

## Radiation Detectors in Medicine, Industry, and National Security XIX

Wednesday - Thursday 22 - 23 August 2018

### Conference Sessions At A Glance

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- 1: Medical Applications: PET/SPECT
- 2: Security and Defense Applications
- 3: Medical Applications: Radiography/CT I
- 4: Medical Applications: Radiography/CT II  
Poster Session
- 5: ICF Diagnostics: Fast X-Ray Imaging
- 6: ICF Diagnostics: Neutron, Gamma, and Other
- 7: ICF Diagnostics: Instrumentation

### Important Dates

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Abstract Due:  
7 February 2018

Author Notification:  
16 April 2018

Manuscript Due Date:  
25 July 2018

### Conference Committee

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#### Conference Chairs

[Gary P. Grim](#), Lawrence Livermore National Lab. (United States)  
[Lars R. Furenliid](#), The Univ. of Arizona (United States)  
[H. Bradford Barber](#), The Univ. of Arizona (United States)

#### Conference Co-Chair

Jeffrey A. Koch, National Security Technologies, LLC (United States)

#### Program Committee

[Stuart A. Baker](#), National Security Technologies, LLC (United States)  
[Yongqiang Cui](#), Brookhaven National Lab. (United States)  
[F. Patrick Doty](#), Sandia National Labs. (United States)  
 Patrick Feng, Sandia National Labs. (United States)  
[Paul P. Guss](#), National Security Technologies, LLC (United States)  
[Geoffrey Harding](#), Morpho Detection (Germany)  
[Khalid M. Hattar](#), Sandia National Labs. (United States)

Program Committee continued...

[Ralph B. James](#), Savannah River National Lab. (United States)  
[Edward S. Jimenez](#), Sandia National Labs. (United States)  
 Will E. Johns, Vanderbilt Univ. (United States)  
 Michael J. King, Rapiscan Systems Labs. (United States)  
[Edward A. McKigney](#), Los Alamos National Lab. (United States)  
[Wondwosen Mengesha](#), Sandia National Labs. (United States)  
 Frank E. Merrill, Los Alamos National Lab. (United States)  
 Rex A. Moats, The Univ. of Southern California (United States)  
[Vivek V. Nagarkar](#), Radiation Monitoring Devices, Inc. (United States)  
[Eiichi Sato](#), Iwate Medical Univ. (Japan)  
[Michael R. Squillante](#), Radiation Monitoring Devices, Inc. (United States)

WEDNESDAY 22 AUGUST

[Show All Abstracts](#)

### Session 1: Medical Applications: PET/SPECT

Wednesday 22 August 2018

8:00 AM - 10:20 AM

Location: Conv. Ctr. Room 24A


Session Chair: [H. Bradford Barber](#), The Univ. of Arizona (United States)

#### Dual-energy x-ray computed tomography scanner using a room-temperature cadmium-telluride detector and a range-region counter

Paper 10763-1

Time: 8:00 AM - 8:20 AM

Author(s): Manabu Watanabe, Toho Univ. (Japan); Eiichi Sato, Yasuyuki Oda, Sohei Yoshida, Iwate Medical Univ. (Japan); Hodaka Moriyama, Osahiko Hagiwara, Hiroshi Matsukiyo, Toshiyuki Enomoto, Shinya Kusachi, Toho Univ. (Japan)


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#### Ionizing radiation induces femtosecond time scale modulations of a material's optical properties (Invited Paper)

Paper 10763-2

Time: 8:20 AM - 8:50 AM

Author(s): Li Tao, Stanford Univ. (United States); Ryan Coffee, SLAC National Accelerator Lab (United States); Craig Levin, Stanford Univ. (United States)


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#### System integration for a SPECT system featuring digital waveform acquisition

Paper 10763-3

Time: 8:50 AM - 9:10 AM

Author(s): Neil Momsen, Garrett Richards, Lars R. Furenliid, College of Optical Sciences, The Univ. of Arizona (United States)


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**Parameters optimization of volumetric reconstruction technique for L-SPECT imaging**

