

## Conference Program

All conference presentations sessions will be held in the Anacapa Ballroom rooms 1-4.  
The industrial exhibit will be held in the Anacapa Ballroom rooms 5-8 on Tuesday-Thursday  
The registration table is in the Anacapa Foyer. It will be open at 5-8pm on Sunday, and will open at 8am on Monday-Friday.

### Sunday, September 15<sup>th</sup>

17:00-20:00 Registration Table open in the Anacapa Foyer.

**18:00-20:00 Welcome Reception.** Beer and wine with light hors d'oeuvres.  
Location: Anacapa Foyer and Terrace.

### Monday, September 16<sup>th</sup>

08:30 Welcome and Opening Remarks by the conference chairs.

#### **08:45-09:30 Session 1: Plenary Talk – Frank Koppens**

Chair: Benjamin Williams

08:45 **Frank Koppens**  
*Nano-lego for light with (twisted) 2D materials (Plenary Talk)*

#### **09:30-10:30 Session 2: Nanoscopy**

Chair: Alexander McLeod

09:30 **Tobias Gokus, Stefan Mastel, Alexander Goyadinov and Andreas Huber**  
*THz near-field imaging and spectroscopy with nanoscale spatial resolution*

09:45 **Andrea Ottomaniello, James Keeley, Pierluigi Rubino, Lianhe H. Li, Edmund H. Linfield, Giles A. Davies, Paul Dean,  
Alessandro Pitanti and Alessandro Tredicucci**  
*Self-mixing optomechanics with nanometer resolution in a Terahertz quantum cascade laser*

10:00 **Qianchun Weng and Susumu Komiyama**  
*Terahertz nanoscopy of non-equilibrium carrier dynamics: A thermometric approach (Invited)*

#### **10:30-10:50 Coffee Break**

#### **10:50-12:20 Session 3: THz quantum cascade lasers**

Chair: Iwao Hosako

10:50 **Lutz Schrottke, Xiang Lue, Benjamin Röben, Klaus Biermann, Till Hagelschuer, Heinz-Wilhelm Hübers and Holger  
Grahn**  
*High-performance GaAs/AlAs terahertz quantum-cascade lasers*

11:05 **Yuan Jin, John Reno and Sushil Kumar**  
*Multi-watt terahertz distributed-feedback lasers*

11:20 **Asaf Albo, Yuri Flores, Qing Hu and John Reno**  
*Advances in Terahertz Quantum Cascade Lasers with Room-Temperature Negative Differential Resistance*

11:35 **Martin A. Kainz, Aaron Maxwell Andrews, Sebastian Schoenhuber, Benedikt Limbacher, Michael Jaidl, Dominik  
Theiner, Hermann Detz, Gottfried Strasser, Gerald Bastard and Karl Unterrainer**  
*Mode Switching of a Dual-color Terahertz Quantum Cascade Laser*

- 11:50 Martin A. Kainz, Mykhaylo Semtsiv, Georgios Tsianos, Sergii Kurloy, W. Ted Masselink, Sebastian Schoenhuber, Benedikt Limbacher, Hermann Detz, Werner Schrenk, Karl Unterrainer, Gottfried Strasser and Aaron Maxwell Andrews  
*Thermoelectrically Cooled Terahertz Quantum Cascade Laser*
- 12:05 Lorenzo Bosco, Martin Franckić, Mattias Beck, Andreas Wacker, Giacomo Scalari and Jerome Faist  
*Thermo-electrically cooled THz Quantum Cascade Lasers*

### 12:20-13:30 Buffet Lunch

### 13:30-15:00 Session 4: THz QCL dynamics and locking

Chair: Juncheng Cao

- 13:30 Francesco Cappelli, Luigi Consolino, Malik Nafa, Roberto Eramo, Iacopo Galli, Davide Mazzotti, Pablo Cancio, Saverio Bartalini and Paolo De Natale  
*Phase analysis and full phase control of chip-scale infrared frequency combs*
- 13:45 Christian Georg Derntl, Dominik Theiner, Giacomo Scalari, Mattias Beck, Jérôme Faist, Karl Unterrainer and Juraj Darmo  
*Spectrally resolved gain dynamics in THz quantum cascade lasers*
- 14:00 Elise Uyehara, Wendao Xu, Ali Khalatpour and Qing Hu  
*Offset phase-locking of two THz quantum cascade lasers for high dynamic range heterodyne imaging*
- 14:15 Valentino Pistore, Feihu Wang, Michael Riesch, Hanond Nong, Pierre-Baptiste Vigneron, Raffaele Colombelli, Olivier Parillaud, Christian Jirauschek, Juliette Mangeney, Jerome Tignon and Sukhdeep Dhillon  
*Active harmonic modelocking and self-starting harmonic emission in THz QCLs*
- 14:30 Martin Wienold, Tasmim Alam, Xiang Lü, Lutz Schrottke, Holger T. Grahn and Heinz-Wilhelm Hübers  
*Light-induced frequency tuning and stabilization of terahertz quantum-cascade lasers*
- 14:45 Yohei Sakasegawa, Shin'Ichiro Hayashi, Shingo Saito and Norihiko Sekine  
*Terahertz transmission responses of quantum cascade lasers over a wide range of incident electric field amplitude*

