, 2], H.J. Kim[1,2, 3], H.S. Yoo[1,2], S. Hong[2, 3], J.O. Hong[2, 3], H.K. Jeong[2, 3], J.H. Je[4], B.R. Kim[4], H.S. Kang[4]
[1]*Department of Radiology, Yonsei University College of Medicine*
[2]*Research Institute of Radiological Science, Yonsei University College of Medicine*
[3]*BK21 Project for Medical Sciences, Yonsei University*
[4]*Department of Material Science, Pohang University of Science and Technology*

M9B-16 Monte Carlo Model for Estimation of Dose Delivered to Small Animals During 3D High Resolution X-Ray Computed Tomography

P.L.Chow[1], A.L. Goertzen[1], F. Berger[1], A.F. Chatziioannou[1], J.J. DeMarco[2]
[1]*Crump Institute for Molecular Imaging,UCLA School of Medicine*
[2]*Department of Radiation Oncology, UCLA School of Medicine*

M9B-17 EEG Distributed Source Imaging with a Realistic Finite-Element Head Model

T.S. Kim, Y. Zhou, S. Kim, M. Singh
University of Southern California

M9B-18 Least Squares Estimation of Mechanical Tissue Parameters from Cine MRI DATA Using a Finite Mechanical Model of The Left Ventricle

B. Feng, A.I. Veress, A. Sitek,G.T. Gullberg
Department of Radiology, University of Utah

M9B-19 Evaluation of Myocardial Perfusion Using Three-Dimensional Myocardial Contrast Echocardiography

K.D. May-Newman[1], C.L. Chen[1], D. Mejia[1], R. Haslim[1], A.N. DeMaria[2]
[1]*San Diego State University*
[2]*University of California, San Diego*

M9B-20 Iterative Reconstruction of Magnetic Resonance Images from Arbitrarly Samples in k-space

B. Desplanques, R.V.D. Walle, I. Lemahieu
Ghent University, Department of Electronics and Information Systems

M9B-21 Implementation and Performance of a Motion Tracking System For Treadmill MWGC Imaging Studies

L. Sun[1], J.L. Lacy[2], C.S. Martin[2], N. Nayak[2], J.W. Clark[1]
[1]*Rice University*
[2]*Proportional Technologies,Inc.*

M9B-22 Design Considerations for Efficient Binary Megavoltage Photon Detector Structures

H. Keller[1], R. Hinderer[1], M. Glass[1], R. Jeraj[1], T.R. Mackie[1], R. Schmidt[2], G. Fang[2], J.M. Kapatoes[2]
[1]*University of Wisconsin,Dept. Medical Physics*
[2]*Tomotherapy Inc.,Middleton,WI*

M9B-23 Scintillating Fiber Based Low Cost Dosimeter for Radiation Therapy Accelerator

J.M. Fontbonne[1], G. Iltis[1], G.Ban[1], B. Tamain[1], J. Tillier[1], N.Bellaize[1], C. LeBrun[2], J.P. Vernhes[3], A. Battala[3], K.Mercier[3]
[1]*Laboratoire de Physysique Corpusculaire de Caen*
[2]*Institut des Sciences Nucléaire de Grenoble*
[3]*Centre Regional de lutte contre le Cancer F. Baclese*

M9B-24 Blurring Artifacts in Megavoltage Radiography with an Amorphous Si Detector:Comparison of Monte Carlo Simulations with Measurements

A.E.S.V. Wittenau, C.M. Logan, M.B. Aufderheide, D.M. Slone
Lawrence Livermore National Laboratory

M9B-25 Automatic Reconstruction of Catheters in CT Based Brachytherapy Treatment Planning

N.B. Milickovic[1], D. Baltas[2], N. Zamboglou[2]
[1]*Klinikum Offenbach,Dept.of Med. Physics & Eng*
[2]*Klinikum Offenbach, Dept.of Med. Physics & Eng;ICCS, NTUA, Athens, Greece*

M9C-1 Accurate Vascular Reconstruction with MAP-EM Method from Few Projections

Y. Kajiura[1], K. Ogawa[1], E. Kunieda[2]
[1]*Hosei University, College of Engineering*
[2]*Keio University, School of Medicine*

M9C-2 Binary Objects Tomographic Reconstruction From Few Noisy X-Ray RadiographsUsing a Region Based Curve Evolution Method

J.P. Bruandet[1], F. Peyrin[2], J.M. Dinten[1], O. Amadieu[3], M. Barlaud[3]
[1]*CEA-LETI, DSIS, Grenoble*
[2]*CREATIS, UMR CNRS 5515, Lyon*
[3]*Laboratoire I3S,UMR CNRS 6070,Nice*

M9C-3 An Adapted Fan Volume Sampling Scheme for 3D Algebraic Reconstruction in Linear Tomosynthesis

P. Bleuet[1], R. Guillemaud[1], I.E. Magnin[2]
[1]*CEA LETI/DSIS Grenoble*
[2]*INSA CREATIS*

M9C-4 3D Image Reconstruction from Exponential X-Ray Projections:A Completeness Condition and an Inversion Formula

F. Noo[1], R. Clackdoyle[1], J.M. Wagner[2]
[1]*University of Utah*
[2]*University of Liege*

M9C-5 Double-Centering Method for Increasing Efficiency of Cone-Beam X-Ray CT Reconstruction

I.A. Hein[1], M.D. Silver[1], K. Taguchi[2]
[1]*Bio-Imaging Research,Inc.*
[2]*Toshiba Corporation*

M9C-6 A Multi-Slice Helical CT Reconstruction Algorithm with Generalized Weighting Approach

J. Hsieh, T. Toth, P. Simoni, C. Slack, B. Grekowitz, G. Seidenschnur, S. Wang
GE Medical Systems

M9C-7 Real-Time PET Image Reconstruction Based on Regularized Pseudo-Inverse of the System Matrix

V. Selivanov, G.Léger, R. Lecomte
Université de Sherbrooke

M9C-8 An Angular Frequency Dependent Filter for PET Reconstruction
J. Feng, C.M. Kao, P.L.Riviere, X. Pan
The University of Chicago

M9C-9 Image Reconstruction of PET Images Using Denoised Data
H. Lu, J.M.M. Anderson
University Of Florida

M9C-10 Efficient and Qualitative Multiscale Reconstruction Methods
M. Galun, A. Brandt
The Weizmann Institute of Science

M9C-11 Accelerated Deterministic Annealing Algorithms forTransmission Tomography Using Ordered Subsets of Projection Data
S.J. Lee
Paichai University

M9C-12 QM Solutions for EM Problems in Image Reconstruction
J. Pauli, G. Anton, E.M. Reinecke, A. Weidemann
University of Erlangen

M9C-13 Maximum Likelihood Image Reconstruction for Positron Emission Tomography Using Subgradient Projections Algorithm
Y. Wang, J.M.M. Anderson
Dept. of Electrical and Computer Engineering/Univ. of Florida

M9C-14 HeinzelCluster:Accelerated Reconstruction for FORE and OSEM 3D
S. Vollmar[1], C. Michel[2], J.T. Treffert[3], D. Newport[3], M. Casey[3], C. Knöss[1], K. Wienhard[1], W.D. Heiss[1]
[1]*Max–Planck–Institut für neurologische Forschung Köln,Germany*
[2]*PET Laboratory, Catholic University of Louvain, Louvain–la–Neuve, Belgium*
[3]*CTI Inc., Knoxville, TN,USA*

M9C-15 Design of a Prototype Real-Time Image Reconstruction System for PET Imaging
M.D. Lepage, J.D. Leroux, V. Selivanov, J. Cadorette, R. Lecomte
Universite de Sherbrooke

M9C-16 Improved Piecewise Cubic Convolution for Two-Dimensional Image Reconstruction
S.E.Reichenbach, F. Geng
University of Nebraska – Lincoln

M9C-17 A Median Prior for Tomographic Reconstruction
I.T. Hsiao[1], A. Rangarajan[2], G.Gindi[1]
[1]*SUNY at Stony Brook*
[2]*University of Florida*

M9C-18 Additive and Multiplicative Versions of the Maximum A Posteriori Algorithm with the Median Root Prior
S. Mustafovic[1], K.Thielemans[2]
[1]*Imperial College of Science, Technology & Medicine, PET Methods Group*
[2]*Imaging Research Solutions Limited, PET Methods Group*

M9C-19 Maximum Entropy-Based Reconstruction in SPECT with Statistical Regularization
N.V. Denisova
Institute of Theoretical and Applied Mechanics

M9C-20 Object Dependency of Resolution and Convergence Rate in OSEM with Filtering
S. Mustafovic[1], K.Thielemans[2], D. Hogg[3], P. Bloomfield[2]
[1]*Imperial College of Science, Tecnology and Medicine, Clinical Sciences, PET Methods Group*
[2]*Imaging Research Solution Ltd.,PET Methods Group*
[3]*Surrey University, PET Methods Group*

M9C-21 Evaluation of the 3D IMF-OSEM Algorithm by Using Data from a High Resolution PET Scanner
H. Baghaei, J. Uribe, H. Li, Y. Wang, M. Aykac, Y. Liu, T. Xing, W.H. Wong
The University Of Texas M.D. Anderson Cancer Center, 1515 Holcombe Blvd., Houston, TX 77030

M9C-22 Evaluation of Filter Function for Volume PET Imaging Using the 3DRP Algorithm
H. Baghaei, W.H. Wong, H. Li, J. Uribe, Y. Wang, M. Aykac, Y. Liu, T. Xing
The University of Texas M.D. Anderson Cancer Center, 1515 Holcombe Blvd., Houston, Texas 77030

M9C-23 ROC Analysis of Ordered Subset Expectation Maximization and Filtered Back Projection Technique for FDG-PET in Lung Cancer
H.K. Son[1], H.J. Kim[1], D.O. Kim[1], H.K.Jeong[1], J.D. Lee[1], T.J. Jeon[2], H.j. Jung[3], H.S. Yoo[3]
[1]*BK21 Project for Medical Sciences, Yonsei University*
[2]*Dept. of Nuclear Medicine, Pochon Cha Univ. College of Medicine*
[3]*Department of Radiology, Yonsei University College of Medicine*

M9C-24 Quantitative Comparison of FBP, EM,and Bayesian Reconstruction Algorithms,Including the Impact of Accurate System Modeling, for the IndyPET Scanner
T. Frese[1], N.C.Rouze[2], C.A. Bouman[1], K. Sauer[3], G.D. Hutchins[2]
[1]*Purdue Univ.,School of Electrical and Computer Engineering*
[2]*Indiana University School of Medicine*
[3]*University of Notre Dame, Dept.of Electrical Engineering*

M9C-25 Overscan Reduction in Spiral Scan Long Object Problem
K.C. Tam[1], G. Lauritsch[2], K. Sourbelle[3]
[1]*Siemens Corporate Research*
[2]*Siemens AG,Medical Solutions*
[3]*Institute of Medical Physics,University of Erlangen*

M9C-26 Quad-HIDAC PET: Comparison of Four Image Reconstruction Techniques for High Resolution Imaging
R.J. Walledge[1], R. Manavaki[1], A.J. Reader[1], J. Zweit1, A.P. Jeavons[2], P.J. Julyan[3], S. Zhao[3], D.L. Hastings[3]
[1]*Department of Instrumentation & Analytical Science, UMIST*
[2]*Oxford Positron Systems*
[3]*Paterson Inst.for Cancer Research & Christie Hospital NHS Trust*

**M10 — INSTRUMENTATION IV:
SMALL ANIMAL SPECT SYSTEMS**
Friday 3:45–5:25pm Town and Country Room
Session Chairs:
BRUCE HASEGAWA, *University of California*
BRAD BARBER, *University of Arizona*

**M10-1 (3:45pm) Optimized Readout of a Small Gamma
Cameras for High Resolution Single Gamma and Positron
Emission Imaging**
R. Wojcik, S. Majewski, B. Kross, V. Popov, A.G. Weisenberger
Thomas Jefferson National Accelerator Facility

**M10-2 (3:59pm) A Novel Design for a SPECT Mouse
Imager**
D.W. Wilson, H.H. Barrett, L.R. Furenlid
Center for Gamma-ray Imaging, University of Arizona

**M10-3 (4:13pm) Fast Simulation of Micro-Pinhole Imaging
by Mixing Monte Carlo and Analytical Modeling**
M. Gieles, H.W. deJong, F.J. Beekman
University Medical Center Utrecht

