

5/30/2008

Monday Plenary I

9-10:15 A.M.

International House

Chairs: Stephen Derenzo and Bill Moses, LBNL

Monday Plenary I-1

Research and Development Opportunities at DNDO

William Hagan, Assistant Director, Office of Transformational Research and Development, Department of Homeland Security/Domestic Nuclear Detection Office

Monday Plenary I-2

Advanced Nuclear Safeguards for the 21st Century

Michael C. Miller, Los Alamos National Laboratory

Monday Plenary II

10:45 A.M. to noon

International House

Chairs: Stephen Derenzo and Bill Moses, LBNL

Monday Plenary II-1

Maximum-Likelihood Methods for Processing Signals from Gamma-Ray Detectors

Harrison H. Barrett, Center for Gamma-ray Imaging, University of Arizona

Monday Plenary II-2

On The Detectability of Nuclear Material Signatures

Tsahi Gozani, Chief Scientist and President Emeritus, Rapiscan Laboratories

5/30/2008

New Scintillators

Tuesday AM I: Stanley 105

Chair: Chuck Melcher, Univ. of Tennessee

Scintillators with Potential to Supersede LaBr₃, *Nerine Cherepy, Lawrence Livermore National Laboratory*

Crystal Growth and Scintillation Properties of Strontium Iodide Scintillators, *Edgar Van Loef, Radiation Monitoring Devices, Inc.*

Novel Mixed Elpasolite Halide Scintillators for Gamma Radiation Detection, *Steven Duclos, GE Global Research*

Scintillation Properties of Undoped and Cerium Doped LiGdCl₄ and NaGdCl₄, *Yetta Porter-Chapman, Lawrence Berkeley National Laboratory*

High Light Yield Scintillator: YI₃:Ce, *Jarek Glodo, Radiation Monitoring Devices Inc.*

Silicon Detectors

Tuesday AM I: Bechtel/Sibley Auditorium

Chair: Gianluigi de Geronimo, BNL

Characteristics of 3D Micro-Structured Semiconductor High Efficiency Neutron Detectors, *Steven L. Bellinger, Kansas State University*

Monolithic Pixel Sensors in 0.15micron Silicon-On-Insulator Technology, *Marco Battaglia, UC Berkeley and LBNL; Devis Contarato (LBNL), presenting*

Development of a 4-Element Large Area Silicon Drift Detector Array for Synchrotron Applications, *Liangyuan (Larry) Feng, SII NanoTechnology USA Inc.*

Characterization and Calibration of PILATUS II Detectors, *Philipp Kraft, Paul Scherrer Institut (PSI)*

Charge Collection Efficiency Measurements of Heavily Irradiated Segmented P-Type Silicon Detectors for Use at the Super-LHC, *Anthony Affolder, University of Liverpool*

Gas-Based, Light, and Radio Detectors

Tuesday AM I: 106 Stanley

Chair: David Nygren, LBNL

Study Of Electroluminescence Light In Low Pressure CS₂-Ne And CS₂-CF₄ Gaseous Mixtures, *Kirill Pushkin, Occidental College*

Recent Developments Of Micromegas Detectors For Neutron Physics, *Samuel Andriamonje, CEA-Saclay DSM/IRFU/SPHN*

Techniques for Radio Detection of Ultra-High Energy Cosmic Rays, *Hartmut Gemmeke, Forschungszentrum Karlsruhe*

Detection of Special Nuclear Material with a Water Cerenkov based Detector, *Steven Dazeley, Lawrence Livermore National Laboratory (LLNL)*

Neutron Gas Detectors for Instrumentation on New Spallation Sources, *Bruno Guerard, Institut Laue-Langevin*

5/30/2008

Ceramic Scintillators

Tuesday AM II: Stanley 105

Chair: Steve Payne, LLNL

- Sintered Sodium Iodide: High Throughput NaI:TI Process**, Kevin P McEvoy, GE Global Research
- GE Healthcare's New Computed Tomography Scintillator – Gemstone**, James Vartuli, GE Global Research
- Development of ZnO-based Polycrystalline Ceramic Scintillators for Use as Alpha-Particle Detectors**, John S. Neal, Oak Ridge National Laboratory (ORNL)
- Transparent Lu₂SiO₅:Ce Optical Ceramic Scintillator**, Yimin Wang, Radiation Monitoring Devices, Inc. (RMD)
- Fabrication of ZnSe:Te by Hot Pressing Techniques**, Steven Cool, Radiation Monitoring Devices, Inc. (RMD); Vivek Nagarkar, presenting