Paper 10763-4

Time: 9:10 AM - 9:30 AM


Author(s): Manu Francis, Murat Tahtali, Tasneem Rahman, Mark R. Pickering, UNSW Canberra (Australia)

[Add To My Schedule](#) **Scintillator-specific optimization of 2-bit sigma-delta modulation A/D for gamma-ray pulse waveform capture**

Paper 10763-5

Time: 9:30 AM - 9:50 AM


Author(s): Maria Ruiz-Gonzalez, Lars R. Furenlid, College of Optical Sciences, University of Arizona (United States), Center for Gamma-Ray Imaging, University of Arizona (United States)

[Add To My Schedule](#) **The Large Area Picosecond Photodetector (LAPPD) 8" MCP-PMT: recent results (Invited Paper)**

Paper 10763-6

Time: 9:50 AM - 10:20 AM

Author(s): Mark A. Popecki, Incom, Inc. (United States)

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**Coffee Break 10:20 AM - 11:10 AM**

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**Session 2:  
Security and Defense Applications**

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Wednesday 22 August 2018

11:10 AM - 12:20 PM


Location: Conv. Ctr. Room 24A

Session Chair: [Lars R. Furenlid](#), The Univ. of Arizona (United States)**Application of international radiological information exchange (IRIX) standards for radiation monitoring data reporting (Invited Paper)**

Paper 10763-7

Time: 11:10 AM - 11:40 AM

Author(s): Sanjoy Mukhopadhyay, Florian Baci, Gurdeep Saluja, Jose Segarra, International Atomic Energy Agency (Austria); Franck Albinet, Independent Contractor - GIS &amp; Data Analysts Consultant (France)

[Add To My Schedule](#) **Feasibility study for the autonomous radiological sensing with UAS and an open-source UAS autopilot simulator (Invited Paper) (Canceled)**

Paper 10763-8

Time: 11:10 AM - 11:40 AM


Author(s):

**Harmonization of radiation monitoring and environmental sampling data in the aftermath of a nuclear or radiological emergency**

Paper 10763-9

Time: 11:40 AM - 12:00 PM


Author(s): Sanjoy Mukhopadhyay, Florian Baci, Kilian Smith, Katerina Kouts, Phillip V. Welter, International Atomic Energy Agency (Austria)

[Add To My Schedule](#) **New energy spectral measurements of a distributed x-ray source with a Compton spectrometer**

Paper 10763-10

Time: 12:00 PM - 12:20 PM

Author(s): Amanda E. Gehring, Michelle A. Espy, Todd J. Haines, Los Alamos National Lab. (United States); A. Steve Richardson, Jacob C. Zier, U.S. Naval Research Lab. (United States)

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**Lunch/Exhibition Break 12:20 PM - 1:30 PM**

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**Session 3:  
Medical Applications: Radiography/CT I**

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Wednesday 22 August 2018

1:30 PM - 3:10 PM

Location: Conv. Ctr. Room 24A


Session Chair: [Edward S. Jimenez](#), Sandia National Labs. (United States)**Demonstration of a high resolution x-ray detector for medical imaging**

Paper 10763-11

Time: 1:30 PM - 1:50 PM

Author(s): Theodore F. Morse, Nicholas Mostovych, Brown Univ. (United States); Rajiv Gupta, Massachusetts General Hospital (United States); Timothy P. Murphy, Brown Univ. (United States), Lifespan Hospital (United States); Peter M. Weber, Brown Univ. (United States); Nerine J. Cherepy, Lawrence

Livermore National Lab. (United States); Bernhard W. Adams, Incom, Inc. (United States); Thomas G. Bifano, The Boston Univ. Photonics Ctr. (United States); Brian Stankus, Adil Akif, Angus I. Kingon, Brown Univ. (United States)

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**Bridgman-grown CsI:TI crystals codoped to suppress afterglow for high-throughput cargo inspection** *(Invited Paper)*

Paper 10763-12

Time: 1:50 PM - 2:20 PM

Author(s): Pijush Bhattacharya, Stuart R. Miller, Megan Wart, Charles Brecher, Vivek V. Nagarkar, Radiation Monitoring Devices, Inc. (United States)


