

## Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensing XIX

Monday - Thursday 16 - 19 April 2018

### Conference Sessions At A Glance

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- 1: Keynote Session
- 2: Advances in Chemical Threat Sensing I
- 2: Advanced in Chemical Threat Sensing II
- 4: Radiological, Nuclear Sensing
- 5: Biological Threat Detection
- 6: Explosive Detection
- 7: Photonic Integrated Circuit Threat Sensing I
- 8: Vapor, Aerosol Detection
- 9: Photonic Integrated Circuit Threat Sensing II
- Posters-Tuesday
- 10: CBE Threat Signature Modeling and Algorithm Advancements

### Important Dates

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Abstract Due:  
9 October 2017

Author Notification:  
11 December 2017  
Notifications will be sent no later than 12/15/17

Manuscript Due Date:  
21 March 2018

### Conference Committee

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#### Conference Chairs

[Jason A. Guicheteau](#), U.S. Army Edgewood Chemical Biological Ctr. (United States)

[Augustus Way Fountain](#), U.S. Army Edgewood Chemical Biological Ctr. (United States)

[Chris R. Howle](#), Defence Science and Technology Lab. (United Kingdom)

#### Program Committee

Russell G. Bartholomew, U.S. Army Edgewood Chemical Biological Ctr. (United States)

[Christopher C. Carter](#), Johns Hopkins Univ. Applied Physics Lab. (United States)

#### Program Committee continued...

[Darren K. Emge](#), U.S. Army Edgewood Chemical Biological Ctr. (United States)

Anthony Esposito, Defense Threat Reduction Agency (United States)

[Timothy J. Johnson](#), Pacific Northwest National Lab. (United States)

Aaron LaPointe, U.S. Army RDECOM CERDEC NVESD (United States)

[Paul M. Pellegrino](#), U.S. Army Research Lab. (United States)

#### MONDAY 16 APRIL

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### Session 1: Keynote Session

Monday 16 April 2018  
8:00 AM - 8:30 AM  
Location: Ballroom Level, Sun 4


Session Chair: [Jason A. Guicheteau](#), U.S. Army Edgewood Chemical Biological Ctr. (United States)

#### First results of a QCL-OPA based standoff system, for detecting hazardous substances in the IR-fingerprint domain (*Invited Paper*)

Paper 10629-1

Time: 8:00 AM - 8:30 AM

Author(s): Frank Wilsenack, Arne Lorenzen, Wehrwissenschaftliches Institut für Schutztechnologien (Germany); François Brygo, Cédric Awanzino, Bertin Technologies (France); François Guty, Arnaud Grisard, Christian Larat, Dominique Papillon, Muriel Schwarz, Eric Lallier, Thales Research & Technology (France); Hans Dieter Tholl, Franz Münzhuber, Diehl Defence GmbH & Co. KG (Germany); Jürgen Kunz, Diehl BGT Defence GmbH & Co. KG (Germany); Michael Raab, Marcel Rattunde, Stefan Hugger, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany); Mariusz Kastek, Tadeusz Piatkowski, Wojskowa Akademia Techniczna im. Jarosława Dąbrowskiego (Poland)

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### Session 2: Advances in Chemical Threat Sensing I

Monday 16 April 2018  
8:30 AM - 10:10 AM  
Location: Ballroom Level, Sun 4

Session Chair: [Jason A. Guicheteau](#), U.S. Army Edgewood Chemical Biological Ctr. (United States)

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**Using infrared spectroscopy in the design of new sorbent materials for detection of chemical warfare agents**

Paper 10629-2

Time: 8:30 AM - 8:50 AM

Author(s): Michael R. Papantonakis, Courtney A. Roberts, U.S. Naval Research Lab. (United States); Tyler G. Grissom, Oak Ridge Institute for Science and Education (United States); Andrew Kusterbeck, Nova Research, Inc. (United States); Viet K. Nguyen, Robert Furstenberg, R. Andrew McGill, U.S. Naval Research Lab. (United States)


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**Detection and identification of chemical warfare agents using mid wave infrared active hyperspectral imaging**

