SPIE. PHOTONICS WEST

TECHNICAL PROGRAM

Photonics West 2019

TECHNICAL PROGRAM

Conferences and Courses
2–7 February 2019

BIOS Expo
2–3 January 2019

Photonics West Exhibition
5–7 February 2019

The Moscone Center
San Francisco, USA

spie.org/pw

SESSION 17
LOCATION: ROOM 304 (SOUTH LEVEL THREE) . . . . . THU 11:00 AM TO 12:10 PM

Plasmonics for Sensing

Session Chairs: **Jerry R. Meyer,** U.S. Naval Research Lab. (USA); **Lincoln J. Lauhon,** Northwestern Univ. (USA)

11:00 am: **High-performance infrared photodetectors based on gold-patched graphene nanostripes** *(Invited Paper)*, Mona Jarrahi, Semih Cakmakyapan, Univ. of California, Los Angeles (USA) . . . . . [10926-75]

11:20 am: **Enhancement of quantum efficiency in nBn detectors with thin absorbers using plasmonic gratings** *(Invited Paper)*, Jill A. Nolde, Eric M. Jackson, U.S. Naval Research Lab. (USA); Mijin Kim, KeyW Corp. (USA); Chul Soo Kim, Chadwick L. Canedy, Michael V. Warren, Stephanie Tomasulo, Chaffra A. Affouda, Erin R. Cleveland, Igor Vurgaftman, Jerry R. Meyer, Edward H. Aifer, U.S. Naval Research Lab. (USA) . . [10926-76]

11:40 am: **High FOM surface plasmon resonance transducers with membrane structure toward gas-sensing applications,** Takahiro Shimodaira, Shogo Suzuki, Yoshiki Aizawa, Yasufumi Iimura, Hiromasa Shimizu, Tokyo Univ. of Agriculture and Technology (Japan) . . . . . [10926-77]

11:55 am: **Plasmonic optical systems for gas detection,** Nicolas Javahiraly, Lab. des sciences de l'Ingénieur, de l'Informatique et de l'Imagerie (France); Cynthia CIBAKA NDAYA, Université Claude Bernard Lyon 1 (France) and Université de Strasbourg - Lab. des sciences de l'Ingénieur (France); Arnaud BRIOUDE, LMI-Université Claude Bernard Lyon 1 (France) . [10926-78]

Lunch/Exhibition Break . . . . . Thu 12:10 pm to 1:40 pm

SESSION 18
LOCATION: ROOM 304 (SOUTH LEVEL THREE) . . . . . THU 1:40 PM TO 3:00 PM

Advances in Material Characterization

Session Chairs: **Giti A. Khodaparast,** Virginia Polytechnic Institute and State Univ. (USA); **Eric Tournié,** Univ. de Montpellier (France)

1:40 pm: **Transient extreme ultraviolet measurement of element-specific charge transfer dynamics in multiple-material junctions** *(Invited Paper)*, Jonathan M Michelsen, William T. Denman, Scott K. Cushing, Caltech (USA) . . . . . [10926-79]

2:00 pm: **Characterizing hysteresis in 2D materials via heavy-tail switching transients in black phosphorous** *(Invited Paper)*, Matthew Grayson, Lintao Peng, Spencer Wells, Mark Hersam, Northwestern Univ. (USA) . . . . . [10926-80]

2:20 pm: **Organic charge-transfer compounds: complex interactions at the nanoscale** *(Invited Paper)*, Rohan Isaac, The Univ. of North Carolina at Chapel Hill (USA); Ajith Ashokan, Veaceslav Coropceanu, Georgia Institute of Technology (USA); Laurie McNeil, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [10926-81]

2:40 pm: **Optical properties of all-inorganic perovskite nanocrystals** *(Invited Paper)*, Tom Gregorkiewicz, Univ. van Amsterdam (Netherlands) . . . . . [10926-82]

Coffee Break . . . . . Thu 3:00 pm to 3:30 pm

SESSION 19
LOCATION: ROOM 304 (SOUTH LEVEL THREE) . . . . . THU 3:30 PM TO 5:15 PM

Frequency Combs

Session Chairs: **Jérôme Faist,** ETH Zurich (Switzerland); **Anna Szerling,** Institute of Electron Technology (Poland)