**M10-4 (4:27pm) A Compact, Ultra-High Resolution
Pinhole SPECT System for I-125 and Tc-99m Small Animal
Imaging In Vivo**
D.P. McElroy[1], L.R. MacDonald[2], F.J. Beekman[3], Y. Wang[4],
B.M.W. Tsui[4], B.E. Patt[2], J.S. Iwanczyk[2], E.J. Hoffman[1]
[1]*UCLA School of Medicine*
[2]*Photon Imaging Inc.*
[3]*Department of Nuclear Medicine, University Hospital Utrecht*
[4]*Department ofBiomedical Engineering, University of North
Carolina*

**M10-5 (4:41pm) SPECT – CT System for Small
Animal Imaging**
A.G. Weisenberger[1], S. Majewski[1], M.F. Smith[1], R. Wojcik[1],
R.E. Welsh[2], E.L.Bradley[3], M.S. Saha[3]
[1]*Thomas Jefferson National Accelerator Facility*
[2]*College of William and Mary Physics Department*
[3]*College of William and Mary Biology Department*

**M10-6 (4:55pm) An Economical Dual-Modality Small
Animal Imaging System**
R.E. Welsh[1], A. Ranck[1], E.L. Bradley[2], M.S. Saha[2], B. Kross[3],
S. Majewski[3], V. Popov[3], M.F. Smith[3], A.G. Weisenberger[3],
R. Wojcik[3]
[1]*College of William and Mary Physics Department*
[2]*College of William and Mary Biology Department*
[3]*Thomas Jefferson National Accelerator Facility*

**M10-7 (5:09pm) Design and Utility of a Small Animal
CT/SPECT System**
K. Iwata[1], A.B. Hwang[2], M.C. Wu[2], H.R. Tang[1], A.J.D. Silva[1],
K.H. Wong[2], M.W. Dae[1], B.H. Hasegawa[2]
[1]*University of California, San Francisco*
[2]*University of California, San Francisco and Berkeley*

**M11 — IMAGE RECONSTRUCTION METHODS:
PET AND SPECT**
Saturday 8:20–10:00am Town and Country Room
Session Chairs:
GRANT GULLBERG, *University of Utah*
PAUL KINAHAN, *University of Washington*

**M11-1 (8:20am) Iterative List-Mode Reconstruction of a
High Resolution Dual-Layer Animal Positron Tomograph
using Monte Carlo Probability Weights**
G. Boening[1], E. Lorenz[1], M. Rafecas[2], B.J. Pichler[2],
M. Schwaiger[2], S.I. Ziegler[2]
[1]*Max-Planck-Institut fuer Physik, Werner-Heisenberg-Institut,
Muenchen,Germany*
[2]*Technische Universitaet Muenchen, Nuklearmedizin,Klinikum
rechts der Isar, Muenchen,Germany*

**M11-2 (8:34am) Regularised One-Pass List-Mode EM
Algorithm for High Resolution 3D PET Image
Reconstruction Into Large Arrays**
A.J. Reader[1], S. Ally[1], F. Bakatselos[1], R. Manavaki[1],
R.J. Walledge[1], A.P. Jeavons[2], P.J. Julyan[3], S. Zhao[3],
D.L. Hastings[3], J. Zweit[3]
[1]*Department of Instrumentation & Analytical Science, UMIST*
[2]*Oxford Positron Systems*
[3]*Paterson Institute for Cancer Research & Christie Hospital
NHS Trust*

**M11-3 (8:48am) Iterative Reconstruction of SPECT Data
with Adaptive Regularization**
C. Riddell[1], I.Buvat[2], A. Savi[3], M.C. Gilardi[3], F. Fazio[3]
[1]*INSERM U494 and GE-SMVI*
[2]*INSERM U494*
[3]*INB-CNR, Ospedale H san Raffaele*

**M11-4 (9:02am) Efficient Fully 3D Monte Carlo Based
Reconstruction for General Quantitative SPECT**
F.J. Beekman, H.W.A.M. de Jong, S. vanGeloven
University Medical Center Utrecht

**M11-5 (9:16am) Image Reconstruction Algorithm for
a Rotating Slat Collimator**
L. Zeng[1], D. Gagnon[2], C. Mattews[2], J. Kolthammer[2],
J. Radachy[2]
[1]*University of Utah*
[2]*Marconi Medical Systems*

**M11-6 (9:30am) Cone-Beam Tomography from 12
Pinhole Vertices**
R. Clackdoyle, F. Noo
University of Utah

**M11-7 (9:44am) Compton Camera 3D Image
Reconstruction Using Rebinning**
J. Li[1], J.D. Valentine[1], J.N.Aarsvold[2], M. Khamzin[1]
[1]*Georgia Institute of Technology*
[2]*Emory University*

M12 — OTHER IMAGING MODALITIES
Saturday 10:30 am–12:10pm Town and Country Room
Session Chairs:
ORHAN NALCIOGLU, *University of California at Irvine*
MANBIR SINGH, *University of Southern California*

M12-1 (10:30am) Improved Breast Scintigraphy Using Digital Mammography
M.B. Williams[1], M.J. More[1], S. Majewski[2], D. Kieper[2], B. Kross[2], R. Wojcik[2], D. Weisenberger[2]
[1]*University of Virginia*
[2]*Jefferson Lab*

M12-2 (10:44am) Combining Electromagnetic and Hemodynamic Brain Activity Measurement Data by Optimization in the Space-Time Hyperspace
M. Negishi, S.J. Hanson, A. Zaimi
Rutgers University

M12-3 (10:58am) Fast 4D Spectral-Spatial Electron Paramagnetic Resonance Imaging for In Vivo Oxymetry
B.B. Williams, M.Elas, C.Mailer, A.D. Parasca, E.D. Barth, H.J. Halpern
University of Chicago, Dept. Radiation Oncology

M12-4 (11:12am) Influence of Conductivity Tensors in the Finite Element Model of the Head on the Forward Solution of EEG
S. Kim[1], T.S. Kim[1], Y. Zhou[1], M. Singh[2]
[1]*University of Southern California/Department of Biomedical Engineering*
[2]*University of Southern California/Department of Biomedical Engineering and Radiology*

M12-5 (11:26am) Independent Component Analysis with Mixture Density Model and Its Application to Localize the Brain Alpha Activity in fMRI and EEG
J.W. Jeong[1], T.S. Kim[1], M. Singh[2]
[1]*Dept. of Biomedical Engineering, University of Southern California*
[2]*Depts. of Biomedical Engineering and Radiology, University of Southern California*

M12-6 (11:40am) Regularized Iterative Reconstruction in Tensor Tomography Using Gradient Constraints
V.Y. Panin, G.L. Zeng, G.T. Gullberg
University of Utah

M12-7 (11:54am) Extraction of Temporal Information in Functional MRI
M. Singh, W. Sungkarat, J.W. Jeong
Univ. Southern California

**M13A — MIC POSTER III:
SMALL SYSTEMS AND DATA ACQUISITION**
Saturday 1:30–3:15pm Grand Ballroom
Session Chairs:
NEAL CLINTHORNE, *University of Michigan*
NICHOLAS YASILLO, *University of Chicago*

M13A-1 New Type of Lead Tungstate Crystals for Medical Imaging
D. Shen[1], X. Fang[1], R. Mao[1], G.Ren[1], S. Wang1, Z. Yin[1], X. Qu[2], L.Zhang[2], R.y. Zhu[2], S.P. Stoll[3], C.L. Woody[3]
[1]*Shanghai Institute of Ceramics, Shanghai 200050, China*
[2]*California Institute of Technology, Pasadena, CA 91125, U.S.A.*
[3]*Brookhaven National Laboratory, Upton, NY 11973, U.S.A.*

M13A-2 Simulation of Maximum-Likelihood Position Estimation in Small Gamma Camera with Position-Sensitive Photomultiplier Tube (PSPMT)
W. Lee, G. Cho, S.W. Lee, S. Chang, T.H. Lee
Korea Advanced Institute of Science and Technology

M13A-3 PET/SPECT Detectors with Light Intensifiers and Fiber Coding
P. Antich, N. Slavin, E. Tsyganov
The University of Texas SWMC at Dallas

M13A-4 Simulation Studies on the Detection Efficiency for a Phoswiched Detector with Noise Rejection Capability
K. Tarutani[1], S. Yamamoto[2], K. Minato[1], M. Senda[3]
[1]*Nara Institute of Science and Technology*
[2]*Kobe City College of Technology*
[3]*Institute for Biomedical Research and Innovation*

M13A-5 A Simulation and Modeling Study Comparing the Performance of a Germanium Orthogonal Strip Detector and an Anger Camera
M. Gombia[1], A.B. Brill[2], M. Stabin[2], D. Bollini[3], A.D. Guerra[4]
[1]*Department of Physics and Department of Nuclear Engineering (DIENCA), University of Bologna*
[2]*Department of Radiology, Vanderbilt University*
[3]*Department of Physics, University of Bologna and sezione INFN di Bologna*
[4]*Dept. of Physics, University of Pisa, and sezione INFN di Pisa*

M13A-6 Evaluation of CsI(Tl)-PIN Diode Array Tiling Schemes
L.R. MacDonald, C.R. Tull, B.E. Patt, J.S. Iwanczyk
Photon Imaging, Inc.

M13A-7 Comparison of Wavelength-Shifting Fiber Types and Methods of Ribbon Assembly for a Depth-Encoding Anger Detector
K.L. Matthews, S.M. Leonard, C.E. Ordonez, W. Chang
Rush-Presbyterian-St.Luke's Medical Center

M13A-8 Analog Readout System with Charge Division Type Output
V. Popov, S. Majewski, A. Weisenberger, R. Wojcik
Thomas Jefferson National Accelerator Facility

M13A-9 A Simulation Study of Coincidence Line Spread Function (CLSF) Estimation for Small Scintillator Blocks
M. Aykac, H.Baghaei, J. Uribe, Y. Wang, H. Li, Y. Liu, T. Xing, W.H. Wong
The University of Texas,MD Anderson Cancer Center

M13A-10 (3:36pm) A High-Performance VME-Based Acquisition System for Positron Emission Mammography
D.J. Abbott,A. Weisenberger, S. Majewski, W.G. Heyes, D. Kieper, B. Kross, V. Popov, R. Wojcik
Thomas Jefferson National Accelerator Facility

M13A-11 Coincidence Time Alignment for Planar Pixellated Positron Emission Tomography Detector Arrays
M. Lenox, T. Gremillion, S. Miller, J. Young, *CTI*

M13A-12 Optimisation of Fibre-Optic Readout of LSO Scintillation Crystals with Acid Etching
D. Strul, J. Sutcliffe-Goulden, P. Halstead, P.K. Marsden
Clinical PET Centre, Guy's, King's and St Thomas'School of Medicine, London

M13A-13 Effect of Photomultiplier Gain-Drift and Radiation Exposure on 2D-Map Decoding of Detector Arrays Used in Positron Emission Tomography
J. Uribe, H.Li, H. Baghaei, M. Aykac, Y. Wang, Y. Liu, T. Xing, W.H. Wong
University of Texas MD Anderson Cancer Center

M13A-14 An Iterative Energy-Centroid Method for Recalibration of PMT Gain In PET or Gamma Camera
Y. Wang, W.H. Wong, M. Aykac, J. Uribe, H. Li, Y. Liu, H.Baghaei, T. Xing
Univ. of Texas,MD Anderson Cancer Center, Houston, TX 77030

M13A-15 A New Pileup-Prevention Front-End Electronic Design for High Resolution PET and Gamma Cameras
H.Li, W.H. Wong, J. Uribe, H.Baghaei, Y. Wang, Y. Liu, T. Xing, M. Aykac
University of Texas,M.D. Anderson Cancer Center

M13A-16 Design of a Firewire Based Data Acquisition System for use in Animal PET Scanners
T.K. Lewellen, C.M. Laymon, R.S. Miyaoka
University of Washington Medical Center

M13A-17 Optimal Design in PET Data Acquisition: A New Approach Using Simulated Annealing and Component-wise Metropolis Updating
W.H. Liao[1], S.C. Huang[2], K. Lange[1], E. Landaw[1], M. Bergsneider[3]
[1]*Department of Biomathematics,UCLA*
[2]*Department ofMolecular and Medical Pharmacology, UCLA*
[3]*Brain Injury Research Center, UCLA School of Medicine*

