

# NSS Program

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## N01 NSS Plenary I

Monday, Nov. 10 08:15-10:00 6B

Session Chairs: **Ingrid-Maria Gregor**, DESY, Germany  
**Adam Bernstein**, Lawrence Livermore National Laboratory, United States

### N01-1 (08:15) NSS Opening and Award Ceremony

I.-M. Gregor, DESY, Germany; A. Laviates, LLNL, USA

### N01-2 (08:45, invited) The Mystery of Mass and the Higgs Boson

O. Botner, Uppsala University, Sweden

### N01-3 (09:30, invited) A Year in the Life of the Curiosity Mars Rover

N. L. Lanza, Los Alamos National Laboratory, United States

## N02 NSS Plenary II

Monday, Nov. 10 10:30-11:30 6B

Session Chairs: **Adam Bernstein**, Lawrence Livermore National Laboratory, United States  
**Ingrid-Maria Gregor**, DESY, Germany

### N02-1 (10:30, invited) Concentrating Solar Power - Solar Power on Demand

C. Richter

*DLR (German Aerospace Center) / SolarPACES, Spain*

### N02-2 (11:15, invited) News from the Hunt for Dark Matter

R. I. Gaitskell, Brown University, United States

## N03 NSS Poster Session I - Analog and Digital Circuits

Monday, Nov. 10 14:00-15:30 4B

Session Chair: **Farah F. Fahim**, Fermi National Accelerator Laboratory, United States

### N03-1 A Method Generating a Time-Varying Threshold to Keep the Time-over-Threshold Linear with Nuclear Pulse Amplitudes

Y. Wang, Y. Xiao, W. Zhu

*University of Science and Technology of China, China*

### N03-2 X-Ray Wide Dynamic Range Imaging

C. P. Lambropoulos, V. V. Zografos, G. Theodoratos

*Technological Educational Institute of Sterea Ellada, Greece*

### N03-3 Design of a Full Scale Building Block Prototype with in-Pixel Discriminator and Improved Rolling Shutter Architecture for the Alice Mft Project

Y. Degerli, A. Baldisseri, C. Flouzat, F. Guilloux, F. Orsini, P. Venault

*CEA - Saclay, France*

### N03-4 STS-XYTER, a High Count-Rate Self-Triggering Strip Silicon Detector Readout IC for High Resolution Time and Energy Measurements

K. Kasinski, P. Grybos, R. Szczygiel, R. Kleczek, P. Otfinowski

*AGH University of Science and Technology, Poland*

### N03-5 A Novel All on-Chip Design Solution for Pole-Zero Cancellation Topology

M. Roknsharifi, N. Zhang, M. E. Casey, R. Grazioso

*Siemens Healthcare, US*

### N03-6 Current Mode-Based Positioning Circuit for SiPM-Based PET

M. Roknsharifi, B. Johannes, R. Grazioso

*Siemens Healthcare, US*

### N03-7 Design and Characterization of the ePix10k Prototype: a High Dynamic Range Integrating Pixel ASIC for LCLS Detectors.

P. Caragiulo, A. Dragone, B. Markovic, R. Herbst, K. Nishimura, B. Reese, S. Herrmann, P. Hart, G. Blaj, J. Segal, A. Tomada, J. Hasi, G. Carini, C.

Kennedy, G. Haller

*Stanford Linear Accelerator Laboratory (SLAC), USA*

### N03-8 Silicon-Drift-Detectors Readout IC with on-Chip 12-Bit Charge-Redistribution SAR Analog-to-Digital Converter

F. Schemban<sup>1,2</sup>, R. Quaglia<sup>1,2</sup>, A. Abba<sup>1,2</sup>, F. Caponio<sup>1,2</sup>, C. Fiorini<sup>1,2</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Sezione di Milano, Italy

**N03-9 A Low-Power, Low-Noise Pixel Readout ASIC for a Hyperspectral Energy-Resolving X-Ray Imaging Detector**

S. Li, G. De Geronimo, J. Fried, D. A. Pinelli, A. Kuczewski, D. P. Siddons  
Brookhaven National Laboratory, U.S.

**N03-11 Design of Fully-Integrated DC-DC Converters for High Energy Physics Applications**

A. Krieger, J. Chang, M. Garcia-Sciveres, C. Grace  
Lawrence Berkeley National Laboratory, USA

**N03-12 Optimization of the Spatial Resolution in a Position Sensitive Detection System Based on a Gas Electron Multiplier Detector**

T. Fiutowski, M. Czogalik, B. Mindur, A. Zielinska  
AGH University of Science and Technology, Poland

**N03-13 Time and Energy Measurement ASIC for Microstrip Detectors with Two-Level Reset System Based on the Time-over-Threshold Technique**

K. Kasinski, R. Kleczek  
AGH University of Science and Technology, Poland

**N03-14 Design of an Integrated Low-Noise Ultra-Fast Charge-Sensitive Micro-Probe for Semiconductor Detectors**

A. Pullia<sup>1,2</sup>, S. Capra<sup>1</sup>, E. Frontini<sup>1</sup>  
<sup>1</sup>University of Milano, Italy; <sup>2</sup>INFN, Italy

**N03-15 An Improved Fast Readout ASIC for Si-Strip Detector in the J-PARC Muon G-2/EDM Experiment and Other Related Applications**

S. Shirabe<sup>1,2</sup>, H. Ikeda<sup>2,3</sup>, M. Ikeno<sup>2,4</sup>, K. Ueno<sup>2,4</sup>, T. Uchida<sup>2,4</sup>, K. Kawagoe<sup>1</sup>, S. Koura<sup>1,2</sup>, T. Kohriki<sup>2,4</sup>, N. Saito<sup>4</sup>, O. Sasaki<sup>2,4</sup>, M. Tanaka<sup>2,4</sup>, J. Tojo<sup>1,2</sup>, S. Nishimura<sup>5</sup>, T. Mibe<sup>2,4</sup>, T. Yoshioka<sup>1</sup>  
<sup>1</sup>Kyushu University, Japan; <sup>2</sup>Open-It, Japan; <sup>3</sup>JAXA, Japan; <sup>4</sup>KEK, Japan; <sup>5</sup>The University of Tokyo, Japan

**N03-16 The Development of a Readout ASIC for a GEM-TPC X-Ray Polarimeter**

H. Y. Zhang<sup>1,2</sup>, L. He<sup>1,2</sup>, Z. Deng<sup>1,2</sup>, H. Feng<sup>1</sup>, J. F. Ji<sup>1</sup>, M. Zeng<sup>1,2</sup>, Y. N. Liu<sup>1,2</sup>  
<sup>1</sup>Tsinghua University, China; <sup>2</sup>Ministry of Education, China

**N03-17 AGIPD 1.0: the High-Speed High Dynamic Range Readout ASIC for the Adaptive Gain Integrated Pixel Detector at the European XFEL**

U. Trunk<sup>1</sup>, A. Allagholi<sup>1</sup>, J. Becker<sup>1</sup>, L. Bianco<sup>1</sup>, R. Dinapoli<sup>2</sup>, E. Fretwurst<sup>3</sup>, P. Göttlicher<sup>1</sup>, H. Graafsma<sup>1,4</sup>, D. Greiffenberg<sup>2</sup>, M. Gronewald<sup>5</sup>, B. Henrich<sup>2</sup>, H. Hirsemann<sup>1</sup>, S. Jack<sup>1</sup>, R. Klanner<sup>3</sup>, A. Klyuev<sup>1</sup>, H. Krüger<sup>5</sup>, A. Marras<sup>1</sup>, D. Mezza<sup>2</sup>, A. Mozzanica<sup>2</sup>, I. Sheviakov<sup>1</sup>, B. Schmitt<sup>2</sup>, J. Schwandt<sup>3</sup>, X. Shi<sup>2</sup>, Q. Xia<sup>1</sup>, J. Zhang<sup>1</sup>, M. Zimmer<sup>1</sup>, A. Delfs<sup>1</sup>  
<sup>1</sup>DESY Deutsches Elektronen-Synchrotron, Germany; <sup>2</sup>PSI Paul-Scherrer-Institut, Switzerland; <sup>3</sup>University of Hamburg, Germany; <sup>4</sup>Mid Sweden University, Sweden; <sup>5</sup>University of Bonn, Germany

**N03-18 Testability Features of a Single Photon Counting Hybrid Pixel Detector Readout Circuit with Charge Sharing Elimination Algorithm**

P. Maj, A. Drozd, P. Grybos, R. Szczygiel, G. Deptuch  
AGH University of Science and Technology, Poland

**N03-19 Fermi CMS Pixel (FCP130) Test ASIC**

E. Fahim, G. W. Deptuch, J. Hoff, A. Shenai, M. Trimpl, D. C. Christian  
Fermi National Accelerator Laboratory, USA

**N03-20 Implementation of an On-Chip Charge Cluster Reconstruction Technique with the miniVIPIC Pixel Readout Chip for Soft X-ray Counting and Timing**

M. Trimpl, G. Deptuch, J. Hoff, F. Fahim, Fermi National Laboratory, USA; P. May, P. Kmon, P. Grybos, R. Szczygiel, AGH-UST, Poland

**N03-21 A Switchless Low-Noise High Voltage Bias Supply**

K. Nishimura, M. Breidenbach, A. Dragone, M. Freytag, R. Herbst, G. Haller  
SLAC National Accelerator Laboratory, USA

**N03-22 Study of the Effects of Parasitic Capacitance on Large Integrated Feedback Resistors for Charge-Sensitive Preamplifiers**

S. Capra<sup>1</sup>, A. Pullia<sup>1,2</sup>  
<sup>1</sup>University of Milano, Italy; <sup>2</sup>INFN, Italy

**N03-23 Design of an Integrated Low - Noise, Low - Power Charge Sensitive Preamplifier for Gamma and Particle Spectroscopy with Solid State Detectors**

S. Capra<sup>1</sup>, A. Pullia<sup>1,2</sup>  
<sup>1</sup>University of Milano, Italy; <sup>2</sup>INFN, Italy

**N03-24 A Novel Signal Compression Circuit for Charge Collecting Pixel Detectors**

F. Erdinger, P. Fischer, Heidelberg University, Germany; M. Porro, Max-Planck-Institut fuer extraterrestrische Physik, Germany

**N03-25 A Dedicated Analog Digital Converter for Silicon Photomultiplier Readout**

W. Shen, K. Briggel, H. Chen, H.-C. Schultz-Coulon  
University of Heidelberg, Germany

**N03-27 A Dedicated Readout ASIC for Time-of-Flight Positron Emission Tomography Using Silicon Photomultiplier (SiPM)**

H. Chen, K. Briggel, P. Fischer, A. Gil, T. Harion, Y. Munwes, M. Ritzert, H.-C. Schultz-Coulon, W. Shen, V. Stankova  
University of Heidelberg, Germany

**N03-28 Interfacing a SiPM to a Current-Mode Front-End: Effects of the Coupling Inductance**

G. Matarrese, F. Ciceriello, F. Corsi, F. Licciulli, C. Marzocca  
*DEI - POLITECNICO DI BARI, Italy*

**N03-29 Dream: a 64-Channel Front-End Chip with Embedded Analog Trigger Latency Buffer for the Micromegas Tracker of the CLAS12 Experiment.**

E. Delagnes, P. Baron, D. Besin, E. Montmarthe, I. Mandjavidze, S. Aune, S. Procureur, F. Sabatie  
*CEA/IRFU, France*

**N04 NSS Poster Session I - Computing and Software**

Monday, Nov. 10 14:00-15:30 4B

Session Chair: **Diego Casadei**, Fachhochschule Nordwestschweiz (FHNW), Switzerland

**N04-1 Dataset Definition for CMS Operations and Physics Analyses**

M. Pierini, *CERN, Switzerland*

On behalf of the CMS Collaboration

**N04-18 The Data Quality Monitoring Software for the CMS Experiment at the LHC**

L. Borello, *University of Wisconsin, USA*

On behalf of the CMS Collaboration

**N04-2 Persistent Monitoring with Distributed Semantics**

J. Kornell, S. Weeks

*Special Technologies Lab, NSTec, DOE, USA*

**N04-3 Validation of Beta Ray Scintillation Spectra in Liquid Scintillation Counter Using Geant4 Simulation**

T. Aso<sup>1</sup>, M. Hara<sup>2</sup>, K. Ogiwara<sup>3</sup>, T. Yoshimura<sup>3</sup>, E. Takada<sup>1</sup>

<sup>1</sup>*Toyama National College of Technology, Japan*; <sup>2</sup>*Toyama University, Japan*; <sup>3</sup>*Hitachi Aloka Medical Ltd., Japan*

**N04-4 Object Composition Identification via Mediated-Reality Supplemented Radiographs**

E. S. Jimenez, L. J. Orr, K. R. Thompson

*Sandia National Laboratories, USA*

**N04-6 The Calibration and System Simulation Software Package for the European XFEL DSSC Detector**

G. Weidenspointner, M. Kuster, S. Schlee, *XFEL, Germany*; R. Andritschke, D. Moch, M. Porro, *MPE, Germany*; S. Aschauer, *PNSensor GmbH, Germany*

**N04-7 CMS Alignment and Calibration Workflows: Lesson Learned and Future Plans**

S. Di Guida, *CERN, Switzerland*

On behalf of the CMS Collaboration

**N04-8 Monte Carlo Simulation of Energy Deposition by Neutron Reaction Products in Lithiated Foam Using Dynamic Path Generation**

M. A. Reichenberger, R. G. Fronk, J. K. Shultis, D. S. McGregor

*Kansas State University, United States of America*

**N04-9 Development of an Educational Game for Understanding Radiation Shielding Concepts**

T. Kasuga, H. Tenzou, R. Johnston, S. Manabe, K. Motoki

*Kagawa National College of Technology, Japan*

**N04-11 Assessing List-Mode Observer Performance in Classification Tasks When Imaging Nuclear Inspection Objects**

C. J. MacGahan, M. A. Kupinski, *University of Arizona, United States*; N. Hilton, W. Johnson, E. Brubaker, *Sandia National Laboratories, United States*

**N04-12 High-Level FPGA Programming Framework and Electronics Developments for High Speed Data Throughput and Processing**

S. Hauf, B. Fernandes, M. Kuster, H. S. Namin, P. Gessler, C. Youngman

*European XFEL GmbH, Germany*

**N04-13 Calibration and Calibration Data Processing Concepts at European XFEL**

S. Hauf, D. Boukhelef, B. C. Heisen, M. Kuster, L. Maia, N. Raab, J. Sztuk-Dambietz, M. Turcato, K. Wrona, G. Weidenspointner, C. Youngman

*European X-ray Free Electron Laser Facility GmbH, Germany*

**N04-14 Recent Developments in Transporting Charged Particles in MCNP6**

H. G. Hughes, *Los Alamos National Laboratory, USA*

**N04-15 Using Muons to Determine Densities**

J. L. Cardenas-martinez, *UASLP, Mi<sup>2</sup>/zxico*

**N04-16 Visualization Software for Multiple Data in Radiation Simulations**

A. Kimura, *Ashikaga Institute of Technology, Japan*; S. Tanaka, *Ritsumeikan University, Japan*; T. Sasaki, *High Energy Accelerator Research Organization, Japan*

**N04-17 Simulation Framework for Novel Medical Applications**

A. Cserkaszkzy<sup>1,2</sup>, M. Zvolosky<sup>3</sup>, B. Frisch<sup>2</sup>, T. Wendler<sup>1</sup>

<sup>1</sup>*SurgicEye GmbH, Germany*; <sup>2</sup>*Technische Universität München, Germany*; <sup>3</sup>*DESY, Germany*

## N05 NSS Poster Session I - Gaseous Detectors

Monday, Nov. 10 14:00-15:30 4B

Session Chair: TBD

### N05-1 Gas Gain Stabilization System for the ATLAS Transition Radiation Tracker

B. Mindur, *AGH University of Science and Technology, Poland*

On behalf of the ATLAS TRT Collaboration

### N05-2 Test Beam Results with a Full Size sTGC

S. Rettie<sup>1,2</sup>, D. Mori<sup>3</sup>

<sup>1</sup>*The University of British Columbia, Canada*; <sup>2</sup>*TRIUMF, Canada*; <sup>3</sup>*Simon Fraser University, Canada*

### N05-3 Simultaneous Measurement of Tritium and Carbon-14 in an Ultra-Low-Background Proportional Counter

E. K. Mace, C. E. Aalseth, A. R. Day, E. W. Hoppe, J. J. Moran, M. E. Panisko, A. Seifert, R. M. Williams

*Pacific Northwest National Laboratory, USA*

### N05-4 Certification and Commissioning of the ATLAS Micromegas Quadruplet Prototype

M. Bianco, *CERN, Switzerland*

On behalf of the ATLAS Muon Collaboration and H. Danielsson, *CERN*, R. De Oliveira, *CERN*, F. Perez Gomez, *CERN*,

### N05-5 Construction of sTGC Prototype for the ATLAS-MUON Upgrade

L. Guan, *University of Michigan, United States*

On behalf of the ATLAS Collaboration

### N05-7 Optimisation of the Front-End Electronics of Drift Tube Chambers for High-Rate Operation

P. Schwegler, S. Abovyan, V. Danielyan, D. Fink, M. Fras, O. Kortner, H. Kroha, S. Nowak, S. Ott, R. Richter, Y. Zhao

*Max-Planck-Institut für Physik, Germany*

### N05-8 Bulk-Micromegas Detector and Synchrotron Radiation Measurement

H. Qi<sup>1,2</sup>, Y. Zhang<sup>1,3</sup>, Q. Ouyang<sup>1,2</sup>, Y. Chen<sup>1,2</sup>, J. Zhang<sup>1,2</sup>, B. Wang<sup>1,2</sup>, P. Liu<sup>1,2</sup>

<sup>1</sup>*State Key Laboratory of Particle Detection and Electronics, China*; <sup>2</sup>*Institute of High Energy Physics, China*; <sup>3</sup>*University of Chinese Academy of Sciences, China*

### N05-9 Construction and Test of High Precision Drift-Tube (sMDT) Chambers for the ATLAS Muon Spectrometer

P. Schwegler, H. Kroha, O. Kortner, F. Sforza

*Max-Planck-Institut für Physik, Germany*

### N05-10 Simulation of a Low-Background Proton Detector for Studying Low-Energy Resonances Relevant in Thermonuclear Reactions

D. Perez Loureiro, C. Wrede, *Michigan State University, USA*

### N05-12 Study of a Large-Area GEM Detector Read Out with Radial Zigzag Strips for Forward Tracking in Experiments at a Future Electron-Ion Collider

A. Zhang, V. Bhopatkar, M. Hohlmann, E. Hansen, M. Phipps, E. Starling, J. Twigger, K. Walton

*Florida Institute of Technology, US*

### N05-13 Online Precision Gas Evaluation of the ATLAS Muon Spectrometer During LHC Run I

D. S. Levin, *University of Michigan, United States*

On behalf of the ATLAS MUON collaboration

### N05-14 Performance Studies of a Large TPC with GEM-Based Gas Amplification

F. V. Bißmeyer, *Technische Universität München, Germany*

On behalf of the GEM-TPC collaboration

### N05-15 Research on the Angle Response of MRPC Detector and Corresponding Correction Method

Z. Luo, X. Wang, Z. Zeng, Y. Wang, M. Zeng, Z. Zhao, H. Yi, B. Yu, X. Yue

*Tsinghua University, China*

### N05-18 High Rate, High Time Precisin RPC for LHC Upgrade Experiments

I. B. Laktineh<sup>1</sup>, L. Mirabito<sup>1</sup>, C. Combaret<sup>1</sup>, A. Petrukhin<sup>1</sup>, V. Buridon<sup>1</sup>, N. Lumb<sup>1</sup>, A. Eynard<sup>1</sup>, L. Germani<sup>1</sup>, P. Calabria<sup>1</sup>, J.-C. Ianigro<sup>1</sup>, H. Mathez<sup>1</sup>, C. Gired<sup>1</sup>, E. Bechtouil<sup>1</sup>, D. Delaunay<sup>1</sup>, G. Grenier<sup>1</sup>, C. de La Taille<sup>2</sup>, N. Seguin-Moreau<sup>2</sup>, S. Carlier<sup>2</sup>, W. Tromeur<sup>1</sup>

<sup>1</sup>*IPNL-UCBL-IN2P3, France*; <sup>2</sup>*OMEGA-Paris, France*

### N05-20 Design and Construction of Large Size Micromegas Chambers for the Muon Spectrometer Upgrade of the ATLAS Experiment

P. Loesel, *Ludwig-Maximilians-University, Germany*

On behalf of the ATLAS MUON collaboration

### N05-22 Development of a Plasma Panel Detector

P. S. Friedman, *Integrated Sensor LLC, United States*; C. Ferretti, D. S. Levin, R. Ball, J. W. Chapman, B. Zhou, C. Weaverdyck, *University of*

*Michigan, United States*; R. L. Varner, *Oak Ridge National Lab, United States*; Y. Silver, E. Etzion, M. B. Moshe, R. Bensimon, *University of Tel Aviv, Israel*

### N05-23 Angular Dependence of Position Resolution for a Short Drift GEM Tracking Detector

B. Azmoun, A. Franz, R. Pak, M. L. Purschke, C. Woody

*Brookhaven National Lab, USA*

## **N05-24 Research and Development of Commercially Manufactured Large GEM Foils**

M. Posik, B. Sorrow, *Temple University, United States*

## **N06 NSS Poster Session I - Radiation Damage Effects and Radiation Hard Devices**

Monday, Nov. 10 14:00-15:30 4B

Session Chair: **Christopher A. Betancourt**, University of Freiburg, Germany

### **N06-1 Effect of Co-Doping on the Radiation Hardness of Gd<sub>3</sub>Ga<sub>3</sub>Al<sub>2</sub>O<sub>12</sub>:Ce Scintillators**

M. Tyagi<sup>1</sup>, F. Meng<sup>2</sup>, M. Koschan<sup>2</sup>, A. K. Singh<sup>1</sup>, C. L. Melcher<sup>2</sup>, S. C. Gadkari<sup>1</sup>

<sup>1</sup>*Bhabha Atomic Research Center, India*; <sup>2</sup>*University of Tennessee, USA*

### **N06-2 Radiation and Magnetic Field Effects on Commercial DC-DC Converters for HL-LHC Experiments**

S. Fiore<sup>1,2</sup>, J. Ameel<sup>3</sup>, D. Amidei<sup>3</sup>, S. Baccaro<sup>1,2</sup>, M. Citterio<sup>2</sup>, R. Edgar<sup>3</sup>, A. Lanza<sup>2</sup>, S. Latorre<sup>2</sup>, M. Lazzaroni<sup>2,4</sup>, K. Sekhon<sup>3</sup>

<sup>1</sup>*ENEA, Italy*; <sup>2</sup>*INFN, Italy*; <sup>3</sup>*University of Michigan, USA*; <sup>4</sup>*Universita' degli Studi di Milano, Italy*

### **N06-3 Radiation Damage and Recovery of Medium Heavy and Light Inorganic Crystalline, Glass and Glass Ceramic Materials after Irradiation with 150MeV Protons and 1.2MeV Gamma-Rays**

R. W. Novotny<sup>1</sup>, K.-T. Brinkmann<sup>1</sup>, A. Borisevich<sup>2</sup>, V. Dormenev<sup>1</sup>, V. Kalinov<sup>3</sup>, M. Korjik<sup>2</sup>, D. Kozlov<sup>2</sup>, A. Voitovich<sup>3</sup>, H.-G. Zaunick<sup>1</sup>

<sup>1</sup>*Justus-Liebig-University, Germany*; <sup>2</sup>*Institute for Nuclear Problems, Belarus*; <sup>3</sup>*Institute of Physics of National Academy of Science, Belarus*

### **N06-5 Photostimulated Luminescence of BaFBr:Eu and KCl:Eu under Ion Irradiation**

M. Koshimizu, M. Hashima, H. Hori, K. Asai

*Tohoku University, Japan*

### **N06-6 Radiation Hardness and Positive Hysteresis of GSO and GSOZ Scintillators**

T. Yanagida<sup>1</sup>, Y. Fujimoto<sup>2</sup>, K. Watanabe<sup>3</sup>, M. Koshimizu<sup>2</sup>

<sup>1</sup>*Kyushu Institute of Technology, Japan*; <sup>2</sup>*Tohoku Univ., Japan*; <sup>3</sup>*Nagoya Univ., Japan*

### **N06-7 66 MeV Proton Testing of the and-or Multiplexer SET Filter Circuit Implemented on a Flash FPGA**

F. Smith, S. van Aard, J.-P. Potgieter, *Nelson Mandela Metropolitan University, South Africa*; A. Brandt, *Cape Peninsula University of Technology, South Africa*; C. Nwosa, D. R. Faber, D. Wright, I. T. Sokeng, *Heliocentric Technologies ZA, South Africa*

### **N06-8 Overview of Main Results from the ATLAS Upgrade Planar Pixel Sensors R&D Project**

E. Gkougkousis<sup>1,2</sup>, <sup>1</sup>*Universite Paris-Sud 11, France*; <sup>2</sup>*Laboratoire de l'Accelérateur Lineaire, France*

On behalf of the ATLAS Upgrade Planar Pixel Sensors R&D collaboration

### **N06-9 Radiation Effects Test and SEL Protection Solution for the Front End ASICs of DAMPE BGO Calorimeter**

S. Gao<sup>1</sup>, C. Feng<sup>1</sup>, D. Jiang<sup>1</sup>, Z. Shen<sup>1</sup>, D. Zhang<sup>1</sup>, K. Xi<sup>2</sup>, S. Liu<sup>1</sup>, Q. An<sup>1</sup>

<sup>1</sup>*University of Science and Technology of China, China*; <sup>2</sup>*Institute of Modern Physics, Chinese Academy of Sciences, China*

### **N06-10 Radiation Damage in Transistors Fabricated with Lapis Semiconductor 200 nm FD-SOI Technology**

S. Glab<sup>1</sup>, Y. Arai<sup>2</sup>, M. Baszczyk<sup>1</sup>, P. Dorosz<sup>1</sup>, M. Idzik<sup>1</sup>, P. Kapusta<sup>3</sup>, W. Kucwicz<sup>1</sup>, T. Miyoshi<sup>2</sup>, L. Mik<sup>1</sup>, M. Sapor<sup>1</sup>, A. Takeda<sup>4</sup>, M. Turala<sup>3</sup>

<sup>1</sup>*AGH University of Science and Technology, Poland*; <sup>2</sup>*Institute of Particle and Nuclear Studies, High Energy Accelerator Research Organization (KEK), Japan*; <sup>3</sup>*Institute of Nuclear Physics PAN, Poland*; <sup>4</sup>*The Graduate University for Advanced Studies (SOKENDAI), School of High Energy Accelerator Science, Japan*

### **N06-11 Gamma Radiation Induced Effects on Optical and Electrical Properties of TeO<sub>2</sub>, (TeO<sub>2</sub>)<sub>0.8</sub> (In<sub>2</sub>O<sub>3</sub>)<sub>0.2</sub> and ZnO Thin Films**

A. K. Gourishetty, P. Tomar, M. Mohil, M. Dhibar

*Indian Institute of Technology Roorkee, INDIA*

### **N06-12 Study of the <sup>60</sup>Co and Neutron Radiation Effects on MOSFETs Manufactured in a 150 and 180 nm Commercial Technology**

M. Carna, M. Havranek, M. Marcisovsky, G. Neue, Z. Janoska, V. Kafka, M. Sedlackova, L. Tomasek, V. Vrba, *Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague, Czech Republic*; M. Koleska, *Research Centre Rez Ltd., Czech Republic*

### **N06-15 Studies of Irradiated Alumina Layer for Development of Silicon Sensors with Slim Edges**

J. M. Rafi, G. Pellegrini, *CNM, Spain*; V. A. Fadeyev, Z. Galloway, H. F. W. Sadrozinski, *UCSC, USA*; M. Christophersen, B. F. Philips, *NRL, USA*;

D. Lynn, J. Kierstead, *BNL, USA*; M. Hoeferkamp, S. Seidel, *UNM, USA*

### **N06-16 Characterisation of an Alternative Novel Diamond Based Microdosimeter Prototype**

J. A. Davis<sup>1</sup>, K. Ganesan<sup>2</sup>, D. A. Prokopovich<sup>3</sup>, M. Petasecca<sup>1</sup>, M. L. F. Lerch<sup>1</sup>, D. N. Jamieson<sup>2</sup>, A. B. Rosenfeld<sup>1</sup>

<sup>1</sup>*Centre for Medical Radiation Physics/University Of Wollongong, Australia*; <sup>2</sup>*University of Melbourne, Australia*; <sup>3</sup>*Australian Nuclear Science and Technology Organisation, Australia*

### **N06-17 Characterization of Surface and Bulk Properties of 3D Sensors after Heavy Irradiation.**

M. Bubna<sup>1</sup>, D. Bortoletto<sup>1</sup>, G.-F. Della Betta<sup>2</sup>, M. Povoli<sup>3</sup>, R. Mendicino<sup>2</sup>, G. Bolla<sup>1</sup>, K. Arndt<sup>1</sup>, I. P. Shipsey<sup>1</sup>, M. Boscardin<sup>4</sup>, G. Giacomini<sup>4</sup>, F. Mattedi<sup>4</sup>, N. Zorzi<sup>4</sup>

<sup>1</sup>*Purdue University, USA*; <sup>2</sup>*INFN Trento, Italy*; <sup>3</sup>*University of Oslo, Norway*; <sup>4</sup>*Fondazione Bruno Kessler, Italy*

### **N06-18 Radiation-Hard Timepix Detector-Based Hodoscope for the Characterization of Harsh Mixed Radiation Environments**

I. Caicedo<sup>1</sup>, B. Bergmann<sup>1</sup>, M. Kříž<sup>1/2</sup>, V. Kraus<sup>1</sup>, C. Leroy<sup>3</sup>, S. Pospisil<sup>1</sup>, M. Suk<sup>1</sup>, Z. Vykydal<sup>2</sup>

<sup>1</sup>*Institute of Experimental and Applied Physics, Czech Technical University in Prague, Czech Republic*; <sup>2</sup>*Czech Metrology Institute, Czech Republic*;

<sup>3</sup>*Université 1/2 de Montri 1/2al, Canada*

### **N06-19 Radiation Hardness of Silicon Nitride Radiation Window and Filter Structures**

J. Kostamo, P. Kostamo, E. Kostamo, P. T. Törmä, M. Mattila, H. Sipilä, *HS Foils Oy, Finland*; N. Nelms, *European Space Agency, The Netherlands*

## **N07 NSS Poster Session I - Photodetectors and Radiation Imaging Detectors**

Monday, Nov. 10 14:00-15:30 4B

Session Chair: TBD

### **N07-1 X-ray Transmission Characteristics Measurement of a Polycapillary Lens Installed in an Analytical Electron Microscope**

A. Takano, K. Maehata, N. Iyomoto, *Kyushu University, Japan*; T. Hara, *National Institute for Materials Science, Japan*; K. Mitsuda, N. Yamasaki, *Institute of Space and Astronautical Science, Japan*; K. Tanaka, *Hitachi High-Tech Science Corporation, Japan*

### **N07-3 Development of a Three-Layer Phoswich Alpha-Beta-Gamma Imaging Detector**

S. Yamamoto, *Nagoya University Graduate School of Medicine, Japan*; H. Ishibashi, *Hitachi Chemical, Japan*

### **N07-4 Performance Studies of Hamamatsu R9800 Photomultiplier Tube with a New Active Base Designed for Use in Hall D Broadband Tagger Hodoscope**

V. Popov, *Thomas Jefferson National Accelerator Facility, USA*; A. Somov, *Thomas Jefferson National Accelerator Facility, USA*; F. Klein, N. Walford, N. Sparks, *Catholic University of America, USA*

### **N07-5 Dual Storage SOI Monolithic Pixel Sensor**

T. Miyoshi<sup>1</sup>, Y. Arai<sup>1</sup>, Y. Fujita<sup>1</sup>, K. Hara<sup>2</sup>, S. Honda<sup>2</sup>, Y. Ikegami<sup>1</sup>, Y. Ikemoto<sup>1</sup>, I. Kurachi<sup>1</sup>, S. Mitsui<sup>1</sup>, K. Tauchi<sup>1</sup>, T. Tsuboyama<sup>1</sup>, M. Yamada<sup>1</sup>  
<sup>1</sup>*HIGH ENERGY ACCELERATOR RESEARCH ORGANIZATION, Japan*; <sup>2</sup>*Univ. of Tsukuba, Japan*

### **N07-6 Study of the Detection Properties of a GYGAG(Ce) Scintillator Ceramic for Medical Imaging Application in Comparison to a LaBr<sub>3</sub>(Ce) Crystal**

A. Fabbri<sup>1</sup>, G. Hull<sup>2</sup>, M. Galasso<sup>1</sup>, N. J. Cherepy<sup>3</sup>, M. N. Cinti<sup>4</sup>, R. Pani<sup>4</sup>  
<sup>1</sup>*University of Roma Tre, Italy*; <sup>2</sup>*Institut de Physique Nucléaire, France*; <sup>3</sup>*Lawrence Livermore National Laboratory, USA*; <sup>4</sup>*University La Sapienza, Italy*

### **N07-7 Position Sensitivity in a 3"x3" LaBr<sub>3</sub> Crystal with a 2x2 PSPMTs Array**

A. Fabbri<sup>1</sup>, M. Galasso<sup>1</sup>, A. Giaz<sup>2</sup>, F. Camera<sup>3,2</sup>  
<sup>1</sup>*University of Roma Tre, Italy*; <sup>2</sup>*Istituto Nazionale di Fisica Nucleare, Italy*; <sup>3</sup>*Universita degli studi di Milano, Italy*

### **N07-8 Development of a PET Detector Module**

S. Adachi, S. Nakamura, M. Hirayanagi, T. Matsumoto, T. Baba, T. Kato, K. Hayatsu, Y. Okuwa, R. Ota  
*HAMAMATSU PHOTONICS K.K., Japan*

### **N07-10 Gain Stabilization of SiPMs - Technical Part**

I. Polak, *FZU, Institute of Physics ASCR, Prague, Czech republic*; G. Eigen, *University of Bergen, Norway, Norway*

### **N07-11 Results of Measurements of Photodetectors for the ECAL0 Calorimeter for the COMPASS-II Experiment.**

A. Rychter, K. Zaremba, J. Marzec, M. Dziewiecki, M. Ziembicki, R. Kurjata, B. Konarzewski, G. Domanski  
*Warsaw University of Technology, Institute of Radioelectronics, Poland*

### **N07-13 Measurement and Modeling of Silicon Photomultiplier Devices by Means of S-Parameter Techniques**

D. Fink, R. Mirzoyan, M. Teshima, O. Reimann  
*Max Planck Institut fuer Physik, Germany*

### **N07-14 Model for the Design of a Prompt Gamma Detection System Using Large Scintillators and Digital Silicon Photomultipliers**

K. E. Roemer<sup>1</sup>, G. Pausch<sup>2</sup>, W. Enghardt<sup>1,2</sup>, C. Golnik<sup>2</sup>, F. Hueso-González<sup>2</sup>, T. Kormoll<sup>2</sup>, J. Petzoldt<sup>2</sup>, H. Rohling<sup>2</sup>, S. Schoene<sup>1</sup>, F. Fiedler<sup>1</sup>  
<sup>1</sup>*Institute of Radiation Physics, Helmholtz-Zentrum Dresden-Rossendorf, Germany*; <sup>2</sup>*OncoRay — National Center for Radiation Research in Oncology, Faculty of Medicine and University Hospital Carl Gustav Carus, Technische Universität Dresden, Helmholtz-Zentrum Dresden - Rossendorf, Germany*

### **N07-15 Development of Large Area UV-Sensitive MPPCs to Detect Scintillation Light from Liquid Xenon**

T. Iwamoto, *The University of Tokyo, Japan*  
On behalf of the MEG II Collaboration

### **N07-16 Timing Performance of New Hamamatsu Silicon Photomultipliers**

A. Mangu<sup>1</sup>, J. Duarte<sup>1</sup>, M. Spiropulu<sup>1</sup>, C. Pena<sup>1</sup>, S. Xie<sup>1</sup>, A. Bornheim<sup>1</sup>, A. Ronzhin<sup>2</sup>, E. Ramberg<sup>2</sup>, S. Los<sup>2</sup>, A. Apresya<sup>1</sup>  
<sup>1</sup>*California Institute of Technology, USA*; <sup>2</sup>*Fermi National Accelerator Laboratory, USA*

### **N07-17 Development of Photon-Counting High Energy X-Ray Imaging System with Silicon Strip Detector and Time-over-Threshold ASIC**

X. Yan, H. Takahashi, K. Shimazoe, Y. Tian, T. Fujiwara, *The University of Tokyo, Japan*; T. Ishikura, *Fuji Electric Co. Ltd, Japan*; H. Tomita, *Nagoya University, Japan*

### **N07-18 Strong Improvement of the Main Parameters of Classical PMTs**

R. Mirzoyan<sup>1</sup>, T. Toyama<sup>1</sup>, Y. Hanabata<sup>2</sup>, J. Hose<sup>1</sup>, U. Menzel<sup>1</sup>, D. Nakajima<sup>2</sup>, M. Takahashi<sup>2</sup>, M. Teshima<sup>1,2</sup>, T. Yamamoto<sup>3</sup>  
<sup>1</sup>*Max-Planck-Institute for Physics, Germany*; <sup>2</sup>*ICRR, University of Tokyo, Japan*; <sup>3</sup>*Konan University, Japan*

### **N07-19 Optimal SiPM Cell Size for Energy Measurements with Scintillator-Enhanced Optical Crosstalk**

A. Gola, F. Acerbi, A. Ferri, G. Paternoster, N. Zorzi, C. Piemonte  
*Fondazione Bruno Kessler, Italy*

### **N07-20 A Mixed-Field Imaging Approach to Reactor Monitoring**

J. Beaumont<sup>1</sup>, M. P. Mellor<sup>2</sup>, M. J. Joyce<sup>1</sup>  
<sup>1</sup>*Lancaster University, UK*; <sup>2</sup>*Creteac Ltd., UK*

**N07-21 High-Resolution Commercial CMOS Image Sensors as X-Ray Imagers and Low-Intensity Particle Beam Monitors**

A. Castoldi<sup>1,2</sup>, C. Guazzoni<sup>1,2</sup>, S. Maffessanti<sup>1</sup>, G. V. Montemurro<sup>1</sup>, L. Carraresi<sup>3,2</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>Universita' degli Studi di Firenze, Italy

**N07-22 A Modified Measurement Method for Photon Detection Efficiency (PDE) of Different SiPM Devices**

G. Fu, S. Dolinsky, A. Ivan, J. Guo

GE Global Research Center, USA

**N07-23 New Shapes and Configurations of Compton Camera Detectors' to Mitigate the Negative Effects of Their Finite Spatial Resolution**

B. D. Smith, University of Texas San Antonio, USA

**N07-24 Stereographic Backscattered X-Ray Tomography with Scanning Pencil-Beam for One-Sided Nondestructive Inspection**

T. Tohyama, A. Yamazaki, K. Watanabe, A. Uritani

Nagoya University, Japan

**N07-25 A Noise Reduction Method for Single Photon Avalanche Diodes in 0.8  $\mu\text{m}$  HV CMOS Technology**

S. Parent<sup>1</sup>, V.-P. Rhéaume<sup>1</sup>, B.-L. Bérubé<sup>1</sup>, S. Martel<sup>2</sup>, R. Fontaine<sup>1</sup>, S. A. Charlebois<sup>1</sup>, J.-F. Pratte<sup>1</sup>

<sup>1</sup>Université de Sherbrooke, Canada; <sup>2</sup>Teledyne Dalsa, Canada

**N07-26 Characterization of Silicon Photomultipliers for Calorimetry Applications**

S. P. Stoll, C. L. Woody

Brookhaven National Laboratory, USA

**N07-27 Characterization and Performance Assessment of a 4D PET Module Based on Continuous Crystals and Double Side SiPM Read-Out**

M. Morrocchi<sup>1,2</sup>, G. Ambrosi<sup>3</sup>, M. G. Bisogni<sup>1,2</sup>, P. Cerello<sup>4</sup>, A. Del Guerra<sup>1,2</sup>, M. Ionica<sup>3</sup>, B. Liu<sup>1,2</sup>, F. Pennazio<sup>4</sup>, M. A. Piliero<sup>1,2</sup>, G. Pirrone<sup>1,2</sup>, V.

Postolache<sup>3</sup>, R. Wheadon<sup>4</sup>

<sup>1</sup>INFN Pisa, Italy; <sup>2</sup>University of Pisa, Italy; <sup>3</sup>INFN Perugia, Italy; <sup>4</sup>INFN Torino, Italy

**N08 NSS Poster Session I - Detectors for Synchrotron Radiation and FEL Instrumentation**

Monday, Nov. 10 14:00-15:30 4B

Session Chair: TBD

**N08-1 Performance and Future Improvement Potentials of DEPFET Sensors with Nonlinear Amplification for Photon Counting Applications**

S. Aschauer<sup>1</sup>, K. Hermenau<sup>1</sup>, P. Lechner<sup>1</sup>, G. Lutz<sup>1</sup>, P. Majewski<sup>1</sup>, M. Porro<sup>2</sup>, C. Sandow<sup>1</sup>, L. Strüder<sup>1</sup>

<sup>1</sup>PNSensor GmbH, Germany; <sup>2</sup>Max-Planck-Institut für extraterrestrische Physik, Germany

**N08-2 Spatial, Spectroscopic and Timing Performance of Pixellated Single X-Ray Photon Counting Devices**

J. N. E. McGrath, J. Marchal, R. Plackett, I. Horswell, D. Omar, E. N. Gimenez, N. Tartoni

Diamond Light Source, UK

**N08-3 A 960x960 Fast Frame Store CCD Detector for X-Ray Photon Correlation Spectroscopy**

J. T. Weizeorick, T. Madden, S. Narayanan, S. Niu, A. Sandy, Argonne National Laboratory, United States; D. Contarato, P. Denes, D. Doering, J.

Joseph, P. McVittie, V. Moeller-Chan, Lawrence Berkeley National Laboratory, United States

**N08-4 Laboratory Infrastructure for Detector Calibration and Characterisation at the European XFEL - Status and First Results**

J. Sztuk-Dambietz, M. Kuster, S. Hauf, N. Raab, M. Turcato

European XFEL GmbH, Germany

**N08-5 Calibration of the Non-Linear System Characteristic of a Prototype of the DSSC Detector for the European XFEL**

D. Moch, M. Porro, Max-Planck-Institut fuer extraterrestrische Physik, Germany; G. Weidenspointer, S. Schlee, European XFEL GmbH, Germany; S.

Aschauer, PNSensor GmbH, Germany; F. Erdinger, P. Fischer, M. Kirchgessner, J. Soldat, Universitaet Heidelberg, Germany; K. Hansen, C. Reckleben,

Deutsches Elektronen-Synchrotron, Germany

**N08-6 Multi-Element Si(Li)- and HPGe-Detectors Used for High-Resolution Spectroscopy of X-Rays with Energies up to Several 100 keV**

T. Krings, D. Protic, C. Ross

SEMIKON Detector GmbH, Germany

**N08-7 Design and TCAD Simulations of Planar Active-Edge Pixel Sensors for Future XFEL Applications**

G.-F. Dalla Betta<sup>1,2</sup>, <sup>1</sup>University of Trento, Italy; <sup>2</sup>INFN, Italy

On behalf of the PixFEL Collaboration

**N08-9 Studies of the ePix100 Low-Noise X-Ray Camera at SLAC**

G. A. Carini, S. Herrmann, K. Nishimura, P. Hart, G. Blaj, A. Tomada, J. Pines, M. Weaver, A. Dragone, P. Caragiulo, B. Markovic, R. Herbst, C.

Kenney, J. Segal, J. Hasi, S. Osier, G. Haller, H. Lemke, S. Nelson, A. Robert, D. Zhu

SLAC National Accelerator Laboratory, USA

**N08-10 Flip Chip Assembly of Thin Substrates, Fine Pitch, and Small Area Prototype Die**

A. Tomada, G. Carini, S. Herrmann, G. Blaj, J. Segal, J. Hasi, C. Kenney

SLAC, USA

**N08-11 High-Resolution High-Contrast X-Ray Radiography with Large Area Hybrid Pixel Detector as a Novel Ultimate Tool for Investigation of Painted Arts**

J. Zemlicka<sup>1</sup>, J. Jakubek<sup>1</sup>, F. Krejci<sup>1</sup>, I. Kumpova<sup>2</sup>, D. Vavrik<sup>1,2</sup>, J. Lauterkranc<sup>3</sup>, J. Zivny<sup>3</sup>

<sup>1</sup>Institute of Experimental and Applied Physics, Czech Technical University Prague, Czech Republic; <sup>2</sup>Centre of Excellence Telc, Czech Republic; <sup>3</sup>Private restorer, Czech Republic

#### **N08-12 LAMP and the Second Generation pnCCD X-Ray Imaging Detector Operational Experience at the LCLS**

S. Carron, A. Mitra, G. Blaj, P. Hart, C. Kenney, C. Bostedt, K. Ferguson, J. C. Castagna, M. Swiggers, M. Bucher, *SLAC National Accelerator Laboratory, USA*; T. Osipov, *University of Western Michigan, USA*; N. Berrah, *University of Connecticut, USA*; L. Englert, G. Hauser, *Max Plank Institute for Extraterrestrial Physics, Germany*; R. Hartmann, *PNSensor GmbH, Germany*

### **N09 NSS Poster Session I - Instrumentation on Nuclear Security Applications**

Monday, Nov. 10 14:00-15:30 4B

Session Chair: **Jennifer Ressler**, Lawrence Livermore National Laboratory,

#### **N09-1 Status Report for the CRIPT Muon Tomography Project**

D. Waller, *Defence Research and Development Canada, Canada*

On behalf of the CRIPT Collaboration

#### **N09-2 Detection of Hidden Objects Using a Compton Camera**

Y. Maghrbi<sup>1</sup>, D. Al-Abdulmalik<sup>2</sup>, I. Y. Al-Qaradawi<sup>2</sup>, O. Bouhali<sup>1</sup>, J. Gerl<sup>3</sup>, M. E. Zayed<sup>2</sup>

<sup>1</sup>Texas A&M University at Qatar, Qatar; <sup>2</sup>Qatar University, Qatar; <sup>3</sup>Gesellschaft für Schwerionenforschung, Germany

#### **N09-4 Differential Die-Away Instrument: Benchmarking of Monte Carlo to Experiment**

A. V. Goodsell, M. T. Swinhoe, V. Henzl, K. D. Ianakiev, M. Iliev, C. D. Rael, D. J. Desimone

*Los Alamos National Laboratory, USA*

#### **N09-5 3D Imaging in Non Destructive Assays of Nuclear Waste Drums**

M. A. Belzunce<sup>1,2</sup>, L. Martinez Garbino<sup>1,2</sup>, C. A. Verrastro<sup>1,2</sup>, E. da Ponte<sup>1</sup>

<sup>1</sup>CNEA, Argentina; <sup>2</sup>UTN-FRBA, Argentina

#### **N09-6 Radiographic Imaging Components for Dose Reduction in Cargoes**

A. Danagoulian, W. Bertozzi, W. A. Franklin, S. E. Korbly, R. J. Ledoux, D. Swenson

*Passport Systems, Inc., USA*

#### **N09-7 A Robust Simulation Look-up Library for Real-Time Airborne Gamma-Ray Spectroscopy**

J. A. Kulisek, R. S. Wittman, W. J. Kernan, J. D. McCall, E. A. Miller, J. E. Schweppe, C. E. Seifert, S. C. Stave, T. N. Stewart

*Pacific Northwest National Laboratory, USA*

#### **N09-8 Simulations of Material-Based Detector Responses for Airborne Gamma-Ray Spectroscopy**

T. N. Stewart, W. J. Kernan, J. A. Kulisek, J. E. Schweppe, C. E. Seifert, R. S. Wittman

*Pacific Northwest National Laboratory, United States*

#### **N09-9 Distributed Detector Radiation Networks: Static and Mobile Sensor Configurations**

C. Shenton-Taylor, S. Gillespie, D. Blackie, A. Caister, A. Bell, R. Murphy, C. Steer, N. Shute

*AWE, UK*

#### **N09-10 Wavelet Analysis of Shielded Radiological Material: the Applicability of Wavelet Analysis for Homeland Security**

K. Vaughan, R. L. Turner, P. A. Kendall, *AWE, UK*

#### **N09-11 Actinide Assay of Post-Detonation Samples Using Alpha Coincidence Techniques**

G. A. Warren, M. P. Dion, B. W. Miller

*Pacific Northwest National Laboratory, USA*

#### **N09-12 Performance Evaluation of Californium Interrogation Prompt Neutrons (CIPN) Technique Using Fresh and Spent Nuclear Fuel**

D. Henzlova<sup>1</sup>, C. D. Rael<sup>1</sup>, H. O. Menlove<sup>1</sup>, R. M. Zedric<sup>1</sup>, J. S. Hendricks<sup>1</sup>, J. Hu<sup>2</sup>, I. P. Martinez<sup>1</sup>, S. J. Tobin<sup>1</sup>, H. R. Trellue<sup>1</sup>, R. A. Weldon<sup>1</sup>

<sup>1</sup>Los Alamos National Laboratory, USA; <sup>2</sup>Oak Ridge National Laboratory, USA

#### **N09-13 Low-Profile Wearable Sensor Using CLYC Detectors**

M. J. Myjak, B. S. McDonald, M. A. Zalavadia, J. E. Smart, P. C. Landgren, J. A. Willett

*Pacific Northwest National Laboratory, USA*

#### **N09-14 Multiplicity Counter Development with LiF/ZnS**

A. T. Lintereur, S. C. Stave, R. T. Kouzes, E. R. Siciliano, S. M. Robinson

*Pacific Northwest National Laboratory, USA*

#### **N09-15 Neutron Multiplicity Distributions from a Configurable Multiplying Source**

E. C. Miller<sup>1</sup>, J. M. Kalter<sup>1</sup>, D. L. Chichester<sup>2</sup>, M. M. Kinlaw<sup>2</sup>, S. M. Watson<sup>2</sup>, C. M. Lavelle<sup>1</sup>, W. A. Noonan<sup>1</sup>

<sup>1</sup>Johns Hopkins University Applied Physics Laboratory, USA; <sup>2</sup>Idaho National Laboratory, USA

#### **N09-17 A Method for Improvement of Short-Lived Fission Product Nuclear Data Through Gamma Ray Spectroscopy**

A. M. Prinke, L. R. Greenwood, D. A. Haas, S. C. Stave, *Pacific Northwest National Laboratory, USA*; S. R. Biegalski, K. J. Dayman, M. T.

Montgomery, *University of Texas at Austin, USA*; J. T. Burke, J. J. Ressler, A. P. Tonchev, *Lawrence Livermore National Laboratory, USA*

**N09-18 A High-Throughput High-Resolution Gamma Spectroscopy System for the Measurement of Delayed G-Rays after Photon-Induced Fission**

X. Wen<sup>1</sup>, D. Nakazawa<sup>2</sup>, H. Yang<sup>1</sup>

<sup>1</sup>Oregon State University, USA; <sup>2</sup>Canberra Industries, USA

**N09-19 Design of a Cosmic-Ray Muon Radiography System for Dry Storage Cask Imaging**

C. Liao, H. Yang, Oregon State University, USA

**N09-20 Geant4 Simulation of Pulse Shape Discrimination with Plastic Scintillator and SiPM for Simultaneous Gamma/Neutron Measurements**

C. Liao, H. Yang, Oregon State University, USA

**N09-21 Real-Time Gamma-Ray Background Estimation for Aerial Surveys**

J. E. Schweppe, B. E. Bernacki, D. V. Jordan, J. A. Kulisek, R. J. McConn, Jr., C. E. Seifert, S. C. Stave, T. N. Stewart

Pacific Northwest National Laboratory, USA

**N09-22 Algorithm for Radionuclide Analysis Using Energy-Weighted Count with Plastic Scintillation Detector for Radiation Portal Monitor: A Monte Carlo Study**

W. G. Shin<sup>1</sup>, H. C. Lee<sup>1</sup>, C. I. Choi<sup>2</sup>, H. S. Hong<sup>2</sup>, C. H. Min<sup>1</sup>

<sup>1</sup>Yonsei University, Korea; <sup>2</sup>Korea Institute of Nuclear Safety, Korea

**N09-24 Identifying Neutron Source Type by Neutrons in High Scattering Environment<sup>1</sup>**

J. A. Crow<sup>1</sup>, E. R. Myers<sup>1</sup>, C. B. Hoshor<sup>1</sup>, B. J. Rogers<sup>1</sup>, S. M. Young<sup>1</sup>, J. E. Currie<sup>1</sup>, T. M. Oakes<sup>1</sup>, P. R. Scott<sup>1</sup>, W. H. Miller<sup>2,3</sup>, S. L. Bellinger<sup>4</sup>, D. S. McGregor<sup>4</sup>, A. N. Caruso<sup>1</sup>

<sup>1</sup>University of Missouri - Kansas City, USA; <sup>2</sup>University of Missouri - Columbia, USA; <sup>3</sup>Missouri University Research Reactor, USA; <sup>4</sup>Kansas State University, USA

**N09-25 Muon Tomography Using a Density-Based Clustering Technique**

K. B. Perry, C. H. G. Wright, S. F. Barrett, D. Schwellenbach, W. Dreesen

University of Wyoming, Albany

**N09-26 Development of Gamma-Ray Imager with Stacked Bar-Type Scintillators**

J. Kawarabayashi, T. Takahashi, H. Sugano, H. Tomita, T. Iguchi, Nagoya University, Japan; E. Takada, D. Matsui, Toyama National College of Technology, Japan

**N09-27 An MAP Algorithm with Edge-Preserving Prior for Muon Tomography**

B. Yu<sup>1,2</sup>, Z. Zhao<sup>1,2</sup>, X. Wang<sup>1,2</sup>, D. Wu<sup>1,2</sup>, Z. Zeng<sup>1,2</sup>, Y. Wang<sup>1,2</sup>, M. Zeng<sup>1,2</sup>, H. Yi<sup>1,2</sup>, Z. Luo<sup>1,2</sup>, X. Yue<sup>1,2</sup>, J. Cheng<sup>1,2</sup>

<sup>1</sup>Ministry of Education, China; <sup>2</sup>Tsinghua University, China

**N09-28 A Fast Neutron Detector for Homeland Security Based on Scintillation Light by a Noble Gas Sensed by Silicon Photomultiplier Arrays**

M. Caccia, R. Santoro, V. Chmill, Universit  di Insubria, Italy; A. Martemyanov, ITEP, Russia

**N09-29 Bayesian-Theory-Based Most Probable Trajectory Reconstruction Algorithm in Cosmic Ray Muon Tomography**

H. Yi<sup>1,2</sup>, Z. Zeng<sup>1,2</sup>, B. Yu<sup>1,2</sup>, J. Cheng<sup>1,2</sup>, Z. Zhao<sup>1,2</sup>, X. Wang<sup>1,2</sup>, M. Zeng<sup>1,2</sup>, Y. Wang<sup>1,2</sup>

<sup>1</sup>Tsinghua University, China; <sup>2</sup>Ministry of Education, China

**N09-30 Fusion of Photon-Neutron Spectroscopies**

C. B. Hoshor<sup>1</sup>, T. M. Oakes<sup>1</sup>, E. R. Myers<sup>1</sup>, S. L. Bellinger<sup>2</sup>, W. H. Miller<sup>3</sup>, B. J. Rogers<sup>1</sup>, S. M. Young<sup>1</sup>, J. E. Currie<sup>1</sup>, J. A. Crow<sup>1</sup>, D. S. McGregor<sup>2</sup>,

A. N. Caruso<sup>1</sup>

<sup>1</sup>University of Missouri - Kansas City, USA; <sup>2</sup>Kansas State University, USA; <sup>3</sup>University of Missouri - Columbia, USA

**N09-31 Use of Thermal-Neutron Time-Correlated Counting to Analyze Multiplying Assemblies of HEU**

D. L. Chichester, M. T. Kinlaw, S. M. Watson, Idaho National Laboratory, USA; J. M. Kalter, E. C. Miller, W. A. Noonan, Johns Hopkins University

Applied Physics Laboratory, USA

**N09-32 Imaging Shielded Configurations Using near-Horizontal and near-Vertical Trajectory Cosmic-Ray Muons**

D. Schwellenbach, W. Dreesen, J. A. Green, D. Aberle, A. Tibbitts

National Security Technologies, US

**N09-33 Fast Neutron Backgrounds for Anti-Neutrino Based Nuclear Reactor Monitoring as a Function of Overburden**

C. Roecker, University California Berkeley, USA; J. Brennan, M. Gerling, P. Marleau, Sandia National Laboratory, USA; O. B. O. the WATCHMAN

collaboration, Lawrence Livermore National Laboratory, USA

**N09-34 Momentum Estimation of Cosmic Ray Muons Through Multiple Scattering in Muon Tomography Scanner**

P. Kurnadi, S. Simon, T. Taylor

Decision Sciences International Corporation, US

**N09-35 X-Ray Radar Imaging Technique Using a 2 MeV Linear Electron Accelerator**

W. Dreesen, D. Schwellenbach, National Security Technologies, USA; J. R. Wood, M. Browder, Lockheed Martin, USA; J. M. Potter, JP Accelerator

Works, USA

**N09-36 Detection of Petawatt Laser-Induced Muon Source for Rapid High-Z Material Detection**

W. Dreesen, D. Schwellenbach, J. A. Green, National Security Technologies, USA; M. Browder, J. R. Wood, Lockheed Martin, USA; T. Ditmire,

National Energetics, USA; C. Wagner, G. Tiwari, University of Texas at Austin, USA

**N09-37 Non-Destructive Inspection System of Nuclear Material Hidden in Cargo**

I. Daito<sup>1</sup>, M. Kando<sup>2</sup>, C. Angell<sup>2</sup>, T. Shizuma<sup>2</sup>, T. Hayakawa<sup>2</sup>, R. Hajima<sup>2</sup>, H. Ohgaki<sup>1</sup>  
<sup>1</sup>*Institute of Advanced Energy, Kyoto University, Japan;* <sup>2</sup>*Japan Atomic Energy Agency, Japan*

#### **N09-38 Plutonium Metal Spontaneous Fission Neutron Cross-Correlation Measurements**

M. J. Marcatch, T. Shin, S. D. Clarke, J. L. Dolan, M. Flaska, E. W. Larsen, S. A. Pozzi, *University of Michigan, USA;* P. Peerani, *Joint Research Centre, Italy*

#### **N09-40 Development of Realtime 90Sr Counter Used in Low Rate Radioactive**

S. Iijima<sup>1</sup>, H. Ito<sup>1</sup>, S. Han<sup>1,2</sup>, H. Kawai<sup>1</sup>, S. Kodama<sup>1</sup>, D. Kumogoshi<sup>1</sup>  
<sup>1</sup>*Graduate School of Science, Chiba Univ., Japan;* <sup>2</sup>*National Institute of Radiological Science, Japan*

#### **N09-41 Image Reconstruction of Shielded Mixed-Oxide Fuel Using a Dual-Particle Imaging System**

J. K. Polack, A. Poitrasson-Rivière, M. C. Hamel, S. D. Clarke, M. Flaska, S. Pozzi, *University of Michigan, USA;* A. Tomanin, P. Peerani, *Joint Research Centre, Italy*

#### **N09-42 Development of Portable Compact Gamma-Ray Spectrometer with CsI(Tl)+MPPC**

H. Takahashi, T. Nakagawa, T. Ohsugi, Y. Fukazawa, T. Mizuno, *Hiroshima University, Japan;* T. Takagaki, *TAC Inc., Kyoto*

#### **N09-43 Development of Semiconductor Compton Camera GREI for Imaging Analysis of Radioactive Substances in the Environment**

S. Motomura<sup>1</sup>, T. Ida<sup>1,2</sup>, T. Fukuchi<sup>1</sup>, M. Hiromura<sup>1</sup>, H. Haba<sup>1</sup>, Y. Watanabe<sup>1</sup>, S. Enomoto<sup>1,2</sup>  
<sup>1</sup>*RIKEN, Japan;* <sup>2</sup>*Okayama University, Japan*

#### **N09-44 Learning to See What Has Never Been Seen, an Effective Machine Learning Framework for Nuclear Security Applications**

S. E. Labov<sup>1</sup>, A. Dubrawski<sup>2</sup>, P. Huggins<sup>2</sup>, C. Mattoon<sup>1</sup>, K. E. Nelson<sup>1</sup>, S. Ray<sup>2</sup>  
<sup>1</sup>*Lawrence Livermore National Laboratory, USA;* <sup>2</sup>*Carnegie Mellon University, USA*

#### **N09-45 Development of Direction-Sensitive Radiation Detector using Ce:GAGG Scintillators and MPPCs**

T. Nakamori<sup>1</sup>, H. Sato<sup>2</sup>, M. Takebe<sup>1</sup>, S. Gunji<sup>1</sup>, S. Ito<sup>2</sup>, M. Yoshino<sup>2</sup>, S. Kato<sup>2</sup>, Y. Usuki<sup>2</sup>, J. Kataoka<sup>3</sup>  
<sup>1</sup>*Yamagata University, Japan;* <sup>2</sup>*Furukawa Co., Ltd., Japan;* <sup>3</sup>*Waseda University, Japan*

#### **N09-46 Pulse Shape Analysis in Broad Energy Germanium Detectors, to Improve Minimum Detectable Activity in Safety and Security Applications**

L. J. Harkness-Brennan, A. J. Boston, H. C. Boston, S. J. Colosimo, J. Dormand, J. R. Cresswell, D. S. Judson, P. J. Nolan, *University of Liverpool, UK;* A. Aderemi, J. Colaresi, J. Cocks, W. Mueller, *CANBERRA Industries Inc, USA*

#### **N09-47 Optimizing the Coherent X-Ray Diffraction Signal for Identification of Liquids**

M. Janeczek, J. A. Kerner, E. Franco  
*Rapiscan Laboratories, Inc., USA*

### **N10 NSS Poster Session I - Nuclear Physics Instrumentation**

Monday, Nov. 10 14:00-15:30 4B

Session Chair: **Sara Pozzi**, University of Michigan, United States

#### **N10-1 Growth of Co-Doped TeO2 Crystals with High Bi Doping for Scintillating Bolometers**

Y. Zhu, Z. Ge, S. Yue, W. Wang, Y. Pan, X. Feng, *Shanghai Institute of Ceramics, Chinese Academy of Sciences, China;* I. Dafinei, *Sezione INFN di Roma and Universit, Italy*

#### **N10-2 Construction and Characterization of the CLAS12 Central Neutron Detector**

G. Hull, J. Bettane, A. Maroni, M. Imre, C. Theneau, G. Minier, S. Niccolai  
*Institut de Physique Nucleaire d'Orsay, France*

#### **N10-3 Clad Failure Detection System Based on Delayed Neutron Detection Without Photoneutron Noise Designed for Sodium-Cooled Fast Reactors**

E. Rohee, R. Coulon, C. Jammes, S. Normand, F. Carrel, F. Laine, H. Hamrita  
*French Atomic Energy and Alternative Energies Commission, France*

#### **N10-4 Development of a Microcalorimeter for Measurement of L X-Rays Emitted from Transuranium Elements**

K. Nakamura<sup>1</sup>, M. Maeda<sup>1</sup>, K. Maehata<sup>2</sup>, N. Iyomoto<sup>2</sup>, K. Ishibashi<sup>2</sup>, K. Takasaki<sup>1</sup>, K. Mitsuda<sup>3</sup>  
<sup>1</sup>*Japan Atomic Energy Agency, Japan;* <sup>2</sup>*Kyushu University, Japan;* <sup>3</sup>*Japan Aerospace Exploration Agency, Japan*

#### **N10-6 Position-Sensitive Coincidence Detection of Nuclear Reaction Products with Configurable Array of Timepix Detectors**

C. Granja, V. Kraus, S. Pospisil, *Czech Technical University in Prague, Czech Republic;* V. Pugatch, *Kiev Institute for Nuclear Research, Ukraine*

#### **N10-7 Development of a Front-End Electronics for an Innovative Monitor Chamber for High-Intensity Charged Particle Beams**

L. K. Fanola Guarachi<sup>1,2</sup>, F. Fausti<sup>1,2</sup>, F. Marchetto<sup>1</sup>, S. Giordanengo<sup>1</sup>, G. Mazza<sup>1</sup>, M. Varasteh Anvar<sup>1,2</sup>, V. Monaco<sup>1,2</sup>, R. Sacchi<sup>1,2</sup>, R. Cirio<sup>1,2</sup>  
<sup>1</sup>*INFN, Italy;* <sup>2</sup>*Torino University, Italy*

#### **N10-8 Optimization of the Sampling Process for the Close Orbit Data in the Digital Beam Position Measurement for SSRF**

W. Wu, L. Zhao, Q. An, E. Chen, S. Liu, *USTC, China*

#### **N10-9 Detailed Mapping of the Interstrip Response in Double Sided Silicon Strip Detectors in Front and Back Injection by Means of IR Laser Irradiation**

A. Castoldi<sup>1,2</sup>, C. Guazzoni<sup>1,2</sup>, T. Parsani<sup>1,2</sup>, F. Riccio<sup>1,2</sup>, P. Zambon<sup>1,2</sup>  
<sup>1</sup>*Politecnico di Milano, Italy;* <sup>2</sup>*INFN, Italy*

## **N10-10 Future Upgrades for the sPHENIX Experiment at RHIC**

C. Woody, Brookhaven National Lab, USA

On behalf of the PHENIX Collaboration

## **N10-12 Characterization of a NTD Double-Sided Silicon Strip Detector Using a Pulsed Ion Beam**

A. Castoldi<sup>1</sup>, C. Guazzoni<sup>1</sup>, T. Parsani<sup>1</sup>, F. Riccio<sup>1</sup>, L. Carrarresi<sup>2,3</sup>, F. Taccetti<sup>3</sup>, L. Acosta<sup>4,3</sup>, I. Martel<sup>4</sup>, J. A. Duenas<sup>4</sup>

<sup>1</sup>Politecnico di Milano and INFN, Italy; <sup>2</sup>Universita' degli Studi di Firenze, Italy; <sup>3</sup>INFN, Italy; <sup>4</sup>Universidad de Huelva, Spain

## **N10-13 Investigation of the Requirements of a Digital Holographic Interferometer for Proton Beam Dosimetry**

A. Cavan, University of Canterbury, New Zealand; J. Meyer, E. Ford, P. Jing, L. Y. Lin, University of Washington, USA

## **N10-14 HyPix-3000 – a Large Area Single-Photon Counting Detector with Two Discriminator Thresholds**

P. Maj, P. Grybos, R. Szczygiel, AGH University of Science and Technology, Poland; T. Taguchi, Y. Nakaye, Rigaku Corporation, Japan

## **N10-15 Real Time Digital Constant Fraction Discriminator for Fast Timing Measurements**

P. Mutti, E. Ruiz-Martinez, Institut Laue-Langevin, France; M. Alarcón Ortiz, Universidad Politécnica de Cartagena, Spain; C. De Cesare, University of Milano, Italy

## **N10-16 RICH with Hamamatsu MPPC Module S11834**

R. Pestotnik<sup>1</sup>, S. Korpar<sup>2,1</sup>, P. Križan<sup>3,1</sup>, E. Tahirovic<sup>1</sup>

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

## **N10-17 A Selectable-Gain CMOS Frontend for Pulse Shape Analysis in Double Sided Silicon Microstrip Detectors**

A. Castoldi, C. Guazzoni, T. Parsani

Politecnico di Milano and INFN, Italy

## **N10-18 Comparing Analog and Digital Pulse-Shape-Discrimination System Performance for Organic-Liquid Scintillators**

C. S. Sosa, M. Flaska, S. A. Pozzi

University of Michigan, USA

## **N11 NSS Poster Session I - Semiconductors Tracking and Spectroscopy**

Monday, Nov. 10 14:00-15:30 4B

Session Chair: TBD

### **N11-1 Optimization of Proximity Charge Sensing Readout HPGe Detectors**

M. Amman, A. Priest, J. S. Lee, P. N. Luke, K. Vetter, Lawrence Berkeley National Laboratory, 94720; S. Asztalos, K. Sabourov, XIA LLC, 94544

### **N11-2 Towards High-Fidelity Molecular Dynamics Simulations of Ionic Transport of TlBr**

X. Zhou, M. E. Foster, R. E. Jones, P. F. Doty, P. Yang, H. Fan

Sandia National Laboratories, USA

### **N11-3 Design, Construction and Prototyping of the Silicon Strip Tracker for the Micro Vertex Detector of the PANDA Experiment**

H.-G. Zaunick<sup>1</sup>, R. Schnell<sup>1</sup>, T. Quagli<sup>1</sup>, K. T. Brinkmann<sup>1</sup>, A. Rivetti<sup>2</sup>, V. Di Pietro<sup>1</sup>, A. Riccardi<sup>1</sup>, A. Goerres<sup>3</sup>, H. Sohlbach<sup>4</sup>

<sup>1</sup>2nd Physics Institute, University Giessen, Germany; <sup>2</sup>Istituto Nazionale di Fisica Nucleare, Italy; <sup>3</sup>IKP, Forschungszentrum Juelich, Germany;

<sup>4</sup>Fachhochschule Suedwestfalen, Germany

### **N11-4 Ultra-Fast, Low-Power MAPS Prototype**

P. Giubilato, S. Mattiazzo, D. Pantano, D. Bisello, Padova University and INFN, Italy; W. Snoeys, T. Kugathasan, C. Marin Tobon, J. Rousset, L.