3:30 pm: **Linewidth of the laser optical frequency comb with arbitrary temporal profile** *(Invited Paper)*, Jakob B. Khurgin, Johns Hopkins Univ. (USA); David Burghoff, Univ. of Notre Dame (USA); Qing Hu, Massachusetts Institute of Technology (USA) . . . . . [10926-83]

3:50 pm: **Exploratory research on the light quantum future technical basis** *(Invited Paper)*, Siwen Bi, Institute of Remote Sensing and Digital Earth (China) . . . . . [10926-84]

4:10 pm: **Controllable nonlinear optics in the GHz-THz range** *(Invited Paper)*, Mauro Fernandes Pereira, Institute of Physics of the CAS, v.v.i. (Czech Republic) . . . . . [10926-85]

4:30 pm: **Coherent control of QCL frequency combs for miniaturized dual-comb spectroscopy,** Johannes Hillbrand, Hermann Detz, Aaron M. Andrews, Gottfried Strasser, Benedikt Schwarz, Technische Univ. Wien (Austria) . . . . . [10926-86]

4:45 pm: **Stable and efficient mid-infrared III-V semiconductor frequency combs with two-color pumping,** Robert J. Weiblen, Igor Vurgaftman, U.S. Naval Research Lab. (USA) . . . . . [10926-88]

5:00 pm: **Wide-bandwidth low-threshold THz frequency combs,** Giacomo Scalari, Tudor Olariu, Andres Forrer, David Stark, Mattias Beck, Jérôme Faist, ETH Zurich (Switzerland) . . . . . [10926-89]

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Time: 3:30 PM - 3:50 PM
Author(s): Jakob B. Khurgin, Johns Hopkins Univ. (United States); David Burghoff, Univ. of Notre Dame (United States); Qing Hu, Massachusetts Institute of Technology (United States)

Add To My Schedule

Exploratory research on the light quantum future technical basis *(Invited Paper)*
Paper 10926-84
Time: 3:50 PM - 4:10 PM
Author(s): Siwen Bi, Institute of Remote Sensing and Digital Earth (China)

Add To My Schedule

Numerical studies of superlattice multipliers performance *(Invited Paper)*
Paper 10926-85
Time: 4:10 PM - 4:30 PM
Author(s): Apostolos Apostolakis, Institute of Physics (Czech Republic); Mauro Fernandes Pereira, Institute of Physics of the CAS, v.v.i. (Czech Republic)

Add To My Schedule

Coherent control of QCL frequency combs for miniaturized dual-comb spectroscopy
Paper 10926-86
Time: 4:30 PM - 4:45 PM
Author(s): Johannes Hillbrand, Hermann Detz, Aaron M. Andrews, Gottfried Strasser, Benedikt Schwarz, Technische Univ. Wien (Austria)

Add To My Schedule

Dual-comb spectroscopy, without the need of any movable parts, is an ideal tool to realize miniaturized gas sensing instruments. QCL frequency combs are an ideal candidate for practical realizations. Optical feedback is known to be fatal for QCL comb operation by destroying intermodal coherence. Optical insulators or strong attenuation are required, which limits their applicability for miniaturization. In this work, we show how to stabilize QCL frequency combs against both static and dynamic feedback. With a first prototype, we demonstrate that with the presented method QCL based dual-comb spectrometers can be build on a small footprint.

Stable and efficient mid-infrared III-V semiconductor frequency combs with two-color pumping
Paper 10926-88
Time: 4:45 PM - 5:00 PM
Author(s): Robert J. Weiblen, Igor Vurgaftman, U.S. Naval Research Lab. (United States)

Add To My Schedule

Wide-bandwidth low-threshold THz frequency combs
Paper 10926-89
Time: 5:00 PM - 5:15 PM
Author(s): Giacomo Scalari, Tudor Olariu, Andres Forrer, David Stark, Mattias Beck, Jérôme Faist, ETH Zurich (Switzerland)

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