Paper 10629-3

Time: 8:50 AM - 9:10 AM

Author(s): Keith Ruxton, Robin Head, M Squared Lasers Ltd. (United Kingdom); Rhea J. Clewes, Defence Science and Technology Lab. (United Kingdom); Sarah Marchant, Defence Science and Technology Laboratory (United Kingdom); Nils Hempler, Graeme P. A. Malcolm, Gareth T. Maker, M Squared Lasers Ltd. (United Kingdom)


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**Threat detection using a standoff, wide-area hyperspectral Raman imaging sensor**

Paper 10629-4

Time: 9:10 AM - 9:30 AM

Author(s): Nathaniel R. Gomer, Nirmal Lamsal, Haiyin Sun, Matthew P. Nelson, ChemImage Corp. (United States)


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**Photonic micro-gas-chromatography detection of chemical threat agents**

Paper 10629-5

Time: 9:30 AM - 9:50 AM

Author(s): Robert Furstenberg, U.S. Naval Research Lab. (United States); Christopher J. Breshike, American Society for Engineering Education (United States); Benjamin Andrews, Andrew Kusterbeck, Dawn Dominguez, Nova Research, Inc. (United States); Christopher A. Kendziora, R. Andrew McGill, Todd Stievater, Dmitry Kozak, U.S. Naval Research Lab. (United States)


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**UV Raman imaging of surface contaminants using tunable laser and narrow bandpass filters**

Paper 10629-6

Time: 9:50 AM - 10:10 AM

Author(s): Lars Landström, Fredrik Kullander, Hampus Lundén, Pär Wästerby, FOI-Swedish Defence Research Agency (Sweden)

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**Coffee Break 10:10 AM - 10:40 AM**

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## Session 2: Advanced in Chemical Threat Sensing II

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Monday 16 April 2018

10:40 AM - 12:00 PM

Location: Ballroom Level, Sun 4

Session Chair: [Christopher R. Howle](#), Defence Science and Technology Lab. (United Kingdom)


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**A portable standoff spectrometer for chemical warfare agent identification using integrated monolithic quantum cascade laser arrays from 6.5-11 microns**

Paper 10629-7

Time: 10:40 AM - 11:00 AM

Author(s): Mark F. Witinski, Pendar Technologies (United States)


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**High-speed and large-area scanning of surfaces for trace chemicals using wavelength-tunable quantum cascade lasers**

Paper 10629-8

Time: 11:00 AM - 11:20 AM

Author(s): David B. Kelley, Derek A. Wood, Anish K. Goyal, Petros Kotidis, Block Engineering, Inc. (United States)


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**Enabling standoff detection of hazardous materials using a fiber optic coupled quantum cascade infrared laser system**

Paper 10629-9

Time: 11:20 AM - 11:40 AM

Author(s): Kenneth J. Ewing, Kevin J. Major, Jasbinder S. Sanghera, Rafael R. Gattass, L. Brandon Shaw, Lynda Busse, U.S. Naval Research Lab. (United States); David Amone, Enrique Lopez, Michael Pushkarsky, Justin Kane, DRS Daylight Solutions (United States); Rhea J. Clewes, Linda Lee, Chris Howle, Defence Science and Technology Lab. (United Kingdom)


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**Development of a compact airborne threat analyzer integrating quantum cascade laser arrays and quartz-enhanced photoacoustic spectroscopy**

Paper 10629-10

Time: 11:40 AM - 12:00 PM

Author(s): Romain Blanchard, Brandt Pein, Mark F. Witinski, Christian Pfluegl, Daryoosh Vakhshoori, Pendar Technologies (United States)

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**Lunch Break 12:00 PM - 1:30 PM**

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## Session 4: Radiological, Nuclear Sensing

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Monday 16 April 2018

1:30 PM - 3:10 PM

Location: Ballroom Level, Sun 4

Session Chair: [Timothy J. Johnson](#), Pacific Northwest National Lab. (United States)


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### UAV-based LiDAR and gamma probe with real-time data processing and downlink for survey of nuclear disaster locations