M13A-18 Design of Front-End Circuits for Dedicated PET Detectors
N.Zhang[1], C.J. Thompson[2], D. Togane[2]
[1]*BioMedical Engineering Department/McGill University*
[2]*Montreal Neurological Institute/McGill University*

M13A-19 Development of Low Power High Speed Readout Electronics for High Resolution PET with LSO and Avalanche Photodiode Arrays
G. Visser[1], M. Clajus[1], T. Tumer[1], S. Cherry[2], Y. Shao[2]
[1]*NOVA R&D, Inc*
[2]*Crump Institute for Biological Imaging,UCLA*

M13A-20 Monte Carlo Simulator for Depth Encoding Multicrystal Detector for PET
H. Haneishi[1], A. Yamada[1], K. Takagi[1], H.Murayama[2]
[1]*Chiba University*
[2]*National Institute of Radiological Sciences*

M13A-21 Monte-Carlo Modeling of Scintillator Crystal Performance for Stratified PET Detectors with DETECT2000
F. Cayouette[1], C.J. Thompson[1], C. Moisan[2]
[1]*Montreal Neurological Institute*
[2]*Quebec City University Hospital*

M13A-22 Intraoperative Imaging Probe for Sentinel Node Localization
S. Pitre[1], M. Solal[1], P. Lanièce[1], R. Mastrippolito[1], Y. Charon[2], L. Ménard[2], M.Ricard[3]
[1]*Institut de Physique Nucléaire d'Orsay*
[2]*Groupe Modélisation Physique Interfaces Biologie, Université Paris 7*
[3]*Institut Gustave Roussy & U66-INSERM*

M13A-23 A Comparison Study of Intracerebral Scintillation Beta Microprobes
C.L. Woody, D.J. Schlyer, S.P. Stoll, S. Shokouhi, M. Gerasimov, P. Vaska, N. Volkow, J.S. Fowler, S.L. Dewey
Brookhaven National Lab

M13A-24 Real Time Beta-imaging with Silicon Hybrid Pixel Detectors:Investigations into Amino Acids Uptake and Genetics
E. Bertolucci,M. Conti, A.D. Cosmo, M. Maiorino, G. Mettivier, M.C. Montesi, G.P.T. Pecorella, P. Russo, R. Scognamiglio
Federico II University and INFN, Napoli,Italy

M13B-1 Compensation for Head Movements in 3D PET
R.R. Fulton[1], L. Tellmann[2], U. Pietrzyk[2], H.Herzog[2], K. Zilles[2]
[1]*Royal Prince Alfred Hospital*
[2]*Institut fur Medizin, Forschungszentrum Juelich*

M13B-2 Arterial Input Function Measurements using Radiotracers and Microbubbles: Preliminary Results
A.E. Spinelli, R.J. Ott, G.R.t.Harr
Institute of Cancer Research

M13B-3 Image Contrast Improvement with Local Weighting Corrections from Organ Biodistribution Information by External TLD Measurement in PET Studies

S.L.Dong1, T.C.Chu[1], J.S. Lee[2], R.S. Liu[3]
[1]*National Tsing–Hua University, Hsin–Chu*
[2]*National yang–Ming University, Taipei*
[3]*National PET/Cyclotron Center, TVGH, Taipei*

M13B-4 Non-negative Matrix Factorization of Dynamic Images in Nuclear Medicine

J.S. Lee[1], K.S. Park[1], D.S. Lee[1], D.D. Lee[2], S. Choi[3]
[1]*Seoul National University*
[2]*Bell Laboratories,Lucent Technologies*
[3]*Pohang University of Science and Technology*

M13B-5 Randoms Correction for Gamma Camera Based PET Listmode Reconstruction

S. Vandenberghe[1], Y. D'Asseler[1], M. Koole[1], L. Bouwens[1], R.V.D. Walle[1], I. Lemahieu[1], R. Dierckx[2]
[1]*Medisip, Elis*
[2]*Department Of Nuclear Medicine*

M13B-6 A Monte Carlo Model of Noise Components in 3D PET

I.Castiglioni, M.Gilardi,A. Savi, O. Cremonesi, E.Bellotti, G.Rizzo, V. Bettinardi, F. Fazio
INB – CNR, Università di Milano – Bicocca,Istituto H S. Raffaele, Milano (Italia)

M13B-7 Tracking Cardiac Twist in Gated PET Imagery

G.J. Klein[1], A. Sitek[2], G.T. Gullberg[2], R.H. Huesman[1]
[1]*Lawrence Berkeley National Laboratory*
[2]*University of Utah*

M13B-8 Dynamic and Static Tomographic Renal Coincidence Imaging with a Gamma Camera Using Rb-82: A Feasibility Study.

P.H. Pretorius, L.C.T. Fung, C.P. Schell,K. Nishinaka, C.J. Groiselle, S.J. Glick,M.A. King
University of Massachusetts Medical School

M13B-9 A New Data Model for PET Blank Scan and the ML Estimation of Detector Efficiencies

W.H. Lee, J.M.M. Anderson, J.R. Votaw
University of Florida

M13B-10 Evaluation of the Reliability in Kinetic Analysis for Dual Tracer Injection of FDG and Flumazenil PET Study

Y. Ikoma[1], A. Uchiyama[1], H. Toyama[2], K.Uemura[2]
[1]*Waseda University*
[2]*National Institute of Radiological Sciences*

M13B-11 Determination of Three-Dimensional Voxel Sensitivity for Two- and Three-Headed Coincidence Imaging

E.J. Soares[1], K.Germino[1], S.J. Glick[2]
[1]*College of the Holy Cross*
[2]*University of Massachusetts Medical School*

M13B-12 Real-time Event Stream Correction for Patient Motion in Clinical 3-D PET

W.F. Jones
CTI PET Systems,Inc.

M13B-13 Maximum-Likelihood Estimation of Normalisation Factors for PET

D. Hogg, K.Thielemans, T. Spinks
Imaging Research Services Ltd.

M13B-14 Measurement of the Change in Noise-Effective Count-Rate During PET Brain Studies with Additional Shielding

C.J. Thompson[1,2], M.L. Camborde[1]
[1]*Montreal Neurological Institute*
[2]*Scanwell Systems*

M13B-15 Evaluation of the Bootstrap Method for Estimations of Image Noise in PET

M. Dahlbom
UCLA

M13B-16 Correction Methods For Random Coincidences in 3D Wholebody PET Imaging

D. Brasse[1], P.E. Kinahan[1], C. Lartizien[1], M. Casey[2], C. Michel[2], T. Bruckbauer[2], C. Comtat[3]
[1]*Department of Radiology, University of Pittsburgh, Pittsburgh, PA 15213 USA*
[2]*CTI Inc., Knoxville, TN USA*
[3]*Dept. of Medical Research,SHFJ, CEA, 91401 Orsay, France*

M13B-17 Simultaneous Optimization of Attenuation and Activity Image Estimates Using Paraboloidal Surrogates

M. Jacobson, J.A. Fessler
University of Michigan, Ann Arbor

M13B-18 Segmentation Based WLS and MLAttenuation Correction for PET Data

R. Srinivasan, J.M.M. Anderson, B.A.Mair, J.R. Votaw
University of Florida

M13B-19 Segmented Attenuation Correction Using Cs-137 Single Photon Transmission

K. Bilger, L.E. Adam, J.S. Karp
University of Pennsylvania

M13B-20 Attenuation Correction for Whole-Body PET Imaging using Automated Fuzzy Clustering-Based Segmentation Method

M. Diaz-Gomez, H. Zaidi, D.O. Slosman
Division of Nuclear Medicine, Geneva University Hospital

M13B-21 Expanding the Versatility of an Accelerated Monte Carlo Simulation for Scatter in 3D PET: Data Correction of PET Emission Scans Using [124]I

C.H. Holdsworth[1], M.Dahlbom[1], M. Janecek[1], E. Hoffman[1], A. Liu[2], L. Williams[2], C.S. Levin[3]
[1]*UCLA*
[2]*City of Hope National Medical Center*
[3]*UCSD and San Diego VA Medical Center*

M13B-22 A Monte-Carlo Simulation Study on Coarse Septa for Scatter Correction in 3D PET
T. Hasegawa[1], E. Tanaka[2], T. Yamashita[2], M. Watanabe[2], T. Yamaya[3], H. Murayama[4]
[1]*Kitasato University*
[2]*Hamamatsu Photonics KK*
[3]*National Institute of Radiological Sciences, Tokyo Institute of Technology*
[4]*National Institute of Radiological Sciences*

M13B-23 Attenuation and Scatter Correction in Fully 3D Limited Angle PET
F. Pönisch[1], W. Enghardt[1], K. Lauckner[2]
[1]*Forschungszentrum Rossendorf*
[2]*Scientific Consulting Group GmbH Freiburg*

M13B-24 Quantitative and Imaging Performance of the Non-pure Positron Emitter ^{124}I
H. Herzog[1], L. Tellmann[1], T. Jacke[1], S. Spellerberg[2], H.H.Coenen[2], S.M.Qaim[2]
[1]*Institute of Medicine, Forschungszentrum Jülich*
[2]*Institute of Nuclear Chemistry, Forschungszentrum Jülich*

M13B-25 Biases Affecting Tumor Uptake Measurements in FDG PET
M. Soret, C. Riddell, S. Hapdey, I. Buvat
U494 INSERM

M13B-26 The Effect of Attenuation on Lesion Detection in PET Oncology
C. Bai, L. Shao, M.Zhao, A.D. Silva, J. Ye
ADAC Laboratories

M13C — MIC POSTER III: QUANTITATIVE SPECT TECHNIQUES
Saturday 1:30–3:15pm Grand Ballroom
Session Chairs:
MARK SMITH, *Jefferson Lab*
FREEK BEEKMAN, *Univ. Medical Center Utrecht, Netherlands*

M13C-1 PI-Scheme Short-Scan SPECT and Image Reconstruction
X. Pan, C.M. Kao, C.Metz
University of Chicago

M13C-2 A Noise Reduction Method for Non-Stationary Noise Model of SPECT Sinogram Based on Kalman Filter
X. Li, H. Lu, G.Han, Z. Liang
State University of New York at Stony Brook

M13C-3 Collimator Blurring Reduction Method Using Fine Angular Sampling Projection Data in SPECT
N.Motomura[1], K. Nambu[1], A. Kojima[2], S. Tomiguchi[2], K.Ogawa[3]
[1]*Toshiba Medical Systems*
[2]*Kumamoto University*
[3]*Hosei University*

M13C-4 Investigation of Acquisition and Image Reconstruction Parameters for Multi-Segment Rotating Slant-Hole SPECT
Y. Wang, W.H. Baird, B.M.W. Tsui, E.C. Frey, D.E. Wessell
The University of North Carolina at Chapel Hill

M13C-5 Direct 3D image reconstruction for the Energy Subtraction Compton Scattering Camera (ESCSC)
J. Li, J.D. Valentine
Georgia Institute of Technology

M13C-6 Reconstruction of Compton-Camera Images Using Artificial Neural Networks
T. Karg, G. Anton, W. Beulertz, J. Pauli
University of Erlangen

M13C-7 Optimization of Iterative Reconstructions of Tc-99m Cardiac SPECT Studies Using Numerical Observers
M.V. Narayanan[1], H.C. Gifford[1], M.A. King[1], P.H. Pretorius[1], T.H. Farncombe[1], P. Bruyant[1], M.N. Wernick[2]
[1]*University of Massachusetts Medical School, Worcester, MA*
[2]*Illinois Institute of Technology, Chicago, IL*

M13C-8 Evaluation of Data Acquisition Geometries and Strategies for Myocardial SPECT Imaging
Y. Qi[1], B.M.W. Tsui[1], E.C. Frey[1], K.J. Gilland[1], G.T. Gullberg[2]
[1]*Department of Biomedical Engineering, University of North Carolina at Chapel Hill*
[2]*Department of Radiology, University of Utah*

M13C-9 Selection of Optimum Projection Angles in Three Dimensional Myocardial SPECT
S. Ohno, K. Ogawa
Hosei University

M13C-10 Development of Quantitative Imaging Methods for the GE Hawkeye CT/SPECT System
K.H. Wong[1], H.R. Tang[1], G.M. Segall[2], B.H. Hasegawa[1]
[1]*University of California San Francisco*
[2]*VA Palo Alto Health Care System, Stanford Medical Center*