Musa, P. Riedler, CERN, Switzerland

### **N11-5 Charge Collection Efficiency Mapping of a Frisch-Collar BiI3 Device**

N. S. Edwards, D. S. McGregor

Kansas State University, United States

### **N11-6 Track Analysis Techniques and Lineal Energy Transfer Measurements by Means of a Timepix Detector**

B. Bergmann<sup>1</sup>, S. Brons<sup>2</sup>, I. Caicedo<sup>1</sup>, M. Holik<sup>1</sup>, V. Kraus<sup>1</sup>, S. Pospisil<sup>1</sup>

<sup>1</sup>Institute for Experimental and Applied Physics at CTU in Prague, Czech Republic; <sup>2</sup>Heidelberger Ionenstrahl-Therapiezentrum (HIT), Germany

### **N11-7 SiMPI - SiPMs with Bulk Integrated Quench Resistors**

J. Ninkovic, L. Andricek, C. Jendrysik, R. Lehmann, S. Petrovics, R. Richter, F. Schopper

MPG Halbleiterlabor, Germany

### **N11-8 Weightfield: a Simulation Program to Evaluate the Performance of Silicon Detectors**

N. Cartiglia<sup>1</sup>, F. Cenna<sup>1</sup>, A. Picerno<sup>1</sup>, F. Ravera<sup>1</sup>, V. Fadeyev<sup>2</sup>, P. Freeman<sup>2</sup>, H. Sadrozinski<sup>2</sup>, A. Seiden<sup>2</sup>, Z. Galloway<sup>2</sup>, M. Friedl<sup>3</sup>, B. Kolbinger<sup>1</sup>

<sup>1</sup>INFN, Italy; <sup>2</sup>Santa Cruz Institute for Particle Physics, United States; <sup>3</sup>OEAW, Austria

### **N11-9 Irradiation Effects of a Monolithic Pixel Sensor in FD-SOI Technology with 62 MeV-Protons**

P. L. Alvarez-Rengifo<sup>1,2</sup>, E. Cortina<sup>1</sup>, L. Soung Yee<sup>1</sup>

<sup>1</sup>Université Catholique de Louvain, Belgium; <sup>2</sup>Universitat Autònoma de Barcelona, Spain

### **N11-11 The Silicon Upstream Tracker for the LHCb Upgrade**

M. Artuso, Syracuse university, USA

On behalf of the LHCb Upstream Tracker Collaboration

## N12 NSS Poster Session I - Trigger and Frontend Systems

Monday, Nov. 10 14:00-15:30 4B

Session Chair: TBD

### N12-1 Demonstrator System for the Phase-I Upgrade of the Trigger Readout Electronics of the ATLAS Liquid-Argon Calorimeters

K. Chen, Brookhaven National Laboratory, United States

On behalf of the ATLAS Liquid Argon Calorimeter Group

### N12-3 Concept of a Stand-Alone Muon Trigger with High Transverse Momentum Resolution for the ATLAS Detector at the High-Luminosity LHC

Y. Horii, Nagoya University, Japan

On behalf of the ATLAS MUON collaboration

### N12-4 Design and Test of a Demonstrator for the New Level-1 Muon Trigger of the ATLAS Detector at the High-Luminosity LHC

P. Schwegler, H. Kroha, O. Kortner, R. Richter, M. Fras, V. Gabrielyan, V. Danielyan, D. Fink, S. Nowak, S. Abovyan, S. Ott

Max-Planck-Institut für Physik, Germany

### N12-6 Linearity Improvement of the FPGA-Based Time-to-Digital Converter (TDC) Using Dual-Output Tapped-Delay Line

J. Y. Won, J. S. Lee

Seoul National University, South Korea

### N12-7 Trigger of the Educational ALIBAVA System

J. Bernabeu<sup>1</sup>, G. Casse<sup>2</sup>, C. Garcia<sup>1</sup>, A. Greenall<sup>2</sup>, C. Lacasta<sup>1</sup>, M. Lozano<sup>3</sup>, S. Marti-Garcia<sup>1</sup>, G. Pellegrini<sup>3</sup>, J. Rodriguez<sup>4</sup>, M. Ullan<sup>3</sup>

<sup>1</sup>Instituto de Fisica Corpuscular (IFIC), Spain; <sup>2</sup>Univeristy of Liverpool, United Kingdom; <sup>3</sup>Institut de Microelectrònica de Barcelona IMB-CNM, Spain;

<sup>4</sup>ALIBAVA Systems, Spain

### N12-9 Upgrade of the ATLAS Level-1 Calorimeter Trigger

F. Mueller, Ruprecht-Karls-Universitaet, Germany

On behalf of the ATLAS

### N12-10 The ATLAS FTK Auxiliary Card: a Highly Functional VME Rear Transition Module for a Hardware Track Finding Processing Unit

J. Alison, A. Boevia, M. Bogdan, P. Bryant, Y. Cheng, K. Krizka, M. Shochet, L. Tompkins, J. Webster

University of Chicago, USA

### N12-11 The Input Mezzanine Card for the ATLAS Fast TrackKer (FTK) System

A. Annovi<sup>1</sup>, M. Beretta<sup>1</sup>, M. Gatta<sup>1</sup>, S. Gkaitatzis<sup>2</sup>, T. Iizawa<sup>3</sup>, N. Kimura<sup>3</sup>, K. Kordas<sup>2</sup>, T. Korikawa<sup>3</sup>, T. Mitani<sup>3</sup>, S. Nikolaidis<sup>2</sup>, C. Petridou<sup>2</sup>, D. Sampsonidis<sup>2</sup>, D. Sampsonidou<sup>2</sup>, C. Sotiropoulou<sup>2</sup>, K. Yorita<sup>3</sup>

<sup>1</sup>INFN, Italy; <sup>2</sup>Aristotle University of Thessaloniki, Greece; <sup>3</sup>Waseda University, Japan

### N12-13 Development of DAQ board SEABAS2 for SOI pixel detectors

S. Mitsui, Y. Arai, Y. Fujita, Y. Ikegami, Y. Ikemoto, T. Miyoshi, K. Tauchi, T. Tsuboyama, M. Yamada, High energy accelerator research organization, Japan; K. Hara, S. Honda, University of Tsukuba, Japan

### N12-14 An Artificial Retina Processor for Track Reconstruction at the LHC Bunch-Crossing Rate

S. Stracka<sup>1</sup>, A. Abba<sup>2</sup>, F. Bedeschi<sup>1</sup>, F. Caponio<sup>2</sup>, M. Citterio<sup>2</sup>, A. Cusimano<sup>2</sup>, A. Geraci<sup>2</sup>, F. Lionetto<sup>1</sup>, P. Marino<sup>1</sup>, M. Morello<sup>1</sup>, N. Neri<sup>2</sup>, D. Ninci<sup>1</sup>, M. Petruzzo<sup>2</sup>, A. Piucci<sup>1</sup>, G. Punzi<sup>1</sup>, L. Ristori<sup>3</sup>, F. Spinella<sup>1</sup>, D. Tonelli<sup>4</sup>, J. Walsh<sup>1</sup>

<sup>1</sup>INFN Sezione di Pisa, Scuola Normale Superiore, and University of Pisa, Italy; <sup>2</sup>INFN Sezione di Milano and Politecnico of Milano, Italy; <sup>3</sup>Fermilab, USA;

<sup>4</sup>CERN, Switzerland

## N13 Instrumentation for Nuclear Security Applications I

Monday, Nov. 10 16:00-18:00 6A

Session Chairs: **Clair J. Sullivan**, University of Illinois-Nuclear, Plasma, and Radiological Eng, United States

**William K. Pitts**, Pacific Northwest National Laboratory, United States

### N13-1 (16:00) Mobile Outdoor SuperMISTI Compton Imager

E. A. Wulf<sup>f</sup>, A. L. Hutcheson<sup>1</sup>, B. E. Leas<sup>2</sup>, L. J. Mitchell<sup>1</sup>, R. Woolf<sup>g</sup>, B. F. Philips<sup>1</sup>

<sup>1</sup>Naval Research Laboratory, USA; <sup>2</sup>SRA International, USA; <sup>3</sup>National Research Council/NRL, USA

### N13-2 (16:15) Polaris-H Measurements and Performance

C. G. Wahl, W. R. Kaye, W. Wang, F. Zhang, J. M. Jaworski, Y. A. Boucher, A. King, Z. He

H3D, Inc., USA

### N13-3 (16:30) Development, Commissioning and First Results from a Modular Detection System for Special Nuclear Material (MODES-SNM)

R. Santoro, Universita dell'Insubria, Italy

On behalf of the MODES-SNM Collaboration

### N13-4 (16:45) Improved Nuclear Material Detection Using Joint Neutron and Gamma Ray Detections and Analysis

J. M. Ryan, P. F. Blosser, J. S. Legere, E. Lindner, A. C. Madden, M. L. McConnell

UNH, USA

### **N13-5 (17:00) Enhanced Data Analysis for an Imaging Neutron/Gamma-Ray Spectrometer**

A. C. Madden, P. F. Blosser, J. S. Legere, E. Linder, M. L. McConnell, R. J. M  
*University of New Hampshire, USA*

### **N13-6 (17:15) Multi-Level, Multi-Modal Data Fusion for Improved Vehicular Radiation Detection and Tracking**

D. A. Cooper, R. J. Ledoux, K. Kamieniecki, S. E. Korbly, J. Barcheler, J. Costales, J. Dey, R. Niyazov  
*Passport Systems, Inc., USA*

### **N13-7 (17:30) Improvements in the Method of Radiation Anomaly Detection by Spectral Comparison Ratios**

D. M. Pfund, K. D. Jarman, B. D. Milbrath  
*Pacific Northwest National Laboratory, U.S.A.*

### **N13-8 (17:45) Wireless Radiation Sensor Network with Directional Radiation Detectors**

D. Waller, *Defence Research and Development Canada, Canada*; C. Liu, P.-L. Drouin, *Calian, Canada*; G. St-Jean, M. Deziel, *Communications Research Centre, Canada*

## **N14 Astrophysics and Space Instrumentation I**

Monday, Nov. 10 16:00-18:00 606 & 607

Session Chairs: **Kaixuan Ni**, Shanghai Jiao Tong University, China  
**Meng Su**, MIT, United States

### **N14-1 (16:00) The 2013 Flight of the PoGOLite Balloon-Borne Hard X-Ray Polarimeter**

M. Pearce, *KTH Royal Institute of Technology, Sweden*  
On behalf of the PoGOLite Collaboration

### **N14-2 (16:15) Development of Superconducting Tunnel Junction Detector Using Hafnium for Neutrino Radiative Decay Search**

K. Takemasa, S. Kim, Y. Takeuchi, K. Kiuchi, K. Nagata, K. Kasahara, T. Okudaira, T. Ichimura, M. Kanamaru, R. Senzaki, K. Moriuchi, *University of Tsukuba, Japan*; H. Ikeda, S. Matsuura, T. Wada, *JAXA/ISAS, Japan*; H. Ishino, A. Kibayashi, *Okayama university, Japan*; H. Sato, S. Mima, *RIKEN, Japan*; T. Yoshida, R. Hirose, *University of Fukui, Japan*; Y. Kato, *Kinki university, Japan*; M. Hazumi, Y. Arai, *KEK, Japan*; E. Ramberg, J. Yoo, M. Kozlovsky, P. Rubinov, D. Sergatskov, *Fermilab, USA*; S. Kim, *Seoul national university, South Korea*

### **N14-3 (17:30) The 2014/15 Antarctic Balloon Campaign of the Compton Spectrometer and Imager (COSI)**

A. Zoglauer<sup>1</sup>, S. E. Boggs<sup>1</sup>, J.-L. Chiu<sup>2</sup>, C. Kierans<sup>1</sup>, A. Lowell<sup>1</sup>, J. A. Tomsick<sup>1</sup>  
<sup>1</sup>*University of California at Berkeley, USA*; <sup>2</sup>*National Tsing Hua University, Taiwan*

### **N14-4 (17:45) Effectiveness and Performance of a Full Ray-Tracing Sub-MeV Compton Imager**

Y. Mizumura<sup>1</sup>, A. Takada<sup>1</sup>, S. Iwaki<sup>1</sup>, S. Komura<sup>1</sup>, H. Kubo<sup>1</sup>, Y. Matsuoka<sup>1</sup>, K. Miuchi<sup>2</sup>, T. Mizumoto<sup>1</sup>, K. Nakamura<sup>1</sup>, S. Nakamura<sup>1</sup>, M. Oda<sup>1</sup>, J. D. Parker<sup>1</sup>, S. Sonoda<sup>1</sup>, T. Sawano<sup>3</sup>, T. Tanimori<sup>1</sup>, D. Tomono<sup>1</sup>  
<sup>1</sup>*Kyoto University, Japan*; <sup>2</sup>*Kobe University, Japan*; <sup>3</sup>*Kanazawa University, Japan*

### **N14-5 (17:00) R&D Results for a Solid Xenon Particle Detector**

E. J. Ramberg, J. Yoo, *Fermi National Accelerator Laboratory, USA*; M. Filipenko, *University of Erlangen, Germany*

### **N14-6 (17:15) Ionization/Scintillation Yields and Energy Scale in Noble Element Detectors**

B. G. Lenardo, M. Tripathi, M. Szydagis  
*University of California, Davis, United States*

### **N14-7 (17:30) Athena, the Next Large ESA Mission to Study the Hot and Energetic Universe**

D. Haas, *SRON, Netherlands Institute for Space Research, Netherlands*  
On behalf of the Athena collaboration

### **N14-8 (17:45) Preflight Model Performance of the Soft Gamma-Ray Detector Onboard the ASTRO-H**

K. Hayashi<sup>1</sup>, H. Tajima<sup>2</sup>, Y. Fukazawa<sup>3</sup>, S. Watanabe<sup>1</sup>, M. Ohta<sup>1</sup>, K. Nakazawa<sup>4</sup>, K. Yamaoka<sup>2</sup>, H. Uchiyama<sup>5</sup>, H. Odaka<sup>1</sup>, T. Yuasa<sup>6</sup>, S. Saito<sup>1</sup>, S. Takeda<sup>1</sup>, M. Kawaharada<sup>1</sup>, A. Harayama<sup>1</sup>, T. Mizuno<sup>3</sup>, H. Takahashi<sup>3</sup>, Y. Tanaka<sup>3</sup>, J. Kataoka<sup>7</sup>, R. Sato<sup>1</sup>, Y. Yatsu<sup>8</sup>, G. Sato<sup>7</sup>, M. Kokubun<sup>1</sup>, T. Takahashi<sup>1</sup>, K. Makishima<sup>4</sup>  
<sup>1</sup>*ISAS/JAXA, Japan*; <sup>2</sup>*Nagoya University, Japan*; <sup>3</sup>*Hiroshima University, Japan*; <sup>4</sup>*The University of Tokyo, Japan*; <sup>5</sup>*Shizuoka University, Japan*; <sup>6</sup>*Institute of Physical and Chemical Research (RIKEN), Japan*; <sup>7</sup>*Waseda University, Japan*; <sup>8</sup>*Tokyo Institute of Technology, Japan*

## **N15 Detectors for Synchrotron Radiation and FEL Instrumentation I**

Monday, Nov. 10 16:00-18:00 608 & 609

Session Chairs: **Gabriella A. Carini**, SLAC National Accelerator Laboratory, United States  
**Farah F. Fahim**, Fermi National Accelerator Laboratory, United States

### **N15-1 (16:00) The LAMBDA Photon-Counting Pixel Detector: Development of High-Z Sensors and Edgeless Modules**

D. Pennicard<sup>1</sup>, S. Smoljanin<sup>1</sup>, B. Struth<sup>1</sup>, H. Hirsemann<sup>1</sup>, M. Sarajlic<sup>1</sup>, J. Zhang<sup>1</sup>, H. Graafsma<sup>1,2</sup>, M. Zuvic<sup>3</sup>, M.-O. Lampert<sup>3</sup>, T. Fritsch<sup>4</sup>, M. Rothermund<sup>4</sup>  
<sup>1</sup>*DESY, Germany*; <sup>2</sup>*Mid Sweden University, Sweden*; <sup>3</sup>*Canberra France, France*; <sup>4</sup>*Fraunhofer IZM, Germany*

### **N15-2 (16:15) The Large Pixel Detector for XFEL.EU**

M. D. Hart, T. Nicholls, C. Angelsen, J. Coughlan, M. French, S. Burge, J. Lipp, P. Seller, M. Prydderch, *STFC - Rutherford Appleton Laboratory, United Kingdom*; M. Kuster, S. Hauf, A. Koch, *European XFEL GmbH, Germany*; G. A. Carini, M. Chollet, S. C. Herrmann, H. T. Lemke, S. Nelson, S. Song, M. Weaver, D. Zhu, *SLAC National Accelerator Laboratory, USA*

**N15-3 (16:30) PERCIVAL: the Design and Characterisation of a CMOS Image Sensor for Direct Detection of Low-Energy X-Rays**

B. Marsh<sup>1</sup>, D. Das<sup>1</sup>, I. Sedgwick<sup>1</sup>, R. Turchetta<sup>1</sup>, M. Bayer<sup>2</sup>, J. Correa<sup>2</sup>, A. Marras<sup>2</sup>, I. Shevyakov<sup>2</sup>, S. Smoljanin<sup>2</sup>, M. Viti<sup>2</sup>, C. B. Wunderer<sup>2</sup>, Q. Xia<sup>2</sup>, M. Zimmer<sup>2</sup>, G. Cautero<sup>3</sup>, D. Giuressi<sup>3</sup>, R. Menk<sup>3</sup>, L. Stebel<sup>3</sup>, H. Yousef<sup>3</sup>, J. Marchal<sup>4</sup>, N. Rees<sup>4</sup>, N. Tartoni<sup>4</sup>, J. Thompson<sup>4</sup>, H. Graafsma<sup>2,5</sup>  
<sup>1</sup>Rutherford Appleton Laboratory, UK; <sup>2</sup>DESY, Germany; <sup>3</sup>Eletra – Sincrotrone Trieste, Italy; <sup>4</sup>Diamond Light Source, UK; <sup>5</sup>Mid Sweden University, Sweden

**N15-4 (16:45) Novel Lutetium-Iodide Scintillators for High-Energy X-Ray Imaging Applications**

P. Kenesei<sup>1</sup>, M. D. Moore<sup>1</sup>, Z. Marton<sup>2</sup>, R. Woods<sup>1</sup>, A. Miceli<sup>1</sup>, S. Ross<sup>3</sup>, J. D. Almer<sup>1</sup>, V. V. Nagarkar<sup>2</sup>, B. Singh<sup>2</sup>  
<sup>1</sup>Argonne National Laboratory, USA; <sup>2</sup>Radiation Monitoring Devices, Inc., USA; <sup>3</sup>Northern Illinois University, USA

**N15-5 (17:00) Latest Results and Prospects of the Development of the DSSC Camera for the European XFEL**

M. Porro, *Max Planck Institut fuer Extraterrestrische Physik, Germany*

On behalf of the DSSC Collaboration

**N15-6 (17:15) Expanding the Dynamic Range of X-Ray pnCCDs for Free Electron Laser and Synchrotron Applications**

L. W. J. Strueder<sup>1,2</sup>, R. Hartmann<sup>1</sup>, J. Schmidt<sup>1</sup>, M. Huth<sup>1</sup>, P. Holl<sup>1</sup>, J. A. Soltau<sup>3</sup>, D. Kalok<sup>1</sup>, D. Steigenhofer<sup>1</sup>, H. Soltau<sup>3</sup>  
<sup>1</sup>PNSensor GmbH, Germany; <sup>2</sup>University of Siegen, Germany; <sup>3</sup>PNDetector GmbH, Germany

**N15-7 (17:30) Improved Rate Resolution Performance in Monolithic Segmented HPGe Detectors**

G. J. Dennis<sup>1</sup>, W. I. Helsby<sup>2</sup>, D. B. S. Omar<sup>1</sup>, I. C. Horswell<sup>1</sup>, N. Tartoni<sup>1</sup>, S. Diaz-Moreno<sup>1</sup>  
<sup>1</sup>Diamond Light Source, UK; <sup>2</sup>Science & Technology Facilities Council, UK

**N15-8 (17:45) The AGIPD Detector for the European XFEL**

D. Greiffenberg, *Paul-Scherer-Institut (PSI), Switzerland*

On behalf of the AGIPD collaboration

**N16 Instrumentation for Nuclear Security Applications II**

Tuesday, Nov. 11 08:00-10:00 6A

Session Chairs: **Leif A. Hansen**, DTRA,  
**Nathan Hilton**, Sandia National Labs, United States

**N16-1 (08:00) MINER - A Mobile Imager of Neutrons for Emergency Responders**

M. D. Gerling, J. E. M. Goldsmith, J. S. Brennan  
*Sandia National Laboratories, USA*

**N16-2 (08:15) Improved Metallic Magnetic Calorimeters for Gamma-Ray Spectroscopy**

C. R. Bates, S. Friedrich, *Lawrence Livermore National Laboratory, United States*; D. Hengstler, C. Pies, A. Fleischmann, L. Gastaldo, C. Enss, *Universität Heidelberg, Germany*

**N16-3 (08:30) Characterization of Construction Materials for Improved Radiation Background Assessments in Complex Environments**

B. R. Kowash, J. D. Casebolt, D. J. Bunker, T. W. Johannes, J. W. McClory  
*Air Force Institute of Technology, USA*

**N16-4 (08:45) Wandering Pixels: Evaluating Moving Sources from an Aerial Platform Using Adaptively Reevaluated Bayesian Localization (ARBL)**

S. M. Robinson, E. Miller, K. Anderson, J. Webster, J. McCall, C. Seifert  
*Pacific Northwest National Laboratory, USA*

**N16-5 (09:00) Radioactive Source Localization from an Aerial Platform Using Adaptively Reevaluated Bayesian Localization (ARBL)**

E. A. Miller, S. M. Robinson, K. K. Anderson, J. D. McCall, J. B. Webster, C. E. Seifert  
*Pacific Northwest National Laboratory, USA*

**N16-6 (09:15) Low Altitude Measurements of the Neutron Background**

L. J. Mitchell, B. F. Philips, A. L. Hutcheson, E. A. Wulf, R. S. Woolf, *Naval Research Laboratory, USA*; D. R. Polaski, *Praxis Inc., USA*

**N16-7 (09:30) Automated Isotope Identification of Single-Source and Mixed-Sources**

J. B. Stinnett, C. J. Sullivan  
*University of Illinois at Urbana-Champaign, 61801*

**N16-8 (09:45) An Affordable Gamma-Ray Spectrometer for General Population**

A. T. Farsoni, E. M. Becker, *Oregon State University, USA*

**N17 High Energy Physics Instrumentation I**

Tuesday, Nov. 11 08:00-10:00 606 & 607

Session Chairs: **Erika Garutti**, University of Hamburg, Germany  
**Frank Simon**, Max-Planck-Institut fuer Physik, Germany

**N17-1 (08:00) CMS Electromagnetic Calorimeter Calibration and Timing: Performance during LHC Run I and Future Prospects**

M. M. Obertino, *Universita del Piemonte Orientale and INFN Torino, Italy*

On behalf of the CMS Collaboration

**N17-2 (08:15) CMS Forward Calorimeters Phase II Upgrade**

B. Bilki, *University of Iowa, USA*

On behalf of the CMS Collaboration

**N17-3 (08:30) Technological Prototype of a Fully Instrumented Silicon-Tungsten Electromagnetic Calorimeter Featuring 5000 Channels/dm<sup>3</sup>**

R. Cornat, *Laboratoire Leprince-Ringuet - Ecole Polytechnique / IN2P3-CNRS, FRANCE*

On behalf of the CALICE Collaboration

**N17-4 (08:45) A Prototype Silicon-Tungsten Calorimeter with Integrated Readout**

R. Frey, J. Brau, S. David, D. Mead, K. Travis, G. Craig, *Univ. of Oregon, USA*; M. Breidenbach, D. Freytag, G. Haller, R. Herbst, *SLAC National Accelerator Center, USA*; B. Holbrook, C. Neher, M. Tripathi, *Univ. of California, USA*

**N17-5 (09:00) Response of the Shashlyk Forward Spectrometer of PANDA to Photons below 800MeV Energy**

R. W. Novotny<sup>1</sup>, S. Diehl<sup>1</sup>, V. Dormenev<sup>1</sup>, P. Drexler<sup>1</sup>, S. Bukreeva<sup>2</sup>, D. Morozov<sup>2</sup>, S. Ryzhikov<sup>2</sup>, P. Semenov<sup>2</sup>

<sup>1</sup>*Justus-Liebig-University, Germany*; <sup>2</sup>*Kurchatov Institute, Russia*

**N17-6 (09:15) Beam Test Results for a Tungsten-Cerium Fluoride Sampling Calorimeter with Wavelength-Shifting Fiber Readout**

P. Meridiani<sup>1</sup>, G. Dissertori<sup>2</sup>, M. Donega<sup>2</sup>, W. Lustermann<sup>2</sup>, F. Nessi-Tedaldi<sup>2</sup>, M. Quittnat<sup>2</sup>, F. Pandolfi<sup>2</sup>, M. Peruzzi<sup>2</sup>, A. Martelli<sup>3</sup>, T. Tabarelli<sup>3</sup>, F. Cavallari<sup>1</sup>, R. Paramatti<sup>1</sup>, I. Dafinei<sup>1</sup>, M. Diemoz<sup>1</sup>, C. Rovelli<sup>1</sup>, G. D'imperio<sup>4</sup>, D. Del Re<sup>4</sup>, S. Gelli<sup>4</sup>, C. Jorda Lopez<sup>4</sup>, F. Micheli<sup>4</sup>, G. Organtini<sup>4</sup>, S. Rahatlou<sup>4</sup>, F. Santanastasio<sup>4</sup>, L. Soffi<sup>4</sup>, N. Pastrone<sup>5</sup>, G. Della Ricca<sup>6</sup>, V. Candelise<sup>6</sup>

<sup>1</sup>*INFN Sezione di Roma, Italy*; <sup>2</sup>*Eidgenössische Technische Hochschule, Switzerland*; <sup>3</sup>*Universita' di Milano-Bicocca e INFN-Sezione di Milano-Bicocca, Italy*;

<sup>4</sup>*Universita' di Roma, Italy*; <sup>5</sup>*INFN Sezione di Torino, Italy*; <sup>6</sup>*Universita' di Trieste e INFN-Sezione di Trieste, Italy*

**N17-7 (09:30) The SDHCAL Technological Prototype : Construction, First Results and Ongoing R&D.**

L. Mirabito, *IPNL-UCBL-IN2P3, France*

On behalf of the CALICE Collaboration

**N17-8 (09:45) A Design of Dimpled Scintillator Tiles Read Out by Surface-Mounted Silicon Photomultipliers for a Future Hadron Calorimeter**

Y. Liu, *University of Mainz, Germany*

On behalf of the CALICE Collaboration

**N18 Analog and Digital Circuits I**

Tuesday, Nov. 11 08:00-10:00 608 & 609

Session Chairs: **Valerio Re**, *Università di Bergamo, Italy*

**Farah F. Fahim**, *Fermi National Accelerator Laboratory, United States*

**N18-1 (08:00) Front-End ASIC for Charge-Interpolating Trackers and Spectrometry**

G. De Geronimo, A. D'Andragora, N. Nambiar, E. Vernon, V. Polychronakos

*Brookhaven National Laboratory, USA*

**N18-2 (08:15) Low-Noise Readout Channel with a Novel Dynamic Signal Compression for Future XFEL Applications**

D. Comotti<sup>1,2</sup>, <sup>1</sup>*University of Pavia, Italy*; <sup>2</sup>*INFN, Italy*

On behalf of the PixFEL Collaboration

**N18-3 (08:30) MARC: a Fast Current-Readout CMOS Front-End for n-Substrate, Fully-Depleted Scientific CCDs**

F. Schembari<sup>1,2</sup>, F. Lazzari<sup>1</sup>, C. Fiorini<sup>1,2</sup>, M. Uslenghi<sup>3</sup>, M. Fiorini<sup>3</sup>

<sup>1</sup>*Politecnico di Milano, Italy*; <sup>2</sup>*INFN, Sezione di Milano, Italy*; <sup>3</sup>*IASF, Istituto Nazionale di Astrofisica, Italy*

**N18-4 (08:45) Low Noise Single Photon Counting Chip with Energy Window for Hybrid Pixel Detector with Precise Offset and Gain Correction**

P. Maj, P. Grybos, P. Kmon, R. Szczygiel

*AGH University of Science and Technology, Poland*

**N18-5 (09:00) A Low Noise and High Dynamic Range CMOS Integrated Electronics associated with Double Sided Silicon Strip Detectors for a Compton Camera gamma-ray Detecting System.**

M. Dahoumane, D. Dauvergne, R. Della Negra, F. Doizon, J. Krimmer, J. L. Ley, H. Mathez, E. Testa, W. Tromeur, Y. Zoccarato

*IPNL, Universiti $\frac{1}{2}$  de Lyon, F-69003 Lyon, France; Universiti $\frac{1}{2}$  Lyon 1 and CNRS/IN2P3, UMR 5822 F-69622, France*

**N18-6 (09:15) A CMOS Charge Sensitive Amplifier with Sub-Electron Equivalent Noise Charge**

G. Bertuccio, D. Macera, C. Graziani, M. Ahangarianabbari

*Politecnico di Milano, Italy*

**N18-7 (09:30) A New Circuit Technology for Improving the Performance of CMOS Preamplifiers for Semiconductor Radiation Detectors**

A. Pullia<sup>1,2</sup>, S. Capra<sup>2</sup>, F. Zocca<sup>2</sup>

<sup>1</sup>*University of Milano, Italy*; <sup>2</sup>*INFN, Italy*

**N18-8 (09:45) Development of a 64-Channel Readout ASIC for an 8x8 SiPM Array for PET Applications**

X. Zhu<sup>1,2</sup>, Z. Deng<sup>1,2</sup>, Y. Chen<sup>1,2</sup>, Y. Liu<sup>1,2</sup>, Y. Liu<sup>1,2</sup>  
<sup>1</sup>Ministry of Education, China; <sup>2</sup>Tsinghua University, China

## N19 Trigger and Front-end Systems I

Tuesday, Nov. 11 10:30-12:00 6A

Session Chairs: **Hans-Christian Schultz-Coulon**, Heidelberg University, Germany  
**Nigel P. Hessey**, Nikhef, Netherlands

### N19-1 (10:30) Installation and Commissioning of the CMS Level-1 Calorimeter Trigger Upgrade

D. A. Belknap<sup>1</sup>, P. Klabbers<sup>1</sup>, J. Brooke<sup>2</sup>, M. Cepeda Hermida<sup>1</sup>, I. A. Cali<sup>3</sup>, S. Dasu<sup>1</sup>, S. Fayer<sup>4</sup>, R. Fobes<sup>1</sup>, R. Frazier<sup>2</sup>, C. Ghabrous<sup>5</sup>, T. Gorski<sup>1</sup>, Z. Guo<sup>1</sup>, G. Hall<sup>4</sup>, C. Hunt<sup>4</sup>, G. Iles<sup>4</sup>, G. M. Innocenti<sup>3</sup>, J. Jones<sup>6</sup>, C. Lucas<sup>2</sup>, R. Lucas<sup>4</sup>, M. Magrans de Abril<sup>5</sup>, D. Newbold<sup>2,7</sup>, I. Ojalvo<sup>1</sup>, S. Paramesvaran<sup>2</sup>, A. Rose<sup>4</sup>, D. Sankey<sup>6</sup>, W. H. Smith<sup>1</sup>, A. Svetek<sup>1</sup>, A. Thea<sup>7</sup>, J. Tikalsky<sup>1</sup>, A. Tapper<sup>4</sup>, M. Vicente<sup>1</sup>, T. Williams<sup>2</sup>

<sup>1</sup>University of Wisconsin, USA; <sup>2</sup>University of Bristol, UK; <sup>3</sup>Massachusetts Institute of Technology, USA; <sup>4</sup>Imperial College, UK; <sup>5</sup>CERN, Switzerland; <sup>6</sup>Iceberg Technology, UK; <sup>7</sup>Rutherford Appleton Laboratory, UK

### N19-2 (10:45) The ATLAS Trigger System: Past, Present and Future

E. Pianori, University of Warwick, UK

On behalf of the ATLAS Collaboration

### N19-3 (11:00) The Design, Performance and Preliminary Commissioning of the ATLAS Fast Tracker

L. Tompkins, Stanford University, USA

On behalf of the ATLAS Collaboration

### N19-4 (11:15) First Prototype of a Tracking System with "Artificial Retina" for Fast Track Finding

N. Neri<sup>1</sup>, A. Abba<sup>1,2</sup>, F. Bedeschi<sup>3</sup>, F. Caponio<sup>2</sup>, M. Citterio<sup>1</sup>, S. Coelli<sup>1</sup>, J. Fu<sup>1,4</sup>, A. Geraci<sup>1,2</sup>, P. Marino<sup>3,5</sup>, M. Monti<sup>1</sup>, M. J. Morello<sup>3,5</sup>, M. Petruzzo<sup>1</sup>, A. Piucci<sup>3</sup>, G. Punzi<sup>3,6</sup>, L. Ristori<sup>3</sup>, F. Spinella<sup>3</sup>, S. Stracka<sup>3,4</sup>, D. Tonelli<sup>4</sup>, J. Walsh<sup>3</sup>

<sup>1</sup>INFN, Sezione di Milano, Italy; <sup>2</sup>Politecnico di Milano, Italy; <sup>3</sup>INFN, Sezione di Pisa, Italy; <sup>4</sup>CERN, Switzerland; <sup>5</sup>Scuola Normale Superiore di Pisa, Italy; <sup>6</sup>Universita' di Pisa, Italy

### N19-5 (11:30) ANGUS: a Multichannel CMOS Circuit for Large Capacitance Silicon Photomultiplier Detectors for SPECT Applications

P. Trigilio<sup>1,2</sup>, R. Quaglia<sup>1,2</sup>, C. Fiorini<sup>1,2</sup>, F. Schembari<sup>1,2</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>Istituto Nazionale di Fisica Nucleare, Italy

### N19-6 (11:45) Readout System for the Belle II imaging Time of Propagation Detector

K. Nishimura, SLAC National Accelerator Laboratory, USA; M. Andrew, M. Barrett, S. Dubey, B. Kirby, B. Macek, G. Varner, Univ. of Hawaii, USA; G. Visser, Indiana University, USA; L. Wood, Pacific Northwest National Laboratory, USA

## N20 Scintillators and Scintillation Detectors I: Scintillators - Fabrication and Processing

Tuesday, Nov. 11 10:30-12:00 606 & 607

Session Chairs: **Etiennette Auffray**, CERN, Switzerland  
**Chuck Melcher**, University of Tennessee, United States

### N20-1 (10:30) Comparison of Nanosecond and Femtosecond Pulsed Laser Ablation for the Creation of Thick Segmented CdWO<sub>4</sub> Scintillator Arrays.

S. A. Richards<sup>1,2</sup>, M. A. Baker<sup>2</sup>, A. Lohstroh<sup>2</sup>, D. Neely<sup>1</sup>, P. Seller<sup>1</sup>, M. D. Wilson<sup>1</sup>

<sup>1</sup>STFC-Rutherford Appleton Laboratory, United Kingdom; <sup>2</sup>University of Surrey, United Kingdom

### N20-2 (10:45) Directionally Solidified Eu<sup>3+</sup> and Y<sup>3+</sup> Co-Doped HfO<sub>2</sub>/a-Al<sub>2</sub>O<sub>3</sub> Eutectic Scintillators

K. Hishinuma<sup>1</sup>, K. Kamada<sup>2,3</sup>, S. Kurosawa<sup>1,2</sup>, A. Yamaji<sup>1</sup>, J. Pejchal<sup>1,4</sup>, Y. Yokota<sup>2</sup>, Y. Ohashi<sup>1</sup>, A. Yoshikawa<sup>1,2,3</sup>

<sup>1</sup>Tohoku University, IMR, Japan; <sup>2</sup>NiChE Tohoku University, Japan; <sup>3</sup>C&A Corp, Japan; <sup>4</sup>Institute of Physics ASCR, Czech Republic

### N20-3 (11:00) Scintillation Characteristics of 90%Lu LGSO with Different Decay Times

F. Loignon-Houle, C. M. Pepin, R. Lecomte

Universite de Sherbrooke, Canada

### N20-4 Investigation of Anisotropy in Anthracene Crystals Through Cosmic Muon Events

P. Schuster, UC Berkeley, USA

### N20-5 (11:30) Scintillation Properties and Electronic Structure of Intrinsic and Extrinsic Mixed Elpasolites Cs<sub>2</sub>NaREBr<sub>6-x</sub> (0 < x < 6, RE = La, Y)

H. Wei<sup>1</sup>, M.-H. Du<sup>2</sup>, L. Standl<sup>1</sup>, M. Zhuravleva<sup>1</sup>, J. A. Stewart<sup>1</sup>, G. K. Schweitzer<sup>1</sup>, C. L. Melcher<sup>1</sup>

<sup>1</sup>University of Tennessee, Knoxville, United States; <sup>2</sup>Oak Ridge National Laboratory, United States

### N20-6 (11:45) Characterization and Optimization of New High-Quality Inorganic Fibers Made of LuAG:Ce and LYSO:Ce

S. Diehl, R. W. Novotny, 2nd Physics Institute, University Giessen, Germany; N. Aubry, S. Faraj, Societe Fibercryst, France; G. Ferro, Universite Claude Bernard Lyon 1, CNRS, France

## N21 Computing and Software I - Controlling, Data Monitoring and Concurrent Processing

Tuesday, Nov. 11 10:30-12:00 608 & 609  
Session Chairs: **Simon E. Labov**, Lawrence Livermore National Laboratory, United States  
**Steffen Hauf**, European X-ray Free Electron Laser Facility GmbH, Germany

**N21-1 (10:30) Karabo: Integrating Control, Data Management, and Scientific Computing Tasks into a Single Software Framework**  
B. C. Heisen, D. Boukhelef, S. Esenov, S. Hauf, I. Kozlova, M. Kumar, L. Maia, A. Parenti, J. Szuba, M. Teichmann, K. Weger, K. Wrona, C. Youngman  
*European XFEL GmbH, Germany*

**N21-3 (11:00) CMS Data Preparation for Run II**  
F. Fabozzi, *CERN, Switzerland*  
On behalf of the CMS Collaboration

**N21-4 (11:15) Graph-Based Decision Making for Task Scheduling in Concurrent Gaudi**  
I. Shapoval<sup>1,2,3,4</sup>, M. Clemencic<sup>1</sup>, B. Hegner<sup>1</sup>, D. Funke<sup>1,5</sup>, D. Piparo<sup>1</sup>, P. Mato<sup>1</sup>  
<sup>1</sup>*CERN, Switzerland*; <sup>2</sup>*KIPT, Ukraine*; <sup>3</sup>*INFN-FE, Italy*; <sup>4</sup>*UNIFE, Italy*; <sup>5</sup>*KIT, Germany*

**N21-5 (11:30) Real-Time MPI-Based Software for Processing of XPCS Data**  
T. J. Madden, S. Niu, S. Narayanan, A. R. Sandy, J. Weizeorick, *Argonne Laboratory, USA*; P. Denes, J. Joseph, V. Moeller-Chan, D. Doering, P. McVittie, D. Contarato, *Lawrence Berkeley Laboratory, USA*

**N21-6 (11:45) Cluster-Based Approach to a Multi-GPU CT Reconstruction Algorithm**  
L. J. Orr, E. S. Jimenez, K. R. Thompson  
*Sandia National Laboratories, USA*

## N22 NSS Poster Session II - Astrophysics and Space Instrumentation

Tuesday, Nov. 11 14:00-15:30 4B  
Session Chair: **Frank Simon**, Max-Planck-Institut fuer Physik, Germany

### Astrophysics and Space Instrumentation

**N22-1 Verification of Dosimetry Measurements with Timepix Pixel Detectors for Space Applications**  
M. Kroupa<sup>1</sup>, L. S. Pinsky<sup>2</sup>, J. Idarraga-Munoz<sup>2</sup>, S. M. Hoang<sup>2</sup>, E. J. Semones<sup>3</sup>, A. A. Bahadori<sup>3</sup>, N. N. Stoffle<sup>1</sup>, R. R. Rios<sup>1</sup>, Z. Vykydal<sup>4</sup>, J. Jakubek<sup>4</sup>, S. Pospisil<sup>4</sup>, D. Turecek<sup>4</sup>, H. Kitamura<sup>5</sup>  
<sup>1</sup>*Lockheed-Martin, USA*; <sup>2</sup>*University of Houston, USA*; <sup>3</sup>*NASA JSC, USA*; <sup>4</sup>*Institute of Experimental and Applied Physics, Czech Technical University in Prague, Czech Republic*; <sup>5</sup>*National Institute for Radiological Sciences, Japan*

**N30-5 Design of the Time Assignment System for ASTRO-H and Its Performance Before Launch**  
Y. Terada<sup>1</sup>, S. Yamaguchi<sup>1</sup>, S. Sugimoto<sup>1</sup>, T. Inoue<sup>1</sup>, S. Nakaya<sup>1</sup>, M. Ogawa<sup>2</sup>, T. Dotani<sup>2</sup>, Y. Ishisaki<sup>3</sup>, K. Mizushima<sup>4</sup>, T. Kominato<sup>4</sup>, H. Mine<sup>4</sup>, H. Hihara<sup>5</sup>, K. Iwase<sup>5</sup>, T. Kouzu<sup>1,5</sup>, M. S. Tashiro<sup>1</sup>, C. Natsukari<sup>2</sup>, M. Ozaki<sup>2</sup>, M. Kokubun<sup>2</sup>, T. Takahashi<sup>2</sup>, S. Kawakami<sup>5</sup>, M. Kasahara<sup>5</sup>, S. Kumagai<sup>5</sup>, L. Angelini<sup>6</sup>, M. Witthoef<sup>6</sup>  
<sup>1</sup>*Saitama University, Japan*; <sup>2</sup>*JAXA, Japan*; <sup>3</sup>*Tokyo Metropolitan University, Japan*; <sup>4</sup>*NEC, Japan*; <sup>5</sup>*NEC TOSHIBA Space Systems, Japan*; <sup>6</sup>*NASA, US*

**N22-3 Characterization of Silicon Photomultipliers for the Cherenkov Telescope Array Medium-Sized Telescopes**  
J. Biteau, *University of California Santa Cruz, USA*  
On behalf of the CTA Consortium

**N22-4 Energy Response of Protons on CCD236**  
J.-Q. Zhang<sup>1</sup>, Y.-J. Yang<sup>2</sup>, Y.-S. Wang<sup>2</sup>, H. Shi<sup>1</sup>, Y. Chen<sup>2</sup>  
<sup>1</sup>*China Institute of Nuclear Information & Economics, China*; <sup>2</sup>*Chinese Academy of Sciences, China*

**N22-5 The Dynamic Digital Radiography System Design and Data Calibration Method for Monitoring the Running Aero-Engine**  
M. Chang<sup>1,2</sup>, Y. Xiao<sup>1,2</sup>, Z. Chen<sup>1,2</sup>  
<sup>1</sup>*Tsinghua University, China*; <sup>2</sup>*Ministry of Education, China*

**N22-6 Development of Superconducting Tunnel Junction Photon Detector with SOI Preamplifier Board to Search for Radiative Decays of Cosmic Background Neutrino**  
T. Okudaira, S. Kim, Y. Takeuchi, K. Kasahara, R. Senzaki, K. Takemasa, K. Kiuchi, T. Ichimura, M. Kanamaru, K. Moriuchi, *University of Tsukuba, Japan*; H. Ikeda, S. Matsuura, T. Wada, *JAXA/ISAS, Japan*; H. Ishino, A. Kibayashi, *Okayama University, Japan*; S. Mima, *RIKEN, Japan*; T. Yoshida, R. Hirose, *University of Fukui, Japan*; Y. Kato, *Kinki University, Japan*; M. Hazumi, Y. Arai, *KEK, Japan*; E. Ramberg, J. Yoo, M. Kozlovsky, P. Rubinov, D. Sergatskov, *Fermilab, USA*; S. Kim, *Seoul National University, Korea*

**N22-7 Active Particle-Induced X-Ray Spectrometer with Distant Sensing for CHANG'E-3 YuTu Rover Mission and Its Primary Results**  
H. Wang, *Institute of high energy physics, China*  
On behalf of the APXS group of Lunar exploration Project in Beijing

**N22-8 FACT -- Calibration of the First G-APD Cherenkov Telescope**  
T. Bretz, *ETH Zurich, Switzerland*  
On behalf of the FACT Collaboration

**N22-10 Recent Progress in Spectral Performances of SOI Pixel Sensors for X-Ray Astronomy**

T. Tanaka, A. Takeda, H. Matsumura, T. G. Tsuru, *Kyoto University, Japan*; S. Nakashima, *Japan Aerospace Exploration Agency (JAXA), Japan*; Y. Arai, *High Energy Accelerator Research Organization (KEK), Japan*; K. Mori, Y. Nishioka, R. Takenaka, *University of Miyazaki, Japan*; T. Kohmura, *Tokyo University of Science, Japan*

**N22-12 Study of the Low Energy Electron Recoil Response of Liquid Xenon with a Position-Sensitive Dual-Phase Xenon TPC**

B. Beskers, P. Sissol, M. Scheibelhut, R. Othegraven, U. G. Oberlack  
*Johannes Gutenberg University Mainz, Germany*

**N23 NSS Poster Session II - Data Acquisition and Analysis System**

Tuesday, Nov. 11 14:00-15:30 4B

Session Chair: TBD

**N23-2 Pile-up Discrimination Method Applied to Novel Gamma-Ray Detectors Based on SiPMs Arrays**

J. Barberá<sup>1</sup>, A. J. González<sup>2</sup>, V. Carrilero<sup>1</sup>, C. Correcher<sup>1</sup>, L. Hernandez<sup>2</sup>, C. Molinos<sup>1</sup>, F. Sánchez<sup>2</sup>, J. M. Benlloch<sup>2</sup>  
<sup>1</sup>*Oncovision, SA, Spain*; <sup>2</sup>*Institute for Instrumentation in Molecular Imaging, Spain*

**N23-3 A Real-Time Neutron/Gamma Discrimination Algorithm for a Low Cost LiF:ZnS(Ag) Neutron Detector**

K. Pritchard<sup>1</sup>, A. Osovitzky<sup>1,2</sup>, N. Maliszewskij<sup>1</sup>, C. Majkrzak<sup>1</sup>, J. Ziegler<sup>1</sup>, C. Hurlbut<sup>3</sup>, M. Jackson<sup>3</sup>, A. Thompson<sup>1</sup>  
<sup>1</sup>*NIST Center for Neutron Research, USA*; <sup>2</sup>*Rotem Industries Ltd, Israel*; <sup>3</sup>*Eljen Technologies, USA*

**N23-6 Feasibility Study of PERCIVAL Data Acquisition Backend Architecture**

U. K. Pedersen<sup>1</sup>, N. Tartoni<sup>1</sup>, J. Marchal<sup>1</sup>, J. Thompson<sup>1</sup>, N. Rees<sup>1</sup>, N. De Maio<sup>1</sup>, A. Greer<sup>1</sup>, C. B. Wunderer<sup>2</sup>, A. Marras<sup>2</sup>, M. Bayer<sup>2</sup>, J. Correa<sup>2</sup>, S. Lange<sup>2</sup>, I. Shevyakov<sup>2</sup>, S. Smoljanin<sup>2</sup>, M. Viti<sup>2</sup>, Q. Xia<sup>2</sup>, M. Zimmer<sup>2</sup>, G. Cautero<sup>3</sup>, D. Giuressi<sup>3</sup>, R. Menk<sup>3</sup>, L. Stebel<sup>3</sup>, H. Yousef<sup>3</sup>, T. Nicholls<sup>4</sup>, R. Turchetta<sup>4</sup>, I. Sedgwick<sup>4</sup>, D. Das<sup>4</sup>, B. Marsh<sup>4</sup>, H. Graafsma<sup>2</sup>  
<sup>1</sup>*Diamond Light Source, United Kingdom*; <sup>2</sup>*DESY, Germany*; <sup>3</sup>*Eltra, Italy*; <sup>4</sup>*Rutherford Appleton Laboratory, United Kingdom*

**N23-7 General Purpose Digital Processors for Scintillation Spectroscopy**

R. H. Redus, A. C. Huber, D. J. Sperry, *Amptek, Inc., USA*; P. Schotanus, *Scionix Holland BV, The Netherlands*; W. Westmeier, *Dr. Westmeier GmbH, Germany*

**N23-8 Quantization Noise in Non-Homogeneous Calibration Table of a TCD Implemented in FPGA**

N. Lusardi, A. Abba, F. Caponio, A. Geraci  
*Politecnico di Milano, Italy*

**N23-9 A Ultra-Compact and Portable Digital Pulse Processor for Gamma and X-Ray Spectroscopy**

F. Caponio, A. Abba, N. Lusardi, A. Cusimano  
*Politecnico di Milano, Italy*

**N23-10 Resolution Improvements on the Novel VCO Based Time Measurements Technique**

F. Caponio, A. Abba, M. Ran, N. Lusardi, A. Geraci, G. Ripamonti  
*Politecnico di Milano, Italy*

**N23-12 Fully Programmable Emulator of Fast Events from Setups for Radiation Detection**

A. Abba, F. Caponio, N. Lusardi, A. Geraci  
*Politecnico di Milano, Italy*

**N23-13 Electronic Readout System for Retina-Based Cosmic-Ray Telescope**

A. Abba, F. Caponio, N. Lusardi, A. Geraci, *Politecnico di Milano, Italy*; N. Neri, *INFN, Italy*

**N23-14 A Digital System for Artificial Generation of Images from Radiation Detectors**

F. Caponio, A. Abba, N. Lusardi, A. Geraci  
*Politecnico di Milano, Italy*

**N23-15 A New Data Acquisition System for Silicon Photomultipliers**

J. T. Anderson, P. M. De Lurgio, Z. Djuric, G. R. Drake, W. N. Haberichter, A. S. Kreps, M. B. Oberling  
*Argonne National Laboratory, United States of America*

**N23-16 Development of a Multichannel Signal Processing System using MPPCs**

D. Matsui, E. Takada, H. Uehori, M. Takasaki, *Toyama National College of Technology, Japan*; H. Sugano, T. Takahashi, J. Kawarabayashi, T. Iguchi, *Nagoya University, Japan*

**N23-17 Using IDT Analog-to-Digital Converter "ADC1413D" for High-Resolution Gamma-Ray Spectroscopy**

A. Pullia<sup>1,2</sup>, D. Barrientos<sup>2</sup>, D. Bazzacco<sup>2</sup>, M. Bellato<sup>2</sup>, F. Recchia<sup>3</sup>  
<sup>1</sup>*University of Milano, Italy*; <sup>2</sup>*INFN, Italy*; <sup>3</sup>*University of Padova, Italy*

**N23-18 Open-Source Diagnostic Tool with GUI for the New AGATA/GALILEO Digitizer Cards**

A. Pullia<sup>1,2</sup>, D. Barrientos<sup>2</sup>, S. Capra<sup>1</sup>  
<sup>1</sup>*University of Milano and INFN, Italy*; <sup>2</sup>*INFN, Italy*

**N23-20 8-Channel 14-Bit 125MHz FADC Electronics with 1G Ethernet Readout Based on ZYNQ for HPGe Detector**

T. Xue, M. Zeng, G. Gong, J. Li, *Tsinghua University, China*

**N23-21 Energy Calibration Method for an All-Digital High Resolution Gamma-Ray Spectroscopy**

L. Anwen<sup>1,2</sup>, Z. Qiude<sup>1</sup>, X. Zhangjing<sup>1</sup>, X. Peng<sup>1,3</sup>, X. Qingguo<sup>1,3</sup>

<sup>1</sup>HuaZhong university of science & technology, China; <sup>2</sup>Jinggangshan University, China; <sup>3</sup>Wuhan National Laboratory for Optoelectronics, China

#### **N23-22 A Volume Clearing Algorithm for Muon Tomography**

D. Mitra, K. Day, M. Hohlmann

Florida Institute of Technology, USA

#### **N23-23 Data Analysis Software for Radionuclide Standardization with a Digital Coincidence Counting System**

F. Brancaccio, M. D. S. Dias, M. F. Koskinas

IPEN-CNEN/SP, Brazil

#### **N23-25 Gamma Ray Tracking Modeling Using a Hidden Markov Model**

S. S. Huh, B. Quiter, R. Cooper, M. Quinlan, M. Bandstra, J. Kua, D. Chivers, L. Mihailescu, K. Vetter

Lawrence Berkeley National Lab, USA

#### **N23-26 Development of a FPGA Based Multichannel Scalable DAQ System for PET**

G. Kim, Y. Choi, S. Kim, Sogang University, Korea

#### **N23-27 Timing and Data Acquisition Systems for a Multichannel X-Ray Smart Pixel Array Detector**

D. M. Kline, Y. Li, D. A. Walko, Argonne National Laboratory, USA; S. Ross, Northern Illinois University, USA; G. M. Williams Jr, J. Rhee, H. Zou, A. Lee, Voxel, Inc., USA; E. C. Landahl, DePaul University, USA

#### **N23-28 Slow Control and Environmental Monitoring System for the Majorana Demonstrator**

W. Xu<sup>1</sup>, J. A. Detwiler<sup>2</sup>, J. Goettl<sup>1</sup>, M. P. Green<sup>3</sup>, M. A. Howe<sup>4,5</sup>, S. Meijer<sup>4,5</sup>, C. O'Shaughnessy<sup>4,5</sup>, D. G. Phillips II<sup>6,5</sup>, B. Shanks<sup>4,5</sup>, J. F. Wilkerson<sup>4,5,3</sup>

<sup>1</sup>Los Alamos National Laboratory, USA; <sup>2</sup>University of Washington, USA; <sup>3</sup>Oak Ridge National Laboratory, USA; <sup>4</sup>University of North Carolina, USA;

<sup>5</sup>Triangle Universities Nuclear Laboratory, USA; <sup>6</sup>North Carolina State University, USA

#### **N23-29 Upgrade of the Minos+ Experiment Data Acquisition for the High Energy NuMI Beam Run**

W. Badgett, S. R. Hahn, D. Torretta, Fermi National Accelerator Laboratory, U.S.A.; J. Meier, J. Gunderson, D. Osterholm, D. Saranen, Soudan Underground Laboratory, U.S.A.

#### **N23-30 Image Based Object Identification in Muon Tomography**

R. Patnaik, Y. Lee, D. Dorroh

Decision Sciences International Corporation, U.S.A.

#### **N23-31 Realtime Photo-Peak Searching Method Implemented on Digital Circuit**

S. Kim, Y. Choi, J. H. Jung, J. Jung

Sogang University, Korea

#### **N23-33 A New Approach for a Camera $\frac{1}{2}$ s Back-End Design Used for the 75 $\mu$ m Pitch Hybrid Pixel Detector**

P. Maj, P. Grybos, R. Szczygiel, K. Kasinski, M. Zoladz, J. Rauza, A. Koziol

AGH University of Science and Technology, Poland

### **N24 NSS Poster Session II - High Energy Physics Instrumentation**

Tuesday, Nov. 11 14:00-15:30 4B

Session Chair: **Daniel Haas**, SRON Netherlands Institute for Space Research, Netherlands

#### **N24-1 Development of a New Fast Shower Maximum Detector Based on Micro Channel Plates Photomultipliers (MCP-PMT) as an Active Element.**

A. Ronzhin, Fermi National Accelerator Laboratory, USA

#### **N24-2 Large Area Position-Sensitive Plastic Scintillator Detector with Wavelength-Shifting Fiber Readout**

J. Dong<sup>1,2</sup>, Y. Zhang<sup>1,2</sup>, Z. Zhang<sup>1,2</sup>, D. Liu<sup>1,2</sup>, S. Wen<sup>1,2</sup>, Z. Xu<sup>1,2</sup>, X. Wang<sup>1,2</sup>, X. Jin<sup>1,2</sup>, S. Liu<sup>1,2</sup>

<sup>1</sup>State Key Laboratory of Particle Detection and Electronics(IHEP-USTC), China; <sup>2</sup>University of Science and Technology of China, China

#### **N24-3 Scintillating Fibre Tracker Front-End Electronics for LHCb upgrade**

A. Comerma, Physikalisches Institut - Heidelberg Universitat, Germany

On behalf of the LHCb Scintillating Fibre Tracker Group

#### **N24-4 APD readout for Belle II Endcap Calorimeter Upgrade with Undoped Cesium Iodide Crystals**

S. Fiore<sup>1,2</sup>, A. Aloisio<sup>3,2</sup>, S. Baccaro<sup>1,2</sup>, P. Branchini<sup>2</sup>, S. Cavaliere<sup>3,2</sup>, C. Cecchi<sup>4,2</sup>, A. Cemmi<sup>1,2</sup>, E. De Lucia<sup>2</sup>, G. De Nardo<sup>3,2</sup>, R. de Sangro<sup>2</sup>, G. Felici<sup>2</sup>, G. Finocchiaro<sup>2</sup>, R. Giordano<sup>3,2</sup>, P. Lubrano<sup>2</sup>, E. Manoni<sup>2</sup>, M. Montecchi<sup>1,2</sup>, A. Ordine<sup>2</sup>, A. Passeri<sup>2</sup>, P. Patteri<sup>2</sup>, I. Peruzzi<sup>2</sup>, M. Piccolo<sup>2</sup>, A. Rossi<sup>2</sup>, C. Sciacca<sup>3,2</sup>, G. Corradi<sup>2</sup>, D. Tagnani<sup>2</sup>

<sup>1</sup>ENEA, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>Universita' degli Studi di Napoli "Federico II, Italy; <sup>4</sup>Universita' degli Studi di Perugia, Italy

#### **N24-5 Validation of Cmos Active Pixel Sensor with Double Readout Rolling Shutter Architecture for Charged Particles Tracking**

F. Orsini, Y. Degerli, C. Flouzat, F. Guilloux, P. Venault

CEA Saclay, FRANCE

#### **N24-6 The Design and Construction of a Liquid Argon TPC for the LBNE 35ton Cryostat**

B. Yu, Brookhaven National Laboratory, USA

On behalf of the LArTPC group of the LBNE Collaboration

#### **N24-7 New Area for High Rate Tracking**

A. Soha, S. Hahn, *Fermilab, United States*

**N24-9 A Scintillating Fiber Tracking Detector for LHCb Upgrade**

R. Lindner, *CERN, CH*

On behalf of the LHCb SciFi group

**N24-10 Imaging Detector for Particle Identification with Large Liquid Scintillator Detector**

T. Mitsui, K. Ishidoshiro, H. Watanabe, S. Ishio, Y. Shirahata

*Research Center for Neutrino Science, Tohoku University, Japan*

**N24-11 Development of High-Speed, Low-Fixed Latency Serial Links for the Router of ATLAS NSW sTGC Detector**

X. Hu<sup>1,2</sup>, <sup>1</sup>*University of Science and Technology of China, China*; <sup>2</sup>*University of Michigan, USA*

On behalf of the ATLAS MUON collaboration

**N24-32 Proof-of-Principle of a New Geometry for Sampling Calorimetry Using Inorganic Scintillator Plates**

F. Nessi-Tedaldi, G. Dissertori, Q. Huang, W. Lustermann, D. Luckey, S. Lutterer, F. Pandolfi, F. Pauss, M. Peruzzi, M. Quittnat, R. Wallny  
*ETH Zurich, Switzerland*

**N24-13 Maximization of the Acceptance and Momentum Resolution of the ATLAS Muon Spectrometer with Novel Drift-Tube and Resistive Plate Chambers**

P. Schwegler, *Max-Planck-Institut für Physik, Germany*

On behalf of the ATLAS Collaboration

**N24-14 The Design of a New Electromagnetic Calorimeter for COMPASS II Experiment**

M. Dziejewicki<sup>1</sup>, N. Anfimov<sup>2</sup>, V. Anosov<sup>2</sup>, V. Chalyshev<sup>2</sup>, I. Chirikov-Zorin<sup>2</sup>, D. Fedoseev<sup>2</sup>, O. Gavrishchuk<sup>2</sup>, B. Grinyov<sup>3</sup>, A. Guskov<sup>2</sup>, Z. Krumshyteyn<sup>2</sup>, R. Kurjata<sup>1</sup>, J. Marzec<sup>1</sup>, G. Meshcheryakov<sup>2</sup>, A. Nagaytsev<sup>2</sup>, A. Olchevskiy<sup>2</sup>, I. Orlov<sup>2</sup>, T. Rezinko<sup>2</sup>, V. Rodionov<sup>2</sup>, A. Rybnikov<sup>2</sup>, A. Rychter<sup>1</sup>, Z. Y. O. Sadygov<sup>2</sup>, I. Savin<sup>2</sup>, A. Selyunin<sup>2</sup>, K. Zarembo<sup>1</sup>, P. Zhmurin<sup>3</sup>, M. Ziembicki<sup>1</sup>

<sup>1</sup>*Warsaw University of Technology, Poland*; <sup>2</sup>*Joint Institute for Nuclear Research, Russia*; <sup>3</sup>*Institute for Scintillation Materials, National Academy of Sciences of Ukraine, Ukraine*

**N24-15 The CMS Electromagnetic Calorimeter Barrel Upgrade for High-Luminosity LHC**

E. Di Marco, *CERN, Switzerland*

On behalf of the CMS Collaboration

**N24-16 The 5x5mm<sup>2</sup> Granular Electromagnetic Calorimeter Using 45x5mm<sup>2</sup> Scintillator Strips and SiPMs**

K. Kotera, *Shinshu university, Japan*

**N24-18 Design and Response of a Close to Final Prototype for the Barrel of the PANDA Electromagnetic Calorimeter to Photons at Energies below 1 GeV**

S. Diehl<sup>1</sup>, D. Bremer<sup>1</sup>, P. Drexler<sup>1</sup>, V. Dormenev<sup>1</sup>, T. Eissner<sup>1</sup>, C. Le Gallard<sup>2</sup>, M. Imre<sup>2</sup>, M. Kavatsyuk<sup>3</sup>, T. Kuske<sup>1</sup>, D. Marchand<sup>2</sup>, R. W. Novotny<sup>1</sup>, P. Rosier<sup>2</sup>, A. Ryantsev<sup>4</sup>, C. Rosenbaum<sup>1</sup>, P. Wiecezorek<sup>5</sup>, A. Wilms<sup>5</sup>, H.-G. Zaunick<sup>1</sup>

<sup>1</sup>*2nd Physics Institute, University Giessen, Germany*; <sup>2</sup>*IPN Orsay, France*; <sup>3</sup>*KVI Groningen, The Netherlands*; <sup>4</sup>*IHEP Protvino, Russia*; <sup>5</sup>*GSI Helmholtzzentrum für Schwerionenforschung, Germany*

**N24-19 Commissioning of the New Multilayer Integration Prototype with SiPM Readout of the CALICE Tile Hadron Calorimeter**

A. Ebrahimi, *DESY, Germany*

On behalf of the CALICE Collaboration

**N24-21 The Upgrade of the Laser Calibration System for the Atlas Tile Hadron Calorimeter**

C. Bohm, *University of Stockholm, Department of physics, Sweden*

On behalf of the On behalf of the Atlas Tile Calorimeter System

**N24-22 Status of the CALICE Digital Hadron Calorimeter**

B. Bilki<sup>1,2</sup>, <sup>1</sup>*Argonne National Laboratory, USA*; <sup>2</sup>*University of Iowa, USA*

On behalf of the CALICE Collaboration

**N24-23 Monitoring LSO/LYSO Crystal Calorimeters**

F. Yang, L. Zhang, R.-Y. Zhu

*California Institute of Technology, USA*

**N24-24 Secondary Emission Calorimetry R&D**

B. Bilki<sup>1,2</sup>

<sup>1</sup>*University of Iowa, USA*; <sup>2</sup>*Argonne National Laboratory, USA*

**N24-25 Functional and Performance Evaluation of Low-Resistance Strip Sensors for Beam-Loss Event Protection**

M. Lozano, M. Ullan, D. Quirion, M. Zabala, G. Pellegrini, V. Benitez, *Centro Nacional de Microelectronica (IMB-CNM, CSIC), Spain*; C. Lacasta, U. Soldevila, C. Garcia, *Instituto de Fisica Corpuscular (IFIC, CSIC-UV), Spain*; V. Fadeyev, J. Wortman, M. Domingo, J. Defilippis, M. Shumko, A. Grillo, H. F.-W. Sadrozinski, *Santa Cruz Institute for Particle Physics (SCIPP, UCSC), United States*

**N24-26 Measurement of the DAFNE Beam Test Facility's Microbunching Dstructure with Micro-Channel Plate Based Cherenkov Detector**

F. Iacoangeli, G. Cavoto, L. Foggetta, *INFN, Italy*

**N24-27 The LBNE 35 Ton Prototype Cryostat**

A. A. Hahn, M. Adamowski, D. Montanari, B. Norris, R. Rucinski, T. Tope, *Fermi National Accelerator Laboratory, USA*; J. Reichenbacher, *University of Alabama (Tuscaloosa), USA*; J. Stewart, *Brookhaven National Laboratory, USA*

**N24-28 On-Detector High Voltage Multiplexing for the ATLAS SCT Upgrade**

L. B. A. Hommels, *Cavendish Laboratory, University of Cambridge, United Kingdom*; G. E. Villani, P. W. Phillips, J. Matheson, *STFC Rutherford Appleton Laboratory, United Kingdom*; D. Lynn, *Brookhaven National Laboratory, USA*; I. M. Gregor, M. Bessner, K. Tackmann, *DESY, Germany*; M. F. Newcomer, *University of Pennsylvania, USA*; E. Spencer, *University of California Santa Cruz (SCIPP-UCSC), USA*; A. Greenall, *Oliver Lodge Laboratory, The University of Liverpool, United Kingdom*

**N24-29 A Novel Design for a Highly Granular Hadron Calorimeter Scintillator-SiPM Tile**

E. Garutti, M. Ramilli, S. Laurien  
*University of Hamburg, Germany*

**N24-30 Progress in 3D Diamond Detector Development**

T. Wulz, E. Lukosi, M. D. Richardson, G. Riley, S. Spanier  
*University of Tennessee, United States*

**N24-31 A Disc-DIRC Cherenkov Detector with High Resolution Micro Channel Plate Photomultiplier Tubes**

J. Rieke, *JLU Gießen, Germany*

On behalf of the PANDA Cherenkov Group

**N25 NSS Poster Session II - Neutron Detectors and Instrumentation**

Tuesday, Nov. 11 14:00-15:30 4B

Session Chair: TBD

**N25-1 High Effective Fast Neutron Detectors Based on Inorganic Scintillators**

V. D. Ryzhikov<sup>1</sup>, S. V. Naydenov<sup>2</sup>, G. M. Onyshchenko<sup>1</sup>, L. A. Piven<sup>1</sup>, T. Pochet<sup>3</sup>, C. F. Smith<sup>4</sup>

<sup>1</sup>*Institute for Scintillation Materials, Ukraine*; <sup>2</sup>*Institute for Single Crystals, Ukraine*; <sup>3</sup>*DETEC-Europe, France*; <sup>4</sup>*Naval Postgraduate School, USA*

**N25-2 A Broad-Band Neutron Source Facility for Detector Characterization**

J. Scherzinger<sup>1,2</sup>, J. R. M. Annand<sup>3</sup>, K. G. Fissum<sup>1,2</sup>, R. Hall-Wilton<sup>2,4</sup>, R. Jebali<sup>3</sup>

<sup>1</sup>*Lund University, Sweden*; <sup>2</sup>*European Spallation Source ESS AB, Sweden*; <sup>3</sup>*University of Glasgow, UK*; <sup>4</sup>*Mid-Sweden University, Sweden*

**N25-3 Evaluation of Light Transport Property in Alternative He-3 Neutron Detectors Using ceramic Scintillators by a Ray-Tracing Simulation**

A. Ohzu, M. Takase, N. Kurata, N. Kobayashi, H. Tobita, M. Haruyama, M. Kureta, T. Nakamura, H. Suzuki, K. Toh, K. Sakasai, K. Soyama, M. Seya

*Japan Atomic Energy Agency, Japan*

**N25-4 Efficiency Measurements of Two Boron Straw Detector Designs**

P. R. Arthur, M. Owen, P. Kendall, *AWE, UK*; A. Athanasiades, *Proportional Technologies Inc, USA*

**N25-5 Comparative Study of the Pulse Shape Discrimination (PSD) Performance of Fast Neutron Detectors**

P. A. Kendall, K. Duroe, P. R. Arthur, M. Ellis, M. C. Owen, *AWE, UK*; R. S. Woolf, *National Research Council Postdoctoral Fellow, USA*; E. A. Wulf, A. L. Hutchison, B. F. Philips, *U.S. Naval Research Laboratory, USA*

**N25-6 Stilbene Scintillators for Fast Neutron Detection**

C. Lynch, S. Selin, A. Inzalaco, T. Caughey

*Inrad Optics, USA*

**N25-7 High-Energy Background Measurements at SNS**

D. D. Di Julio<sup>1</sup>, N. Cherkashyna<sup>1</sup>, A. Khaplanov<sup>1</sup>, D. Pfeiffer<sup>1,2</sup>, J. Scherzinger<sup>1,3</sup>, C. Cooper-Jensen<sup>1,4</sup>, K. G. Fissum<sup>1,3</sup>, E. B. Iverson<sup>5</sup>, G. Ehlers<sup>5</sup>, F. X. Gallmeier<sup>5</sup>, K. Kanaki<sup>1</sup>, R. J. Hall-Wilton<sup>1,6</sup>, P. M. Bentley<sup>1,4</sup>

<sup>1</sup>*European Spallation Source ESS AB, Sweden*; <sup>2</sup>*CERN, Switzerland*; <sup>3</sup>*Lund University, Sweden*; <sup>4</sup>*Uppsala University, Sweden*; <sup>5</sup>*ORNL, USA*; <sup>6</sup>*Mid-Sweden University, Sweden*

**N25-8 High Energy Background Measurements at SINQ**

N. Cherkashyna<sup>1</sup>, D. D. Di Julio<sup>1</sup>, T. Panzner<sup>2</sup>, E. Rantsiou<sup>2</sup>, U. Filges<sup>2</sup>, P. M. Bentley<sup>1,3</sup>

<sup>1</sup>*European Spallation Source ESS AB, Sweden*; <sup>2</sup>*Paul Scherrer Institute, Switzerland*; <sup>3</sup>*Uppsala University, Sweden*

**N25-9 A Compact Readout System for the R<sup>3</sup>B High-Resolution Neutron Time-of-Flight Spectrometer (NeuLAND)**

K. Koch, J. Hoffmann, C. Ugur, M. Heil

*GSI Helmholtzzentrum für Schwerionenforschung GmbH, Germany*

**N25-10 Characterization of Secondary Neutron Production During Proton Therapy**

S. D. Clarke, B. M. Wieger, E. Pryser, R. Arghal, S. A. Pozzi, *University of Michigan, USA*; R. Halg, *Paul Scherrer Institut, Switzerland*; V. A. Bashkurov, *Loma Linda University, USA*; R. W. Schulte, *Loma Linda University Medical Center, USA*

**N25-11 Comparison Between Silicon Photomultipliers and Photomultiplier Tubes for Pulse Shape Discrimination with Stilbene**

M. L. Ruch, C. Sivals, S. Czyz, M. Flaska, S. A. Pozzi

*University of Michigan, USA*

**N25-12 Spatial Pulse Shape Discrimination Response of an Organic-Liquid Scintillator Using a Collimated Source**

S. F. Naeem, S. D. Clarke, S. A. Pozzi, Y. Lagisetty, T. Schwarz

*University of Michigan, United States*

**N25-13 Neutron and Gamma Ray Discrimination for CLYC Using Cross Correlation Analysis**

P. Chandhran, K. E. Holbert, *Arizona State University, USA*; E. B. Johnson, S. Vogel, *Radiation Monitoring Devices, USA*

**N25-14 Receiver Operating Characteristic (ROC) Curves for EJ-299-33 Plastic and EJ-309 Liquid Scintillators**

W. A. Noonan, J. M. Kalter, C. M. Lavelle, E. C. Miller

*Johns Hopkins University Applied Physics Laboratory, USA*

**N25-15 A Time-of-Flight Neutron Imaging Detector Using a ZnS Scintillator and Wavelength-Shifting Fiber with a High Spatial Resolution and a Low Gamma-Ray Sensitivity**

T. Nakamura, K. Toh, T. Kawasaki, K. Honda, A. Birumachi, M. Ebine, K. Sakasai, K. Soyama, *Japan Atomic Energy Agency, Japan*; M. Katagiri,

*Ibaraki University, Japan*

**N25-16 First Order Numerical Optimization of Fission Chamber Coatings Using Natural Uranium and Thorium**

M. A. Reichenberger, J. A. Roberts, D. S. McGregor

*Kansas State University, United States of America*

**N25-17 LiF-Based Eutectic Scintillators for Thermal Neutron Detection**

K. Fukuda, *Tokuyama Corporation, Japan*; T. Yanagida, *Kyushu Institute of Technology, Japan*; N. Kawaguchi, *A&T Corporation, Japan*

**N25-18 Semiconductor Neutron Detector for Harsh Radiation Applications**

Y. M. Abubakar<sup>1,2</sup>, P. Sellin<sup>1</sup>, A. Lohstroh<sup>1</sup>

<sup>1</sup>*University of Surrey, United Kingdom*; <sup>2</sup>*Ahmadu Bello University, Nigeria*

**N25-19 Defining Performance and Standards for Neutron Detectors at the European Spallation Source**

R. J. Hall-Wilton<sup>1,2</sup>, M. Anastasopoulos<sup>1</sup>, R. Andersson<sup>1</sup>, M. Echegary<sup>1</sup>, K. Fissum<sup>1,3</sup>, C. Hoglund<sup>1,4</sup>, M. Imam<sup>1,4</sup>, K. Kanaki<sup>1</sup>, A. Khaplanov<sup>1</sup>, O.