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**Digital image capture for high-resolution medical x-ray diagnostics**

Paper 10763-13

Time: 2:20 PM - 2:40 PM

Author(s): Theodore F. Morse, Nicholas A. Mostovych, Brown Univ. (United States); Rajiv Gupta, Massachusetts General Hospital (United States), Harvard Univ. (United States); Timothy P. Murphy, Lifespan Hospital (United States), Brown Univ. (United States); Peter M. Weber, Brown Univ. (United States); Nerine J. Cherepy, Lawrence Livermore National Lab. (United States); Bernhard W. Adams, Incom, Inc. (United States); Thomas G. Bifano, The Boston Univ. Photonics Ctr. (United States); Brian Stankus, Adil Akif, Angus I. Kingon, Brown Univ. (United States)


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**Non-destructive examination of additive manufactured acetabular hip prosthesis cups** *(Invited Paper)*

Paper 10763-14

Time: 2:40 PM - 3:10 PM

Author(s): Nadia Kourra, Jason M. Warnett, Alex Attridge, The Univ. of Warwick (United Kingdom); Greg Dibling, James McLoughlin, Sarah Muirhead-Allwood, Corin Group (United Kingdom); Richard King, Univ. Hospitals Coventry and Warwickshire NHS Trust (United Kingdom); Mark A. Williams, The Univ. of Warwick (United Kingdom)

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**Coffee Break 3:10 PM - 3:40 PM**

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**Session 4:  
Medical Applications: Radiography/CT II**

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Wednesday 22 August 2018

3:40 PM - 5:10 PM

Location: Conv. Ctr. Room 24A

Session Chair: Neil Momsen, College of Optical Sciences, The Univ. of Arizona (United States)


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**Unsupervised learning methods to perform material identification tasks on spectral computed tomography data** *(Invited Paper)*

Paper 10763-15

Time: 3:40 PM - 4:10 PM

Author(s): Isabel O. Gallegos, Srivathsan Koundinyan, April Suknot, Edward S. Jimenez, Kyle R. Thompson, Ryan N. Goodner, Sandia National Labs. (United States)


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**Triple-energy high-count-rate x-ray computed tomography scanner using a cooled cadmium-telluride detector**

Paper 10763-16

Time: 4:10 PM - 4:30 PM

Author(s): Hodaka Moriyama, Toho Univ. (Japan); Eiichi Sato, Yasuyuki Oda, Yuichi Sato, Sohei Yoshida, Satoshi Yamaguchi, Iwate Medical Univ. (Japan); Osahiko Hagiwara, Hiroshi Matsukiyo, Toshiyuki Enomoto, Manabu Watanabe, Shinya Kusachi, Toho Univ. (Japan)

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**Development of a forward model for signal formation that includes K-x-ray fluorescence events in double-sided strip detectors (DSSDs)**  
**(Canceled)**

Paper 10763-17

Time: 4:30 PM - 4:50 PM


Author(s):

**Dual-energy high-count-rate x-ray computed tomography using a cerium-doped yttrium-aluminum-perovskite crystal and a photomultiplier tube**

Paper 10763-18

Time: 4:50 PM - 5:10 PM

Author(s): Eiichi Sato, Yasuyuki Oda, Sohei Yoshida, Satoshi Yamaguchi, Yuichi Sato, Iwate Medical Univ. (Japan); Hodaka Moriyama, Osahiko Hagiwara, Hiroshi Matsukiyo, Toshiyuki Enomoto, Manabu Watanabe, Shinya Kusachi, Toho Univ. (Japan)

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**Session PWed:  
Poster Session**

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Wednesday 22 August 2018

5:30 PM - 7:30 PM

Location: Conv. Ctr. Room 20C


Conference attendees are invited to view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines at <http://spie.org/OPPosterGuidelines>.