M13C-11 Experimental Verification of 3-D Detector Response Compensation Using the OSEM Reconstruction Method
S.A.Blinder[1], A.Celler[1], R.G. Wells[2], D. Thomson[3], R. Harrop[1]
[1]*Vancouver Hospital and Health Sciences Centre*
[2]*Lawson Health Research Institute*
[3]*University of British Columbia*

M13C-12 Effect of Including Detector Response in SPECT Quantification of Focal 131-I Activity
K.F. Koral, Q. Lin, A.Akhtar, J. Lia, Y.K.Dewaraja, J.A. Fessler
University of Michigan Medical Center

M13C-13 Comparison of Two Methods for SPECT Attenuation Correction Without Transmission Measurements
D. Gourion[1], X. Hatchondo[1], P. Gantet[1], J.P. Esquerré[1], D. Noll[2]
[1]*Laboratoire Traceurs et Traitement de l'Image, Toulouse*
[2]*Mathématiques pour l'Industrie et la Physique*

M13C-14 Comparison of Scatter Compensation Strategies for Cardiac Perfusion Imaging Using Tc-99m Labeled Sestamibi
Y.S. Gur[1], T. Farncombe[2], H.P. Pretorius[2], H. Gifford[2], M. Nararayan[2], M.A. King[2], E.C. Frey[3], D. Gagnon[4]
[1]*Soreq NRC and UMASS Medical School*
[2]*UMASS Medical School*
[3]*University of North Carolina*
[4]*Marconi Medical System*

M13C-15 A Novel Klein-Nishina Based Scatter Correction Method for SPECT and Planar Imaging
C. Jonsson[1], M. Pagani[2], L. Johansson[1], A. Sánchez-Crespo[1], P. Schnell[1], S.A. Larsson[3]
[1]*Karolinska Hospital, Stockholm, Sweden*
[2]*Institute of Experimental Medicine, CNR, Rome, Italy*
[3]*Karolinska Hospital and Institute, Stockholm, Sweden*

M13C-16 Using Energy Information in SPECT List-Mode Reconstruction to Correct for Scatter
L. Bouwens[1], R.V.D. Walle[1], S. Vandenberghe[1], I. Lemahieu[1], H.Gifford[2], M.King[2], R. Dierckx[3]
[1]*Ghent University, ELIS-MEDISIP*
[2]*University of Massachusetts Medical School, Division of Nuclear Medicine*
[3]*Ghent University Hospital, Division of Nuclear Medicine*

M13C-17 Comparative Assessment of Energy-Based Methods of Compensating for Scatter and Lead X-Rays in Ga-67 SPECT Imaging
S.C.Moore[1], G. ElFakhri[1], P. Maksud[2]
[1]*Brigham & Women's Hospital and Harvard Medical School*
[2]*University of Paris XI and INSERM U494*

M13C-18 Quantitative Image Reconstruction in Simultaneous I-123/Tc-99m Myocardial SPECT
N. Yamada, K.Ogawa
Hosei Univ., College of Eng.

M13C-19 Characterization and Correction of Scatter in LEHR Collimated Gamma Camera PET
E.V.R. DiBella
University of Utah

M13C-20 A Model-Based Crosstalk Compensation Method for Simultaneous Tl-201 and Tc-99m Dual Isotope Myocardial SPECT Imaging
W.T. Wang, E.C. Frey, B.M.W. Tsui, C. Tocharoenchai
UNC–Chapel Hill

M13C-21 An Investigation into the Impact of Photon Scatter in the Detection of Ga-67 Tumours Using Channelized Hotelling and Human Observers
T.H. Farncombe, H.C. Gifford, M.A. King, M.V. Narayanan, P.H. Pretorius, P. Bruyant
University of Massachusetts Medical School

M13C-22 Correction of the Respiratory Motion of the Heart by Tracking of the Center of Mass of Thresholded Projections: A Simulation Study using the Dynamic MCAT Phantom
P.P. Bruyant, M.A. King, P.H. Pretorius
Univ. of Massachusetts Medical School

M13C-23 Study of the Effect of Statistical Fluctuations on Defect Detectability at Clinical Count Levels in Cardiac SPECT
M.K. Durbin, C.Bai, J. Ye, Z. Zhao, A.J.D. Silva, L. Shao
ADAC Laboratories

M13C-24 Observer Studies of Cardiac Lesion Detectability with Triple-Head 360 Degree vs. Dual-Head 180 Degree SPECT Acquisition Using Simulated Projection Data
M. Chen, R. Jaszczak, D. Gilland, J. Bowsher, M. Tornai, J. Peter, S. Metzler, S. Li
Duke University

M13C-25 Conjugate View 131-I Activity Quantification Using Registered Whole-Body Scintillation-CameraImages and a Projected CT
K. Sjogreen, M. Ljungberg, S.E. Strand
Department, Radiation Physics, The Jubileum Institute, Lund University, Sweden

M14-1 (3:45pm) Small Spheres for Lesion Detection Phantoms
T.G. Turkington, T.R. DeGrado, W.H. Sampson
Duke University Medical Center

M14-2 (3:59pm) Assessment of Image Quality with a Fast Fully 3D Reconstruction Algorithm
M.E. Daube-Witherspoon, S. Matej, J.S. Karp
University of Pennsylvania

M14-3 (4:13pm) Numerical and Human Observer Comparisons of 2D versus 3D Wholebody PET Imaging Protocols for Tumor Detection
C. Lartizien[1], P.E.Kinahan[1], R. Swensson[1], M.Lin[1], C. Comtat[2], R. Trebossen[2]
[1]*Department of Radiology, University of Pittsburgh, Pittsburgh, PA*
[2]*Department of Medical Research, SHFJ, CEA, 91401 Orsay, France*

M14-4 (4:27pm) Lesion Detectability of Positron Emission Mammography
J. Qi, R.H. Huesman
Lawrence Berkeley National Laboratory

M14-5 (4:41pm) Analysis of Factors Affecting PEM Image Formation
M.F. Smith[1], S. Majewski[1], A.G. Weisenberger[1], D. Kieper[1], R.R. Raylman[2], T.G. Turkington[3]
[1]*Thomas Jefferson National Accelerator Facility*
[2]*West Virginia University*
[3]*Duke University Medical Center*

M14-6 (4:55pm) Using the Channelized Hotelling Observer on Multi-Slice and Multi-View Simulated SPECT Myocardial Perfusion Images
M. Chen[1], J.E.Bowsher[1], A.H. Baydus[1], R.J. Jaszczak[1], K.L. Gilland[2]
[1]*Duke University*
[2]*The University of North Carolina at Chapel Hill*

M14-7 (5:09pm) An Investigation of Projection Sampling for Ga-67 Tumor Detection
H.C. Gifford, T.H. Farncombe, M.A. King
University of Massachusetts Medical School

SeaWorld San Diego is a 150-acre marine zoological park on San Diego's Mission Bay. With several major shows, fascinating exhibits, rides,aquariums, and Shamu (the star attraction, shown above), SeaWorld is one of the most popular attractions.

ROOM-TEMPERATURE SEMICONDUCTOR X-RAY AND GAMMA-RAY DETECTORS (RTSD)

It is our great pleasure to welcome you to the 12th International Workshop on Room-Temperature Semiconductor X-Ray and Gamma-Ray Detectors. This bi-annual conference represents the largest forum of scientists and engineers working to develop new solid-state radiation detectors and imaging arrays.

For those of you who have attended the past workshops, welcome back! As Chairs for the workshop, we are particularly delighted to make the acquaintance of new contributors, as there are many challenges that lie ahead, some of which will be solved by those who are now relatively new to the subject area.

It is our sincere hope that this conference will facilitate cross-fertilization of research and spawn creative ideas, and that these ideas will be incarnated into knowledge, leading to new directions and thrusts. We urge you to take time at this meeting to build on the commonality of your work with colleagues within the RTSD, NSS and MIC conferences, and to share your data, energy and experience, and explore ways to enhance cooperation and collaboration with others.

We have chosen to hold this meeting as a satellite to the IEEE NSS and MIC meetings for the purpose of encouraging information exchange between a much larger body of scientists and engineers who have an in-depth knowledge of detectors, instrumentation,nuclear science and technology, and medical imaging. Joint sessions between the NSS and MIC are planned to help bring people together with common interests and offer the right environment for the creation of new and fruitful associations.

We would like to thank the speakers and attendees for their contributions,and express our gratitude to the session chairs and members of the Workshop Program Committee, who have offered their time to enlist the involvement of most researchers working in the field.

Ralph B. James, RTSD Program Chair
Paul Siffert, RTSD Program Deputy Chair

**RTSDPROGRAMCHAIR
RALPH B. JAMES**

**RTSDPROGRAMCHAIR
DEPUTY, PAUL SIFFERT**

Monday 8:30am Sunrise Room
Welcome: RALPH B. JAMES, *Brookhaven National Laboratory*
Session Chair:
YOSSI EISEN, *Soreq, Israel*

R1-1 (8:40am) Performance of 1x1x1cm[3] Pixelated CdZnTe Gamma Detectors
A. Shor, I. Mardor, and Y. Eisen
Soreq NRC, Yavne 81800 Israel

R1-2 (8:58am) Effects of Bulk and Surface Conductivity on the Performance of CdZnTe Pixel Detectors
A.E. Bolotnikov, S.E. Boggs, C.M.H. Chen, W.R. Cook,
F.A. Harrison, I. Kuvvetli, A.S.M. Schindler
California Institute of Technology, Pasadena, CA

R1-3 (9:16am) Noise Reduction in CdZnTe Coplanar-Grid Detectors
P.N. Luke, J.S. Lee, M. Amman, K.M. Yu
Lawrence Berkeley National Laboratory, Berkeley, CA

R1-4 (9:34am) CdZnTe Schottky Diodes for Radiation Spectroscopy
M.A. Hossain
University of Surrey, Dept. of Physics, UK

R1-5 (9:52am) Development of Drift-Strip Detectors Based on CdZnTe
V. Gostilo[1], D. Gryaznov[1], I. Lisjutin[1], A. Loupilov[1],
C. Budtz-Jorgensen[2], I. Kuvvetli[2]
[1]*Baltic Scientific Instruments*
[2]*Danish Space Research Institute, Copenhagen, Denmark*

Monday 10:30am Sunrise Room
Session Chair:
MICHAEL FIEDERLE, *University of Freiburg*

R2-1 (10:30am) Development of Large Gamma Ray Imaging Arrays with Schottky CdTe Detectors
K.-L. Giboni, E. Aprile, U. Oberlack
Columbia Astrophysics Laboratory

R2-2 (10:48am) Comparison of Pixelized Structures to Discrete CdTe Detectors Arrays for Hand Held Imaging Gamma Probes Applications (Invited)
E. Baumann[1], A. van Lingen[2], N.M. Bruin[2], T. Ijbema[3],
D. Feder[1], P.G.H.M. Raijmakers[2], and G.J.J. Teule[2]
[1]*EURORAD, Strasbourg Cedex 2*
[2]*Department of Nuclear Medicine, University Hospital, Amsterdam, The Netherlands*
[3]*PI-Medical Diagnostic Equipment, The Netherlands*

R2-3 (11:12am) The Investigation of Resistivity Mapping of CdTe: Cl in Correlation with Te-Precipitates Annealing
M. Ayoub[1], M. Hage-Ali[1], A. Zumbiehl[1], R. Regal[1],
J.M. Koebel[1], C. Rit[1], P. Fougères[2], P. Siffert[1]
[1]*PHASE-CNRS, 23, Strasbourg, France*
[2]*EURORAD II-VI, 23, Strasbourg, France*

R2-4 (11:30am) Study of the Homogeneity in the THM-CdTe Monolithic Nuclear Detector Arrays: The Role of the Electron Lifetime and the Resistivity
A. Zumbiehl, M. Hage-Ali, R. Regal, M. Ayoub,
J.M. Koebel, P. Siffert
Laboratoire PHASE-CNRS, 23, Strasbourg, France

R2-5 (11:48am) N-Type and P-Type Doping Techniques for CdTe Crystal Using Excimer Laser Annealing
A. Nakamura, M. Niraula, K. Asano, T. Aoki, Y. Hatanaka
Research Institute of Electronics, Shizuoka University, 3-5-1 Johoku, Hamamatsu 432-8011, Japan