Kirstein<sup>1,5</sup>, T. Kittelmann<sup>1</sup>, S. Kolya<sup>1</sup>, B. Nilsson<sup>1,6</sup>, L. Ortega<sup>1</sup>, D. Pfeiffer<sup>1,7</sup>, F. Piscitelli<sup>1,8</sup>, J. Scherzinger<sup>1,3</sup>, I. Stefanescu<sup>1,9</sup>

<sup>1</sup>*European Spallation Source ESS AB, Sweden*; <sup>2</sup>*Mid-Sweden University, Sweden*; <sup>3</sup>*Lund University, Sweden*; <sup>4</sup>*Linköping University, Sweden*; <sup>5</sup>*University of Newcastle, Australia*; <sup>6</sup>*MAX-IV Laboratory, Sweden*; <sup>7</sup>*CERN, Switzerland*; <sup>8</sup>*ILL, France*; <sup>9</sup>*FRM-II Laboratory, Germany*

**N25-20 Development and Evaluation of Activation Neutron Detectors for Spectrum Measurements of Quasi-Monoenergetic High-Energy Neutron Fields**

A. Masuda<sup>1</sup>, T. Matsumoto<sup>1</sup>, H. Harano<sup>1</sup>, H. Yoshitomi<sup>2</sup>, Y. Tanimura<sup>2</sup>, Y. Shikaze<sup>2</sup>, S. Kurashima<sup>2</sup>, H. Seito<sup>2</sup>, M. Hagiwara<sup>3</sup>, Y. Unno<sup>1</sup>, J. Nishiyama<sup>4</sup>, M. Yoshizawa<sup>2</sup>

<sup>1</sup>*National Institute of Advanced Industrial Science and Technology, Japan*; <sup>2</sup>*Japan Atomic Energy Agency, Japan*; <sup>3</sup>*High Energy Accelerator Research Organization, Japan*; <sup>4</sup>*Tokyo Institute of Technology, Japan*

**N25-21 Study on Neutron Imaging Technique Using Transparent RUBBER SHEET (TRUST) LiCaAlF<sub>6</sub> Neutron Scintillator**

D. Sugimoto, K. Watanabe, A. Yamazaki, T. Yamazaki, A. Uritani, T. Iguchi, *Nagoya University, Japan*; K. Fukuda, S. Ishidzu, *Tokuyama Corporation, Japan*; T. Yanagida, *Kyushu Institute of Technology, Japan*

**N25-23 Development of a Real-Time Processing System for Pulsed Neutron Imaging System Using a High-Speed Camera**

K.-I. Mochiki, K. Ishizuka, *Faculty of Engineering, Tokyo City University, JAPAN*; T. Kai, T. Shinohara, M. Segawa, *Japan Atomic Energy Agency, Japan*

**N25-24 Development of a Novel Neutron Energy Spectrometer Using Onion-like Multi-Shell Single Bonner Sphere**

K. Watanabe, M. Ushida, A. Yamazaki, A. Uritani, T. Iguchi, *Nagoya University, Japan*; T. Ogata, T. Muramatsu, *Mitsubishi Heavy Industries. Ltd., Japan*

**N25-25 Neutron Detection Signatures at Zero Bias in Novel Semiconducting Boron Carbide Containing Pyridine Polymers**

E. M. Echeverria<sup>1</sup>, R. James<sup>2</sup>, F. L. Pasquale<sup>2</sup>, J. A. Colón<sup>3</sup>, S. Adenwalla<sup>1</sup>, A. Enders<sup>1</sup>, J. A. Kelber<sup>2</sup>, P. A. Dowben<sup>1</sup>

<sup>1</sup>*University of Nebraska - Lincoln, United States*; <sup>2</sup>*University of North Texas, United States*; <sup>3</sup>*Center for Energy Sciences Research, United States*

**N25-27 Can a Semiconductor-Based Neutron Detector Replace an Equivalent Volume of High Pressure 3-He?**

B. Rogers, C. Hoshier, P. Scott, J. Crow, A. Caruso, T. Soberig, *University of Missouri-Kansas City, United States*; S. Bellingier, *Kansas State University, United States*

**N25-28 Development of a New Type of Manganese Bath for Determination of Neutron Emission Rate of a Neutron Source**

T. Matsumoto, H. Harano, A. Masuda, *National Institute of Advanced Industrial Science and Technology, Japan*; J.-I. Hori, *Kyoto University, Japan*

**N25-29 Response Studying of Photodiode Coupled with Boron for Neutron Detection**

H. J. Hyun<sup>1</sup>, H. B. Jeon<sup>1</sup>, D. H. Kah<sup>2</sup>, K. H. Kang<sup>1</sup>, G. N. Kim<sup>1</sup>, H. J. Kim<sup>1</sup>, M. K. Moon<sup>3</sup>, H. Park<sup>1</sup>

<sup>1</sup>*Kyungpook National University, South Korea*; <sup>2</sup>*Agency for Defense Development, South Korea*; <sup>3</sup>*Korea Atomic Energy Research Institute, South Korea*

**N25-30 New Technology for Production of Large-Area 10B-Based Thin-Film Neutron Converters**

S. Alimov, A. Styervoyedov, T. Wilpert

*Helmholtz-Zentrum-Berlin, Germany*

**N25-31 Study of neutron-gamma Discrimination by Zero-Crossing Method with SiPM Based Scintillation Detectors**

M. Grodzicka, T. Szczesniak, M. Moszynski, D. Wolski, L. Swiderski, *National Centre for Nuclear Research (NCBJ), Poland*; J. Baszak, *Hamamatsu Photonics Deutschland GmbH, Germany*

**N25-32 In-Situ Regeneration of BF<sub>3</sub>-Filled Linear-Position Sensitive Neutron Detectors**

T. Wilpert, S. Alimov, C. Schulz, C. Rethfeldt, J. Schleuer

*Helmholtz-Zentrum Berlin, Germany*

**N25-33 Results and Potential Applications of Handheld, Mid-Sized, and Large-Area Low-Cost Li Foil MPWC Neutron Detectors**

K. A. Nelson<sup>1</sup>, N. J. Hinson<sup>1</sup>, M. R. Kusner<sup>2</sup>, M. R. Mayhugh<sup>2</sup>, B. W. Montag<sup>1</sup>, A. J. Schmidt<sup>1</sup>, D. S. McGregor<sup>1</sup>

<sup>1</sup>*Kansas State University, USA*; <sup>2</sup>*Saint Gobain Crystals, USA*

#### **N25-34 Fabrication of Present-Generation Microstructured Semiconductor Neutron Detectors**

R. G. Fronk<sup>1</sup>, S. L. Bellinger<sup>2</sup>, L. C. Henson<sup>2</sup>, T. R. Ochs<sup>1</sup>, C. J. Rietcheck<sup>1</sup>, T. J. Sobering<sup>1</sup>, R. D. Taylor<sup>1</sup>, D. S. McGregor<sup>1</sup>

<sup>1</sup>Kansas State University, USA; <sup>2</sup>Radiation Detection Technologies, Inc., USA

#### **N25-35 Neutron Detection Using a Mobile Liquid Activation Material**

R. O'Brien, W. Culbreth

University of Nevada, Las Vegas, United States

### **N26 NSS Poster Session II - New Concepts in Solid-State Detectors**

Tuesday, Nov. 11 14:00-15:30 4B

Session Chair: **Peter Fischer**, Institute for Computer Engineering, Heidelberg University, Germany

#### **N26-1 Mechanisms of Electric Field and Temperature Dependent Effective Mobility and Impact Ionization in Amorphous Selenium**

M. Z. Kabir, N. Hijazi, Concordia University, Canada

#### **N26-2 Fundamental Study on Applying Organic Photodiodes Fabricated on Plastic Scintillator to X-Ray Distribution Measurement**

E. Takada, K. Fujii, H. Imai, Toyama National College of Technology, Japan; Y. Namito, High Energy Accelerator Research Organization, Japan; T. Nakamura, Tohoku University, Japan; H. Okada, University of Toyama, Toyama

#### **N26-3 Timing Resolution Dependence on MPPC Performance Parameters**

T. Nagano, N. Hosokawa, A. Ishida, R. Tsuchiya, K. Sato, K. Yamamoto

HAMAMATSU PHOTONICS K.K., Japan

#### **N26-4 Modeling and Optimization of the Timing Resolution of Digital SiPM PET Detectors**

L. H. C. Braga, L. Gasparini, D. Stoppa

Fondazione Bruno Kessler (FBK), Italy

#### **N26-6 Thermally Stimulated Luminescence Property of Ceramic AlN**

K. Fukuda, Tokuyama Corporation, Japan; T. Yanagida, Kyushu Institute of Technology, Japan; N. Kawaguchi, A&T Corporation, Japan

#### **N26-7 Luminescence and dosimetric properties of Ce<sup>3+</sup>-doped CaB<sub>2</sub>O<sub>4</sub> crystal**

Y. Fujimoto, Tohoku University, Japan; T. Yanagida, Kyushu Institute of Technology, Japan

#### **N26-8 Radiation Response Properties of Lumilass-B Fluorescent Glass**

Y. Fujimoto, Tohoku University, Japan; T. Yanagida, Kyushu Institute of Technology, Japan

#### **N26-9 Design of High-Spatial Resolution Neutron Imager Using Single Crystal LiInSe<sub>2</sub>**

E. H. Herrera, E. D. Lukosi, The University of Tennessee Knoxville, USA; A. Stowe, Y-12 National Security Complex, USA; A. Burger, Fisk University, USA

#### **N26-10 Dynamic Range Measurements of a Dual Camera Complementary Metal-Oxide-Semiconductor (CMOS) Active Pixel Sensor (APS) X-Ray Detector**

Y. Zheng<sup>1</sup>, N. Vassiljev<sup>1</sup>, A. Konstantinidis<sup>2</sup>, T. Anaxagoras<sup>3</sup>, J. Griffiths<sup>1</sup>, R. Speller<sup>1</sup>

<sup>1</sup>University College London, UK; <sup>2</sup>Barts Health NHS Trust, UK; <sup>3</sup>ISDI Ltd (Image sensor design and innovation), UK

#### **N26-11 A Novel Concept for Radiation-Hard Large-Area Strip Detectors Based on Active HV/HR-CMOS Sensors**

H. Grabas, SCIPP/UC, USA

On behalf of the ATLAS Upgrade HV/HR-CMOS collaboration

#### **N26-12 Integrated High Voltage Photo-Voltaic Device for Radiation Detector Systems**

J. Segal<sup>1</sup>, C. Kenney<sup>1</sup>, M. Breidenbach<sup>1</sup>, G. Gratta<sup>2</sup>, A. Tomada<sup>1</sup>, C.-E. Chang<sup>2</sup>, J. Corbett<sup>1</sup>

<sup>1</sup>SLAC, USA; <sup>2</sup>Stanford University, USA

#### **N26-13 Progress in the Development of Low-Gain Avalanche Detectors (LGAD)**

H. F. W. Sadrozinski, Univ. of California Santa Cruz, USA

On behalf of the LGAD Collaboration

#### **N26-14 Consideration of Primary Recoiled Electrons and Incomplete Charge Collection in the Spectral Response Simulation of Thin-Film Based Radiation Detectors**

G. Kim, C. J. Park, Sejong University, South Korea

#### **N26-15 Characterisation of a Novel 3D Silicon Strip Detector for Microbeam Radiation Therapy (MRT) Quality Assurance**

M. J. Cameron, I. M. Cornelius, S. Guatelli, M. L. F. Lerch, M. Petasecca, A. B. Rosenfeld

Centre for Medical Radiation Physics, University of Wollongong, Australia

#### **N26-16 Dosimetric Characterization of a Novel Epitaxial Silicon Array**

C. Talamonti<sup>1,2,3</sup>, M. Zani<sup>1</sup>, D. Menichelli<sup>4</sup>, F. Bisello<sup>4,5</sup>, M. Scaringella<sup>1</sup>, M. Bucciolini<sup>1,2,3</sup>, M. Bruzzi<sup>1,2</sup>

<sup>1</sup>University of Florence, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>Azienda Ospedaliera Universitaria Careggi, Italy; <sup>4</sup>IBA, Germany; <sup>5</sup>FAU University Erlangen-Nürnberg, Germany

#### **N26-17 A Simplified Process for the Fabrication of Monolithic Silicon Diode Arrays**

A. K. Rumaiz<sup>1</sup>, D. Elliott<sup>1</sup>, T. Krings<sup>2</sup>, D. P. Siddons<sup>1</sup>

<sup>1</sup>Brookhaven National Laboratory, USA; <sup>2</sup>Semikon Detectors, GmbH, Germany

## N27 NSS Poster Session II - Scintillators and Scintillation Detectors

Tuesday, Nov. 11 14:00-15:30 4B

Session Chair: TBD

### N27-1 The Effects of Thermal Processing on the Luminescence of $\text{Y}_2\text{O}_3:\text{Tm}$ Transparent Ceramic

M. G. Chapman, M. R. Marchewka, S. A. Roberts, J. M. Schmitt, C. J. Kucera, J. Ballato, T. A. DeVol, L. G. Jacobsohn  
Clemson University, USA

### N27-2 Investigation of Pr Incorporation in LuAG Powders and Ceramics

M. R. Marchewka, M. G. Chapman, H. Qian, L. G. Jacobsohn  
Clemson University, USA

### N27-3 Physical and Scintillation Degradation of Hygroscopic Scintillators

M. Zhuravleva<sup>1</sup>, L. Stand<sup>1</sup>, H. Wei<sup>1</sup>, C. Hobbs<sup>1</sup>, G. Schweitzer<sup>1</sup>, L. Boatner<sup>2</sup>, D. Leonard<sup>2</sup>, K. Shah<sup>3</sup>, A. Burger<sup>4</sup>, C. L. Melcher<sup>1</sup>  
<sup>1</sup>University of Tennessee, USA; <sup>2</sup>Oak Ridge National Laboratory, USA; <sup>3</sup>Radiation Monitoring Devices, USA; <sup>4</sup>Fisk University, USA

### N27-4 Properties of $\text{CeBr}_{3-x}\text{Cl}_x$ Single Crystal Scintillators

H. Wei, V. Martin, A. Lindsey, M. Zhuravleva, C. L. Melcher  
University of Tennessee, Knoxville, United States

### N27-6 A Novel Method to Create an Intrinsic Reflective Layer on a $\text{Gd}_3\text{Ga}_3\text{Al}_2\text{O}_{12}:\text{Ce}$ Scintillation Crystal

F. Meng<sup>1,2</sup>, M. Koschan<sup>2</sup>, M. Tyagi<sup>3</sup>, C. L. Melcher<sup>1,2</sup>, P. Cohen<sup>4</sup>  
<sup>1</sup>Materials Science and Engineering, USA; <sup>2</sup>Scintillation Materials Research Center, USA; <sup>3</sup>Bhabha Atomic Research Center, India; <sup>4</sup>Siemens Medical Solutions Molecular Imaging, USA

### N27-7 3" x 3" $\text{LaBr}_3:\text{Ce}$ position sensitivity with multi-anode PMT readout

A. Giaz<sup>1</sup>, F. Camera<sup>1,2</sup>, N. Blasi<sup>1</sup>, C. Boiano<sup>1</sup>, S. Brambilla<sup>1</sup>, B. Million<sup>1</sup>, S. Riboldi<sup>1,2</sup>  
<sup>1</sup>INFN sezione di Milano, Italy; <sup>2</sup>Università degli studi di Milano, Italy

### N27-8 Measurement of Beta Decay Continuum Spectrum of $^{138}\text{La}$

A. Giaz<sup>1</sup>, G. Gosta<sup>2</sup>, F. Camera<sup>1,2</sup>, S. Riboldi<sup>1,2</sup>, S. Brambilla<sup>1</sup>, N. Blasi<sup>1</sup>, B. Million<sup>1</sup>  
<sup>1</sup>INFN sezione di Milano, Italy; <sup>2</sup>Università degli studi di Milano, Italy

### N27-10 A Cognitive Filter to Stabilize Peak Positions and Widths of a Scintillation Detector and to Determine Its Material

E. Jacobs<sup>1</sup>, C. Henke<sup>2</sup>, M. J. Neuer<sup>1</sup>  
<sup>1</sup>smartoptics GmbH., Germany; <sup>2</sup>

### N27-11 Evolutionary Ensembles That Learn Spectroscopic Characteristics of Scintillation and CZT Detectors

M. J. Neuer, N. Teofilov, Y. Kong, VDEh-Betriebsforschungsinstitut GmbH., Germany; E. Jacobs, smartoptics GmbH., Germany

### N27-12 Effect of Annealing Atmosphere on the Cerium Valence State in Ca Codoped GGAG:Ce Single Crystals

F. Meng<sup>1</sup>, Y. Wu<sup>1</sup>, M. Koschan<sup>1</sup>, C. L. Melcher<sup>1</sup>, P. Cohen<sup>2</sup>  
<sup>1</sup>University of Tennessee, USA; <sup>2</sup>Siemens Medical Solutions Molecular Imaging, USA

### N27-13 Suppression of YAG Phase Formation in YAP:Ce Pellets

F. Meng, M. Koschan, S. B. Donald, Y. Wu, C. L. Melcher  
University of Tennessee, USA

### N27-14 A Compact Detector for Sr/Y-90 Radioactivity Measurements with a Through Hole NaI(Tl) Scintillator

Y. Unno<sup>1</sup>, T. Sanami<sup>2</sup>, S. Sasaki<sup>2</sup>, M. Hagiwara<sup>2</sup>, A. Yunoki<sup>1</sup>  
<sup>1</sup>National Institute of Advanced Industrial Science and Technology, Japan; <sup>2</sup>High Energy Accelerator Research Organization, Japan

### N27-16 Performance Test of Photodiode coupled with a $\text{CdWO}_4$

K. H. Kang<sup>1</sup>, G. H. Chae<sup>1</sup>, H. J. Hyun<sup>1</sup>, H. B. Jeon<sup>1</sup>, B. B. Kim<sup>1</sup>, H. J. Kim<sup>1</sup>, M. K. Moon<sup>2</sup>, H. Park<sup>1</sup>  
<sup>1</sup>Kyungpook National University, Korea; <sup>2</sup>Korea Atomic Energy Research Institute, Korea

### N27-17 Thermal and Fast Neutron Detection with Two CLYC Scintillators

L. Pellegrini<sup>1</sup>, A. Giaz<sup>1</sup>, F. Camera<sup>1,2</sup>, N. Blasi<sup>1</sup>, S. Brambilla<sup>1</sup>, B. Million<sup>1</sup>, S. Riboldi<sup>1,2</sup>, S. Ceruti<sup>1,2</sup>  
<sup>1</sup>INFN sezione di Milano, Italy; <sup>2</sup>Università degli studi di Milano, Italy

### N27-18 Performances of New Scintillator Detectors: $\text{SrI}_2:\text{Eu}$ , $\text{CeBr}_3$ , GYGAG:Ce

A. Giaz<sup>1</sup>, G. Hull<sup>2</sup>, F. Camera<sup>1,3</sup>, V. Fossati<sup>3</sup>, S. Brambilla<sup>1</sup>, B. Million<sup>1</sup>, S. Riboldi<sup>1,3</sup>  
<sup>1</sup>INFN sezione di Milano, Italy; <sup>2</sup>Institut de Physique Nucléaire d'Orsay, France; <sup>3</sup>Università degli studi di Milano, Italy

### N27-19 Luminescence and Scintillation Properties of Tm and Nd-Doped $\text{LuF}_3$ Single Crystals

J. Pejchal<sup>1,2</sup>, K. Fukuda<sup>3</sup>, S. Kurosawa<sup>1</sup>, Y. Yokota<sup>1</sup>, A. Yoshikawa<sup>1</sup>  
<sup>1</sup>Tohoku University, Japan; <sup>2</sup>Academy of Sciences of the Czech Republic, Czech Republic; <sup>3</sup>Tokuyama Corporation, Japan

### N27-20 Preparation of Translucent $\text{Gd}_2\text{Si}_2\text{O}_7:\text{Ce}$ Thin Plates by Liquid-Phase Sintering and Their Scintillation Performance for Alpha-Particles

M. Nishikata, M. Higuchi, A. Ueda, Y. Tsubota, J. H. Kaneko, Hokkaido university, Japan; H. Ishibashi, Hitachi Chemical Co., Japan

### N27-21 $\text{SrBPO}_5:\text{Eu}^{2+}$ Storage Phosphors for Wide-Range Neutron Detection

K. Sakasai, K. Toh, T. Nakamura, K. Ochiai, C. Konno  
Japan Atomic Energy Agency, Japan

**N27-22 Development of a Detector Based on Silicon Drift Detectors and Large ( $2'' \times 2''$ ) Lanthanum Bromide Scintillator for Gamma-Ray Spectroscopy and Imaging Applications**

A. D. Burr<sup>1,2</sup>, R. Quaglia<sup>1,2</sup>, C. Fiorini<sup>1,2</sup>, P. Busca<sup>1,2</sup>, M. Occhipinti<sup>1,2</sup>, G. Giacomini<sup>3</sup>, C. Piemonte<sup>3</sup>, N. Nelms<sup>4</sup>, B. Shortt<sup>4</sup>, F. Camera<sup>2,5</sup>, B. Million<sup>2</sup>  
<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN Sezione di Milano, Italy; <sup>3</sup>Fondazione Bruno Kessler, Italy; <sup>4</sup>European Space Agency, The Netherlands; <sup>5</sup>Università degli Studi di Milano, Italy

**N27-23 Common Approach to Study Scintillators Response to Gamma-Rays and Protons**

L. Swiderski<sup>1</sup>, M. Szawłowski<sup>1</sup>, M. Moszynski<sup>1</sup>, A. Para<sup>2</sup>, W. Czarnacki<sup>1</sup>, M. Grodzicka<sup>1</sup>, J. Wojtkowska<sup>1</sup>  
<sup>1</sup>National Centre for Nuclear Research, Poland; <sup>2</sup>Fermi National Accelerator Laboratory, USA

**N27-24 Development of Li-loaded liquid scintillator for anti-neutrino directional measurement**

Y. Shirahata, H. Watanabe, H. Ikeda, T. Mitsui, K. Ishidoshiro, K. Inoue, S. Ishio  
Research Center for Neutrino Science, Tohoku University, Japan

**N27-25 Design of a Low Background Liquid Scintillation Counter for a Shallow Underground Laboratory**

J. L. Orrell<sup>1</sup>, J. Erchinger<sup>1,2</sup>, C. E. Aalseth<sup>1</sup>, B. E. Bernacki<sup>1</sup>, M. Douglas<sup>1</sup>, E. S. Fuller<sup>1</sup>, E. Finn<sup>1</sup>, M. E. Keillor<sup>1</sup>, S. M. Morley<sup>1</sup>, M. E. Panisko<sup>1</sup>, S. M. Shaff<sup>1</sup>, G. A. Warren<sup>1</sup>, M. E. Wright<sup>1</sup>  
<sup>1</sup>Pacific Northwest National Laboratory, USA; <sup>2</sup>Texas A&M University, USA

**N27-26 Crystal Growth and Scintillation Properties of Eu:SrI<sub>2</sub> Co-Doped with La<sup>3+</sup> and Lu<sup>3+</sup>**

S. Lam, A. Datta, S. Swider, S. Motakef, Capesym, Inc., USA

**N27-27 Scintillation Performance of Ce Only and Sr Co-Doped Cs<sub>2</sub>LiYCl<sub>6</sub> Crystals up to 180° C**

K. Yang, P. R. Menge, Saint-Gobain Crystals, USA; V. Ouspenski, J. Lejay, Saint-Gobain Recherche, France

**N27-28 Longitudinal Pores in Cesium Iodide Produced by the Edge-Defined Film-Fed Growth Method**

A. Yeckel<sup>1</sup>, S. Podowitz<sup>2</sup>, C. Gugushev<sup>2</sup>, R. S. Feigelson<sup>2</sup>, J. J. Derby<sup>1</sup>  
<sup>1</sup>University of Minnesota, U.S.A.; <sup>2</sup>Stanford University, U.S.A.

**N27-29 Modify the Scintillation Center in Lead Tungstate by Doping**

C. He, Y. Li, L.-E. Dai, C. Wu, R. Mao, Shanghai Institute of Ceramics, Chinese Academy of Sciences, CHINA; L. Zhang, R.-Y. Zhu, California Institute of Technology, USA; Q. Tang, Sun Yat-sen University, CHINA

**N27-30 Growth and Scintillation Properties of Large Size YSO:Ce Crystal**

L.-E. Dai, C. He, C. Wu, Y. Li, R. Mao, Shanghai Institute of Ceramics, Chinese Academy of Sciences, CHINA; Q. Tang, Sun Yat-sen University, CHINA

**N27-31 Study of Fluorescence Quenching in BGO Crystal**

Y. Zhang, Z. Zhang, C. Wang, Y. Wei, X. Wang, Z. Xu, G. Huang  
USTC, China

**N27-32 Evaluation of Afterglow of Inorganic Scintillators by Pulse X-Ray Irradiation**

T. Yanagida, Kyushu Institute of Technology, Japan; Y. Fujimoto, Tohoku Univ., Japan; T. Ito, K. Uchiyama, K. Mori, Hamamatsu Photonics, Japan

**N27-33 Scintillation Responses of Transparent Ceramic Bi-Doped LaZrO<sub>3.5</sub>**

T. Yanagida, Kyushu Institute of Technology, Japan; S. Kuretake, K. Murayama, N. Tanaka, Murata Manufacturing Co. Ltd., Japan

**N27-34 Evaluation of Composite Transparent Ceramic Ce:YAG/nondoped YAG for Scintillator Use**

T. Yanagida, Kyushu Institute of Technology, Japan; K. Watanabe, Nagoya Univ., Japan; H. Yagi, T. Yanagitani, Konoshima Chemical Co. Ltd., Japan

**N27-35 OSL, TSL, and Scintillation Properties of Sn<sup>2+</sup>-Doped 60ZnO-40P<sub>2</sub>O<sub>5</sub> Glass**

T. Yanagida, Kyushu Institute of Technology, Japan; H. Masai, Kyoto Univ., Japan

**N27-36 Scintillator Characterization at Energies Relevant for a Prompt Gamma Detection System in Particle Therapy**

K. E. Roemer<sup>1</sup>, G. Pausch<sup>2</sup>, M. Berthel<sup>2</sup>, A. Dreyer<sup>2</sup>, W. Enghardt<sup>1,2</sup>, C. Golnik<sup>2</sup>, F. Hueso-González<sup>2</sup>, T. Kormoll<sup>2</sup>, J. Petzoldt<sup>2</sup>, F. Fiedler<sup>1</sup>  
<sup>1</sup>Institute of Radiation Physics, Helmholtz-Zentrum Dresden-Rossendorf, Germany; <sup>2</sup>Oncoray — National Center for Radiation Research in Oncology, Faculty of Medicine and University Hospital Carl Gustav Carus, Technische Universität Dresden, Helmholtz-Zentrum Dresden – Rossendorf, Germany

**N27-37 Evaluation of Scintillation Properties of Mg<sup>2+</sup> Co-Doped Ce:(La, Gd)<sub>2</sub>Si<sub>2</sub>O<sub>7</sub> Crystal Grown by the Czochralski Process**

R. Murakami<sup>1</sup>, S. Kurosawa<sup>1</sup>, Y. Shoji<sup>1,2</sup>, Y. Ohashi<sup>1</sup>, J. Pejchal<sup>1,3</sup>, Y. Yokota<sup>1</sup>, K. Kamada<sup>1</sup>, A. Yoshikawa<sup>1,2</sup>  
<sup>1</sup>Tohoku University, Japan; <sup>2</sup>C&A Corporation, Japan; <sup>3</sup>The Academy of Sciences of the Czech Republic, Czech Republic

**N27-38 Effect of Y Co-Doping to Eu:LiCaAlF<sub>6</sub> on TSL and OSL Responses**

K. Fukuda, Tokuyama Corporation, Japan; T. Yanagida, Kyushu Institute of Technology, Japan; N. Kawaguchi, A&T Corporation, Japan

**N27-39 Scintillation Responses of Nd<sup>3+</sup>-Doped LiYF<sub>4</sub>**

K. Fukuda, Tokuyama Corporation, Japan; T. Yanagida, Kyushu Institute of Technology, Japan; N. Kawaguchi, A&T Corporation, Japan

**N27-41 Wavelength-Based Neutron/Gamma Ray Discrimination in CLYC**

Z. W. Bell, D. E. Hornback, M. Z. Hu, J. S. Neal  
Oak Ridge National Laboratory, USA

**N27-42 Growth of Transparent Microstructured Lu<sub>2</sub>O<sub>3</sub>:Eu Thin Film Scintillator for Hard X-Ray Imaging**

Z. Marton<sup>1</sup>, S. R. Miller<sup>1</sup>, C. Brecher<sup>1</sup>, P. Kenesei<sup>2</sup>, S. Ross<sup>3</sup>, J. D. Almer<sup>2</sup>, B. Singh<sup>1</sup>, V. V. Nagarkar<sup>1</sup>  
<sup>1</sup>Radiation Monitoring Devices, Inc., USA; <sup>2</sup>Argonne National Laboratory, USA; <sup>3</sup>Northern Illinois University, USA

**N27-43 Chemical Polishing on Garnet Scintillators and Their Scintillation Properties**

K. Kamada<sup>1,2</sup>, Y. Shoji<sup>1,2</sup>, S. Yamamoto<sup>3</sup>, A. Nagura<sup>1</sup>, K. Hishinuma<sup>1</sup>, S. Kurosawa<sup>1</sup>, Y. Ohashi<sup>1</sup>, J. Pejchal<sup>1,4</sup>, Y. Yokota<sup>1</sup>, A. Yoshikawa<sup>1,2</sup>

<sup>1</sup>Tohoku University, Japan; <sup>2</sup>C&A Corporation, Japan; <sup>3</sup>Nagoya University, Japan; <sup>4</sup>Institute of Physics AS CR, Czech Republic

**N27-44 Growth and Scintillation Properties of Neodymium Doped (Lu, Y, Gd)<sub>3</sub>(Al,Ga)<sub>5</sub>O<sub>12</sub> Single Crystals**

K. Kamada<sup>1,2</sup>, S. Kurosawa<sup>1</sup>, A. Yamaji<sup>1</sup>, Y. Ohashi<sup>1</sup>, J. Pejchal<sup>1,3</sup>, Y. Yokota<sup>1</sup>, A. Yoshikawa<sup>1,2</sup>

<sup>1</sup>Tohoku University, Japan; <sup>2</sup>C&A Corporation, Japan; <sup>3</sup>Institute of Physics AS CR, Czech Republic

**N27-45 Comparative Investigation of near-Infrared Scintillation Properties of Nd<sup>3+</sup>-Doped YVO<sub>4</sub> Crystals with Several Concentrations**

Y. Fujimoto, Tohoku University, Japan; T. Yanagida, Kyushu Institute of Technology, Japan

**N27-46 New X-Ray Imaging Sensor - Microcolumnar Ba<sub>2</sub>CsI<sub>5</sub>:Eu**

H. B. Bhandari, O. Ovechkina, S. R. Miller, S. C. Rose, V. V. Nagarkar

RMD Inc., USA

**N27-49 Development of Bar-Type Scintillator for Energy and Position Measurement**

J. Kawarabayashi, H. Sugano, T. Takahashi, H. Tomita, T. Iguchi, Nagoya University, Japan; E. Takada, Toyama National College of Technology, Japan

**N27-50 Scintillation Properties of Na<sub>2</sub>O-Al<sub>2</sub>O<sub>3</sub>-B<sub>2</sub>O<sub>3</sub> Based Glasses for Thermal Neutron Detection**

Y. Fujimoto, Tohoku University, Japan; T. Yanagida, Kyushu Institute of Technology, Japan

**N27-51 Characterization of Three LYSO Crystal Batches**

F. Yang, R. Mao, L. Zhang, R. Zhu

California Institute of Technology, USA

**N27-52 Radiation Damage in BaF<sub>2</sub>, CsI and CeF<sub>3</sub> Crystals**

F. Yang, L. Zhang, R. Zhu

California Institute of Technology, USA

**N27-53 Next Generation LYSO:Ce,Ca Single Crystals**

S. Blahuta, V. Ouspenski, Saint-Gobain Recherche, France; P. Menge, K. Yang, Saint-Gobain Crystals, USA

**N27-54 Detection of Fast Moving Objects from Response of Inorganic Scintillators**

S. Banerjee, V. Yadav, R. I. Bakhtsingh, K. P. Dixit, K. C. Mittal

Bhabha Atomic Research Center, India

**N27-55 Development of Large Area Sintered GPS:Ce Scintillator Plate Aiming for Application of Alpha Particle Dust Monitor and Position Detection, Energy Discrimination Type Radiation Detector.**

S. Nabeta, J. H. Kaneko, Y. Tsubota, K. Toi, M. Nishikata, M. Higuchi, T. Shimaoka, Hokkaido university, Japan; Y. Morishita, K. Izaki, Japan Atomic Energy Agency, Japan

**N27-56 True Coincidence Summing Correction in NaI(Tl) and LaBr<sub>3</sub>(Ce) Scintillation Detectors: a Comparative Study**

M. Dhibar, C. K. Singh, L. Mittal, A. K. Gourishetty

Indian Institute of Technology Roorkee, India

**N27-57 Fabrication of Organic-Inorganic Hybrid Scintillators by Sol-Gel Method**

M. Koshimizumi<sup>1</sup>, Y. Sun<sup>1</sup>, H. Kitajima<sup>1</sup>, F. Nishikido<sup>2</sup>, R. Haruki<sup>3</sup>, S. Kishimoto<sup>3</sup>, K. Asai<sup>1</sup>

<sup>1</sup>Tohoku University, Japan; <sup>2</sup>Natinoal Institute of Radiological Sciences, Japan; <sup>3</sup>High Energy Accelerator Research Organization, Japan

**N27-58 Temperature Dependence on Scintillation Properties of Orthorhombic Yttrium-GPS Scintillators**

Y. Tsubota, J. H. Kaneko, M. Higuchi, M. Minagawa, Hokkaido University, Japan; H. Ishibashi, Hitachi Chemical co. Ltd., Japan

**N27-59 Scintillation Response and Energy Transfer in Ce<sup>3+</sup> Doped GdGa-LuAG Garnet Scintillators**

M. Kucera, Z. Onderisinova, M. Hanus, Charles University, Czech Republic; J. Bok, ISI ASCR, Czech Republic; M. Nikl, Institute of Physics ASCR, Czech Republic

**N27-60 Impurities in Zone-Refined Precursors for Halide Scintillators**

S. E. Swider, S. Lam, S. Motakef, Capesym, Inc., USA; E. Donohoe, L. Coers, S. Spencer, SAF-C-Hitech, USA

**N27-61 New Eu<sup>2+</sup> Doped Mixed Scintillators CsSrBrI<sub>2</sub>, CsCaBrI<sub>2</sub> and CsSrClBr<sub>2</sub>**

L. M. Stand, M. Zhuravleva, H. Wei, W. McAlexander, C. L. Melcher

University of Tennessee, 37919

**N27-62 Czochralski Growth and Scintillation Properties of Mg<sup>2+</sup> and Zr<sup>4+</sup> Co-Doped Ce:Gd<sub>3</sub>Ga<sub>3</sub>Al<sub>2</sub>O<sub>12</sub> Single Crystals**

A. Nagura<sup>1</sup>, K. Kamada<sup>1,2</sup>, V. V. Kochurikhin<sup>3</sup>, K. Hishinuma<sup>1</sup>, A. Yamaji<sup>1</sup>, S. Kurosawa<sup>1</sup>, J. Pejchal<sup>1,4</sup>, Y. Yokota<sup>1</sup>, Y. Ohashi<sup>1</sup>, A. Yoshikawa<sup>1,2</sup>

<sup>1</sup>Tohoku University, Japan; <sup>2</sup>C&A Corporation, Japan; <sup>3</sup>General Physics Institute, Russia; <sup>4</sup>The Academy of Sciences of the Czech Republic, Czech Republic

**N27-63 Improvement of Eu Segregation on Eu:LiCaAlF<sub>6</sub> Scintillator Crystals by Al Metal and Their Scintillation Properties**

Y. Yokota<sup>1</sup>, S. Kurosawa<sup>1,2</sup>, K. Fukuda<sup>3</sup>, J. Pejchal<sup>1</sup>, Y. Ohashi<sup>2</sup>, K. Kamada<sup>1,4</sup>, A. Yoshikawa<sup>1,2,4</sup>

<sup>1</sup>New Industry Creation Hatchery Center (NICHe), Tohoku University, Japan; <sup>2</sup>Institute for Materials Research, Japan; <sup>3</sup>Tokuyama Corporation, Japan;

<sup>4</sup>C&A Corporation, Japan

**N27-64 Growth of Eu:SrI<sub>2</sub> Bulk Crystals by Modified Bridgeman Method and Scintillation Properties**

Y. Yokota<sup>1</sup>, S. Kurosawa<sup>1,2</sup>, Y. Shoji<sup>1</sup>, J. Pejchal<sup>1</sup>, Y. Ohashi<sup>2</sup>, K. Kamada<sup>1,3</sup>, A. Yoshikawa<sup>1,2,3</sup>

<sup>1</sup>New Industry Creation Hatchery Center (NICHe), Tohoku University, Japan; <sup>2</sup>Institute for Materials Research, Japan; <sup>3</sup>C&A Corporation, Japan

**N27-65 Preparation of GPS:Ce sintered compacts composed of grains 100 μm by the addition of Ti and their scintillation properties for alpha particles**

M. Minagawa, J. H. Kaneko, Y. Tsubota, M. Higuchi, M. Nishikata, Hokkaido University, Japan; H. Ishibashi, Hitachi Chemical co. Ltd., Japan

#### **N20-4 Investigation of Anisotropy in Anthracene Crystals Through Cosmic Muon Events**

P. Schuster, *UC Berkeley, USA*

#### **N27-67 Gamma-Ray Suppression with Pulse Shape Discrimination Technique for Transparent RUBber SheeT (TRUST) LiCaAlF<sub>6</sub> Neutron Scintillator with Wavelength-Shifting Fiber Readout**

T. Yamazaki, K. Watanabe, A. Yamazaki, D. Sugimoto, A. Uritani, T. Iguchi, *Nagoya University, Japan*; K. Fukuda, S. Ishidu, *Tokuyama Corporation, Japan*; T. Yanagida, *Kyusyu Institute of Technology, Japan*

#### **N27-68 SiPM Based PET Detector Modules with Air-Gapped Pixelated LYSO**

Q. Wei<sup>1</sup>, T. Ma<sup>1</sup>, D. Li<sup>2</sup>, T. Xu<sup>1</sup>, N. Jiang<sup>3</sup>, F. He<sup>3</sup>, C. Jia<sup>3</sup>, S. Wang<sup>1</sup>, X. Jiang<sup>1</sup>, Y. Liu<sup>1</sup>  
<sup>1</sup>*Tsinghua University, China*; <sup>2</sup>*National Institute of Metrology, China*; <sup>3</sup>*Nucmed Inc, China*

#### **N27-69 Boron-Loaded Plastic Scintillators Containing Inexpensive Borate Esters**

P. Meysing, A. Mahl, C. Pecinovsky, U. Greife, J. Dorgan  
*Colorado School of Mines, USA*

#### **N27-70 Study on Factors Degrading the Scintillation Properties of Eu-Doped SrI<sub>2</sub>**

S. Kurosawa<sup>1</sup>, Y. Yokota<sup>1</sup>, Y. Homma<sup>1</sup>, K. Shirasaki<sup>1</sup>, K. Nishimoto<sup>1</sup>, T. Ito<sup>1</sup>, Y. Shoji<sup>1,2</sup>, J. Pejchal<sup>1,3</sup>, Y. Ohashi<sup>1</sup>, K. Kamada<sup>1,3</sup>, T. Yamamura<sup>1</sup>, D. Aoki<sup>1</sup>, A. Yoshikawa<sup>1,2</sup>  
<sup>1</sup>*Tohoku University, Japan*; <sup>2</sup>*C&A Corporation, Japan*; <sup>3</sup>*AS CR, Czech Republic*

#### **N27-71 Near Infra-Red Imaging with New Scintillators**

S. Kurosawa<sup>1</sup>, A. Yamaji<sup>1</sup>, A. Suzuki<sup>1</sup>, V. V. Kochurikhin<sup>2</sup>, Y. Ohashi<sup>1</sup>, J. Pejchal<sup>1,3</sup>, Y. Yokota<sup>1</sup>, K. Kamada<sup>1,4</sup>, A. Yoshikawa<sup>1,4</sup>  
<sup>1</sup>*Tohoku University, Japan*; <sup>2</sup>*General Physics Institute, Russia*; <sup>3</sup>*AS CR, Czech Republic*; <sup>4</sup>*C&A Corp, Japan*

#### **N27-73 Characterization of a YAG:Ce Calorimeter with High-Energy Proton Beam**

V. Sipala<sup>1,2</sup>, N. Randazzo<sup>3</sup>, M. Bruzzi<sup>4,5</sup>, M. Bucciolini<sup>4,5</sup>, M. Carpinelli<sup>1,2</sup>, C. Civinini<sup>5</sup>, G. A. P. Cirrone<sup>6</sup>, G. Cuttone<sup>6</sup>, D. Lo Presti<sup>3,7</sup>, S. Pallotta<sup>4,5</sup>, C. Pugliatti<sup>3,7</sup>, F. Romano<sup>6</sup>, M. Scaringella<sup>4</sup>, C. Stancampiano<sup>6</sup>, C. Talamonti<sup>4,5</sup>, E. Vanzi<sup>4,5</sup>, M. Zani<sup>4,5</sup>  
<sup>1</sup>*University of Sassari, Italy*; <sup>2</sup>*INFN Cagliari, Italy*; <sup>3</sup>*INFN Catania, Italy*; <sup>4</sup>*University of Florence, Italy*; <sup>5</sup>*INFN Florence, Italy*; <sup>6</sup>*INFN-Laboratori Nazionali del Sud, Italy*; <sup>7</sup>*University of Catania, Italy*

### **N28 NSS Poster Session II - Ultra Fast Detectors**

Tuesday, Nov. 11 14:00-15:30 4B

Session Chair: **Georg Steinbrueck**, University of Hamburg, Germany

#### **N28-1 Analytical Model for the Timing Resolution of SiPM-Based Scintillation Detectors for PET**

J. Breuer, *Siemens, Germany*

On behalf of the COMET Collaboration

#### **N28-2 Simulations of Low-Energy Electron Interactions with Matter**

A. M. M. G. Theulings, *Nikhef/TU Delft, Netherlands*

On behalf of the MEMBRane group

#### **N28-3 Ab Initio Simulations of the Electron Affinity of Silicon Nitride-Effects of Various Surface Terminations**

A. Theulings, *Nikhef, The Netherlands*

On behalf of the MEMBRane group

#### **N28-4 MD-SiPM PET Detector Module Design**

E. Venialgo<sup>1,2</sup>, S. Mandai<sup>1</sup>, E. Charbon<sup>1</sup>

<sup>1</sup>*TU Delft, Netherlands*; <sup>2</sup>*Instituto Sabato, Argentina*

#### **N28-6 Characterization of TSV MPPC Arrays (4x4 ch and 8x8 ch) in Scintillation Spectrometry**

M. Grodzicka, T. Szczesniak, M. Moszynski, *National Centre for Nuclear Research (NCBJ), Poland*; J. Baszak, *Hamamatsu Photonics Deutschland GmbH, Germany*

### **N29 Instrumentation for Nuclear Security Applications III**

Tuesday, Nov. 11 16:00-18:00 6A

Session Chairs: **James Peltz**, NNSA,  
**Daniel Stephens Jr.**, Pacific Northwest National Laboratory, United States

#### **N29-1 (16:00) Time-Related Pulse-Height Analysis of a Multiplying HCU Assembly**

E. C. Miller<sup>1</sup>, D. L. Chichester<sup>2</sup>, J. M. Kalter<sup>1</sup>, S. M. Watson<sup>2</sup>, M. T. Kinlaw<sup>2</sup>, C. M. Lavelle<sup>1</sup>, W. A. Noonan<sup>1</sup>

<sup>1</sup>*Johns Hopkins University Applied Physics Laboratory, USA*; <sup>2</sup>*Idaho National Laboratory, USA*

#### **N29-2 (16:15) <sup>235</sup>U and <sup>239</sup>Pu Characterization in Radioactive Waste Using Neutron-Induced Fission Delayed Gamma Rays**

T. Nicol<sup>1</sup>, B. Perot<sup>1</sup>, C. Carasco<sup>1</sup>, E. Brackx<sup>2</sup>, A. Mariani<sup>1</sup>, C. Passard<sup>1</sup>, E. Mauerhoffer<sup>3</sup>, J. Collot<sup>4</sup>

<sup>1</sup>CEA, DEN, Cadarache, France; <sup>2</sup>CEA, DEN, Marcoule, France; <sup>3</sup>FZJ Institute for Energy and Climate Research, Germany; <sup>4</sup>CNRS/IN2P3, Université Grenoble Alpes, France

**N29-3 (16:30) Correlation Analysis Techniques for Real-Time Neutron Source Identification with a Hand-Held Moderating Type Neutron Spectrometer**

C. B. Hoshor<sup>1</sup>, T. M. Oakes<sup>2</sup>, E. R. Myers<sup>1</sup>, B. J. Rogers<sup>1</sup>, J. E. Currie<sup>1</sup>, S. M. Young<sup>1</sup>, J. A. Crow<sup>1</sup>, P. R. Scott<sup>1</sup>, W. H. Miller<sup>2</sup>, S. L. Bellinger<sup>3</sup>, D. S. McGregor<sup>3</sup>, A. N. Caruso<sup>1</sup>

<sup>1</sup>University of Missouri - Kansas City, United States of America; <sup>2</sup>University of Missouri - Columbia, United States of America; <sup>3</sup>Kansas State University, United States of America

**N29-4 (16:45) Spherical Moderating Neutron Spectrometers for Locating Induced Fission Sources**

E. R. Myers<sup>1</sup>, S. M. Young<sup>1</sup>, C. B. Hoshor<sup>1</sup>, B. R. Rogers<sup>1</sup>, T. M. Oaks<sup>1,2</sup>, W. H. Miller<sup>2,3</sup>, D. S. McGregor<sup>4</sup>, S. L. Bellinger<sup>4</sup>, A. N. Caruso<sup>1</sup>

<sup>1</sup>University of Missouri - Kansas City, United States; <sup>2</sup>University of Missouri - Columbia, United States; <sup>3</sup>Missouri University Research Reactor, United States;

<sup>4</sup>Kansas State University, United States

**N29-5 (17:00) Performance of a Neutron Coincidence Counter Based on Boron-Coated Straws**

J. L. Lacy, A. Athanasiades, L. Sun, C. S. Martin, G. J. Vazquez-Flores, M. Regmi, *Proportional Technologies, Inc., USA*; S. Croft, *Oak Ridge National Laboratory, USA*

**N29-6 (17:15) Nuclear Material Detection by One-Short-Pulse-Laser-Driven Neutron Source**

A. Favalli<sup>1</sup>, J. Bridgewater<sup>1</sup>, S. Croft<sup>2</sup>, K. Falk<sup>1</sup>, J. Fernandez<sup>1</sup>, D. Gautier<sup>1</sup>, J. Goettee<sup>1</sup>, N. Guler<sup>1</sup>, C. Hamilton<sup>1</sup>, D. Henzlova<sup>1</sup>, K. Ianakiev<sup>1</sup>, M. Iliev<sup>1</sup>, R. Jonhson<sup>1</sup>, D. Jung<sup>1</sup>, M. Roth<sup>3</sup>, T. Shimada<sup>1</sup>, M. Swinhoe<sup>1</sup>

<sup>1</sup>Los Alamos National Laboratory, USA; <sup>2</sup>Oak Ridge National Laboratory, USA; <sup>3</sup>Technische Universität Darmstadt, Germany

**N29-7 (17:30) Scoping Study for High-Energy Fission Neutrons as a Signature for Active Detection with an Intense Interrogating Neutron Source\***

S. L. Jackson<sup>1</sup>, J. P. Apruzese<sup>2</sup>, R. J. Comisso<sup>1</sup>, J. W. Schumer<sup>1</sup>, S. B. Swanekamp<sup>1</sup>, B. V. Weber<sup>1</sup>, J. C. Zier<sup>1</sup>, C. N. Boyer<sup>2</sup>, A. N. Caruso<sup>3</sup>, E. R. Myers<sup>3</sup>

<sup>1</sup>Naval Research Laboratory, USA; <sup>2</sup>Engility Corporation, USA; <sup>3</sup>University of Missouri-Kansas City, USA

**N29-8 (17:45) Adaptive Pulse Shape Discrimination Techniques for Multiplicity Counting**

S. M. Robinson, S. Stave, A. Lintereur, E. Siciliano, R. Kouzes

*Pacific Northwest National Laboratory, 99354*

**N30 Astrophysics and Space Instrumentation II**

Tuesday, Nov. 11 16:00-18:00 606 & 607

Session Chairs: **Daniel Haas**, SRON Netherlands Institute for Space Research, Netherlands  
**Mark Pearce**, KTH Stockholm,

**N30-1 (16:00) PANGU: a High Resolution Gamma-Ray Space Telescope**

A. Bravar<sup>1</sup>, M. Pohl<sup>1</sup>, M. Su<sup>2</sup>, R. Walter<sup>3</sup>, X. Wu<sup>1</sup>

<sup>1</sup>University of Geneva, Switzerland; <sup>2</sup>MIT, United State; <sup>3</sup>University of Geneva, Switzerland

**N30-2 (16:15) Quantum Imaging Monitoring and Directional Visualization of Space Radiation with the Timepix Based SATRAM Payload in Open Space on board the ESA Proba-V Satellite**

C. Granja, S. Polansky, S. Pospisil, D. Turecek, Z. Vykydal, *Czech Technical University in Prague, Czech Republic*; A. Owens, K. Mellab, P. Nieminen, *European Space Agency (ESA), The Netherlands*; Z. Dvorak, M. Simcak, *Czech Space Research Center (CSRC), Czech Republic*

**N30-3 (16:30) The X-Ray Scattering Polarimeter X-Calibur**

F. Kislat<sup>1</sup>, M. G. Baring<sup>2</sup>, S. Barthelmy<sup>3</sup>, M. Beilicke<sup>1</sup>, A. Bodaghee<sup>4</sup>, R. Cowsik<sup>1</sup>, Q. Guo<sup>1</sup>, Y. Haba<sup>5</sup>, T. Hams<sup>3</sup>, H. Kunieda<sup>6</sup>, T. Maccarone<sup>7</sup>, H. Matsumoto<sup>6</sup>, T. Miyazawa<sup>6</sup>, T. Okajima<sup>3</sup>, M. Sasaki<sup>3</sup>, J. D. Schnittman<sup>3</sup>, K. Tamura<sup>6</sup>, A. Zajczyk<sup>1</sup>, H. Krawczynski<sup>1</sup>

<sup>1</sup>Washington University in St. Louis, USA; <sup>2</sup>Rice University, USA; <sup>3</sup>NASA Goddard Space Flight Center, USA; <sup>4</sup>University of California, USA; <sup>5</sup>Aichi University of Education, Japan; <sup>6</sup>Nagoya University, Japan; <sup>7</sup>Texas Tech University, USA

**N30-4 (16:45) Development of High Spatial Resolution Detector for at-Wavelength Metrology of X-Ray Optics**

J. K. Vogel, M. J. Pivovarov, *Lawrence Livermore National Laboratory (LLNL), USA*; B. Singh, S. R. Miller, V. V. Nagarkar, *Radiation Monitoring Devices, Inc, USA*; B. D. Ramsey, *NASA Marshall Space Flight Center, USA*

**N30-5 Design of the Time Assignment System for ASTRO-H and Its Performance Before Launch**

Y. Terada<sup>1</sup>, S. Yamaguchi<sup>1</sup>, S. Sugimoto<sup>1</sup>, T. Inoue<sup>1</sup>, S. Nakaya<sup>1</sup>, M. Ogawa<sup>2</sup>, T. Dotani<sup>2</sup>, Y. Ishisaki<sup>3</sup>, K. Mizushima<sup>4</sup>, T. Kominato<sup>4</sup>, H. Mine<sup>4</sup>, H. Hihara<sup>5</sup>, K. Iwase<sup>5</sup>, T. Kouzu<sup>1,5</sup>, M. S. Tashiro<sup>1</sup>, C. Natsukari<sup>2</sup>, M. Ozaki<sup>2</sup>, M. Kokubun<sup>2</sup>, T. Takahashi<sup>2</sup>, S. Kawakami<sup>5</sup>, M. Kasahara<sup>5</sup>, S. Kumagai<sup>5</sup>, L. Angelini<sup>6</sup>, M. Witthoef<sup>6</sup>

<sup>1</sup>Saitama University, Japan; <sup>2</sup>JAXA, Japan; <sup>3</sup>Tokyo Metropolitan University, Japan; <sup>4</sup>NEC, Japan; <sup>5</sup>NEC TOSHIBA Space Systems, Japan; <sup>6</sup>NASA, US

**N30-6 (17:15) Nuclei Identification with the AMS-02 Silicon Tracker**

P. E. Saouter, *Université de Genève, Switzerland*

On behalf of the AMS-02 Collaboration

**N30-7 (17:30) The JEM-EUSO Mission and Pathfinders Status.**

F. S. Cafagna, *INFN, Bari section, Italy*

On behalf of the JEM-EUSO Collaboration

### **N30-8 (17:45) Solar Flare Measurements with STIX and MiSolFA**

D. Casadei, *Fachhochschule Nordwestschweiz, Switzerland*

### **N31 Detectors for Synchrotron Radiation and FEL Instrumentation II**

Tuesday, Nov. 11 16:00-18:00 608 & 609

Session Chairs: **Cornelia B. Wunderer**, DESY, Germany  
**D Peter Siddons**, National Synchrotron Light Source, United States

#### **N31-1 (16:00) Ultimate 3D for a Pixel Detector - Tests of X-Rays Detection**

G. W. Deptuch<sup>1</sup>, G. Carini<sup>2</sup>, P. Grybos<sup>3</sup>, S. Holm<sup>1</sup>, R. Lipton<sup>1</sup>, P. Maj<sup>3</sup>, D. P. Siddons<sup>4</sup>, A. Shenai<sup>1</sup>, R. Szczygiel<sup>3</sup>, M. Trimpl<sup>1</sup>, R. Yarema<sup>1</sup>  
<sup>1</sup>Fermilab, USA; <sup>2</sup>SLAC, USA; <sup>3</sup>AGH-UST, Poland; <sup>4</sup>BNL, USA

#### **N31-2 (16:15) Detectors in Extreme Conditions**

G. Blaj, G. Carini, S. Herrmann, P. Hart, A. Tomada, S. Carron, A. Mitra, C. Kenney, G. Haller  
*SLAC National Accelerator Laboratory, USA*

#### **N31-3 (16:30) PixFEL: Enabling Technologies, Building Blocks and Architectures for Advanced X-Ray Pixel Cameras at the Next Generation FELs**

L. Ratti, *University of Pavia, Italy*  
On behalf of the PixFEL Collaboration

#### **N31-4 (16:45) Development of Multi-Port Charge-Coupled Device Detector with a 300 um Thick Depletion for X-Ray Free-Electron Laser Experiments**

S. Ono<sup>1</sup>, K. Ozaki<sup>1</sup>, K. Kobayashi<sup>1,2</sup>, Y. Kirihara<sup>1</sup>, N. Teranishi<sup>1,3</sup>, T. Kameshima<sup>1,2</sup>, T. Hatsui<sup>1,2</sup>  
<sup>1</sup>RIKEN, Japan; <sup>2</sup>Japan Synchrotron Radiation Research Institute, Japan; <sup>3</sup>University of Hyogo, Japan

#### **N31-5 (17:00) 2nd Generation Cameras for LCLS and the New Challenges of High Repetition Rates at LCLS-II**

S. C. Herrmann, K. Nishimura, M. Weaver, A. Dragone, G. A. Carini, J. Pines, A. Tomada, S. Osier, R. Herbst, P. Caragiulo, B. Markovic, J. Thayer, C. Kenney, J. Segal, J. Hasi, B. Reese, G. Blaj, G. Haller  
*SLAC National Accelerator Laboratory, USA*

#### **N31-6 (17:15) Superconducting Ultra-High Resolution Tunnel Junction X-Ray Detectors**

S. Friedrich<sup>1</sup>, F. Ponce<sup>1,2</sup>, J. Harris<sup>3</sup>, W. K. Warburton<sup>3</sup>, M. H. Carpenter<sup>1,2,4</sup>, R. Cantor<sup>4</sup>  
<sup>1</sup>Lawrence Livermore National Laboratory, USA; <sup>2</sup>University of California, USA; <sup>3</sup>XIA LLC, USA; <sup>4</sup>STAR Cryoelectronics, USA

#### **N31-7 (17:30) Characterization of the Epix10k X-Ray Camera at SSRL and LCLS**

P. A. Hart, G. Carini, S. Herrmann, K. Nishimura, G. Blaj, A. Tomada, J. Pines, M. Weaver, A. Dragone, P. Caragiulo, B. Markovic, R. Herbst, C. Kenney, J. Segal, J. Hasi, G. Haller, H. Lemke, S. Nelson, D. Zhu  
*SLAC National Accelerator Laboratory, US*

#### **N31-8 (17:45) Terbium Doped Gadolinium Garnet Single Crystal Films for X-Ray Micro-Imaging**

P.-A. Douissard, T. Martin, E. Mathieu, *ESRF, France*

### **N32 New Concepts in Solid-State Detectors**

Wednesday, Nov. 12 08:00-10:00 606 & 607

Session Chairs: **Marc Winter**, IPHC - IN2P3/CNRS, France  
**Grzegorz W. Deptuch**, Fermilab, United States

#### **N32-1 (08:00) High Gain, Low Noise, and Large Linear Dynamic Range Nanocomposite UV-NIR Photodetectors Based on Interfacial Trap-controlled Charge Injection**

F. Guo, R. Dong, Y. Fang, J. Huang  
*University of Nebraska Lincoln, United States*

#### **N32-2 (08:15) Improved Efficiency at Low Energies with P-Type HPGe Detectors**

G. Geurkov, E. Roth, K. Schmitt, T. Twomey, T. Underwood  
*AMETEK - ORTEC, USA*

#### **N32-4 (08:45) Nanopattern Multi-Well Avalanche Selenium Detector with Picosecond Time Resolution**

A. H. Goldan<sup>1</sup>, J. A. Rowlands<sup>1</sup>, M. Lu<sup>2</sup>, W. Zhao<sup>1</sup>  
<sup>1</sup>Stony Brook University, USA; <sup>2</sup>Brookhaven National Lab, USA

#### **N32-5 (09:00) 3D-Mesa "Bridge" Silicon Microdosimeter for RBE Studies in 12C Radiation Therapy**

L. T. Tran<sup>1</sup>, D. A. Prokopovich<sup>2</sup>, L. Chartier<sup>1</sup>, M. I. Reinhard<sup>2</sup>, M. Petasecca<sup>1</sup>, M. L. F. Lerch<sup>1</sup>, V. Perevertaylo<sup>3</sup>, M. Zaider<sup>4</sup>, N. Matsufuji<sup>5</sup>, A. B. Rosenfeld<sup>1</sup>

<sup>1</sup>University of Wollongong, Australia; <sup>2</sup>Australian Nuclear Science and Technology Organisation, Australia; <sup>3</sup>SPA-BIT, Ukraine; <sup>4</sup>Memorial Sloan-Kettering Cancer Center, USA; <sup>5</sup>National Institute of Radiological Science, Japan

#### **N32-6 (09:15) HL-LHC/ATLAS New Hybrid Pixel Detector Approach. A First Review of Several HV-CMOS Solutions.**

P. Pangaud, *CPPM/IN2P3/CNRS - AIX MARSEILLE UNIVERSITY, FRANCE*

On behalf of the HVCMOS collaboration

**N32-7 (09:30) 3D Sensors with Fast, High-Resolution, Low-Mass and Embedded Cooling Capabilities: First Prototypes Test Results**

C. Da Via<sup>1</sup>, M. Borri<sup>2</sup>, M. Boscardin<sup>3</sup>, G. Dalla Betta<sup>4</sup>, I. Haughton<sup>1</sup>, C. Kenney<sup>5</sup>, A. Kluge<sup>6</sup>, A. Mapelli<sup>6</sup>, S. Parker<sup>7</sup>, P. Petagna<sup>6</sup>, M. Povoli<sup>8</sup>, G. Romagnoli<sup>6</sup>

<sup>1</sup>University of Manchester /CERN, UK; <sup>2</sup>STFC, UK; <sup>3</sup>FBK, Italy; <sup>4</sup>Trento University, Italy; <sup>5</sup>SLAC, USA; <sup>6</sup>CERN, Switzerland; <sup>7</sup>University of Hawaii, USA;

<sup>8</sup>University of Oslo, Norway

**N32-8 (09:45) Development of a Time and Position Detectable Detector for a Stigmatic Imaging Mass Spectrometer**

Y. Fujita, Y. Ikemoto, Y. Arai, *High Energy Accelerator Research Organization, KEK, Japan*; Y. Kawai, H. Matsuoka, H. Hazama, J. Aoki, M. Toyoda, K. Awazu, *Osaka University, Japan*

**N33 Computing and Software II - Monte Carlo Methods, Analysis and Reconstruction**

Wednesday, Nov. 12 08:00-10:00 608 & 609

Session Chairs: **Steffen Hauf**, European X-ray Free Electron Laser Facility GmbH, Germany  
**Ron A. Soltz**, LLNL, United States

**N33-1 (08:00) MCNP 6.1.1 - New Features Demonstrated**

G. W. McKinney, F. B. Brown, H. G. Hughes, M. R. James, R. L. Martz, G. E. McMath, T. A. Wilcox  
*Los Alamos National Laboratory, USA*

**N33-2 (08:15) A Universal Detector Calibration Framework Within MEGALib**

A. Zoglauer, *University of California at Berkeley, USA*

**N33-3 (08:30) Dose Enhancement of a Proton Beam by Nanoparticles Investigated by Geant4 Monte Carlo Simulation**

S. McKinnon<sup>1</sup>, S. Guatelli<sup>1</sup>, S. Incerti<sup>2</sup>, K. Konstantinov<sup>1</sup>, M. Tehei<sup>1</sup>, M. Lerch<sup>1</sup>, A. Rosenfeld<sup>1</sup>

<sup>1</sup>University of Wollongong, Australia; <sup>2</sup>Bordeaux I University, France

**N33-4 (08:45) Simulation Environment for the Evaluation of Nuclear Object Classification Performance**

A. D. Kaplan, S. E. Labov, P. R. Beck, K. E. Nelson

*Lawrence Livermore National Laboratory, United States*

**N33-5 (09:00) X-CSIT: a Toolkit for Simulating 2D Pixel Detectors**

A. Joy<sup>1</sup>, M. Kuster<sup>2</sup>, S. Hauf<sup>2</sup>, M. Wing<sup>1</sup>

<sup>1</sup>University College London, UK; <sup>2</sup>European X-ray Free Electron Laser Facility GmbH, Germany

**N33-6 (09:15) Novel Bonner Sphere Response Function Calculations Using MCNP6**

A. W. Decker, *Air Force Institute of Technology, USA*

**N33-7 (09:30) Efficient Network Detection of Radiation Sources Using Localization**

C. Q. Wu, *University of Memphis, USA*; S. Sen, N. S. V. Rao, *Oak Ridge National Laboratory, USA*; R. R. Brooks, *Clemson University, USA*

**N33-8 (09:45) Model-Based Least Squares Reconstruction of Coded Source Neutron Radiographs: Integrating the ORNL HFIR CG1D Source Model**

H. J. Santos-Villalobos, P. R. Bingham, *Oak Ridge National Laboratory, USA*; J. Gregor, *University of Tennessee, USA*

**N34 Trigger and Front-end Systems II**

Wednesday, Nov. 12 08:00-10:00 602 & 603 & 604

Session Chairs: **Martin L. Purschke**, Brookhaven National Lab, United States  
**Stefan Ritt**, Paul Scherrer Institute,

**N34-1 (08:00) Front-End Electronics with Fast Signal Shaper for Silicon Photomultipliers**

P. Dorosz, M. Baszczyk, S. Glab, W. Kucewicz, L. Mik, M. Sapor

*AGH University of Science and Technology, Poland*

**N34-2 (08:15) Pulsar II: an FPGA-Based Full Mesh ATCA General Purpose Processor Board**

T. T. Liu<sup>1</sup>, J. Olsen<sup>1</sup>, Y. Okumura<sup>2</sup>, H. Yin<sup>1</sup>, Z. Xu<sup>3</sup>

<sup>1</sup>Fermilab, USA; <sup>2</sup>University of Chicago, USA; <sup>3</sup>Peking University, China

**N34-3 (08:30) On-Detector Electronics for the ATLAS TileCal Demonstrator**

H. Akerstedt<sup>1</sup>, K. Andersson<sup>2</sup>, C. Bohm<sup>1</sup>, G. Drake<sup>3</sup>, S. Muschter<sup>1</sup>, M. Oreglia<sup>2</sup>, A. Paramonov<sup>3</sup>, F. Tang<sup>2</sup>

<sup>1</sup>University of Stockholm, Sweden; <sup>2</sup>University of Chicago, USA; <sup>3</sup>Argonne National Laboratory, USA

**N34-4 (08:45) A New Generation of Integrated Trigger and Read Out System for the MEG-II Experiment**

L. Galli<sup>1</sup>, U. Hartmann<sup>2</sup>, F. Morsani<sup>1</sup>, D. Nicolò<sup>1</sup>, S. Ritt<sup>2</sup>

<sup>1</sup>Istituto Nazionale di Fisica nucleare, Italy; <sup>2</sup>Paul Scherrer Institute, Switzerland

**N34-5 (09:00) Capacitor Based Multiplexing Readout Method for Solid State Photon-Multiplier Array Readout**

X. Sun, K. Lou, Y. Shao, *UT MD Anderson Cancer Center, USA*

**N34-6 (09:15) Status and Performances of the NA62 Liquid Krypton Electromagnetic Calorimeter Level 0 Trigger**

D. Badoni<sup>1</sup>, M. Bizzarri<sup>2</sup>, V. Bonaiuti<sup>3</sup>, B. Checcucci<sup>1</sup>, N. De Simone<sup>3</sup>, L. Federici<sup>3</sup>, A. Fucci<sup>4</sup>, G. Paoluzzi<sup>1</sup>, A. Papi<sup>1</sup>, M. Piccini<sup>1</sup>, A. Salamon<sup>1</sup>, G. Salina<sup>1</sup>, E. Santovetti<sup>3</sup>, F. Sargeni<sup>3</sup>, S. Venditti<sup>4</sup>

<sup>1</sup>INFN, Italy; <sup>2</sup>University of Perugia, Italy; <sup>3</sup>University of Rome Tor Vergata, Italy; <sup>4</sup>CERN, Switzerland

#### **N34-7 (09:30) An Embedded Processor-Based Front-End Architecture for the Daq System of a Kinetic Inductance Detector**

L. Capasso<sup>1</sup>, P. Branchini<sup>1,2</sup>, A. Budano<sup>1</sup>, D. Marchetti<sup>1,2</sup>

<sup>1</sup>INFN, Italy; <sup>2</sup>University "Roma Tre", Italy

#### **N34-8 (09:45) Upgrade Prototype Design for TREND Experiment**

Z.-A. Liu<sup>1</sup>, F. Guo<sup>1,2</sup>, H. Lin<sup>1</sup>, Z. Liu<sup>1,2</sup>, F. Deng<sup>1,2</sup>, C. Wang<sup>1,2</sup>, J. Zhao<sup>1</sup>, K. Wang<sup>1</sup>, O. Martineau-Huynh<sup>3,4</sup>

<sup>1</sup>Inst. of High Energy Physics, Chinese Academy of Sciences, China; <sup>2</sup>University of Chinese Academy of Sciences, China; <sup>3</sup>National Astronomical Observatories, Chinese Academy of Sciences, China; <sup>4</sup>LPNHE, IN2P3-CNRS and University Paris 6, France

### **N35 Scintillators and Scintillation Detectors II: Scintillators - Mechanisms**

Wednesday, Nov. 12 10:30-12:00 606 & 607

Session Chairs: **Paul Lecoq**, CERN, Switzerland  
**Stephen A. Payne**, LLNL, United States

#### **N35-1 (10:30) Scintillation, Photon Density Response, and Track Modeling in the Semiconductor Materials LiInSe<sub>2</sub>, ZnSe:Te, CdTe, CdSe/CdS, and ZnO**

R. T. Williams, X. Lu, Q. Li, *Wake Forest University, USA*; A. Burger, E. Rowe, E. Tupitsyn, M. Groza, P. Bhattacharya, *Fisk University, USA*; K. Biswas, R. Adhikari, *Arkansas State University, USA*; J. Q. Grim, I. Moreels, *Istituto Italiano Tecnologia, Italy*; V. Ryzhikov, *Institute for Single Crystals, Ukraine*

#### **N35-2 (10:45) DX-like Centers in NaI:Tl Codoped with Ca**

K. Biswas, R. Adhikari, *Arkansas State University, USA*; A. Burger, *Fisk University, USA*; Q. Li, R. T. Williams, *Wake Forest University, USA*

#### **N35-3 (11:00) Non-Proportionality Components in Doped CsI**

A. Syntfeld-Kazuch, L. Swiderski, M. Moszynski, *National Centre for Nuclear Research, Poland*; A. V. Gektin, *Institute for Scintillation Materials, Ukraine*