CdZnTe/CdTe Detectors and Imagers

Tuesday AM II: Bechtel/Sibley Auditorium

Chair: Ralph James, BNL

- Characterization of 10 mm Thick Pixellated Redlen CdZnTe Detectors**, Feng Zhang, University of Michigan
- Investigation of Internal Electric Field Distribution in CdZnTe Detectors By Using X-Ray Mapping Technique**, Aleksey Bolotnikov, Brookhaven National Laboratory
- The Experimental Results of a Gamma-Ray Imaging with a Si/CdTe Semiconductor Compton Camera**, Shin'ichiro Takeda, ISAS/JAXA
- High Energy Resolution Gamma-Ray Imagers Using CdTe Diode Devices**, Shin Watanabe, ISAS/JAXA
- Assessment of the Radiation Tolerance of CdZnTe and HgI₂ to Solar Proton Events**, Alan Owens, Advanced Studies and Technology Preparation Division, ESA/ESTEC)

Cryogenic Detectors and Techniques

Tuesday AM II: 106 Stanley

Chair: Michael Rabin, LANL

- Liquid Xenon Time Projection Chamber for LUX [or other substitute LUX talk]**, Adam Bernstein, Lawrence Livermore National Laboratory, for Adam Bradley, Case Western Reserve University
- Ultra-High Resolution Alpha Particle Spectroscopy Using Superconducting Microcalorimeter Detectors**, Robert Horansky, National Institute of Standards and Technology (NIST)
- Large-area Microcalorimeter Detectors for Ultra-High-Resolution X- and gamma-Ray Spectroscopy**, Minesh Bacrania, Los Alamos National Laboratory
- Superconducting High- Resolution High-Speed Tunnel Junction Spectrometers for Soft X-Ray Spectroscopy**, Stephan Friedrich, Lawrence Livermore National Laboratory
- Fabrication of Large Uniform Arrays of Superconducting Ultra-high Resolution Gamma Detectors**, Stephan Friedrich, Lawrence Livermore National Laboratory; Presenter: Miguel Velazquez

5/30/2008

Neutron Detection with Scintillators

Wednesday AM I: Stanley 105

Chair: Marek Moszynski, Soltan Inst. for Nucl. Studies

Improved Capture-Gated Neutron Spectrometers, *J. Bart Czirr, MSI Photogenics*
Development of New Composite Scintillation Materials Based On Organic Crystalline Grains, *Nikolai Z. Galunov, Institute for Scintillation Materials (ISM)*
New Copolymer Architectures for Next Generation Plastic Neutron Scintillators, *Banu Kesanli, Oak Ridge National Laboratory (ORNL); John S. Neal, presenting*
New Organic Crystals for Pulse Shape Discrimination, *Giulia Hull, Lawrence Livermore National Laboratory (LLNL)*
Use of a Lithium-6-Glass/Plastic-Scintillation Detector for Nuclear Nonproliferation Applications, *Marek Flaska, University of Michigan*

Ge Detectors and Imagers

Wednesday AM I: Bechtel/Sibley Auditorium

Chair: Mark Amman, LBNL

Gamma-ray Imaging with the High-Resolution Si+Ge Compact Compton Imager, *K. Vetter, Lawrence Livermore National Laboratory; L. Mihailescu, presenting*
Pulse Shape Analysis of a p-Type Point Contact Germanium Detector for Dark Matter and Neutrinoless Double-beta Decay Searches, *John L. Orrell, Pacific Northwest National Laboratory (PNNL)*
The Use of High Purity Germanium (HPGe) detectors for Single Photon Emission Computed Tomography, *Helen Boston, University of Liverpool*
Inter-strip Position Interpolation in a High-Purity Germanium Double-Sided Strip Detector, *Jason P Hayward, The University of Tennessee*
Acquisition of Contrast Images using a Segmented Planar Germanium Detector, *David Oxley, University of Liverpool*

Simulation and Analysis of Radiation Interactions

Wednesday AM I: 106 Stanley

Chair: Todd Palmer, Oregon State Univ.