Monday 1:45pm Sunrise Room
Session Chair:
WALDES DUSI, *Instituto TESRE/CNR*

R3-1 (1:45pm) Industrial Applications of Semiconductor X-Ray Detectors in Portable Analytic Instruments (Invited)
Lee Grodzins
R&D, Niton Corporation, Billerica, MA

R3-2 (2:09pm) Performance of Large-Area CZT Detectors for Hard X-Ray Imaging
M. Pelling, W. Heindl, J. Matteson and R. Rothschild
Center for Astrophysics and Space Sciences, University of California, San Diego

R3-3 (2:27pm) Temperature Dependent Performance of InP Radiation Detectors
P. Sellin, H. El-Abbassi, S. Rath
University of Surrey, UK

R3-4 (2:45pm) CZT Detectors with 3-D Readout for Gamma-Ray Spectroscopy and Imaging
J. Matteson, M. Pelling and T. Skelton
Center for Astrophysics and Space Sciences, University of California, San Diego, CA

R3-5 (3:03pm) CACAO a Collimation Means Well Suited for Pixellated Gamma-Camera
C. Jeanguillaume[1,2], A. Douiri1, M. Quartuccio[1], M. Tence[1],
P. Ballongue[1]
[1]*Bat 510 Faculte Des Sciences D'Orsay*
[2]*Hopital Henri Mondor CRETEIL*

Monday 3:45pm Sunrise Room
Session Chair:
DAVID SPEARS, *U.S.Department of Energy*

R4-1 (3:45pm) Characterization of CdTe and (Cd,Zn)Te the Crystals Grown by the Vertical Bridgman Method
M. Fiederle, A. Fauler, J. Franc, V. Babentsov, K.-W. Benz
Material Research Center FMF, Freiburg, Germany

R4-2 (3:53pm) Main Advances in X- and Gamma-Ray Imaging with CdTe/CZT (Invited)
O. Peyret
LETI (cea-Recherche Technologique), France

R4-3 (4:17pm) Characterization of CdTe/CdZnTe Detectors
G. Sato[1], T. Takahashi[1], M. Kouda[1], S. Watanabe[1], T. Mitani[1], Y. Okada[2], M. Sugiho[2]
[1]*Institute of Space and Astronautical Science, and Dept.of Physics, University of Tokyo, Japan*
[2]*Dept. of Phyiscs, University of Tokyo,Japan*

R4-4 (4:35pm) Spectral Characteristics of Large Volume CdTe (CZT) Detectors:Comparison Between Hemispheric, Planar and Planar Grid Devices
M. Sowinska[1], G. Hennard[1], D. Feder[1] and M.Hage Ali[2]
[1]*EURORAD, Strasbourg Cedex 2*
[2]*CNRS-PHASE,Strasbourg, France*

R4-5 (4:59pm) Detector Characterization of Melt-Grown Cadmium Zinc Telluride Crystals
M. Schieber[1], T.E. Schlesinger[2], R.B. James[3], H.Hermon[4], H. Yoon[5,6], and M.Goorsky[5]
[1]*The Hebrew University of Jerusalem,Jerusalem,Israel*
[2]*Carnegie Mellon University, Pittsburgh, PA*
[3]*Brookhaven National Laboratory, Upton,NY*
[4]*Real Time Radiography Readout, Malkha Technological Park, Jerusalem,Israel*
[5]*University of California at Los Angeles,Los Angeles, CA*
[6]*Present Address:Spectrolab, Sylmar, CA*

R4-6 (5:17pm) Single and Back-To-Back Room Temperature Operated Detectors:A Comparison (Invited)
Eugenio Perillo[1], Natalia Auricchio[2], Ezio Caroli[2], Ariano Donati[2], Waldes Dusi[3], Paul Fougeres[4], Makram Hage-Ali[5], Paul Siffert[5]
[1]*Dip. di Scienze Fisiche, Universita "Federico II", UdR INFM and Sezione INFN, Napoli, Italy*
[2]*Istituto TESRE/CNR, Bologna,Italy*
[3]*Instituto TESRE/CNR and Sezione INFN,Bologna,Italy*
[4]*EURORAD, Strasbourg, France*
[5]*Lab. PHASE/CNRS,Strasbourg, France*

R4-7 (5:41pm) Characterization of CdTe and CdZnTe Detectors in High Radiation Fields
A. Rybka, V. Kutny, A.Abyzov, I. Prokhoretz, E.Al
National Science Center "KIPT",Kharkov, Ukraine

Tuesday 8:30am Sunrise Room
Session Chair:
ARNOLD BURGER, *Fisk University*

R5-1 (8:30am) Radiation Damage Effects on CZT Drift Strip Detectors
C. Budtz-Jorgensen[1], I. Kuvvetli[1], U. Korsbech[2], M.Jensen[3]
[1]*Danish Space Research Institute, Copenhagen, Denmark*
[2]*Technical University of Denmark,Denmark*
[3]*Copenhagen University Hospital,Copenhagen,Denmark*

R5-2 (8:48am) Photo-Electronic Investigation of CdZnTe Spectral Detectors
M. A.Hossain, E. J. Morton, M. E. Ozsan
University of Surrey, UK

R5-3 (9:06am) Investigation of the Influence of Electrical Contacts on the Performance of CZT Detectors Using a Nuclear Microprobe (Invited)
G. Vizkelethy[1], B.L.Doyle[1], D.S. Walsh[1], and R.B. James[2]
[1]*Sandia National Laboratories, Albuquerque, NM*
[2]*Brookhaven National Laboratory, Upton NY*

R5-4 (9:30am) A System for the Electro-Optical Characterization of CdZnTe Radiation Detectors
A. Cola
CNR-IME, Italy

R5-5 (9:48am) Electronic Transport Properties of the CZT Counter Grade Detectors
Z. Pastuovic[1], M. Jaksic[1], Z.Medunic[1], N. Skukan[1], R.B. James[2]
[1]*Institute "rudjer Boskovic"*
[2]*Brookhaven National Laboratories, Upton NY*

BRETT SHOAF/SAN DIEGO CVB

The centerpiece of San Diego's revitalized downtown is Horton Plaza, an 11.5 acre multi-level shopping and entertainment complex.

R6-1 (10:35am) Prototype 3-Dimensional Position-Sensitive HgI$_2$ Gamma-Ray Spectrometers
Z.He[1] and R.P. Devito[2]
[1]*The University of Michigan, Ann Arbor, MI*
[2]*Constellation Technology Corporation, Largo, FL*

R6-2 (10:53am) Progress in Mercuric Iodide Detector Development (Invited)
L. van den Berg
Constellation Technology Corporation, Largo, FL

R6-3 (11:17am) Mercuric Iodide Elevated Temperature Spectral Performance Evaluation
F. Vaccaro, M.Hykin, R. Vigil, L. V. D. Berg, R. Devito, C. Johnson
Constellation Technology Corporation, Largo, FL

R6-4 (11:35am) Polycrystalline Mercuric Iodide Films: Deposition, Properties and Detector Performance
U.N. Roy[1], Y. Cui[1], G. Wright[1], C. Barnett[1], A. A. Burger[1], L.A. Franks[2], Z. W. Bell[3]
[1]*Fisk University, Nashville, TN*
[2]*Consultant, Santa Barbara, CA*
[3]*BWXT Y-12*

R8-1 A Study of the Spectroscopic Response of a Single CdTe Detector When Irradiated at Various Angels of Incidence
W. Dusi[1], N. Auricchio[2], E.Caroli[2], A. Donati[2], P. Fougeres[3], G. Landini[2], E. Perillo[4], P. Siffert[5], G. Ventura[2]
[1]*Instituto TESRE/CNR and Sezione INFN, Bologna, Italy*
[2]*Instituto TESRE/CNR, Bologna, Italy*
[3]*EURORAD, Strasbourg, France*
[4]*Dip. Di Scienze Fisiche, Universita "Federico II", Udr INFM and Sezione INFN, Napoli, Italy*
[5]*Lab. PHASE/CRNS, Strasbourg, France*

R8-2 High-Resolution CdTe Radiation Detectors with Single-Polarity Charge Sensing Technique
R. Tomie, K. Hitomi, T. Shoji, Y. Hiratate
Tohoku Institute of Technology, Japan

R8-3 A Compact Array of CdTe Spectrometers for a Prototype Balloon Flight
E. Caroli, A.Donati, G. Landini, J.B. Stephen, G. Ventura
Instituto TESRE/CNR

R8-4 Radiation Damage Induced by 2 MeV Protons in CdTe and CdZnTe Planar Detectors
M. Zanarini[1], P. Chirco[1], W. Dusi[2], N. Auricchio[2], E.Caroli[2], A.Cavallini[3], B. Fraboni[3], P. Siffert[4], P. Fougeres[5], M. Bianconi[6]
[1]*SOFTEC, Bologna, ITALY*
[2]*Instituto TESRE – CNR, Bologna, ITALY*
[3]*INFM and Dipartimento di Fisica, Universita di Bologna, Bologna, ITALY*
[4]*Lab. PHASE – CNRS, Strasbourg, FRANCE*
[5]*EURORAD, FRANCE*
[6]*Instituo LAMEL – CNR, Bologna, ITALY*

R8-5 Growth of CdTe and (Cd,Zn)Te Crystals from the Vapor Phase for Spectrometer Applications
A. Fauler[1], M. Fiederle[1], K.-W. Benz[1], S.S. Stoleyarov[2], Y. Gorelik[2], Y. Nemirovsky[2]
[1]*Material Research Center*
[2]*Israel Institute of Electrical Engineering, Dept. of Electrical Engineering, Technion City*

R8-6 In-Situ Evaluation of the Caesium Deposit by a CZT Detector
D. Brajnik
J. Stefan Institute and Faculty of Electrical Engineering, *University of Ljubljana*

R8-7 Geometrically Weighted CdZnTe Frisch Grid Nuclear Radiation Detector
V. Ivanov, P. Dorogov, A. Loutchansky
RITEC Ltd.

R8-8 10mm Thick CZT Strip Detectors with Orthogonal Coplanar Anodes
J.R. Macri[1], M.L. Mcconnell[1], M. Mcclish[1], J.M. Ryan[1], M. Widholm[1], F. Boulva[2], P. Dufour[2], L.A. Hamel[2], M. Julien[2]
[1]*University of New Hampshire*
[2]*University of Montreal*

R8-9 Modeling of Processes of Charge Division and Collection in GaAs Detectors Taking into Account Trapping Effects
G.I. Ayzenshtat[1], O.P. Tolbanov[2], A.P. Vorobiev[3]
[1]*Scientific & Production State Enterprise "Semiconductor Devices Research Institute", Tomsk, Russia*
[2]*Siberian Physical Technical Institute", Tomsk, Russia*
[3]*Scientific State Center "High Energy Physics Institute", Protvino, Russia*

R8-10 GaAs X-Ray Coordinate Detectors

G.I. Ayzenshtat[1], V.G. Kanaev[1], A.V. Khan[1], A.I. Potapov[2], O.P. Tolbanov[2], A.P. Vorobiev[3]
[1]*Scientific & Production State Enterprise "Semiconductor Devices Research Institute", Tomsk, Russia*
[2]*Siberian Physical Technical Institute", Tomsk, Russia*
[3]*Scientific State Center "High Energy Physics Institute", Protvino, Russia*

R8-11 Noise Analysis of Gallium Arsenide X-Ray Pixel Detectors Coupled to Ultra Low Noise Electronics

G. Bertuccio[1], R. Casiraghi[1], A. Owens[2], M.Bavdaz[2], A. Peacock[2], H. Andersson[3], S. Nenonen[3]
[1]*Politecnico Di Milano, Department of Electronics Engineering and Information Science, Milano,Italy*
[2]*Space Science Department of ESA, Noordwijk, Netherlands*
[3]*Metorex International Oy, Espoo, Finland*

R8-12 Study of GaAs Detectors Characteristics for Medical Imaging

S.R. Amendolia[1], M.G. Bisogni[2], P. Delogu[2], M.E. Fantacci[2], A. Marchi[2], M. Novelli[2], P. Oliva[2], M. Quattrocchi[2], V. Rosso[2], A. Stefanini[2], S. Zucca[2], A.Cola[3], F. Quaranta[3], L. Vasanelli[3]
[1]*Instituto Di Matematica E Fisica,Universita'of Sassari, and Sezione INFN Pisa,Italy*
[2]*Dipartimento Di Fisica,Universita'of Pisa,and Sezione INFN Pisa, Italy*
[3]*instituto Per Lo Studio Di Nuovi Materiali Per L'elettronica I.M.E.-C.N.R. of Lecce, Italy*