Paper 10629-11

Time: 1:30 PM - 1:50 PM

Author(s): Thomas Hinterhofer, Martin Pfennigbauer, Andreas Ullrich, RIEGL Laser Measurement Systems GmbH (Austria); Dieter Rothbacher, CBRN Protection GmbH (Austria); Stephan Schraml, Michael Hofstätter, AIT Austrian Institute of Technology GmbH (Austria)


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### Effect of additives: organic-metal oxide nanocomposites for $\gamma$ -ray sensors

Paper 10629-12

Time: 1:50 PM - 2:10 PM

Author(s): Narsingh Bahadur Singh, Univ. of Maryland, Baltimore County (United States); Ching Hua Su, NASA Marshall Space Flight Ctr. (United States); Bradley Arnold, Fow-Sen Choa, Univ. of Maryland, Baltimore County (United States); Christopher Cooper, Stacey Sova, Puneet Gill, Vishal Dayal, Lisa Kelly, Univ. of Maryland (United States); Narasimha Prasad, NASA Langley Research Center (India); Paul Smith, Brian Cullum, Univ. of Maryland (United States)


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### Radiation induced defects in high-Z shielded Ytterbium doped fibers

Paper 10629-13

Time: 2:10 PM - 2:30 PM

Author(s): Diana Cruz, Samuel D. Butler, Air Force Institute of Technology (United States); Briana J. Singleton, Asian Office of Aerospace Research and Development (Japan)


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### Development of the Virtual Source Training Toolkit for physically accurate simulation of the response of handheld radiation detectors

Paper 10629-14

Time: 2:30 PM - 2:50 PM

Author(s): John A. Wright, Physical Sciences Inc (United States); Kirill N. Shokhirev, Eric N. Rapoport, Daniel B. Brown, Bogdan R. Cosofret, Physical Sciences Inc. (United States)

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### Characterization of uranium ore concentrate chemical composition via Raman spectroscopy

Paper 10629-15

Time: 2:50 PM - 3:10 PM

Author(s): Yin-Fong Su, Russ G. Tonkyn, Lucas E. Sweet, Jordan F. Corbey, Samuel A. Bryan, Timothy J. Johnson, Pacific Northwest National Lab. (United States)

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

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## Session 5: Biological Threat Detection

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Monday 16 April 2018

3:40 PM - 4:40 PM

Location: Ballroom Level, Sun 4

Session Chair: Russell G. Bartholomew, U.S. Army Edgewood Chemical Biological Ctr. (United States)


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### Advancements in MOF characterization for enhanced MALDI sensing

Paper 10629-16

Time: 3:40 PM - 4:00 PM

Author(s): Rabih Jabbour, Ashish Tripathi, Erik D. Emmons, Phillip G. Wilcox, Jason A. Guicheteau, Gregory Peterson, Jared Decoste, U.S. Army Edgewood Chemical Biological Ctr. (United States)

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### Grating coupled-surface plasmon resonance and fluorescent plasmonics biosensor for diagnosis of Lyme disease

Paper 10629-17

Time: 4:00 PM - 4:20 PM

Author(s): Eunice Chou, SUNY Polytechnic Institute (United States); Gabriel Zenteno, Univ. at Albany (United States); Benjamin Taubner, Wadsworth Ctr.

(United States); Arturo Pilar, Ernest Guignon, William Page, Ciencia, Inc. (United States); Yi-Pin Lin, Wadsworth Ctr. (United States); Nathaniel Cady, SUNY Polytechnic Institute (United States)


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#### Rapid optical detection and classification of microbes in suspicious powders

Paper 10629-18

Time: 4:20 PM - 4:40 PM

Author(s): William F. Hug, Photon Systems, Inc. (United States); Rohit Bhartia, Jet Propulsion Lab. (United States); Kripa K. Sijapati, Quoc Nguyen, Prashant Oswal, Ray D. Reid, Photon Systems, Inc. (United States)

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**TUESDAY 17 APRIL**

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## Session 6: Explosive Detection