#### **N35-4 (11:15) The Role of Ce<sup>4+</sup> in Scintillation Mechanism: Codoped Gd<sub>3</sub>Ga<sub>3</sub>Al<sub>2</sub>O<sub>12</sub>:Ce as a Case Study**

Y. Wu<sup>1</sup>, F. Meng<sup>1</sup>, Q. Li<sup>2</sup>, M. Koschan<sup>1</sup>, C. L. Melcher<sup>1</sup>

<sup>1</sup>University of Tennessee, USA; <sup>2</sup>Wake Forest University, USA

#### **N35-5 (11:30) Fracture Mechanics of Strontium Iodide: Causes and Remedies**

S. Motakef, A. Datta, S. Swider, S. Lam, *Capesym, Inc., USA*

#### **N35-6 (11:45) Comparison of the Scintillation Detector Leading Edge Timing Precision with the Statistical Lower Bound**

S. E. Derenzo, W. Choong, W. W. Moses  
*Lawrence Berkeley National Laboratory, U.S.A.*

### **N36 Photodetectors and Radiation Imaging Detectors I**

Wednesday, Nov. 12 10:30-12:00 608 & 609

Session Chairs: **Anna Erickson**, Georgia Tech, United States  
**Peter Marleau**, Sandia National Laboratories, United States

#### **N36-1 (10:30) Breakthrough in the Lifetime of Microchannel-Plate PMTs**

J. Schwiening, *GSI Helmholtzzentrum fuer Schwerionenforschung GmbH, Germany*

On behalf of the PANDA Cherenkov Group

#### **N36-2 (10:45) A Dense SPAD Array with Full Frame Readout and Fast Cluster Position Reconstruction**

P. Fischer, T. Armbruster, R. Blanco, M. Ritzert, I. Sacco, *Heidelberg University, Germany*; S. Weyers, *Fraunhofer Institute, Germany*

#### **N36-3 (11:00) Evaluating SPADnet-I Detector Module: 8x16 Digital SiPM Pixels Coupled to a 3x6 LYSO:Ce Crystal Matrix**

L. H. C. Braga<sup>1</sup>, B. Jatekos<sup>2</sup>, L. Gasparini<sup>1</sup>, F. Ujhelyi<sup>2</sup>, G. Erdei<sup>2</sup>, E. Lorincz<sup>2</sup>, D. Stoppa<sup>1</sup>

<sup>1</sup>Fondazione Bruno Kessler (FBK), Italy; <sup>2</sup>Budapest University of Technology and Economics (BME), Hungary

#### **N36-4 (11:15) Impact of a 3D Microfabrication Process on the Dark Count Rate of Single Photon Avalanche Diodes**

L. Maurais, S. A. Charlebois, S. Parent, V.-P. Rhéaume, J.-F. Pratte

*Université de Sherbrooke, Canada*

#### **N36-5 (11:30) New Methods and Circuits for Gain Stabilization of Photomultipliers with Scintillators**

J. R. Stein, Y. Kong, K. Ruhnau, F. Scherwinski, A. Wolf

*Target Systemelektronik, Germany*

#### **N36-6 (11:45) Digital SiPM in HV CMOS with Adjustable Analog Dynamic Range**

F. Nolet, V.-P. Rhéaume, S. Parent, R. Fontaine, J.-F. Pratte

*Université de Sherbrooke, Canada*

## N37 Instrumentation for Nuclear Security Applications IV

Wednesday, Nov. 12 10:30-12:00 602 & 603 & 604

Session Chairs: **Alan Janos**, DHS/DNDO, United States  
**William K. Pitts**, Pacific Northwest National Laboratory, United States

### N37-1 (10:30) Combining Radiography and Passive Measurements for Radiological Threat Localization in Cargo

E. A. Miller, T. A. White, K. D. Jarman, R. T. Kouzes, J. A. Kulisek, S. M. Robinson, R. A. Wittman  
*Pacific Northwest National Laboratory, USA*

### N37-2 (10:45) Nuclear Reaction Based Monoenergetic Gamma Ray Radiography System for Detection of Nuclear Materials

R. C. Lanza<sup>1</sup>, A. Erickson<sup>2</sup>, J. Fisher<sup>1</sup>, I. Jovanovic<sup>3</sup>, M. Mayer<sup>3</sup>, G. McKinney<sup>4</sup>, A. B. Meddeb<sup>3</sup>, J. Nattress<sup>3</sup>, B. O'Day<sup>1</sup>, Z. Ounaies<sup>3</sup>, G. Papachristoudis<sup>1</sup>, P. B. Rose, Jr.<sup>2</sup>, R. Sheffield<sup>4</sup>, C. Trivelpiece<sup>3</sup>, A. Danagouliau<sup>1</sup>, Z. Hartwig<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, USA; <sup>2</sup>Georgia Institute of Technology, USA; <sup>3</sup>Pennsylvania State University, USA; <sup>4</sup>Los Alamos National Laboratory, USA

### N37-3 (11:00) Identification of Nuclear Materials Using Cosmic-Ray Muons and Neutrons

T. B. Blackwell, V. A. Kudryavtsev  
*University of Sheffield, United Kingdom*

### N37-4 (11:15) Passive 3D Imaging of Nuclear Waste Containers with Cosmic Muons

C. Thomay, J. Velthuis, P. Baesso, D. Cussans  
*University of Bristol, UK*

### N37-5 (11:30) Development of a Low-Noise Front-End ASIC for Si/CdTe Detectors in a Radioactive Substance Visualizing System

A. Harayama<sup>1</sup>, H. Ikeda<sup>1</sup>, S. Takeda<sup>1</sup>, G. Sato<sup>2</sup>, S. Watanabe<sup>1</sup>, T. Takahashi<sup>1</sup>  
<sup>1</sup>Institute of Space Astronautical Science, JAXA, Japan; <sup>2</sup>Waseda University, Japan

### N37-6 (11:45) Material Discrimination Using Scattering and Stopping of Cosmic Ray Muons and Electrons and Detection of Gamma Radiation

G. S. Blanpied, S. Kumar, D. Dorroh, C. Morgan, I. Blanpied, M. Sossong, S. McKenney, B. Nelson  
*Decision Sciences International Corporation, USA*

## N38 Neutron Detectors and Instrumentation I - Applications

Wednesday, Nov. 12 14:00-15:30 606 & 607

Session Chairs: **Emily K. Mace**, Pacific Northwest National Laboratory, United States  
**John Mattingly**, North Carolina State University, United States

### N38-1 (14:00) Imaging of Gases Enclosed Within High-Z Materials Through Neutron Resonance Absorption

A. S. Tremsin<sup>1</sup>, A. Losko<sup>2</sup>, S. C. Vogel<sup>2</sup>, M. Mocko<sup>2</sup>, D. D. Byler<sup>2</sup>, K. J. McClellan<sup>2</sup>, J. B. McPhate<sup>1</sup>, J. V. Vallerga<sup>1</sup>, O. H. W. Siegmund<sup>1</sup>, W. B. Feller<sup>3</sup>  
<sup>1</sup>Space Sciences Laboratory, UC Berkeley, USA; <sup>2</sup>Los Alamos National Laboratory, USA; <sup>3</sup>Nova Scientific, USA

### N38-2 (14:15) A Water-Based Neutron Multiplicity Counter

S. Dazeley<sup>1</sup>, A. Asghari<sup>2</sup>, A. Bernstein<sup>1</sup>, N. S. Bowden<sup>1</sup>, V. Mozin<sup>1</sup>  
<sup>1</sup>LLNL, USA; <sup>2</sup>UC Berkeley, USA

### N38-3 (14:30) Progress in Development of a <sup>6</sup>LiF/ZnS-Based Neutron Multiplicity Counter

S. C. Stave, M. Bliss, R. T. Kouzes, A. T. Lintereur, S. M. Robinson, E. R. Siciliano  
*Pacific Northwest National Laboratory, 99352*

### N38-4 (14:45) Monte Carlo Simulation of a Very High Resolution Thermal Neutron Detector Composed of Glass Scintillator Microfibers

Y. Song, *Harbin Engineering University, China*; J. Conner, X. Zhang, J. Hayward, *University of Tennessee, USA*

### N38-5 (15:00) Mixed-Field Neutron-Gamma Dosimetry Using Low Pressure Proportional Counters

S. Al-Bayati, G. M. Orchard, A. J. Waker  
*University of Ontario Institute of Technology (UOIT), Canada*

### N38-6 (15:15) Digital Neutron-Gamma Discrimination Methods: Charge Comparison versus Zero-Crossing

T. Szczesniak, M. Grodzicka, M. Moszynski, D. Wolski, L. Swiderski, M. Szawlowski  
*National Centre for Nuclear Research, Poland*

## N39 Scintillators and Scintillation Detectors III: Scintillators - Applications I

Wednesday, Nov. 12 14:00-15:30 608 & 609

Session Chairs: **Alex Gektin**, Institute for Scintillation Materials, Ukraine  
**Arnold Burger**, Fisk University, United States

### N39-1 (14:00) Performance Comparison of Scintillators for Alpha Particle Detectors

Y. Morishita, S. Yamamoto, *Nagoya University, Japan*; K. Izaki, *Japan Atomic Energy Agency, Japan*; J. H. Kaneko, K. Toi, Y. Tsubota, M. Highchi, *Hokkaido University, Japan*

**N39-2 (14:15) Enhanced Alpha-Gamma Discrimination in Co-Doped LaBr<sub>3</sub>(Ce)**

K. Yang, P. R. Menge, *Saint-Gobain Crystals, USA*; V. Ouspenski, *Saint-Gobain Recherche, France*

**N39-3 (14:30) Advancements in Gamma Spectrometers Based on Europium-Doped Strontium Iodide and Characterization of Its Gamma and Electron Response**

P. R. Beck, N. J. Cherepy, S. A. Payne, S. L. Hunter, E. L. Swanberg, P. A. Thelin, S. E. Fisher, *Lawrence Livermore National Laboratory, USA*; K. S. Shah, R. Hawrami, *Radiation Monitoring Devices, USA*; A. Burger, *Fisk University, USA*; L. A. Boatner, *Oak Ridge National Laboratory, USA*; M. Momayezi, *Bridgeport Instruments, USA*; K. Stevens, M. H. Randles, D. Solodovnikov, *Northrop Grumman SYNOPTICS, USA*

**N39-4 (14:45) A Handheld Gamma Spectrometer Using Pixelated GYGAG(Ce) Transparent Ceramic Scintillators on Si Photodiode Array**

E. L. Swanberg, N. J. Cherepy, P. R. Beck, Z. M. Seeley, B. M. Wihl, S. L. Hunter, S. E. Fisher, S. A. Payne, *Lawrence Livermore National Lab, USA*; J. Kindem, *Cokiyu, Inc, USA*

**N39-5 (15:00) Improved 1.5 $\times$ 1/2 $\times$ 1/2 and Larger CLYC and CLLB Detectors for Dual Gamma and Neutron Detection**

J. Lejay, S. Blahuta, V. Ouspenski, *Saint-Gobain Recherche, France*; K. Yang, P. Menge, *Saint-Gobain Crystals, USA*; D. Richaud, *Saint-Gobain Cristaux et Detecteurs, France*

**N39-6 (15:15) Characterization of 6LiF:ZnS(Ag) Scintillator for Neutron Detection applications**

A. Osovizky<sup>1,2</sup>, K. Pritchard<sup>1</sup>, C. Cooksey<sup>1</sup>, K. Siebein<sup>1</sup>, J. B. Ziegler<sup>1</sup>, Y. Yehuda-Zada<sup>3</sup>, E. Binkley<sup>1</sup>, M. Jackson<sup>4</sup>, C. Hurlbut<sup>4</sup>, N. Hadad<sup>1</sup>, R. M. Ibberson<sup>1</sup>, C. F. Majkrzak<sup>1</sup>, N. C. Maliszewskyj<sup>1</sup>

<sup>1</sup>National Institute of Standards and Technology, Maryland; <sup>2</sup>Rotem Industries Ltd, Israel; <sup>3</sup>Nuclear Research Center Negev, Israel; <sup>4</sup>Eljen Technology, Texas

**N40 Data Acquisition and Analysis Systems I**

Wednesday, Nov. 12 14:00-15:30 602 & 603 & 604

Session Chairs: **Sergio Zimmermann**, Lawrence Berkeley National Laboratory, United States  
**Ryosuke Itoh**, KEK, Japan

**N40-1 (14:00) A 72-Channel FPGA-Only MVT Digitizer Board and a Mini-System for Coincidence Detection/Imaging**

X. Mei<sup>1</sup>, D. Xi<sup>1,2</sup>, C. Zeng<sup>1</sup>, W. Liu<sup>1</sup>, X. Liu<sup>1</sup>, H. Kim<sup>3</sup>, P. Xiao<sup>1,4</sup>, C.-M. Kao<sup>3</sup>, Q. Xie<sup>1,4</sup>

<sup>1</sup>Huazhong University of Science & Technology, China; <sup>2</sup>Raycan Technology Co., Ltd (Suzhou), China; <sup>3</sup>University of Chicago, US; <sup>4</sup>Wuhan National Laboratory for Optoelectronic, China

**N40-2 (14:15) Synchronisation Protocol for the Trigger-Less Front-End Electronics of the PANDA Electromagnetic Calorimeter**

M. Kavatsyuk, *KVI-CART, University of Groningen, The Netherlands*

On behalf of the PANDA Collaboration

**N40-3 (14:30) A Heterogeneous Image Processing Platform for High-Speed Scientific Cameras**

D. Doering<sup>1</sup>, A. P. D. Binotto<sup>2</sup>, S. Zimmermann<sup>3</sup>, A. Rettberg<sup>4</sup>, C. E. Pereira<sup>1</sup>

<sup>1</sup>Universidade Federal do Rio Grande do Sul, Brazil; <sup>2</sup>IBM Research - Brazil, Brazil; <sup>3</sup>Lawrence Berkeley National Laboratory, USA; <sup>4</sup>Carl von Ossietzky Universitat Oldenburg, Germany

**N40-4 (14:45) On the Performance of Linear Optimal Filter and Wiener Filter for Signal Detection in Liquid Ionization Calorimeters**

H. Xu<sup>1</sup>, D. Gong<sup>2</sup>, Y. Chiu<sup>1</sup>

<sup>1</sup>The University of Texas at Dallas, USA; <sup>2</sup>Southern Methodist University, USA

**N40-5 (15:00) High Count Rate and Throughput Pulse Processing Technology for Large Channel Count Systems**

P. A. B. Scoullar, C. C. McLean

*Southern Innovation, Australia*

**N40-6 (15:15) Using Gaussian Rate Priors with Poisson Data Likelihoods for Improved Detection of Sources of Known Types in Cluttered Background Scenes**

P. Huggins, J. Jin, A. Dubrawski, *Carnegie Mellon University, USA*; S. Labov, K. Nelson, *Lawrence Livermore National Laboratory, USA*

**N41 High Energy Physics Instrumentation II**

Wednesday, Nov. 12 16:00-18:00 606 & 607

Session Chairs: **Frank Simon**, Max-Planck-Institut fuer Physik, Germany  
**Alexandra Junkes**, Hamburg University, Germany

**N41-1 (16:00) The Pixel Detector of the ATLAS Experiment for the Run2 at the Large Hadron Collider**

M. Marx, *University of Washington, USA*

On behalf of the ATLAS Collaboration

**N41-2 (16:15) The Upgrade of the CMS Outer Tracker**

G. Steinbrueck, *University of Hamburg, Germany*

On behalf of the CMS Collaboration

**N41-3 (16:30) Milestone Achievements in the Construction of a DEPFET Based High-Precision Vertex Detector**

L. Andricek, *MPG Semiconductor Lab, Germany*

On behalf of the DEPFET Collaboration

**N41-4 (16:45) First Test Results of Full Scale Building Blocks Composing CMOS Pixel Sensors for Particle Tracking**

M. Winter, *IPHC - IN2P3/CNRS, France*

On behalf of the PICSEL group

**N41-5 (17:00) Measurement of the Time Resolution of Ultra-Fast Silicon Detectors**

N. Cartiglia, F. Cenna, A. Picerno, F. Ravera, *INFN, Italy*; V. Fadeyev, H. Sadrozinski, A. Seiden, P. Freeman, Z. Galloway, *Santa Cruz Institute for Particle Physics, USA*; G. Pellegrini, P. Fernández-Martínez, M. Baselga, V. Greco, S. Hidalgo, D. Quirion, *Centro Nacional de Microelectrónica, Spain*; C. Royon, E. Delagnes, M. Saimper, *CEA/IRFU, France*; D. Breton, J. Maalmi, *LAL, France*; N. Minafra, *Universita' di Bari, Italy*

**N41-6 (17:15) A Real-Time Track Trigger System for Belle II Central Drift Chamber Detector**

J.-G. Shiu<sup>1</sup>, C. H. Wang<sup>2</sup>, D. H. Lee<sup>3</sup>, E. Won<sup>3</sup>, H. K. Moon<sup>3</sup>, J. B. Kim<sup>3</sup>, K. T. Kim<sup>3</sup>, M. C. Chang<sup>4</sup>, S. M. Liu<sup>2</sup>, Y. Iwasaki<sup>5</sup>, Y. S. Teng<sup>2</sup>, Y. T. Lai<sup>1</sup>, K. Y. Chen<sup>4</sup>, Z. X. Chen<sup>4</sup>, C. Y. Hsu<sup>4</sup>, H. Y. Huang<sup>4</sup>

<sup>1</sup>National Taiwan University, Taiwan (R.O.C.); <sup>2</sup>National United University, Taiwan (R.O.C.); <sup>3</sup>Korea University, Republic of Korea; <sup>4</sup>Fu-Jen Catholic University, Taiwan (R.O.C.); <sup>5</sup>KEK High Energy Accelerator Research Organization, Japan

**N41-7 (17:30) TORCH, an Innovative High-Precision Time-of-Flight PID for LHCb Upgrade**

N. H. Brook<sup>1</sup>, L. Castillo-García<sup>2</sup>, T. Conneely<sup>3</sup>, E. N. Cowie<sup>1</sup>, D. Cussans<sup>1</sup>, C. D'Ambrosio<sup>2</sup>, J. Fopma<sup>4</sup>, R. Forty<sup>2</sup>, C. Frei<sup>2</sup>, R. Gao<sup>4</sup>, T. Gys<sup>2</sup>, N. Harnew<sup>4</sup>, J. Howorth<sup>3</sup>, P. Kapetanopoulos<sup>3</sup>, M. W. U. van Dijk<sup>1</sup>, J. S. Lapington<sup>3</sup>, J. S. Milnes<sup>3</sup>, D. Piedigrossi<sup>2</sup>, C. Slatter<sup>3</sup>, K. Foehl<sup>2</sup>

<sup>1</sup>University of Bristol, UK; <sup>2</sup>CERN, Swiss; <sup>3</sup>Photek Limited, UK; <sup>4</sup>University of Oxford, UK

**N41-8 (17:45) Performance of the PANDA Barrel DIRC Prototype**

M. Zühlsdorf<sup>1,2</sup>, *Goethe-Universität, Germany*; <sup>2</sup>GSI Helmholtzzentrum für Schwerionenforschung GmbH, Germany

On behalf of the PANDA Cherenkov Group

**N42 Scintillators and Scintillation Detectors IV: Scintillators - Materials**

Wednesday, Nov. 12 16:00-18:00 608 & 609

Session Chairs: **Richard T. Williams**, Wake Forest University, United States

**Gregory A. Bizarri**, LBNL - Berkeley, United States

**N42-1 (16:00) Scintillation Properties of Lanthanum Yttrium Oxide Ceramic for Gamma-Ray Detection**

U. Shirwadkar, B. Rhodes, C. Brecher, G. Baldoni, Y. Wang, J. Glodo, K. Shah

*Radiation Monitoring Devices, Inc., USA*

**N42-2 (16:15) Barium-Based Bright Scintillators as Transparent Ceramics**

M. Gascon<sup>1</sup>, R. Gaume<sup>2</sup>, E. Bourret-Courchesne<sup>1</sup>, G. Bizarri<sup>1</sup>

<sup>1</sup>Lawrence Berkeley National Laboratory, United States; <sup>2</sup>University of Central Florida, United States

**N42-3 (16:30) Alkaline Earth Halide Scintillators**

U. Shirwadkar, R. Hawrami, L. Soundara Pandian, J. Glodo, J. Tower, E. V. D. van Loef, K. Shah

*Radiation Monitoring Devices, Inc., USA*

**N42-4 (16:45) High-Resolution, Highly Proportional Scintillators K<sub>2</sub>R<sub>2</sub>I<sub>5</sub>:Eu, KBa<sub>2</sub>I<sub>5</sub>:Eu and K<sub>2</sub>BaI<sub>4</sub>:Eu**

M. Zhuravleva, L. Stand, A. Lindsey, C. L. Melcher

*University of Tennessee, USA*

**N42-5 (17:00) Co-Doping Effects on Luminescence and Scintillation Properties of Ce Doped (Lu,Gd)<sub>3</sub>(Ga,Al)<sub>5</sub>O<sub>12</sub> Scintillator**

K. Kamada<sup>1,2</sup>, M. Nikl<sup>3</sup>, A. Nagura<sup>1</sup>, S. Kurosawa<sup>1</sup>, Y. Shoji<sup>2,1</sup>, J. Pejchal<sup>2,3</sup>, Y. Yokota<sup>2</sup>, Y. Ohashi<sup>1</sup>, A. Yoshikawa<sup>1,2</sup>

<sup>1</sup>Tohoku University, Japan; <sup>2</sup>C&A Corporation, Japan; <sup>3</sup>Institute of Physics AS CR, Czech Republic

**N42-6 (17:15) Scintillation Properties of Large Size Ce:(La, Gd)<sub>2</sub>Si<sub>2</sub>O<sub>7</sub> Crystals Grown by the Czochralski Process**

S. Kurosawa<sup>1</sup>, Y. Shoji<sup>1,2</sup>, R. Murakami<sup>1</sup>, Y. Ohashi<sup>1</sup>, J. Pejchal<sup>1,3</sup>, Y. Yokota<sup>1</sup>, K. Kamada<sup>1,2</sup>, A. Yoshikawa<sup>1,2</sup>

<sup>1</sup>Tohoku University, Japan; <sup>2</sup>C&A Corporation, Japan; <sup>3</sup>AS CR, Czech Republic

**N42-7 (17:30) Relationship Between Ca<sup>2+</sup> Concentration and Properties of GGAG:Ce Scintillators**

F. Meng<sup>1</sup>, M. Koschan<sup>1</sup>, Y. Wu<sup>1</sup>, C. L. Melcher<sup>1</sup>, P. Cohen<sup>2</sup>

<sup>1</sup>University of Tennessee, USA; <sup>2</sup>Siemens Medical Solutions Molecular Imaging, USA

**N42-8 (17:45) Composite Structure in High Luminosity CsBa<sub>2</sub>I<sub>5</sub>:Eu Scintillators**

S. E. Swider, S. Lam, S. Motakef, F. John

*Capesym, Inc., USA*

**N43 Analog and Digital Circuits II**

Wednesday, Nov. 12 16:00-18:00 602 & 603 & 604

Session Chairs: **Lorenzo Fabris**, Oak Ridge National Laboratory, United States

**Gianluigi De Geronimo**, Brookhaven National Laboratory, United States

**N43-1 (16:00) Design and Characterization of the ePix100a prototype: a Low Noise integrating pixel ASIC for LCLS detectors**

B. Markovic, A. Dragone, P. Caragiulo, R. Herbst, K. Nishimura, B. Reese, S. Herrmann, P. Hart, G. Blaj, J. Segal, A. Tomada, J. Hasi, G. Carini, C. Kenney, G. Haller  
*SLAC National Accelerator Laboratory, USA*

**N43-2 (16:15) The Full Format DSSC Pixel Readout ASIC with Local Amplitude Digitization and Storage for the European XFEL**

F. Erdinger<sup>1</sup>, B. Nasri<sup>2</sup>, C. Fiorini<sup>2</sup>, P. Fischer<sup>1</sup>, K. Hansen<sup>3</sup>, P. Kalavakuru<sup>3</sup>, M. Kirchgessner<sup>1</sup>, M. Manghisoni<sup>4</sup>, M. Porro<sup>5</sup>, D. Comotti<sup>4</sup>, C. Reckleben<sup>3</sup>, J. Szymanski<sup>3</sup>, J. Soldat<sup>1</sup>

<sup>1</sup>Heidelberg University, Germany; <sup>2</sup>Politecnico di Milano, Italy; <sup>3</sup>Deutsches Elektronen-Synchrotron DESY, Germany; <sup>4</sup>Universita di Bergamo, Italy; <sup>5</sup>Max-Planck-Institut fuer extraterrestrische Physik, Germany

**N43-3 (16:30) A 12-Bit 20 MS/s Asynchronous SAR ADC in 110nm CMOS**

X. Shi, A. Bergamaschi, S. Cartier, R. Dinapoli, D. Greiffenberg, I. Johnson, D. Mezza, A. Mozzanica, B. Schmitt, J. Smith, G. Tinti  
*Paul Scherrer Institut, Switzerland*

**N43-4 (16:45) The SAMPIC Time and Waveform to Digital Converter Chip**

E. Delagnes, H. Grabas, M. Saimpert, *CEA/IRFU, France*; D. Breton, J. Maalmi, *IN2P3/LAL, France*

**N43-5 (17:00) The SST Fully-Synchronous Multi-GHz Analog Waveform Recorder with Nyquist-Rate Bandwidth and Flexible Trigger Capabilities**

S. A. Kleinfelder, E. Chiem, T. Prakash  
*University of California, U.S.A.*

**N43-6 (17:15) Performance of a High-Frequency Synthesizable Digitally Controlled Oscillator**

R. Giordano<sup>1,2</sup>, A. Aloisio<sup>1,2</sup>, F. Ameli<sup>3</sup>, V. Bocci<sup>3</sup>, S. Cadeddu<sup>4</sup>, V. Izzo<sup>2</sup>, A. Lai<sup>4</sup>, S. Mastroianni<sup>2</sup>

<sup>1</sup>Università di Napoli 'Federico II', Italy; <sup>2</sup>INFN Sezione di Napoli, Italy; <sup>3</sup>INFN Sezione di Roma, Italy; <sup>4</sup>INFN Sezione di Cagliari, Italy

**N43-7 (17:30) 10 Gb/s Radiation-Hard VCSEL Array Driver**

K. K. Gan, *The Ohio State University, USA*

**N43-8 (17:45) Trigger Data Serializer ASIC Chip for the ATLAS New Small Wheel sTGC Detector**

J. Wang, *University of Michigan, USA*

On behalf of the ATLAS MUON collaboration

**N44 Gaseous Detectors I**

Thursday, Nov. 13 08:00-10:00 606 & 607

Session Chairs: **Serge Duarte Pinto**, Photonis, Netherlands  
**Phillip S. Barbeau**, Duke University, United States

**N44-1 (08:00) Status of the ALICE TPC Upgrade**

M. Ball, *Universität Bonn, HISKP, Germany*

On behalf of the ALICE TPC Collaboration

**N44-2 (08:30) The Upgrade of BESIII ETOF**

H. Dai, *IHEP, china*

On behalf of the group of the upgrade of BESIII ETOF

**N44-3 (08:45) Micromegas Chambers for the ATLAS Muon Spectrometer Upgrade: Design and performance studies**

K. Ntekas, *National Technical University of Athens, Greece*

On behalf of the ATLAS MUON collaboration

**N44-4 (09:00) Status Report on the CMS Forward Muon Upgrade with Large-Size Triple-Gem Detectors**

P. Barria, *Universite Libre de Bruxelles, Belgium*

On behalf of the CMS Collaboration

**N44-5 (09:15) Advances in Cryogenic Gaseous Photomultipliers for Future Noble-Liquid Detectors for Dark Matter and Rare Event Searches**

L. Arazi<sup>1</sup>, A. E. C. Coimbra<sup>2</sup>, E. Erdal<sup>1</sup>, I. Israelashvili<sup>3</sup>, H. Landsman<sup>1</sup>, M. L. Rappaport<sup>1</sup>, S. Shchemelinin<sup>1</sup>, D. Vartsky<sup>4</sup>, A. Breskin<sup>1</sup>

<sup>1</sup>Weizmann Institute of Science, Israel; <sup>2</sup>Coimbra University, Portugal; <sup>3</sup>NRC Negev, Israel; <sup>4</sup>Soreq NRC, Israel

**N44-6 (09:30) The KLOE-2 Inner Tracker: the First Cylindrical GEM Detector**

E. De Lucia<sup>1</sup>, A. Balla<sup>1</sup>, G. Bencivenni<sup>1</sup>, P. Branchini<sup>2</sup>, A. Budano<sup>2</sup>, M. Capodiferro<sup>3</sup>, S. Cerioni<sup>1</sup>, P. Ciambone<sup>1</sup>, E. Czerwinski<sup>4</sup>, G. De Robertis<sup>5</sup>, A. Di Cicco<sup>2</sup>, A. Di Domenico<sup>3</sup>, D. Domenici<sup>1</sup>, J. Dong<sup>1</sup>, G. Fanizzi<sup>3</sup>, G. Felici<sup>1</sup>, M. Gatta<sup>1</sup>, N. Lacalamita<sup>3</sup>, R. Liuzzi<sup>3</sup>, F. Loddò<sup>3</sup>, M. Mongelli<sup>3</sup>, G. Morello<sup>1</sup>, A. Palladino<sup>1</sup>, A. Pelosi<sup>3</sup>, L. Quintieri<sup>1</sup>, A. Ranieri<sup>5</sup>, E. Tskhadadze<sup>1</sup>, V. Valentino<sup>5</sup>

<sup>1</sup>INFN-LNF, Italy; <sup>2</sup>INFN-Roma Tre, Italy; <sup>3</sup>INFN-Roma and Sapienza Universita' di Roma, Italy; <sup>4</sup>Jagiellonian University Cracow, Poland; <sup>5</sup>INFN-Bari, Italy

**N44-7 (09:45) Development of Large-Aperture GEMs as a Gating Device of ILC-TPC for Blocking Positive Ion Feedback**

K. Ikematsu, *Saga University, JAPAN*

On behalf of the LCTPC-Japan Collaboration

**N45 Semiconductor Tracking and Spectroscopy Detectors**

Thursday, Nov. 13 08:00-10:00 608 & 609

Session Chairs: **Gian-Franco Dalla Betta**,  
**Grzegorz W. Deptuch**, Fermilab, United States

#### **N45-1 (08:00) Readout Electronics and Performance of a MAPS Based Silicon Vertex Detector at STAR**

G. Contin, *Lawrence Berkeley National Lab, USA*

On behalf of the STAR HFT PXL collaboration

#### **N45-2 (08:15) Using a Micro Focused X-Ray Beam for the Evaluation of Edgeless Silicon Pixel & Strip Sensor Technologies**

A. Blue<sup>1</sup>, R. Bates<sup>1</sup>, M. Christophersen<sup>2</sup>, L. Eklund<sup>1</sup>, S. Ely<sup>3</sup>, V. Fadeyev<sup>3</sup>, E. N. Gimenez<sup>4</sup>, D. Hynds<sup>1</sup>, V. Kachkanov<sup>4</sup>, J. Kalliopuska<sup>5</sup>, A. Macchiolo<sup>6</sup>, D. Maneuski<sup>1</sup>, B. F. Philips<sup>2</sup>, H. F.-W. Sadrozinski<sup>3</sup>, N. Tartoni<sup>4</sup>

<sup>1</sup>University of Glasgow, Kelvin Building, G12 8QQ, UK; <sup>2</sup>U.S. Naval Research Laboratory, 4555 Overlook Ave., SW Washington, 20375, USA; <sup>3</sup>University of California, UC Santa Cruz, 95064, USA; <sup>4</sup>Diamond Light Source Ltd, Diamond House, Harwell Science and Innovation Campus, OX11 0DE, UK; <sup>5</sup>VTT Micro and Nanoelectronics, Tietotie 3, FI-02044 VTT, Finland; <sup>6</sup>Max-Planck-Institut, Otto-Hahn-Ring 6, D-81739, Germany

#### **N45-3 (08:30) The LHCb Vertex Locator Upgrade**

P. Tsopelas, *Nikhef, The Netherlands*

On behalf of the LHCb VELO group

#### **N45-4 (08:45) Characterisation of a Silicon Strip Detector for QA in Heavy Ion Therapy**

M. Newall<sup>1</sup>, M. Petasecca<sup>1</sup>, C. Cassell<sup>1</sup>, S. Guatelli<sup>1</sup>, D. Bolst<sup>1</sup>, M. L. F. Lerch<sup>1</sup>, N. Matsufuji<sup>2</sup>, A. B. Rosenfeld<sup>1</sup>

<sup>1</sup>University of Wollongong, Australia; <sup>2</sup>National Institute of Radiological Sciences, Japan

#### **N45-5 (09:00) CERBEROS: a High Rate MIP Beam Diagnostic Instrument**

J. Wirth

*Excellence Cluster "Origin and Structure of the Universe", Germany*

#### **N45-6 (09:15) The CMS Tracker and Vertexing Before and after the Upgrade**

C. Beluffi, *Universite Catholique de Louvain, Belgium*

On behalf of the CMS Collaboration

#### **N45-7 (09:30) An Iterative Energy Calibration Method for Large-Scale Semiconductor Multilayer Compton Cameras**

Y. Ichinohe<sup>1,2</sup>, H. Odaka<sup>1</sup>, S. Takeda<sup>1</sup>, S. Watanabe<sup>1,2</sup>, T. Takahashi<sup>1,2</sup>, H. Tajima<sup>3</sup>, D. Matsuura<sup>4</sup>, K. Genba<sup>4</sup>, Y. Kuroda<sup>4</sup>

<sup>1</sup>Institution of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan; <sup>2</sup>University of Tokyo, Japan; <sup>3</sup>Solar-Terrestrial Environment Laboratory, Nagoya University, Japan; <sup>4</sup>Mitsubishi Heavy Industry, Japan

#### **N45-8 (09:45) CCD-Based Characterization of MeV Photons from Laser Plasma Accelerated Electrons**

P. Barton<sup>1</sup>, B. Quiter<sup>1</sup>, Y. Zhang<sup>2</sup>, K. Vetter<sup>2</sup>, C. Geddes<sup>1</sup>, B. Plimley<sup>2</sup>

<sup>1</sup>Lawrence Berkeley National Laboratory, United States; <sup>2</sup>University of California Berkeley, United States

### **N46 Neutron Detectors and Instrumentation II - Imaging Detectors**

Thursday, Nov. 13 08:00-10:00 602 & 603 & 604

Session Chairs: **Ralf Engels**, Forschungszentrum Juelich GmbH, Germany  
**Abdallah Lyoussi**, CEA / French Atomic Energy Commission, France

#### **N46-1 (08:00) Thermal Neutron Imaging Using a New Pad-Based Position-Sensitive Neutron Detector**

P. E. Vanier<sup>1</sup>, I. Dioszegi<sup>1</sup>, L. Forman<sup>2</sup>, N. Schaknowski<sup>1</sup>, J. Fried<sup>1</sup>, G. C. Smith<sup>1</sup>, C. Salwen<sup>1</sup>, B. Yu<sup>1</sup>

<sup>1</sup>BNL, USA; <sup>2</sup>Ion Focus Technology, USA

#### **N46-2 (08:15) Performance of the Micro-Strip Gas Chamber for High Rate Thermal Neutrons Detection**

B. Mindur<sup>1</sup>, S. Alimov<sup>2</sup>, T. Fiutowski<sup>1</sup>, C. Schulz<sup>2</sup>, T. Wilpert<sup>2</sup>

<sup>1</sup>AGH University of Science and Technology, Poland; <sup>2</sup>Helmholtz-Zentrum Berlin für Materialien und Energie, Germany

#### **N46-3 (08:30) Comparative Performance Evaluation of Straw and <sup>3</sup>He Neutron Science Detectors**

J. L. Lacy, L. Sun, A. Athanasiades, C. S. Martin, G. J. Vazquez-Flores, M. Regmi, *Proportional Technologies, Inc., U.S.A.*; G. Ehlers, R. A. Riedel, *Oak Ridge National Laboratory, U.S.A.*

#### **N46-4 (08:45) A Novel Thermal Neutron Detector with Micron-Order Spatial Resolution**

J. Conner, Y. Song, X. Zhang, J. Hayward

*University of Tennessee, USA*

#### **N46-5 (09:00) Novel MPGD Based Neutron Detectors for the European Spallation Source**

D. Pfeiffer<sup>1,2</sup>, F. Resnati<sup>2</sup>, R. Hall-Wilton<sup>1,3</sup>, G. Iakovidis<sup>2,4</sup>, K. Kanaki<sup>1</sup>, T. Kittelmann<sup>1</sup>, E. Olivieri<sup>2</sup>, L. Ropelewski<sup>2</sup>, H. Schindler<sup>2</sup>, I. Stefanescu<sup>1</sup>, P. Thuiner<sup>2,5</sup>, R. Veenhof<sup>2,6</sup>

<sup>1</sup>European Spallation Source ESS AB, Sweden; <sup>2</sup>CERN, Switzerland; <sup>3</sup>Mid-Sweden University, Sweden; <sup>4</sup>National Technical University of Athens, Greece;

<sup>5</sup>Vienna University of Technology, Austria; <sup>6</sup>Uludag University, Turkey

#### **N46-6 (09:15) A Novel 10B-Based Detector with Stacked Macrostructured Cathodes and Resistive Wire Readout for Neutron Scattering Applications**

I. Stefanescu<sup>1,2</sup>, R. Hall-Wilton<sup>1</sup>, C. Höglund<sup>1,3</sup>, I. Defendi<sup>2</sup>, K. Zeitelhack<sup>2</sup>, M. Zee<sup>2</sup>, L. Hultman<sup>3</sup>, J. Birch<sup>3</sup>

<sup>1</sup>European Spallation Source ESS AB, Sweden; <sup>2</sup>MLZ/FRM2, Technische Universität München, Germany; <sup>3</sup>Linköping University, Sweden

#### **N46-7 (09:30) Detector System Component Studies for a Single-Volume Neutron Scatter Camera**

E. Brubaker, J. Brennan, A. Nowack, J. Steele, M. Sweany, Sandia National Laboratories, USA; J. Mattingly, K. Weinfurther, North Carolina State University, USA

#### **N46-8 (09:45) Neutron Source Location and Identification Development from a Volumetrically Sensitive Spherical Neutron Spectrometer**

S. M. Young<sup>1</sup>, E. R. Myers<sup>1</sup>, C. B. Hoshor<sup>1</sup>, J. E. Currie<sup>1</sup>, T. M. Oakes<sup>1,2</sup>, W. H. Miller<sup>2</sup>, D. S. McGregor<sup>3</sup>, S. L. Bellinger<sup>3</sup>, T. J. Sobering<sup>3</sup>, A. N. Caruso<sup>1</sup>

### **N47 High Energy Physics Instrumentation III**

Thursday, Nov. 13 10:30-12:00 606 & 607

Session Chairs: **Andrew J. Blue**, University Of Glasgow, United Kingdom  
**Mingwu Jin**, University of Texas at Arlington, United States

#### **N47-1 (10:30) Test Beam Results on Crystal Fibers for Calorimetry Applications**

M. T. Lucchini<sup>1</sup>, N. Aubry<sup>2</sup>, A. Benaglia<sup>3</sup>, C. Dujardin<sup>4</sup>, S. Faraj<sup>2</sup>, G. Ferro<sup>3</sup>, A. Heering<sup>5</sup>, V. Kononets<sup>4</sup>, K. Lebbou<sup>4</sup>, P. Lecoq<sup>3</sup>, T. Medvedeva<sup>6</sup>, K. Pauwels<sup>3</sup>, O. Sidletskiy<sup>7</sup>, C. Tully<sup>6</sup>, X. Xu<sup>4</sup>, E. Auffray<sup>3</sup>

<sup>1</sup>CERN and University of Milano-Bicocca, Italy; <sup>2</sup>FiberCryst S.A.S, France; <sup>3</sup>European Organization for Nuclear Research, Switzerland; <sup>4</sup>Université Lyon 1, France; <sup>5</sup>University of Notre Dame, USA; <sup>6</sup>Princeton University, USA; <sup>7</sup>Institute for Scintillation Materials of NASU, Ukraine

#### **N47-2 (10:45) R&D on Radiation Hard Active Media Based on Quartz Plates**

Y. Onel, University of Iowa, USA

#### **N47-3 (11:00) Precision Timing Calorimetry for High Energy Physics**

C. Pena<sup>1</sup>, A. Apresyan<sup>1</sup>, D. Anderson<sup>1</sup>, A. Bornheim<sup>1</sup>, J. Duarte<sup>1</sup>, A. Ronzhin<sup>2</sup>, M. Spiropulu<sup>1</sup>, J. Trevor<sup>1</sup>, S. Xie<sup>1</sup>

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

#### **N47-4 (11:15) Development of Electromagnetic Calorimeter Using GSO and LYSO Crystals for the J-PARC Muon-to-Electron Conversion Search Experiment**

K. Oishi, Kyushu University, Japan

On behalf of the COMET Collaboration

#### **N47-5 (11:30) Measurements of Electron Diffusion Coefficients in Liquid Argon for Large LAr Time-Projection Chambers**

Y. Li, C. Thorn, W. Morse, F. Lanni, T. Tsang, T. Rao, S. Rescia, J. Sondericker, S. Duffin, J. Farrell, R. Burns, A. Hoffman  
Brookhaven National Laboratory, USA

#### **N47-6 (11:45) A High-Performance, Low-Cost Readout System for the Belle II KL and Muon (KLM) Scintillator Subsystem**

I. Mostafanezhad, G. Varner, X. Shi, B. Kirby, B. Macek, University of Hawaii at Manoa, USA; X. Wang, Virginia Tech, USA

### **N48 Ultra Fast Detectors**

Thursday, Nov. 13 10:30-12:00 608 & 609

Session Chairs: **Harry van der Graaf**, Nikhef & Delft University of Technology, Netherlands  
**John Smedley**, Brookhaven National Laboratory, United States

#### **N48-1 (10:30) Electron Emission Processes in Photocathodes, Dynodes and MCPs**

J. Smedley, K. Attenkofer, S. G. Schubert, Brookhaven National Laboratory, USA; J. Xie, Argonne National Laboratory, USA; H. A. Padmore, J. Wong, Lawrence Berkeley National Laboratory, USA; E. M. Muller, M. Ruiz Osés, Stony Brook University, USA

#### **N48-2 (10:45) Micro-Machined Low-Stress Silicon Nitride Transmission Dynode for Electron Amplification**

V. Prodanovic, Delft University of Technology, DIMES-Electronic Components Technology & Materials Lab, The Netherlands

On behalf of the MEMbrane group

#### **N48-3 (11:00) Measurement of the Scintillation Rise Time for Different LSO Type Crystals and Its Influence on the CTR**

S. Gundacker, E. Auffray, A. Knapitsch, T. Meyer, K. Pauwels, N. Di Vara, P. Lecoq  
CERN, Switzerland

#### **N48-4 (11:15) Fast Timing with BGO on Digital Silicon Photomultipliers for Prompt Gamma Imaging**

J. Petzoldt<sup>1</sup>, K. Roemer<sup>2</sup>, T. Kormoll<sup>1</sup>, M. Berthel<sup>1</sup>, A. Dreyer<sup>1</sup>, W. Enghardt<sup>1,2</sup>, F. Fiedler<sup>2</sup>, F. Hueso-Gonzalez<sup>1</sup>, C. Golnik<sup>1</sup>, T. Kirschke<sup>2</sup>, A. Wagner<sup>2</sup>, G. Pausch<sup>1</sup>

<sup>1</sup>OncoRay - National Center for Radiation Research in Oncology, Faculty of Medicine and University Hospital Carl Gustav Carus, Technische Universität Dresden, Dresden, Helmholtz-Zentrum Dresden - Rossendorf, Germany; <sup>2</sup>Helmholtz-Zentrum Dresden Rossendorf, Germany

#### **N48-5 (11:30) A Dual Backside-Illuminated 800-Cell Multi-Channel Digital SiPM with 100 TDCs in 130nm 3D IC Technology**

J. M. Pavia, M. Wolf, Universitäts Spital Zuerich, Switzerland; E. Charbon, TU Delft, Netherlands

#### **N48-6 (11:45) Measuring the Photon Time-Spread Distribution of Scintillators with 2 Picoseconds Time Resolution**

D. N. ter Weele, D. R. Schaart, P. Dorenbos  
Delft University of Technology, the Netherlands

## N49 Neutron Detectors and Instrumentation III - Detectors

Thursday, Nov. 13 10:30-12:00 602 & 603 & 604

Session Chairs: **John Valentine**, Lawrence Berkeley National Laboratory, United States  
**Scott Kiff**, Sandia National Laboratories, United States

### N49-1 (10:30) High-Yield Uniform Reel-to-Reel 10B4C Coating for Large-Area Neutron Detectors

M. Regmi, G. J. Vazquez, J. L. Lacy, S. Davenport, A. Athanasiades, C. S. Martin, L. Sun  
*Proportional Technologies Inc, USA*

### N49-2 (10:45) Development of the Dual-Sided Microstructured Semiconductor Neutron Detector

R. G. Fronk, S. L. Bellinger, L. C. Henson, T. R. Ochs, D. S. McGregor, D. E. Huddleston, T. J. Sobering, R. Taylor, C. J. Rietcheck  
*Kansas State University, USA*

### N49-3 (11:00) Characterization of Large Area Transparent RUBBER SheeT (TRUST) LiCaAlF<sub>6</sub> Neutron Scintillator

K. Watanabe, A. Yamazaki, D. Sugimoto, T. Yamazaki, A. Uritani, T. Iguchi, *Nagoya University, Japan*; K. Fukuda, S. Ishidu, *Tokuyama Corporation, Japan*; T. Yanagida, Y. Fujimoto, *Kyushu Institute of Technology, Japan*

### N49-4 (11:15) Silicon Photomultiplier use in a 6LiF:ZnS(Ag) Scintillator

A. Osovitzky<sup>1,2</sup>, K. Pritchard<sup>1</sup>, A. K. Thompson<sup>1</sup>, J. B. Ziegler<sup>1</sup>, R. M. Ibberson<sup>1</sup>, C. F. Majkrzak<sup>1</sup>, N. C. Maliszewskyj<sup>1</sup>  
<sup>1</sup>NIST Center for Neutron Research, Maryland; <sup>2</sup>Rotem Industries Ltd., Israel

### N49-5 (11:30) Optimization and Fabrication of a Fast Neutron Composite Detector

J. T. Nattress, M. Mayer, I. Jovanovic, Z. Ounaies, A. B. Meddeb, C. Trivelpiece, *The Pennsylvania State University, United States*; K. Kazkaz, *Lawrence Livermore National Laboratory, United States*; G. C. Rich, *University of North Carolina at Chapel Hill, United States*

### N49-6 (11:45) He-4 based Neutron Detectors: a Rugged and Scalable Alternative to Liquid Scintillators

R. Chandra, G. Davatz, U. Gendotti, D. Murer, H. Friederich  
*Arktis Radiation Detectors Ltd, Switzerland*

## N50 Gaseous Detectors II

Thursday, Nov. 13 14:00-15:30 606 & 607

Session Chairs: **Georg Steinbrueck**, University of Hamburg, Germany  
**Serge Duarte Pinto**, Photonis, Netherlands

### N50-1 (14:00) Charge Transfer Properties Through Graphene Layers in Gas Detectors

P. Thuiner<sup>1,2</sup>, R. Hall-Wilton<sup>3</sup>, R. B. Jackman<sup>4</sup>, H. Müller<sup>1</sup>, T. T. Nguyen<sup>4</sup>, E. Oliveri<sup>1</sup>, D. Pfeiffer<sup>1,3</sup>, F. Resnati<sup>1</sup>, L. Ropelewski<sup>1</sup>, J. A. Smith<sup>4</sup>, M. van Stenis<sup>1</sup>, R. Veenhof<sup>5</sup>

<sup>1</sup>CERN, Switzerland; <sup>2</sup>Technische Universität Wien, Austria; <sup>3</sup>ESS, European Spallation Source, Sweden; <sup>4</sup>London Centre for Nanotechnology and University College London, United Kingdom; <sup>5</sup>Uludag University, Turkey and RD51 Collaboration

### N50-2 (14:15) Progress in THGEM Detectors

L. Arazi<sup>1</sup>, S. Bressler<sup>1</sup>, L. Moleri<sup>1</sup>, M. Pitt<sup>1</sup>, A. Rubin<sup>1</sup>, A. Broisman<sup>1</sup>, C. D. R. Azevedo<sup>2</sup>, J. F. C. A. Veloso<sup>2</sup>, F. D. Amaro<sup>3</sup>, J. M. F. dos Santos<sup>3</sup>, A. Breskin<sup>1</sup>

<sup>1</sup>Weizmann Institute of Science, Israel; <sup>2</sup>Aveiro University, Portugal; <sup>3</sup>Coimbra University, Portugal

### N50-3 (14:30) High Precision Tracking with Gossip: a Gaseous Pixel Detector Made with MEMS Post-Processing of CMOS Pixel Chips

N. P. Hessey, N. van Bakel, V. Gromov, F. Hartjes, P. de Jong, S. Tsigaridas  
*Nikhef, Netherlands*

### N50-4 (14:45) The Scintillating GlassGEM Detector for X-ray Imaging

T. Fujiwara, H. Takahashi, Y. Mitsuya, M. Uesaka  
*The University of Tokyo, Japan*

### N50-5 (15:00) Performance of a Large-Area GEM Detector Prototype for the Upgrade of the CMS Muon Endcap System

Y. Bhopatkar, M. Hohlmann, M. Phipps, J. Twigger, A. Zhang  
*Florida Institute of Technology, USA*

### N50-6 (15:15) Comparison of the Experimental Data with Simulation for the Micro-TPC with "InGrid" Pixel Readout and Future Studies Using a LAL/PHIL Facility

M. Titov<sup>1</sup>, S. Barsuk<sup>2</sup>, A. Chaus<sup>1</sup>, D. Attie<sup>1</sup>, P. Colas<sup>1</sup>, O. Bezshyko<sup>3</sup>, O. Fedorchuk<sup>3</sup>, L. Burmistrov<sup>2</sup>, H. Monard<sup>2</sup>, A. Variola<sup>2</sup>

<sup>1</sup>CEA Saclay, IRFU/SPP, France; <sup>2</sup>Laboratoire de l'Accelérateur Lineaire (LAL), France; <sup>3</sup>Taras Shevchenko National University of Kyiv, Ukraine

## N51 Data Acquisition and Analysis Systems II

Thursday, Nov. 13 14:00-15:30 608 & 609

Session Chairs: **Zhen-An Liu**, Inst. of High Energy Physics, Chinese Academy of Sciences, China  
**Adam Bernstein**, Lawrence Livermore National Laboratory, United States

### N51-1 (14:00) Development of New Data Acquisition System at Super-Kamiokande for Nearby Supernova Bursts

A. Orii, *the university of Tokyo, Japan*

On behalf of the Super-Kamiokande Collaboration

**N51-2 (14:15) Development of a DAQ Front-End Board for X-Ray Free-Electron Laser Experiments**

C. Saji, T. Ohata, T. Abe, R. Tanaka, M. Yamaga, *JASRI/SPring-8, Japan*; T. Hatsui, T. Kudo, *RIKEN SPring-8 Center, Japan*

**N51-3 (14:30) The ArduSiPM a Compact Trasportable Software/Hardware Data Acquisition System for SiPM Detector.**

V. Bocci, G. Chiodi, F. Iacoangeli, M. Nuccetelli, L. Recchia

*INFN, Italy*

**N51-4 (14:45) The sROD Module for the Tile Calorimeter Demonstrator Project**

E. Carrio<sup>1</sup>, V. Castillo<sup>1</sup>, A. Ferrer<sup>1</sup>, L. Fiorini<sup>1</sup>, Y. Hernández<sup>1</sup>, E. Higón<sup>1</sup>, P. Moreno<sup>1,2</sup>, A. Valero<sup>1</sup>, J. Valls<sup>1</sup>, C. Solans<sup>3</sup>, B. Mellado<sup>2</sup>, R. Reed<sup>2</sup>

<sup>1</sup>*University of Valencia, Spain*; <sup>2</sup>*High Energy Physics Group, South Africa*; <sup>3</sup>*CERN, Switzerland*

**N51-5 (15:00) Design of the SLAC RCE Platform: A General Purpose ATCA Based Data Acquisition System**

R. Herbst, R. Claus, M. Freytag, G. Haller, M. Huffer, S. Maldonado, K. Nishimura, C. O' Grady, A. Perazzo, B. Reese, L. Ruckman, J. G. Thayer, M. Weaver, J. Panetta

*SLAC National Accelerator Laboratory, USA*

**N51-6 (15:15) A New ATCA-Based Data Processor for Track Processing in HEP Experiments**

J. T. Anderson, G. R. Drake, T. Hayden

*Argonne National Laboratory, USA*

**N52 Scintillators and Scintillation Detectors V - Applications II**

Thursday, Nov. 13 14:00-15:30 602 & 603 & 604

Session Chairs: **Zane Bell**, Oak Ridge National Laboratory, United States

**Hartmut Hillemanns**, CERN, Switzerland

**N52-1 (14:00) iPhos, a New Technique for the CALIFA CsI(Tl) Calorimeter**

R. Gernhaeuser, *University of Technology, Munich, Germany*

On behalf of the NUSTAR Collaboration

**N52-2 (14:15) Proton Light Yield Measurements of a Water-Based Liquid Scintillator**

L. J. Bignell, D. Beznosko, M. Yeh, S. Hans, R. Rosero, C. Zhang, E. Worcester, B. Viren, D. E. Jaffe, H. Themann, S. Kettell, M. Diwan

*Brookhaven National Laboratory, USA*

**N52-3 (14:30) Fogging in Polyvinyl Toluene Scintillators Used in Outdoor Environments**

R. Smola, A. Ramey, C. Hurlbut, *Eljen Technology, USA*; R. Cameron, R. Kouzes, *Pacific Northwest National Laboratory, USA*

**N52-4 (14:45) New Scintillators for Lens-Coupled X- and Neutron Radiography**

N. Cherepy, S. Payne, Z. Seeley, T. Tillotson, R. Sanner, P. Beck, P. Thelin, D. Schneberk, R. Perry, G. Stone, E. Updike

*Lawrence Livermore National Laboratory, USA*

**N52-5 (15:00) Light Crosstalk in Pixelated Arrays of LYSO PET Detectors with Different Reflectors**

M. Bergeron, C. M. Pepin, R. Fontaine, R. Lecomte

*Université de Sherbrooke, Canada*

**N52-6 (15:15) Prediction of Optimal Aspect Ratio of Scintillators Used in Scintillation Radiation Detectors for Downhole Application**

J. Liu, *GE Oil and Gas, Summit*

**N53 Nuclear Physics Instrumentation**

Thursday, Nov. 13 16:00-18:00 606 & 607

Session Chairs: **Azriel Goldschmidt**, Lawrence Berkeley National Laboratory, United States

**Patrick Beck**, Lawrence Livermore National Laboratory, United States

**N53-1 (16:00) Results of R&D for Sampling Calorimeters for Electron Ion Collider**

O. D. Tsai, *University of California at Los Angeles, USA*

On behalf of the EIC Calorimeter Consortium

**N53-2 (16:15) AMoRE Project for Neutrinoless Double Beta Decay of 100Mo**

G.-B. Kim, *Institute for Basic Science, Republic of Korea*

On behalf of the AMoRE collaboration

**N53-3 (16:30) Upgrade of the GERDA Setup for  $0\nu 2\beta$  Decay Searches of  $^{76}\text{Ge}$**

S. Riboldi, *Milan University - INFN Milano, Italy*

**N53-4 (16:45) Performance of the sPHENIX Prototype Calorimeter Readout Electronics**

E. J. Mannel, *Brookhaven National Laboratory, USA*

On behalf of the The PHENIX Collaboration

**N53-5 (17:00) Recent Measurements with the NIFFTE Fission TPC and the Potential to Advance Thorium Fueled Reactors**

R. Towell, *Abilene Christian University, USA*

**N53-6 (17:15) Development of a Tracking and Electron Identification System Using GEM for the J-PARC E16 Experiment**

Y. Komatsu, *University of Tokyo, Japan*

On behalf of the J-PARC E16 Collaboration

**N53-7 (17:30) Time-of-Flight Neutron Spectrum Unfolding for Mixed-Oxide Nuclear Fuel and Plutonium Metal Using a Dual-Particle Imager**

M. C. Hamel, A. Poitras-Riviere, J. K. Polack, M. Flaska, S. D. Clarke, S. A. Pozzi, *University of Michigan, USA*; A. Tomanin, P. Peerani, *Joint Research Centre, Italy*

**N53-8 (17:45) Thin dE/dx Detectors Fabricated from Silicon-on-Insulator Wafers: Development and Test Results**

M. E. Wiedenbeck, *Jet Propulsion Laboratory, California Institute of Technology, USA*; C. S. Tindall, *Lawrence Berkeley National Laboratory, USA*; J. Klemic, J. A. Burnham, A. C. Cummings, A. W. Labrador, R. A. Leske, R. A. Mewaldt, J. S. Rankin, E. C. Stone, *California Institute of Technology, USA*; E. R. Christian, S. Shuman, T. T. von Roseninge, *NASA / Goddard Space Flight Center, USA*

**N54 Photodetectors and Radiation Imaging Detectors II**

Thursday, Nov. 13 16:00-18:00 608 & 609

Session Chairs: **Melinda Sweany**, Sandia National Laboratories,  
**Peter Fischer**, Institute for Computer Engineering, Heidelberg University, Germany

**N54-1 (16:00) Three-Dimensional Hybrid X-Ray-Color Imagers for 20 to 1000 keV Photons**

Z. Wang, J. L. Barber, E. Guardincerri, M. A. Hoffbauer, J. S. Kapustinsky, K. Kwiatkowski, Q. Liu, C. L. Morris, V. Pavlenko, J. Perry, D. C. Poulson, T. Williamson, J. Yoo, *Los Alamos National Laboratory, USA*; R. Zhu, *California Institute of Technology, USA*

**N54-2 (16:15) Optimization and Characterization of SiPM Detectors for Use in Liquid Xenon Experiments**

I. Ostrovskiy, *Stanford University, USA*; F. Retiere, *TRIUMF, Canada*

**N54-3 (16:30) Development of a Compton Camera for Unmanned Helicopter Survey System**

K. Shimazoe, J. Jianyong, Y. Nakamura, H. Takahashi, *The University of Tokyo, Japan*; Y. Shikaze, Y. Sanada, T. Torii, *Japan Atomic Energy Agency, Japan*; S. Kurosawa, K. Kamada, A. Yoshikawa, *Tohoku University, Japan*; M. Yoshino, H. Sato, Y. Usuki, *Furukawa Corporation, Japan*

**N54-4 (16:45) Operation of Silicon Photomultipliers at Liquid Helium Temperatures**

A. Cardini<sup>1</sup>, V. Fanti<sup>1,2</sup>, A. Lai<sup>1</sup>

<sup>1</sup>INFN Sezione di Cagliari, Italy; <sup>2</sup>Universita di Cagliari, Italy

**N54-5 (17:00) Time Resolution and Detection Efficiency of the CaLIPSO Detector on 511 keV Annihilation Photons.**

E. Ramos, D. F. Yvon, G. Tauzin, P. Verrecchia, S. Viatcheslav, C. Flouzat  
*CEA Saclay, France*

**N54-6 (17:15) Three Dimensional Event Localization in Bulk Scintillator Crystals Using Optical Coded Apertures**

J. B. Braverman, *University of Tennessee, United States*; L. Fabris, J. Newby, D. Hornback, K. P. Ziock, *Oak Ridge National Laboratory, United States*

**N54-7 (17:30) SiPM Performance Boost for Scintillating Fiber Tracker Upgrade at CERN LHCb**

E. Wies<sup>1</sup>, C. Dietzinger<sup>2</sup>, E. Engelm<sup>3</sup>, T. Ganka<sup>2</sup>, W. Gebauer<sup>2</sup>, W. Hartinger<sup>1</sup>, P. Iskra<sup>1</sup>, S. Loebner<sup>1</sup>, A. M. Seco<sup>1</sup>, N. Miyakawa<sup>1</sup>

<sup>1</sup>KETEK GmbH, Germany; <sup>2</sup>Universitaet der Bundeswehr, Germany; <sup>3</sup>Technische Universitaet Muenchen, Germany

**N54-8 (17:45) Experimental Validation of a Single Photon Avalanche Diode Array Detector Simulator**

A. C. Therrien, S. Parent, B.-L. Berube, V.-P. Rheume, S. A. Charlebois, R. Lecomte, R. Fontaine, J.-F. Pratte  
*Universite de Sherbrooke, Canada*

**N55 Radiation Damage Effects**

Thursday, Nov. 13 16:00-18:00 602 & 603 & 604

Session Chairs: **Vitaliy A. Fadeyev**, UCSC, United States  
**Ingrid-Maria Gregor**, DESY, Germany

**N55-1 (16:00) Electric Field in Silicon Detectors Irradiated with Neutrons up to  $10^{16}$  n<sub>eq</sub>/cm<sup>2</sup>**

M. Mikuž<sup>1,2</sup>, G. Kramberger<sup>2</sup>, V. Cindro<sup>2</sup>, I. Mandic<sup>2</sup>, M. Zavrtanik<sup>2</sup>

<sup>1</sup>Univ. Ljubljana, Slovenia; <sup>2</sup>Jozef Stefan Institute, Slovenia

**N55-2 (16:15) Energy Dependence of Proton Radiation Damage in Si-Sensors**

A. Junkes, *Hamburg University, Germany*

On behalf of the CMS tracker collaboration and E. Donegani

**N55-3 (16:30) Radiation Hardness of Low Gain Amplification Detectors**

G. Kramberger, V. Cindro, I. Mandic, M. Mikuž, M. Zavrtanik, *Jozef Stefan Institute, Slovenia*; G. Pellegrini, M. Baselga Bacardit, V. Greco, S.