R8-13 Development of a Neutron Tomography System for the Assay of Nuclear Fuel

J.D. Sanders[1], D.S. McGregor[1], H.K. Gersch[1], J.T. Lindsay[2]
[1]*S.M.A.R.T Laboratory, NERS Dept.,University of Michigan*
[2]*Phoenix Memorial Laboratory, University of Michigan*

R8-14 Growth of Bulk Mercuric Iodide in Horizontal Furnaces

E. Ariesanti, D.S. McGregor
S.M.A.R.T Laboratory, N.E.R.S., University of Michigan

R8-15 Purification and Growth of PbI$_2$ Crystals: Dependence of the Radiation Response on the PbI$_2$ Crystal Purity

I.B.D. Oliveira, M.M. Hamada
Instituto De Pesquisas Energ. E. Nucleares-Ipen-Cnen/sp

R8-16 Electron Trapping Variations in Single-Crystal Pixellated HgI$_2$ Gamma-Ray Spectrometers

J.E.Baciak[1], Z. He[1], R.P. Devito[2]
[1]*University of Michigan*
[2]*Constellation Technology Corporation, Largo,FL*

R8-17 New Ways for Purifying Lead Iodide Appropriate as Spectrometric Grade Material

L. Fornaro, E. Saucedo, L. Mussio, A. Gancharov, G.Ardanaz
Radiochemistry Department, Faculty of Chemistry, Montevideo,11800,Uruguay

R8-18 Fabrication and Characterization of Thallium Bromide Photodetectors for Gamma-Ray Spectroscopy

K. Hitomi, O. Muroi,M. Matsumoto, T. Numata, T. Shoji, Y. Hiratate
Tohoku Institute of Technology, Japan

R8-19 Bismuth Iodide (III) Crystals for Nuclear Radiation Detectors

M. Matsumoto, K.Hitomi, T. Shoji, Y. Hiratate
Tohoku Institute of Technology, Japan

R8-20 Detection of High-Energy Gamma Rays by Pair Production in Compressed Xenon

P.E. Vanier, L. Forman
Brookhaven National Laboratory, Upton,NY

R8-21 Characterization of Room Temperature Si(Li) Detectors by a Combination of the Copper Staining and X-Ray Microscopy

H. Kume[1], H. Onabe[2], M. Obinata[3], T. Kashiwagi[4]
[1]*National Institute for Environmental Studies*
[2]*Raytech Co.,Ltd.*
[3]*Tohnic Co.,Ltd.*
[4]*Kanagawa University, Japan*

R8-22 Numerical Simulation of CdZnTe Detector Using Infrared Microscopy Electric Field Profiles

M. Watson[1], J. Reynolds[1], A. Burger[1], R.B. James[2]
[1]*Fisk University, Nashville, TN*
[2]*Brookhaven National Laboratory, Upton,NY*

R8-23 Novel Electrode Configurations for CdZnTe Detectors

N. Auricchio[1], E. Caroli[1], A. Cola[2], A.Onati[1], W. Dusi[3], D. Grassi[4], K.B. Parnham[5], E. Perillo[6], F. Quaranta[2], C.Szeles[5]
[1]*Instituto TESRE/CNR, Bologna,Italy*
[2]*Instituto IME/CNR, Lecce, Italy*
[3]*Instituto TESRE/CNR and Sezione INFN,Bologna,Italy*
[4]*UdR INFM, Napoli, Italy*
[5]*eV Products, Saxonburg, PA*
[6]*Dip. di Scienze Fisiche, Universita "Federico II",Sezione INFN and UdR INFM, Napoli,Italy*

R8-24 Universal Power Supply Unit for Peltier Cooled Semiconductor Detectors

V. Kondrashov, V. Fedotenkov
Baltic Scientific Instruments,Riga,Latvia

R9-1 (8:30am) Statistical Modeling of the Spectral Performance of a 2D Array of Gamma-Ray Spectrometers (Invited)
Y. Nemirovsky, M.Ifraimov, A. Ludwig
Technion–Israel Institute of Technology, Israel

R9-2 (8:54am) Clustering Algorithm with Adaptive Shaping Method for CdZnTe Detectors
A. Nakamura[1], H. Takahashi[1], L. Zhang[1], D. Fukuda[1], M. Nakazawa[1], M. Misawa[2], H. Murayama[3]
[1]*The University of Tokyo, Japan*
[2]*National Institute of Advanced Industrial Science and Technology*
[3]*National Institute of Radiological Sciences*

R9-3 (9:12am) The BaBar RadfET Monitoring Board
W.T. Meyer[1], H.B. Crawley[1], R.L.Mckay[1], E.I. Rosenberg[1], B. Camanzi[2], A. Holmes-Siedle[2], A.Mckemey[2], J. Tinslay[2]
[1]*Dept. of Physics and Astronomy, Iowa State University*
[2]*Dept. of Electronic and Computer Engineering, Brunel University*

R9-4 (9:30am) Optimization of Front-End Design in Imaging and Spectrometry Applications with Room Temperature Semiconductor Detectors (Invited)
L. Fabris[1], P. Manfredi[2]
[1]*Lawrence Berkeley National Laboratory, Berkeley, CA*
[2]*Lawrence Berkeley National Laboratory, University of Pavia,INFN Pavia*

R9-5 (9:54am) Instrumentation for Noise Measurements of High Frequency Bipolar and CMOS Transistors for Fast Detector Preamplifiers
M. Manghisoni[1], L. Ratti[2], V. Speziali[2], F. Svelto[2], V. Re[3]
[1]*INFN–Sezione Di Pavia, ST Microelectronics*
[2]*Universita'Di Pavia*
[3]*Universita'Di Bergamo*

R10 — SPACE APPLICATIONS
Wednesday 10:40am Sunrise Room
Session Chair:
JIM MATTESON, *University of California, San Diego*

R10-1 (10:40am) CZT Imaging Arrays For Space Applications (Invited)
B. Ramsey
NASA/ Marshall Space Flight Center, Huntsville, Al

R10-2 (11:04am) The Burst Alert Telescope (BAT) on the Swift Gamma-Ray Burst Explorer (Invited)
A. M. Parsons[1], L. Barbier[1], S. Barthelmy[1], N. Gehrels[1], H. Krimm[1], J. Tueller[1], E. Fenimore[2], D. Palmer[2]
[1]*NASA/ Goddard Space Flight Center*
[2]*Los Alamos National Laboratory, Los Alamos, NM*

R10-3 (11:22am) Design and Performance of a Ruggedized Large-Area CZT Detector Module for Hard X-Ray Astronomy
R. Rothschild, W. Heindl, J. Matteson, M. Pelling, F. Duttweiler, P. Leblanc and E. Stephan Jr.
Center for Astrophysics and Space Sciences,University of California, San Diego

R10-4 (11:40am) Semiconductor Detectors for Space Applications (Invited)
M. Bavdaz, A. Owens, T. Peacock
European Space Agency

NOVEMBER 7, 2001

RTSD WORKSHOP LUNCHEON
LE CHANTCLAIR ROOM
Wednesday, 12:00–2:00 pm

R11 — CZT DETECTORS
Wednesday 2:00pm Sunrise Room
Session Chair:
T.E. SCHLESINGER, *Carnegie Mellon University*

R11-1 (2:00pm) Carrier Transport Properties of HPB $Cd_{0.9}Zn_{0.1}Te$ and THM CdTe:Cl (Invited)
K. Suzuki[1], T. Sawada[1], K. Imai[1], S. Seto[2]
[1]*Hokkaido Institute of Technology*
[2]*Ishikawa National College of Technology*

R11-2 (2:24pm) Optical and Nuclear Microscopy Probe of Defects and Charge Transport in CdZnTe Radiation Detectors
S. Rath[1], P. Sellin[1], M. Breese[1], A. Holland[2]
[1]*University of Surrey, UK*
[2]*University of Leicester*

R11-3 (2:38pm) A New Method for Growing Detector-Grade Cadmium Zinc Telluride Crystals (Invited)
L. Li[1], F. Lu[1], W. Yao[2], P.N. Luke[3], Y. Nemirovsky[4], A. Burger[5], G. Wright[5], K. Shah[6], R.B. James[7]
[1]*Yinnel Tech*
[2]*AMD, Inc.*
[3]*Lawrence Berkeley National Laboratory, Berkeley, CA*
[4]*Technion Institute of Technology, Israel*
[5]*Fisk University, Nashville, TN*
[6]*RMD*
[7]*Brookhaven National Laboratory, Upton,NY*

R11-4 (2:56pm) Uniformity Mapping of CdTe and CZT Detectors with Scanning Electrons and Photon Beams
J.M. Koebel[1], M. Sowinska[2], P. Siffert[1], D. Ballutaud[3], A. Riviere[3], A. Laugier[4], A. Kaminski[4], and J.P. Boyeaux[4]
[1]*PHASE/CNRS,Strasbourg*
[2]*EURORAD, Strasbourg Cedex 2*
[3]*Laboratoire de Physique de Solides/CNRS, 1 Pl.Briant, F-92195 Meudon*
[4]*Laboratoire de Physique de la Matiere/CNRS/INSA, 20 avenue A.Einstein,F-69621 Villeurbanne Cedex*

R12-1 (3:30pm) Gallium Arsenide Neutron Detectors: A Design for Improved Efficiency
R. T. Klann[1], D. S. Mcgregor[2], H.K. Gersch[2]
[1]*Argonne National Laboratory, Argonne, IL*
[2]*University of Michigan*

R12-2 (3:48pm) Thallium Bromide X-Ray and Gamma-Ray Detectors (Invited)
K.Hitomi
Tohoku Institute of Technology, Japan

R12-3 (4:12pm) Epitaxial Structures Based on Compensated GaAs for γ and X-Ray Detectors
V.P. Germogenov[1], S.M. Guschin[1], A.A. Larionov[2], A.I. Potapov[3], O.P. Tolbanov[3], A.P. Vorobiev[4]
[1] *Tomsk State University, Tomsk, Russia,*
[2] *Scientific & Production State Enterprise "Semiconductor Devices Research Institute", Tomsk, Russia*
[3] *Siberian Physical Technical Institute, Tomsk, Russia,*
[4] *Scientific State Center "High Energy Physics Institute", Protvino, Russia*

R12-4 (4:30pm) X-Ray Sensitivity of Polycrystalline PbI_2 Films
P.R. Bennett, K.S. Shah, Y. Dmitryev, T. Gupta and M. Klugerman
Radiation Monitoring Devices, Watertown,MA

R12-5 (4:48pm) Lead Iodide Platelets:Correlations Between Surface, Optical,Electrical & Charge Transport Properties with X- and Gamma-Ray Spectrometric Performance
L. Fornaro[1], E. Saucedo[1], L. Mussio[1], A.Gancharov[1], G.Ardanaz[1], F. Guimaraes[2], and A. Hernandes[2]
[1]*Radiochemstry Department, Faculty of Chemistry, Montevideo,Uruguay*
[2]*Instituto de Fisica de San Carlos,Universidade de Sao Paulo, SP, Brasil*

R12-6 (5:06pm) Single Detectors and Pixel Arrays Based on TlBr
V. Gostilo[1], A. Owens[2], M. Bavdaz[2], I.Lisjutin[1], A. Peacock[2], H. Sipila[3], S. Zatoloka[1]
[1]*Baltic Scientific Instruments,Riga,Latvia*
[2]*Astrophysics Division, ESA/ESTEC,The Netherlands*
[3]*Metorex Int. Oy, Espoo, Finland*

R12-7 (5:24pm) GaAs Structures for X-Ray Imaging Detectors
G.I. Ayzenshtat[1], S.S Khludkov[2], O.B. Koretskaya[2], L.S. Okaevich[3], V.A. Novikov[3], A.I. Potapov[2], K.M. Smith[4], O.P. Tolbanov[2], A.V. Tyazhev[2], A.P. Vorobiev[5]
[1]*Scientific & Production State Enterprise "Semiconductor Devices Research Institute", Tomsk, Russia*

[2]*Siberian Physical Technical Institute, Russia, Tomsk*
[3]*Tomsk State University, Russia, Tomsk*
[4]*University of Glasgow, UK,Scotland, Glasgow*
[5]*Scientific State Center "High Energy Physics Institute", Russia, Protvino, Moscow Region*

