

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

CONFERENCE 10939

POSTERS-WEDNESDAY

LOCATION: MARRIOTT MARQUIS HOTEL,
GOLDEN GATE BALLROOM WED 6:00 PM TO 8:00 PM

Conference attendees are invited to attend the OPTO poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Wednesday 10:00 AM – 5:00 PM

View poster presentation guidelines and set-up instructions at <http://spie.org/PWPosterGuidelines>

Bistability in a monolithic two-section quantum dot semiconductor laser, Dominik Auth, Christoph Weber, Technische Univ. Darmstadt (Germany); Paolo Bardella M.D., Lorenzo L. Colombo, Politecnico di Torino (Italy); Stefan Breuer, Technische Univ. Darmstadt (Germany).....[10939-64]

Utilization of methane/hydrogen/chlorine-based plasma etching for production of 4.7 μ m wavelength QCLs with taper-type ridge waveguides, Aleksandr Kuzmich, Krzysztof Chmielewski, Maciej Sakowicz, Kamil Pierściński, Dorota Pierścińska, Maciej Bugajski, Institute of Electron Technology (Poland)[10939-55]

THURSDAY 7 FEBRUARY

SESSION 12

LOCATION: ROOM 74 (SOUTH LOWER MEZZANINE) . . THU 8:10 AM TO 10:00 AM

High Power/Brightness

Session Chair: Gary M. Smith, MIT Lincoln Lab. (USA)

8:10 am: **High-spectral radiance distributed Bragg reflector tapered diode lasers at 1060 nm with novel internal output DBR-grating**, David Feise, Daniel Jedrzejczyk, Dennis Krug, Nils Werner, Frank Bugge, André Maassdorf, Ralph-Stephan Unger, Peter Ressel, Katrin Paschke, Ferdinand-Braun-Institut (Germany)[10939-51]

8:30 am: **Reliability of high-power 1030nm DBR tapered diode lasers with different lateral layouts**, Andre Mueller, Christof Zink, Karl Häusler, Bernd Sumpf, Ferdinand-Braun-Institut (Germany)[10939-52]

8:50 am: **Multi-emitter 638-nm high-power broad area laser diodes for display application (Invited Paper)**, Takehiro Nishida, Kyosuke Kuramoto, Yuji Iwai, Takuma Fujita, Tetsuya Yagi, Mitsubishi Electric Corp. (Japan).....[10939-53]

9:20 am: **USHIO 3.5W red laser diode for projector light source**, Masato Hagimoto, Shintaro Miyamoto, Yuki Kimura, Haruki Fukai, Manabu Hashizume, Satoshi Kawanaka, Ushio Opto Semiconductors, Inc. (Japan).....[10939-54]

9:40 am: **Investigation of controlled external feedback on the properties of low- and high-power frequency-stabilized diode laser**, Christof Zink, Ferdinand-Braun-Institut (Germany); Mathias Christensen, Muhammad T. Jamal, Anders K. Hansen, DTU Fotonik (Denmark); Martin Maiwald, Ferdinand-Braun-Institut (Germany); Ole B. Jensen, DTU Fotonik (Denmark); Bernd Sumpf, Günther Tränkle, Ferdinand-Braun-Institut (Germany)[10939-55]

Coffee Break Thu 10:00 am to 10:30 am

SESSION 13

LOCATION: ROOM 74 (SOUTH LOWER MEZZANINE) . THU 10:30 AM TO 11:50 AM

QCL Growth and Design

Session Chair: Benedict Schwartz

10:30 am: **Quantum cascade lasers on lattice-mismatched substrates (Invited Paper)**, Arkadiy A. Lyakh, Univ. of Central Florida (USA) . . . [10939-56]

10:50 am: **Effects of elastic scattering on high-performance step-taper active-region quantum cascade lasers**, Colin Boyle, Kevin Oresick, Jeremy D. Kirch, Luke J. Mawst, Univ. of Wisconsin-Madison (USA); Donald F. Lindberg III, Thomas Earles, Intraband, LLC (USA); Yuri V. Flores, Philipps-Univ. Marburg (Germany); Dan Botez, Univ. of Wisconsin-Madison (USA).....[10939-57]

11:10 am: **Characterizing the frequency chirp of pulsed DFB QCLs using a gas-filled Fabry-Perot etalon**, Paul Chevalier, Marco Piccardo, Arman Amirzhan, Harvard Univ. (USA); Fan Wang, Steven Johnson, Massachusetts Institute of Technology (USA); Henry Everitt, Duke Univ. (USA); Federico Capasso, Harvard Univ. (USA)[10939-58]

11:30 am: **Characterization and fabrication of monolithic two-section mid-IR quantum cascade lasers**, Kamil Pierściński, Dorota Pierścińska, Aleksandr Kuźmich, Krzysztof Chmielewski, Grzegorz Sobczak, Piotr Gutowski, Maciej Bugajski, Institute of Electron Technology (Poland)[10939-59]

Lunch/Exhibition Break Thu 11:50 am to 1:20 pm

SESSION 14

LOCATION: ROOM 74 (SOUTH LOWER MEZZANINE) . . THU 1:20 PM TO 2:50 PM

QCLs: New Designs and Applications

Session Chair: Dan Botez, Univ. of Wisconsin-Madison (USA)

1:20 pm: **QCL and ICL ring laser (Invited Paper)**, Gottfried Strasser, Rolf Szedlak, Martin Holzbauer, Benedikt Schwarz, Borislav Hinkov, Hermann Detz, Aaron M. Andrews, Werner Schrenk, Technische Univ. Wien (Austria).....[10939-60]