A First Application of the FRAM Isotopic Analysis Code to High-Resolution Microcalorimetry Gamma-Ray Spectra, *P. J. Karpus, Los Alamos National Laboratory*
Cosmic-Ray Background Generator (CRY) for Monte Carlo Transport Codes, *Douglas Wright, Lawrence Livermore National Laboratory*
Monte Carlo Assessment of Active Photon Interrogation Systems for the Detection of Fissionable Material, *Shaun D. Clarke, University of Michigan*
Intrinsic Properties of CsI and CdZnTe: Monte Carlo Simulations, *Fei Gao, Pacific Northwest National Laboratory (PNNL)*
Monte Carlo Simulation on Early Breast Cancer Detection Using Wire Mesh Collimator Gamma Camera, *M Iqbal Saripan, Universiti Putra Malaysia*

5/30/2008

Non-Proportionality and Characterization of Scintillators

Wednesday AM II: Stanley 105

Chair: Edgar van Loef, RMD, Inc.

Light Yield Non-Proportionality and Energy Resolution of Praseodymium Doped LuAG

Scintillator, Lukasz Swiderski, Soltan Institute for Nuclear Studies

Comparing Fast Scintillators with TOF PET Potentiality, *Maurizio Conti, Siemens Molecular Imaging*

Progress in Studying Scintillator Non-Proportionality: Phenomenological Model and

Experiments, *G. Bizarri, Lawrence Berkeley National Laboratory (LBNL)*

Ion Technique for Screening Gamma Detector Candidate Materials, *Yanwen Zhang, Pacific Northwest National Laboratory*

Scintillation Non-Proportionality of Lutetium and Yttrium Silicates and Aluminates, *Paul Cutler, The University of Tennessee, Knoxville*

Other Semiconductor Detector Materials and Techniques

Wednesday AM II: Bechtel/Sibley Auditorium

Chair: Uri El-Hanany

Developing Larger TlBr Detectors - Detector Performance, *Hadong Kim, Radiation Monitoring Devices Inc. (RMD)*

Anisotropic III-VI Chalcogenide Semiconductors for Radiation Detectors, *Krishna C. Mandal, EIC Laboratories, Inc.*

Development of 15-mm Thick HgI₂ Gamma-Ray Spectrometers, *Zhong He, The University of Michigan*

Novel Quaternary Semiconductor Materials: Growth and Characterization, *N. B. Singh, Northrop Grumman Corporation ES*

Proximity Charge Sensing with Semiconductor Detectors. *Paul Luke, Lawrence Berkeley National Laboratory*

Imaging/Directional Algorithms

Wednesday AM II: 106 Stanley

Chair: Cornelia Wunderer, UC-Berkeley

The Image Reconstruction Approach for the Nuclear Compton Telescope NCT, *Andreas Zoglauer, University of California at Berkeley*

Directionality in the GammaTracker Handheld Radioisotope Identifier, *Carolyn E. Seifert, Pacific Northwest National Laboratory*

Iterative Image Reconstruction Algorithms for Post-processing of Synthetic Aperture Gamma Source Images, *Ralph T Hoctor, GE Global Research*

Reconstruction of UCL Germanium Compton Camera Data using ITEM, *Nicolas Dedek, University College London*

Cross Section and Angular Dependence of a Bonner Sphere Extension, *Eric Burgett, Georgia Institute of Technology*

5/30/2008

National and Homeland Security: Active Technologies

Wednesday PM I: Stanley 105

Chair: Alan Janos, Domestic Nuclear Detection Office

Muon Radiography for the Detection of Special Nuclear Materials in Containers, *Enrico Conti, INFN Padova*

Photofission Signatures in the Prompt Regime for Special Nuclear Material Identification, *Sara Pozzi, University of Michigan*

Material Response of Depleted Uranium at Various Standoff Distances from a Hardened 25 MeV Bremsstrahlung Photon Source, *David Gerts, Idaho National Laboratory*

Active Detection of Shielded SNM with 60-keV Neutrons
Christian Hagmann, Lawrence Livermore National Laboratory (LLNL)

Using CsI and NaI detectors for Beta-Delayed Delayed Gamma-Ray SNM Detection Study,
Willem G.J. Langeveld, Rapiscan Laboratories, Inc.; Dan A. Strellis, presenter

Photodetectors and Scintillators

Wednesday PM I: Bechtel/Sibley Auditorium

Chair: Nerene Cherepy, LLNL

A Comparative Study of Fast Photomultipliers for Timing Experiments and TOF PET,
Tomasz Szczesniak, Soltan Institute for Nuclear Studies