R13-1 (8:00am) Optimization of Time Response and Energy Resolution in a Large-Volume High Purity Germanium Detector
D. Koltick, C.Cooper, J. Teter
Purdue University Physics Department, W. Lafayette, IN

R13-2 (8:18am) Algorithms for Calculation of DRRs for Different Accelerator Voltages and Its Application in Brachytherapy Treatment Planning
N. B. Milickovic[1], D. Baltas[2], N. Zamboglou[2]
[1]*Offenbach Klinikum, Department of Medical Physics & Eng., Germany*
[2]*Offenbach Klinikum, Dept.of Medical Physics & Eng.,Germany, ICCS, NTUA, Athens, Greece*

R13-3 (8:36am) CZT and CdTe Detectors for Combined CT-SPECT
K. Iwata[1], A.E. Sakdinawat[2], S.I. Kwon[3], L.Cirignano[4], P. R. Bennett[4], K.S. Shah[4], B.H. Hasegawa[5]
[1]*University of California San Francisco*
[2]*University of California Berkeley*
[3]*University of California San Francisco and Kyonggi Univ. Korea*
[4]*Radiation Monitoring Devices,Inc.*
[5]*University of California San Francisco and Berkeley*

R13-4 (8:54am) Current and Prospective Applications of CZT and CdTe Detectors in Nuclear Medicine: Towards Molecular Imaging (Invited)
C. Scheiber
Strasbourg University, France

R13-5 (9:18am) Performance Evaluation of a Novel CCD for Application to Medical Imaging
E. . Harris,G.J. Royle, R.D. Speller
University College London

R13-6 (9:36am) Diode Type CdTe Strip and Linear Array Detectors for Gamma-Ray Detection and Imaging (Invited)
M. Niraula[1], A. Nakamura[1], T. Aoki[1], Y. Tomita[2], and Y. Hatanaka[1]
[1]*Research Institute of Electronics, Shizuoka University 3-5-1 Johoku, Hamamatsu 432-8011,Japan*
[2]*Electron Tube R & D Center, Hamamastu Photonics K. K., 314-5 Shimokanzo,Iwata-gun,Shizuoka Pref.,Japan*

R14-1 (10:30am) Advances in the Crystal Growth of Semi-Insulating CdZnTe for Radiation Detector Applications
C. Szeles, S. Cameron, J. Ndap, and W. Chalmers
eV Products Inc., Saxonburg, PA

R14-2 (10:48am) CdTe and CdZnTe Detectors for Timing Measurement
Y. Okada[1], K. Makishima[1], T. Takahashi[2], G. Sato[2], S. Watanabe[2]
[1]*University of Tokyo, Japan*
[2]*Institute of Space and Astronautical Science*

R14-3 (11:06am) CdTe Stacked Detectors for Gamma-Ray Detection
S. Watanabe, T. Takahashi, G. Sato, M.Kouda, T. Mitani, Y. Kobayashi, K. Nakazawa
Institute of Space and Astronautical Science

R14-4 (11:24am) Characterization of Fast Polycrystalline CdTe
E. Rossa[1], M. Placidi[1], H. Schmickler[1], A.Brambilla[2], F. Mongellaz[2], L. Verger[2], V. Cindro[3], M.Mikuz[3], E. Berdermann[4], P. Moritz[4]
[1]*CERN Geneva Switzerland*
[2]*LETI (cea-Technologies Avancees) Grenoble, France*
[3]*JSI Ljubljana Slovenia*
[4]*GSI Germany*

R14-5 (11:42am) Defects Engineering for Producing High Quality CdZnTe Radiation Detectors (Invited)
M. Chu[1], S. Terterian[1], D. Ting[1], R.B. James[2], J.C.Erickson[3], H.W. Yao[3], T.T. Lam[4], M. Szawlowski[5], R. Szeboitz[5]
[1]*Fermionics Corporation*
[2]*Brookhaven National Laboratory, Upton, NY*
[3]*Sandia National Laboratory,*
[4]*UCLA*
[5]*Advanced Photonix, Inc.*

R15-1 (2:00pm) Silicon PIN Detectors with On-Chip Front-End Electronics. Results of a Test Chip
A. Fazzi[1], G.-F. D. Betta[2], M. Boscardin[2], P. Gregori[2], N. Zorzi[2], G. U. Pignatel[3]
[1]*Politecnico Di Milano*
[2]*IRST*
[3]*University of Trento*

R15-2 (2:18pm) Novel Detectors for X-Ray Astronomy and Spectroscopy (Invited)
G. Lutz
MPI Semiconductor Laboratory, Munich, Germany

R15-3 (2:36pm) Thermalization Pattern for Broad Neutron Energy Range Real Time Semiconductor Personal Dosimetry
M. Jung, J. Morel, G. Nurdin, C. Teissier and P. Siffert
CNRS, Laboratoire PHASE (UPR 292), Strasbourg Cedex 2, France

R16-1 (3:30pm) Charge Collection Efficiency Adjacent to the Rectifying Contact in Si(Li) X-Ray Detectors
P. Norman[1], E.Morton[1], P. Statham[2]
[1]*University of Surrey, UK*
[2]*Oxford Instruments Analytical, UK*

R16-2 (3:48pm) Development of Double-Sided Microstructured Si(Li)-Detectors
D. Protic, T. Krings, R. Schleichert
Institut Fuer Kernphysik, Forschungszentrum Juelich, 52525 Juelich, Germany

R16-3 (4:06pm) Timing in Silicon Detectors for a Compton PET Camera
M. Mikuz, A. Studen, V. Cindro, G.Kramberger
Jozef Stefan Institute and Department of Physics, University of Ljubljana, Slovenia

R16-4 (4:24pm) Designs for Thin-Film-Coated Semiconductor Neutron Detectors (Invited)
D.S. McGregor[1], H.K. Gersch[1], J. Sanders[1], R.T. Klann[2]
[1]*SMART Laboratory, Nuclear Engineering Dept., University of Michigan, Ann Arbor, MI*
[2]*Argonne National Laboratory, Argonne, IL 60439*

R17-1 (8:10am) Annealing Effects on the Uniformity of Electrical Properties and Defect Levels of CdTe:Cl Materials
M. Ayoub[1], M. Hage-Ali[1], J.M. Koebel[1], A. Zumbiehl[1], C. Rit[1], F. Klotz[1], R. Regal[1], P. Fougeres[2], P. Siffert[1]
[1]*PHASE-CNRS, Strasbourg, France*
[2]*EURORAD II-VI, 23, Strasbourg, France*

R17-2 (8:28am) Experimental and Theoretical Comparisons of the Formation and Observation of the Te-Antisite Complexes in CdZnTe and CdTe
S. Awadalla[1], K.G. Lynn[1], A.Hunt[1], R. Tjossem, J. Jaffe, M. Bliss[2], C.Szeles[3]
[1]*Washington State University*
[2]*PNNL*
[3]*eV Products, Saxonburg, PA*

R17-3 (8:46am) Interfacial Chemistry and the Performance of Bromine-etched CdZnTe Radiation Detector Devices
A. Rouse[1], C. Szeles[1], F.-0. Ndap[1], D. Gaspar[2], M. Engelhard[2], S. Shutthanandan[2]
[1]*eV Products, Saxonburg, PA*
[2]*EMSL-PNNL*

R17-4 (9:04am) High Resolution Schottky CdTe Diode Detectors (Invited)
T. Takahashi
Institute of Space and Astronautical Science and Department of Physics, University of Tokyo, Japan

R17-5 (9:28am) Simulation of CZT Detector Absolute Efficiency Measurements
J.M. Perez[1], Z.He[2], D.K. Wehe[2], Y. Du[2]
[1]*The University of Michigan & CIEMAT*
[2]*The University of Michigan*

R17-6 (9:46am) Progress in the VPE Growth of CdTe for RT X-ray Detectors (Invited)
N. Lovergine[1], M. Traversa[1], P. Prete[2], L. Tapfer[3], and A.M. Mancini[1]
[1]*INFM, and Innovation Engineering Dept., University of Lecce, Italy*
[2]*IME-CNR, Lecce, Italy*
[3]*Pastis-CNRSM, Brindisi, Italy*

BRETT SHOAF/SANDIEGO.COM

Historic Gaslamp is the hottest dining and entertainment district.

The following technical sessions cover subjects of major interest to the operation of nuclear power stations and their contributors of these sessions are from nuclear suppliers, services, power utilities, architect engineering firms, the U. S. Nuclear Regulatory Commission, the Electric Power Research Institute, the American Nuclear Society, etc., and especially the Nuclear Power Engineering Committee of the IEEE.

Jay Forster
SNPS Program Chairman

NOTE: The presentation period will be twenty minutes followed by a five minute discussion period, unless otherwise indicated.

SNPS PROGRAM CHAIR
JAY FORSTER

SNPS PLENARY SESSION

NUCLEAR POWER ENGINEERING COMMITTEE ACTIVITIES 2001 AND RELATED KEY PAPERS
Thursday 9:00am–12:00pm Sunset Room
Chair:
N. P. SMITH, *Exelon Nuclear*

P-1 (10) Introduction
N.P. Smith, *Exelon Nuclear*

P-2 Review of Nuclear Standards
J.E.Thomas, *MPR Associates*

P-3 Future of Nuclear Power Standards Activities — Panel
N.P. Smith, *Exelon Nuclear*
B.P. Grim, *GE Nuclear Energy*
J.E.Thomas, *MPR Associates*
J.P. Carter, *Duke Engineering and Services*

P-4 IEC 2001 — An Update on the International Electrotechnical Commission Nuclear Power Standards Activities
G.L. Johnson, *LLNL*

P-5 Research and Regulatory Activities in Power, Control and Instrumentation: A Status Report
S.K. Aggarwal, *US NRC*

P-6 Summary of Regulatory Related Papers Including a Workshop on Digital I&C from ANS NPIC and HMIT 2000
D.W. Miller, *Ohio State University*

P-7 IEEE-Energy Policy Committee Position Paper on Nuclear Power to the US Congress
J. Forster, *GE Nuclear Energy*

P2 — PLANT MODERNIZATION: PART 1
Thursday 2:00–5:00pm Sunset Room
Chair:
B. P. GRIM, *GE Nuclear Energy*

P2-1 Revision of Guideline on Licensing Digital Upgrades to Reflect New 10 CFR 50.59 Rule
R. Torok, *EPRI*; E.Claude, K. Davis, R. Fink, *MPR Associates*

P2-2 Generation II Measurement Systems for Generation IV Nuclear Power Plants
D.W. Miller, *Ohio State University*

P2-3 Comparison of IEC and IEEE Standards for Computer-Based Control Systems Important to Safety
G.L. Johnson, *LLNL*

P2-4 Information Security Needs for Nuclear Power Plants
J.M. Weiss, *EPRI*

P2-5 Reliability Based Maintenance to Increase Plant Life Extension
R.F. DeRivi, *GE Energy Services*

P2-6 Impact of Failures of Direct Current Systems on Nuclear Power Generating Station
N.K. Trehan, *U.S.NCR*

P2-7 Safety Assessment of NPP Instrumentation and Control Systems
M.A. Yastrebenetsky, *Ukrainian State Scientific Technical Center of Nuclear and Radiation Safety*

P3 — PLANT MODERNIZATION: PART 2
Friday 9:00am–12:00pm Sunset Room
Chair:
J. P. CARTER, *Duke Engineering and Services*

P3-1 Feasibility of Determining Margin of Remaining Life Using Void Content
R.L. Steinman, Ph.D. and D.A.Horvath,
Advent Engineering Services

P3-2 New I&C System for the Refueling Machine for VVER
O. Maslov, M. Maksimov, I. Maysyan, O. Galchenkov,
Odessa State Polytechnic University

P3-3 Military Applications of Nuclear Power "A Think Piece"
R.R. Pfeffer, W.A.Macon,Jr., *USANCA*

P3-4 Design and Evaluation of an Observer for Nuclear Reactor State Estimation
Q. Li and J.A. Bernard, *Department of Nuclear Engineering and Nuclear Reactor Laboratory, MIT*

P3-5 Fluid Flow Monitoring By Means of Industrial Single Photon Emission Computed Tomograph
S. Legoupil, *CEN Saclay*

P3-6 Distributed Modular Rt-Systems for Daq and Control Applications
D.V.I. Vinogradov, *Institute for Nuclear Research Russian Academy of Science*

The 2002 IEEE Nuclear Science Symposium and Medical Imaging Conference will be held in Norfolk, Virginia, at the Norfolk Waterside Marriott and the Sheraton Norfolk Waterside Hotels. Norfolk is a 400 year-old seaport packed with galleries, museums, a variety of shopping options, and a wealth of military history!Theater, opera,ballet and rock-n-roll are also on the agenda. Norfolk sits at the center of the east coast of the United States at the base of the historic Chesapeake Bay. A trip to Norfolk can include wonderful activities ranging from attending outdoor concerts, to shopping and dining at Norfolk's waterside, to historical tours and cruises.

