

Sandia National Laboratories

CLEO 2019

Invited Talks

A&T Topical Review on Flat Optics I

Optical Power Limiters Based on Intersub-band Polaritonic Metasurfaces (AM3K.5)

6 May 2019

3:00PM

Meeting Room 212 A/B

Authors: Nishant Nookala¹, Sander Mann², Ahmed Mekkaoui², John F. Klem³, Igal Brenner³, Andrea Alu², Mikhail A. Belkin¹

1. Univ. of Texas at Austin (U.S.) 2. Advances Science Research Center, City Univ. of New York (U.S.) 3. Sandia National Labs (U.S.)

Symposium on Intense-Field Nonlinear Optics & High Harmonic Generation in Nanoscale Material I

Extreme Nonlinear Optics With Dielectric Metasurfaces (JTU3M.1)

7 May 2019

1:00PM

Marriott Salon I & II

Author: Igal Brener, Sandia National Labs (U.S.)

Presentations

Nonlinear Nano-Optics

Tailoring Second Harmonic Diffraction in GaAs Metasurfaces via Crystal Orientation (FM2C.3)

6 May 2019 11:00AM Executive Ballroom 210C

Authors: Polina Vabishchevich^{1,2}, Aleksandr Vaskin³, Sadhvikas Addamane⁴, Sheng Liu^{1,2}, Andrei P. Sharma⁴, Ganesh Balakrishnan⁴, John Reno^{1,2}, Gordon Keeler¹, Michael B. Sinclair¹, Isabelle Staude³, Igal Brener^{1,2}

1. Sandia National Labs (U.S.) 2. Center for Integrated Nanotechnologies (U.S.) 3. Inst. of Applied Physics, Abbe Center of Photonics, Friedrich Schiller Univ. Jena, Germany; 4. Center for High Technology Materials (CHTM), Univ. of New Mexico (U.S.)

Ultrafast Coherent Spectroscopy

Revealing the Orientation Dependence of Coherent Coupling in Silicon-Vacancy Centers in Diamond (FM3D.1)

6 May 2019 11:00AM Executive Ballroom 210D

Authors: Matthew W. Day¹, Kelsey Bates¹, Christopher L. Smallwood^{3,2}, Ronald Ulbricht^{4,2}, Travis Autry^{5,2}, Rachel C. Owen¹, Geoffrey M. Diederich⁶, Tim Schröder⁷, Edward S. Bielejec⁸, Mark Siemens⁶, Steven Cundiff^{1,2}

1. Physics, Univ. of Michigan (U.S.) 2. JILA, (U.S.) 3. Physics and Astronomy, San Jose State Univ. (U.S.) 4. Physics and Astronomy, Nanyang Technological Univ., Singapore 5. NIST, (U.S.) 6. Physics and Astronomy, Univ. of Denver, (U.S.) 7. Physics, Humboldt Univ. of Berlin, (Germany) 8. Sandia National Labs, (U.S.)

Terahertz Spectroscopy

Ultrafast Time-Domain Spectrometer in the 25 T Split Florida-Helix Magnet (STu4F.1)

7 May 2019 5:00PM Executive Ballroom 210F

Authors: Ashlyn D. Burch¹, Jeremy A. Curtis¹, Biplob Barman¹, A. G. Linn¹, Luke M. McLintock¹, Aidan L. O'Beirne¹, Matthew J. Stiles¹, John Reno², Stephen A. Mc-Gill³, Denis Karaickaj⁴, David J. Hilton¹

1. Univ. of Alabama at Birmingham (U.S.) 2. Center for Integrated Nanotechnologies, Sandia National Labs (U.S.) 3. National High Magnetic Field Lab (U.S.) 4. Physics, Univ. of South Florida (U.S.)

Thermal Photonics

High-Temperature Refractory Metasurfaces for Solar Thermophotovoltaic Energy Harvesting (FTu4D.2)

7 May 2019 5:15PM Executive Ballroom 210D

Authors: Chun-Chieh Chang^{1,2}, Wilton J. Kort-Kamp^{3,4}, John Nogan⁵, Ting S. Luk⁶, Abul Azad¹, Antoinette Taylor⁶, Diego A. Dalvit¹, Milan Sykora⁷, Hou-Tong Chen¹

1. Center for Integrated National Lab, (U.S.) 2. Inst. of Electro-Optical Science and Technology, National Taiwan Normal Univ., (Taiwan) 3. Center for Nonlinear Studies, Los Alamos National Lab, (U.S.) 4. Theoretical Division, Los Alamos National Lab, (U.S.) 5. Center for Integrated Nanotechnologies, Sandia National Labs, (U.S.) 6. Chemistry, Life, and Earth Sciences Directorate, Los Alamos National Lab, (U.S.) 7. Chemistry Division, Los Alamos National Lab (U.S.)

Cascade Lasers

High-Power Edge-Emitting Terahertz Plasmonic Quantum-Cascade Laser (SW3N.5)

8 May 2019 2:30PM Marriott Salon III

Authors: Yuan Jin¹, Liang Gao¹, John Reno², Sushil Kumar¹

1. Lehigh Univ. (U.S.) 2. Sandia National Labs (U.S.)

Nanoscale Nonlinear Optics

A Hybrid Dielectric-Semiconductor Resonant Nanostructure for Broadband and Efficient Second-Harmonic Generation (FW4B.1)

8 May 2019 5:00PM Executive Ballroom 210B

Authors: Raktim Sarma¹, Domenico de Ceglia², Nishant Nookala³, Maria Antonietta Vincenti⁴, Salvatore Campione¹, Omri Wolf¹, Michael Scalora⁵, Mikhail A. Belkin¹, Igal Brener¹

1. Sandia National Labs (U.S.) 2. Univ. of Padova (Italy) 3. Univ. of Texas at Austin (U.S.) 4. Univ. of Brescia (Italy) 5. US Army AMRDEC (U.S.)