#### SEPAGE: a proton-ion-electron spectrometer for LMJ-PETAL

Paper 10763-33

Time: 5:30 PM - 7:30 PM

Author(s): Isabelle Lantuéjoul, Benjamin Vauzour, Alain Duval, Ludovic Lecherbourg, Bruno Marchet, Charles Reverdin, Bertrand Rossé, Christophe Rousseaux, CEA-DAM Ile-de-France (France); Jean-Christian Toussaint, Antoine Chancé, Didier Dubreuil, Bernard Gastineau, Jean-Christophe Guillard, Francis Harrault, Didier Leboeuf, Xavier Leboeuf, Denis Loiseau, Ange Lotode, Chhon Pes, CEA-Paris-Saclay (France); Guillaume Boutoux, Tony Caillaud, Francois Granet, Pierre Prunet, CEA-DAM-CESTA (France); Tiberio Ceccotti, CEA-Paris-Saclay (France); Julien Fuchs, LULI (France); Dimitri Batani, CELIA (France); Jean-Eric Ducret, CELIA (France), CEA-Paris-Saclay (France); Sébastien Hulin, CELIA (France), CEA-DAM-CESTA (France); Katarzyna Jakubowska, Nesrine Rabhi, Didier Raffestin, CELIA (France); Laurent Sérani, CENBG (France)

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THURSDAY 23 AUGUST

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## Session 5: ICF Diagnostics: Fast X-Ray Imaging

Thursday 23 August 2018

8:30 AM - 10:20 AM

Location: Conv. Ctr. Room 24A


Session Chair: [Arthur C. Carpenter](#), Lawrence Livermore National Lab. (United States)

#### Late-time radiography at the National Ignition Facility using the Crystal Backlighter Imager (CBI) *(Invited Paper)*

Paper 10763-19

Time: 8:30 AM - 9:00 AM

Author(s): Nathaniel Thompson, Gareth Hall, Marion Ayers, Justin Buscho, Edwin Casco, Jeremy Dixon, Robin Hibbard, Daniel Kalantar, Thomas Kohut, Lawrence Livermore National Lab. (United States); Christine Krauland, General Atomics (United States); Roger Lowe-Webb, Thomas McCarville, Kenneth Piston, Cal Smith, Lawrence Livermore National Lab. (United States)


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#### Performance characterization of a four-frame nanosecond gated hybrid CMOS image sensor

Paper 10763-20

Time: 9:00 AM - 9:20 AM

Author(s): Emily R. Hurd, Arthur C. Carpenter, Matthew S. Dayton, Cassandra E. Durand, Sabrina R. Nagel, Lawrence Livermore National Lab. (United States); Kyle Engelhorn, General Atomics (United States); Laim D. Claus, Marcos O. Sanchez, Sandia National Labs. (United States)


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#### Design and characterization of a novel 1-ns multi-frame imager for the Ultra-Fast X-ray Imager (UXI) program at Sandia National Laboratories

Paper 10763-21

Time: 9:20 AM - 9:40 AM

Author(s): Liam D. Claus, Alexis Boone, Troy England, Lu Fang, Quinn Looker, Brandon Mitchell, Andrew Montoya, John L. Porter, Marcos O. Sanchez, Amando J. Vigil, Sandia National Labs. (United States); Emily R. Hurd, Arthur C. Carpenter, Matthew S. Dayton, Cassandra E. Durrand, Lawrence Livermore National Lab. (United States); Gregory Rochau, Sandia National Labs. (United States)


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#### Design of radiation tolerant FPGAs for the LLNL nanosecond gated CMOS camera program

Paper 10763-22

Time: 9:40 AM - 10:00 AM

Author(s): Chris Macaraeg, Matthew S. Dayton, Brad Funsten, Arthur C. Carpenter, Lawrence Livermore National Lab. (United States)


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#### Pixel-level characterization of a multi-frame nanosecond-gated CMOS camera using a short-pulse x-ray source (the COMET laser)

Paper 10763-23

Time: 10:00 AM - 10:20 AM

Author(s): Nathan E. Palmer, Hui Chen, Pratik B. Patel, Matthew S. Dayton, Arthur C. Carpenter, Sabrina R. Nagel, Jaebum Park, Lawrence Livermore National Lab. (United States)