Hidalgo, P. Fernandez, D. Quirion, *Centro Nacional de Microelectrónica, IMB-CNMI-CSIC, Spain*; V. Fadeyev, H. Sadrozinski, *Santa Cruz Institute for Particle Physics, UC Santa Cruz, USA*

**N55-4 (16:45) Long-Term Stability of Silicon Detectors Operated in the Charge Multiplication Mode**

C. A. Betancourt<sup>1</sup>, M. Baselga<sup>2</sup>, V. Greco<sup>2</sup>, A. Hasenfratz<sup>1</sup>, M. Hauser<sup>1</sup>, S. Hidalgo<sup>2</sup>, K. Jakobs<sup>1</sup>, K. Lohwasser<sup>3</sup>, S. Kuehn<sup>1</sup>, P. Fernández-Martínez<sup>2</sup>, R. Mori<sup>1</sup>, U. Parzefall<sup>1</sup>, G. Pellegrini<sup>2</sup>, D. Quirion<sup>2</sup>, M. Thomas<sup>1</sup>

<sup>1</sup>Albert-Ludwigs Universität Freiburg, Germany; <sup>2</sup>IMB-CNM-CSIC, Spain; <sup>3</sup>Deutsches Elektronensynchrotron DESY, Germany

**N55-5 (17:00) Performance of and Radiation Damage Effects in the LHCb Vertex Locator**

S. de Capua, University of Manchester, UK

On behalf of the LHCb VELO group

**N55-6 (17:15) Investigation of the Insulator Layers for Segmented Silicon Sensors Before and after X-Ray Irradiation**

R. Klanner, E. Garutti, I. Kopsalis, J. Schwandt, University of Hamburg, Germany; J. Zhang, DESY, Germany

**N55-7 (17:30) Compensation of Radiation Effect in Double Silicon-on-Insulator Pixel Sensor**

K. Hara, M. Asano, S. Honda, N. Tobita, Faculty of Pure and Applied Sciences, University of Tsukuba, Japan; Y. Arai, I. Kurachi, T. Miyoshi, High Energy Accelerator Research Org. (KEK), Japan; T. Hatsui, K. Kobayashi, T. Kudo, RIKEN, SPring-8 Center, Japan

**N55-8 (17:45) Comparative Study of Damage Effects Induced by Gamma and High Energy Protons Irradiation in YAP:Ce, YAG:Ce and DSB:Ce Scintillating Materials**

E. Auffray<sup>1</sup>, A. Fedorov<sup>2</sup>, M. Korjik<sup>2</sup>, D. Kozlov<sup>2</sup>, M. Lucchini<sup>1,3</sup>, V. Mechinsky<sup>2</sup>, K. Pauwels<sup>1</sup>

<sup>1</sup>CERN, Switzerland; <sup>2</sup>Research Institute for Nuclear Problems, Belarus; <sup>3</sup>UNIMIB, Italy

# MIC Program

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## M01 MIC Plenary

Wednesday, Nov. 12 08:00-10:00 6B

Session Chairs: **Georges El Fakhri**, Harvard Medical School and Massachusetts General Hospital, United States  
**Katia Parodi**, Ludwig Maximilians University Munich, Germany

(08:00) Opening Remarks MIC Chair

(08:15) Notes from the General Chair

### M01-1 (08:20) Exploring Human Brain Architecture

V. Wedeen, *Massachusetts General Hospital, USA*

### M01-2 (09:10) Sub mm PET would change our understanding of life and disease

Y. Fujibayashi

*National Institute of Radiological Sciences, Japan*

## M02 MIC Awards and Plenary II

Wednesday, Nov. 12 10:30-12:00 6B

Session Chairs: **Georges El Fakhri**, Harvard Medical School and Massachusetts General Hospital, United States  
**Katia Parodi**, Ludwig Maximilians University Munich, Germany

## M03 Intra-Operative Probes & Portable Imaging Systems

Wednesday, Nov. 12 14:00-15:30 6A

Session Chairs: **Paul Lecoq**, CERN, Switzerland  
**John N. Aarsvold**, Atlanta Veterans Affairs Medical Center & Emory University, United States

### M03-1 (14:00) A CMOS Multi-Channel Digital SiPM for Endoscopic PET

A. J. Carimatto, S. Mandai, E. Charbon  
*TU-DELFT, Netherlands*

### M03-2 (14:15) FreeHand SPECT with a Hand-Held Imager

B. L. Welch<sup>1</sup>, J.-M. Fischer<sup>2</sup>, B. Kross<sup>3</sup>, S. Lee<sup>3</sup>, J. E. McKisson<sup>3</sup>, J. McKisson<sup>3</sup>, A. Weisenberger<sup>3</sup>, M. Williams<sup>4</sup>, V. Njagi<sup>1</sup>  
<sup>1</sup>*Dilon Technologies, USA*; <sup>2</sup>*SurgicEye, Germany*; <sup>3</sup>*Jefferson Lab, Virginia*; <sup>4</sup>*University of Virginia, Virginia*

### M03-3 (14:30) Preliminary Results from a Portable PET Probe System with Fast Image Reconstruction

K. Li, A. J. Mathews, Q. Wang, J. Wen, J. A. O'Sullivan, Y.-C. Tai  
*Washington University in St. Louis, USA*

### M03-4 (14:45) Image Quality Assessment for Extended-Volume C-Arm CT Using a Multi-Turn Reverse Helix

Z. Yu<sup>1</sup>, A. Maier<sup>2</sup>, G. Lauritsch<sup>3</sup>, F. Vogt<sup>3</sup>, M. Schoenborn<sup>3</sup>, C. Koehler<sup>3</sup>, J. Hornegger<sup>3</sup>, E. Noo<sup>1</sup>  
<sup>1</sup>*University of Utah, USA*; <sup>2</sup>*University of Erlangen-Nuremberg, Germany*; <sup>3</sup>*Siemens AG, Germany*

### M03-5 (15:00) Monte-Carlo Simulation and Image Reconstruction for an Endoscopic TOPPET Detector

M. Zvolsky, *DESY Hamburg, Germany*; A. Cserkaszky, *SurgicEye GmbH, Germany*; G. Cucciati, *University of Milano Bicocca, Italy*; E. Garutti, *University of Hamburg, Germany*; P. Mitsakis, *Centre hospitalier universitaire vaudois (CHUV), Switzerland*; B. Frisch, *Technische Universität München, Germany*

### M03-6 (15:15) MAGICs: a Miniaturized Gamma Imager for Cancer Surgery

M.-A. Verdier, T. Imando, L. Pinot, C. Esnault, B. Janvier, N. Dinu, B. Ky, S. Callier, V. Vandenbussche, D. Breton, Y. Charon, M.-A. Duval, L. Raux, L. Menard  
*IN2P3-CNRS, France*

## M04 New Detector Materials and Technologies

Wednesday, Nov. 12 16:00-18:00 6A

Session Chairs: **Craig S. Levin**, Stanford University, United States  
**Dennis R. Schaart**, Delft University of Technology, Netherlands

### M04-1 (16:00) The X'tal Cube PET Detector of Isotropic (0.8 mm)<sup>3</sup> Crystal Segments

M. Nitta<sup>1</sup>, N. Inadama<sup>2</sup>, Y. Hirano<sup>2</sup>, F. Nishikido<sup>2</sup>, E. Yoshida<sup>2</sup>, H. Tashima<sup>2</sup>, H. Kawai<sup>1</sup>, T. Yamaya<sup>2,1</sup>

<sup>1</sup>Chiba University, Japan; <sup>2</sup>National Institute of Radiological Sciences, Japan

#### **M04-02 Novel Cost-Effective and High-Performance Modular Detectors for Emission Tomography Systems**

H. Saber, G. El-Fakhri

Massachusetts General Hospital, Harvard Medical School, USA

#### **M04-03 Energy-Resolved X-Ray Computed Tomography Using a Current-Mode Two-Dimensional Detector**

I. Kanno, Y. Yamashita, T. Ogawa, E. Kanai, M. Kitahara, *Department of Nuclear Engineering, Kyoto University, Japan*; K. Shinsho, *Graduate School of Human Health Sciences, Tokyo Metropolitan University, Japan*; M. Ohtaka, M. Hashimoto, K. Ara, *Japan Atomic Energy Agency, Japan*; H. Onabe, *Raytech Corporation, Japan*

#### **M04-4 (16:45) A Compact, Water Cooled, 144 Channel Photo Sensor Module for $\gamma$ Detection in PET**

L. Sacco<sup>1</sup>, R. Dohle<sup>2</sup>, P. Fischer<sup>1</sup>, C. Piemonte<sup>3</sup>, M. Ritzert<sup>1</sup>

<sup>1</sup>Heidelberg University, Germany; <sup>2</sup>Micro Systems Engineering, Germany; <sup>3</sup>Fondazione Bruno Kessler, Italy

#### **M04-5 (17:00) Precise Timing Performance Measurements of Si-PM Based Phoswich Detectors for TOF-DOI-PET Systems**

T. Kobayashi<sup>1,2</sup>, S. Yamamoto<sup>1</sup>, N. Kato<sup>1</sup>, J. Y. Yeom<sup>3</sup>, N. Shimura<sup>4</sup>, H. Ishibashi<sup>4</sup>

<sup>1</sup>Nagoya University Graduate School of Medicine, Japan; <sup>2</sup>Daiyukai General Hospital, Japan; <sup>3</sup>Kumoh National Institute of Technology, South Korea; <sup>4</sup>Hitachi Chemical, Japan

#### **M04-6 (17:15) Directional Charged Particle Detector with a 2-Layer Ultrathin Phosphor Foil**

Y. Ding, L. Caucci, H. H. Barrett

University of Arizona, USA

#### **M04-7 (17:30) Novel Manufacturing Techniques for Block Detector Light Guides**

M. S. Judenhofer, S. R. Cherry

University of California, Davis, USA

#### **M04-8 (17:45) Cherenkov TOF PET with Silicon Photomultipliers**

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

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

### **M06 PET Instrumentation I**

Thursday, Nov. 13 08:00-10:00 6A

Session Chairs: **Joel S. Karp**, University of Pennsylvania, United States

**Simon R. Cherry**, University of California-Davis, United States

#### **M06-1 (08:00) A New Method of Depth-of-Interaction Determination for Continuous Crystal PET Detectors**

Y. Wang, L. Wang, D. Li, X. Cheng

University of Science and Technology of China, China

#### **M06-2 (08:15) Batched Histogramming: a Memory-Efficient Algorithm for PET Sinogram Acquisitions**

Y. Wang, W. Whiteley, *Siemens Medical Solutions, U.S.A.*

#### **M06-3 (08:30) Performance Evaluation of a New Brain PET Scanner Using MPPC Based DOI Detectors**

M. Watanabe, R. Yamada, A. Saito, T. Isobe, K. Ote, I. Suzuki, T. Moriya, H. Yamauchi, T. Omura

Hamamatsu Photonics K.K., Japan

#### **M06-4 (08:45) Stackable Electronics Architecture for Densely Packed PET Detectors**

P. D. Reynolds, A. Vandenbroucke, D. Freese, D. Hsu, D. Innes, C. S. Levin

Stanford University, United States

#### **M06-5 (09:00) Temperature Properties of Scintillators for PET Detectors: a Comparative Study**

W. Wolszczak, *Faculty of Physics, Poland*; M. Moszynski, T. Szczesniak, M. Grodzicka, *National Centre for Nuclear Research, Poland*; K. Kacperski, *Maria Skłodowska-Curie Memorial Cancer Centre and Institute of Oncology, Poland*

#### **M06-6 (09:15) Learning the Characteristics of a DOI Detector**

S. Pedemonte<sup>1,2</sup>, S. Arridge<sup>3</sup>, S. Ourselin<sup>3</sup>

<sup>1</sup>Massachusetts General Hospital, USA; <sup>2</sup>Aalto University, Finland; <sup>3</sup>University College London, UK

#### **M06-7 (09:30) Multiplexed PET in Clinical Scanners Based on Triple Coincidences**

J. L. Herraiz<sup>1,2</sup>, S. C. Moore<sup>2</sup>, M. Cervo<sup>2</sup>, S. España<sup>3</sup>, J. Ruiz-Cabello<sup>3,4</sup>, E. Lage<sup>1,2</sup>

<sup>1</sup>Madrid-MIT M+Vision Consortium, United States; <sup>2</sup>Brigham and Women's Hospital and Harvard Medical School, United States; <sup>3</sup>Centro Nacional de Investigaciones Cardiovasculares, Spain; <sup>4</sup>Universidad Complutense de Madrid and Ciber Enfermedades Respiratorias, Spain

#### **M06-8 (09:45) Improving Photon Position Estimation in Monolithic PET Detector Modules via Lookup Table Manipulation**

L. Pierce, W. Hunter, R. Miyaoka

University of Washington, USA

### **M05 Image Reconstruction Methods I**

Thursday, Nov. 13 08:00-10:00 6B

Session Chairs: **Johan L. Nuyts**, K.U.Leuven, Belgium, Belgium  
**Jinyi Qi**, University of California, Davis, United States

**M05-1 (08:00) Handling Big Data in Medical Imaging: Iterative Reconstruction with Large-Scale Automated Parallel Computation**

J. H. Lee<sup>1,2</sup>, Y. Yao<sup>2</sup>, U. Shrestha<sup>3</sup>, G. T. Gullberg<sup>2</sup>, Y. Seo<sup>3</sup>  
<sup>1</sup>University of North Carolina, United States; <sup>2</sup>Lawrence Berkeley National Laboratory, United States; <sup>3</sup>University of California, United States

**M05-2 (08:15) Comparison of Maximum Likelihood Estimators for Low Flux X-Ray CT**

D. Perlmutter, S. M. Kim, P. Kinahan, A. Alessio  
University of Washington, USA

**M05-3 (08:30) Theoretical Analysis of Resolution and Noise Properties of PET Image Reconstruction with and without Sinogram Blurring Modeling**

S. Ahn, GE Global Research, USA

**M05-4 (08:45) A Simple and Flexible MAP Approach for Static and Dynamic Emission Tomography Reconstruction**

K. Vunckx<sup>1,2</sup>, M. Germino<sup>2</sup>, Y. Jian<sup>2</sup>, C. Chan<sup>2</sup>, J. Nuyts<sup>1</sup>, R. E. Carson<sup>2</sup>  
<sup>1</sup>KU Leuven, Belgium; <sup>2</sup>Yale University, USA

**M05-5 (09:00) Application of the Entropic Mirror Descent Algorithm to TOF PET Image Reconstruction**

S. D. Rose, E. Y. Sidky, C.-M. Kao  
University of Chicago, United States

**M05-6 (09:15) Analysis of Statistical Models for Iterative Reconstruction of Extremely Low-Dose CT Data**

S. M. Kim<sup>1</sup>, A. M. Alessio<sup>1</sup>, D. S. Perlmutter<sup>1</sup>, J.-B. Thibault<sup>2</sup>, B. De Man<sup>3</sup>, P. E. Kinahan<sup>1</sup>  
<sup>1</sup>University of Washington, USA; <sup>2</sup>GE Healthcare, USA; <sup>3</sup>General Electric Global Research Center, USA

**M05-7 (09:30) Comparison Between Pre-Log and Post-Log Statistical Models in Low-Dose CT Iterative Reconstruction**

L. Fu<sup>1</sup>, S. M. Kim<sup>2</sup>, A. M. Alessio<sup>2</sup>, P. Kinahan<sup>2</sup>, B. De Man<sup>1</sup>  
<sup>1</sup>GE Global Research, USA; <sup>2</sup>University of Washington, USA

**M05-8 (09:45) Validation of Anatomy-Enhanced Cardiac FDG-PET Imaging: an Ex Vivo Sheep Study**

A. Turco, J. Duchenne, J. Nuyts, O. Gheysens, J.-U. Voigt, P. Claus, K. Vunckx  
KU Leuven, België

**M08 Multi-Modality Systems**

Thursday, Nov. 13 10:30-12:00 6A

Session Chairs: **Paul K. Marsden**, King's College London, England, United Kingdom  
**Michael A. King**, Univ of Mass Med School, United States

**M08-1 (10:30) RF-Transmissive PET Detector Insert for Simultaneous PET/MRI**

B. J. Lee, A. M. Grant, C.-M. Chang, G. H. Glover, C. S. Levin  
Stanford University, USA

**M08-2 (10:45) Combined 3D PET and Optical Projection Tomography Techniques for Plant Root Phenotyping**

Q. Wang<sup>1</sup>, S. Komarov<sup>1</sup>, A. J. Mathews<sup>1</sup>, K. Li<sup>1</sup>, C. Topp<sup>2</sup>, J. A. O'Sullivan<sup>1</sup>, Y.-C. Tai<sup>1</sup>  
<sup>1</sup>Washington University in St. Louis, United States; <sup>2</sup>Donald Danforth Plant Science Center, United States

**M08-3 (11:00) A Comparison of Transparent RF-Shielding Materials for to be used in PET/MRI Scanners**

C. Parl, D. Stricker-Shaver, A. Kolb, H. F. Wehrl, B. J. Pichler  
Werner Siemens Imaging Center, Germany

**M08-4 (11:15) ToF Performance Evaluation of a PET Insert with Digital Silicon Photomultiplier Technology During MR Operation**

D. Schug<sup>1</sup>, J. Wehner<sup>1</sup>, P. M. Dueppenbecker<sup>1,2</sup>, B. Weissler<sup>1,3</sup>, P. Gebhardt<sup>2</sup>, B. Goldschmidt<sup>1</sup>, T. Solf<sup>4</sup>, V. Schulz<sup>1,3</sup>  
<sup>1</sup>RWTH Aachen University, Aachen, NRW; <sup>2</sup>King's College London, United Kingdom; <sup>3</sup>Philips Research, Germany; <sup>4</sup>Philips Research, Netherlands

**M08-5 (11:30) Development of a SiPM-Based Anger Camera for INSERT, a New Multi-Modality SPECT/MRI System for Preclinical and Clinical Imaging**

P. Busca<sup>1,2</sup>, C. Fiorini<sup>1,2</sup>, A. D. Butt<sup>1,2</sup>, M. Occhipinti<sup>1,2</sup>, R. Quaglia<sup>1,2</sup>, P. Trigilio<sup>1,2</sup>, K. Nagy<sup>3</sup>, T. Bukki<sup>3</sup>, M. Czeller<sup>3</sup>, Z. Nyitrai<sup>3</sup>, C. Piemonte<sup>4</sup>, A. Ferri<sup>4</sup>, A. Gola<sup>4</sup>, J. Rieger<sup>5</sup>  
<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN - Sezione di Milano, Italy; <sup>3</sup>Fondazione Bruno Kessler, Italy; <sup>4</sup>Mediso Medical Imaging Systems, Hungary; <sup>5</sup>MRI.TOOLS GmbH, Germany

**M08-6 (11:45) PET NEMA Performance Measurements for a SiPM-Based Time-of-Flight PET/MR System**

T. W. Deller<sup>1</sup>, A. M. Grant<sup>2</sup>, M. M. Khalighi<sup>1</sup>, S. H. Maramraju<sup>1</sup>, G. Delso<sup>3</sup>, C. S. Levin<sup>2</sup>  
<sup>1</sup>GE Healthcare, USA; <sup>2</sup>Stanford University, USA; <sup>3</sup>GE Healthcare, CH

**M07 Parametric Imaging / Image Processing**

Thursday, Nov. 13 10:30-12:00 6B

Session Chairs: **Richard E. Carson**, Yale University, United States  
**Marc D. Normandin**, Massachusetts General Hospital, Harvard Medical School, United States

**M07-1 (10:30) Exploiting an MRI Derived Arterial Input Function to Improve the PET Simultaneous Estimation Method: Validation of Assumptions**

H. Sari, K. Erlandsson, A. Barnes, D. Atkinson, S. Arridge, S. Ourselin, B. F. Hutton  
*University College London, UK*

**M07-2 (10:45) Impact of Acquisition Time-Window on Clinical Whole-Body PET Parametric Imaging**

N. A. Karakatsanis<sup>1,2</sup>, M. A. Lodge<sup>2</sup>, M. E. Casey<sup>3</sup>, H. Zaidi<sup>1,4</sup>, A. Rahmim<sup>2</sup>  
<sup>1</sup>*University of Geneva, Switzerland;* <sup>2</sup>*Johns Hopkins University, United States;* <sup>3</sup>*Siemens Medical Solutions, United States;* <sup>4</sup>*University of Groningen, Netherlands*

**M07-3 (11:00) A unified PET-fMRI Kinetic Model for Estimation of Neurotransmitter Release Profiles**

N. J. Guehl, D. W. Wooten, G. El Fakhri, N. M. Alpert, M. M. Normandin  
*Center for Advanced Medical Imaging and Sciences, Massachusetts General Hospital and Harvard Medical School, USA*

**M07-4 (11:15) Introducing Time-of-Flight and Resolution Recovery Image Reconstruction to Whole-Body PET Parametric Imaging**

N. A. Karakatsanis<sup>1,2</sup>, A. Rahmim<sup>2</sup>, H. Zaidi<sup>1,3</sup>  
<sup>1</sup>*University of Geneva, Switzerland;* <sup>2</sup>*Johns Hopkins University, United States;* <sup>3</sup>*University of Groningen, Netherlands*

**M07-5 (11:30) Application of Pattern Recognition Framework for Quantification of Parkinson's Disease in DAT SPECT Imaging**

S. Jain<sup>1</sup>, L. Younes<sup>1</sup>, G. Smith<sup>1</sup>, Z. Mari<sup>1</sup>, V. Sossi<sup>2</sup>, A. Rahmim<sup>1</sup>  
<sup>1</sup>*Johns Hopkins University, United States;* <sup>2</sup>*University of British Columbia, Canada*

**M07-6 (11:45) Searching for New Dementia-Related Features Within MRI: Keypoint Detection and Description**

E. Stuehler, M. R. Berthold  
*University of Konstanz, Germany*

**M09 MIC Poster Session I - Student Poster Competition**

Thursday, Nov. 13 14:00-15:30 4B

Session Chairs: **Vesna Sossi**, University of British Columbia,  
**Ramsey D. Badawi**, UC Davis Medical Center, United States  
**Brian F. Hutton**, Institute of Nuclear Medicine, UCL, London, United Kingdom

**M09-1 Brain Shaving: Adaptive Detection for Brain PET Data**

E. Grecchi<sup>1</sup>, O. M. Doyle<sup>1</sup>, A. Bertoldo<sup>2</sup>, N. Pavese<sup>3</sup>, F. E. Turkheimer<sup>1</sup>  
<sup>1</sup>*King's College London, UK;* <sup>2</sup>*University of Padova, Italy;* <sup>3</sup>*Imperial College London, UK*

**M09-2 Digital PET/MRI Insert: Assessment of the MR-Compatibility**

J. Wehner<sup>1</sup>, B. Weissler<sup>2</sup>, P. Dueppenbecker<sup>1</sup>, P. Gebhardt<sup>3</sup>, B. Goldschmidt<sup>4</sup>, A. Salomon<sup>4</sup>, D. Schug<sup>1</sup>, F. Kiessling<sup>1</sup>, V. Schulz<sup>1,2</sup>  
<sup>1</sup>*Department for Experimental Molecular Imaging, RWTH Aachen University Hospital, Germany;* <sup>2</sup>*Philips Research Europe, Germany;* <sup>3</sup>*King's College London, United Kingdom;* <sup>4</sup>*Philips Research Europe, The Netherlands*

**M09-3 Uniform Spatial Resolution for Statistical Image Reconstruction for 3D Cone-Beam CT**

J. H. Cho, J. A. Fessler  
*University of Michigan, United States*

**M09-4 Optical Transmission of Analog SiPM Signals for ToF PET/MRI**

M. F. Bieniosek, C. S. Levin  
*Stanford University, USA*

**M09-6 Feasibility of Scatter Based Electron Density Reconstruction for Attenuation Correction in Positron Emission Tomography**

G. Zhang<sup>1,2</sup>, H. Sun<sup>1,2</sup>, S. Pistorius<sup>1,2</sup>  
<sup>1</sup>*University of Manitoba, Canada;* <sup>2</sup>*CancerCare Manitoba, Canada*

**M09-7 Design and Simulation of a Stationary SPECT Imaging System Based on Axially Varying Tilted Parallel-Hole Collimation**

L. R. V. Pato, S. Vandenberghe, K. Van Audenhaege, R. Van Holen  
*MEDISIP, Ghent University-iMinds-IBiTech, Belgium*

**M09-8 Improved Myocardial Perfusion PET Imaging with MRI Learned Dictionaries**

X. Wang<sup>1</sup>, Y. Wang<sup>2</sup>, D. Han<sup>1</sup>, W. Deng<sup>1</sup>, L. Ying<sup>2</sup>, J. Tang<sup>1</sup>  
<sup>1</sup>*Oakland University, USA;* <sup>2</sup>*The State University of New York at Buffalo, USA*

**M09-9 Crystal Growth and Scintillation Properties of Potassium Strontium Bromide**

L. M. Stand, M. Zhuravleva, H. Wei, C. L. Melcher  
*University of Tennessee, United States*

**M09-10 Effect of Scatter Correction When Comparing Attenuation Maps: Application to Brain PET/MR**

N. Burgos, K. Thielemans, M. J. Cardoso, P. Markiewicz, J. Jiao, J. Dickson, J. S. Duncan, D. Atkinson, S. R. Arridge, B. F. Hutton, S. Ourselin  
*University College London, United Kingdom*

## M10 MIC Poster Session I - Data Analysis & Image Generation I

Thursday, Nov. 13 14:00-15:30 4B

Session Chairs: **Dimitris Visvikis**, LaTIM, France  
**Benjamin M. W. Tsui**, Johns Hopkins University, United States  
**Arek D. Sitek**, Massachusetts General Hospital,

### M10-1 An Approximate Contrast to Noise Ratio (CNR) Formula for PET System Performance Assessment

R. Yao, State University of New York at Buffalo, USA; Q. Wei, T. Ma, Tsinghua University, China

### M10-2 Scattered PET Data for Attenuation-Map Reconstruction in PET/MRI

Y. Berker<sup>1</sup>, V. Schulz<sup>1,2</sup>

<sup>1</sup>RWTH Aachen University, Germany; <sup>2</sup>Philips Technologie GmbH Innovative Technologies, Germany

### M10-3 Monte Carlo Simulation Based Scatter Correction in 3D List-Mode Image Reconstruction

K. Lou<sup>1,2</sup>, X. Sun<sup>2</sup>, J. W. Clark, Jr.<sup>1</sup>, Y. Shao<sup>2</sup>

<sup>1</sup>Rice University, USA; <sup>2</sup>University of Texas MD Anderson Cancer Center, USA

### M10-4 Evaluation of a Self-Normalization Method for Two PET Cameras Using Prompt, Delay or Total Emission Data

H. Baghaei, Y. Zhang, H. Yan, W.-H. Wong

University of Texas, M.D. Anderson Cancer Center, USA

### M10-5 List-Mode Motion Tracking for Positron Emission Tomography Imaging Using Low-Activity Fiducial Markers

M. Chamberland<sup>1</sup>, R. deKemp<sup>1,2</sup>, T. Xu<sup>1</sup>

<sup>1</sup>Carleton University, Canada; <sup>2</sup>University of Ottawa Heart Institute, Canada

### M10-6 4D FDG-PET Quantification in Thoracic Anatomical Structures for Anthropomorphic Phantom Measurements.

M. Carles, A. Chirindel, T. Fechter, U. Christ, A. Schaefer, M. Mix, U. Nestle

UKL, Germany

### M10-7 Data-Driven Respiratory Gating Approach for Detecting Anterior-Posterior Tumor Motion in PET

M. Hess, F. Büther, K. P. Schäfers

European Institute for Molecular Imaging (EIMI), Germany

### M10-8 An Algorithm for Direct 4-D PET Image Reconstruction/non-Rigid Motion Estimation with Limited MRI Prior Information

A. Bousse<sup>1</sup>, J. Jiao<sup>2</sup>, L. Pizarro<sup>2</sup>, K. Thielemans<sup>2</sup>, D. Atkinson<sup>2</sup>, S. Ourselin<sup>2</sup>, B. F. Hutton<sup>1,3</sup>

<sup>1</sup>Institute of Nuclear Medicine, UCL, UK; <sup>2</sup>Centre for Medical Image Computing, University College London, UK; <sup>3</sup>Centre for Medical Radiation Physics, University of Wollongong, Australia

### M10-9 Comparison of Multi Modal SPECT Reconstruction Methods Using a Clinically Relevant Assessment of the Image Resolution at Various Noise Levels

J. Ma, A. H. Vija, Siemens, United States

### M10-10 Activities and Volumes Determined by IADT Method for 177-Lu Images Reconstructed with and Without Resolution Recovery

C. F. Uribe<sup>1</sup>, L. Frauenstein<sup>1,2</sup>, P. L. Esquinas<sup>1</sup>, É. Gaudin<sup>3</sup>, M. Gonzalez<sup>4</sup>, J.-M. Beaugard<sup>5</sup>, A. Celler<sup>1</sup>

<sup>1</sup>University of British Columbia, Canada; <sup>2</sup>University of Magdeburg, Germany; <sup>3</sup>Université Laval, Canada; <sup>4</sup>Vancouver Coastal Health Authority, Canada; <sup>5</sup>CHU de Quebec and Université Laval, Canada

### M10-11 Validation of Scatter Simulation in 3D and Count-Rate Dependent Component-Based Normalization for the HRRT

S. H. Keller<sup>1</sup>, C. Svarer<sup>1</sup>, M. Sibomana<sup>1,2</sup>

<sup>1</sup>Copenhagen University, Rigshospitalet, Denmark; <sup>2</sup>Sibomana Consulting, Belgium

### M10-12 Model-Based Correction for Artifacts Generated by Localized High-Intensity in a PET Scanner.

J. Huang<sup>1</sup>, T. Mou<sup>1</sup>, M. Muzi<sup>2</sup>, F. O'Sullivan<sup>1</sup>

<sup>1</sup>University College Cork, Ireland; <sup>2</sup>University of Washington, USA

### M10-13 Investigating the Influence of Baseline Drifts of Respiratory Signals in Amplitude-Based Gating for Positron Emission Tomography

F. Buether, M. Hess, K. P. Schaefers

European Institute for Molecular Imaging, Germany

### M10-14 Analysis of the Effects of Errors in Attenuation Maps on PET Quantitation in TOF PET

S. Ahn, L. Cheng, R. M. Manjeshwar, GE Global Research, USA

### M10-15 Model Based Corrections for the Reconstruction of Lu-176 Transmission Data

H. E. Rothfuss, V. Y. Panin, C. C. Watson, S. B. Siegel

Siemens Molecular Imaging, USA

### M10-16 PVA Cryogel Test Objects for Image-Based Quantification in Nuclear Medicine

S.-M. Gould<sup>1</sup>, G. M. Soutanidis<sup>2</sup>, P. K. Marsden<sup>2</sup>, L. Livieratos<sup>1</sup>

<sup>1</sup>Guy's and St Thomas' NHS Foundation Trust, UK; <sup>2</sup>King's College London, UK

### M10-17 Comparison of Transmission- and Emission-Based Attenuation Correction for TOF-PET/MRI

P. M. Mollet, S. Vandenberghe

MEDISIP GHENT UNIVERSITY iMinds Medical IT IBiTech, Belgium

### M10-18 Improved Intrinsic Motion Detection Using Time-of-Flight PET

J. Xu, B. M. W. Tsui, *Johns Hopkins University, USA*

**M10-19 Evaluation of Rigid Body Motion Compensation in Cardiac Perfusion SPECT Employing Polar Map Quantification**

P. H. Pretorius, K. L. Johnson, M. A. King  
*University of Massachusetts Medical School, USA*

**M10-20 Prerequisite of SPECT/CT Image Segmentation Approach Potentially Leading to Precise Absolute Quantification of Myocardial Focal Tracer Uptake: Phantom and Canine Validations**

Y.-H. Liu, S. Li  
*Yale University/Yale New Haven Hospital, USA*

**M10-21 A Generalized Scatter Reconstruction Algorithm for Limited Energy Resolution PET Detectors**

H. Sun<sup>1,2</sup>, S. Pistorius<sup>1,2</sup>  
<sup>1</sup>*University of Manitoba, Canada;* <sup>2</sup>*Cancercare Manitoba, Canada*

**M10-22 Motion Compensation (MoCo) for Simultaneous PET/MR Based on Strongly Undersampled Radial MR Data - a Simulation Study**

C. M. Rank, T. Heußer, M. Brehm, M. Kachelrieß  
*German Cancer Research Center (DKFZ), Germany*

**M10-23 Improved Spatial and Temporal Resolution of Gated Myocardial Perfusion PET Using Post Reconstruction Dual Respiratory and Cardiac Motion Compensation**

J. Wang<sup>1</sup>, L. Hu<sup>2</sup>, T. Feng<sup>1</sup>, J. Xu<sup>1</sup>, L. Shao<sup>2</sup>, B. Tsui<sup>1</sup>  
<sup>1</sup>*Johns Hopkins University, United States;* <sup>2</sup>*Philips Healthcare, United States*

**M10-24 Markerless PET Motion Correction: Tracking in Narrow Gantries Through Optical Fibres**

R. R. Jensen<sup>1</sup>, O. V. Olesen<sup>1</sup>, C. Benjaminsen<sup>1</sup>, L. Højgaard<sup>2</sup>, R. Larsen<sup>1</sup>  
<sup>1</sup>*The Technical University of Denmark, Denmark;* <sup>2</sup>*Copenhagen University Hospital, Denmark*

**M10-25 Comparison Between View Summing and View Pulsing in Ultra Low Dose CT Acquisitions for PET Attenuation Correction**

X. Rui, L. Cheng, A. Alessio, P. Kinahan, B. De Man  
*General Electric - Global Research, USA*

**M10-26 Data Driven Gating Using PCA for 4D PET/CT Reconstruction**

S. R. Thiruvengadam, *GE Global Research, India;* K. Thielemans, *King's College, United Kingdom;* R. Manjeshwar, *GE Global Research, USA*

**M10-27 General Expression Based Loop Unrolling Scheme for Real-Time Implementation of PAI**

J. Huang, C. Zhang, J. Ren, Y. Wang  
*Fudan University, China*

**M10-28 Acceleration of Sensitivity Map Calculation for PET Imaging Using Intel Xeon Phi Coprocessor**

T. Dey, P. Rodrigues, *Philips Research, the Netherlands*

**M10-29 Tensor based Dictionary Learning Approach for Dynamic CT Reconstruction**

S. Tan<sup>1,2,3</sup>, Y. Zhang<sup>4</sup>, G. Wang<sup>3</sup>, X. Mou<sup>4</sup>, Z. Wu<sup>1,2</sup>, H. Yu<sup>3</sup>  
<sup>1</sup>*Beijing Key Laboratory of Nuclear Detection & Measurement Technology, China;* <sup>2</sup>*Institute of Nuclear and New Energy Technology, Tsinghua University, China;* <sup>3</sup>*Department of Biomedical Engineering, Wake Forest University Health Sciences, USA;* <sup>4</sup>*Institute of Image Processing and Pattern Recognition, Xi'an Jiaotong University, China;* <sup>5</sup>*Biomedical Imaging Center/Cluster, CBIS, Dept. of BME, Rensselaer Polytechnic Institute, USA*

**M10-30 A 4D MAP Image Reconstruction Method for Emission Tomography Data Employing Mean-Shift Filtering for Denoising**

A. Ihsani, T. H. Farncombe, *McMaster University, Canada*

**M10-31 3D Model for Computing the System Response Matrix of an Hexagonal PET Scanner**

M. A. Belzunce<sup>1,2</sup>, C. A. Verrastro<sup>1,2</sup>  
<sup>1</sup>*CNEA, Argentina;* <sup>2</sup>*UTN-FRBA, Argentina*

**M10-32 A Concurrent, Object-Oriented API for Statistical Image Reconstruction**

E. R. Rannou, C. Giha, *Universidad de Santiago de Chile, Chile;* A. Iriarte, *Universidad San Pablo CEU, Spain*

**M10-33 Gated Reconstruction for PET Scan with Continuous Bed Motion**

J. Hu, V. Y. Panin, F. Kehren, M. E. Casey, *Siemens, USA*

**M10-34 Spatially Variant Resolution Modelling Using Redistributed Lines-of-Response and the Image Space Reconstruction Algorithm**

M. G. Bickell<sup>1</sup>, J. Gillam<sup>2</sup>, R. Fulton<sup>2</sup>, J. Nuyts<sup>1</sup>  
<sup>1</sup>*KULeuven, Belgium;* <sup>2</sup>*University of Sydney, Australia*

**M10-35 Could Simultaneous Reconstruction of Multiple Bed Positions Have Benefits in Whole-Body PET ?**

S. Stute, C. Comtat, *CEA/I2BM, France*

**M10-36 Image Quality Comparison of Reconstruction Using Total Variation-Based Regularizers**

J. Zhang<sup>1</sup>, S. Li<sup>2</sup>, E. Lipson<sup>1</sup>, C. Schmidtlein<sup>3</sup>, D. Feiglin<sup>4</sup>, Y. Xu<sup>2</sup>, A. Krol<sup>4</sup>  
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**M10-37 Revisit of the Ramp Filter**

G. Zeng<sup>1,2</sup>  
<sup>1</sup>*Weber State University, USA;* <sup>2</sup>*University of Utah, USA*

**M10-38 Dictionary Learning Based Panel PET Image Reconstruction**

X. Cao, X. Peng, Q. Xie

*Huazhong University of Science and Technology, China*

**M10-39 Efficient Bregman Iteration in Fully 3D PET**

L. Szirmay-Kalos, B. Toth, *Budapest University of Technology and Economics, Hungary*; G. Jakab, *Mediso Ltd., Hungary*

**M10-40 Joint Region-of-Interest Activity and Alignment Estimation in Emission Tomography**

J. L. Nuyts, A. Rezaei, *K.U.Leuven, Belgium, Belgium*

**M10-41 Comparison of Two Projectors with Image-Based Resolution Models in a Fully 3D List-Mode PET Reconstruction**

H. Ye<sup>1</sup>, X. Niu<sup>1</sup>, C. Ji<sup>1</sup>, T. Xia<sup>1</sup>, E. Asma<sup>1</sup>, M. Winkler<sup>2</sup>, W. Wang<sup>1</sup>, D. Gagnon<sup>1</sup>

<sup>1</sup>*Toshiba Medical Research Institute USA, Inc., United States*; <sup>2</sup>*Steinberg Diagnostic Medical Imaging, United States*

**M10-42 Low Frequency Cone-Beam Artifacts Reduction Using Iterative Reconstruction Algorithm**

Q. Tang, Z. Yu, D. Shi, S. Nakanishi

*Toshiba Medical Research Institute, USA, USA*

**M10-43 The Long Object Imaging Problem in Volumetric CT Using Iterative Reconstruction Algorithm, Revisited**

D. Shi, *Toshiba medical research institute, USA, Inc., USA*

**M10-44 Image Reconstruction Methods for I-123 DaTscan Imaging Using a Multi-Pinhole and Fan Collimator Dual-Headed SPECT System**

J. M. Mukherjee<sup>1</sup>, J. Dey<sup>2</sup>, M. King<sup>1</sup>

<sup>1</sup>*University of Massachusetts, United States*; <sup>2</sup>*Passport Systems Inc, US*

**M10-45 Preliminary Investigation on Algorithm-Enabled PET-Configuration Design**

Z. Zhang, B. Chen, C.-M. Kao, E. Y. Sidky, X. Pan

*University of Chicago, USA*

**M10-46 Performance of Primal-Dual Algorithms for Multi-Channel Image Reconstruction in Spectral X-Ray CT**

J. Niesen, A. Sawatzky

*Institute for Computational and Applied Mathematics, University of Muenster, Germany*

**M10-47 Detector Response Modeling with Asymmetric 2D Gaussian Functions for GPU-Based Image Reconstruction of the Whole-Body Dual-Ring OpenPET**

H. Tashima, E. Yoshida, T. Shinaji, T. Yamaya

*National Institute of Radiological Sciences, Japan*

**M10-48 An Efficient Ordered Subsets CT Image Reconstruction Algorithm for Sparse-View, Noisy Data**

S. Rose<sup>1</sup>, M. S. Andersen<sup>2</sup>, E. Y. Sidky<sup>1</sup>, X. Pan<sup>1</sup>

<sup>1</sup>*University of Chicago, USA*; <sup>2</sup>*Technical University of Denmark, Denmark*

**M10-49 Investigation of Super-Sampling Techniques with Blob-Based Super-Resolution Reconstructions for PET Imaging**

Y. Li, S. Matej, J. S. Karp, S. D. Metzler

*University of Pennsylvania, USA*

**M10-50 Basis-Image Reconstruction Directly from Sparse-View Data in Spectral CT**

B. Chen, Z. Zhang, X. Han, E. Sidky, X. Pan

*The University of Chicago, USA*

**M10-51 Improving Lesion Detectability in Breast Cancer by Optimizing PET Imaging Time**

K. A. Wangerin<sup>1,2</sup>, R. M. Manjeshwar<sup>2</sup>, L. M. Peterson<sup>1,3</sup>, M. Muzi<sup>1</sup>, F. O'Sullivan<sup>4</sup>, H. M. Linden<sup>3</sup>, D. M. Mankoff<sup>5</sup>, P. E. Kinahan<sup>1</sup>

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**M10-52 Direct EM Reconstruction of Kinetic Parameters from List-Mode Cardiac PET**

M. Germino, A. J. Sinusas, C. Liu, R. E. Carson

*Yale University, US*

**M10-53 Posterior Analysis of Compartmental Kinetic Modeling in PET**

A. Sitek<sup>1,2</sup>, M. F. Kijewski<sup>3,2</sup>, M.-A. Park<sup>3,2</sup>, H. Pan<sup>3,2</sup>, M. J. Coleman<sup>3</sup>, J. I. Epstein<sup>3,2</sup>, A. P. Belanger<sup>3,2</sup>, S. Dubey<sup>3,2</sup>, L. Leung<sup>3</sup>, M. Y. Giverc<sup>3</sup>, K. Green<sup>3</sup>, B. A. Dahlben<sup>3</sup>, E. S. Fredman<sup>3</sup>, R. L. Cohn<sup>3</sup>, S. Wang<sup>3</sup>, J. Semer<sup>3</sup>, W. Sticka<sup>3</sup>, K. Seaver<sup>3</sup>, J. M. Paolino<sup>3</sup>, G. El Fakhri<sup>1,2</sup>, R. D. Zafonte<sup>3,4,2</sup>, M. E. Shenton<sup>5,3,2</sup>, E. Stern<sup>3,2</sup>

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**M10-54 Comprehensive Modeling of Spatiotemporal FDG Distribution in Solid Tumors Based on the Diffusion-Convection-Reaction Equation**

M. Soltani, M. Sefidgar, M. E. Casey, R. M. Subramaniam, R. L. Wahl, A. Rahmim

*Johns Hopkins University, US*

**M10-55 CardioViewer: A Novel Modular Software Tool for Integrating Cardiac Electrophysiology Voltage Measurements and PET/SPECT Data**

M. F. Smith<sup>1</sup>, X. Gibert-Serra<sup>2</sup>, F. Arrate<sup>2</sup>, R. Chellappa<sup>2</sup>, K. Chodnicki<sup>1</sup>, J. Tian<sup>3</sup>, T. Dickfeld<sup>1</sup>, V. Dilsizian<sup>1</sup>

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**M10-56 Pressure Distribution Simplified Algorithm Using Plantar Scanned Images**

L. D. L. Narciso<sup>1,2</sup>, G. Chungath<sup>3</sup>

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<sup>3</sup>Centennial College, Canada

**M10-57 Alpha Divergence Based Registration of Dynamic Scans for MR Cystography**

H. Han<sup>1</sup>, Q. Lin<sup>2</sup>, L. Li<sup>3</sup>, C. Duan<sup>4</sup>, H. Li<sup>1</sup>, J. Fitzgerald<sup>1</sup>, Z. Liang<sup>1</sup>

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**M10-58 Modeling Amyloid Imaging Data to Determine an Ideal Cutoff and Reference Region**

S. L. Baker, S. Landau, S. Marks, Lawrence Berkeley National Lab, United States; W. J. Jagust, University of California, Berkeley, United States

**M10-59 DSP Based Real Time 3D Adaptive Filtering for Portable Medical Imaging Systems**

O. Bockenbach<sup>1</sup>, M. Ali<sup>2</sup>, I. Wainwright<sup>3</sup>, M. Nadeski<sup>1</sup>

<sup>1</sup>TechGmbh.com, Germany; <sup>2</sup>Texas Instruments, USA; <sup>3</sup>ContextVision, Sweden

**M10-60 Study on the Conformal Conversion in the Open Electrical Impedance Tomography**

P. M. Yan, J. H. Yao, R. A. Payne, H. J. Jia, L. Jin

Shanghai University, China

**M10-61 Ant Colony Segmentation Approach for Volume Delineation in PET**

M. Hafri, D. Visvikis, H. Fayad

INSERM UMR1101, Université de Bretagne Occidentale, LaTIM, France

**M10-62 Multiple Kernel Learning with Adaptive Kernel Method for Computer-Aided Detection of Colonic Polyps**

M. Ma<sup>1</sup>, H. Wang<sup>2</sup>, B. Song<sup>1</sup>, Y. Hu<sup>1</sup>, X. Gu<sup>1</sup>, Z. Liang<sup>1</sup>

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**M10-63 Automatic Detection of the Circular Region of Interest (ROI) for a Novel Patient Dose Reduction Technique in Fluoroscopic-Guided Interventions**

S. V. Setlur Nagesh, C. N. Ionita, D. R. Bednarek, S. Rudin

Toshiba Storke and Vascular Research Center, USA

**M10-65 Towards Dose Reduction for Dual-Energy CT: a Non-Local Image Optimization Method and Its Application**

J. Hao, National Energy Administration, China; L. Zhang, K. Kang, Tsinghua University, China

**M10-66 Spatial and Temporal Processing for Functional Imaging Probes**

M. Jin, C. Zhao, J. Yu, W. Chen, University of Texas at Arlington, USA; G. Hao, X. Sun, G. Balch, University of Texas Southwestern Medical Center, USA

**M10-67 The Development of a Tool to Semi-Automatically Perform Image Quality Evaluation**

F. Gao, G. Bal, D. Manthey, F. Kehren, C. Watson

Siemens Medical Solutions, USA

**M10-68 Line-Ratio Based Ring Artifact Removal in Computed Tomography**

Y. Kim, D. Hwang, Yonsei University, Korea

**M10-69 Weighted Retinex Algorithm Based on Histogram for Dental CT Image Enhancement**

T.-Y. YangDai, L. Zhang, Tsinghua University, China

**M10-70 Adaptive Filtering on Conditional Mutual Information for Intermodal Non-Rigid Image Registration**

J. Y. Song, J. A. Fessler, C. R. Meyer

University of Michigan, USA

**M10-71 Simulation Study of a Pinhole SPECT System with a Triple Head Gamma Camera**

Y. Ichimura, K. Ogawa

Graduate School of Engineering, Hosei University, Japan

**M10-72 Effect of Angular Distribution and Collection of Scintillation Photons on PET Detectors Timing Resolution**

E. Roncali<sup>1</sup>, C. L. Kim<sup>2</sup>, D. L. McDaniel<sup>2</sup>, C. Bircher<sup>3</sup>, S. R. Cherry<sup>1</sup>

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**M10-73 Monte Carlo Simulations of the GE Discovery Alcyone CZT SPECT system**

M. Ljungberg<sup>1</sup>, P. Fan<sup>2,3</sup>, C. Liu<sup>3</sup>, P. H. Pretorius<sup>4</sup>

<sup>1</sup>Lund University, Sweden; <sup>2</sup>Tsinghua University, China; <sup>3</sup>Yale University, USA; <sup>4</sup>University of Massachusetts Medical School, USA

**M10-74 A Heuristic Function for Modelling Scintillation Pulses and Other Phenomena of Interest in Medical Imaging**

S. B. Siegel, L. A. Eriksson, Siemens, USA; C. L. Melcher, University of Tennessee, USA

**M10-75 Simulations of a Combined Fan-Beam and Multi-Pinhole SPECT System for Clinical I-123 DaTscan Imaging**

A. Konik<sup>1</sup>, J. De Beenhouwer<sup>2</sup>, J. M. Mukherjee<sup>1</sup>, M. A. King<sup>1</sup>

<sup>1</sup>University of Massachusetts Medical School, USA; <sup>2</sup>University of Antwerp, Belgium

**M10-76 Monte Carlo Dose Simulation for Automatic Exposure Control Technique of CT System**

Y. Huh, J. Kim, J. Kim, C.-L. Lee, J. Jung, J. Yi, I. Seong

Health and Medical Equipment Business, Samsung Electronics Co., LTD., Korea

**M10-77 Geant4 and Beyond: Precision Physics Modeling and Validation**

M. G. Pia<sup>1</sup>, M. Batic<sup>2</sup>, M. Begalli<sup>3</sup>, M. C. Han<sup>4</sup>, S. Hau<sup>5</sup>, G. Hoff<sup>6</sup>, C. H. Kim<sup>4</sup>, H. S. Kim<sup>4</sup>, S. H. Kim<sup>4</sup>, M. Kuster<sup>5</sup>, P. Saracco<sup>1</sup>, G. Weidenspointner<sup>5</sup>

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**M10-78 Validation of Convolution Based Forced Detection SIMIND Using GATE**

M. I. Karamat<sup>1</sup>, T. H. Farncombe<sup>1,2</sup>

<sup>1</sup>McMaster University, Canada; <sup>2</sup>Hamilton Health Sciences, Canada

**M10-79 Automated PET Detector Optimization with a Genetic Algorithm**

B. McIntosh<sup>1</sup>, J. D. Fiege<sup>1,2</sup>, S. Pistorius<sup>1</sup>, A. L. Goertzen<sup>1</sup>

<sup>1</sup>University of Manitoba, Canada; <sup>2</sup>NQube Technical Computing, Canada

**M10-80 Monte Carlo Simulation of a Continuous Crystal Coupled to a SiPM Array**

A. Etxebeeste<sup>1</sup>, J. Cabello<sup>2</sup>, J. Barrio<sup>1</sup>, C. Lacasta<sup>1</sup>, J. F. Oliver<sup>1</sup>, M. Rafecas<sup>1</sup>, C. Solaz<sup>1</sup>, G. Llosá<sup>1</sup>

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**M10-81 Scatter Feature of a Positron Imager with Dual Plane Geometry**

Y. C. Ni<sup>1,2</sup>, K. S. Chuang<sup>2</sup>, H. H. Lin<sup>2</sup>, Z. K. Lin<sup>1</sup>, W. B. Lin<sup>1</sup>, J. C. Lin<sup>1</sup>, M. L. Jan<sup>1</sup>

<sup>1</sup>Institute of Nuclear Energy Research, Taiwan; <sup>2</sup>National Tsing-Hua University, Taiwan

**M10-82 Validation of GATE Optical Transportation with Experimental Single Scintillator Dual-End Readout Data**

Y. Zhang, H. Baghaei, W.-H. Wong

University of Texas MD Anderson Cancer Center, USA

**M10-83 A Simple Semi-Empirical Model for Positron Annihilation Non-Collinearity Based on quadHIDAC Measurements**

D. Vernekohl<sup>1</sup>, K. Schäfers<sup>2</sup>, J. Wessels<sup>1</sup>

<sup>1</sup>Institute for Nuclear Physics, WWU Muenster, Germany; <sup>2</sup>European Institute for Molecular Imaging, Muenster, Germany

**M10-84 Fast and Accurate Detector Module Crystal Blur and Mis-Position Error Modeling for PET Imaging**

T. Xia<sup>1</sup>, H. Du<sup>1</sup>, W. Wang<sup>1</sup>, K. Burr<sup>1</sup>, J. Zhou<sup>2</sup>, K. Balakrishnan<sup>1</sup>, H. Ye<sup>1</sup>, X. Niu<sup>1</sup>, C. Ji<sup>1</sup>, E. Asma<sup>1</sup>, J. Qi<sup>2</sup>, D. Gagnon<sup>1</sup>

<sup>1</sup>Toshiba Medical Research Institute USA, Inc., USA; <sup>2</sup>University of California Davis, USA

**M10-85 Comparison of Different Approaches for System Matrix Calculation for PET Systems with VP-PET Insert Detector**

S. A. Komarov, Y.-C. Tai

Washington University in St. Louis, USA

**M10-86 Simulation Study of a Novel SPECT Design Using a Variable Pinhole Collimator**

H. Lee, S. Bae, J. Bae, H. Cha, K. Lee

Korea University, Korea

**M10-87 MRI-Based Pseudo-CT Generation Using Sorted Atlas Images in Whole-Body PET/MRI**

H. Arabi, H. Zaidi

Division of Nuclear Medicine & Molecular Imaging, Switzerland

**M10-88 Sparse-View Image Reconstruction with Nonlocal Total Variation**

H. Zhang, B. Yan, L. Wang, L. Li, X. Xi, G. Hu

National Digital Switching System Engineering and Technological Research Center, China

**M10-89 Impact of Respiratory Motion Correction on Diagnostic Accuracy of Myocardial Perfusion SPECT**

I. Polycarpou<sup>1</sup>, I. Chrysanthou<sup>2</sup>, O. Demetriadou<sup>3</sup>, Y. Parpottas<sup>2,4</sup>, P. K. Marsden<sup>1</sup>, L. Livieratos<sup>1</sup>

<sup>1</sup>King's College London, UK; <sup>2</sup>Frederic Research Center, Cyprus; <sup>3</sup>Limassol General Hospital, Cyprus; <sup>4</sup>Frederic University Nicosia, Cyprus

**M10-90 Quantitative Performance of Iterative Algorithms, with and Without PSF and TOF, in the Conditions of a Dynamic Cardiac 13N-Ammonia Study.**

L. Presotto<sup>1,2</sup>, E. De Bernardi<sup>3</sup>, L. Gianolli<sup>2</sup>, M. Gilardi<sup>1</sup>, V. Bettinardi<sup>2</sup>

<sup>1</sup>National Research Council (CNR), Italy; <sup>2</sup>San Raffaele Scientific Institute, Italy; <sup>3</sup>Tecnomed Foundation, University of Milano Bicocca, Italy

**M10-91 The Application of KL Transform in Feature Extraction and Selection**

Y. Hu, B. Song, M. Ma, Z. Liang, Stony Brook University, US

**M10-92 Efficient Tracking of Active Marker for Head Motion Correction in Simultaneous PET-MR**

C. Huang<sup>1,2</sup>, T. G. Reese<sup>2,1</sup>, J. L. Ackerman<sup>2,1</sup>, Y. Petibon<sup>1</sup>, G. El Fakhri<sup>1,2</sup>, J. Ouyang<sup>1,2</sup>

<sup>1</sup>Massachusetts General Hospital, USA; <sup>2</sup>Harvard Medical School, USA

**M10-93 Accelerated Acquisition of Tagged MRI for Cardiac Motion Correction in Simultaneous PET-MR: a Phantom and Patient Study**

C. Huang<sup>1,2</sup>, Y. Petibon<sup>1</sup>, J. Ouyang<sup>1,2</sup>, T. G. Reese<sup>2,1</sup>, M. Ahlman<sup>3</sup>, D. Bluemke<sup>3</sup>, G. El Fakhri<sup>1,2</sup>

<sup>1</sup>Massachusetts General Hospital, USA; <sup>2</sup>Harvard Medical School, USA; <sup>3</sup>National Institutes of Health - Clinical Center, USA

**M10-94 A Novel Generalized Total Effective Entrapment Metric to Quantify Tumor Burden in PET Imaging for Clinical Outcome Prediction**

A. Rahmim<sup>1</sup>, C. R. Schmidlein<sup>2</sup>, A. Jackson<sup>2</sup>, S. Ashrafinia<sup>1</sup>, C. Marcus<sup>1</sup>, M. Soltani<sup>1</sup>, R. Subramaniam<sup>1</sup>

<sup>1</sup>Johns Hopkins University, USA; <sup>2</sup>Memorial Sloan-Kettering Cancer Center, USA

**M10-95 Simultaneous Monitoring of PET Image Resolution, Noise, Uniformity and Quantitative Accuracy Using Uniform Cylinder Phantom Measurements in the Multi-Center Setting**

A. Rahmim, M. A. Lodge, A. H. Crabb, Y. Zhou, D. F. Wong, R. F. Gottesman

Johns Hopkins University, USA

#### **M10-96 Real-Time PET Reconstruction**

L. Hong, W. Luk, V. Panin, C. Watson, F. Kehren, M. Casey  
Siemens Healthcare, USA

#### **M10-97 Ultrafast Elastic Motion Correction via Motion Deblurring**

L. Hong, J. Jones, M. Casey, Siemens Medical Solutions, USA

### **M11 MIC Poster Session I - System & Detector Instrumentation I**

Thursday, Nov. 13 14:00-15:30 4B

Session Chairs: **Robert S. Miyaoka**, University of Washington, United States  
**Yuan-Chuan Tai**, Washington University in St. Louis, United States  
**Chin-Tu Chen**, The University of Chicago, United States

#### **M11-1 On Reconstructed PET Image Resolution and the Block Effect**

L. A. Eriksson<sup>1,2,3</sup>, S. Siegel<sup>1</sup>, M. Conti<sup>1</sup>

<sup>1</sup>Siemens Medical Solutions, Molecular Imaging, USA; <sup>2</sup>Scintillation Materials Research Center, USA; <sup>3</sup>University of Stockholm, Sweden

#### **M11-2 A Digital PET System based on SiPMs and FPGA-only MVT Digitizers**

D. Xi<sup>1,2</sup>, C. Zeng<sup>1</sup>, X. Mei<sup>1</sup>, L. Wan<sup>1,3</sup>, X. Liang<sup>1</sup>, W. Liu<sup>1</sup>, X. Liu<sup>1</sup>, H. Kim<sup>4</sup>, P. Xiao<sup>1,3</sup>, C.-M. Kao<sup>4</sup>, Q. Xie<sup>1,3</sup>

<sup>1</sup>Huazhong University of Science & Technology, China; <sup>2</sup>Raycan Technology Co., Ltd (Suzhou), China; <sup>3</sup>Wuhan National Laboratory for Optoelectronic, China; <sup>4</sup>University of Chicago, US

#### **M11-3 Evaluation of <sup>57</sup>Co Flood Source Purity with PET**

F. P. DiFilippo, Cleveland Clinic, USA

#### **M11-4 Examination of Spatial Covariance Characteristics in a Collection of 3-D PET scanners used in Clinical Imaging Trials**

T. Mou<sup>1</sup>, J. Huang<sup>1</sup>, B. Elston<sup>2</sup>, P. Kinahan<sup>2</sup>, M. Muzi<sup>1</sup>, A. Opanowski<sup>3</sup>, Y. Zhang<sup>1</sup>, F. O'Sullivan<sup>1</sup>

<sup>1</sup>University College Cork, Ireland; <sup>2</sup>University of Washington, USA; <sup>3</sup>ACRIN, USA

#### **M11-5 A PET/MR Compatible Device for Production of Radiowater**

H. T. Sipilä<sup>1</sup>, V. Haaslahti<sup>2</sup>, V. Saunavaara<sup>1</sup>, M. Teras<sup>1</sup>

<sup>1</sup>Turku University Hospital, Finland; <sup>2</sup>Hidex Oy, Finland

#### **M11-6 Disjunct Matrices for Multiplexing PET Detector Signal Readout**

G. Chinn<sup>1,2</sup>, C. S. Levin<sup>1,2,3,4</sup>

<sup>1</sup>Stanford School of Medicine, USA; <sup>2</sup>Molecular Imaging Program at Stanford, USA; <sup>3</sup>Stanford University, USA; <sup>4</sup>Stanford University, USA

#### **M11-7 Development of a Singles-Based Scalable Data Acquisition System for the Whole-Body OpenPET**

E. Yoshida<sup>1</sup>, K. Shimizu<sup>2</sup>, T. Shinaji<sup>1</sup>, F. Nishikido<sup>1</sup>, T. Yamaya<sup>1</sup>

<sup>1</sup>National Institute of Radiological Sciences, Japan; <sup>2</sup>Hamamatsu photonics. K.K., Japan

#### **M11-8 Development of the New Method of Measuring ToF with MPPC**

T. Tsujikawa, J. Kataoka, T. Ambe, T. Fujita, Y. Kurei, T. Nishiyama, Waseda Univ., Japan; S. Nakamura, T. Kato, Hamamatsu Photonics K.K., Japan

#### **M11-9 3-D Photon Impact Determination Using Fitting Approaches to the Light Distribution**

P. Conde<sup>1</sup>, A. J. González<sup>1</sup>, A. Iborra<sup>1</sup>, C. Correcher<sup>2</sup>, L. Hernández<sup>1</sup>, P. Bellido<sup>1</sup>, E. Crespo<sup>1</sup>, J. P. Rigla<sup>1</sup>, M. J. Rodríguez-Álvarez<sup>1</sup>, F. Sánchez<sup>1</sup>, M. Seimetz<sup>1</sup>, A. Soriano<sup>1</sup>, L. F. Vidal<sup>1</sup>, J. M. Benlloch<sup>1</sup>

<sup>1</sup>Instituto de Instrumentación para Imagen Molecular (I3M), Spain; <sup>2</sup>Oncovision, GEM Imaging S.A., Spain

#### **M11-10 Continuous Bed Motion in TOF PET: Finer Planar Sampling and Axial Image Resolution**

W. F. Jones, W. Luk, Siemens Medical Solutions, USA

#### **M11-11 ROCSTAR: Data Acquisition Electronics for TOF PET**

B. C. LeGeyt, W. J. Ashmanskas, J. Dormer, S. Krishnamoorthy, J. S. Karp, S. Surti  
university of pennsylvania, USA

#### **M11-12 Comparative Timing Measurements of LYSO and LFS to Achieve the Best Coincidence Time Resolution for Time Of Flight-PET.**

K. Doroud<sup>1</sup>, A. Rodriguez<sup>1,2</sup>, M. C. S. Williams<sup>1,3</sup>, A. Zichichi<sup>1,2,3</sup>, R. Zuyewski<sup>1,2</sup>

<sup>1</sup>CERN, Switzerland; <sup>2</sup>World Laboratory, Switzerland; <sup>3</sup>INFN, Italy

#### **M11-13 Maximum Likelihood Estimation of Inter-Crystal Scattering events for Light Sharing PET Detectors**

K. Shinohara<sup>1</sup>, M. Suga<sup>1</sup>, E. Yoshida<sup>2</sup>, F. Nishikido<sup>2</sup>, N. Inadama<sup>2</sup>, H. Tashima<sup>2</sup>, T. Yamaya<sup>2,1</sup>

<sup>1</sup>Chiba University, Japan; <sup>2</sup>National Institute of Radiological Sciences, Japan

#### **M11-14 Evaluation of SiPM Photodetectors for Use in Phoswich Detectors**

G. R. Schellenberg<sup>1</sup>, A. L. Goertzen<sup>1,2</sup>

<sup>1</sup>University of Manitoba, Canada; <sup>2</sup>

#### **M11-15 Depth of Interaction Calibration and Capabilities in 2x2 Discrete Crystal Arrays and Digital Silicon Photomultipliers**

A. L. Lehnert, W. C. J. Hunter, T. K. Lewellen, R. S. Miyaoka

University of Washington, USA

**M11-16 Development of 3D-PET with wavelength shifting fiber**

H. Ito, S. Han, S. Iijima, H. Kawai, S. Kodama, D. Kumogoshi  
*Graduate School of Science, Chiba Univ., Japan*

**M11-17 Experimental and Theoretical Study of Positron Emission Tomography for Multiple Molecular Imaging**

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**M11-18 phenoPET: a Dedicated PET Scanner for Plant Research Based on Digital SiPMs (DPCs)**

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**M11-19 Optimisation of IQ-SPECT in Myocardial Perfusion Imaging: Comparison with Conventional SPECT and Echocardiography Imaging**

E. Joel, Y. Bouchareb, A. Haroon, M. Luqman, M. S. Newell, H. Jan  
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**M11-20 Comparison of SBP and TMBP Positioning Algorithms Implemented on an FPGA Platform for Continuous Miniature Crystal Element PET Detectors**

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**M11-21 High Sensitivity Collimators for Optimising Lesion Detection in SPECT Images**

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**M11-22 Timing Performance of a Time-of-Flight PET System Based on High Quantum Efficiency MA-PMT and FPGA-Based TDC**

J.-W. Son, J. Y. Won, G. B. Ko, H. S. Yoon, J. S. Lee  
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**M11-23 Multiplexing Silicon Photomultiplier (SiPM) Arrays for SPECT**

D. M. Khan, T. H. Farncombe, *McMaster University, Canada*

**M11-24 Evaluation of Stationary and Semi-Stationary Acquisitions in a Dual-Head Multi-Pinhole System for Myocardial Perfusion SPECT**

P. Yan, L. Chen, G. S. P. Mok, *University of Macau, China*

**M11-25 Progress in Scalable PET System for Plant Biology**

S. Lee, H. Dong, J. McKisson, J. E. McKisson, A. G. Weisenberger  
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**M11-26 A Compact SiPM Photodetector Array for SPECT Applications**

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**M11-27 Firmware and Software Framework of OpenPET Electronics System for Radiotracer Imaging**

Q. Peng, G. M. M. Netscher, J. S. Huber, C. Q. Vu, W. Moses, W.-S. Choong  
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**M11-28 Simulations, Testing and Results for the Pixelation of LYSO Crystals for Gamma Detectors Using SSLE Techniques**

G. D. Konstantinou<sup>1</sup>, R. Chil<sup>1</sup>, J. Ripoll<sup>1,2</sup>, J. M. Udias<sup>3</sup>, M. Desco<sup>1,2</sup>, J. J. Vaquero<sup>1,2</sup>  
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**M11-29 Quantitative Evaluation of Improved Detector Scatter Correction for Wire Chamber based Small Animal PET Scanners**

M. Dawood, D. Vernekohl, F. Buether, F. Wuebbeling, K. P. Schaefers  
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**M11-30 Characterization of a Linearly-Graded Silicon Photomultiplier (LG-SiPM) for High Resolution Small-Animal PET**

J. Du<sup>1</sup>, Y. Yang<sup>1</sup>, X. Bai<sup>1</sup>, A. Gola<sup>2</sup>, C. Piemonte<sup>2</sup>, S. R. Cherry<sup>1</sup>  
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**M11-31 Implanting a Simple Device to Facilitate Longitudinal Quantitative MicroPET Imaging in Rat**

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**M11-32 Optimization of Axial Helical Movement Sampling Parameters for an Animal SPECT with Slit-Slat Collimator**

S. Wang<sup>1,2</sup>, R. Yao<sup>3</sup>, T. Ma<sup>1,2</sup>  
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**M11-33 PET Reconstruction of Freely-Moving Mice Comprising Registration-Based Motion-Correction of Internal Structures**

D. Mannweiler, J. Rasch, S. Schmid, F. Wübbeling, K. P. Schäfers  
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**M11-34 Development of MR Compatible Small Animal PET Insert Utilizing High Resolution Event Positioning Circuit**

S. Lee, Y. Choi, J. H. Jung, J. Choi  
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**M11-35 Extraction of High-Contrast Anatomical Elements in Small-Animal X-Ray Tomosynthesis**

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**M11-36 Phantom-Based Correction of Geometric Distortions in Whole-Body Small Animal PET-MRI Using 3D Thin-Plate Splines**

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**M11-38 Towards a High-Resolution Full-Ring Small-Animal PET Based on Continuous LYSO Crystals and SiPMs**

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**M11-39 A Comparison of Position-Sensitive Avalanche Photodiode and Silicon Photomultiplier Readout of Dual-Ended Depth Encoding Detectors for Small-Animal PET**

Y. Yang<sup>1</sup>, T. Zhang<sup>1</sup>, J. Du<sup>1</sup>, X. Bai<sup>1</sup>, J. P. Schmall<sup>2</sup>, P. A. Dokhale<sup>2</sup>, J. Christian<sup>2</sup>, M. McClish<sup>2</sup>, K. S. Shah<sup>2</sup>, R. Farrell<sup>2</sup>, S. R. Cherry<sup>1</sup>

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**M11-40 A 4-Channel Continuous Depth of Interaction PET Detector Based on SiPMs**

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**M11-41 A DOI Detector with Scatter Identification Capability for High Sensitivity, High Spatial Resolution PET Imaging**

Z. Gu, D. L. Prout, R. W. Silverman, H. Herman, A. Dooraghi, A. F. Chatziioannou

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**M11-42 Preliminary results of a depth encoding PET detector with wavelength-shifting (WLS) fibers and SiPM**

S. J. An, H.-I. Kim, C. Y. Lee, S.-J. Lee, H. K. Song, J. Lee, Y. H. Chung

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**M11-43 Characterization of an Ultra-High-Resolution PET Detector Composed of an 8 × 8 TSV-MPPC Array One-to-One Coupled to 1.2-mm Pitch LFS Crystals**

R. Yamada, A. Saito, H. Uchida, T. Omura, T. Miwa, M. Watanabe

Hamamatsu Photonics K.K., Japan

**M11-44 A New Concept for High Resolution PET Imaging Using Temporal Information**

A. Iltis, Damavan Imaging, France; H. Snoussi, University of Technology of Troyes, France

**M11-45 Feasibility of Re-188 Imaging Using a Small Animal SPECT/PET/CT System, the VECTor/CT**

P. L. Esquinas, M. Shirmohammad, U. O. Häfeli, V. Sossi, A. Celler

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**M11-46 Synthetic Sampling for Region of Interest (ROI) Imaging Using an Ultrahigh Resolution Stationary SPECT System**

L.-J. Meng, X.-C. Lai

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**M11-47 Building a Better MoUSE Trap**

R. S. Miyaoka, W. C. Hunter, A. L. Lehnert

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**M11-48 Sub-Millimeter PET Detector Based on Monolithic LYSO and Digital Photon Counter for Dedicated Small-Animal System**

R. Marcinkowski, R. Van Holen, S. Vandenberghe

MEDISIP, Ghent University-IMinds-IBiTech, Belgium

**M11-49 Initial Results and Performance Analyses of a Sub-mm Spatial Resolution Small Animal PET Scanner**

B. Ravindranath<sup>1</sup>, J. Wen<sup>1</sup>, A. J. Mathews<sup>1</sup>, K. Li<sup>1</sup>, D. Tomov<sup>1</sup>, D. Catherall<sup>2</sup>, J. A. O'Sullivan<sup>1</sup>, Y.-C. Tai<sup>1</sup>

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**M11-50 Preliminary Investigation of CBCT Imaging Optimization for Image-Guided Radiation Therapy**

J. Bian, G. Sharp, Y. Park, T. Bortfeld, G. El Fakhri

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**M11-51 Comparison of Filtered Backprojection and Iterative Reconstruction for Proton CT Using Most Likely Paths**

S. Rit, Université de Lyon, France; D. C. Hansen, Aarhus University, Denmark

**M11-52 Monitoring Hadron and Y90 Therapies: PET Reconstruction at Extremely Low Counts**

M. Conti<sup>1</sup>, V. Panin<sup>1</sup>, I. Hong<sup>1</sup>, T. Carlier<sup>2</sup>, K. Parodi<sup>3,4</sup>

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**M11-53 High Rate Silicon Tracker for Proton Computed Tomography**

T. Kawasaki, T. Izumikawa, J. Goto, Niigata University, Japan; Y. Saraya, National Institute of Radiological Science, Japan

**M11-54 Image-Based Retrospective 4D MRI for Different Anatomical Orientations**

C. Paganelli<sup>1</sup>, P. Summers<sup>2</sup>, M. Bellomi<sup>2,3</sup>, G. Baroni<sup>1,4</sup>, M. Riboldi<sup>1,4</sup>

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**M11-55 Development of a dSiPM-based in-room PET system for heavy ion beam range verification**

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**M11-56 Beam Model Inclusion into Compton Camera Image Reconstruction**

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**M11-57 Commissioning of a Compton Camera Prototype with Electron Tracking Capability**

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**M11-58 A Three Layer Compton Telescope for Dose Monitoring in Hadron Therapy**

M. Trovato<sup>1</sup>, P. Solevi<sup>1</sup>, J. Barrio<sup>1</sup>, J. Cabello<sup>2</sup>, J. E. Gillam<sup>3</sup>, C. Lacasta<sup>1</sup>, J. F. Oliver<sup>1</sup>, M. Rafecas<sup>1,4</sup>, C. Solaz<sup>1</sup>, V. Stankova<sup>5</sup>, I. Torres-Espallardo<sup>1</sup>, G. Llosá<sup>1</sup>

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**M11-59 Diamond Dosimeter Array for Radiotherapy Beam Imaging**

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**M11-60 A Compact in-Beam PET Prototype for Treatment Monitoring: First Tests at CNAO**

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**M11-61 Effects of High Photon Fluence from Therapeutic Radionuclides on Preclinical and Clinical PET Systems**

M. Dahlbom<sup>1</sup>, E. Mellhammar<sup>2</sup>, J. Axelsson<sup>2</sup>, T. Tran<sup>2</sup>, S.-E. Strand<sup>1,2</sup>

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**M11-62 Development of a Large Field-of-View Alpha-Particle Imaging System for Alpha Radionuclide Therapy Using Si-PM Arrays**

Y. Morishita, S. Yamamoto, Nagoya University, Japan; K. Izaki, Japan Atomic Energy Agency, Japan; J. H. Kaneko, K. Toi, Y. Tsubota, Hokkaido University, Japan

**M11-63 Results from a Pre-Clinical Head Scanner for Proton CT**

R. P. Johnson, T. Plautz, H. F.-W. Sadrozinski, Senior Member IEEE, A. Zatserklyaniy, University of California, Santa Cruz, USA; K. E. Schubert, Senior Member IEEE, M. Witt, B. Schultze, Baylor University, USA; V. Bashkurov, R. F. Hurley, R. Schulte, N. Vence, Loma Linda University Medical Center, USA; V. Giacometti, University of Wollongong, Australia

**M11-64 Projection-Based Deformable Registration for Tomographic Imaging in Ion Beam Therapy**

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**M11-65 Proton Radiography with Timepix-Based Time Projection Chambers**

J. Visser, M. van Beuzekom, T. Klaver, Nikhef, The Netherlands; S. Brandenburg, A. K. Biegun, N. Ghazanfari, M.-J. van Goethem, KVI-CART, The Netherlands

**M11-66 Patient Positioning in Radiotherapy Using Time-of-Flight (ToF) Cameras.**

M. Gilles<sup>1</sup>, H. Fayad<sup>1,2</sup>, P. Miglierini<sup>3</sup>, N. Bousson<sup>1,3</sup>, O. Pradier<sup>3</sup>, S. Scheib<sup>4</sup>, L. Cozzi<sup>4</sup>, D. Visvikis<sup>1</sup>

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**M11-67 Particle Range Retrieval in Heterogeneous Phantoms with the Prompt Gamma Timing Method at a Clinical Proton Accelerator**

F. Hueso-Gonzalez<sup>1</sup>, C. Golnik<sup>1</sup>, M. Berthel<sup>1</sup>, A. Dreyer<sup>1</sup>, W. Enghardt<sup>1,2</sup>, F. Fiedler<sup>2</sup>, K. Heidel<sup>2</sup>, G. Janssens<sup>3</sup>, T. Kormoll<sup>1</sup>, J. Petzoldt<sup>1</sup>, D. Prieels<sup>3</sup>, M. Prieognitz<sup>2</sup>, K. E. Roemer<sup>2</sup>, J. Smeets<sup>3</sup>, M. Sobiella<sup>2</sup>, F. Vander Stappen<sup>3</sup>, A. Wagner<sup>2</sup>, D. Weinberger<sup>2</sup>, G. Pausch<sup>1</sup>

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**M11-68 Handheld Scintillation Gamma Locator for Radionuclide Diagnostics**

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**M11-69 Development of a dual-head mobile DOI-TOF PET system having multi-modality compatibility**

Y. Yamakawa, T. Kobayashi, M. Furuta, M. Sato, J. Ohi, H. Tonami, T. Furumiya, T. Tsuda, M. Nakazawa, N. Hashizume, K. Kitamura  
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**M11-70 Quality Control of the LYSO Crystal Matrices, MPPC Arrays, and the Assembled MPPC-Crystal Modules for the External Plate of the EndoTOFPET-US System**

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**M11-71 FPGA-Based Fast Gamma-Ray Time Mark Estimator for Ultra-Miniature Endoscopic PET Applications**

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**M11-72 An Intraoperative Positron Imaging Probe Based on Silicon Photomultipliers Dedicated to the Control of Tumor Margins During Radioguided Cancer Surgery**

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**M11-73 Intraoperative beta- Detecting Probe for Radio-Guided Surgery of Brain Tumors**

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**M11-74 A Compact Detector Module for Time of Flight PET and the Associated DAQ System**

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**M11-75 Implementation of Compton Endoscope with Ohmic-Type Semiconductor Detectors for Intra-operative Lymph Node Metastasis Detection**

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**M11-76 Development of a GSO Dual-Layer Phoswich Intraoperative Positron Probe for the Use of Radio-Guided Surgery**

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**M11-77 A Feasibility Study of Intraoperative near-Infrared Fluorescence and Gamma Imaging System with CCD Camera**

H. G. Kang<sup>1</sup>, G. C. Hong<sup>1,2</sup>, H. S. Lee<sup>1</sup>, H. Y. Lee<sup>3</sup>, K. M. Kim<sup>3</sup>, S. J. Hong<sup>1</sup>

<sup>1</sup>Eulji University, Korea; <sup>2</sup>Samsung Medical Center, Korea; <sup>3</sup>Seoul Nat'l University College of Medicine, Korea; <sup>4</sup>Korea Institute of Radiological and Medical Science, Korea

**M11-78 A Feasibility Study of PET/MRI Insert Detector Using Strip-Line and Waveform Sampling Data Acquisition**

H. Kim<sup>1</sup>, C.-T. Chen<sup>1</sup>, N. Eclou<sup>1</sup>, A. Ronzhin<sup>2</sup>, E. Ramberg<sup>2</sup>, S. Los<sup>2</sup>, P. Murat<sup>2</sup>, A. M. Wyrwicz<sup>3</sup>, L. Li<sup>3</sup>, H.-T. Chen<sup>1</sup>, C.-M. Kao<sup>1</sup>

<sup>1</sup>University of Chicago, United States; <sup>2</sup>Fermi National Accelerator Laboratory, United States; <sup>3</sup>NorthShore University HealthSystem Research Institute, United States

**M11-79 MR Performance Comparison of a PET/MR System Before and After SiPM-Based Time-of-Flight PET Detector Insertion**

M. M. Khalighi<sup>1</sup>, G. Delso<sup>2</sup>, S. H. Maramraju<sup>1</sup>, T. W. Deller<sup>1</sup>, C. S. Levin<sup>3</sup>

<sup>1</sup>GE Healthcare, USA; <sup>2</sup>GE Healthcare, CH; <sup>3</sup>Stanford University, USA

**M11-80 Attenuation Correction Maps for PET/MR Brain Images Based on Neural Network with Multimodal Input Information**

E. Rota Kops<sup>1</sup>, A. F. Santos Ribeiro<sup>2</sup>, N. A. da Silva<sup>1</sup>, H. Hautzel<sup>3</sup>, N. J. Shah<sup>1</sup>

<sup>1</sup>Research Center Juelich, Germany; <sup>2</sup>Imperial College London, UK; <sup>3</sup>Heinrich-Heine-University Duesseldorf, Germany

**M11-81 A Novel Brain PET Insert for the MINDView Project**

A. J. Gonzalez<sup>1</sup>, F. Sanchez<sup>1</sup>, P. Conde<sup>1</sup>, S. Aussenhofer<sup>2,3</sup>, D. Gareis<sup>2</sup>, R. Pani<sup>4</sup>, R. Pellegrini<sup>4</sup>, M. Bettiol<sup>4</sup>, A. Fabbri<sup>4</sup>, S. Majewski<sup>5</sup>, A. Stolin<sup>5</sup>, J. Bert<sup>6</sup>, D. Visvikis<sup>6</sup>, J. M. Benlloch<sup>1</sup>