Polycrystalline Mercuric Iodide Photodetectors for Cesium Iodide Scintillators, *William C. Barber, DxRay Inc.*

A Comparative Study of Silicone Drift Detectors with Photomultipliers, Avalanche Photodiodes and PIN Photodiodes in Gamma Spectrometry with LaBr₃ Crystals, *Marek Moszynski, Soltan Institute for Nuclear Studies*

A High-Speed, High Dynamic-Range, Linear Optical Sensor Array, *Stuart Kleinfelder, University of California, Irvine*

Luminescence of Heavily Cerium Doped Alkaline-Earth Fluorides, *Alexandr Gektin, Institute for Scintillation Materials, Ukraine (ISM)*

National and Homeland Security: Passive Technologies

Wednesday PM II: Stanley 105

Chair: Robert Mayo, DOE NA-22

A High-Efficiency Fieldable Germanium Detector Array, *James Fast, Pacific Northwest National Laboratory*

Directional Detection of Special Nuclear Materials Using a Neutron Time Projection Chamber, *Igor Jovanovic, Purdue University*

Demonstration of a Dual-Range Photon Detector with SDD and LaBr₃(Ce³⁺) Scintillator,
Guntram Pausch, ICx Radiation GmbH

Development of Flat Panel Amorphous Silicon Imaging Detectors for Cargo Imaging,
Clifford Bueno, GE Global Research

Three-Dimensional Imaging of Hidden Objects Using Positron Emission Backscatter, *Laura C. Stonehill, Los Alamos National Laboratory (LANL)*

5/30/2008

Silicon Photomultipliers

Wednesday PM II: Bechtel/Sibley Auditorium

Chair: James Christian, RMD, Inc.

Energy Resolution from an LYSO Scintillator Coupled to CMOS SSPM Detectors, Erik Johnson, Radiation Monitoring Devices, Inc. (RMD)

Features of Silicon Photo Multipliers: Precision Measurements of Noise, Cross-Talk, Afterpulsing, Detection Efficiency, Paolo Finocchiaro, INFN-LNS

High Performance Solid-State Photodetector for Nuclear Detection and Imaging, Purushottam Dokhale, Radiation Monitoring Devices, Inc.; Kanai Shah, presenting

Mass Sample Test of HPK MPPCs for the T2K Neutrino Experiment, Kazunori Nitta, Kyoto University, Japan

Silicon Photomultipliers As Readout for the CEDAR counter of the K⁺ → pi⁺ nu Nubar Experiment P326/NA62 at CERN, Gianmaria Collazuol, Scuola Normale Superiore and INFN Pisa

Detector Systems

Thursday AM I: Stanley 105

Chair: Lorenzo Fabris, ORNL

IceCube - a Cube Kilometer Radiation Detector, Spencer Klein, Lawrence Berkeley National Laboratory

Multi-Frame High Resolution Imaging System for Time-Resolved Fast-Neutron Radiography, Volker Dangendorf, Physikalisch-Technische Bundesanstalt

Development of a Fast-Neutron Detector with Silicon Photomultiplier Readout, Raffaele Bencardino, CSIRO Minerals

Advanced Compact HPC System with Switched Architectures for Large High-Performance Detectors, V.I. Vinogradov, Institute for Nuclear Research, Russian Academy of Sciences

Analysis of the signal and Noise Characteristics Induced By Unattenuated X-Rays from a Scintillator in Indirect-Detection CMOS Photodiode Array Detectors, Ho Kyung Kim, Pusan National University; Seung Man Yun, presenting (Pusan National University)

Novel Radiation Sources for Security and Research

Thursday AM I: Bechtel/Sibley Auditorium

Chair: Arlyn Antolak, SNL

Laser-based, Ultrabright Gamma-Ray Sources: Nuclear Photo-Science and Applications, C.P.J. Barty, Lawrence Livermore National Laboratory

Pulsed White Neutron Generator for Explosives Detection, Michael King, Lawrence Berkeley National Laboratory

Intensity Modulated Advanced X-Ray Source (IMAXS) for Homeland Security Applications, Willem G.J. Langeveld, Rapiscan Laboratories, Inc.