Tuesday 17 April 2018

8:00 AM - 10:00 AM

Location: Ballroom Level, Captiva 2

Session Chair: Aaron LaPointe, U.S. Army Night Vision & Electronic Sensors Directorate (United States)


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#### Recent development of UV Raman standoff explosive detection systems for near trace detection

Paper 10629-19

Time: 8:00 AM - 8:20 AM

Author(s): Robert D. Waterbury, Robert Babnick, Thuyanh Conghuyentonn, Hunter Hardy, Tim Molner, Darius Vunck, Alakai Defense Systems, Inc. (United States)


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#### Persistence of explosive particles in various environmental conditions

Paper 10629-20

Time: 8:20 AM - 8:40 AM

Author(s): Michael R. Papantonakis, Viet K. Nguyen, Robert Furstenberg, U.S. Naval Research Lab. (United States); Tyler G. Grissom, Oak Ridge Institute for Science and Education (United States); Andrew Kusterbeck, Nova Research, Inc. (United States); Christopher A. Kendziora, R. Andrew McGill, U.S. Naval Research Lab. (United States)


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#### Comparison of handheld Raman sensors through opaque containers

Paper 10629-21

Time: 8:40 AM - 9:00 AM

Author(s): Phillip G. Wilcox, Jason A. Guicheteau, U.S. Army Edgewood Chemical Biological Ctr. (United States)


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#### Using infrared backscatter imaging spectroscopy to detect trace explosives at standoff distances

Paper 10629-22

Time: 9:00 AM - 9:20 AM

Author(s): Christopher J. Breshike, American Society for Engineering Education (United States); Christopher A. Kendziora, Robert Furstenberg, Viet Nguyen, U.S. Naval Research Lab. (United States); Andrew Kusterbeck, Nova Research, Inc. (United States); R. Andrew McGill, U.S. Naval Research Lab. (United States)

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#### Mobile real-time quantum cascade spectrometer for defense and security (Canceled)

Paper 10629-23

Time: 9:20 AM - 9:40 AM


Author(s):

#### High-confidence discrimination of explosive materials on surfaces using a non-spectroscopic optical biomimetic sensing method

Paper 10629-24

Time: 9:40 AM - 10:00 AM

Author(s): Kevin J. Major, Kenneth J. Ewing, Jasbinder S. Sanghera, U.S. Naval Research Lab. (United States); Thomas C. Hutchens, Menelaos K. Poutous, Matthew Potter, Christopher Wilson, The Univ. of North Carolina at Charlotte (United States); Ishwar D. Aggarwal, The Univ. of North Carolina at Charlotte (United States), Sotera Defense Solutions, Inc. (United States); Mikella E. Farrell, Ellen L. Holthoff, Paul M. Pellegrino, U.S. Army Research Laboratory, RDRL-SEE-E (United States)

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**Coffee Break and Dedicated Exhibition Time 10:00 AM - 11:00 AM**

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## Session 7: Photonic Integrated Circuit Threat Sensing I


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Tuesday 17 April 2018  
11:00 AM - 11:40 AM  
Location: Ballroom Level, Captiva 2


Session Chair: [Paul M. Pellegrino](#), U.S. Army Research Lab. (United States)

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#### Enhanced whispering gallery mode sensors

Paper 10629-25  
Time: 11:00 AM - 11:20 AM  
Author(s): Cheng Li, Mohammad Teimourpour, Euan McLeod, Judith Su, The Univ. of Arizona (United States)  
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#### Whispering-gallery microresonators for sensing technologies

Paper 10629-26  
Time: 11:20 AM - 11:40 AM  
Author(s): Xuefeng Jiang, Abraham J. Qavi, Lan Yang, Washington Univ. in St. Louis (United States)  
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### Lunch/Exhibition Break 11:40 AM - 1:10 PM

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## Session 8: Vapor, Aerosol Detection


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Tuesday 17 April 2018  
1:10 PM - 3:10 PM  
Location: Ballroom Level, Captiva 2


Session Chair: Anthony Esposito, Defense Threat Reduction Agency (United States)