1:50 pm: **Short-cavity THz QC-VECSEL with 20% fractional tuning**, Christopher Curwen, Univ. of California, Los Angeles (USA); John L. Reno, Sandia National Labs. (USA); Benjamin S. Williams, Univ. of California, Los Angeles (USA).....[10939-61]

2:10 pm: **Quartz-enhanced photoacoustic spectroscopy employing a distributed feedback-quantum cascade laser array for broadband nitrous oxide and methane detection**, Marilena Giglio, Univ. degli Studi di Bari Aldo Moro (Italy); Pietro Patimisco, Angelo Sampaolo, Politecnico di Bari (Italy); Andrea Zifarelli, Univ. degli Studi di Bari Aldo Moro (Italy); Giansergio Menduni, Politecnico di Bari (Italy); Arianna Elefante, Univ. degli Studi di Bari Aldo Moro (Italy); Romain Blanchard, Christian J. Pfluegl, Mark F. Witinski, Daryoosh Vakhshoor, Pendar Technologies (USA); Vittorio M. N. Passaro, Politecnico di Bari (Italy); Frank K. Tittel, Rice Univ. (USA); Vincenzo Spagnolo, Politecnico di Bari (Italy).....[10939-62]

2:30 pm: **Quantum-cascade vertical-cavity surface-emitting laser**, Tomasz G. Czyszanowski, Sandra Grzempa, Włodzimierz Nakwaski, Lodz Univ. of Technology (Poland)[10939-63]



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Characterizing the frequency chirp of pulsed DFB QCLs using a gas-filled Fabry-Perot etalon

Paper 10939-58

Time: 11:10 AM - 11:30 AM

Author(s): Paul Chevalier, Marco Piccardo, Arman Amirzhan, Harvard Univ. (United States); Fan Wang, Steven Johnson, Massachusetts Institute of Technology (United States); Henry Everitt, Duke Univ. (United States); Federico Capasso, Harvard Univ. (United States)

[Add To My Schedule](#) **Characterization and fabrication of monolithic two-section mid-IR quantum cascade lasers**

Paper 10939-59

Time: 11:30 AM - 11:50 AM

Author(s): Kamil Pierscinski, Dorota Pierścińska, Aleksandr Kuźmicz, Krzysztof Chmielewski, Grzegorz Sobczak, Piotr Gutowski, Maciej Bugajski, Institute of Electron Technology (Poland)

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Lunch/Exhibition Break 11:50 AM - 1:20 PM

**Session 14:
QCLs: New Designs and Applications**

Thursday 7 February 2019

1:20 PM - 2:50 PM

Location: Room 74 (South Lower Mezzanine)


Session Chair: [Dan Botez](#), Univ. of Wisconsin-Madison (United States)

QCL and ICL ring laser (Invited Paper)

Paper 10939-60

Time: 1:20 PM - 1:50 PM

Author(s): Gottfried Strasser, Rolf Szedlak, Martin Holzbauer, Benedikt Schwarz, Borislav Hinkov, Hermann Detz, Aaron M. Andrews, Werner Schrenk, Technische Univ. Wien (Austria)

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We report on recent advances in chemical sensing applications based on surface and/or substrate emitting ring quantum cascade lasers (QCLs). QCLs can be implemented in monolithically integrated on-chip laser/detector compact sensor systems, twisted light beams can be generated on-chip from such rings by a monolithic gradient index meta-material fabricated directly into the substrate of the semiconductor chip, inducing a twist of the light's wavefront. The low threshold power of intersubband cascade lasers (ICLs) makes them very attractive for mobile systems. We will report on substrate emitting ICL ring lasers and the different polarization schemes of QCLs and ICLs.

Short-cavity THz QC-VECSEL with 20% fractional tuning

Paper 10939-61

Time: 1:50 PM - 2:10 PM

Author(s): Christopher Curwen, Univ. of California, Los Angeles (United States); John L. Reno, Sandia National Labs. (United States); Benjamin S. Williams, Univ. of California, Los Angeles (United States)

[Add To My Schedule](#) **Quartz-enhanced photoacoustic spectroscopy employing a distributed feedback-quantum cascade laser array for nitrous oxide and methane broadband detection**

Paper 10939-62

Time: 2:10 PM - 2:30 PM

Author(s): Marilena Giglio, Univ. degli Studi di Bari Aldo Moro (Italy); Pietro Patimisco, Angelo Sampaolo, Politecnico di Bari (Italy); Andrea Zifarelli, Univ. degli Studi di Bari Aldo Moro (Italy); Giansergio Menduni, Politecnico di Bari (Italy); Arianna Elefante, Univ. degli Studi di Bari Aldo Moro (Italy); Romain Blanchard, Christian J. Pfluegl, Mark F. Witinski, Daryoosh Vakhshoori, Pendar Technologies (United States); Vittorio M. N. Passaro, Politecnico di Bari (Italy); Frank K. Tittel, Rice Univ. (United States); Vincenzo Spagnolo, Politecnico di Bari (Italy)

[Add To My Schedule](#) **Quantum-cascade vertical-cavity surface-emitting laser**

Paper 10939-63

Time: 2:30 PM - 2:50 PM

Author(s): Tomasz G. Czyszanowski, Sandra Grzempa, Włodzimierz Nakwaski, Lodz Univ. of Technology (Poland)

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