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Coffee Break 10:20 AM - 10:50 AM

## Session 6: ICF Diagnostics: Neutron, Gamma, and Other

Thursday 23 August 2018

10:50 AM - 12:20 PM

Location: Conv. Ctr. Room 24A


Session Chair: Jeffrey A. Koch, National Security Technologies, LLC (United States)

**Lens design challenges for scintillator-based neutron imaging** *(Invited Paper)*

Paper 10763-24

Time: 10:50 AM - 11:20 AM


Author(s): Verena Geppert-Kleinrath, Landon Tafoya, Christopher Danly, Valerie Faterley, Emily Mendoza, Jacquelynne Vaughan, Carl A. Wilde, Petr L. Volegov, Los Alamos National Lab. (United States)

[Add To My Schedule](#) **Evolution of the neutron imaging aperture**

Paper 10763-25

Time: 11:20 AM - 11:40 AM


Author(s): Valerie E. Faterley, Los Alamos National Lab. (United States); David N. Fittinghoff, Lawrence Livermore National Lab. (United States); Verena Geppert-Kleinrath, Los Alamos National Lab. (United States); Gary P. Grim, Lawrence Livermore National Lab. (United States); H. J. Jorgenson, John A. Oertel, Derek W. Schmidt, Petr L. Volegov, Carl A. Wilde, Los Alamos National Lab. (United States)

[Add To My Schedule](#) **Recommendations and lessons learned from testing a prototype gamma-ray imaging diagnostic system for NIF**

Paper 10763-26

Time: 11:40 AM - 12:00 PM


Author(s): Daniel A. Lemieux, College of Optical Sciences, The Univ. of Arizona (United States); Gary P. Grim, Lawrence Livermore National Lab. (United States); H. Bradford Barber, The Univ. of Arizona (United States)

[Add To My Schedule](#) **Debris studies for high-repetition rate and high-power laser experiments at the Central Laser Facility**

Paper 10763-27

Time: 12:00 PM - 12:20 PM

Author(s): Nicola Booth, Sam Astbury, Elliot Bryce, Robert J. Clarke, Christopher D. Gregory, James Green, David Haddock, Robert I. Heathcote, Christopher Spindloe, Central Laser Facility, STFC Rutherford Appleton Lab. (United Kingdom)

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**Lunch/Exhibition Break 12:20 PM - 1:50 PM**

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**Session 7:  
ICF Diagnostics: Instrumentation**

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Thursday 23 August 2018

1:50 PM - 3:20 PM

Location: Conv. Ctr. Room 24A

Session Chair: Valerie E. Faterley, Los Alamos National Lab. (United States)


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**X-ray doppler velocimetry at the Sandia Z-Beamlet facility** *(Invited Paper)*

Paper 10763-30

Time: 1:50 PM - 2:20 PM


Author(s): Jeffrey A. Koch, James King, Eric Huffman, Richard Freeman, Nevada National Security Site (United States); Eric Harding, Greg Rochau, Marius Schollmeier, John Porter, Sandia National Laboratory (United States)

[Add To My Schedule](#) **Coded aperture x-ray imaging of high power laser-plasma interactions on the Vulcan Laser System**

Paper 10763-29

Time: 2:20 PM - 2:40 PM

Author(s): Robert I. Heathcote, Asha Anderson-Asubonteng, Robert J. Clarke, Matthew P. Selwood, Christopher Spindloe, Nicola Booth, STFC Rutherford Appleton Lab. (United Kingdom)

[Add To My Schedule](#) **Determination of magnetic field strengths in laser ablation z-pinch plasmas via Zeeman-Induced Magnetic Splitting (ZIMS) streaked optical spectroscopy****(Canceled)**

Paper 10763-31

Time: 2:40 PM - 3:00 PM

Author(s):

**Capacitor transient effects in a high-dose-rate environment**

Paper 10763-32

Time: 3:00 PM - 3:20 PM

Author(s): Matthew S. Dayton, Arthur C. Carpenter, Mai Beach, Travis Ruiz, Perry Bell, Lawrence Livermore National Lab. (United States)

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