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#### Remote sensing of chlorine using UV lidar at U.S. Army Dugway Proving Ground

Paper 10629-27  
Time: 1:10 PM - 1:30 PM  
Author(s): James T. Pearson, George W. Lemire, William L. Brown, R. James Berry, U.S. Army Dugway Proving Ground (United States); Joshua P. Herron, Space Dynamics Lab. (United States)  
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#### Four-wavelength lidar for in-situ speciation of aerosols

Paper 10629-28  
Time: 1:30 PM - 1:50 PM  
Author(s): Michael Wojcik, Alan Bird, Jason Wooden, Jim Peterson, Morgan Davidson, Monte Frandsen, Space Dynamics Lab. (United States)  
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#### Development and calibration of an eye-safe elastic backscatter lidar for chemical and biological aerosol tracking

Paper 10629-29  
Time: 1:50 PM - 2:10 PM  
Author(s): Joshua P. Herron, Utah State Univ. (United States); Michael Wojcik, Space Dynamics Lab. (United States); George W. Lemire, William L. Brown, U.S. Army Dugway Proving Ground (United States); Kori D. Moore, Space Dynamics Lab. (United States)  
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#### Optical parametric oscillator-based trace detection of gases in the mid-infrared region using phase-fluctuation optical heterodyne spectroscopy

Paper 10629-30  
Time: 2:10 PM - 2:30 PM  
Author(s): Jack Thomas, Adam Polak, Gerald Bonner, Fraunhofer Ctr. for Applied Photonics (United Kingdom); Sandra Enderle, Hochschule Aalen (Germany); Malcolm Dunn, Univ. of St. Andrews (United Kingdom); David J. M. Stothard, Fraunhofer Ctr. for Applied Photonics (United Kingdom)  
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#### Regional sensing with an open-path dual comb spectroscopy and a UAS (Conference Presentation)

Paper 10629-31  
Time: 2:30 PM - 2:50 PM  
Author(s): Ian Coddington, Kevin Cossel, Eleanor Waxman, Fabrizio R. Giorgetta, Esther Baumann, National Institute of Standards and Technology (United States); Robert Wright, Sean Coburn, Daniel Hesselius, Univ. of Colorado Boulder (United States); Michael Cermak, Eli Hoenig, National Institute of Standards and Technology (United States); Gregory Rieker, Univ. of Colorado Boulder (United States); Nathan R. Newbury, National Institute of Standards and Technology (United States)  
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#### Detecting unknown chemical clouds at distance with multispectral imagery

Paper 10629-32  
Time: 2:50 PM - 3:10 PM  
Author(s): Le Brun Gay, Aymeric Alazarine, Sylvain Favier, Bertin Technologies (France); Sébastien Blanchard, Bertin Corp. (United States)  
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### Coffee Break 3:10 PM - 3:40 PM

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## Session 9: Photonic Integrated Circuit Threat Sensing II

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Tuesday 17 April 2018

3:40 PM - 5:00 PM

Location: Ballroom Level, Captiva 2

Session Chair: [Paul M. Pellegrino](#), U.S. Army Research Lab. (United States)


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### Localization and quantification of trace-gas fugitive emissions using a portable optical spectrometer

Paper 10629-33

Time: 3:40 PM - 4:00 PM

Author(s): Eric Zhang, IBM Thomas J. Watson Research Ctr. (United States); Cheyenne C. Teng, Princeton Univ. (United States); Theodore G. van Kessel, Levente Klein, Ramachandran Muralidhar, Chi Xiong, Yves Martin, Jason S. Orcutt, Marwan Khater, Laurent Schares, Tymon Barwicz, Nathan Marchack, Swetha Kamlapurkar, Sebastian U. Engelmann, IBM Thomas J. Watson Research Ctr. (United States); Gerard Wysocki, Princeton Univ. (United States); Norma Sosa, William M. J. Green, IBM Thomas J. Watson Research Ctr. (United States)


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### Design, manufacture, and testing of a silicon nitride ring resonator-based biosensing platform