<sup>1</sup>Institute for Instrumentation in Molecular Imaging, Spain; <sup>2</sup>NORAS MRI products GmbH, Germany; <sup>3</sup>C.J. Gorter Center for High Field MRI, The Netherlands; <sup>4</sup>Sapienza University of Rome, Italy; <sup>5</sup>West Virginia University, USA; <sup>6</sup>Université de Bretagne Occidentale, France

**M11-82 Basic Evaluation of Three-Dimensional Position Sensitive CdTe Detector Unit for Clinical Use of Ultra-High Resolution Human PET Scanner**

S. Takyu, K. Ishii, Y. Kikuchi, A. Terakawa, S. Matsuyama, A. Ahmed, T. Matsuyama

*Tohoku University, JAPAN*

**M11-83 Precise Timing Resolution Measurements of GSO Scintillators with Different Ce Concentration Combined with Silicon Photomultipliers**

S. Yamamoto<sup>1</sup>, N. Kato<sup>1</sup>, J. Y. Yeom<sup>2</sup>, T. Kobayashi<sup>1</sup>, S. Okumura<sup>1</sup>, N. Shimura<sup>3</sup>, H. Ishibashi<sup>3</sup>

<sup>1</sup>Nagoya University Graduate School of Medicine, Japan; <sup>2</sup>Kumoh National Institute of Technology, South Korea; <sup>3</sup>Hitachi Chemical, Japan

**M11-84 New Dry Process to Fabricate Anodes on CZT Detectors for Improving Performances and Long-Term Reliability and Stability**

A. Shahar, P. Rusian, G. Yaron, J. Levy

*GE Healthcare DCD-CoE, Israel*

**M11-85 Design, Simulation, and Fabrication of a "Smart" Active Pixel Sensor for High-Resolution and Low-Dose X-Ray Imaging**

H. Ou<sup>1</sup>, L. Wang<sup>1</sup>, J. Chen<sup>1</sup>, K. Wang<sup>2,3</sup>

<sup>1</sup>Sun Yan-sen University, China; <sup>2</sup>Sun Yan-sen University-Carnegie Mellon University Joint Institute of Engineering, China; <sup>3</sup>Sun Yan-sen University-Carnegie Mellon University Shunde International Joint Research Institute, China

**M11-87 HEMT-Based Photon-Counting Energy-Resolving Ultra-Fast X-Ray Detector with Improved Sensitivity**

M. G. Ertosun, C. S. Levin, *Stanford University, USA*

**M11-88 Comparative Study of Differently Fabricated Novel Ceramic Garnet Scintillators (GLuGAG:Ce) for Positron Emission Tomography**

S. I. Kwon<sup>1</sup>, S. Takyu<sup>1</sup>, G. Baldoni<sup>2</sup>, Y. Wang<sup>2</sup>, M. S. Judenhofer<sup>1</sup>, Y. Yang<sup>1</sup>, K. S. Shah<sup>2</sup>, S. R. Cherry<sup>1</sup>

<sup>1</sup>University of California, Davis, USA; <sup>2</sup>Radiation Monitoring Devices, Inc., USA

**M11-89 Development of a SiPM Based MR-Compatible DOI-TOF-PET Detector**

T. Furumiya, T. Tsuda, H. Tonami, M. Satoh, M. Nakazawa, J. Ohi, K. Kitamura

Shimadzu Corporation, Japan

**M11-90 Development of a Gamma-Ray Detector Based on 1mm Pixel GAGG:Ce Scintillators Coupled to a Silicon Photomultiplier Array**

S. L. David<sup>1</sup>, M. Georgiou<sup>2</sup>, E. Fysikopoulos<sup>3</sup>, G. Loudos<sup>1</sup>

<sup>1</sup>Technological Educational Institute (TEI) of Athens, Greece; <sup>2</sup>University of Thessaly, Greece; <sup>3</sup>National Technical University of Athens, Greece

**M11-92 The Focal Spot Model Based High Spatial Resolution Iterative Reconstruction Method for a Dual-Focus CT**

M. Chang<sup>1,2</sup>, Y. Xiao<sup>1,2</sup>, Z. Chen<sup>1,2</sup>

<sup>1</sup>Tsinghua University, China; <sup>2</sup>Ministry of Education, China

**M11-93 A Non-Destructive Scattering Technique for Measurement of Pulmonary Edema and Mandibular Bone Density**

B. S. Sandhu, Punjabi University, India

**M11-94 Large View X-Ray Imaging for Oversized Sample with the Grating Interferometry**

X. Zhu<sup>1,2</sup>, L. Zhang<sup>1,2</sup>, X. Jiang<sup>1,2</sup>, R. Zhang<sup>1,2</sup>

<sup>1</sup>Tsinghua University, China; <sup>2</sup>Key Laboratory of Particle and Radiation Imaging (Tsinghua University), Ministry of Education, China

**M11-95 An Image-Based Approach for Reducing Metal Artifacts in CT**

R. D. Pua, G. Cho, S. Cho, KAIST, South Korea

**M11-97 Statistical Analysis of External Respiratory Motion Using Microsoft Kinect**

F. Tahavori, K. Wells, University of Surrey, UK

**M11-99 Pre-Clinical AuNP Cone-Beam Spectral Tomography Imaging Assessment Using Pixelated CdZnTe Detectors and Voxellised Mouse Models**

M. E. Myronakis, S. Nill, J. Bamber, U. Oelfke, D. G. Darambara

Institute of Cancer Research, UK

**M11-100 Comparative Morphology of 3D microCT Imaging of Internal Structures of Rhodnius Prolixus Head Using Different Fixation Methods**

G. S. Souza<sup>1</sup>, L. P. Nogueira<sup>2</sup>, A. P. Almeida<sup>2</sup>, D. Braz<sup>1</sup>, M. S. Gonzalez<sup>3</sup>, P. Azambuja<sup>4</sup>, R. Nagata<sup>5</sup>, P. J. Reis<sup>5</sup>, F. Lopes<sup>5</sup>, C. R. Appoloni<sup>5</sup>, R. C. Barroso<sup>2</sup>

<sup>1</sup>Federal University of Rio de Janeiro, Brazil; <sup>2</sup>State University of Rio de Janeiro, Brazil; <sup>3</sup>Federal Fluminense University, Brazil; <sup>4</sup>Oswaldo Cruz Institute, Brazil; <sup>5</sup>State University of Londrina, Brazil

**M11-101 Dense Motion Propagation from Sparse Samples for Free Breathing Respiratory Motion Modelling**

R. L. Smith<sup>1</sup>, P. Dasari<sup>2</sup>, C. Lindsay<sup>2</sup>, M. King<sup>2</sup>, K. Wells<sup>1</sup>

<sup>1</sup>University of Surrey, UK; <sup>2</sup>University of Massachusetts Medical School, USA

**M11-102 Scanning Setup for X-Ray Phase-Contrast Grating Interferometry Using a Tilted Grating**

C. Arboleda<sup>1,2</sup>, Z. Wang<sup>1</sup>, M. Stampanoni<sup>1,2</sup>

<sup>1</sup>Paul Scherrer Institute, Switzerland; <sup>2</sup>ETH, Switzerland

**M11-103 Improved Quantification of Chemical Exchange Saturation Transfer (CEST) MRI by Nonlocal Means**

J. Yuan, Hong Kong Sanatorium & Hospital, China; G. S. P. Mok, University of Macau, China; Q. Zhang, Y.-X. Wang, The Chinese University of Hong Kong, China; J. Zhou, Johns Hopkins University, USA

**M11-104 Calibration and Data Standardization of a Prototype Bench-Top Preclinical CT**

R. Taschereau<sup>1</sup>, N. T. Vu<sup>2</sup>, A. F. Chatziioannou<sup>1</sup>

<sup>1</sup>University of California Los Angeles, USA; <sup>2</sup>Sofie Biosciences, USA

**M11-105 Development of K-Edge Spectral Tomography Using XPAD3 Composite Pixels**

C. Kronland-Martinet, F. Cassol, A. Bonissent, Y. Boursier, M. Dupont, C. Morel, Aix-Marseille University, CNRS/IN2P3, France; F. Debarbieux, Aix-Marseille University, CNRS/INSB, France

**M11-106 Joint Estimation of Linear Attenuation Coefficients and Tissue Types for Single-Energy CT**

K. Taguchi, Johns Hopkins University, USA; K. Nakada, K. Amaya, Tokyo Institute of Technology, Japan

**M11-107 Development of Calibration Phantoms for Generating Quantitative Perfusion Images Using 2D Angiography Data**

T. Sakaguchi, Toshiba Medical Systems Corporation, Japan; T. Natsume, Y. Kanamori, T. Ichihara, Fujita Health University, Japan

**M11-108 Characterization of a Compressed Sensing PET Detector and DAQ: Effects of Multiplexing and Sampling Rate**

C.-M. Chang, A. M. Grant, B. J. Lee, S. Cui, C. S. Levin

Stanford University, USA

**M11-109 Analysis of Phosphor-Coated Crystal Arrays: Towards a Block Detector for TOF-DOI PET**

E. J. Berg, E. Roncali, V. Viswanath, S. R. Cherry

University of California, Davis, USA

**M11-110 Design and Initial Performance Evaluation of DbPET/CT 2.1, a Second Generation Breast PET/CT Prototype**

A. Ferrero<sup>1</sup>, Q. Peng<sup>2</sup>, B. Sumanasema<sup>1</sup>, J. Zhou<sup>1</sup>, G. W. Burkett Jr.<sup>1</sup>, W. W. Moses<sup>2</sup>, R. D. Badawi<sup>1</sup>

<sup>1</sup>University of California, Davis, United States; <sup>2</sup>Lawrence Berkeley National Laboratory, United States

### **M11-111 Influence of Scattering on Material Quantification Using Multi-Energy X-Ray Imaging**

A. Sossin<sup>1</sup>, V. Rebuffel<sup>1</sup>, J. Tabary<sup>1</sup>, J.-M. Létang<sup>2</sup>, N. Freud<sup>2</sup>, L. Verger<sup>1</sup>

<sup>1</sup>CEA-LETI, France; <sup>2</sup>University of Lyon, France

### **M11-112 Improved Performance and High Fill Factor TSV Packaged SiPM**

C. Jackson, K. O'Neill, L. Wall, B. McGarvey

SensL, Ireland

### **M11-113 Timing Optimization for Digital PET Detector Module based on FPGA-Only MVT Digitizers**

C. Zeng<sup>1</sup>, D. Xi<sup>1,2</sup>, W. Liu<sup>1</sup>, X. Mei<sup>1</sup>, X. Liu<sup>1</sup>, H. Kim<sup>3</sup>, P. Xiao<sup>1,4</sup>, C.-M. Kao<sup>3</sup>, Q. Xie<sup>1,4</sup>

<sup>1</sup>Huazhong University of Science & Technology, China; <sup>2</sup>Raycan Technology Co., Ltd (Suzhou), China; <sup>3</sup>University of Chicago, US; <sup>4</sup>Wuhan National Laboratory for Optoelectronic, China

### **M11-114 Maximization of Digital Photon Counter Efficiency When Using Neighbor Logic**

G. Stortz<sup>1</sup>, F. Retiere<sup>2</sup>, A. L. Goertzen<sup>3</sup>, M. S. Khan<sup>3</sup>, P. Kozlowski<sup>1</sup>, E. Shams<sup>3</sup>, J. D. Thiessen<sup>4</sup>, C. J. Thompson<sup>5</sup>, V. Sossi<sup>1</sup>

<sup>1</sup>University of British Columbia, Canada; <sup>2</sup>TRIUMF, Canada; <sup>3</sup>University of Manitoba, Canada; <sup>4</sup>Lawson Health Research Institute, Canada; <sup>5</sup>McGill University, Canada

### **M11-115 Design and Assemble a Novel Block Detector for Whole-Body PET System**

H. Shi, D. Du, Tsinghua University, China; J. Xu, B. Xu, Huazhong University of Science and Technology, China; Q. Huang, Shanghai Jiaotong

University, China; Q. Peng, Lawrence Berkeley National Laboratory, USA

### **M11-116 A Full-Ring Prototype PET-MRI System Based on Four-Layer DOI-PET Detectors Integrated with a RF Coil**

E. Nishikido<sup>1</sup>, K. Shimizu<sup>2</sup>, M. Suga<sup>2</sup>, N. Inadama<sup>1</sup>, E. Yoshida<sup>1</sup>, H. Tashima<sup>1</sup>, T. Obata<sup>1</sup>

<sup>1</sup>National Institute of Radiological Sciences, Japan; <sup>2</sup>Chiba University, Japan

### **M11-117 Real-Time Monitoring System of Skin Dose Distribution in Interventional Radiology Using Organic Photo Diodes Combined to Plastic Scintillator**

E. Nishikido<sup>1</sup>, E. Takada<sup>2</sup>, T. Moritake<sup>3</sup>, T. Yamaya<sup>1</sup>

<sup>1</sup>National Institute of Radiological Sciences, Japan; <sup>2</sup>Toyama National College of Technology, Japan; <sup>3</sup>University of Occupational and Environmental Health, Japan

### **M11-118 Collimator Design for Cardiac SPECT with Iterative Reconstruction**

J. Strologas<sup>1</sup>, S. Metzler<sup>2</sup>, X. Zheng<sup>2</sup>, W. Chang<sup>1</sup>

<sup>1</sup>Rush University Medical Center, USA; <sup>2</sup>university of pennsylvania, USA

### **M11-119 Development of a High-Performance Compact Stationary Prototype Small Animal PET with DOI Measurement**

X. Sun<sup>1</sup>, K. Lou<sup>1</sup>, Z. Deng<sup>2</sup>, Y. Shao<sup>1</sup>

<sup>1</sup>UT MD Anderson Cancer Center, USA; <sup>2</sup>Tsinghua University, China

### **M11-120 Gain, Cross Talk, after Pulse and Dark Counts of MPPCs in 7T Magnetic Fields**

Y. Hirano, D. Kokuryo, F. Nishikido, N. Inadama, I. Aoki, T. Yamaya

Department of Biophysics Molecular Imaging Center National Institute of Radiological Sciences, Japan

### **M11-121 Inter-Period Large Phase-Stepping Approach for X-Ray Grating-Based Imaging**

X. Jiang<sup>1,2</sup>, L. Zhang<sup>1,2</sup>, R. Zhang<sup>1,2</sup>, X. Zhu<sup>1,2</sup>

<sup>1</sup>Tsinghua University, China; <sup>2</sup>Key Laboratory of Particle and Radiation Imaging (Tsinghua University), Ministry of Education, China

### **M11-122 X-Ray Dark-Field Tomography of Biological Samples with the Grating Interferometry**

X. Jiang, L. Zhang, R. Zhang, X. Zhu

Tsinghua University, China

### **M11-123 Geometrical Calibration Method for X-Ray Intraoral Digital Tomosynthesis**

Y. Yang, L. Li, Z. Chen, M. Chang

Tsinghua University, China

## **M13 Other Medical Imaging Modalities**

Thursday, Nov. 13 16:00-18:00 6A

Session Chairs: **Seungryong Cho**, KAIST, South Korea  
**Xiaochuan Pan**, The University of Chicago, United States

### **M13-1 (16:00) Single Shot X-Ray Phase Contrast Imaging Using Charge Integrating Detectors with Single Photon Sensitivity**

M. Kಾಗias<sup>1,2</sup>, S. Cartier<sup>1,2</sup>, Z. Wang<sup>2</sup>, A. Bergamaschi<sup>2</sup>, M. Stampanoni<sup>1,2</sup>

<sup>1</sup>University and ETH Zurich, Switzerland; <sup>2</sup>Paul Scherrer Institut, Switzerland

### **M13-2 (16:15) Shading Correction for Grating-based Differential Phase Contrast X-Ray Imaging**

S. Kaeppler, J. Wandner, T. Weber, A. Maier, G. Anton, J. Hornegger, C. Riess

Friedrich-Alexander-University Erlangen-Nuremberg, Germany

### **M13-3 (16:30) Stimulated Emission Tomography for Mapping and Region-of-Interest Quantification of Trace Metals in Biological Samples**

A. Groll<sup>1</sup>, J. George<sup>1</sup>, P. La Riviere<sup>2</sup>, L.-J. Meng<sup>1</sup>

<sup>1</sup>University of Illinois at Urbana-Champaign, USA; <sup>2</sup>University of Chicago, USA

**M13-4 (16:45) A Magnetic Relaxometry Apparatus for Early Cancer Detection**

R. B. Pahlka, K. B. Mathieu, J. D. Hazle  
*MD Anderson Cancer Center, USA*

**M13-5 (17:00) Hybrid Decomposition Method for Dual Energy CT**

L. Shen<sup>1</sup>, Y. Xing<sup>2,3</sup>, L. Zhang<sup>2,3</sup>, Q. Huang<sup>1</sup>, X. Jin<sup>1</sup>

<sup>1</sup>*Nuctech Company Limited, China*; <sup>2</sup>*Key Laboratory of Particle & Radiation Imaging (Tsinghua University), Ministry of Education, China*; <sup>3</sup>*Tsinghua University, China*

**M13-6 (17:15) A Silicon-Strip Detector for Photon-Counting Spectral CT**

B. Huber, H. Bornefalk, H. Chen, M. Danielsson, S. Karlsson, X. Liu, M. Persson, C. Xu  
*Royal Institute of Technology, Sweden*

**M13-7 (17:30) Evaluation of a Model of Spectral Distortions from Spectral Response Effects and Pulse Pileup Effects in Photon-Counting Detectors for CT**

J. Cammin<sup>1</sup>, S. Kappler<sup>2</sup>, T. Weidinger<sup>2</sup>, K. Taguchi<sup>1</sup>

<sup>1</sup>*The Johns Hopkins University, School of Medicine, USA*; <sup>2</sup>*Siemens Healthcare, Germany*

**M13-8 (17:45) Initial Validation of Model Observers for Microcalcification Detection in Dedicated Breast CT**

A. A. Sanchez, E. Y. Sidky, X. Pan

*University of Chicago, USA*

**M12 Student Paper Competition**

Thursday, Nov. 13 16:00-18:00 6B

Session Chairs: **Georges El Fakhri**, Harvard Medical School and Massachusetts General Hospital, United States  
**Steven R. Meikle**, University of Sydney, Australia

**M12-1 (16:00) Hybrid Pixel-Waveform (HPWF) CdTe and CZT Detectors for Sub-500 Um Resolution PET Imaging Systems**

A. Groll, Z.-M. Shen, L.-J. Meng

*University of Illinois at Urbana-Champaign, USA*

**M12-2 (16:15) Novel Collimation for Simultaneous SPECT/MRI**

D. Salvado<sup>1</sup>, K. Erlandsson<sup>1</sup>, A. Bousse<sup>1</sup>, P. van Mullekom<sup>2</sup>, B. F. Hutton<sup>1,3</sup>

<sup>1</sup>*University College London, UK*; <sup>2</sup>*Nuclear Fields, The Netherlands*; <sup>3</sup>*University of Wollongong, Australia*

**M12-3 (16:30) Collimator Design for a Multi-Pinhole Brain SPECT Insert for MRI**

K. Van Audeghaege, C. Vanhove, S. Vandenberghe, R. Van Holen

*University of Ghent - iMinds Medical IT, Belgium*

**M12-4 (16:45) Proton Beam Range Verification Through Prompt Gamma-Ray Spectroscopy**

J. M. Verburg, M. Testa, T. Bortfeld, J. Seco

*Harvard Medical School and Massachusetts General Hospital, MA*

**M12-5 (17:00) MR-Based Motion Correction in Simultaneous Cardiac PET-MR: in-Vivo Studies**

Y. Petibon<sup>1</sup>, C. Huang<sup>1</sup>, T. G. Reese<sup>1</sup>, M. D. Normandin<sup>1</sup>, M. Ahlman<sup>2</sup>, D. Bluemke<sup>2</sup>, J. Ouyang<sup>1</sup>, G. El Fakhri<sup>1</sup>

<sup>1</sup>*Center for Advanced Medical Imaging Sciences, Massachusetts General Hospital, USA*; <sup>2</sup>*National Institutes of Health, USA*

**M12-6 (17:15) Joint Reconstruction of PET-MRI by Parallel Level Sets**

M. J. Ehrhardt, K. Thielemans, L. Pizarro, P. Markiewicz, D. Atkinson, S. Ourselin, B. F. Hutton, S. R. Arridge

*University College London, United Kingdom*

**M12-7 (17:30) Task-Based Resolution Modeling in Penalized Maximum-Likelihood PET Image Reconstruction**

L. Yang, J. Zhou, J. Qi

*University of California Davis, USA*

**M12-8 (17:45) Monte Carlo Simulations of a Cherenkov-Only PET Detector Block with 6-Sided-Readout**

I. Somlai-Schweiger, S. I. Ziegler

*Nuklearmedizinische Klinik und Poliklinik, Klinikum rechts der Isar, Technische Universität München, Germany*

**M15 Imaging in Radio- & Hadrontherapy**

Friday, Nov. 14 08:00-10:00 6A

Session Chairs: **Taiga Yamaya**, National Institute of Radiological Sciences, Japan  
**Stefaan Vandenberghe**, Ghent University, Belgium

**M15-1 (08:00) Proton Computed Tomography: Beyond the Stopping Power**

C. Bopp, R. Rescigno, M. Rousseau, D. Brasse

*IPHC - CNRS, France*

**M15-2 (08:15) Simulation and Testing of Thin Microstrip Silicon Dosimeters for the Microbeam Radiation Therapy**

M. Povoli<sup>1</sup>, E. Alagoz<sup>2</sup>, A. Bravin<sup>3</sup>, I. Cornelius<sup>4</sup>, E. Brauer-Krisch<sup>3</sup>, P. Fournier<sup>4</sup>, T.-E. Hansen<sup>5</sup>, A. Kok<sup>5</sup>, M. Lerch<sup>4</sup>, E. Monakhov<sup>1</sup>, J. Morse<sup>3</sup>, M. Petasecca<sup>4</sup>, H. Requardt<sup>3</sup>, A. Rosenfeld<sup>4</sup>, D. Rohrich<sup>2</sup>, H. Sandaker<sup>2</sup>, B. Stugu<sup>2</sup>, B. G. Svensson<sup>1</sup>  
<sup>1</sup>University of Oslo, Norway; <sup>2</sup>University of Bergen, Norway; <sup>3</sup>European Synchrotron Radiation Facility (ESRF), France; <sup>4</sup>University of Wollongong, Australia; <sup>5</sup>SINTEF, Norway

#### **M15-3 (08:30) Robust and Unbiased Data Processing Algorithms for Optimized Ion Radiography**

I. Rinaldi<sup>1</sup>, N. Krah<sup>2</sup>, S. Brons<sup>3</sup>, B. Voss<sup>4</sup>, K. Parodi<sup>1</sup>

<sup>1</sup>Heidelberg University Hospital / Ludwig-Maximilian University Munich, Germany; <sup>2</sup>Heidelberg Collaboratory for Image Processing, Heidelberg University, Germany; <sup>3</sup>Heidelberg Ion Therapy Center, Germany; <sup>4</sup>GSI Helmholtz Center for Heavy Ion Research, Germany

#### **M15-4 (08:45) Development of a PET System Based on New Concept: the Gap-PET for in-Beam Imaging Application**

S. Yamamoto<sup>1</sup>, S. Okumura<sup>1</sup>, T. Watabe<sup>2</sup>, H. Ikeda<sup>2</sup>, Y. Kanai<sup>2</sup>, T. Toshito<sup>3</sup>, M. Komori<sup>1</sup>, H. Watabe<sup>4</sup>, K. Kato<sup>1</sup>, J. Hatazawa<sup>2</sup>

<sup>1</sup>Nagoya University Graduate School of Medicine, Japan; <sup>2</sup>Osaka University Graduate School of Medicine, Japan; <sup>3</sup>Nagoya Proton Therapy Center, Japan; <sup>4</sup>Tohoku University CYRIC, Japan

#### **M15-5 (09:00) Clinical Investigations of a 4D ML Reconstruction Strategy for PET-Based Treatment Verification In Ion Beam Therapy**

C. Gianoli<sup>1,2</sup>, R. Ricotti<sup>1</sup>, E. De Bernardi<sup>3</sup>, M. Riboldi<sup>1,4</sup>, J. Bauer<sup>2</sup>, J. Debus<sup>2</sup>, G. Baroni<sup>1,4</sup>, K. Parodi<sup>2,5</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>Heidelberg University Hospital, Germany; <sup>3</sup>University of Milano-Bicocca, Italy; <sup>4</sup>National Center for Oncologic Hadrontherapy (CNAO Foundation), Italy; <sup>5</sup>Ludwig Maximilians University, Germany

#### **M15-6 (09:15) In-Vivo Monitoring of Proton Therapy with PET: Biological Considerations**

K. Grogg, N. Alpert, X. Zhu, M. Testa, P. Harald, T. Bortfeld, G. El Fakhri

Massachusetts General Hospital, United States

#### **M15-7 (09:30) In Vivo Neutron Treatment Verification Using Positron Emission Tomography (PET)**

R. D. Stewart<sup>1</sup>, D. C. Argento<sup>1</sup>, M. Muzi<sup>1</sup>, R. S. Miyaoka<sup>1</sup>, M. J. Nyflor<sup>1</sup>, F. O'Sullivan<sup>1,2</sup>

<sup>1</sup>University of Washington, USA; <sup>2</sup>University College Cork, Ireland

#### **M15-8 (09:45) Whole-Body Dual-Ring OpenPET for in-Beam Particle Therapy Imaging**

T. Yamaya<sup>1,2</sup>, E. Yoshida<sup>1</sup>, H. Tashima<sup>1</sup>, N. Inadama<sup>1</sup>, F. Nishikido<sup>1</sup>, Y. Hirano<sup>1</sup>, Y. Nakajima<sup>1</sup>, T. Shinaji<sup>1</sup>, M. Nitta<sup>1,2</sup>, M. Suga<sup>2</sup>, H. Haneishi<sup>2</sup>, K. Masuda<sup>3</sup>, K. Shimizu<sup>3</sup>, S. Sato<sup>1</sup>, T. Inaniwa<sup>1</sup>, H. Ito<sup>1</sup>

<sup>1</sup>National Institute of Radiological Sciences, Japan; <sup>2</sup>Chiba University, Japan; <sup>3</sup>Hamamatsu Photonics K.K., Japan

### **M14 Data Corrections and Quantitative Imaging Techniques I**

Friday, Nov. 14 08:00-10:00 6B

Session Chairs: Irene Buvat, IMNC France,

Tom K. Lewellen, University of Washington, United States

#### **M14-1 (08:00) ML Estimation of the Scatter Scaling in TOF PET**

M. Defrise, K. Salvo, Vrije Universiteit Brussel, Belgium; A. Rezaei, J. Nuyts, Siemens Healthcare, USA; V. Panin, M. Casey, Katholieke Universiteit Leuven, Belgium

#### **M14-2 (08:15) Detector Efficiency Calibration from Clinical Listmode TOF PET Data**

M. E. Werner, J. S. Karp, University of Pennsylvania, USA

#### **M14-3 (08:30) Reconstruction of a Motion and Attenuation Corrected Activity Distribution in Gated TOF-PET**

A. Rezaei<sup>1</sup>, M. Defrise<sup>2</sup>, J. Nuyts<sup>1</sup>

<sup>1</sup>KU Leuven, Belgium; <sup>2</sup>Vrije Universiteit Brussel, Belgium

#### **M14-4 (08:45) A Sparse Transmission Method for PET Attenuation Correction in the Head**

C. C. Watson, V. Y. Panin

Siemens Healthcare Molecular Imaging, USA

#### **M14-5 (09:00) Non-Rigid Event-by-Event Motion Correction for PET with Motion-Dependent PSF**

C. Chan, Y. Jian, M. Germino, R. E. Carson, C. Liu

Yale University, USA

#### **M14-6 (09:15) A Simultaneous Dual-Isotope I-131/In-111 Quantitative SPECT Reconstruction Method and Validation with Monte Carlo Simulation**

J. Yue<sup>1</sup>, Y. Du<sup>1</sup>, X. Rong<sup>2</sup>, R. F. Hobbs<sup>1</sup>, G. Sgouros<sup>1</sup>, R. L. Wahl<sup>1</sup>, E. C. Frey<sup>1</sup>

<sup>1</sup>Johns Hopkins University, United States; <sup>2</sup>Siemens Medical Systems, United States

#### **M14-7 (09:30) Quantification of Local Reconstruction Accuracy for Helical CT with Motion Correction**

T. Sun<sup>1</sup>, R. Clackdoyle<sup>2</sup>, R. Fulton<sup>3,4</sup>, J. Nuyts<sup>1</sup>

<sup>1</sup>Katholieke Universiteit Leuven, Belgium; <sup>2</sup>CNRS and Université Jean Monnet, France; <sup>3</sup>University of Sydney, Australia; <sup>4</sup>Westmead Hospital, Australia

#### **M14-8 (09:45) Data-Driven Dual-Gating for Cardiac PET**

K. Thielemans<sup>1</sup>, P. Schleyer<sup>2</sup>, P. K. Marsden<sup>2</sup>, J. Teuho<sup>3</sup>, M. Teras<sup>3</sup>, V. Bettinardi<sup>4</sup>, L. Menezes<sup>5</sup>, R. M. Manjeshwar<sup>6</sup>, C. W. Stearns<sup>7</sup>

<sup>1</sup>University College London, UK; <sup>2</sup>King's College London, UK; <sup>3</sup>Turku University Hospital, Finland; <sup>4</sup>Scientific Institute Ospedale San Raffaele, Italy; <sup>5</sup>University College London Hospitals, UK; <sup>6</sup>GE Research, USA; <sup>7</sup>GE Healthcare, USA

## M17 SPECT, TOF-PET Instrumentation II

Friday, Nov. 14 10:30-12:00 6A

Session Chairs: **Suleman Surti**, University of Pennsylvania, United States  
**Georges El Fakhri**, Harvard Medical School and Massachusetts General Hospital, United States

### M17-1 (10:30) Assessing the Performance of the C-SPECT Cardiac SPECT/Tct System: First Results from a Partial Section

M. Rozler<sup>1</sup>, K. Popovic<sup>1</sup>, S. Poopalasingam<sup>1</sup>, J. Strologas<sup>1</sup>, X. Zheng<sup>2</sup>, S. Metzler<sup>2</sup>, W. Chang<sup>1</sup>

<sup>1</sup>Rush University Medical Center, USA; <sup>2</sup>university of pennsylvania, USA

### M17-2 (10:45) Characterization of Signal Shapes in Stacked Crystal Detector Designs for TOF-DOI

J. P. Schmall<sup>1</sup>, S. Surti<sup>1</sup>, P. A. Dokhale<sup>2</sup>, K. S. Shah<sup>2</sup>, J. S. Karp<sup>1</sup>

<sup>1</sup>University of Pennsylvania, US; <sup>2</sup>Radiation Monitoring Devices, US

### M17-3 (11:00) Simultaneous Activity and Crystal Efficiencies Reconstruction: TOF Patient Based Detector Quality Control

V. Y. Panin, Siemens Healthcare, USA

### M17-4 (11:15) The Minimum Achievable Timing Resolution with High-Aspect-Ratio Scintillation Detectors for Time-of-Flight PET

J. W. Cates, R. Vinke, C. S. Levin

Stanford University, USA

### M17-5 (11:30) Precise Timing Measurements of Lutetium Based Scintillators Combined with Silicon Photomultipliers for TOF-PET Systems

S. Yamamoto<sup>1</sup>, N. Kato<sup>1</sup>, J. Y. Yeom<sup>2</sup>, T. Kobayashi<sup>1</sup>, S. Okumura<sup>1</sup>, N. Shimura<sup>3</sup>, H. Ishibashi<sup>3</sup>

<sup>1</sup>Nagoya University Graduate School of Medicine, Japan; <sup>2</sup>Kumoh National Institute of Technology, South Korea; <sup>3</sup>Hitachi Chemical, Japan

### M17-6 (11:45) Tests on Scalability of a Strip-line based TOF PET Signal Readout Method

H. Kim<sup>1</sup>, C.-T. Chen<sup>1</sup>, N. Eclou<sup>1</sup>, A. Ronzhin<sup>2</sup>, E. Ramberg<sup>2</sup>, S. Los<sup>2</sup>, P. Murat<sup>2</sup>, C.-M. Kao<sup>1</sup>

<sup>1</sup>University of Chicago, United States; <sup>2</sup>Fermi National Accelerator Laboratory, United States

## M16 Signal and Image Processing

Friday, Nov. 14 10:30-12:00 6B

Session Chairs: **Quanzheng Li**, MGH, Harvard Medical School, United States  
**Andrew J. Reader**, McGill University, Canada

### M16-1 (10:30) Numerical Observer for Objective Assessment on Carotid Plaque Using Spectral CT

A. Lorskul<sup>1,2</sup>, G. El Fakhri<sup>1</sup>, J. Ouyang<sup>1</sup>, W. Worstell<sup>1,3</sup>, Y. Rakvongthai<sup>1</sup>, A. F. Laine<sup>2</sup>, Q. Li<sup>1</sup>

<sup>1</sup>Massachusetts General Hospital, Harvard Medical School, USA; <sup>2</sup>Columbia University, USA; <sup>3</sup>PhotoDiagnostic System Inc., USA

### M16-2 (10:45) Comparison of the Scanning Linear Estimator (SLE) and ROI Uptake Estimation for Quantitative <sup>111</sup>In-Octreotide SPECT Imaging of Signals Embedded in Random Backgrounds

A. Konik<sup>1</sup>, M. Kupinski<sup>2</sup>, P. H. Pretorius<sup>1</sup>, M. A. King<sup>1</sup>, H. H. Barrett<sup>2</sup>

<sup>1</sup>University of Massachusetts Medical School, United States; <sup>2</sup>University of Arizona, United States

### M16-3 (11:00) Impact of Anatomical Noise on Model Observers for Prostate SPECT

A. Sen, F. Kalantari, H. C. Gifford

University of Houston, USA

### M16-4 (11:15) No-Gold-Standard Methods for Objective Evaluation of Reconstruction Methods for Quantitative SPECT Imaging

A. K. Jha, E. C. Frey, Johns Hopkins University, United States; N. Song, Yeshiva University, United States

### M16-5 (11:30) Vectorial Total Variation Smoothing for Myocardial Blood Flow Estimation in Dynamic CT

D. Modgil<sup>1</sup>, D. S. Rigie<sup>1</sup>, M. D. Bindschadler<sup>2</sup>, A. M. Alessio<sup>2</sup>, P. J. La Riviere<sup>1</sup>

<sup>1</sup>University of Chicago, USA; <sup>2</sup>University of Washington, USA

### M16-6 (11:45) Texture and Shape Analysis on High and Low Spatial Resolution Emission Images

S. A. L. Blinder<sup>1</sup>, I. Klyuzhin<sup>1</sup>, M. E. Gonzalez<sup>2</sup>, A. Rahmim<sup>3</sup>, V. Sossi<sup>1</sup>

<sup>1</sup>University of British Columbia, Canada; <sup>2</sup>Vancouver Coastal Health Authority, Canada; <sup>3</sup>Johns Hopkins Medical Institutions, USA

## M18 MIC Poster Session II - Data Analysis & Image Generation II

Friday, Nov. 14 14:00-15:30 4B

Session Chairs: **Stephen C. Moore**, Brigham & Women's Hospital, United States  
**Kris Thielemans**, University College London, United Kingdom  
**David Brasse**, CNRS - IPhC, France

### M18-1 An Effect of Time of Flight (TOF) Information on Normalization Components in Positron Emission Tomography (PET)

M. Aykac, V. Panin, I. Hong, M. E. Casey

Siemens Molecular Imaging, USA

### M18-2 Joint Estimation of Activity and Attenuation in PET/MR Using MR-Constrained Gaussian Priors

A. Mehranian<sup>1</sup>, H. Zaidi<sup>1,2,3</sup>

<sup>1</sup>Geneva University Hospital, Switzerland; <sup>2</sup>University of Geneva, Switzerland; <sup>3</sup>University of Groningen, Netherlands

**M18-3 Evaluation of a Local Respiratory Motion Correction (LRMC) for Oncological and Cardiac PET/CT Imaging**

F. Lamare, P. Fernandez, Univ. Bordeaux, INCIA, UMR 5287, France; D. Visvikis, INSERM UMR 1101, LaTIM, Université de Bretagne occidentale, France

**M18-4 Comparison of Single-Scatter Simulation and Monte Carlo Single-Scatter Simulation on Philips Ingenuity TF PET/MR**

J. Teuho<sup>1</sup>, J. Johansson<sup>1</sup>, M. Teräs<sup>1,2</sup>

<sup>1</sup>Turku PET Centre, Finland; <sup>2</sup>Department of Medical Physics, Finland

**M18-5 Quantitative Assessment of Induced Errors in Attenuation Corrected Myocardial SPECT Images Due to Misregistration**

H. Babaeifar, H. Rajabi, Tarbiat Modares University, Iran; A. Sen, F. Kalantari, University of Houston, USA

**M18-6 4-D PET/MR with Volumetric Navigators**

S. Pedemonte<sup>1,2</sup>, C. Catana<sup>1</sup>, D. Tisdall<sup>1</sup>, K. Van Leemput<sup>1,2</sup>

<sup>1</sup>Massachusetts General Hospital, USA; <sup>2</sup>Aalto University, Finland

**M18-7 MR-Based PET Attenuation Correction Through the Generation of Pseudo-CT Data from a Single MRI Sequence**

F. Monnier<sup>1</sup>, H. Fayad<sup>1</sup>, J. Bert<sup>1</sup>, J. Lapuyade-Lahorgue<sup>1</sup>, P. Veit-Haibach<sup>2</sup>, G. Delso<sup>2</sup>, D. Visvikis<sup>1</sup>

<sup>1</sup>LaTIM, INSERM UMR 1101, France; <sup>2</sup>University Hospital Zurich, Switzerland

**M18-8 PET/MR Motion Correction with Image-Based ITK Motion Estimation**

M. Botelho<sup>1</sup>, L. Caldeira<sup>2</sup>, J. J. Scheins<sup>2</sup>, N. Matela<sup>1</sup>, E. Rota Kops<sup>2</sup>, N. J. Shah<sup>2</sup>

<sup>1</sup>Instituto de Biofísica e Engenharia Biomédica, Faculdade de Ciências, Universidade de Lisboa, Portugal; <sup>2</sup>Institute of Neuroscience and Medicine (INM-4), Forschungszentrum Jülich, Germany

**M18-9 Calibration and Dead Time Correction for a PET Scanner with Variable Geometry**

I. P. Almeida, IST, Portugal; N. C. Ferreira, FMUC / ICNAS, Portugal; C. Ortigão, R. Bugalho, J. Varela, LIP, Portugal

**M18-10 Quantitative Analysis in Preliminary Lung Phantom SPECT/CT Studies**

J. L. Zhang, W. McDougald, R. S. Miyaoka, P. E. Kinahan, T. K. Lewellen, H. Vesselle

University of Washington, United States

**M18-11 Advanced Arc Correction to Improve Sinogram Consistency and Increase Contrast in Analytic and Statistical PET Reconstruction**

G. Stortz, M. D. Walker, I. Klyuzhin, V. Sossi

University of British Columbia, Canada

**M18-12 Spatially-Variant Positron Range Correction in 3D PET Imaging**

J. Cal-Gonzalez<sup>1</sup>, J. Lopez-Herraiz<sup>2</sup>, M. Perez-Liva<sup>1</sup>, J. J. Vaquero<sup>3</sup>, M. Desco<sup>3,4</sup>, J. M. Udias<sup>1</sup>

<sup>1</sup>Universidad Complutense de Madrid, Spain; <sup>2</sup>Madrid-MIT M+Vision Consortium, USA; <sup>3</sup>Universidad Carlos III de Madrid, Spain; <sup>4</sup>Hospital General Universitario Gregorio Marañón. CIBERSAM, Spain

**M18-13 Quantitative Signature of Coronary Steal in a Patient with Occluded Coronary Arteries Supported by Collateral Circulation Using Dynamic SPECT**

U. Shrestha, E. H. Botvinick, Y. Yeghiazarians, Y. Seo, Univ of California, San Francisco, USA; G. T. Gullberg, Lawrence Berkeley National Laboratory, USA

**M18-14 Accuracy of Respiratory Motion Compensated Image Reconstruction Using 4DPET-Derived Deformation Fields**

J. Dutta, M. Chelala, X. Shao, A. Lorsakul, Q. Li, G. El Fakhri

Harvard Medical School, Massachusetts General Hospital, USA

**M18-15 Propagation of Errors in Motion Field Estimation During PET Motion Correction**

I. Polycarpou, D. Peressutti, A. P. King, A. J. Reader, P. K. Marsden

King's College London, UK

**M18-16 Motion Modulated Sensitivity Internal Gating for Quantitative PET**

K. S. Lee, D. H. Hristov

Stanford University School of Medicine, United States

**M18-17 Impact of CT Attenuation Correction Method on 4D-PET/CT Activity Recovery under Respiratory Motion with an Anthropomorphic Lung Phantom**

T.-C. E. Lee<sup>1</sup>, M. J. Nyflor<sup>1</sup>, S. R. Bowen<sup>1</sup>, A. M. Alessio<sup>1</sup>, S. D. Wollenweber<sup>2</sup>, C. Stearns<sup>2</sup>, P. E. Kinahan<sup>1</sup>

<sup>1</sup>University of Washington, U.S.A.; <sup>2</sup>GE Healthcare, U.S.A.

**M18-18 Ultra-Short Echo Time MRI-Based Attenuation Correction for MRI Receiver Coils in Combined PET/MR Imaging**

M. Eldib<sup>1,2</sup>, J. Bini<sup>1,2</sup>, P. M. Robson<sup>1</sup>, D. D. Faul<sup>3</sup>, Z. A. Fayad<sup>1</sup>

<sup>1</sup>Icahn School of Medicine at Mount Sinai, USA; <sup>2</sup>The City College of New York, USA; <sup>3</sup>Siemens Healthcare, USA

**M18-19 Assessment of SNR and Quantitative Accuracy with a PET Regularized Reconstruction Algorithm**

S. G. Ross<sup>1</sup>, S. D. Wollenweber<sup>1</sup>, J. Miao<sup>1</sup>, X. Jin<sup>1</sup>, S. Ahn<sup>2</sup>, R. M. Manjeshwar<sup>2</sup>, C. W. Stearns<sup>1</sup>

<sup>1</sup>GE Healthcare, 53188; <sup>2</sup>GE Global Research Center, 12309

**M18-20 Quantitative Accuracy and Small Lesion Detectability for Low-Dose PET**

J. D. Schaefferkoetter, J. Yan, D. W. Townsend, A\*STAR-NUS, Singapore; M. Conti, Siemens Healthcare, US

**M18-21 Development and Evaluation of Two 4D Image Reconstruction Methods with Dual Respiratory and Cardiac Motion Compensation for Gated Myocardial Perfusion PET**

T. Feng<sup>1</sup>, M. A. Ahlman<sup>2</sup>, L. Guo<sup>1</sup>, D. A. Bluemke<sup>2</sup>, B. Tsui<sup>1</sup>

<sup>1</sup>Johns Hopkins University, US; <sup>2</sup>National Institutes of Health, US

**M18-22 Transmission Imaging for a Simultaneous MR-PET System**

S. L. Bowen, C. Catana, Massachusetts General Hospital, USA

**M18-23 Lesion Contrast Enhancement in MRI Based Partial Volume Correction for PET Brain Image**

X. Shao<sup>1,2</sup>, C. Peng<sup>1,2</sup>, Y. Chen<sup>3</sup>, K. Ying<sup>1,2</sup>

<sup>1</sup>Ministry of Education, China; <sup>2</sup>Tsinghua University, China; <sup>3</sup>General Hospital of PLA, China

**M18-24 Evaluation of Full Monte Carlo Based Scatter Correction in Brain PET/MR**

M. E. Gaens<sup>1</sup>, J. Bert<sup>2</sup>, P. Lohmann<sup>1</sup>, N. J. Shah<sup>1</sup>, D. Visvikis<sup>2</sup>, U. Pietrzyk<sup>1,3</sup>

<sup>1</sup>Forschungszentrum Juelich, Germany; <sup>2</sup>LaTIM, France; <sup>3</sup>University of Wuppertal, Germany

**M18-25 A Maximum Likelihood Gamma Positioning Method with Accurate Calibration of the Mean Detector Response Function in a Clinical SPECT Detector**

Z. Lyu<sup>1,2,3</sup>, S. Chen<sup>1,2,3</sup>, X. Wang<sup>4</sup>, L. Gao<sup>3</sup>, Y. Liu<sup>1,2,3</sup>, S. Wang<sup>1,2,3</sup>, T. Ma<sup>1,2,3</sup>

<sup>1</sup>Tsinghua University, China; <sup>2</sup>Ministry of Education, China; <sup>3</sup>NucMed Technology Ltd, China; <sup>4</sup>Navy General Hospital of PLA, China

**M18-26 Characterisation of Inter- and Intra-Subject Variation of Internal-External Respiratory Motion Correspondence**

A. A. Abd. Rahni, Universiti Kebangsaan Malaysia, Malaysia; E. Lewis, K. Wells, University of Surrey, United Kingdom

**M18-27 Analytic Motion-Compensated Region-of-Interest Reconstruction from Truncated Projections**

J. Hoskovec<sup>1,2</sup>, R. Clackdoyle<sup>1</sup>, L. Desbat<sup>3</sup>, S. Rit<sup>2</sup>

<sup>1</sup>Laboratoire Hubert Curien, CNRS and Université Jean Monnet (UMR 5516), France; <sup>2</sup>Université de Lyon, France; <sup>3</sup>TIMC-IMAG, UMR 5525 CNRS UJF-Grenoble 1, France

**M18-28 Transthoracic Impedance Based Respiratory Gating in PET Imaging: a Feasibility Study**

M. A. A. Ahmed<sup>1</sup>, Q. Xie<sup>1,2</sup>, P. Xiao<sup>1</sup>

<sup>1</sup>Huazhong University of Science and Technology, China; <sup>2</sup>Wuhan National Laboratory for Optoelectronics, China

**M18-30 Comparison of Atlas-Based Bone Segmentation Methods in Whole-Body PET/MRI**

H. Arabi, H. Zaidi, Geneva University Hospital, Switzerland

**M18-31 Low-Dose Cardiac 4D Cone-Beam CT Image Reconstruction Using Two-Cycle Data**

S. Wi, Y. Lee, J. Lee, S. Abbas, S. Cho

KAIST(Korea advanced institute of science and technology), Korea

**M18-32 Prior Image based Anisotropic Edge Guided TV Minimization for Few-View CT Reconstruction**

J. Rong, P. Gao, W. Liu, Q. Liao, C. Jiao, H. Lu

The Fourth Military Medical University, China

**M18-33 Novel 4D Image Reconstruction for Dynamic X-Ray Computed Tomography in Slow Rotating Scanners**

M. Abella<sup>1,2</sup>, J. F. P. J. Abascal<sup>1,2</sup>, E. Marinetto<sup>1,2</sup>, J. J. Vaquero<sup>1,2</sup>, M. Desco<sup>1,2,3</sup>

<sup>1</sup>Universidad Carlos III de Madrid, Spain; <sup>2</sup>Instituto de Investigacion Sanitaria Gregorio Marañón (IiSGM), Spain; <sup>3</sup>Centro de Investigacion en Red de Salud Mental (CIBERSAM), Spain

**M18-34 Parallelization of MLEM Algorithm for PET Reconstruction Based on GPUs**

C. Vazquez<sup>1</sup>, M. J. Rodriguez-Alvarez<sup>2</sup>, C. Correcher<sup>1</sup>, A. J. Gonzalez<sup>2</sup>, F. Sanchez<sup>2</sup>, J. M. Benlloch<sup>2</sup>

<sup>1</sup>Centro de Investigacion Principe Felipe, Spain; <sup>2</sup>Centro Mixto Universidad Politecnica de Valencia- CSIC - CIEMAT, Spain

**M18-35 Evaluation of the Possibilities of Limited Angle Reconstruction for the use of Digital Radiography System as a Tomograph**

C. de Molina<sup>1,2</sup>, J. F. P. Abascal<sup>1,2</sup>, J. Pascau<sup>1,2</sup>, M. Desco<sup>1,2,3</sup>, M. Abella<sup>1,2</sup>

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**M18-36 Functional Priors in Bayesian PET Reconstruction**

P. Novosad<sup>1</sup>, A. J. Reader<sup>1,2</sup>

<sup>1</sup>McGill University, Canada; <sup>2</sup>King's College London, UK

**M18-37 Fast and Accurate Processing for Magnetic Resonance Imaging under Non-Cartesian Acquisitions Using NUFFTs and GPUs**

A. Capozzoli, C. Curcio, A. Liseno

Università di Napoli Federico II, Italy

**M18-38 GPU based MLEM Joint Estimation of Emission Activity and Photon Attenuation in Positron Emission Tomography**

A. Mihlin, C. S. Levin

Stanford University, United States

**M18-40 An FBP-Type Reconstruction Method for CBCT with Significantly Displaced Detector**

L. Zhang<sup>1,2</sup>, D. Wu<sup>1,2</sup>

<sup>1</sup>Ministry of Education, China; <sup>2</sup>Tsinghua University, China

**M18-42 Parallelizing Ray-Tracing Method for Matched Conical Projector and Backprojector in Compton Imaging**

V.-G. Nguyen, Le Quy Don Technical University, Vietnam; S.-J. Lee, Paichai University, S. Korea

**M18-43 Regulated OSEM Reconstruction for Pinhole Emission Tomography**

P. E. B. Vaissier<sup>1</sup>, M. C. Goorden<sup>1</sup>, F. J. Beekman<sup>1,2,3</sup>

<sup>1</sup>TU Delft, The Netherlands; <sup>2</sup>MILabs B.V., The Netherlands; <sup>3</sup>Brain Center Rudolf Magnus, The Netherlands

**M18-44 Regularized PET Image Reconstruction via Reparameterized MAP Estimation**

M. S. Tahaei<sup>1</sup>, A. J. Reader<sup>1,2</sup>

<sup>1</sup>McGill University, Canada; <sup>2</sup>King's College, UK

**M18-45 GPU-Based Sparse Bayesian Learning for Adaptive Transmission Tomography**

H. Jeon, Y. Kaganovsky, S. Han, L. Carin

Duke University, USA

**M18-46 Parallelization of Iterative Reconstruction Algorithms in Multiple Modalities**

D. Mitra, H. Pan, Florida Institute of Technology, USA; F. Alhassen, Y. Seo, UCSF, USA

**M18-47 Segmentation-Free Quasi-Newton Method for Polyenergetic CT Reconstruction**

T. D. Humphries, A. Faridani, Oregon State University, USA

**M18-48 Towards Uncertainty Quantification Using a New Interval Reconstruction Algorithm in PET**

K. Loquin, IMNC UMR8165 CNRS, France; L. Buvač, CEA-I2BM-SHFJ, France; D. Mariano-Goulart, Service de Médecine Nucléaire, CHU Lapeyronie, France; O. Strauss, LIRMM, France

**M18-49 Simultaneous Reconstruction of Activity and Attenuation Using UTE  $\mu$ -Maps and T1-Weighted MR Images for PET/MR Brain Imaging**

D. Benoit<sup>1</sup>, C. N. Ladefoged<sup>1</sup>, A. Rezaei<sup>2</sup>, S. H. Keller<sup>1</sup>, F. L. Andersen<sup>1</sup>, L. Hoejgaard<sup>1</sup>, A. E. Hansen<sup>1</sup>, S. Holm<sup>1</sup>, J. Nuyts<sup>2</sup>

<sup>1</sup>Rigshospitalet, Denmark; <sup>2</sup>Medical Imaging Research Center, Belgium

**M18-50 A prior-less quasi-symmetries search algorithm for Iterative PET Reconstruction**

N. Camarlinghi<sup>1,2</sup>, G. Sportelli<sup>1,2</sup>, N. Belcari<sup>1,2</sup>, S. Ferretti<sup>1,2</sup>, E. Fabbiani<sup>1,2</sup>, D. Panetta<sup>3</sup>, A. Del Guerra<sup>1,2</sup>

<sup>1</sup>University of Pisa, Italy; <sup>2</sup>Istituto Nazionale Fisica Nucleare Pisa, Italy; <sup>3</sup>Institute of Clinical Physiology (IFC) CNR, Italy

**M18-51 An effective technique for high resolution iterative reconstruction with stationary Digital Breast Tomosynthesis**

S. Xu<sup>1</sup>, J. Lu<sup>2</sup>, O. Zhou<sup>2</sup>, Y. Chen<sup>1</sup>

<sup>1</sup>Southern Illinois University Carbondale, United States; <sup>2</sup>University of North Carolina Chapel Hill, United States

**M18-52 Efficient Time-Weighted Sensitivity Image Calculation for Motion Compensated List Mode Reconstruction**

G. L. Angelis<sup>1</sup>, J. E. Gillam<sup>1</sup>, W. J. Ryder<sup>1</sup>, A. Z. Kyme<sup>1</sup>, R. R. Fulton<sup>1,2</sup>, S. R. Meikle<sup>1</sup>

<sup>1</sup>The University of Sydney, Australia; <sup>2</sup>Westmead Hospital, Australia

**M18-53 Adaptive Nonlocal Means-Regularized Iterative Image Reconstruction for Sparse-View X-Ray CT**

H. Zhang<sup>1</sup>, J. Ma<sup>2</sup>, J. Wang<sup>3</sup>, Y. Liu<sup>1</sup>, H. Han<sup>1</sup>, M. Salerno<sup>1</sup>, Z. Liang<sup>1</sup>

<sup>1</sup>Stony Brook University, USA; <sup>2</sup>Southern Medical University, China; <sup>3</sup>University of Texas Southwestern Medical Center, USA

**M18-54 Registration-Incorporated Joint Ictal/Interictal Reconstruction for Improved Epileptic Foci Localization**

Y. Rakvongthai<sup>1</sup>, K. Borvorntanajanya<sup>1</sup>, F. Fahey<sup>2</sup>, G. El Fakhri<sup>1</sup>, J. Ouyang<sup>1</sup>

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**M18-55 Hybrid Reconstruction Method for Exterior CT**

M. Cao<sup>1,2</sup>, Y. Xing<sup>1,2</sup>

<sup>1</sup>Department of Engineering Physics, Tsinghua University, China; <sup>2</sup>Key Laboratory of Particle & Radiation Imaging (Tsinghua University), Ministry of Education, China

**M18-56 Theoretical Analysis of Noise Property in Total-Variation Regularized Image Reconstruction for PET**

G. Wang, J. Qi, University of California, Davis, USA

**M18-57 CT Image Resolution Improvement by Geometric Modelling in Iterative Reconstruction**

X. Xiong<sup>1</sup>, S. Chen<sup>1</sup>, H. Liu<sup>1</sup>, J. Wu<sup>2</sup>, Y. Liu<sup>1</sup>, S. Wang<sup>1</sup>, T. Ma<sup>1</sup>

<sup>1</sup>Key Laboratory of Particle & Radiation Imaging (Tsinghua University), China; <sup>2</sup>National Institute of Metrology, China

**M18-58 Efficient Bandwidth Estimation in Clinical Positron Emission Tomography Image Reconstruction**

R. Maitra, Iowa State University, USA

**M18-59 Millisecond SPECT Image Reconstruction Acceleration Using OSEM Algorithm Based on CPU / GPU Hybrid Parallel Hardware Platform**

Q. Wang<sup>1</sup>, S. Chen<sup>1</sup>, X. Li<sup>2</sup>, K. Wang<sup>2</sup>, S. Wang<sup>1</sup>, Y. Liu<sup>1</sup>, T. Ma<sup>1</sup>

<sup>1</sup>Key Laboratory of Particle & Radiation Imaging, Ministry of Education, China; <sup>2</sup>Division of Metrology in Ionizing Radiation and, Medicine, China

**M18-60 How difficult Is the SPECT Reconstruction Problem? a Comparison with Deconvolution.**

C. Jeanguillaume, N. Cherif, LARIS, France

**M18-61 An Expectation-Maximization Parameter Estimation of Arterial Spin Labeled MRI Data: a Feasibility Study**

H. Han<sup>1</sup>, L. Li<sup>2</sup>, Z. Wang<sup>3</sup>, F. Wu<sup>1</sup>, B. Song<sup>1</sup>, J. Detre<sup>3</sup>, Z. Liang<sup>1</sup>, H. Lu<sup>4</sup>

<sup>1</sup>Stony Brook University, USA; <sup>2</sup>City University of New York - CSI, USA; <sup>3</sup>University of Pennsylvania, USA; <sup>4</sup>Fourth Military Medical University, China

**M18-62 Optimization with Integrated Kinetic Modeling for SPECT Dynamic Image Reconstruction**

M. Khan<sup>1</sup>, R. Bouchko<sup>2</sup>, M. M. Abdalah<sup>1</sup>, G. T. Gullberg<sup>2</sup>, D. Mitra<sup>1</sup>

<sup>1</sup>Florida Institute of Technology, FL; <sup>2</sup>Lawrence Berkeley National Lab, CA

**M18-63 Joint Estimation of the Patlak Model and Plasma Input Function Within a Direct 4D Parametric Image Reconstruction Algorithm Integrating Respiratory Motion Correction for PET Oncology Applications**

T. Merlin<sup>1</sup>, P. Fernandez<sup>1</sup>, D. Visvikis<sup>2</sup>, E. Lamare<sup>1</sup>

<sup>1</sup>I. Hôpital de Bordeaux, INCLIA, CNRS UMR, France; <sup>2</sup>UMR 1101 INSERM, LaTIM, Université de Bretagne Occidentale, France

**M18-64 N Automatic Flood Histogram Calibration Method for the 4-Layer DOI Detector Based on Light Sharing**

T. Shinaji, E. Yoshida, H. Tashima, T. Yamaya

National Institute of Radiological Sciences, Japan

**M18-65 Feasibility of Using Geometric Descriptors of Tracer Distribution for Disease Assessment**

I. S. Klyuzhin, E. Shahinfard, M. Gonzalez, V. Sossi

University of British Columbia, Canada

**M18-66 Design of a High Speed Online Maximum Likelihood Positioning Algorithm Using FPGA**

X. Cheng, Y. Xiao, Y. Wang

University of Science and Technology of China, China

**M18-67 Implementation of Self-Organizing Map Based Positioning Scheme on FPGA**

D. Li, Y. Wang, L. Wang, X. Cheng

University of Science and Technology of China, China

**M18-68 Multi-Class Multimodal SPEQTACLE: a New Fuzzy Clustering Algorithm for Fully Automatic Delineation of Tumors in Multimodality Imaging**

J. Lapuyade-Lahorgue, D. Visvikis, M. Hatt, LaTIM, France

**M18-69 Performances of Principal Component Analysis for the Extraction of Respiratory Signal from Time-of-Flight PET Coincidences Stream**

L. Presotto<sup>1,2</sup>, E. De Bernardi<sup>3</sup>, M. Gilardi<sup>1</sup>, L. Gianolli<sup>2</sup>, V. Bettinardi<sup>2</sup>

<sup>1</sup>National Research Council (CNR), Italy; <sup>2</sup>San Raffaele Scientific Institute, Italy; <sup>3</sup>Tecnomed Foundation, University of Milano Bicocca, Italy

**M18-70 Model Based 3D Registration of an EP-Ablation Catheter to Single View X-Ray Images**

C. Haase<sup>1,2</sup>, D. Schäfer<sup>1</sup>, R. Bullens<sup>3</sup>, A. Thran<sup>1</sup>, O. Dössel<sup>2</sup>, M. Grass<sup>1</sup>

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**M18-71 AB-PET Image Analysis with Weighted Two-Point Correlation Functions**

S. Shokouhi, H. Kang, D. Claassen, B. Rogers, W. R. Riddle

Vanderbilt University, USA

**M18-72 A Random Forest-Based Feature Selection Strategy with Application to Computer-Aided Diagnosis of Colonic Lesions for CT Colonography**

B. Song, Y. Hu, W. Zhu, Z. Liang

Stony Brook University, USA

**M18-73 Model-Based Segmentation of Left Ventricle from Nuclear Medicine Cardiac Images**

Y. Dong, E. Frey, I. Madar, Y. Du

Johns Hopkins University, USA

**M18-74 Objective evaluation of photon-processing and photon-counting imaging systems for absolute quantification in SPECT**

A. K. Jha, E. C. Frey

Johns Hopkins University, United States

**M18-75 Frechet Distance for Model Observer Training Data Selection**

I. Lorente, J. G. Brankov

Illinois Institute of Technology, USA

**M18-76 Machine Learning Based Parametric Image Estimation for Analyzer-Based Phase Contrast Imaging**

O. Caudevilla, J. G. Brankov

Illinois Institute of Technology, United States

**M18-77 "Mixture" Classifier for Computer-Aided Diagnosis (CADx)**

Y. Hu, B. Song, M. Ma, Z. Liang, Stony Brook University, US

**M18-78 Automatic Detection of Vascular Lesions of the Retina Using a Localized Adaptive Thresholding Approach**

E. Kapoor, M. Khanna, SINOVA, USA

**M18-79 Iterative and Self-Adaptive PSF-Based Method for Partial Volume Effect Correction in PET-MRI Imaging**

C. Peng<sup>1,2</sup>, X. Shao<sup>1,2</sup>, E. Johnson<sup>3</sup>, X. Zhu<sup>1,2</sup>, M. Chen<sup>4</sup>, K. Ying<sup>1,2</sup>

<sup>1</sup>Tsinghua University, China; <sup>2</sup>Ministry of Education, China; <sup>3</sup>Stanford University, United States of America; <sup>4</sup>The general hospital of Chinese People's Liberation, China

**M18-80 Comparative Methods for Metal Artifact Reduction in X-Ray CT**

M. Abdoli, The Netherlands Cancer Institute, Netherlands; A. Mehranian, A. Ailianou, M. Becker, H. Zaidi, Geneva University Hospital, Switzerland

**M18-81 A SPECT Aperture Simulation Method Built on the SolidWorks™ 3D-Design Package and GPU Programming That Includes Penetration, Scatter, and Fluorescence**

X. Li, L. R. Furenlid, *University of Arizona, United States*

**M18-82 A Next-Generation Concept Design for Positron Emission Tomographic Imaging**

A. McNamara<sup>1,2</sup>, M. Toghiani<sup>1</sup>, C.-C. Shieh<sup>1</sup>, J. Gillam<sup>1</sup>, Z. Kuncic<sup>1</sup>

<sup>1</sup>*The University of Sydney, Australia;* <sup>2</sup>*Massachusetts General Hospital and Harvard Medical School, USA*

**M18-83 Impact of Depth-of-Interaction on Image Resolution in Long Axial-FOV PET**

Y. Yu<sup>1,2</sup>, Y. Xia<sup>1,2</sup>, H. Shang<sup>1,2</sup>, J. Wu<sup>1,2</sup>, Q. Wang<sup>1,2</sup>, X. Wang<sup>3</sup>, Y. Liu<sup>1,2</sup>, S. Wang<sup>1,2</sup>, T. Ma<sup>1,2</sup>

<sup>1</sup>*Key Laboratory of Particle & Radiation Imaging (Tsinghua University), Ministry of Education Departme, China;* <sup>2</sup>*Tsinghua University, China;* <sup>3</sup>*Navy General Hospital, China*

**M18-84 Cascaded-Systems Analysis of Charge Sharing in Photon-Counting X-Ray Detectors**

J. Tanguay, *University of British Columbia, Canada;* S. Yun, H. K. Kim, *Pusan National University, Republic of Korea;* I. Cunningham, *Western University, Canada*

**M18-86 A Simulation Procedure to Assess the Data Sufficiency of Motion Corrected Helical X-Ray CT**

J.-H. Kim<sup>1</sup>, J. Nuyts<sup>2</sup>, Z. Kuncic<sup>1</sup>, R. Fulton<sup>1,3</sup>

<sup>1</sup>*University of Sydney, Australia;* <sup>2</sup>*Katholieke Universiteit, Belgium;* <sup>3</sup>*Westmead Hospital, Australia*

**M18-87 High throughput CUDA implementation of accurate geometric modelling for iterative reconstruction of PET data**

P. J. Markiewicz, K. Thielemans, M. J. Ehrhardt, J. Jiao, N. Burgos, D. Atkinson, S. R. Arridge, B. F. Hutton, S. Ourselin  
*University College London, UK*

**M18-88 Hybrid CPU/GPU SPECT Monte Carlo Simulations: the Hexagonal Hole Collimator Case**

M.-P. Garcia<sup>1</sup>, J. Bert<sup>2</sup>, D. Villoing<sup>1</sup>, A. Reilhac<sup>3</sup>, M.-C. Gregoire<sup>3</sup>, D. Visvikis<sup>2</sup>, M. Bardies<sup>1</sup>

<sup>1</sup>*UMR 1037 INSERM/UPS, CRCT, France;* <sup>2</sup>*LaTIM UMR 1101 INSERM, CHRU Brest, France;* <sup>3</sup>*LifeSciences, ANSTO, Australia*

**M18-89 Can a Single Detector Provide the Best Image Quality in the Double-Shot Dual-Energy Imaging?**

D. W. Kim<sup>1</sup>, H. K. Kim<sup>1</sup>, S. Yun<sup>1</sup>, J. C. Han<sup>1</sup>, H. Youn<sup>1</sup>, S. Kam<sup>1</sup>, J. Tanguay<sup>2</sup>, I. A. Cunningham<sup>3</sup>

<sup>1</sup>*Pusan National University, Republic of Korea;* <sup>2</sup>*University of British Columbia, Canada;* <sup>3</sup>*Western University, Canada*

**M18-90 Evaluation of the Quantitative Accuracy of a Breast-Imaging PET Scanner**

C. Zeng<sup>1</sup>, P. E. Kinahan<sup>1</sup>, K. M. Champley<sup>2</sup>, R. L. Harrison<sup>1</sup>, L. A. MacDonald<sup>1</sup>

<sup>1</sup>*University of Washington, USA;* <sup>2</sup>*Lawrence Livermore National Laboratory, USA*

**M18-91 Preliminary Assessment of Fully 3D Monte Carlo Reconstruction for Preclinical PET Using Iodine-124**

M. Moreau<sup>1,2</sup>, I. Buvat<sup>3</sup>, L. Ammour<sup>4</sup>, N. Chouin<sup>2</sup>, F. Kraeber-Bodéré<sup>1,4</sup>, M. Chérel<sup>1</sup>, T. Carlier<sup>1,4</sup>

<sup>1</sup>*CRCNA UMR892 INSERM - 6299 CNRS, France;* <sup>2</sup>*ONIRIS - AMAROC, France;* <sup>3</sup>*CEA-I2BM-SHFJ, France;* <sup>4</sup>*University Hospital - Nantes Hotel Dieu, France*

**M18-92 Fast Scattering Simulation Tool for Multi-Energy X-Ray Imaging**

A. Sossin<sup>1</sup>, J. Tabary<sup>1</sup>, V. Rebuffel<sup>1</sup>, J. M. Letang<sup>2</sup>, N. Freud<sup>2</sup>, L. Verger<sup>1</sup>

<sup>1</sup>*CEA-LETI, France;* <sup>2</sup>*University of Lyon, France*

**M18-93 Investigation and Evaluation of a Simulated Dedicated PET Prototype for Brain Studies: Applicability to a Trimodal PET/MR/EEG System**

P. Papadimitroulas, *University of Patras, Greece;* G. Loudos, *Technological Educational Institute of Athens, Greece;* J. Cabello, *Technische Universität München, Germany;* J. J. Scheins, *Forschungszentrum Juelich, Germany;* N. Belcari, A. Del Guerra, *University of Pisa, Italy*

**M18-94 Assessment of a Monte-Carlo Simulation of SPECT Recordings from a New-Generation Heart-Centric Semiconductor Camera: from Phantom to Human Images**

L. Imbert<sup>1,2,3</sup>, E. Galbrun<sup>3</sup>, F. Odille<sup>4</sup>, S. Poussier<sup>5</sup>, A. Noel<sup>3</sup>, D. Wolf<sup>6</sup>, G. Karcher<sup>1,5,6</sup>, P.-Y. Marie<sup>1,5,6,7</sup>

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**M18-95 Successful Suppression of Cone Beam Artifacts Using Iterative Reconstruction Algorithm**

D. Shi, *Toshiba medical research institute, USA, Inc., USA*

**M18-96 Anatomical-Based Resolution Recovery for 18F-Fluoride PET/CT**

E. Grecchi<sup>1</sup>, J. O'Doherty<sup>1</sup>, C. Tsoumpas<sup>2</sup>, G. J. Cook<sup>1</sup>, F. E. Turkheimer<sup>1</sup>

<sup>1</sup>*King's College London, UK;* <sup>2</sup>*University of Leeds, UK*

**M18-97 Respiration Average CT for Myocardial Perfusion SPECT/CT Attenuation Correction**

G. S. P. Mok, D. Zhang, C. Y. T. Ho

*University of Macau, China*

**M18-98 Reconstruction Based Respiratory Motion Correction in PET/MR Imaging**

H. Fayad<sup>1</sup>, H. Schmidt<sup>2</sup>, C. Wuerslin<sup>2</sup>, D. Visvikis<sup>1</sup>

<sup>1</sup>*INSERM UMRI101, Université de Bretagne Occidentale, LaTIM, France;* <sup>2</sup>*University Hospital of Tubingen, Germany*

**M18-99 Comparison of FBP and Iterative Algorithms with Non-Uniform Angular Sampling**

G. Zeng<sup>1,2</sup>

<sup>1</sup>*Weber State University, USA;* <sup>2</sup>*University of Utah, USA*

**M18-100 A Method for Daily Setup and Quality Checks of LSO:Ce Based Time of Flight Positron Emission Tomographs**

H. E. Rothfuss, A. P. Moor, J. W. Young, L. A. Eriksson  
*Siemens Molecular Imaging, USA*

**M18-101 Reduced Effective Scanning Time in SPECT Due to OSEM Accelerated Reconstruction**

K. Kacperski<sup>1</sup>, D. Switlik<sup>1</sup>, J. Pietrzak<sup>1,2</sup>

<sup>1</sup>*The Maria Skłodowska - Curie Memorial Cancer Centre and Institute of Oncology, Poland;* <sup>2</sup>*University of Warsaw, Poland*

**M18-102 CT-MRI Image Reconstruction with Mask-Enhanced Dual-Dictionary Learning**

B. Wang, L. Li, D. Wu, *Tsinghua University, China*

**M18-103 The Simulation of a Multi Energy Bone Mineral Densitometry Method**

R. Li, L. Li, Z. Chen, L. Zhang, *Tsinghua University, China*

**M18-104 Adaptive Bilateral Filtering for PET**

L. Szirmay-Kalos<sup>1</sup>, L. Papp<sup>2</sup>, G. Jakab<sup>2</sup>, B. Toth<sup>1</sup>

<sup>1</sup>*Budapest University of Technology and Economics, Hungary;* <sup>2</sup>*Mediso Ltd., Hungary*