Terahertz Sources & Communication

20 GHz Continuous Electrical Tuning of a High-power Terahertz Distributed-Feedback Laser (SW4F.2)

8 May 2019 5:30PM Executive Ballroom 210F

Authors: Liang Gao¹, Yuan Jin¹, John Reno², Sushil Kumar¹

1. *Lehigh Univ. (U.S.)* 2. *Sandia National Labs (U.S.)*

High-Speed Optical Interconnects

Silicon Photonic Single-Sideband Generation with Dual-Parallel Mach-Zehnder Modulators (Sth4N.6)

9 May 2019 6:15PM Marriott Salon III

Authors: Ashok Kodigala, Michael R. Gehl, Christopher DeRose, Dana Hood, Andrew T. Pomerene, Christina Dallo, Douglas Trotter, Penny Moore, Andrew Starbuck, Jongmin Lee, Grant Biedermann, Anthony Lentine, *Sandia National Labs (U.S.)*

RF Read-Out of Minority Carrier Lifetimes in Micro-Scale Infrared Materials (Sth4O.4)

9 May 2019 5:15PM Marriott Salon IV

Authors: Sukrith Dev¹, Yinan Wang¹, Kyoungwan Kim¹, Marziyeh Zamiri², Clark Kadlec³, Michael Goldflam³, Samuel Hawkins³, Eric Shaner³, Jin Kim³, Sanjay Krishna⁴, Monica Allen⁵, Jeffery Allen⁵, Emanuel Tutuc¹, Daniel Wasserman¹

1. *Univ. of Texas at Austin (U.S.)* 2. *Univ. of Wisconsin (U.S.)* 3. *Sandia National Labs (U.S.)* 4. *Ohio State Univ. (U.S.)* 5. *Eglin Air Force Base (U.S.)*

Epitaxial Materials & Strain Engineering

Ultrawide Strain Tuning of Luminescence from Mechanically Stressed InGaAs Nanomembranes

9 May 2019 5:00PM Marriott Salon IV

Authors: Xiaowei Wang¹, Xiaorui Cui², Abhishek Bhat², Donald Savage², John Reno³, Max Lagally², Roberto Paiella¹

1. *Boston Univ. (U.S.)* 2. *Univ. of Wisconsin – Madison (U.S.)* 3. *Univ. of Wisconsin -Madison (U.S.)* 3. *Sandia National Labs (U.S.)*

Linear/Non-Linear Metasurfaces

All-Optical Tuning of Fano Resonances in Broken-Symmetry GaAs Metasurfaces (FF2B.2)

10 May 2019 10:45AM Executive Ballroom 210B

Authors: Nicholas Karl^{1,2}, Polina Vabishchevich^{1,2}, Sheng Liu^{1,2}, Michael B. Sinclair¹, Gordon Keeler¹, Gregory Peake¹, Igal Brener^{1,2}

1. *Sandia National Labs (U.S.)* 2. *Center for Integrated Nanotechnologies, Sandia National Labs (U.S.)*

Posters

Optimization of Si-Photonics Compatible AlN Waveguides for Integrated Nonlinear Optics Applications (JTU2A.96)

7 May 2019 11:30A-1:00PM Exhibit Halls 1-3

Authors: Aleem M. Siddiqui, Daniel Dominguez, Christopher Michael, Ryan Sims, Paul Stanfield, Lisa Anne Plucinski Hackett, Andrew J. Leenheer, Matt Eichenfield, *Sandia National Labs (U.S.)*

Phase Optimization of a Silicon Photonic Two-Dimensional Electro-Optic Phased Array (JTh2A.39)

9 May 2019 11:30AM-1:00PM Exhibit Halls 1-3

Authors: Michael R. Gehl¹, Galen Hoffman¹, Paul Davids¹, Christina Dallo¹, Zeb Barber², Emil Kadlec², R. Krishna Mohan², Stephen Crouch², Christopher Long¹

1. *Sandia National Labs (U.S.)* 2. *Blackmore Sensors and Analytics, Inc. (U.S.)*

Largely Tunable Plasmonic Antennas-on-Waveguide Directional Couplers with Deep Subwavelength Volume (JTh2A.43)

9 May 2019 11:30AM-1:00PM Exhibit Halls 1-3

Authors: Yuan Meng^{1,2}, Futai Hu¹, Yuanmu Yang^{1,3}, Qirong Xiao¹, Zhoutian Liu¹, Mali Gong¹

1. *State Key Lab of Precision Measurement Technology and Instruments, Tsinghua Univ. (China)* 2. *Research Lab of Electronics, MIT (U.S.)* 3. *Sandia National Labs (U.S.)*

High-Mobility Transparent Conducting Oxides for Compact Epsilon-Near-Zero Silicon Photonic Phase Modulators (JTh2A.57)

9 May 2019 11:30AM-1:00PM Exhibit Halls 1-3

Authors: Michael G. Wood¹, Isak Reines¹, Ting S. Luk¹, Darwin Serkland¹, Salvatore Campione¹

1. *Sandia National Labs (U.S.)* 2. *Center for Integrated Nanotechnologies (U.S.)*