We welcome scientists and engineers in the field of nuclear science and medical imaging to participate and present original work in a variety of subject areas related to these fields. A preliminary announcement including a Call for Papers will be available at the 2001 San Diego conference. Additional information can be obtained by contacting:

Joel Karp
2002 NSS/MIC General Chair
karp@rad.upenn.edu

IEEE COMMITTEE MEMBERS

Gary Alley, Oak Ridge National Laboratory
Guy Armantrout, Lawrence Livermore National Laboratory
Lynn Bergman
Judi Berman
Uwe Bratzler, CERN
Barbara Darnell, Scin Tech
Jay Forster, GE Nuclear Energy
Eric C. Frey, University of North Carolina at Chapel Hill
Allen Friensehner, Lawrence Livermore National Laboratory
Roger Gearhart
Richard Greene, Trade Associates
Jan Grimm, Lawrence Livermore National Laboratory
Ralph James, Brookhaven National Laboratory
Margaret Kennedy, Town and Country Hotel & Resort
Kim Soo-Bing, Seoul National University
Margy Klein, Travel Destination Management Group
Ed Lampo, Lawrence Berkeley National Laboratory
Lee Lampo
Anthony D. Lavietes, Lawrence Livermore National Laboratory
Dimitris Loukas
Shaun Lund
Joe Mauger, Lawrence Livermore National Laboratory
Dawn Pratt, Travel Destination Management Group
Vern Price, IEEE
Lei Loni Rodriguez, Lawrence Livermore National Laboratory
Nancy Salmon, Lawrence Livermore National Laboratory
Christina Sanders, Lawrence Livermore National Laboratory
Judy Sanders, Lawrence Livermore National Laboratory
Tony Seibert, UC Davis
Mag Simmons, Lawrence Livermore National Laboratory
Brad Sleaford, Lawrence Livermore National Laboratory
Graham Smith, Brookhaven National Laboratory
Malica Tareb, CERN
Benjamin M. W. Tsui, University of North Carolina at Chapel Hill
Ann Silva Tyler, Lawrence Livermore National Laboratory
John Valentine, Georgia Institute of Technology
Lynette Willard, Lawrence Livermore National Laboratory
Bo Yu, Brookhaven National Laboratory

NSS PROGRAM COMMITTEE

Graham Smith, NSS Program Chair
Bo Yu, NSS Program Deputy Chair

David Anderson, FNAL
Kalsushi Arisaka, UCLA
Guy Armantrout, LLNL
John Armitage, Carleton U
Ronaldo Bellazzini, INFN Pisa
Steve Biagi, Liverpool U
Dario Bisello, INFN Padova
Aleksey Bolotnikov, Cal Tech
Uwe Bratzler, CERN
Amos Breskin, Weizmann Inst
Chuck Britton, ORNL
Denis Calvet, CEA Saclay
Ariella Cattai, CERN
Rachel Chechik, Weizmann Inst
Wei Chen, BNL
Peter Chiaro, ORNL
David Christian, FNAL
Vince Cianciolo, ORNL
Mauro Citterio, INFN Milan
Bill Cleland, U Pittsburgh
Carlos Conde, Coimbre U
Chris Damerell, Rutherford Lab.
Gianluigi De Geronimo, BNL
Alberto Del Guerra, U Pisa
Tim DeVol, Clemson U
Jean-Pierre, Dufey CERN
John Elias, FNAL
Lorenzo Fabris, LBL
Wasi Faruqi, MRC Cambridge
George Fraser, Leicester U
Emilio Gatti, Milan Polytechnic
Tom Glanzman, SLAC
Chris Hall, Daresbury Lab.
Michael Haney, U Illinois
Zhong He, U Michigan
Eric Heijne, CERN
Robert Hollander, TU Delft
Delft Derek Imrie, Brunel U
Jan Iwanczyk, Photon Imaging Inc
Neil Johnson, NRL
Valentin Jordanov, Canberra
John Kadyk, LBL
Jon Kapustinsky, LANL
Menhard Kocsis, ESRF
Peter Krizan, Josef Stefan Inst
Simon Kwan, FNAL

Richard Lanza, MIT
Paul Lecoq, CERN
Rob Lewis, Daresbury Lab.
Paul Luke, LBL
Michael Maier, LBL
Franco Manfredi, LBL
Alessandro Marchioro, CERN
Ralf Menk, ELETTRA
Jacques Millaud, LBL
John Morse, ESRF
Bill Moses, LBL
Calvin Moss, LANL
Marek Moszynski, Soltan Inst
Edward O'Brien, BNL
Sherwood Parker, U Hawaii
Vladimir Peskov, RIT Sweden
Bernard Phlips, NRL
Francois Piuz, CERN
Armondo Policarpo, Coimbra U
Veljko Radeka, BNL
Sy Rankowitz, BNL
Pavel Rehak, BNL
Brian Rooney, LANL
John Rutherfoord, U Arizona
Hartmut Sadrozinski, UC Santa Cruz
Fabio Sauli, CERN
Jacques Seguinot, CERN
Peter Siddons, BNL
Melissa Smith, ORNL
Walter Snoeys, CERN
Vitali Souchkov, LBL
Helmut Spieler, LBL
Michael Squillante, RMD Inc
Gary Tepper, Virginia CU
John Valentine, Georgia I T
Rick van Berg, U Penn
Carel van Eijk, TU Delft
Jerry Va'vra, SLAC
Ramkumar Venkataraman, GE
Richard Wigmans, Texas Tech U
Alan Wintenberg, ORNL
Glenn Young, ORNL
Ren-yuan Zhu, Cal Tech
Carl Zorn, TJNAF

NSS Assistant Program Chairs:

Paul O'Connor, Brookhaven National Laboratory
Brian Ramsey, MSFC NASA
Archana Sharma, CERN
Craig Woody, Brookhaven National Laboratory
Zheng Li, Brookhaven National Laboratory
Paul Reeder, PNNL
Stanislav Pospisil, TU Prague
Patrick Le Dû, CEA
Saclay Maris Abolins, Michigan SU

MIC PROGRAM COMMITTEE

Benjamin M. W. Tsui, MIC Program Chair
Eric C. Frey, MIC Program Deputy Chair

John Aarsvold, Emory University
Paul Acton, University of Pennsylvania
Dale Bailey, Guy's and St.Thomas'Hospital, England
Brad Barber, University of Arizona
Freek Beekman, University Hospital Utrecht, Netherlands
David Binkley, University of North Carolina at Charlotte
Irene Buvat, INSERM, France
Anna Celler, Vancouver Hospital and Health Sciences Centre, Canada
Heang-Ping Chan, University of Michigan
Simon Cherry, University of California Davis
Rolf Clackdoyle, University of Utah
Neal Clinthorne, University of Michigan
James Colsher, GE Medical Systems
Carl Crawford, Analogic
Magnus Dahlbom, University of California at Los Angeles
Margaret Daube-Witherspoon, National Institute of Health
Michel Defrise, Vrije Univesiteit Brussels, Belgium
Alberto Del Guerra, INFN/University of Pisa, Italy
Stephen Derenzo, Lawrence Berkeley Lab
F. Dilmanian, Brookhaven National Lab
John Engdahl, Siemens Medical Systems
Lars Eriksson, CTI Pet Systems
Jeff Fessler, University of Michigan
Eric C. Frey, University of North Carolina at Chapel Hill
Daniel Gagnon, Marconi Medical Systems
Gene Gindi, SUNY Stoneybrook
Stephen Glick, University of Massachusetts Medical Center
Pierre Grangeat, LETI/CEA, France
Grant Gullberg, University of Utah
Robert Harrison, University of Washington
Bruce Hasegawa, University of California at San Francisco
Richard Hichwa, University of Iowa
Edward Hoffman, University of California at Los Angeles
Jiang Hsieh, GE Medical Systems
(Henry) Sung-Cheng Huang, University of California at Los Angeles
Jennifer Huber, Lawrence Berkeley Lab
Ronald Huesman, Lawrence Berkeley Lab
Brian Hutton, Westmead Hospital, Australia
Hidehiro Iida, National Cardiovascular Center, Japan
Marija Ivanovic, University of North Carolina at Chapel Hill
Ronald Jaszczak, Duke University
William Jones, CTI PET Systems
Dan Kadrmas, University of Utah
Andrew Karellas, University of Massachusetts Medical Center
Joel Karp, University of Pennsylvania
Marie Kijewski, Brigham and Women's Hospital
Paul Kinahan, University of Washington
Michael King, University of Massachusetts Medical Center
Dennis Kirch
Hiroyuki Kudo, University of Tsukuba, Japan
David Lalush, The University of North Carolina at Chapel Hill
Stig Larsson, Karolinska Institute, Sweden
Richard Leahy, University of Southern California
Roger Lecomte, University of Sherbrooke, Canada
Craig Levin, University of California at San Diego
Tom Lewellen, University of Washington
Michael Ljungberg, Lund University, Sweden
Steven Meikle, Royal Prince Alfred Hospital, Australia
Robert Miyaoka, University of Washington

Stephen Moore, Brigham and Women's Hospital
William Moses, Lawrence Berkely Lab
Orhan Nalcioglu, University of California at Irvine
Frederic Noo, University of Utah
Koichi Ogawa, Hosei University, Japan
Xiaochuan Pan, University of Chicago
Roberto Pani, INFN, Italy
Brad Patt, Photon Imaging, Inc.
Bernd Pichler, University of Munich, Germany
Stefan Schaller, Siemens Medical Systems, Germany
W. Paul Segars, The University of North Carolina at Chapel Hill
Lingxiong Shao, ADAC Laboratories
Manbir Singh, University of Southern California
Mark Smith, Jefferson Lab
Charles Stearns, GE Medical Systems
Kwok Tam, Siemens Medical Systems
Chris Thompson, McGill University, Canada
Dave Townsend, University of Pittsburgh
Benjamin M. W. Tsui, University of North Carolina at Chapel Hill
Timothy Turkington, Duke University
Ge Wang, University of Iowa
Charles Watson, CTI PET Systems
Andy Welch, The John Mallard Scottish PET Centre, Scotland
R. Glenn Wells, St.Josephs Health Centre, Canada
Wai-Hoi (Gary) Wong, M.D. Anderson Cancer Center
Nicholas Yasillo, University of Chicago
Larry Zeng, University of Utah
Sibylle Ziegler, University of Munich, Germany

MIC Assistant Program Chairs:
Simon Cherry, University of California, Davis
Stephen Glick, University of Massachusetts
Grant T. Gullberg, University of Utah
Ronald J. Jaszczak, Duke University
Joel Karp, University of Pennsylvania
Paul Kinahan, University of Washington
Michael A. King, University of Massachusetts
Stig Larsson, Karolinska Institute, Sweden
Robert Miyaoka, University of Washington
Larry Zeng, University of Utah

RTSD PROGRAM COMMITTEE

Ralph B. James, RTSD Program Chair
Paul Siffert, RTSD Program Deputy Chair

RTSD Assistant Program Chairs:
Arnold Burger, Fisk University
E. Caroli, Instituto TESRE/CNR
Waldes Dusi, Instituto TESRE/CNR
David Gordon, Brookhaven National Laboratory
Makrem Hage-Ali, CNRS/Lab PHASE
K. Hitomi, Tohoku Institute of Technology
Glenn Knoll, Univ. of Michigan
Jan Iwanczyk, Photon Imaging
James L. Matteson, Univ. of California/San Diego
Richard Olsen, Consultant
Eugenio Perillo, Univ. degli Studi di Napoli Federico II
Karen Savino, Brookhaven National Laboratory
John Van Scyoc III, Sandia National Laboratories
David Spears, Dept. of Energy
Michael R. Squillante, Radiation Monitoring Devices, Inc.
T. Takahashi, Univ. of Tokyo