Paper 10629-34

Time: 4:00 PM - 4:20 PM

Author(s): Michael R. Bryan, Daniel J. Steiner, John C. Cagnetti, Benjamin L. Miller, Univ. of Rochester Medical Ctr. (United States)


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### Fish-bone subwavelength grating waveguide photonic integrated circuit sensor array

Paper 10629-35

Time: 4:20 PM - 4:40 PM

Author(s): Justin R. Bickford, Pak Cho, Mikella Farrell, Ellen Holthoff, U.S. Army Research Lab. (United States)


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### Real-time gas analysis using mid-infrared microcavities

Paper 10629-36

Time: 4:40 PM - 5:00 PM

Author(s): Tiening Jin, Junchao Zhou, Pao Lin, Texas A&M Univ. (United States)

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## Session PS1: Posters-Tuesday

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Tuesday 17 April 2018

6:00 PM - 8:00 PM

Location: Ballroom Level, Osceola Ballroom C

All symposium attendees – You are invited to attend the evening Interactive Poster Session to view the high-quality posters and engage the authors in discussion. Enjoy light refreshments while networking with colleagues in your field. Authors may set up their posters between 10:00 am and 5:00 pm the day of their poster session. Special daytime previewing prior to the session from 10:00 am to 5:00 pm. Attendees are required to wear their conference registration badges to access the Osceola Ballroom to view the posters.

Posters that are not set up by the 5:00 pm cut-off time will be considered no-shows, and their manuscripts may not be published. Poster authors should accompany their posters from 6:00 to 8:00 pm to answer questions from attendees. All posters and other materials must be removed no later than 8:30 pm. Any posters or materials left behind at the close of the poster session will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.


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### Multi-heterodyne hyperspectral imaging for chemical identification

Paper 10629-47

Time: 6:00 PM - 8:00 PM

Author(s): Jonas Westberg, Lukasz Sterczewski, Gerard Wysocki, Princeton Univ. (United States)


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### Coherent dual-comb spectroscopy of broad absorbers in the mid infrared

Paper 10629-48

Time: 6:00 PM - 8:00 PM

Author(s): Fabrizio R. Giorgetta, Gabriel Ycas, Esther Baumann, Ian Coddington, Daniel Herman, Scott A. Diddams, Nathan R. Newbury, National Institute of Standards and Technology (United States)


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### Enhanced photoacoustic spectroscopy sensitivity through intra-cavity OPO excitation

Paper 10629-49

Time: 6:00 PM - 8:00 PM

Author(s): Adam Polak, David J. M. Stothard, Fraunhofer Ctr. for Applied Photonics (United Kingdom)

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**Fiber-based chemical sensing and sensing platforms with colorimetric dyes**

Paper 10629-50

Time: 6:00 PM - 8:00 PM

Author(s): Richard Kingsborough, MIT Lincoln Lab. (United States); Stephen Giardini, U.S. Army Natick Soldier Research, Development and Engineering Ctr. (United States); Do-Joong Lee, Jin Ho Kim, Keegan Quigley, Brown Univ. (United States); Alexander Stolyarov, Lauren Cantley, Shane Tysk, MIT Lincoln Lab. (United States); Conor Hennessy, U.S. Army Natick Soldier Research, Development and Engineering Ctr. (United States); Mordechai Rothschild, MIT Lincoln Lab. (United States); Rachel Odessey, Jimmy Xu, Brown Univ. (United States); Richard M. Osgood, U.S. Army Natick Soldier Research, Development and Engineering Ctr. (United States)


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**Near-field infrasound classification of rocket launch signatures**

Paper 10629-51

Time: 6:00 PM - 8:00 PM

Author(s): Kaleb Smith, Mitchell Solomon, Kaylen J. Bryan, Anthony O. Smith, Adrian M. Peter, Florida Institute of Technology (United States)

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**Thermal bioaerosol cloud tracking with Bayesian classification: advanced capability demonstration**