**M18-105 4D PET Tumor Segmentation Algorithm Evaluation with Experimental Phantom Measurements.**

M. Carles, T. Fechter, U. Christ, A. Schaefer, M. Mix, U. Nestle

*UKL, Germany*

**M18-106 Automatic Parameter Tuning for X-Ray Computed Tomography Reconstruction**

L. Liu, W. Lin, *Tianjin University, China;* M. Jin, *University of Texas at Arlington, USA*

**M18-107 Random Forest Based Computer-Aided Detection of Polyps in CT Colonography**

M. Ma, B. Song, Y. Hu, X. Gu, Z. Liang

*Stony Brook University, United States*

**M18-108 Characterization the annihilation position distribution within a geometrical model associated with scattered coincidences in PET**

H. Sun<sup>1,2</sup>, S. Pistorius<sup>1,2</sup>

<sup>1</sup>*University of Manitoba, Canada;* <sup>2</sup>*Cancercare Manitoba, Canada*

**M18-109 Dynamic PET Denoising Incorporating a Composite Image Guided Filter**

L. Lu<sup>1</sup>, D. Hu<sup>1</sup>, X. Ma<sup>1</sup>, J. Ma<sup>1</sup>, A. Rahmim<sup>2</sup>, W. Chen<sup>1</sup>

<sup>1</sup>*School of Biomedical Engineering, Southern Medical University, China;* <sup>2</sup>*Department of Radiology, Johns Hopkins University, USA*

**M19 MIC Poster Session II - System & Detector Instrumentation II**

Friday, Nov. 14 14:00-15:30 4B

Session Chairs: **Yong Choi**, Sungkyunkwan University/Sogang Institute of Advanced Technology,  
**Hamid Sabet**, Massachusetts General Hospital, Harvard Medical School, United States  
**Martin S. Judenhofer**, University of California, Davis, United States

**M19-2 A SiPM Based Dual-Ended Readout Detector Using a Mean-Timing Method for TOF-DOI PET**

H. G. Kang<sup>1</sup>, G. B. Ko<sup>2</sup>, J. S. Lee<sup>2</sup>, S. J. Hong<sup>1</sup>

<sup>1</sup>*Eulji University, Korea;* <sup>2</sup>*Seoul National University, Korea*

**M19-3 Scintillation Light Distribution Quantitative Analysis for LaBr<sub>3</sub>:Ce Gamma Imager**

P. Bennati<sup>1,2</sup>, M. N. Cinti<sup>1,3</sup>, S. Lo Meo<sup>3,4</sup>, A. Fabbri<sup>1,3</sup>, E. Preziosi<sup>1,3</sup>, R. Pellegrini<sup>1,3</sup>, M. Colarieti-Tosti<sup>2</sup>, R. Pani<sup>1,3</sup>

<sup>1</sup>*Sapienza University, Italy;* <sup>2</sup>*KTH-STH Royal Institute of Technology, Sweden;* <sup>3</sup>*INFN National Institute of Nuclear Physics, Italy;* <sup>4</sup>*ENEA National Agency for new technologies, Italy*

**M19-4 Development of a High Resolution Detector for Positron Emission Mammography Using Finely Pitched LYSO Arrays**

A. A. Wagadarikar, S. Dolinsky, C. Bircher

*GE Global Research, USA*

**M19-5 Using Timing Information for the Estimation of the Interaction Position in a Monolithic Scintillator Detector**

V. Tabacchini, G. Borghi, D. N. ter Weele, D. R. Schaart

*Delft University of Technology, Netherlands*

**M19-6 Improved Walk-Correction Method for Timing Measurements in PET Detector**

G. Fu, S. Dolinsky, J. Guo, A. Ivan

*GE Global Research Center, USA*

**M19-7 Fully Solid-State Positron Emission Mammography Block Detector for Low Dose Screening Applications of High-Risk Women.**

O. Bubon<sup>1,2</sup>, A. Teymurazyan<sup>1,2</sup>, G. DeCrenzenzo<sup>2</sup>, P. Joanis<sup>2,1</sup>, J. A. Rowlands<sup>2</sup>, A. Reznik<sup>1,2</sup>

<sup>1</sup>*Lakehead University, Canada;* <sup>2</sup>*Thunder Bay Regional Research Institute, Canada*

**M19-8 A Novel Method for Optimizing Light Sharing in a Block Detector**

H. Shi<sup>1,2</sup>, D. Du<sup>1</sup>, J. Xu<sup>3</sup>, Q. Peng<sup>2</sup>

<sup>1</sup>*Tsinghua University, China;* <sup>2</sup>*Lawrence Berkeley National Laboratory, USA;* <sup>3</sup>*Huazhong University of Science and Technology, China*

**M19-9 Integration Time Window for Pulse Width Modulation Readout of Silicon Photomultipliers for 0.5 mm Resolution 3-D Position Sensitive PET Scintillation Detectors**

M. Chin, M. F. Bieniosek, B. J. Lee, C. S. Levin

Stanford University, United States

**M19-10 Design and Development of Novel and Practical PET Detectors for Advanced Imaging Applications**

X. Sun, K. Lou, Y. Shao, *UT MD Anderson Cancer Center, USA*

**M19-11 Ultra-High Sensitivity Collimator for Low-Dose Breast Imaging**

B. L. Welch, *Dilon Technologies, USA*; B. Kross, S. Lee, J. E. McKisson, J. McKisson, *Jefferson Lab, USA*; D. Gilland, *University of Florida, USA*

**M19-12 Development and Evaluation of an Integrated Readout Electronics for PET Detector Using SiPM Arrays**

J. Choi, Y. Choi, S. Lee, H.-J. Choe, G.-C. Ahn, Y.-S. Kwak

*Sogang University, Korea*

**M19-13 A Pulse Modeling Tool for PET Scanners**

L. J. Martinez Garbino<sup>1,2</sup>, E. Venialgo<sup>1,2</sup>, D. S. Estryk<sup>1</sup>, C. A. Verrastro<sup>1,2</sup>, M. A. Belzunce<sup>1,2</sup>

<sup>1</sup>CNEA, Argentina; <sup>2</sup>UTN, Argentina

**M19-14 Feasibility Studies of a High Sensitivity, Stationary Dedicated Cardiac SPECT with Multi-Pinhole Collimators on a Clinical Dual-Head Scanner**

H. Liu<sup>1</sup>, S. Chen<sup>1</sup>, J. Wu<sup>1</sup>, B. Guo<sup>2</sup>, S. Wang<sup>1</sup>, Y. Liu<sup>1</sup>, T. Ma<sup>1</sup>

<sup>1</sup>Key Laboratory of Particle & Radiation Imaging (Tsinghua University), Ministry of Education, China; <sup>2</sup>National Institute of Metrology, China

**M19-15 Design of a 32-Channel High-Performance OpenPET Detector Board**

Q. Peng, W. Moses, C. Vu, J. Huber, W.-S. Choong

*Lawrence Berkeley National Laboratory, USA*

**M19-16 A Curved Section of a Pixelated NaI(Tl) Detector for SPECT/TCT**

K. Popovic, M. Rozler, S. Poopalasingam, W. Chang

*Rush University Medical Center, USA*

**M19-17 A New Multiplexing Method Using Multi-Voltage Threshold Based PET DAQ with FPGA and Exclusive-or Logic Gate**

K. B. Kim, Y. Choi, G. Kim, S. Kim, S. Lee

*Sogang University, South Korea*

**M19-18 Experimental Characterization of a Practical Monolithic Scintillator Detector for Clinical TOF-PET Scanners Based on a 32 mm X 32 mm X 22 mm LYSO:Ce Crystal and a DPC Array**

G. Borghi, V. Tabacchini, D. R. Schaart

*Delft University of Technology, Netherlands*

**M19-21 Event Pulse Classification with Multi-Voltage Threshold Samples for Scatter Rejection in PET**

Z. Deng<sup>1,2</sup>, P. Xiao<sup>1,2</sup>, Q. Xie<sup>1,2</sup>

<sup>1</sup>Huazhong University of Science and Technology, P.R.China; <sup>2</sup>Wuhan National Laboratory for Optoelectronics, P.R.China

**M19-22 Proposal of a PET Positron Detector with Scintillation Fibers for the Diagnosis of Intestinal Cancers**

N. Kaneko, S. Han, S. Iijima, H. Ito, H. Kawai, S. Kodama, D. Kumogoshi, M. Tabata

*Chiba university, Japan*

**M19-23 Effects of Out of Field-of-View Activity on Imaging Performance in a 1mm<sup>3</sup> Resolution Clinical PET System**

D. F. C. Hsu, A. Vandenbroucke, D. Innes, D. L. Freese, P. D. Reynolds, F. W. Y. Lau, C. S. Levin

*Stanford University, USA*

**M19-24 A New Multiplexing Method Using Delay and Asynchronous Logic Gate for Pixelated Radiation Detector**

H. T. Lim, Y. Choi, K. B. Kim, G. Kim, *Sogang University, Korea*; J. Y. Yeom, *Kumoh National Institute of Technology, Korea*

**M19-25 Development of a TOF Detector for Brain PET**

H.-J. Choe, Y. Choi, J. H. Jung, H. T. Lim, G. Kim

*Sogang University, South Korea*

**M19-26 Adjustable Resolution/Sensitivity Slit-Slat Collimator for Task Specific SPECT Imaging**

S. Poopalasingam, M. Rozler, K. Popovic, W. Chang

*Rush University Medical Center, 60612*

**M19-27 Fast Calibration of SPECT Detector Response Using Adaptive Iterative Technique**

V. Solovov<sup>1</sup>, A. Morozov<sup>1,2</sup>, V. Chepel<sup>1,2</sup>, V. Domingos<sup>1</sup>, R. Martins<sup>1,2</sup>, F. Alves<sup>2</sup>

<sup>1</sup>LIP-Coimbra, Portugal; <sup>2</sup>Coimbra University, Portugal

**M19-28 Imaging with a Partial C-SPECT Laboratory Prototype : a Simulations Study**

J. Strologas<sup>1</sup>, S. Metzler<sup>2</sup>, X. Zheng<sup>2</sup>, W. Chang<sup>1</sup>

<sup>1</sup>Rush University Medical Center, USA; <sup>2</sup>university of pennsylvania, USA

**M19-29 Study on Four Layer Depth of Interaction LYSO Crystal on MPPC with Newly Developed Time over Threshold ASIC**

Y. Yoshihara<sup>1</sup>, Y. Nakamura<sup>1</sup>, K. Shimazoe<sup>1</sup>, H. Takahashi<sup>1</sup>, F. Nishikido<sup>2</sup>, E. Yoshida<sup>2</sup>, T. Yamaya<sup>2</sup>

<sup>1</sup>The University of Tokyo, Japan; <sup>2</sup>National Institute of Radiological Science, Japan

**M19-30 Investigation of a Four Layer DOI Detector Combined with Laser Processed Boundaries**

A. Gondo<sup>1</sup>, T. Shinaji<sup>2</sup>, N. Inadama<sup>2</sup>, F. Nishikido<sup>2</sup>, E. Yoshida<sup>2</sup>, T. Sakai<sup>3</sup>, T. Yamaya<sup>2,4</sup>, T. Ohnishi<sup>4</sup>, H. Haneishi<sup>4</sup>

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**M19-31 A Smart Enclosure for Open-Field Small Animal Brain PET During Learning Tasks**

A. Kyme, J. Eisenhuth, G. Hart, S. Meikle  
*University of Sydney, Australia*

**M19-32 Monte Carlo Simulation Study of a Mouse PET System Consists of 256-Channel TSV-MPPC Detector Modules with Individual Crystal Readout**

R. Yamada, M. Watanabe, *Hamamatsu Photonics K.K., Japan*

**M19-33 Spatial Resolution Uniformity, Isotropy, and the Effect of Depth-of-Interaction Information in a 1mm<sup>3</sup> Resolution, Limited-Angle PET System**

D. L. Freese, A. Vandenbroucke, P. D. Reynolds, D. F. C. Hsu, D. Innes, F. W. Y. Lau, C. S. Levin  
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**M19-34 Studies of DOI Estimation Method in LOR Data for 3D PET List-Mode Reconstruction**

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**M19-35 Efficient System Modeling for a Tapered PET Scanner**

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**M19-36 Feasibility of Motion-Corrected Planar Projection Imaging of Single Photon Emitters: a Phantom Study**

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**M19-37 Optimized Acquisition Protocols for Dynamic Cardiac SPECT Imaging of Rats with 123I-MIBG**

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**M19-38 cMiCE PET Detector Using a New Multi-Anode PMT**

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**M19-39 Directional Resolution of Limited Angle SPECT Cameras**

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**M19-40 MADPET4 - a MRI Compatible Dual Layer PET Insert: First Tests with Two Modules**

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**M19-41 First Acquisition of Data from a Prototype 3-D Position Sensitive CZT PET System**

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**M19-42 Iterative Reconstruction with an Innovative Monte Carlo-Based System Matrix for PETiPIX Small Animal PET Scanner**

K. Li<sup>1</sup>, M. Safavi-Naeini<sup>1</sup>, D. R. Franklin<sup>2</sup>, A. B. Rosenfeld<sup>1</sup>, B. Hutton<sup>1,3</sup>, M. L. F. Lerch<sup>1</sup>  
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**M19-43 Effect of Inter-Crystal Scatter Events on Coincidence Detection in LabPET Scanners**

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**M19-44 Progress for the Large-Bore BNL/Penn PET-MRI System for Whole Body Rodent Imaging**

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**M19-45 Characteristics of an LYSO – [LYSO/NaI(Tl) Phoswich] Detector Pair for Simultaneous Whole-Body Single Photon and Positron Projection Imaging of Mice**

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**M19-46 Development of Three-Dimensional Quantitative Imaging Analysis Method by Opposed Dual-Head Semiconductor Compton Camera GREI**

S. Motomura<sup>1</sup>, T. Ida<sup>1,2</sup>, T. Fukuchi<sup>1</sup>, M. Hiromura<sup>1</sup>, H. Haba<sup>1</sup>, Y. Watanabe<sup>1</sup>, S. Enomoto<sup>1,2</sup>  
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**M19-47 Analytic Determination of Rectangular-Pinhole Sensitivity with Penetration**

S. D. Metzler, D. Xia, *University of Pennsylvania, USA;* S. C. Moore, *Brigham & Women's Hospital and Harvard Medical School, USA*

**M19-48 Mercury-197(m) as a Promising Radionuclide for Theragnostic Application**

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**M19-49 Toward Concurrent Imaging for in-beam Positron Emission Tomography**

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**M19-50 Proposal of a 4D ML Reconstruction Strategy for PET-Based Treatment Verification in Ion Beam Radiotherapy**

E. De Bernardi, University of Milano-Bicocca, Italy; C. Gianoli, R. Ricotti, M. Riboldi, G. Baroni, Politecnico di Milano, Italy

**M19-51 In-Silico Comparison of X-Ray and Proton Computed Tomography for Proton Therapy Dose Simulation with a Full Monte Carlo Treatment Planning**

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**M19-52 A Novel Phantom and Method for Calibration of the Phase 2 Proton CT Scanner**

V. A. Bashkurov<sup>1</sup>, N. Vence<sup>1</sup>, R. P. Johnson<sup>2</sup>, V. Giacometti<sup>3</sup>, T. Plautz<sup>2</sup>, A. Zatserklyaniy<sup>2</sup>, H. F. W. Sadrozinski, Senior Member IEEE<sup>2</sup>, R. W. Schulte<sup>1</sup>

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**M19-53 Spatial Resolution Studies and Measurement of the Modulation Transfer Function for a Prototype Proton CT Scanner**

T. E. Plautz, R. P. Johnson, H. F.-W. Sadrozinski, A. Zatserklyaniy, University of California, Santa Cruz, USA; V. Bashkurov, R. F. Hurley, R. Schulte, Loma Linda University, USA; V. Giacometti, University of Wollongong, Australia

**M19-54 Feasibility of Secondary <sup>150</sup>Be Beam Production for in-Beam PET**

A. Mohammadi, Y. Hirano, F. Nishikido, E. Yoshida, T. Inaniwa, T. Yamaya

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**M19-55 PET Isotopes and Prompt Gamma Rays for In-Vivo Dose Delivery Verification in Proton Therapy in Strongly Heterogeneous Tissues**

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**M19-56 An Experimental Test of a Beam Monitoring Method by Measuring Low Energy Photons Using a Gamma Camera**

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**M19-57 Compton Imaging of Prompt- $\gamma$  Radiation in Proton Therapy: Simulation of the Influence of the Detector Response and the Patient Attenuation**

E. Hilaire, D. Sarrut, F. Peyrin, V. Maxim, CREATIS, France

**M19-58 TOF-PET for Quality Assurance in Proton Therapy: a Patient Case Study**

F. Dible<sup>1,2</sup>, H. J. T. Buitenhuis<sup>1</sup>, D. C. Oxley<sup>1</sup>, A. K. Biegun<sup>1</sup>, A. J. van der Borden<sup>3</sup>, S. Brandenburg<sup>1</sup>, A. van der Schaaf<sup>2</sup>, S. Vandenberghe<sup>2</sup>, A. A. van 't Veld<sup>3</sup>, P. Dendooven<sup>1</sup>

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**M19-59 An Experimental Approach to Evaluate the <sup>11</sup>C Washout Parameters for hadronPET Applications**

I. Martinez-Rovira, IMNC - UMR 8165, France; R. Boisgard, G. Pottier, B. Kuhnast, S. Jan, CEA/DSV/DRM/SHFJ - Service Hospitalier Frédéric Joliot, France

**M19-60 Silicon Microstrip Detector for Microbeam Radiation Therapy**

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**M19-61 Performance of a Fast Acquisition System for In-Beam PET Monitoring Tested with Clinical Proton Beams**

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**M19-62 An Investigation of Tc-99m MAA as a Surrogate for Pre-Therapy Treatment Planning in Y-90 Glass Microsphere Therapy for Liver Cancer**

T. Mauxion, Y. Du, R. F. Hobbs, J.-F. Geschwind, J. M. Herman, J. Yue, M. A. Lodge, D. K. Reyes, S. Mirpour, R. L. Wahl, E. C. Frey, Johns Hopkins University School of Medicine, USA

**M19-63 BrachyView, a Real Time Source Tracking System for Use in HDR Brachytherapy: Experimental Results**

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**M19-64 Dose Enhancement at Tungsten-Tissue Interfaces with <sup>192</sup>Ir Source in HDR Brachytherapy**

Z. Han, M. Safavi-Naeini, S. Alnaghy, D. Cutajar, S. Guatelli, M. Petasecca, M. Lerch, A. Rosenfeld, Centre for Medical Radiation Physics at University of Wollongong, Australia; D. R. Franklin, University of Technology, Sydney, Australia; J. Bucci, St George Hospital Cancer Care Centre, Australia; M. Zaider, Memorial Sloan Kettering Cancer Center, U.S.A

**M19-65 In-Beam Image Based  $\beta^+$  Activity Measurement in <sup>12</sup>C and <sup>11</sup>C Irradiations Using a Small OpenPET Prototype**

Y. Hirano<sup>1</sup>, Y. Nakajima<sup>1</sup>, F. Nishikido<sup>1</sup>, T. Shinaji<sup>1</sup>, M. Nitta<sup>1</sup>, E. Yoshida<sup>1</sup>, K. Parodi<sup>2</sup>, T. Yamaya<sup>1</sup>

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**M19-66 Ion Beams of Therapeutical Energy on PMMA Phantoms Measurements in View of an Innovative Dose Profiler Realization for on Line Monitoring in Hadrontherapy Treatments.**

M. Marafini<sup>1,2</sup>, F. Bellini<sup>3,2</sup>, F. Collamati<sup>3,2</sup>, E. De Lucia<sup>4</sup>, R. Faccini<sup>3,2</sup>, F. Ferroni<sup>3,2</sup>, P. M. Frallicciardi<sup>1,2</sup>, I. Mattei<sup>4,5</sup>, S. Morganti<sup>2</sup>, V. Patera<sup>6,2</sup>, L. Piersanti<sup>7,2</sup>, D. Pinci<sup>2</sup>, A. Russomando<sup>3,2,6</sup>, A. Sarti<sup>7,4</sup>, A. Sciubba<sup>7,2</sup>, E. Solfaroli Camillucci<sup>6</sup>, C. Voena<sup>3,2</sup>, G. Battistoni<sup>8</sup>

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**M19-67 Geant4 Simulation Platform for the Phase 2 Proton CT Scanner**

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**M19-68 Measuring the Effect on MRI Field Homogeneity of CZT Detector Materials**

A. Tao, M. Noseworthy, McMaster University, Canada; T. H. Farncombe, Hamilton Health Sciences, Canada

**M19-69 The Effect of Magnetic Field on Positron Range and Spatial Resolution in an Integrated Whole-Body Time-of-Flight PET/MRI System**

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**M19-70 Hybrid PET/MRI Insert: B<sub>0</sub> Field Optimization by Applying Active and Passive Shimming on PET Detector Level**

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**M19-71 Quantitative Analysis of Effect of Shield Boxes for PET Electronics Combined with an MR Head Coil**

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**M19-72 Preliminary Simultaneous PET/MRI Images Acquired with an RF-Transmissive PET Insert**

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**M19-73 Novel Rodent Imaging Results from the Simultaneous PET-MRI System Based on the RatCAP**

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**M19-74 Development of a Quantitative Simultaneous MR/Scintimammography System**

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**M19-75 Parameter Optimization for the FixER Method: a PET/MRI Attenuation Correction with a Weak Fixed-Position External Radiation Source**

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**M19-76 Subject-Specific Refinement of Attenuation Correction Maps for Hybrid PET/MRI Based on Multi-Resolution Regional Learning**

K. Shi<sup>1</sup>, S. Fuerst<sup>1</sup>, M. Lukas<sup>1</sup>, L. Sun<sup>2</sup>, N. Navab<sup>1</sup>, S. Foerster<sup>1</sup>, S. I. Ziegler<sup>1</sup>

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**M19-77 Evaluation of Performance and Stability of a MR Compatible PET Detector**

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**M19-78 Performance Evaluation of a PET/MR Detector Based on the ClearPEM Technology**

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**M19-79 Notch Filtering of RF Interference in PET Data for Simultaneous PET-MR Acquisition**

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**M19-80 Geometrical Calibration of a PET-Scanner-Based Multi-Pinhole SPECT Using LYSO Background Radiation**

Q. Wei<sup>1</sup>, T. Ma<sup>1</sup>, L. Hui<sup>1</sup>, J. Wu<sup>1</sup>, T. Dai<sup>2</sup>, X. Huang<sup>3</sup>, N. Jiang<sup>3</sup>, S. Wang<sup>1</sup>, X. Jiang<sup>1</sup>, Y. Liu<sup>1</sup>

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**M19-81 Magnetic Field and PET: Does the Effect of Magnetic Field Vary with the Intrinsic Resolution of PET Scanners?**

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**M19-82 Position Sensitive Photosensors Using Sparse Sensor Arrays**

R. S. Miyaoka, W. C. Hunter, A. L. Lehnert, University of Washington, USA; S.-J. Lee, Y. H. Chung, Yonsei University, Korea

**M19-83 Development of Multi-Channel Fast SiPM Readout Electronics for Clinical TOF PET Detector**

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**M19-84 Performance Evaluation of a GAGG:Ce Scintillation Crystal Array with SiPMs for High-Resolution Compact SPECT Detector**

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**M19-85 Development of a SiPM-Based PET Detector for EXPLORER**

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**M19-86 High Fill Factor 8x8 SiPM Tiles Based on FBK RGB-HD Technology**

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**M19-87 High Volume SiPM, Reliability Testing Procedure and Results**

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**M19-88 Effective Gap Width and Implications for Position Estimation in Germanium Strip Detectors**

R. S. Perea, O. Ovchinnikov, T. E. Peterson

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**M19-89 A Compact High-Resolution Flat Panel PET Detector for Biomedical Applications Based on the New 4-Side Buttable MPPC**

Q. Wang, B. Ravindranath, K. Li, A. J. Mathews, D. Tomov, J. A. O'Sullivan, Y.-C. Tai

Washington University in St. Louis, United States

**M19-90 Analysis of Detector Quantum Efficiency of a Sandwich Detector for Single-Shot Dual-Energy Mouse Imaging**

J. Kim<sup>1</sup>, H. K. Kim<sup>1</sup>, S. Yun<sup>1</sup>, D. W. Kim<sup>1</sup>, J. C. Han<sup>1</sup>, H. Youn<sup>1</sup>, S. Kam<sup>1</sup>, J. Tanguay<sup>2</sup>, I. A. Cunningham<sup>3</sup>

<sup>1</sup>Pusan National University, Republic of Korea; <sup>2</sup>University of British Columbia, Canada; <sup>3</sup>Western University, Canada

**M19-91 Microflow Measurements of Antibodies' Fluorescence Using Silicon Photomultipliers**

P. Dorosz, M. Baszczyk, S. Glab, W. Kucewicz, L. Mik, M. Sapor

AGH University of Science and Technology, Poland

**M19-92 On-Line C-Arm Intrinsic Calibration: Simulation Study**

B. Spencer, L. Desbat, UJF-Grenoble 1, France

**M19-93 Sensitive Phase Gratings for X-Ray Phase Contrast – a Simulation-Based Comparison**

O. Preusche, University Erlangen-Nuremberg, Germany

**M19-94 Graphic User Interface (GUI) Based Cervical, Thoracic, and Lumbar (C-T-L) Spine Magnetic Resonance Image Stitching**

D. H. Lee, Johns Hopkins University School of Medicine, USA; C. P. Hong, KOREA Research Institute of Standards and Science (KRISS), South Korea; B. S.

Han, Yonsei University, South Korea

**M19-95 Time Resolved Optical Tomographic Imaging: a Simulation Study**

A.-N. Rapsomanikis<sup>1</sup>, A. Eleftheriou<sup>1</sup>, M. Mikeli<sup>1</sup>, M. Zioga<sup>1</sup>, E. Stiliaris<sup>1,2</sup>

<sup>1</sup>National & Kapodistrian University of Athens, Greece; <sup>2</sup>Institute of Accelerating Systems and Applications, Greece

**M19-96 An Optical Therapeutic Protocol to Treat Brain Metastasis by Mapping NIR Activated Drug Release: a Pilot Study**

A. Prabhu Verleker<sup>1</sup>, Q. Fang<sup>2</sup>, M.-R. Choi<sup>3</sup>, S. Clare<sup>3</sup>, K. Stantz<sup>1</sup>

<sup>1</sup>Purdue University, USA; <sup>2</sup>Harvard University, USA; <sup>3</sup>Northwestern University, USA

**M19-97 Performance Evaluation of Analytic- and Optimization-Based Reconstruction Algorithms for C-Arm Cone-Beam CT in Low-Contrast Imaging**

X. Han<sup>1</sup>, S. Oishi<sup>2</sup>, T. Satow<sup>3</sup>, H. Yokoyama<sup>3</sup>, M. Yamada<sup>3</sup>, M. D. Silver<sup>4</sup>, Z. Zhang<sup>1</sup>, Y.-B. Chang<sup>4</sup>, E. Y. Sidky<sup>1</sup>, X. Pan<sup>1</sup>

<sup>1</sup>The University of Chicago, USA; <sup>2</sup>Toshiba Medical Systems Corporation, Japan; <sup>3</sup>National Cerebral and Cardiovascular Center Hospital, Japan; <sup>4</sup>Toshiba Medical Research Institute USA, USA

**M19-98 Laboratory-Based Edge-Illumination Phase-Contrast Imaging: Dark-Field Retrieval and High-Resolution Implementations**

M. Endrizzi<sup>1</sup>, P. C. Diemoz<sup>1</sup>, C. K. Hagen<sup>1</sup>, T. P. Millard<sup>1</sup>, F. A. Vittoria<sup>1,2</sup>, U. H. Wagner<sup>3</sup>, C. Rau<sup>3</sup>, I. K. Robinson<sup>4,2</sup>, A. Olivo<sup>1</sup>

<sup>1</sup>University College London, United Kingdom; <sup>2</sup>Research Complex at Harwell, United Kingdom; <sup>3</sup>Diamond Light Source, United Kingdom; <sup>4</sup>London Centre for Nanotechnology, United Kingdom

**M19-99 A Novel Decomposition Method for Dual-Energy Computed Tomography**

Y. Li<sup>1,2</sup>, L. Zhang<sup>1,2</sup>, K. Kang<sup>1,2</sup>, Z. Chen<sup>1,2</sup>

<sup>1</sup>Tsinghua University, China; <sup>2</sup>Ministry of Education, China

**M19-100 A Predictive Model for Monitoring Brain Disease Progression**

P. H. Lim, W. K. Lim, University of Nottingham, England

**M19-101 Optimization of Sensitivity, Dose and Spatial Resolution in Edge Illumination X-Ray Phase-Contrast Imaging**

P. C. Diemoz, M. Endrizzi, C. K. Hagen, F. A. Vittoria, T. P. Millard, A. Olivo

University College London, United Kingdom

**M19-102 Low-Dose X-Ray Phase Contrast Tomography: Experimental Setup, Image Reconstruction and Applications in Biomedicine**

C. K. Hagen, A. Zamir, P. C. Diemoz, M. Endrizzi, F. Kennedy, R. Jager, A. Olivo  
*University College London, UK*

**M19-103 aET: Alpha Emission Tomography**

Y. Ding, L. Caucci, H. H. Barrett  
*University of Arizona, USA*

**M19-104 Research of Spectroscopic Method for Intense X-Ray Image Diagnostics**

S. Muto, *National Institute for Fusion Science, JAPAN*; K. Mori, *Ibaraki Prefectural University of Health Sciences, JAPAN*; K. Hyodo, *High Energy Accelerator Research Organization, Japan*

**M19-105 A Joint Beta and Coincidence-Gamma Data Modeling and Image Reconstruction Framework for Plant Leaf Imaging**

H. Ranjibar, A. J. Mathews, J. Wen, Q. Wang, S. Komarov, J. A. O'Sullivan, Y.-C. Tai  
*Washington University in St. Louis, United States*

**M19-106 Contrast-to-noise Estimation and Optimization of a Novel Multi-Energy CT system for a Clinical Dual-Energy Imaging Task**

A. Hadjipanteli<sup>1</sup>, W. Worstell<sup>2</sup>, Y. Rakvongthai<sup>1</sup>, J. Ouyang<sup>1</sup>, J. Bian<sup>1</sup>, A. Lorsakul<sup>1</sup>, G. El Fakhri<sup>1</sup>  
<sup>1</sup>*Massachusetts General Hospital, USA*; <sup>2</sup>*Photo Diagnostic Systems, Inc., USA*

**M19-107 Real-Time Brain Activation Detection by FPGA Implemented Adaptive Algorithm**

M. S. Nazir, M. Aqil, A. Akram, B. C. Maheshwari, M. U. Hadi  
*Pakistan Institute of Engineering And Applied Sciences, Pakistan*

**M19-108 Curved Focusing Crystals for a Hard X-Ray Lens for Medical Imaging in Nuclear Medicine**

C. Ferrari, E. Buffagni, E. Bonnini  
*IMEM-CNR Institute, Italy*

**M19-109 Phase-Contrast X-Ray Imaging Segmentation Using Tsallis Entropy**

I. Dominguez Jimenez, A. Ramirez Reyes, G. Herrera Corral  
*CINVESTAV, Mexico*

**M19-110 Design and Additive Manufacturing of MRI Gradient Coils**

J. P. Rigla<sup>1</sup>, A. Sarwar<sup>2</sup>, A. N. Nacev<sup>2</sup>, M. Urdaneta<sup>2,3</sup>, E. Anashkin<sup>2</sup>, P. Stepanov<sup>2</sup>, I. N. Weinberg<sup>2</sup>, J. M. Benlloch<sup>1</sup>, A. McMillan<sup>4</sup>, S. Fricke<sup>5</sup>  
<sup>1</sup>*Instituto de Instrumentacion para Imagen Molecular, Spain*; <sup>2</sup>*Weinberg Medical Physics LLC, USA*; <sup>3</sup>*Additive Electromagnetics, USA*; <sup>4</sup>*University of Wisconsin, USA*; <sup>5</sup>*Children's National Medical Center, USA*

**M19-111 Pre-Reconstruction Three-Material Decomposition in Dual-Energy CT with an Energy-Resolved Photon-Counting Detector**

S. Lee, H.-J. Kim, *Yonsei University, Republic of Korea*

**M19-112 In Vivo Radiopharmaceutical Excitation Fluorescence Imaging**

Z. Hu<sup>1</sup>, Y. Qu<sup>2</sup>, K. Wang<sup>1</sup>, X. Zhang<sup>3</sup>, H. Liu<sup>2</sup>, J. Tian<sup>1</sup>  
<sup>1</sup>*Institute of Automation (IA), Chinese Academy of Sciences (CAS), China*; <sup>2</sup>*General Hospital of Chinese Armed Police Forces, China*; <sup>3</sup>*Chinese PLA General Hospital, China*

**M19-113 Identification of a region including metals in the projection data using an energy discriminating photon counting detector**

F. Kaibuki<sup>1</sup>, M. Matsumoto<sup>1</sup>, T. Fukui<sup>2</sup>, A. Katsumata<sup>2</sup>, K. Ogawa<sup>1</sup>  
<sup>1</sup>*Hosei University, Japan*; <sup>2</sup>*Asabi University, Japan*

**M19-114 Continuous or Pixelated Scintillators?, Not Longer a Discussion**

S. Majewski<sup>1</sup>, A. J. Gonzalez<sup>2</sup>, J. Proffitt<sup>3</sup>, P. Conde<sup>2</sup>, L. Hernandez<sup>2</sup>, F. Sanchez<sup>2</sup>, A. Stolin<sup>1</sup>, J. M. Benlloch<sup>2</sup>  
<sup>1</sup>*West Virginia University, United States*; <sup>2</sup>*Institute for Instrumentation in Molecular Imaging, Spain*; <sup>3</sup>*AiT Instruments, United States*

**M19-115 Optimization of Digital SiPMs Coupled to a Four-Layered DOI Crystal Block with Light Sharing**

E. Yoshida<sup>1</sup>, I. Somlai-Schweiger<sup>2</sup>, H. Tashima<sup>1</sup>, S. I. Ziegler<sup>2</sup>, T. Yamaya<sup>1</sup>  
<sup>1</sup>*National Institute of Radiological Sciences, Japan*; <sup>2</sup>*Technische Universität München, Germany*

**M19-116 Exploiting Anatomical Information for PET Image Enhancement: a Phantom Experiment for Algorithm Validation**

E. Grecchi, J. O'Doherty, F. E. Turkheimer  
*King's College London, UK*

**M19-117 Radiation Damage of the Multi-Pixel Photon Counter to Be Used for in-Beam PET in Carbon Therapy**

F. Nishikido, Y. Hirano, A. Mohammadi, T. Yamaya  
*National Institute of Radiological Sciences, Japan*

**M19-118 MR Bone Density Measurement Using Water- and Fat-Suppressed Projection Imaging (WASPI) for Attenuation Correction in PET-MR**

C. Huang<sup>1,2</sup>, J. Ouyang<sup>1,2</sup>, T. G. Reese<sup>2,1</sup>, Y. Wu<sup>2,3</sup>, G. El Fakhri<sup>1,2</sup>, J. L. Ackerman<sup>2,1</sup>  
<sup>1</sup>*Massachusetts General Hospital, USA*; <sup>2</sup>*Harvard Medical School, USA*; <sup>3</sup>*Children's Hospital Boston, USA*

**M19-119 Investigation of the Impact of Count Statistics and System Resolution to Intra-fraction Proton Beam Range Verification with PET Imaging**

K. Lou<sup>1,2</sup>, D. Mirkovic<sup>2</sup>, X. Sun<sup>2</sup>, X. R. Zhu<sup>2</sup>, F. Poenisch<sup>2</sup>, D. Grosshans<sup>2</sup>, J. W. Clark, Jr.<sup>1</sup>, Y. Shao<sup>2</sup>  
<sup>1</sup>*Rice University, USA*; <sup>2</sup>*University of Texas MD Anderson Cancer Center, USA*

**M19-120 Randoms and TOF Gain Revisited**

L. A. Eriksson<sup>1,2,3</sup>, M. Conti<sup>1</sup>

<sup>1</sup>Siemens Medical Solutions, Molecular Imaging, USA; <sup>2</sup>Scintillation Materials Research Center, USA; <sup>3</sup>University of Stockholm, Sweden

**M19-121 Probabilistic Layer Identification in a Multi-Layer Fast-Timing Detector for Time-of-Flight PET Using Machine Learning**

M. G. Ertosun, J. W. Cates, C. S. Levin

Stanford University, USA

**M19-122 Development of a PET/Cherenkov-Light Hybrid Imaging System**

S. Yamamoto<sup>1</sup>, F. Hamamura<sup>1</sup>, T. Watabe<sup>2</sup>, H. Ikeda<sup>2</sup>, Y. Kanai<sup>2</sup>, H. Watabe<sup>3</sup>, K. Kato<sup>1</sup>, J. Hatazawa<sup>2</sup>

<sup>1</sup>Nagoya University Graduate School of Medicine, Japan; <sup>2</sup>Osaka University Graduate School of Medicine, Japan; <sup>3</sup>Tohoku University CYRIC, Japan

**M19-123 Quantitative X-Ray Radiography for Nondestructively Evaluating Solid Soluble Content with the Grating Interferometry**

X. Jiang<sup>1,2</sup>, L. Zhang<sup>1,2</sup>, R. Zhang<sup>1,2</sup>, X. Zhu<sup>1,2</sup>

<sup>1</sup>Tsinghua University, China; <sup>2</sup>Key Laboratory of Particle and Radiation Imaging (Tsinghua University), Ministry of Education, China

**M21 High Resolution Instrumentation & Pre-Clinical Imaging**

Friday, Nov. 14 16:00-18:00 6A

Session Chairs: **Roger Lecomte**, Université de Sherbrooke, Canada

**Jae Sung Lee**, Seoul National University, South Korea

**M21-1 Evaluation of DoI Information Based on a Cross Strip Encoding Detector**

A. Kolb<sup>1</sup>, C. Parl<sup>1</sup>, M. Rafecas<sup>1</sup>, E. Lorenz<sup>2</sup>, B. J. Pichler<sup>1</sup>

<sup>1</sup>University of Tuebingen, Germany; <sup>2</sup>Max Planck Institute for Physics, Germany

**M21-2 (16:15) Data Processing Techniques and PET Performance Evaluation of a Preclinical PET/MR Insert with Digital Silicon Photomultiplier Technology**

D. Schug<sup>1</sup>, C. Lerche<sup>2</sup>, B. Weissler<sup>1,3</sup>, P. Gebhardt<sup>4</sup>, B. Goldschmidt<sup>1</sup>, A. Salomon<sup>2</sup>, J. Wehner<sup>1</sup>, P. M. Dueppenbecker<sup>1,4</sup>, F. Kiessling<sup>1</sup>, V. Schulz<sup>1,3</sup>

<sup>1</sup>RWTH Aachen University, Germany; <sup>2</sup>Philips Research, Netherlands; <sup>3</sup>Philips Research, Germany; <sup>4</sup>King's College London, United Kingdom

**M21-3 (16:30) Prototype PET System with a Pair of Digital SiPM-based Continuous Depth-of-interaction Encoding PET Detector**

M. S. Lee, K. Y. Kim, G. B. Ko, J. S. Lee

Seoul National University, Korea

**M21-4 (16:45) Motion Uncertainty Deblurring in Motion Corrected Reconstruction for  $\mu$ PET Brain Imaging of Awake Rats**

A. Miranda<sup>1</sup>, J. Verhaeghe<sup>1</sup>, J. Parthoens<sup>1</sup>, S. Staelens<sup>1</sup>, S. Stroobants<sup>1,2</sup>

<sup>1</sup>University of Antwerp, Belgium; <sup>2</sup>Antwerp University Hospital, Belgium

**M21-5 (17:00) Image Reconstruction Using Tetrahedral Voxels: a List Mode Implementation for Awake Animal Imaging**

J. E. Gillam, G. I. Angelis, W. J. Ryder, S. R. Meikle

The University of Sydney, Australia

**M21-6 (17:15) System Calibration for Adaptive SPECT Imaging**

C. Chaix<sup>1</sup>, M. A. Kupinski<sup>1,2</sup>, H. H. Barrett<sup>1,2</sup>, L. R. Furenlid<sup>1,2</sup>

<sup>1</sup>College of Optical Sciences - The University of Arizona, USA; <sup>2</sup>Center for Gamma Ray Imaging - The University of Arizona, USA

**M21-7 (17:30) MRC-SPECT-I: an Ultrahigh Resolution MR-Compatible SPECT System with Dual FOV Aperture**

X.-C. Lai<sup>1</sup>, A. Groll<sup>1</sup>, H.-M. Tsai<sup>2</sup>, C.-T. Chen<sup>2</sup>, L.-J. Meng<sup>1</sup>

<sup>1</sup>University of Illinois at Urbana-Champaign, USA; <sup>2</sup>University of Chicago, USA

**M21-8 (17:45) Dual-Resolution SPECT Imaging with a Rectangular Pinhole Collimator Tubes: System Integration and Prototype Scout-Tube Imaging**

D. Xia<sup>1</sup>, S. C. Moore<sup>2</sup>, M.-A. Park<sup>2</sup>, M. Cerro<sup>2</sup>, S. D. Metzler<sup>1</sup>

<sup>1</sup>University of Pennsylvania, USA; <sup>2</sup>Brigham & Women's Hospital and Harvard Medical School, USA

**M20 Image Reconstruction Methods II**

Friday, Nov. 14 16:00-18:00 6B

Session Chairs: **Richard M. Leahy**, University of Southern California, United States

**Adam M. Alessio**, University of Washington, United States

**M20-1 (16:00) Application of the Ordered-Subsets Transmission Reconstruction Algorithm to Contrast-Enhanced Dual-Energy Digital Breast Tomosynthesis**

Y. Lu, B. Peng, D. Scaduto, W. Zhao, G. Gindi

Stony Brook University, USA

**M20-2 (16:15) SURE-Based Regularization Parameter Selection for List-Mode Penalized-Likelihood Image Reconstruction in PET**

J. Zhou<sup>1</sup>, X. Niu<sup>2</sup>, H. Ye<sup>2</sup>, W. Wang<sup>2</sup>, J. Qi<sup>1</sup>

<sup>1</sup>University of California, Davis, USA; <sup>2</sup>Toshiba Medical Research Institute USA, Inc., USA

**M20-3 (16:30) List-Mode Reconstruction of Multiple-Pinhole MicroSPECT Data Using Origin Ensembles**

M. Cerro<sup>1,2,3</sup>, D. Xia<sup>4</sup>, S. D. Metzler<sup>4</sup>, S. C. Moore<sup>1,3</sup>

<sup>1</sup>Brigham and Women's Hospital, United States; <sup>2</sup>University of Massachusetts Lowell, United States; <sup>3</sup>Harvard Medical School, United States; <sup>4</sup>University of Pennsylvania, United States

**M20-4 (16:45) Motion Compensated Reconstruction of 4D SPECT Using Parallel Computation and Content Adaptive Mesh**

F. Massanes, J. G. Brankov  
Illinois Institute of Technology, USA

**M20-5 (17:00) Spatiotemporal Total Variation Reconstruction for Dynamic PET**

J. F. P. J. Abascal<sup>1,2</sup>, E. Lage<sup>3</sup>, M. E. Martino<sup>2</sup>, J. L. Herraiz<sup>3</sup>, M. Desco<sup>1,2,4</sup>, J. J. Vaquero<sup>1,2</sup>  
<sup>1</sup>Universidad Carlos III de Madrid, Spain; <sup>2</sup>Instituto de Investigacion Sanitaria Gregorio Maranon (IiSGM), Spain; <sup>3</sup>Madrid-MIT M+Vision Consortium, United States; <sup>4</sup>Centro de Investigacion Biomedica en Red de Salud Mental (CIBERSAM), Spain

**M20-6 (17:15) Fully 3D Image Reconstruction and Quantitative Correction for a Total-Body PET Scanner**

X. Zhang, J. Zhou, R. D. Badawi, J. Qi  
University of California, Davis, USA

**M20-7 (17:30) Sinogram Blurring Matrix Estimation from Point Sources Measurements with Rank-One Approximation**

K. Gong, J. Zhou, J. Qi  
University of California Davis, USA

**M20-8 (17:45) Direct Inversion of Spectral CT Data into a Materials Decomposition and the Effect of Multiple Soft Tissues**

E. Y. Sidky<sup>1</sup>, T. Gilat-Schmidt<sup>2</sup>, X. Pan<sup>1</sup>  
<sup>1</sup>University of Chicago, USA; <sup>2</sup>Marquette University, USA

**M22 Data Corrections and Quantitative Imaging Techniques II**

Saturday, Nov. 15 08:00-10:00 6B

Session Chairs: **Roger R. Fulton**, University of Sydney, Australia  
**Abhijit J. Chaudhari**, UC Davis School of Medicine, United States

**M22-1 (08:00) An ADMM Reconstruction Algorithm for Joint Registration and Attenuation Correction in Transmission-Less Gated TOF PET**

H. Li<sup>1,2</sup>, G. El Fakhri<sup>2</sup>, A. A. Joshi<sup>3</sup>, Q. Li<sup>2</sup>  
<sup>1</sup>boston university, USA; <sup>2</sup>Massachusetts general hospital, harvard university, USA; <sup>3</sup>University of Southern California, USA

**M22-2 (08:15) PET Image Reconstruction with Correction for Non-Periodic Deformable Motion**

I. S. Klyuzhin, G. Stortz, V. Sossi  
University of British Columbia, Canada

**M22-3 (08:30) A Prompt-Gamma Correction Method for Non-Standard PET Radionuclides Based on the Detection of Triple Coincidences**

J. L. Herraiz<sup>1</sup>, S. C. Moore<sup>2</sup>, V. Parot<sup>1</sup>, S. R. Dave<sup>1</sup>, M.-A. Park<sup>2</sup>, S.-S. Yoo<sup>2</sup>, W. Lee<sup>2</sup>, H. Kim<sup>3</sup>, E. Lage<sup>1</sup>  
<sup>1</sup>Madrid-MIT M+Vision Consortium, United States; <sup>2</sup>Brigham and Women's Hospital and Harvard Medical School, United States; <sup>3</sup>Korea Institute of Science and Technology, Korea

**M22-4 (08:45) Multi-Bed Elastic Motion Correction for Whole Body MR-PET**

G. Bal<sup>1</sup>, M. Fenchel<sup>2</sup>, V. Panin<sup>1</sup>, W. Howe<sup>1</sup>, F. Kehren<sup>1</sup>  
<sup>1</sup>Siemens Healthcare, USA; <sup>2</sup>Siemens Healthcare, Germany

**M22-5 (09:00) Scatter and Crosstalk Corrections for <sup>99m</sup>Tc/<sup>123</sup>I Dual-Isotope Imaging Using a CZT SPECT System with Pinhole Collimators**

P. Fan<sup>1,2</sup>, B. Hutton<sup>3</sup>, M. Ljungberg<sup>4</sup>, T. Ma<sup>2</sup>, Y. Liu<sup>2</sup>, S. Wang<sup>2</sup>, R. Prasad<sup>1</sup>, S. Thorn<sup>1</sup>, M. Stacy<sup>1</sup>, A. Sinusas<sup>1</sup>, C. Liu<sup>1</sup>  
<sup>1</sup>Yale University, USA; <sup>2</sup>Tsinghua University, China; <sup>3</sup>Univeristy College London, UK; <sup>4</sup>Lund Univeristy, Sweden

**M22-6 (09:15) MR Based PET Attenuation Correction (MRAC) and Anatomical Localization of Human Brain Using an Optimized UTE-mDixon Pulse Sequence**

L. Hu<sup>1</sup>, C. Stehning<sup>2</sup>, N. Nguyen<sup>3</sup>, C. MartinezRios<sup>3</sup>, A. Sher<sup>3</sup>, Z. Hu<sup>1</sup>, L. Shao<sup>1</sup>  
<sup>1</sup>Philips Healthcare, USA; <sup>2</sup>Philips Research, Germany; <sup>3</sup>University Hospital, USA

**M22-7 (09:30) Data-Driven Respiratory Motion Estimation and Correction Using TOF PET List-Mode Centroid of Distribution**

S. Ren, X. Jin, C. Chan, T. Mulnix, C. Liu, R. E. Carson  
Yale University, USA

**M22-8 (09:45) CT Density Driven Continuous Bed Motion Acquisition**

V. Y. Panin, H. Bal, M. E. Casey, Siemens Healthcare, USA

**M23 Simulation, Modelling & Image Processing**

Saturday, Nov. 15 10:30-12:00 6B

Session Chairs: **Ling-Jian Meng**, University of Illinois at Urbana-Champaign, United States  
**Magdalena Rafecas**, University of Tuebingen, Germany

**M23-1 (10:30) Statistics of Nuclear Imaging**

A. Sitek

*Massachusetts General Hospital and Harvard Medical School, USA*

**M23-2 (10:45) Simulation and Validation of Burrow-SPECT for Awake Animal Imaging**

F. Boisson<sup>1,2</sup>, J. Gillam<sup>2</sup>, P. Kench<sup>2</sup>, G. Angelis<sup>2</sup>, A. Kyme<sup>2</sup>, R. Fulton<sup>2</sup>, S. R. Meikle<sup>2</sup>

<sup>1</sup>*Australian Nuclear Science and Technology Organisation, Australia;* <sup>2</sup>*University of Sydney, Australia*

**M23-3 (11:00) PET Detectors Using Continuous Crystals: a Simulation Study about Detector Limitations**

J. Cabello<sup>1</sup>, F. R. Schneider<sup>1</sup>, A. M. Etxebeste<sup>2</sup>, G. Llosá<sup>2</sup>, S. I. Ziegler<sup>1</sup>

<sup>1</sup>*Klinikum rechts der Isar der Technischen Universität München, Germany;* <sup>2</sup>*Instituto de Física Corpuscular (CSIC/UV), Spain*

**M23-4 (11:15) Analysis of Spatial Patterns in Tumor Imaging Data: A Method for Assessment of Tubularity**

E. Wolsztynski, J. O'Sullivan, J. Eary, F. O'Sullivan

*University College Cork, Ireland*

**M23-5 (11:30) The Evaluation of Treatment Response Using Gaussian Random Field Theory**

M. Wang<sup>1,2</sup>, H. Zhang<sup>1</sup>, G. El Fakhri<sup>2</sup>, Q. Li<sup>2</sup>

<sup>1</sup>*Tsinghua University, China;* <sup>2</sup>*Massachusetts General Hospital, USA*

**M23-6 (11:45) Scatter Correction with Combined Single-Photon Simulation and Monte Carlo Simulation for 3D PET**

J. Ye, X. Song, Z. Hu, *Philips Healthcare, United States*

# RTSD Program

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## R01 RTSD Opening

Monday, Nov. 10 14:00-15:30 611 & 612

Session Chair: **Michael Fiederle**, Freiburger Materialforschungszentrum, Germany

### R01-1 (14:00) Welcome and Introductory Comments

R. B. James, Brookhaven National Laboratory, USA; M. Fiederle, University of Freiburg, Germany

### R01-2 (14:05, invited) Redlen's CZT Growth and Detector Technology for High Flux X-Ray Applications

U. El-Hanany, Redlen Technologies, Canada

On behalf of the Redlen Technologies

### R01-3 (14:25) A 100cm<sup>2</sup> Spectroscopic Imaging Detector Based on the HEXITEC ASIC

M. D. Wilson<sup>1</sup>, S. J. Bell<sup>1,2</sup>, D. D. Duarte<sup>1,2</sup>, A. Schneider<sup>1</sup>, P. Seller<sup>1</sup>, M. C. Veale<sup>1</sup>

<sup>1</sup>STFC, Rutherford Appleton Laboratory, Oxfordshire; <sup>2</sup>University of Surrey, Surrey

### R01-4 (14:40) Stability Investigation of Photon Counting Medipix Chips with Si, GaAs and CdTe Sensors

S. Procz<sup>1</sup>, F. Fischer<sup>1</sup>, A. Fauler<sup>1</sup>, E. Hamann<sup>2</sup>, M. Fiederle<sup>1</sup>

<sup>1</sup>EMF University of Freiburg, Germany; <sup>2</sup>KIT (Karlsruhe Institute of Technology), Germany

### R01-5 (14:55) Control of Electric Field in CdTe and CdZnTe by Light

J. Franc, V. Dedic, M. Rejhon, J. Zazvorka, Institute of Physics, Charles University, Czech Republic; P. Sellin, Department of Physics, University of Surrey, Great Britain

### R01-6 (15:10, invited) Can Large Volume 3-D CdZnTe Detectors Approach HPGe Resolution?

Z. He, Y. Zhu, F. Zhang, M. Streicher, Y. A. Boucher

The University of Michigan, United States

## R02 CZT1

Monday, Nov. 10 16:00-17:50 611 & 612

Session Chair: **Zhong He**, The University of Michigan, United States

### R02-1 (16:00, invited) Characterization of CdZnTe Radiation Detectors at eV Products

M. Prokesch, eV Products, Inc., USA

### R02-2 (16:20) Tellurium Inclusion Density and Distribution in THM-Grown CdZnTe Cooled at Different Rates

J. M. MacKenzie, F. J. Kumar, L. Burgess

Redlen Technologies, Canada

### R02-3 (16:35) Progress of Room-Temperature Radiation Detectors Development at KAERI

M. Jeong, H. S. Kim, J. H. Ha

Korea Atomic Energy Research Institute, South Korea

### R02-4 (16:50) Characterization of CdZnTe Crystal Co-Doped with Indium and Lead

T. Wang, Northwestern Polytechnical University, China

On behalf of the Wanqi Jie's Group

### R02-5 (17:05) Atomic and Electronic Structure of Dislocations in Cd(Zn)Te

V. Lordi<sup>1</sup>, D. Aberg<sup>1</sup>, M. Skarlinski<sup>1,2</sup>, E. Cho<sup>1,3</sup>

<sup>1</sup>Lawrence Livermore National Lab, USA; <sup>2</sup>University of Rochester, USA; <sup>3</sup>Samsung Advanced Institute of Technology, South Korea

### R02-6 (17:20) 3D Position Estimation in a Crossed-Strip CdTe Detector

E. Salcin<sup>1</sup>, H. H. Barrett<sup>1</sup>, H. B. Barber<sup>1</sup>, S. Takeda<sup>2</sup>, S. Watanabe<sup>2,3</sup>, T. Takahashi<sup>2,3</sup>, L. R. Furenlid<sup>1</sup>

<sup>1</sup>University of Arizona, USA; <sup>2</sup>Japan Aerospace Exploration Agency, Japan; <sup>3</sup>University of Tokyo, Japan

### R02-7 (17:35) Effects of Fabrication Processes on Electric Field Distribution and Temporal Stability of CZT Radiation Detectors

G. S. Camarda<sup>1</sup>, A. E. Bolotnikov<sup>1</sup>, Y. Cui<sup>1</sup>, A. Hossain<sup>1</sup>, K. Kim<sup>2</sup>, W. Lee<sup>1,2</sup>, M. F. Wart<sup>1,3</sup>, G. Yang<sup>1</sup>, R. B. James<sup>1</sup>

<sup>1</sup>Brookhaven National Lab, USA; <sup>2</sup>Korea University, Republic of Korea; <sup>3</sup>Rensselaer Polytechnic Institute, USA

## R03 Imaging Applications

Tuesday, Nov. 11 08:00-09:25 611 & 612

Session Chair: **Loick Verger**, CEA-LETI, France

### R03-1 (08:00, invited) System Integration and Application of CdZnTe Detectors in a Compton Camera for Medical Use

F. Fiedler<sup>1</sup>, W. Enghardt<sup>1,2</sup>, C. Golnik<sup>2</sup>, F. Hueso-Gonzales<sup>2</sup>, T. Kormoll<sup>2</sup>, A. Mueller<sup>2</sup>, G. Pausch<sup>2</sup>, J. Petzold<sup>2</sup>, H. Rohling<sup>2</sup>, K. Roemer<sup>1</sup>, S. Schoene<sup>1</sup>  
<sup>1</sup>*Helmholtz-Zentrum Dresden-Rossendorf, Germany*; <sup>2</sup>*OncoRay — National Center for Radiation Research in Oncology, Faculty of Medicine and University Hospital Carl Gustav Carus, Technische Universität Dresden, Helmholtz-Zentrum Dresden – Rossendorf, Germany*

**R03-2 (08:20, invited) New Multi-Energy Photon-Counting X-Ray Detectors for CT Systems**

L. Verger, M. Jurdit, P. Ouvrier-buffet, A. Peizerat, J.-P. Rostaing, M. Tchagaspanian, V. Rebuffel  
*MINATEC Campus, Univ. Grenoble Alpes, FRANCE*

**R03-3 (08:40, invited) CdZnTe Detector Based Systems for Imaging Applications**

B. W. Harris, *eV Products, Inc., USA*

**R03-4 (08:55) Photon Counting X-Ray CT for Low Dose Imaging**

T. Aoki<sup>1,2</sup>, A. Koike<sup>1</sup>, H. Morii<sup>1</sup>, T. Okunoyama<sup>1</sup>, H. Mimura<sup>1</sup>  
<sup>1</sup>*Shizuoka University, Japan*; <sup>2</sup>*ANSeeN Inc., Japan*

**R03-5 (09:10) Mini Compton Camera Based on an Array of Frisch-Ring CdZnTe Detectors**

W. Lee, *Korea University, Korea*; A. Bolotnikov, G. Camarda, Y. Cui, A. Hossain, G. Yang, R. Utpal, R. B. James, *Brookhaven National Laboratory, USA*

**R04 CZT2**

Tuesday, Nov. 11 10:30-11:45 611 & 612

Session Chair: **Jan Franc**, *Institute of Physics, Charles University, Czech Republic*

**R04-1 (10:30, invited) Differential Capacitance Measurement for MIS CdZnTe Detector**

K. Kim, P. Kim, C. Park, *Korea University, Republic of Korea*; G. S. Camarda, A. E. Bolotnikov, R. B. James, *Brookhaven National Laboratory, USA*

**R04-2 (10:50, invited) Spectral Imaging Performance of a CZT Sensor Bonded to Medipix3RX**

E. Frojdh, *Mid Sweden University, Sweden*; R. Ballabriga, M. Campbell, *CERN, Switzerland*; A. Cherlin, I. Radley, *Kromek Ltd., U.K.*

**R04-3 (11:10) Characterization of the VIP-PIX Detector, a Novel Room Temperature Pixelated CdTe Detector for PET Applications.**

G. De Lorenzo, M. Chmeissani, G. Arino, J. G. Macias Montero, C. Puigdenoles, J. Garcia, *IFAE, Barcelona, Spain*; R. Martinez, E. Cabruja, *IMB-CNM (CSIC), Spain*

**R04-4 (11:25, invited) Focused Ion Beam Investigation of Cathodoluminescence Features in Cadmium Zinc Telluride**

N. M. Haegel, P. J. Young, S. K. Menon, *Naval Postgraduate School, USA*; H. Chen, *Henry Chen Consulting Inc., Canada*

**R05 Materials 1**

Tuesday, Nov. 11 14:40-15:30 611 & 612

Session Chair: **Keitaro Hitomi**, *Tohoku University, Japan*

**R05-1 (14:40) Large Volume Crystalline Zinc Telluride Doped with Oxygen as a High Performance Scintillator**

J. T. Mullins<sup>1</sup>, Z. Kang<sup>2</sup>, C. J. Summers<sup>2</sup>, E. Marsden<sup>1</sup>, I. Radley<sup>1</sup>  
<sup>1</sup>*Kromek Ltd., U.K.*; <sup>2</sup>*Georgia Institute of Technology, U.S.A.*

**R05-2 (14:55, invited) Defect Characterization of N-Type 4H-SiC Epitaxial Schottky Detectors: Deep Level Transient Spectroscopy, Cathodoluminescence, and Electron Beam Induced Current Studies**

K. V. Nguyen<sup>1</sup>, M. A. Mannan<sup>1</sup>, S. K. Chaudhuri<sup>1</sup>, M. H. Zaldivar<sup>2</sup>, U. Pal<sup>3</sup>, K. C. Mandal<sup>1</sup>  
<sup>1</sup>*University of South Carolina, USA*; <sup>2</sup>*CNYN-UNAM, Mexico*; <sup>3</sup>*Autonomous University of Puebla, Mexico*

**R05-3 (15:15) Evaluation of Radiation Detection Characteristic for GaN Semiconductor Material**

M. Sugiura, K. Atsumi, Y. Inoue, H. Mimura, T. Aoki, T. Nakano  
*Shizuoka University, Japan*

**R06 Crystal growth and characterization**

Tuesday, Nov. 11 16:00-18:00 611 & 612

Session Chair: **Larry A. Franks**, *United States*

**R06-1 (16:00, invited) The History and Future of Bridgman Crystal Growth and Why This Is Important for Radiation Detector Crystals**

J. J. Derby, *University of Minnesota, U.S.A.*

**R06-2 (16:20, invited) The Effect of Crystal Quality on the Behavior of Semi-Insulating CdZnTe Detectors for X-Ray Spectroscopic and High Flux Applications.**

G. Prekas, A. Densmore, J. MacKenzie, J. Kumar, V. Perumal  
*Redlen Technologies Inc., Canada*

**R06-3 (16:40, invited) Advances in THM Growth of Large Diameter CdZnTe Crystals and Virtual Hemispherical Detectors**

S. Motakef, P. Becla, K. Becla, M. Overholt, J. Fiala  
*CapeSym, Inc., USA*

**R06-4 (17:00) The Physical Property and Crystal Growth of CdMnTe Single Crystals by Using a Modified Floating Zone Method**

G. D. Gu, T. S. Liu, A. Hossain, G. Yang, Y. Cui, G. S. Camarda, U. Roy, A. E. Bolotnikov, R. B. James  
*Brookhaven National Laboratory, USA*

**R06-5 (17:15) Novel Post Growth Cooling and Its Impact on Bridgman Grown Detector Grade CdZnTe Characteristics**

S. K. Swain<sup>1</sup>, Y. Cui<sup>2</sup>, K.-M. Figueroa<sup>1</sup>, A. Burger<sup>2</sup>, K. Lynn<sup>1</sup>  
<sup>1</sup>*Washington State University, USA*; <sup>2</sup>*Fisk University, USA*

**R06-6 (17:30) Influence of Thermal Annealing on the Defects in CdZnTe Crystals**

G. Yang<sup>1</sup>, A. E. Bolotnikov<sup>1</sup>, Y. Cui<sup>1</sup>, G. S. Camarda<sup>1</sup>, A. Hossain<sup>1</sup>, U. N. Roy<sup>1</sup>, P. M. Fochuk<sup>1,2</sup>, R. B. James<sup>1</sup>  
<sup>1</sup>*Brookhaven National Laboratory, USA*; <sup>2</sup>*Chernivtsi National University, Ukraine*

**R06-7 (17:45) Material and Device Engineering for High Performance CZT Detectors**

S. Taherion, P. Lu, P. Gomolchuk, J. Kumar, E. Chen  
*Redlen Technologies, Canada*

**R07 Imaging and growth**

Wednesday, Nov. 12 10:30-12:00 611 & 612

Session Chairs: **Beatrice Fraboni**, Department of Physics and Astronomy, University of Bologna, Italy  
**Henry Chen**, Redlen Technologies, Canada

**R07-1 (10:30, invited) Cadmium Telluride Detector System for Identifying Illicit Substances by X-Ray Energy Dispersive Diffraction**

J. S. Iwanczyk, *DxRay, Inc., USA*; E. Nygard, *Interon AS, Asker, Norway, Norway*; D. Kosciesza, *Morpho Detection Germany GmbH, Germany*

**R07-2 (10:50, invited) High Resistivity, Cr-Compensated GaAs for Photon Counting Pixel Detectors**

E. Hamann<sup>1</sup>, T. Koenig<sup>1</sup>, M. Zuber<sup>1</sup>, O. Tolbanov<sup>2</sup>, A. Tyazhev<sup>2</sup>, S. Procz<sup>3</sup>, A. Fauler<sup>3</sup>, M. Fiederle<sup>1,3</sup>  
<sup>1</sup>*IPSIANKA, Karlsruhe Institute of Technology (KIT), Germany*; <sup>2</sup>*Tomsk State University, Russia*; <sup>3</sup>*FMF, Germany*

**R07-3 (11:10, invited) Prospect of CdTeSe1-X for Room Temperature Radiation Detector Applications**

U. N. Roy<sup>1</sup>, A. Bolotnikov<sup>1</sup>, G. Camarda<sup>1</sup>, Y. Cui<sup>1</sup>, A. Hossain<sup>1</sup>, W. Lee<sup>1,2</sup>, R. Tappero<sup>1</sup>, G. Yang<sup>1</sup>, Y. Cui<sup>3</sup>, A. Burger<sup>3</sup>, R. B. James<sup>1</sup>  
<sup>1</sup>*Brookhaven National Laboratory, USA*; <sup>2</sup>*Korea University, Korea*; <sup>3</sup>*Fisk University, USA*

**R07-4 (11:30) Reducing the Production Cost of THM-Grown CdZnTe Crystals by Utilizing Recycled and Reduced Purity Metals.**

J. M. MacKenzie, F. J. Kumar, L. Burgess  
*Redlen Technologies, Canada*

**R07-5 (11:45) Purification, Bulk Growth, and Characterization Results of LiZnP and LiZnAs for Solid-State Neutron Detectors**

B. W. Montag<sup>1</sup>, M. A. Reichenberger<sup>1</sup>, P. B. Ugorowski<sup>1</sup>, M. Sunder<sup>2</sup>, D. S. McGregor<sup>1</sup>  
<sup>1</sup>*Kansas State University, USA*; <sup>2</sup>*Bruker AXS Inc., USA*

**R08 Poster 1**

Wednesday, Nov. 12 16:00-18:00 4B

Session Chair: **Krishna C. Mandal**, University of South Carolina, United States

**R08-1 High Resolution Mapping of the Electrical Response of CdZnTe Pixelated Detectors in the Dark and under Optical Excitation: a Novel Method for Probing the Material Properties and a Screening Tool for Detector Evaluation.**

G. Prekas, A. Densmore, C. Neilly  
*Redlen Technologies Inc., Canada*

**R08-2 Silicon Photomultiplier Arrays for High Performance Scintillation Detectors**

E. Marsden<sup>1</sup>, P. Joshi<sup>2</sup>, D. Jenkins<sup>2</sup>, A. Tuff<sup>1</sup>  
<sup>1</sup>*Kromek Ltd., U.K.*; <sup>2</sup>*University of York, U.K.*

**R08-3 Optically Excited Transient Current Pulse Shape Formation in (CdZn)Te Detectors**

P. Praus, E. Belas, R. Grill, J. Pekarek  
*Charles University in Prague, Czech Republic*

**R08-4 A Setup for Gamma Ray Sources Localization Using Coded Apertures and CdTe Detectors**

C. Papadimitropoulos<sup>1</sup>, I. Kaissas<sup>2</sup>, K. Karafasoulis<sup>3</sup>, C. Potiriadis<sup>2</sup>, C. P. Lambropoulos<sup>1</sup>  
<sup>1</sup>*Technological Educational Institute of Sterea Ellada, Greece*; <sup>2</sup>*Greek Atomic Energy Commission, Greece*; <sup>3</sup>*Hellenic Army Academy, Greece*

**R08-5 Quantitative Investigation of the Conditioning Phase in Pixelated TlBr Detectors**

W. Koehler, S. O'Neal, Z. He, *University of Michigan, United States*; L. Cirignano, H. Kim, K. Shah, *Radiation Monitoring Devices, United States*

**R08-6 Structural, Electrical and Optical Properties of CdMnTe Crystals Grown by the Floating-Zone Technique**

G. Yang<sup>1</sup>, A. E. Bolotnikov<sup>1</sup>, Y. Cui<sup>1</sup>, G. S. Camarda<sup>1</sup>, G. Gu<sup>1</sup>, A. Hossain<sup>1</sup>, W. Lee<sup>1,2</sup>, U. N. Roy<sup>1</sup>, R. B. James<sup>1</sup>  
<sup>1</sup>*Brookhaven National Laboratory, United States*; <sup>2</sup>*Korea University, South Korea*

**R08-7 Improving and Characterization of the (Cd,Zn)Te Crystal Quality for the Detection of Gamma Radiation**

A. Gerasimenko<sup>1</sup>, M. Kosmyna<sup>1</sup>, N. Kovalenko<sup>1</sup>, L. Davydov<sup>2</sup>, V. Sklyarchuk<sup>2</sup>, O. Panchuk<sup>3</sup>, I. Terzin<sup>1</sup>, A. Zakharchenko<sup>2</sup>, V. Kutniy<sup>2</sup>, A. Rybka<sup>2</sup>, P. Fochuk<sup>3</sup>, A. Bolotnikov<sup>4</sup>, R. B. James<sup>4</sup>

<sup>1</sup>Institute for Single Crystals, Ukraine; <sup>2</sup>National Science Centre Kharkov Institute of Physics & Technology, Ukraine; <sup>3</sup>Chernivtsi National University, USA; <sup>4</sup>Brookhaven National Laboratory, USA

**R08-8 Influence of the Electric Field on the Energy Resolution of Cr/CdTe/Pt Detectors**

V. Sklyarchuk<sup>1</sup>, P. Fochuk<sup>1</sup>, Z. Zakharuk<sup>1</sup>, I. Rarenko<sup>1</sup>, Y. Nykoniuk<sup>2</sup>, O. Sklyarchuk<sup>1</sup>, A. Rybka<sup>3</sup>, N. Kovalenko<sup>4</sup>, A. Bolotnikov<sup>5</sup>, R. B. James<sup>5</sup>  
<sup>1</sup>Chernivtsi National University, Ukraine; <sup>2</sup>National University of Water Management and Natural Resources Application, Ukraine; <sup>3</sup>Kharkiv Institute of Physics & Technology, Ukraine; <sup>4</sup>Institute for Single Crystals, Kharkiv, Ukraine; <sup>5</sup>Brookhaven National Laboratory, USA

**R08-9 Simulation of Characteristics of Cd(Zn)Te-Detectors for Radionuclide Identification Devices**

A. I. Skrypnyk, A. V. Rybka, National Science Centre "Kharkov Institute of Physics & Technology", Ukraine; P. M. Fochuk, Chernivtsi National University, Ukraine; A. E. Bolotnikov, R. B. James, Brookhaven National Laboratory, USA

**R08-10 Investigation of the Dislocations-Related Microstructural Defects Induced by Inclusions in CdZnTe Single Crystals**

Y. He, W. Jie, Y. Xu, T. Wang, N. Jia, Y. Zhou, X. Guo, H. Liu, Y. Zaman, G. Zha  
Northwestern Polytechnical University, China