Pulsed Neutron Facility for Research in Illicit Trafficking and Nuclear Safeguards, Bent Pedersen, Institute for the Protection and Security of the Citizen (IPSC)

Development of New X-ray Source based on Carbon Nanotube Field Emission and Application to the Non Destructive Imaging Technology, Jong Uk Kim, Korea Electrotechnology Research Institute

5/30/2008

Imaging Technology and Special Applications

Thursday AM II: Stanley 105

Chair: Alan Owens, European Space Agency

Overview of the Nuclear Compton Telescope, *Eric Bellm, UC Berkeley; Steven Boggs, presenter*

The Gamma-Ray Imaging Mission GRI, *Cornelia Wunderer, Space Sciences Laboratory, UC Berkeley*

Modelling an Energy-Dispersive X-ray Diffraction System for Drug Detection, *Silvia Pani, School of Medicine and Dentistry-Queen Mary Univ of London/Barts and The London NHS Trust, London, UK; Emily Cook, presenting (Department of Medical Physics and Bioengineering, University College London, UK)*

Observation of the $n(3\text{He},t)p$ Reaction by Detection of Far-Ultraviolet Radiation, *Charles W. Clark, National Institute of Standards and Technology*

Electronics

Thursday AM II: Bechtel/Sibley Auditorium

Chair: Stuart Kleinfelder, UC-Irvine

Fast Self Triggered Multi Channel Readout ASIC for Time- and Energy Measurement, *Michael Ritzert, University of Heidelberg*

High Speed Multichannel Charge Sensitive Data Acquisition System with Self Triggered Event Timing, *Anton S. Tremsin, Space Sciences Laboratory, UC Berkeley*

Electronics Development for Fast-Timing PET detectors: The Multi-Threshold Discriminator Time of Flight PET System, *Jialie Lin, University of Chicago and Enrico Fermi Institute*

High Sensitivity Readout and Data Processing for Environmental Spectral Radiation Measurements, *Vladimir Popov, Jefferson Laboratory*

Radiation Tolerance of an Analog LSI Developed for X-ray CCD Camera Readout System Onboard an Astronomical Satellite, *Hiroshi Nakajima, Osaka University*

Radiation Measurements in Physics

Thursday PM I: Stanley 105

Chair: Yuen-Dat Chan, LBNL

MAJORANA: An Ultra-Low Background Enriched-Germanium Detector Array for Fundamental Physics Measurements, *Jason Detwiler, LBNL*

NA62 RICH: Test Beam Results, *Antonino Sergi, INFN - Perugia, Italy*

Performance of the CREAM-III Calorimeter, *Moo Hyun Lee, University of Maryland*

New X-ray Detectors for Exotic Atom Research, *Johann Marton, Stefan Meyer Inst.*

Active, Beam-Defining Elements for Synchrotron Beamlines, *Chris Kenney, Molecular Biology Consortium; Jasmine Hasi, presenting*

5/30/2008

Medical Applications

Thursday PM I: Bechtel/Sibley Auditorium Chair: David Wehe, Univ. of Michigan

Recent Results from Axial 3-D PET Modules with Long LYSO Crystals, Wave Length Shifter Strips and SiPM Readout, *Peter Weilhammer, University/INFN Perugia and CERN*
Single Crystal Film Scintillators for X-ray Imaging Applications with Micrometer Resolution, *Thierry Martin, ESRF*

Distributed Phantoms in Planar Coded Aperture Nuclear Medicine Imaging: Experimental Results, *David M. Starfield, University of the Witwatersrand*

Characterisation of the Components of a Prototype Scanning Intelligent Imaging System for use in Digital Mammography: The I-ImaS System, *Colin Esbrand, University College London*

Synchrotron X-ray Fluorescence Computed Tomography Using an Emission Tomography System, *Ling-Jian Meng, University of Illinois Urbana-Champaign*

Thursday PM II

3:45-5:15 pm, Stanley 105

Chair: Stephen Derenzo (LBNL)

This is a summary or *rapporteur* session whose content will be based on presentations made throughout the week.

Scintillators (18 minutes)

John Valentine, Lawrence Livermore National Laboratory

Photodetectors (18 minutes)

Kanai Shah, Radiation Monitoring Devices, Inc.

Semiconductor detectors (18 minutes)

Kai Vetter, UC Berkeley / LBNL

Applications and perspectives (30 minutes)

Glenn Knoll, University of Michigan