Paper 10629-53

Time: 6:00 PM - 8:00 PM

Author(s): Christian W. Smith, Julia R. Dupuis, Connor Greene, William J. Marinelli, Physical Sciences Inc. (United States)


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**Molecular explosives detection using Tarkka TOF: Investigations of the potential to detect explosives objects**

Paper 10629-54

Time: 6:00 PM - 8:00 PM

Author(s): H.J. Jost, Karsa Ltd (Finland); Jani Hakala, Aleksei Shcherbinin, Jyri Mikkilä, Verner Hemmilä, Oskari Kausiala, Karsa Ltd. (Finland)

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**WEDNESDAY 18 APRIL**[Show All Abstracts](#)

## Session 10: CBE Threat Signature Modeling and Algorithm Advancements

Wednesday 18 April 2018

8:00 AM - 10:40 AM

Location: Ballroom Level, Captiva 2

Session Chair: [Darren K. Emge](#), U.S. Army Edgewood Chemical Biological Ctr. (United States)

**Accurate measurement of the optical constants for modeling organic and organophosphorous liquid layers and drops**

Paper 10629-41

Time: 8:00 AM - 8:20 AM

Author(s): Tanya L. Myers, Russell G. Tonkyn, Tyler O. Danby, Brent M. De Vetter, Bruce E. Bernacki, Matthew S. Taubman, Timothy J. Johnson, Pacific Northwest National Lab. (United States)


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**Simulating ATR spectra for detecting nerve agent-sorbent binding**

Paper 10629-38

Time: 8:20 AM - 8:40 AM

Author(s): Michael R. Papantonakis, Courtney A. Roberts, U.S. Naval Research Lab. (United States); Andrew Shabaev, George Mason Univ. (United States); Youngchan Kim, R. Andrew McGill, Christopher A. Kendziora, Robert Furstenberg, Samuel G. Lambrakos, U.S. Naval Research Lab. (United States)


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**On constructing surface-distributed-scatterer ensembles for analysis of deposited-explosive-particle diffuse-reflectance spectra**

Paper 10629-39

Time: 8:40 AM - 9:00 AM

Author(s): Robert Furstenberg, Christopher A. Kendziora, U.S. Naval Research Lab. (United States); Andrew Shabaev, George Mason Univ. (United States); Youngchan Kim, R. Andrew McGill, Samuel G. Lambrakos, U.S. Naval Research Lab. (United States)


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**Mid-infrared reflection signatures for trace chemicals on surfaces**

Paper 10629-40

Time: 9:00 AM - 9:20 AM

Author(s): Derek A. Wood, Block Engineering, Inc. (United States); David Kelley, Anish Goyal, Petros Kotidis, Block Engineering (United States)


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**Modeling liquid organic thin films on substrates**

Paper 10629-37

Time: 9:20 AM - 9:40 AM

Author(s): Bruce E. Bernacki, Timothy J. Johnson, Tanya L. Myers, Thomas A. Blake, Pacific Northwest National Lab. (United States)


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**Infrasound threat classification: a statistical comparison of deep learning architectures**

Paper 10629-42

Time: 9:40 AM - 10:00 AM

Author(s): Mitchell Solomon, Kaylen Bryan, Kaleb Smith, Florida Institute of Technology (United States); Dean A. Clauter, Air Force Technical Applications Ctr. (United States); Anthony O. Smith, Adrian M. Peter, Florida Institute of Technology (United States)


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**Deep wavelet scattering features for infrasonic threat identification**

Paper 10629-43

Time: 10:00 AM - 10:20 AM

Author(s): Kaylen J. Bryan, Kaleb E. Smith, Mitchell Solomon, Florida Institute of Technology (United States); Dean A. Clauter, Air Force Technical Applications Ctr. (United States); Anthony O. Smith, Adrian M. Peter, Florida Institute of Technology (United States)

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**Active standoff chemical identification detector**

Paper 10629-44

Time: 10:20 AM - 10:40 AM

Author(s): Jay P. Giblin, Julia R. Dupuis, John Dixon, Joel Hensley, David J. Mansur, William J. Marinelli, Physical Sciences Inc. (United States)

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