**R08-11 Stress Distribution in TlBr Crystals and Its Effect on Detector Performance**

A. Datta, S. Motakef, Capesym, Inc., USA

**R08-12 Photoluminescence of CdTe(111) Single Crystal after Laser Irradiation**

D. V. Gnatyuk, T. Ito, T. Aoki, Shizuoka University, Japan

**R08-13 Characteristics and Stability of Diode Type CdTe-based X-Ray and Gamma-Ray Detectors**

V. A. Gnatyuk<sup>1,2</sup>, O. I. Vlasenko<sup>1</sup>, T. Aoki<sup>2,3</sup>, A. Koike<sup>3</sup>  
<sup>1</sup>V.E. Lashkaryov Institute of Semiconductor Physics of the National Academy of Sciences of Ukraine, Ukraine; <sup>2</sup>Research Institute of Electronics, Shizuoka University, Japan; <sup>3</sup>ANSeeN Inc., Japan

**R08-14 Simulation and Measurement of Pixelated CZT Detector**

J. Fu<sup>1,2</sup>, Y. Li<sup>1,2</sup>, L. Zhang<sup>3</sup>, Y. Liu<sup>1,2</sup>, J. Li<sup>3</sup>, W. Zhang<sup>3</sup>, Y. Li<sup>1,2</sup>  
<sup>1</sup>Tsinghua University, China; <sup>2</sup>Ministry of Education, China; <sup>3</sup>Nuctech Company Limited, China

**R08-15 Photoluminescence of Polished and Etched Semi-Insulating CdTe:In**

J. Zazvorka, J. Franc, P. Hlidek  
Faculty of Mathematics and Physics, Charles University in Prague, Czech Republic

**R08-16 Radiation Response Characteristics of Thick Polycrystalline CdTe Deposited by Vapor Transport Deposition**

K. Yang, B. Cha, S. Jeon  
Korea Electrotechnology Research Institute, South Korea

**R08-17 A Compton Scatter Experiment for the Discrimination of Single- vs. Multi-Site Events in CZT-CPG Detectors**

D. Gehre, Technical University Dresden, Germany  
On behalf of the COBRA Collaboration

**R08-18 Through Silicon Vias in ASICs for Modular Pixelated X-Ray Detectors**

P. Seller, M. C. Veale, M. D. Wilson, A. Schneider, S. L. Thomas, Rutherford Appleton Laboratory, UK; S. J. Bell, D. D. Duarte, University of Surrey, UK

**R08-19 Microbeam Studies and Simulation of a CZT Ring-Drift Detector**

V. H. Boothman, A. Alruhaili, P. Sellin, A. Lohstroh, V. Perumal, University of Surrey, UK; K. Sawhney, S. Kachkanov, Diamond Light Source, UK

**R08-20 Simulation and Characterization of Edge Surfaces in Cd(Zn)Te Radiation Detectors**

D. D. Duarte<sup>1,2</sup>, S. J. Bell<sup>1,2</sup>, J. D. Lipp<sup>1</sup>, A. Schneider<sup>1</sup>, P. Seller<sup>1</sup>, M. C. Veale<sup>1</sup>, M. D. Wilson<sup>1</sup>, M. A. Baker<sup>2</sup>, P. J. Sellin<sup>2</sup>  
<sup>1</sup>STFC Rutherford Appleton Laboratory, United Kingdom; <sup>2</sup>University of Surrey, United Kingdom

**R08-21 Direct Deposition of Polycrystalline CdTe Films on the Medipix Readout Chip, Evaluation of Layer Quality and Imaging Results**

A. Vogt, S. Schuett, F. Fischer, C. Disch, J. Feyrer, Y. Lu, M. Fiederle  
Freiburg Materials Research Center, University of Freiburg, Germany

**R08-22 Characterization of a Digital ASIC Readout System for 11 X 11 Pixelated TlBr Detectors**

S. O'Neal, W. Koehler, Z. He, University of Michigan, United States; H. Kim, L. Cirignano, K. Shah, Radiation Monitoring Devices, United States

**R08-23 Different Surface Contacts on CdTe and CdZnTe Based Radiation Detectors**

J. Pekarek, E. Belas, P. Praus, R. Grill  
Institute of Physics, Charles University, Czech Republic

**R08-24 Comparison of Spectroscopic and Imaging Performance of Schottky CdTe Medipix3RX and HEXITEC Pixelated Detectors**

V. Astromskas<sup>1</sup>, A. Lohstroh<sup>1</sup>, E. N. Gimenez<sup>2</sup>, N. Tartoni<sup>2</sup>, M. Veale<sup>3</sup>, P. Sellin<sup>1</sup>, P. Seller<sup>3</sup>, M. D. Wilson<sup>3</sup>  
<sup>1</sup>University of Surrey, United Kingdom; <sup>2</sup>Diamond Light Source, United Kingdom; <sup>3</sup>Rutherford Appleton Laboratory, United Kingdom

**R08-25 Coded Aperture Imaging with Sub-Pixel Position Resolution Using VAD\_UM V1.2**

Y. Zhu, S. Brown, Z. He, University of Michigan, USA

**R08-26 CZT Detector Modeling for Coded Aperture X-Ray Diffraction Imaging Applications**

J. Greenberg<sup>1</sup>, K. Iniewski<sup>2</sup>, D. Brady<sup>1</sup>  
<sup>1</sup>Duke University, USA; <sup>2</sup>Redden Technologies, Canada

**R08-27 Primary Radiation Sources Tracking in Large Contaminated Area Using Gamma-Ray Imaging Spectrometers**

J. C. Kim<sup>1</sup>, G. Wakabayashi<sup>2</sup>, G. D. Kim<sup>1</sup>, Y.-K. Kim<sup>1</sup>

<sup>1</sup>Institute for Basic Science, Korea; <sup>2</sup>Kinki University, Japan

**R08-28 Performance of the First 3x3 Digital 3D CZT Imaging Spectrometer System**

M. W. Streicher, H. Yang, Y. Zhu, F. Zhang, Z. He

University of Michigan, USA

**R08-29 Ternary Halide Perovskites: a New Class of Radiation Detection Semiconductors**

C. C. Stoumpos<sup>1</sup>, H. Li<sup>1</sup>, C. D. Malliakas<sup>1</sup>, J. Im<sup>2</sup>, M. Sebastian<sup>2</sup>, J. A. Peters<sup>2</sup>, Z. Liu<sup>2</sup>, D. Y. Chung<sup>2</sup>, A. J. Freeman<sup>2</sup>, B. W. Wessels<sup>2</sup>, M. G. Kanatzidis<sup>1,2</sup>

<sup>1</sup>Argonne National Laboratory, United States; <sup>2</sup>Northwestern University, United States

**R08-30 Refined Crystal Growth of Thallium Chalcohalide Hard Radiation Detectors**

P. L. Wang, W. Lin, Z. Liu, B. W. Wessels, M. G. Kanatzidis

Northwestern University, United States

**R08-31 Effect of Purification on TlBr Crystal for Radiation Detectors**

D. J. Kim<sup>1</sup>, H. Kim<sup>1</sup>, Y. Kim<sup>1</sup>, M. Jeong<sup>1</sup>, H. Choi<sup>1,2</sup>, W. Jo<sup>1</sup>, J. Ha<sup>1</sup>

<sup>1</sup>Korea Atomic Energy Research Institute, Republic of Korea; <sup>2</sup>Sungkyunkwan Univ, Republic of Korea

**R08-32 Development of the CdTe X-Ray Sensor for XRF System Analyzing Compound Semiconductor Material with High-Efficiency**

H. Choi<sup>1,2</sup>, Y. Kim<sup>1</sup>, M. Jeong<sup>1</sup>, H. Kim<sup>1</sup>, D. Kim<sup>1</sup>, W. Jo<sup>1</sup>, J.-S. Chai<sup>2</sup>, J. Ha<sup>1</sup>

<sup>1</sup>Korea Atomic Energy Research Institute, Republic of Korea; <sup>2</sup>Sungkyunkwan University, Republic of Korea

**R08-33 Development of a Quad CdTe-Medipix3RX Detector with Spectroscopic Capability for Synchrotron Applications**

E. N. Gimenez<sup>1</sup>, V. Astromskas<sup>2</sup>, N. Tartoni<sup>1</sup>

<sup>1</sup>Diamond Light Source, UK; <sup>2</sup>Surrey University, UK

**R08-34 Effect of Intense Illumination on the Time-of-Flight Current Waveforms of Detector Materials**

K. Suzuki, T. Sawada, Hokkaido University of Science, Japan; S. Seto, Ishikawa National College of Technology, Japan

**R08-35 Performance of Single Photon Counting High-Z Pixel Detectors**

M. Schneebeli, S. Commichau, T. Donath, V. Radicci, M. Rissi, T. Sakhelashvili, S. Traut, G. Tudosie, C. Broennimann

Dectris Ltd., Switzerland

**R08-36 Charge Carriers Properties Measurements in the VIP CdTe Detector**

G. Ariu<sup>1,2</sup>, o-Estrada, M. Chmeissani, G. De Lorenzo, M. Kolstein, C. Puigdemonges, J. Garcia, Institut de Física d'Altes Energies, Spain; E. Cabruja, IMB-CNM (CSIC) Centro Nacional de Microelectrónica, Spain

**R08-37 The Effect of Pixel and Inter-Pixel Gap Size on Detection Efficiency and Spectrum Resolution of CZT Gamma-Ray Detectors**

A. Ofan, Y. Glazer, R. Har-Lavan, GE Healthcare, Israel

**R08-38 Performance of Commercial CdTe Semiconductor Sensors**

O. Korchak, M. Carna, M. Havranek, M. Marcisovsky, G. Neue, Z. Janoska, V. Kafka, L. Tomasek, V. Vrba

FNSPE - Czech Technical University, Czech Republic

**R08-39 Real Time Wide Area Radiation Surveillance System (REWARD) Based on 3D Silicon and (Cd,Zn)Te for Neutron and Gamma-Ray Detection**

C. Disch, Freiburger Materialforschungszentrum, Germany

On behalf of the REWARD Collaboration

**R08-40 Positron Annihilation Spectroscopy of Annealed CdTe/CdZnTe**

L. Šedivý, J. Cížek, E. Belas, R. Grill

Charles University in Prague, Faculty of Mathematics and Physics, Czech republic

**R08-41 Split Charge Model for CZT Pulse Height Spectroscopy**

I. M. Blevis, A. Altman, O. Zarchen

Philips Medical Systems, Israel

**R08-42 New Nonlinearity Calibration Method for 3-D Position-Sensitive CdZnTe Detectors**

F. Zhang, Y. Zhu, M. Streicher, Z. He

The University of Michigan, USA

**R08-43 Gold Electroless Deposition by Water-Based and Alcoholic Solutions**

G. Benassi<sup>1</sup>, M. Bettelli<sup>2</sup>, N. Zambelli<sup>1</sup>, D. Calestani<sup>2</sup>, S. M. Pietralunga<sup>2</sup>, A. Tagliaferri<sup>3</sup>, M. H. Abdellatif<sup>3</sup>, L. Nasi<sup>2</sup>, A. Zappettini<sup>2</sup>

<sup>1</sup>due2lab srl, Italy; <sup>2</sup>CNR, Italy; <sup>3</sup>Polytechnic of Milan, Italy

**R08-44 Investigation of the Radiation Dose in Computed Micro Tomography Using the Medipix3 Semiconductor Detector in Combination with an Iterative Reconstruction Algorithm**

F. Fischer, S. Procz, A. Fauler, Freiburg Materials Research Center (FMF), Germany; M. Fiederle, Karlsruhe Institute of Technology (KIT), Germany

**R08-45 Correction on Temperature Drift on Pixelated CdZnTe Detector Systems**

J. D. Mann, F. Zhang, Z. He, University of Michigan, USA

**R08-46 Elimination of Inclusions in CdTe Crystals by THM**

P. M. Fochuk<sup>1</sup>, Z. Zacharuk<sup>1</sup>, Y. Nykonyuk<sup>2</sup>, I. Rarenko<sup>1</sup>, M. Kolesnik<sup>1</sup>, A. Bolotnikov<sup>3</sup>, R. B. James<sup>3</sup>

<sup>1</sup>Chernivtsi National University, Ukraine; <sup>2</sup>National University of Water Management and Natural Resources Application, Ukraine; <sup>3</sup>Brookhaven National Laboratory, USA

**R08-47 Evaluation of Mercury Iodide Crystals Cast Resin Applied as Radiation Detector**

M. Fiederle, J. Trenscher, *Freiburger Materialforschungszentrum, Germany*; M. M. Hamada, *Institute for Nuclear and Energy Research (IPEN-CNEN/SP, Brazil*

**R08-48 Electrical Properties of Lithium Indium Diselenide**

E. Lukosi<sup>1</sup>, M. Rust<sup>1</sup>, E. Herrera<sup>1</sup>, A. Stowe<sup>2</sup>, B. Wiggins<sup>3</sup>, A. Burger<sup>3,4</sup>

<sup>1</sup>University of Tennessee, USA; <sup>2</sup>Y12 National Security Complex, USA; <sup>3</sup>Vanderbilt University, USA; <sup>4</sup>Fisk University, USA

**R08-49 Current Transient, Polarization and Electromigration Phenomena in Metal – Semiconductor – Metal Structure of Schottky Contacts and Parameter Retrieval of CdTe/CdZnTe Structures**

H. Elhadidy, *Institute of Physics of Materials of the Academy of Sciences of the Czech Republic, Czech Republic*; J. Franc, R. Grill, *Institute of physics of Charles University, Czech Republic*; J. Sikula, *Brno University of Technology, Czech Republic*

**R08-50 In-Situ Monitoring of Resistivity in CdZnTe under Cd/Te Overpressure Annealing**

K. Kim, C. Park, P. Kim, *Korea University, Republic of Korea*; G. S. Camarda, A. E. Bolotnikov, R. B. James, *Brookhaven National Laboratory, USA*

**R08-51 Neutron Source Localization Using Artificial Neural Networks to Enhance Data Analytics of Moderator Based Solid State Detection Systems**

J. E. Currie<sup>1</sup>, C. Hoshor<sup>1</sup>, E. Myers<sup>1</sup>, S. Young<sup>1</sup>, T. Oakes<sup>2</sup>, J. Crow<sup>1</sup>, P. Scott<sup>1</sup>, S. Bellinger<sup>3</sup>, W. Miller<sup>2</sup>, D. McGregor<sup>3</sup>, A. Caruso<sup>1</sup>

<sup>1</sup>University of Missouri - Kansas City, USA; <sup>2</sup>University of Missouri - Columbia, USA; <sup>3</sup>Kansas State University, USA

**R08-52 New Method for Simultaneous Single-Exposure Dark-Field, Phase-Gradient and Absorption X-Ray Imaging**

F. Krejci, J. Jakubek, J. Zemlicka, J. Dudak

*Czech Technical University in Prague, Czech Republic*

**R08-53 PGRIS: Towards Portable Compton Camera Imaging and Spectroscopy**

S. J. Colosimo<sup>1</sup>, A. J. Boston<sup>1</sup>, H. C. Boston<sup>1</sup>, L. J. Harkness-Brennan<sup>1</sup>, D. S. Judson<sup>1</sup>, I. Lazarus<sup>2</sup>, P. J. Nolan<sup>1</sup>, P. Seller<sup>3</sup>, J. Simpson<sup>2</sup>, M. Veale<sup>3</sup>

<sup>1</sup>University of Liverpool, UK; <sup>2</sup>STFC Daresbury Laboratory, UK; <sup>3</sup>STFC Rutherford Appleton Laboratory, UK

**R08-54 VIP-PIX: a 100-Channel Readout ASIC for Pixelated CdTe Detectors for Medical Imaging Applications**

J.-G. Macias-Montero<sup>1</sup>, M. Sarraj<sup>2</sup>, M. Chmeissani<sup>1</sup>, G. De Lorenzo<sup>1</sup>, J. Garcia<sup>1</sup>, C. Puigdengoles<sup>1</sup>, R. Martinez<sup>3</sup>

<sup>1</sup>Institut de Física d'Altes Energies (IFAE), Spain; <sup>2</sup>Texas Instruments Inc., USA; <sup>3</sup>IMB-CNM (CSIC), Spain

**R08-55 Inflight Conditions Experimental Analysis of a Squared Pixel Matrix CdTe Polarimeter**

R. M. Curado da Silva<sup>1</sup>, J. M. Maia<sup>1,2</sup>, M. Pinto<sup>1</sup>, J. Marques<sup>1,3</sup>, L. Pereira<sup>1</sup>, E. Carolí<sup>4</sup>, N. Auricchio<sup>4</sup>, J. B. Stephen<sup>4</sup>, A. M. F. Trindade<sup>1</sup>

<sup>1</sup>Laboratório de Instrumentação e Física Experimental de Partículas, Portugal; <sup>2</sup>University of Beira-Interior, Portugal; <sup>3</sup>Universidade do Porto, Portugal;

<sup>4</sup>INFN/LASF-Bologna, Italy

**R08-56 Multidimensional Characterization of Cadmium-Zinc-Telluride Coplanar-Grid Detectors**

R. Michiels<sup>1</sup>, C. Disch<sup>2</sup>, U. Parzefall<sup>1</sup>, A. Fauler<sup>2</sup>, M. Fiederle<sup>2</sup>

<sup>1</sup>University of Freiburg, Germany; <sup>2</sup>Material Research Center Freiburg, Germany

**R08-57 CdZnTe Technology Development for Small Pixel, High Flux X-Ray Detectors**

A. Densmore, V. Perumal, G. Prekas, C. Neilly

*Redlen Technologies Inc., Canada*

**R08-58 Characteristic Comparison of the Frisch Collar Grid CdZnTe Radiation Detectors**

W. J. Jo, M. Jeong, H. S. Kim, Y. S. Kim, H. J. Choi, D. J. Kim, J. H. Ha

*Korea Atomic Energy Research Institute, Republic of Korea*

**R08-59 Production of High Crystalline Quality CdZnTe Crystals by Low Stress Travelling Heater Method**

F. J. Kumar, J. M. MacKenzie, L. Burgess

*Redlen Technologies, Canada*

**R08-60 Studying the Detection Performance of HgI<sub>2</sub> Nanoparticle Pellets**

M. Perez Barthaburu<sup>1</sup>, I. Aguiar<sup>2</sup>, I. Galain<sup>2</sup>, H. Bentos Pereira<sup>1</sup>, L. Fornaro<sup>1</sup>

<sup>1</sup>CURE/Universidad de la Republica, Uruguay; <sup>2</sup>Facultad de Química/Universidad de la Republica, Uruguay

**R08-61 Monitoring the Dose Distribution of Therapeutic Photons on Korean Typical Man-2 Phantom (KTMAN-2) by Using Multiple Scattering Compton Camera**

T. Lee, W. Lee, *Korea University, Korea*

**R08-62 Sintering of Bismuth Tri-Iodide Nanoparticles: a New Procedure for Fabricating Direct Ionizing Radiation Detectors**

I. Aguiar, M. E. Pérez Barthaburu, M. Mombrú, H. Bentos Pereira, L. Fornaro

*Universidad de la Republica, Uruguay*

**R08-63 A Study on CZT and Scintillator Based Micro-PETs with Compton Tracing Technology**

C. Yoon, W. Lee, *Korea Univ., Korea*

**R08-64 Optically Switching Readout X-Ray Detector Using LED Line Beam**

D. Heo<sup>1</sup>, J.-S. Kim<sup>2</sup>, S. Jeon<sup>1</sup>, K. Yang<sup>1</sup>, B. Cha<sup>1</sup>, R. K. Kim<sup>1</sup>, B. J. Moon<sup>2</sup>, J. Yoon<sup>2</sup>

<sup>1</sup>Korea Electrotechnology Research Institute, South Korea; <sup>2</sup>DRTECH, South Korea

**R08-65 Comparative Study on the Effects of Chemical Treatments on CdZnTe Nuclear Detectors**

S. U. Egariyev, I. O. Okwechime, *Alabama A&M University, USA*; A. Hossain, R. B. James, *Brookhaven National Laboratory, USA*

**R08-66 Effect of Ampoule Carbon Coating on Defects in CdMnTe Crystals for Radiation Detection Applications**

S. U. Egariyev, *Alabama A&M University, USA*; U. N. Roy, A. Hossain, R. B. James, *Brookhaven National Laboratory, USA*

**R08-67 Charge Transport Investigation in Lead Oxide with CELIV**

O. Semeniyuk<sup>1,2</sup>, G. Juska<sup>3</sup>, G. DeCrescenzo<sup>2</sup>, J. A. Rowlands<sup>2</sup>, A. Reznik<sup>1,2</sup>

<sup>1</sup>Lakehead University, Canada; <sup>2</sup>Thunder Bay Regional Research Institute, Canada; <sup>3</sup>Vilnius University, Lithuania

**R08-68 Numerical Simulation of Thermoelectric Effect Spectroscopy of Defect Structure in CdTe Radiation Detectors**

H. Elhadidy, *Institute of Physics of Materials of the Academy of Sciences of the Czech Republic, Czech Republic*; J. Franc, R. Grill, *Institute of physics of Charles University, Czech Republic*

**R08-69 Etch-Pit Studies in Cd<sub>1-x</sub>X<sub>y</sub>Te (X=Zn, Mn, Se, Mg; y=0.05-0.1) as-Grown and Annealed Crystals**

A. Hossain<sup>1</sup>, A. E. Bolotnikov<sup>1</sup>, G. S. Camarda<sup>1</sup>, Y. Cui<sup>1</sup>, G. D. Gu<sup>1</sup>, W. Lee<sup>2</sup>, U. N. Roy<sup>1</sup>, G. Yang<sup>1</sup>, R. B. James<sup>1</sup>

<sup>1</sup>Brookhaven National Laboratory, USA; <sup>2</sup>Korea University, Republic of Korea

**R08-70 A Small 3D CZT Payload for Hard X Ray Polarimetry and Spectroscopic Imaging**

E. Caroli<sup>1</sup>, N. Auricchio<sup>1</sup>, C. Budtz-Jørgensen<sup>2</sup>, G. De Cesare<sup>1</sup>, R. M. Curado da Silva<sup>3</sup>, S. Del Sordo<sup>4</sup>, P. Ferrando<sup>5</sup>, P. Laurent<sup>5</sup>, O. Limousin<sup>5</sup>, J. L.

Galvèz<sup>6</sup>, M. Hernanz<sup>6</sup>, J. Isern<sup>6</sup>, I. Kuvvetli<sup>2</sup>, J. M. Maja<sup>3,7</sup>, A. Meuris<sup>5</sup>, M. Pinto<sup>3</sup>, N. Produit<sup>8</sup>, J. B. Stephen<sup>1</sup>, A. Zappettini<sup>9</sup>

<sup>1</sup>INAF/IASF-Bologna, Italy; <sup>2</sup>DTU Space, Denmark; <sup>3</sup>LIP, Portugal; <sup>4</sup>INAF/IASF-Palermo, Italy; <sup>5</sup>CEA, France; <sup>6</sup>IEEC, CSIC, Spain; <sup>7</sup>Universidade da Beira Interior, Portugal; <sup>8</sup>ISDC, University of Geneva, Swiss; <sup>9</sup>IMEM/CNR, Italy

**R08-71 Development of a CZT 3D Imager Prototype for Hard X Ray Astronomy**

N. Auricchio<sup>1</sup>, E. Caroli<sup>1</sup>, A. Basili<sup>1</sup>, G. Benassi<sup>2</sup>, C. Budtz Jørgensen<sup>3</sup>, R. M. Curado da Silva<sup>4</sup>, S. Del Sordo<sup>1</sup>, I. Kuvvetli<sup>3</sup>, L. Milano<sup>5</sup>, F. Moscatelli<sup>2</sup>,

N. Zambelli<sup>2</sup>, A. Zappettini<sup>2</sup>

<sup>1</sup>INAF, Italy; <sup>2</sup>CNR, Italy; <sup>3</sup>Technical University of Denmark, Denmark; <sup>4</sup>University of Coimbra, Portugal; <sup>5</sup>University of Ferrara, Italy

**R08-72 Crystal Growth and Characterization of Chalcogenide Semiconductors for Radiation Detectors**

R. O. Pak, K. V. Nguyen, M. A. Mannan, S. K. Chaudhuri, K. C. Mandal

*University of South Carolina, USA*

**R08-73 Amorphous Selenium Stabilized Alloys for Nuclear Radiation Detector Applications**

K. C. Mandal, R. O. Pak, K. V. Nguyen, M. A. Mannan, S. K. Chaudhuri

*University of South Carolina, USA*

**R08-74 Characterization of Icosahedral Boron Arsenide (B12As<sub>2</sub>) for Thermal Neutron Detection**

Y. Cui<sup>1</sup>, A. Bolotnikov<sup>1</sup>, G. Camarda<sup>1</sup>, G. Camino<sup>1</sup>, A. Hossain<sup>1</sup>, U. Roy<sup>1</sup>, G. Yang<sup>1</sup>, J. H. Edgar<sup>2</sup>, C. E. Whiteley<sup>2</sup>, U. Nwagwu<sup>2</sup>, R. B. James<sup>1</sup>

<sup>1</sup>Brookhaven National Laboratory, USA; <sup>2</sup>Kansas State University, USA

**R08-75 Modeling the Growth of Cadmium Zinc Telluride (CZT) by the Traveling Heater Method (THM)**

J. H. Peterson, A. Yeckel, J. J. Derby

*University of Minnesota, U.S.A.*

**R08-76 Particle Detectors Based on 4H-SiC High Quality Epitaxial Layer**

B. Zlatko<sup>1</sup>, F. Dubecky<sup>1</sup>, A. Šagátová<sup>2</sup>, K. Sedlacková<sup>2</sup>, L. Ryc<sup>3</sup>, V. Necas<sup>2</sup>

<sup>1</sup>Institute of Electrical Engineering, Slovak Academy of Sciences, Slovakia; <sup>2</sup>Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Slovakia; <sup>3</sup>Institute of Plasma Physics and Laser Microfusion, Poland

**R08-77 High Energy Resolution Pixel Detectors Based on Boron Oxide Vertical Bridgman Grown CdZnTe Crystals**

A. Zappettini<sup>1</sup>, D. Macera<sup>2</sup>, G. Benassi<sup>3</sup>, N. Zambelli<sup>3</sup>, D. Calestani<sup>1</sup>, M. Ahangarianabhari<sup>2</sup>, Y. Shi<sup>2</sup>, G. Rotondo<sup>4</sup>, B. Garavelli<sup>5</sup>, P. Pozzi<sup>6</sup>, G.

Bertuccio<sup>2,7</sup>

<sup>1</sup>CNR, Italy; <sup>2</sup>Politechnic of Milan, Italy; <sup>3</sup>due2lab srl, Italy; <sup>4</sup>Altalab srl, Italy; <sup>5</sup>Base srl, Italy; <sup>6</sup>Xnext srl, Italy; <sup>7</sup>National Institute of Nuclear Physics, Italy

**R08-78 Chloride Surface Incorporation into Pixelated TlBr Gamma Spectrometers**

A. M. Conway, A. J. Nelson, L. F. Voss, E. L. Swanberg, P. R. Beck, R. T. Graff, R. J. Nikolic, S. A. Payne, *Lawrence Livermore National Laboratory,*

*United States*; H. Kim, L. Cirignano, K. Shah, *RMD Inc, USA*

**R09 Materials 2**

Thursday, Nov. 13 08:30-09:55 611 & 612

Session Chair: **Laura Fornaro**, *Universidad de la República, Uruguay*

**R09-1 (08:30, invited) Hybrid-Organic Photodetectors for Radiography**

O. Schmidt, S. F. Tedde, P. Buechele, *Siemens AG, Germany*; T. Kraus, G. N. Anka, *INM - Leibniz Institute for New Materials, Germany*; C.

Gimmler, K. Poulsen, *CAN GmbH, Germany*

**R09-2 (08:50, invited) Organic Semiconducting Single Crystals for X-Ray Detection: Relation Between Molecular Structure and Packing, Carrier Mobility and Sensitivity**

B. Fraboni, *University of Bologna, Italy*

**R09-3 (09:10) Electrode Configuration Effects on Charge Collection in Organic Single Crystal X-Ray Detectors**

A. Ciavatti<sup>1</sup>, A. Fraleoni-Morgera<sup>2</sup>, G. Tromba<sup>2</sup>, D. Dreossi<sup>2</sup>, P. Sellin<sup>3</sup>, B. Fraboni<sup>1</sup>

<sup>1</sup>University of Bologna, Italy; <sup>2</sup>Elettra, Italy; <sup>3</sup>University of Surrey, UK

**R09-4 (09:25) Crystal Growth and Characterization of Mercury Chalcogenide Semiconductors for Radiation Detection Applications**

C. D. Malliakas<sup>1,2</sup>, H. Li<sup>1</sup>, A. C. Wibowo<sup>1</sup>, C. C. Stoumpos<sup>1</sup>, H. Jin<sup>2</sup>, D. Y. Chung<sup>1</sup>, A. J. Freeman<sup>2</sup>, M. G. Kanatzidis<sup>1,2</sup>

<sup>1</sup>Argonne National Laboratory, USA; <sup>2</sup>Northwestern University, USA

**R09-5 (09:40) Development of a GaN Sensor for Neutron Detection**

P. Mulligan, L. R. Cao, *The Ohio State University, USA*

**R10 Materials 3**

Thursday, Nov. 13 10:30-11:55 611 & 612

Session Chair: **Andrea Zappettini**, IMEM-CNR, Italy

**R10-1 (10:30, invited) Recent Progress in Thallium Bromide Gamma-Ray Spectrometer Development**

K. Shah, H. Kim, A. Churilov, Y. Ogorodnik, A. Kargar, G. Ciampi, L. Cirignano, A. Gueorguiev, S. Kim, *Radiation Monitoring Devices Inc., USA*; Z. He, W. Koehler, S. O'Neil, *University of Michigan, USA*

**R10-2 (10:50) Characterization of TlBr Gamma-Ray Detectors**

K. Hitomi<sup>1</sup>, T. Onodera<sup>2</sup>, S.-Y. Kim<sup>1</sup>, T. Shoji<sup>2</sup>, K. Ishii<sup>1</sup>

<sup>1</sup>Tohoku University, Japan; <sup>2</sup>Tohoku Institute of Technology, Japan

**R10-3 (11:10) Direct Observation of Bulk Degradation in TlBr Detectors and Its Correlation with Temperature, Growth and Fabrication Processes**

S. Motakef, A. Datta, *Capesym, Inc., USA*

**R10-4 (11:25) Isochronal Annealing and Deep Level Transient Spectroscopy in 4H-SiC Schottky Barrier Detectors**

M. A. Mannan, K. Nguyen, S. K. Chaudhuri, K. C. Mandal

*University of South Carolina, USA*

**R10-5 (11:40) Development of Large Area Micro-Structured Solid State Neutron Detectors at Low Cost**

R. Dahal, K.-C. Huang, J. J.-Q. Lu, A. Weltz, Y. Danon, I. B. Bhat

*Rensselaer Polytechnic Institute, USA*

**R11 Poster 2**

Thursday, Nov. 13 14:00-15:30 4B

Session Chairs: **Manhee Jeong**, Korea Atomic Energy Research Institute, South Korea

**Jang Ho Ha**, Korea Atomic Energy Research Institute, South Korea

**R12 RTSD Scientist Award**

Thursday, Nov. 13 16:00-17:45 611 & 612

Session Chair: **Arnold Burger**, Fisk University, United States

**R12-1 (16:00) RTSD Scientist Award Winner**

R. B. James, *Brookhaven National Laboratory, USA*; M. Fiederle, *University of Freiburg, Germany*

**R12-2 (16:05, invited) Need for High-Granularity Position Sensing to Improve Performance of Large-Volume CZT Defectors**

A. E. Bolotnikov<sup>1</sup>, G. Camarda<sup>1</sup>, Y. Cui<sup>1</sup>, G. De Geronimo<sup>1</sup>, J. Friedl<sup>1</sup>, A. Hossain<sup>1</sup>, W. Lee<sup>2</sup>, U. Roy<sup>1</sup>, G. Yang<sup>1</sup>, E. Vernon<sup>1</sup>, R. B. James<sup>1</sup>

<sup>1</sup>Brookhaven National Laboratory, USA; <sup>2</sup>Korea University, Korea

**R12-3 (16:25, invited) Complex Study of Deep Levels Participating in Polarization of CdTe:In Radiation Detectors with and Without Radiation Flux**

J. Franc, V. Dedic, J. Zazvorka, P. Hlidek, R. Grill, M. Hakl, M. Rejhon, *Faculty of Mathematics and Physics, Charles University, Czech Republic*; P. Sellin, *University of Surrey, Great Britain*

**R12-4 (16:45) Charge Transport in CdTe Radiation Detectors with Traps**

R. Grill, J. Zazvorka, J. Pekarek, E. Belas, J. Franc, A. Musiienko, P. Moravec, J. Bok, P. Hoschl

*Charles University, Faculty of Mathematics and Physics, Czech Republic*

**R12-5 (17:00) Analyses of CdTe Semiconductor Detectors for 2D and 3D Non-Destructive Fluorescent X-Ray Computed Tomography (FXCT) Experiments**

C. Yoon, W. Lee, *Korea Univ., Korea*

**R12-6 (17:15) Temperature-Gradient Post-Growth Annealing of CdMnTe Wafers for Nuclear Radiation Detection Applications**

S. U. Egarievwe<sup>1</sup>, Z. M. Hales<sup>1</sup>, A. A. Egarievwe<sup>1</sup>, A. Hossain<sup>2</sup>, W. Chan<sup>1</sup>, G. S. Camarda<sup>2</sup>, R. B. James<sup>2</sup>

<sup>1</sup>Alabama A&M University, USA; <sup>2</sup>Brookhaven National Laboratory, USA

**R12-7 (17:30) Modeling the Migration of Second-Phase Particles in Cadmium Zinc Telluride (CZT) via Temperature Gradient Zone Melting (TGZM)**

K. Wang, A. Yeckel, J. J. Derby

*University of Minnesota, U.S.A.*

## R13 Pixel Detectors

Friday, Nov. 14 08:00-10:00 611 & 612

Session Chair: **Simon Procz**, FMF Universität Freiburg, Germany

### R13-1 (08:00) Spatial Variations in the Polarization Phenomena of Cadmium Telluride Detectors with Pixelated Schottky Anodes

M. C. Veale<sup>1</sup>, S. J. Bell<sup>1,2</sup>, D. D. Duarte<sup>1,2</sup>, A. Schneider<sup>1</sup>, P. Seller<sup>1</sup>, M. D. Wilson<sup>1</sup>

<sup>1</sup>STFC Rutherford Appleton Laboratory, United Kingdom; <sup>2</sup>University of Surrey, United Kingdom

### R13-2 (08:15) A CdTe-CMOS Hybrid for Energy, Position and Time Identification

D. Hatzistratis<sup>1</sup>, G. Theodoratos<sup>1</sup>, I. Kazas<sup>2</sup>, E. Zervakis<sup>1</sup>, S. Vlassis<sup>3</sup>, C. P. Lambropoulos<sup>1</sup>

<sup>1</sup>Technological Educational Institute of Sterea Ellada, Greece; <sup>2</sup>NCSR Demokritos, Greece; <sup>3</sup>University of Patras, Greece

### R13-3 (08:30) Evaluation of 1D- and 2D-Type CdTe Detectors Combined with Photon-Counting ASICs

H. Toyokawa, M. Kawase, S. Wu, T. Ohata, K. Kajiwaru, K. Osaka, M. Sato, *Japan Synchrotron Radiation Research Institute, Japan*; T. Hirono, *Universitaet Bonn, Germany*; A. Suenaga, *Howa Sangyo Co., Ltd., Japan*; H. Ikeda, *Japan Aerospace Exploration Agency, Japan*

### R13-4 (08:45) Characterization of a Large Area CdTe Hybrid Pixel Counting Detector for High-Energy Applications

C. Broennimann, T. Donath, M. Schneebeli, M. Rissi, V. Radicci

*DECTRIS AG, Switzerland*

### R13-5 (09:00) Development of a Quad CdTe-Medipix3RX Detector with Spectroscopic Capability for Synchrotron Applications

E. N. Gimenez<sup>1</sup>, V. Amstromskas<sup>2</sup>, N. Tartoni<sup>1</sup>

<sup>1</sup>Diamond Light Source, UK; <sup>2</sup>University of Surrey, UK

### R13-6 (09:15) Characterization of GaAs:Cr Sensors for High Flux X-Ray Imaging Applications

M. C. Veale<sup>1</sup>, S. J. Bell<sup>1,2</sup>, D. D. Duarte<sup>1,2</sup>, M. J. French<sup>1</sup>, M. Hart<sup>1</sup>, A. Schneider<sup>1</sup>, P. Seller<sup>1</sup>, M. D. Wilson<sup>1</sup>, D. Bogg<sup>1</sup>, J. Headspith<sup>1</sup>, S. Kachkanov<sup>3</sup>, A. D. Lozinskaya<sup>4</sup>, O. P. Tolbanov<sup>4</sup>, A. Tyazhev<sup>4</sup>, A. N. Zarubin<sup>4</sup>

<sup>1</sup>Science & Technology Facilities Council, UK; <sup>2</sup>University of Surrey, UK; <sup>3</sup>Diamond Light Source, UK; <sup>4</sup>Tomsk State University, Russia

### R13-7 (09:30) Radiation Detectors Fabricated on High-Purity GaAs Epitaxial Materials

X. Wu<sup>1</sup>, M. Mattila<sup>2</sup>, T. Riekkinen<sup>1</sup>, A. Gädda<sup>1</sup>, M. Partanen<sup>1</sup>, P. Kostamo<sup>2</sup>, S. Nenonen<sup>3</sup>, H. Lipsanen<sup>2</sup>, J. Salonen<sup>1</sup>, H. Pohjonen<sup>1</sup>, S. Eränen<sup>1</sup>, A. Oja<sup>1</sup>

<sup>1</sup>VTT, Finland; <sup>2</sup>Aalto University, Finland; <sup>3</sup>Oxford Instruments Analytical Oy, Finland

### R13-8 (09:45) Comparison of Ohmic and Schottky CdTe Medipix Camera for Spectral Imaging of Ore

J. J. Kalliopuska, S. Vähänen, *Advacam Oy, Finland*; J. Jakubek, D. Turecek, P. Soukup, *Widepix s.r.o, Czech Republic*

## R14 Applications

Friday, Nov. 14 10:30-11:50 611 & 612

Session Chair: **Robert D. McLaren**, Consultant, United States

### R14-1 (10:30, invited) Position Interpolation Technique Used for a 3D CZT Drift Strip Detector

I. Kuvvetli, C. Budtz-Jørgensen, *DTU Space, National Space Institute, Technical University of Denmark, Denmark*; A. Zappettini, *IMEM-CNR, Italy*; N. Zambelli, G. Benassi, *DUE2lab, Italy*

### R14-2 (10:50) Sharp Spectroscopic X-Ray Imaging with a CdTe Large Area Pixel Sensor at 62 Microns Pitch

R. Bellazzini<sup>1,2</sup>, M. Minuti<sup>1,2</sup>, G. Spandre<sup>1,2</sup>, A. Brez<sup>1,2</sup>, M. Pinchera<sup>1,2</sup>, A. Vincenzi<sup>1,2</sup>, L. de Ruvo<sup>1,2</sup>

<sup>1</sup>INFN - sez. Pisa, Italy; <sup>2</sup>PiXirad Imaging Counters srl, Italy

### R14-3 (11:05) Investigations on the Long Term Stability of Underground Operated CZT Detectors Based on the <sup>113</sup>Cd-Decay Analysis

D. Gehre, *Technical University Dresden, Germany*

On behalf of the COBRA Collaboration

### R14-4 (11:20) Performance Comparison of Threshold and Multi-Energy Cd(Zn)Te Detectors for Material Discrimination

V. Moulin<sup>1</sup>, C. Boudou<sup>2</sup>, G. Gonon<sup>1</sup>, G. Alexia<sup>1</sup>, C. Paulus<sup>1</sup>, P. Radisson<sup>2</sup>, L. Verger<sup>1</sup>

<sup>1</sup>CEA, LETI, MINATEC Campus, France; <sup>2</sup>MULTIX S.A., France

### R14-5 (11:35) Enhanced Molecular Breast Image Quality Through Improved CZT Detector Performance

T. Garcia, A. Kivenson, H. Kudrolli

*Gamma Medica, Inc., USA*

## R15 Characterization and Imaging

Friday, Nov. 14 14:00-15:35 611 & 612

Session Chair: **Ian Radley**, Kromek,

### R15-1 (14:00) Charge Trapping and Detrapping in CdTe/CdZnTe Detectors Characterized by Transient Current Technique

E. Belas, P. Praus, J. Pekarek, R. Grill

*Institute of Physics, Charles University, Czech Republic*

**R15-2 (14:15, invited) Digital Techniques for High-Rate High-Resolution Radiation Measurements**

L. Abbene, G. Gerardi, *University of Palermo, Italy*

**R15-3 (14:35) Signal Processing of a Strengthened Electric Field Line Anode CdZnTe Detector**

L. Zhang<sup>1</sup>, J. Fu<sup>2</sup>, Y. Li<sup>2</sup>, Y. Li<sup>2</sup>, Y. Du<sup>1</sup>, J. Li<sup>1</sup>, W. Zhang<sup>1</sup>, H. Jiang<sup>2</sup>, Y. Liu<sup>1</sup>

<sup>1</sup>Nuctech Company Limited, China; <sup>2</sup>Tsinghua University, China

**R15-4 (14:50) Electrical and Optical Characterization of Cadmium Zinc Telluride Co-Doped with Indium and Lead.**

Y. Zaman, W. Jia, T. Wang, L. Xu, Y. He, Y. Xu, G. Zha, R. Guo

*Northwestern Polytechnical University, P.R China*

**R15-5 (15:05) Characterization Results of Sphinx1 ASIC for X-Ray Detection by Photon Counting and Charge Integration with a 100 Electron LSB**

A. Habib<sup>1</sup>, M. Arques<sup>1</sup>, J.-L. Moro<sup>1</sup>, M. Accensi<sup>1</sup>, S. Stanchina<sup>1</sup>, B. Dupont<sup>1</sup>, P. Rohr<sup>2</sup>, G. Sicard<sup>3</sup>, M. Tchagaspanian<sup>1</sup>, L. Verger<sup>1</sup>

<sup>1</sup>CEA-Leti MINATEC CAMPUS, France; <sup>2</sup>TRIXELL, France; <sup>3</sup>TIMA, France

**R15-6 (15:20) A New Detector for X-Ray Spectrometric Imaging: Material Discrimination for Non-Destructive Testing and Security Applications**

C. Boudou, S. Lux, E. Gaboriau, P. Radisson, *Multix, France*

**R16 Defects**

Friday, Nov. 14 16:00-17:30 611 & 612

Session Chair: **Giuseppe S. Camarda**, Brookhaven National Lab, United States

**R16-1 (16:00) Detailed Characterization of Small-Pixel CZT Detectors Using Hybrid Pixel-Waveform Readout for Gamma-Ray Imaging Applications**

J. George<sup>1</sup>, Y. Cui<sup>2</sup>, G. Camarda<sup>2</sup>, A. Hossain<sup>2</sup>, U. Roy<sup>2</sup>, G. Yang<sup>2</sup>, L.-J. Meng<sup>1</sup>, R. B. James<sup>2</sup>

<sup>1</sup>University of Illinois at Urbana-Champaign, United States; <sup>2</sup>Brookhaven National Laboratory, United States

**R16-2 (16:15) 4D Coded Aperture X-Ray Coherent Scatter Imaging System Based on Energy-Sensitive Detectors**

S. Pang, M. Hassan, J. A. Greenberg, A. Holmgren, D. J. Brady

*Duke University, United States*

**R16-3 (12:35) Determining the Density of Dislocations in Detector-Grade CZT Crystals and Their Influence on the Detector's Properties**

A. Hossain<sup>1</sup>, A. E. Bolotnikov<sup>1</sup>, G. S. Camarda<sup>1</sup>, Y. Cui<sup>1</sup>, W. Lee<sup>2</sup>, U. N. Roy<sup>1</sup>, G. Yang<sup>1</sup>, R. B. James<sup>1</sup>

<sup>1</sup>Brookhaven National Laboratory, USA; <sup>2</sup>Korea University, Republic of Korea

**R16-4 (12:50) Research on the Size Effect of Te Inclusions and the Extended Defects in CdZnTe Crystals by CL and IBIC Imaging**

Y. Xu, Y. Gu, R. Guo, Y. He, W. Jie

*Northwestern Polytechnical University, China*

**R16-5 (13:05) Common point defects in CdZnTe, CdMnTe, and CdMgTe detectors: Their nature and influence on device performance**

R. Gul, A. Bolotnikov, A. Hossain, G. Camarda, G. Yang, R. B. James

*Brookhaven National Laboratory, USA*

**R16-6 (13:15) Concluding Remarks**

R. B. James, *Brookhaven National Laboratory, USA*; M. Fiederle, *University of Freiburg, Germany*

# Joint Program

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## J01 NSS-RTSD Joint

Wednesday, Nov. 12 08:00-10:00 6A

Session Chairs: **Douglas S. McGregor**, Kansas State University, United States  
**Paul J. Sellin**, University of Surrey, United Kingdom

### J01-1 (08:00) Direct Measurement of $^{235}\text{U}$ in Spent Fuel Rods with Gamma-Ray Mirrors

J. Ruz<sup>1</sup>, N. F. Brejnholt<sup>1</sup>, T. A. Decker<sup>1</sup>, M. A. Descalle<sup>1</sup>, R. M. Hill<sup>1</sup>, R. Soufli<sup>1</sup>, K. Ziocck<sup>2</sup>, M. J. Pivovarov<sup>1</sup>

<sup>1</sup>Lawrence Livermore National Laboratory, US; <sup>2</sup>Oak Ridge National Laboratory, US

### J01-2 (08:15) Microstructured Semiconductor Neutron Detector (MSND)-Based Helium-3 Replacement Technology

S. L. Bellinger, Radiation Detection Technologies, Inc., USA; R. G. Fronk, T. J. Sobering, D. S. McGregor, Kansas State University, USA

### J01-3 (08:30) Characterisation of Silicon Carbide and Diamond Neutron Detectors for Active Interrogation Security Applications.

M. Hodgson, A. Lohstroh, P. Sellin, University of Surrey, U.K.; D. V. Lewis, AWE, U.K.

### J01-4 (08:45) Ultra Low Noise Silicon Drift Detector and CMOS Front-End for X-Ray Spectroscopy with Less than 100 eV Energy Resolution at Room Temperature

G. Bertuccio<sup>1,2</sup>, M. Ahangarianabhari<sup>1,2</sup>, C. Graziani<sup>1</sup>, D. Macera<sup>1,2</sup>, Y. Shi<sup>1,2</sup>, A. Rachevski<sup>3</sup>, I. Rashevskaya<sup>3</sup>, A. Vacchi<sup>3</sup>, G. Zampa<sup>3</sup>, N. Zampa<sup>3</sup>, P. Belluti<sup>4</sup>, G. Giacomini<sup>4</sup>, A. Picciotto<sup>4</sup>, C. Piemonte<sup>4</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>National Institute of Nuclear Physics, INFN sez. Milano, Italy; <sup>3</sup>National Institute of Nuclear Physics, INFN sez. Trieste, Italy; <sup>4</sup>Fondazione Bruno Kessler - FBK, Italy

### J01-5 (09:00, invited) Fabrication and Development of BGaN Device for the Novel Neutron Semiconductor Detector

T. Nakano, Y. Inoue, H. Mimura, T. Aoki

Shizuoka University, Japan

### J01-6 (09:15) Design of Time-Encoded Thermal Neutron Imaging System for a 3-D Position-Sensitive CdZnTe Array

S. T. Brown, Z. He, University of Michigan, US

### J01-7 (09:30) Production of Large Area 10B Neutron Detectors

J.-C. Buffet<sup>1</sup>, J.-F. Clergeau<sup>1</sup>, S. Cuccaro<sup>1</sup>, B. Guerard<sup>1</sup>, R. Hall-Wilton<sup>2,3</sup>, C. Hoglund<sup>2,4</sup>, S. Jonchery<sup>1</sup>, A. Khaplanov<sup>2,1</sup>, F. Piscitelli<sup>2,1</sup>, P. Van Esch<sup>1</sup>

<sup>1</sup>Institut Laue-Langevin ILL, France; <sup>2</sup>European Spallation Source ESS AB, Sweden; <sup>3</sup>Mid-Sweden University, Sweden; <sup>4</sup>Linköping University, Sweden

### J01-8 (09:45, invited) Crystal Growth and Its Effect on Radiation Detection Properties for 6LiInSe2

A. C. Stowe<sup>1,2</sup>, B. Wiggins<sup>1,2</sup>, J. Tower<sup>3</sup>, H. Hong<sup>3</sup>, A. Kargar<sup>3</sup>, Z. Bell<sup>4</sup>, P. Bhattacharya<sup>5</sup>, E. Tupitsyn<sup>5</sup>, L. Matei<sup>5</sup>, M. Groza<sup>5</sup>, A. Burger<sup>5</sup>

<sup>1</sup>Y-12 National Security Enterprise, USA; <sup>2</sup>Vanderbilt University, USA; <sup>3</sup>Radiation Monitoring Devices, Inc, USA; <sup>4</sup>Oak Ridge National Laboratory, USA; <sup>5</sup>Fisk University, USA

## J02 NSS-MIC-RTSD Joint Session

Wednesday, Nov. 12 14:00-15:30 6B

Session Chairs: **Maxim P. Titov**, CEA Saclay, IRFU/SPP,  
**Dimitris Visvikis**, LaTIM, France

### J02-1 (14:00) Application of Subpixelated CZT Detectors to Gamma-Ray Imaging

G. Montemont, O. Monnet, S. Stanchina, L. Verger

CEA, LETI, France

### J02-2 (14:15) Microscopic SPECT Imaging with Inverted Compound Eye Cameras

X.-C. Lai<sup>1</sup>, J. George<sup>1</sup>, H. Li<sup>2</sup>, Q. Li<sup>2</sup>, L.-J. Meng<sup>1</sup>

<sup>1</sup>University of Illinois at Urbana-Champaign, USA; <sup>2</sup>Harvard Medical School, USA

### J02-3 (14:30) Investigation of Trapping and Bulk Damage in Silicon Photomultipliers

E. Garutti, M. Ramilli, R. Klanner, University of Hamburg, Germany; C. Xu, DESY Hamburg, Germany

### J02-4 (14:45) Development of Ultrahigh Resolution Monolithic Si-PM-Based Block Detectors Using 0.32mm Pixel Scintillators

S. Yamamoto, Nagoya University Graduate School of Medicine, Japan; H. Watabe, Tohoku University CYRIC, Japan; H. Sato, T. Endo, Y. Usuki, FURUKAWA Co., LTD, Japan

### J02-5 (15:00) EndoTOFPET-US: Commissioning of a Multi-Modal Endoscope for Ultrasound and Time of Flight PET

J. Varela, LIP, Portugal

On behalf of the EndoTOFPET-US Collaboration

### J02-6 (15:15) Challenges for Intra-Operative SPECT

B. Frisch, M. Eiber, J. Gardiazabal, P. Matthies, T. Maurer, A. Okur, T. Lasser, N. Navab

Technische Universität München, Germany

## J03 NSS-MIC Joint Session

Wednesday, Nov. 12 16:00-18:00 6B

Session Chairs: **Cinzia Da Via**, University of Manchester /CERN, United Kingdom  
**Paul K. Marsden**, King's College London, England, United Kingdom

### J03-1 (16:00) Improving PET Time-of-Flight Performance with Prompt Photons in Scintillators

P. Lecoq, E. Auffray, S. Gundacker, *CERN, Switzerland*; M. Korjik, *Institute for Nuclear Problems, Belarus*; V. Nagirnyi, S. Omelkov, *University of Tartu, Estonia*; A. Vasiliev, *Lomonosov Moscow State University, Russia*

### J03-2 (16:15) Influence of Active Area and Different Read-Out Mechanisms on the Timing Performance of Silicon Photomultipliers

T. R. Ganka<sup>1</sup>, C. Dietzinger<sup>1</sup>, W. M. Gebauer<sup>1</sup>, E. Engelmann<sup>2</sup>, P. Iskra<sup>3</sup>, F. Wies<sup>3</sup>, R. Fojt<sup>3</sup>, W. Hansch<sup>1</sup>  
<sup>1</sup>Universität der Bundeswehr München, Germany; <sup>2</sup>Technische Universität München, Germany; <sup>3</sup>KETEK GmbH, Germany

### J03-3 (16:30) New Developments on High Dynamic Range SiPM Technology

C. Piemonte, F. Acerbi, A. Ferri, A. Gola, G. Paternoster, A. Picciotto, G. Zappala<sup>1</sup>, N. Zorzi  
*FBK, Italy*

### J03-4 (16:45) A Dual Layer Fast Timing Detector for Time-of-Flight PET

J. W. Cates, M. Günhan Ertosun, C. S. Levin  
*Stanford University, USA*

### J03-5 (17:00) Petiroc 2 : a New SiPM Read-Out ASIC for Time of Flight Application

J. L. Fleury<sup>1</sup>, S. Callier<sup>2</sup>, C. de La Taille<sup>2</sup>, N. Seguin<sup>2</sup>, D. Thienpont<sup>2</sup>, F. Dulucq<sup>2</sup>, S. Ahmad<sup>1</sup>, G. Martin<sup>2</sup>  
<sup>1</sup>Weeroc, France; <sup>2</sup>Omega, France

### J03-6 (17:15) Track Reconstruction with the Silicon Strip Tracker of the Proton CT Phase 2 Scanner

A. Zatserklyaniy, R. P. Johnson, S. Macafee, T. Plautz, H. Sadrozinski, *University of California Santa Cruz, United States*; V. Bashkirov, F. Hurley, R. Schulte, N. Vence, *Loma Linda University, United States*; V. Giacometti, *University of Wollongong, Australia*

### J03-7 (17:30) In-Vivo Range Verification Based on Prompt Gamma-Ray Timing Measurements

C. Golnik<sup>1</sup>, F. Hueso-Gonzalez<sup>1</sup>, W. Enghardt<sup>1,2</sup>, A. Mueller<sup>1</sup>, F. Fiedler<sup>2</sup>, K. Thomas<sup>1</sup>, R. Ostendorf<sup>3</sup>, J. Petzold<sup>1</sup>, K. Roemer<sup>2</sup>, P. Dendooven<sup>3</sup>, G. Pausch<sup>1</sup>  
<sup>1</sup>Technische Universität Dresden, Helmholtz-Zentrum Dresden-Rossendorf, Germany; <sup>2</sup>Helmholtz-Zentrum Dresden-Rossendorf, Germany; <sup>3</sup>University of Groningen, The Netherlands

### J03-8 (17:45) First Acquisitions of Realistic Proton Therapy Treatments Delivered on an Anthropomorphic Phantom with a Prompt Gamma Camera

L. Perali<sup>1,2</sup>, L. Bombelli<sup>3</sup>, R. Peloso<sup>3</sup>, C. Fiorini<sup>1,2</sup>, E. Clementel<sup>4</sup>, L. Hotoiu<sup>4</sup>, G. Janssens<sup>5</sup>, D. Prieels<sup>5</sup>, J. Smeets<sup>5</sup>, E. Sterpin<sup>4</sup>, F. Vander Stappen<sup>5</sup>  
<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>INFN, Italy; <sup>3</sup>XGLab, Italy; <sup>4</sup>iMagx Project, ICTEAM Institute, Université Catholique de Louvain, Belgium; <sup>5</sup>Ion Beam Applications, Belgium

# WKSP Program

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## Satellite Workshops

### (WKSP) Instrumentation and Measurement in a Nuclear Environment

#### NE1 Research and Innovation in Nuclear Reactor Instrumentation & Measurement I

Sunday, Nov. 9 09:00-10:00, 608 & 609

Session Chairs: **Abdallah Lyoussi**, CEA / French Atomic Energy Commission, France

**Patrick Le Du**, IPNL,IN2P3, France

##### **NE1-1 (09:00, overview) General Introduction to the Workshop**

A. Lyoussi, CEA, France

##### **NE1-2 (09:15) Neutron And Gamma Flux And Fluence Measurements: State Of The Art In The CEA Experimental Nuclear Reactors**

C. Destouches, CEA, France

#### NE2 Research and Innovation in Nuclear Reactor Instrumentation & Measurement II

Sunday, Nov. 9 10:30-11:30, 608 & 609

Session Chairs: **Abdallah Lyoussi**, CEA / French Atomic Energy Commission, France

**Patrick Le Du**, IPNL,IN2P3, France

##### **NE2-1 (10:30) Nuclear Heating Measurements By Means Of Differential Calorimeters. New Approach To Improve Instrumentation Characteristics And Out-Of-Pile Calibration Method.**

C. Reynard-Carette, Aix-Marseille University, France

##### **NE2-2 (11:15) Vertigo; Vertically Integrated Heterogeneous Micro-System**

C. Da Via, University of Manchester /CERN, UK

#### NE3 Research and Innovation in Instrumentation for Nuclear Fuel Cycle, Homeland Security, Severe Media I

Sunday, Nov. 9 13:30-15:00, 608 & 609

Session Chairs: **Abdallah Lyoussi**, CEA / French Atomic Energy Commission, France

**Adam Bernstein**, Lawrence Livermore National Laboratory, United States

##### **NE3-1 (13:30) Applications and Advances of Nondestructive Nuclear Measurements in the Fields of Nuclear Fuel Cycle and Homeland Security.**

B. Perot, CEA, France

##### **NE3-2 (14:15) Spent Fuel Assay: Technologies for an Application Crossroads**

E. Smith, Pacific Northwest National Laboratory, USA

#### NE4 Research and Innovation in Instrumentation for Nuclear Fuel Cycle, Homeland Security, Severe Media II

Sunday, Nov. 9 15:30-17:00, 608 & 609

Session Chairs: **Abdallah Lyoussi**, CEA / French Atomic Energy Commission, France

**Adam Bernstein**, Lawrence Livermore National Laboratory, United States

##### **NE4-1 (15:30) Coincidence Counting Using Alternative Neutron Detection**

R. T. Kouzes, A. Lintereur, E. Siciliano, S. Stave

*PNNL, USA*

##### **NE4-2 (16:15) Silicon-Carbide based Thermal Neutron Detectors**

L. Ottaviani, V. Vervisch, F. Issa, R. Ferrone, S. Biondo, W. Vervisch, Aix-Marseille University, France; D. Szalkai, A. Klix, KIT, Germany; M. Lazar, INSA de Lyon, France; L. Vermeeren, SCK, Belgium; A. Kuznetsov, University of Oslo, Norway; A. Hallen, KTH, Sweden; A. Lyoussi, INSTN, France

## (WKSP) Workshop on Hadron Therapy

### HT1 Prospects and challenges in Hadron Therapy

Tuesday, Nov. 11 13:30-16:30, 602 & 603 & 604

#### HT1-1 (13:30) Status of Hadron Therapy worldwide and developments in accelerators

T. Tbd, *TO BE DEFINED, TBD*

#### HT1-2 (13:55) Status of instrumentation for Hadron Therapy

D. Schaart, *TNW, Netherland*

#### HT1-3 (14:20) Status of Biologically Weighted Treatment Planning in Hadron Therapy

A. Carabe, *University of Pennsylvania, USA*

#### HT1-4 (14:45) Big Data and Computational Challenges for Hadron Therapy

H. Kooy, *MGH, USA*

#### HT1-5 (15:10) Beam transport and dosimetry for laser-driven proton beams: from the conventional hadrontherapy to the laser-based concept

V. Scuderi

*Istituto Nazionale di Fisica Nucleare, Laboratori Nazionali del Sud, Italy*

#### HT1-7 (15:40) Updates in OpenPET project toward in situ 3D imaging during particle therapy

T. Yamaya

*National Institute of Radiological Sciences, Japan*

#### HT1-8 (15:55) Prompt gamma imaging with a slit-camera: acquisition of a 2D map on heterogeneous targets

L. Perali, *Politecnico di Milano, Italy*

#### Intensity modulated proton therapy for the irradiation of post-mastectomy chest wall.

N. Depauw, *Francis H. Burr Proton Therapy Center, MGH, USA*

#### HT1-9 (16:10) Progress towards quantified Monte Carlo simulation

M. G. Pia, *INFN Sezione di Genova, Italy*

#### Development of 3D semiconductor microdosimetric sensors for RBE determination in 12C heavy ion therapy

L. T. Tran, *University of Wollongong, Australia*

#### HT1-10 (16:25) Usages and Prospects of Particle Therapy System Simulation Framework in Particle Therapy Facilities in Japan

T. Aso, *National Institute of Technology, Japan*

#### Results from the pCT Collaboration's Phase II Pre-Clinical Head

R. P. Johnson, *University of California at Santa Cruz, USA*

On behalf of the pCT Collaboration

## (WKSP) GATE Users Meeting

### GA1 Gate Users Meeting

Wednesday, Nov. 12 18:00-19:30, 618 & 619

Session Chair: **Irene Buvat**, *IMNC France*,

#### GA1-1 (18:00) Ten years of GATE: an overview

I. Buvat, *CEA-SHFJ, France*; C. Morel, *CPPM, France*

#### GA1-2 (18:25) Simulation of light transport in scintillators based on 3D characterization of crystal surfaces

E. Roncali, *University of California, USA*

#### GA1-3 (18:40) Portal imaging for conformal and intensity modulated fast neutron therapy

S. St. James, D. C. Argento, R. D. Stewart

*University of Washington, USA*

#### GA1-4 (18:55) Fully Bayesian image estimation software for GATE simulations

J. L. Herraiz, *Mass. Institute of Technology, USA*; S. Yip, R. Berbeco, A. Sitek, *Brigham and Women's Hospital and Harvard Medical School, USA*

#### GA1-5 (19:10) GATE in the future

S. Jan, *CEA-SHFJ, France*

## (WKSP) Workshop on large area, low background, VUV sensitive photo-detectors and associated electronics

## RD1 NSS WS2 - Applications

Friday, Nov. 14 08:00-09:40, 608 & 609  
Session Chair: **Fabrice Retiere**, TRIUMF, Canada

### RD1-1 (08:00) EXO, liquid Xenon TPCs for neutrinoless double beta decay

L. Yang, *University of Illinois at Urbana-Champaign, USA*  
On behalf of the EXO-200 and nEXO Collaborations

### RD1-2 (08:20) Topology reconstruction in a gaseous TPC using SiPMs for neutrinoless double beta searches

E. Monrabal, J. J. Gomez Cadenas, *IFIC (CSIC-UV), Spain*; D. Nygren, *Texas University at Arlington, USA*

### RD1-3 (08:40) Dark matter search with Liquid Argon and Liquid Xenon

E. Pantic, *UC Davis, USA*

### RD1-4 (09:00) Neutrino detection with liquid Argon Detectors

T. Kutter, *Louisiana State University (LSU), USA*

### RD1-5 (09:20) XEMIS, Positron Emission Tomography with liquid Xenon

L. Gallego<sup>1</sup>, S. Bassetto<sup>2</sup>, N. Beaupere<sup>1</sup>, P. Briend<sup>2</sup>, T. Carlier<sup>3</sup>, M. Chere<sup>3</sup>, J.-P. Cussonneau<sup>1</sup>, J. Donnard<sup>1</sup>, M. Gorski<sup>2</sup>, R. Hamanishi<sup>4</sup>, F. Kraeber-Bodéré<sup>2</sup>, O. Lemaire<sup>1</sup>, P. Leray<sup>1</sup>, J. Masbou<sup>1</sup>, S. Mihara<sup>4</sup>, E. Morteau<sup>1</sup>, L. Scotti Lavina<sup>1</sup>, J.-S. Stutzmann<sup>1</sup>, T. Tauchi<sup>4</sup>, L. Virone<sup>1</sup>, D. Thers<sup>1</sup>  
<sup>1</sup>SUBATECH, Ecole des Mines de Nantes, CNRS/In2p3, Université de Nantes, France; <sup>2</sup>AIR LIQUIDE, France; <sup>3</sup>Centre Hospitalier Universitaire de Nan, France; <sup>4</sup>High Energy Accelerator Research Organization (KEK), Japan; <sup>5</sup>INSERM U892 equipe 13, France

## RD2 NSS WS2 - SiPMs

Friday, Nov. 14 10:30-12:30, 608 & 609  
Session Chair: **Fabrice Retiere**, TRIUMF, Canada

### RD2-1 (10:30) SiPM Development for MEG II Liquid Xenon Calorimeter

T. Iwamoto, *University of Tokyo, Japan*

### RD2-2 (10:50) SiPM test for nEXO

L. Huth<sup>1</sup>, N. Ohmart<sup>1</sup>, F. Retiere<sup>2</sup>, L. James<sup>1</sup>, I. Ostrovskiy<sup>3</sup>  
<sup>1</sup>Universität Heidelberg, Germany; <sup>2</sup>TRIUMF, Canada; <sup>3</sup>Stanford University, USA

### RD2-3 (11:10) SiPM development for LAr DM experiments

G. Fiorillo<sup>1</sup>, B. Rossi<sup>2</sup>, S. Walker<sup>1</sup>, A. Razeto<sup>3</sup>, M. D'Incecco<sup>3</sup>, D. Sablone<sup>3</sup>, G. Korga<sup>3</sup>, C. Piemonte<sup>4</sup>, A. Gola<sup>4</sup>  
<sup>1</sup>Universita' di Napoli, Italy; <sup>2</sup>INFN Napoli, Italy; <sup>3</sup>INFN Laboratori Nazionali del Gran Sasso, Italy; <sup>4</sup>Fondazione Bruno Kessler, Italy

### RD2-4 (11:30) KETEK -- SiPM Production Update

W. Hartinger, F. Wiest, J. Knobloch, *KETEK GmbH, Germany*

### RD2-5 (11:50) UV Photodetector Development at RMD

E. B. Johnson, *Radiation Monitoring Devices, Inc., USA*

### RD2-6 (12:10) SensL Silicon Photomultiplier Technology – Radiopurity, Reliability and SiPM Technology Update

J. Murphy, *SensL, Ireland*

## RD3 NSS WS2 - Other photo-detectors

Friday, Nov. 14 14:00-15:40, 608 & 609  
Session Chair: **Fabrice Retiere**, TRIUMF, Canada

### RD3-1 (14:00) SiPM with WLS

A. B. Tbd, *Institute, USA*

### RD3-2 (14:20) Silicon Geiger Hybrid Tube: an ultra low background photosensor

Y. Wang<sup>1,2</sup>  
<sup>1</sup>University of California, Los Angeles, USA; <sup>2</sup>Institute of High Energy Physics, China

### RD3-3 (14:40) Wafer scale detector arrays with extrinsic uniform detection/amplification capabilities: Application of amorphous selenium (a-Se) to VUV photon counting detectors

J. Rowlands, *University of Toronto, Canada*

### RD3-4 (15:00) PMT for XENON1T Dark Matter experiment

A. Lyashenko<sup>1</sup>, Y. Wang<sup>1,2</sup>, A. Fan<sup>1</sup>, Y. Meng<sup>1</sup>, T. Nguyen<sup>1</sup>, A. Renshaw<sup>1</sup>, A. Teymourian<sup>1</sup>, H. Wang<sup>1</sup>, E. Pantic<sup>3</sup>, M. Guan<sup>2</sup>, C. Wang<sup>2</sup>  
<sup>1</sup>University of California, Los Angeles, USA; <sup>2</sup>Institute of High Energy Physics, China; <sup>3</sup>University of California, Davis, USA

### RD3-5 (15:20) GEM-based photo-detector

L. Arazi<sup>1</sup>, A. E. C. Coimbra<sup>1,2</sup>, E. Erdal<sup>1</sup>, I. Israellashvili<sup>1,3</sup>, M. L. Rappaport<sup>1</sup>, S. Schemelinin<sup>1</sup>, D. Vartsky<sup>1,4</sup>, J. M. F. dos Santos<sup>2</sup>, A. Breskin<sup>1</sup>  
<sup>1</sup>Weizmann Institute of Science, Israel; <sup>2</sup>Coimbra University, Portugal; <sup>3</sup>NRC Negev, Israel; <sup>4</sup>On leave from Soreq NRC, Israel

## RD4 NSS WS2 - Readout Electronics and Discussion

Friday, Nov. 14 16:00-18:00, 608 & 609

Session Chair: **Lorenzo Fabris**, Oak Ridge National Laboratory, United States

### RD4-1 (16:00) High speed waveform digitizing for the MEG experiment

S. Ritt, Paul Scherrer Institute, Switzerland

### RD4-2 (16:20) OMEGA SiPM ReadOut chips

S. Ahmad<sup>1</sup>, S. Callier<sup>2</sup>, C. de La Taille<sup>2</sup>, F. Dulucq<sup>2</sup>, J. Fleury<sup>1</sup>, G. Martin-Chassard<sup>2</sup>, L. Raux<sup>2</sup>, N. Seguin-Moreau<sup>2</sup>, D. Thienpont<sup>2</sup>

<sup>1</sup>Weeroc SAS, France; <sup>2</sup>Ecole Polytechnique, France

### RD4-3 (16:40) Concepts of SiPM readout electronics

L. Fabris<sup>1,2</sup>, G. De Geronimo<sup>3</sup>, S. Li<sup>3</sup>, V. Radeka<sup>3</sup>, G. Visser<sup>4</sup>

<sup>1</sup>Oak Ridge National Laboratory, USA; <sup>2</sup>University of Bergamo, Italy; <sup>3</sup>Brookhaven National Laboratory, USA; <sup>4</sup>Indiana University CEEM, USA

### RD4-4 (17:00) Round Table Discussion

F. Retiere<sup>1</sup>, L. Fabris<sup>2,3</sup>

<sup>1</sup>TRIUMF, Canada; <sup>2</sup>Oak Ridge National Laboratory, USA; <sup>3</sup>University of Bergamo, Italy

## (WKSP) Advance in Parametric Image Reconstruction

### SP1 Advance in Parametric Image Reconstruction I

Saturday, Nov. 15 13:00-14:40, 618 & 619

#### SP1-1 (13:00) TBD TBD TBD TBD

C. A. Bouman, Purdue University, USA

#### SP1-2 (13:20) Improving SNR in Parametric Image Reconstruction: Methods and Algorithms

J. Qi, UC Davis, USA

#### SP1-3 (13:40) Utilization of Direct 4D Reconstruction for Kinetic-modeled Quantitative PET Imaging

A. Rahmim, Johns Hopkins University, USA

#### SP1-4 (14:00) Direct Estimation of Graphical Model using List Mode Data

Q. Li, MGH, Harvard Medical School, USA

#### SP1-5 (14:20) Fully Bayesian Parametric Imaging

A. Sitek, MGH, Harvard Medical School, USA

### SP2 Advance in Parametric Image Reconstruction II

Saturday, Nov. 15 15:10-16:30, 618 & 619

#### SP2-1 (15:10) Whole-body Patlak Imaging

R. M. Leahy, University of Southern California, USA

#### SP2-2 (15:30) Whole-body PET Parametric Imaging: Facilitating the Transition of Quantitative PET to the Clinic

N. A. Karakatsanis, University of Geneva, Switzerland

#### SP2-3 (15:50) Direct EM Reconstruction of Kinetic Parameters from List-Mode Cardiac PET

M. Germino, R. E. Carson, Yale University, USA

#### SP2-4 (16:10) Computer Observer for Parametric Imaging

G. El Fakhri, MGH, Harvard Medical School, USA