**15:00-19:00 Free Time.** Enjoy the resort's pools, golf, and other amenities - or just explore the local area while the sun shines.

### 18:40-19:00 Coffee and Snacks

### 19:00-20:30 Session 5: 2D Materials

Chair: Frank Koppens

- 19:00 Michael Gensch  
*Terahertz High Harmonic Generation in Dirac Materials (Invited)*
- 19:30 Alessandra Di Gaspare, Eva A. A. Pogna, Francesco Pisani, Osman Balci, Allison Cadore, Cinzia di Franco, Leonardo Viti, Andrea C. Ferrari, Gaetano Scamarcio and Miriam S. Vitiello  
*Tunable gated graphene-on-polyimide Terahertz Modulators*
- 19:45 Alexey Belyanin, Mikhail Tokman, Qianfan Chen, Yongrui Wang, Ryan Kutayiah, Zhongqu Long, Maria Erukhimova and Ivan Oladyskhin  
*Infrared and terahertz optics and plasmonics of Weyl semimetals*
- 20:00 Alexander McLeod  
*Fundamental limits to graphene plasmonics in hBN heterostructures (Invited)*

## Tuesday, September 17<sup>th</sup>

The sessions on Tuesday September 17 are dedicated to a Focused Workshop on Polaritons and Strong Coupling Phenomena. The Focused Session is made up of a tutorial talk, invited talks, regular contributed talks, and several contributed talks upgraded to "extended" status by the program committee during the review process.

### 08:30-10:25 Session 6: Polaritons 1

(Part of the Focused Workshop on Polaritons and Strong Coupling Phenomena)

Chair: Raffaele Colombelli

- 08:30 Alessandro Tredicucci  
*When light is more than a perturbation: what are intersubband polaritons? And how can we use them? (Tutorial)*
- 09:15 Chih-Feng Wang, Terefe Habteyes, Ting Shan Luk, John Klem, Hou-Tong Chen, Oleg Mitrofanov and Igal Brener  
*Near-filed Spectroscopy of Intersubband Polaritons in the Single Nanoantenna Regime (Extended)*

- 09:35 Mathieu Jeannin, Djamal Gacemi, Angela Vasanelli, Lianhe Li, Edmund Linfield, Carlo Sirtori and Yanko Todorov  
*Ultra-strong light-matter coupling and perfect absorption with three-dimensional THz metamaterial (Extended)*
- 09:55 Francesco Paolo Mezzapesa, Juergen Raab, Christoph Lange, Leonardo Viti, Lianhe Li, Giles Davies, Edmund Linfield,  
Rupert Huber and Miriam Serena Vitiello  
*Terahertz saturable absorber mirrors based on intersubband polaritons*
- 10:10 Raktim Sarma, Nishant Nookala, Domenico de Ceglia, Luca Carletti, John Klem, Mikhail Belkin and Igal Brener  
*Strong Light-Matter Interaction and Extreme Nonlinearities in Hybrid Dielectric Metasurfaces*

### 10:30-10:50 Coffee Break (Exhibition is open)

### 10:50-12:15 Session 7: Polaritons 2

(Part of the Focused Workshop on Polaritons and Strong Coupling Phenomena)

Chair: Igal Brener

- 10:50 Christoph Lange, Joshua Mornhinweg, Maike Halbhuber, Andreas Bayer, Dominique Bougeard and Rupert Huber  
*Subcycle dynamics of ultrastrongly light-matter coupled structures (Invited)*
- 11:20 Giacomo Scalari, Gianlorenzo Paravicini-Bagliani, Shima Rajabali, Felice Appugliese, Johan Andberger, Janine Keller,  
Nicola Bartolo, Crisitiano Ciuti, Thomas Ihn, Klaus Ensslin, Mattias Beck and Jerome Faist  
*Vacuum field controlled magnetotransport and upper branch broadening in Landau polaritons (Extended)*
- 11:40 Erika Cortese, Ngoc-Linh Tran, Jean-Michel Manceau, Giorgio Biasiol, Iacopo Carusotto, Raffaele Colombelli and  
Simone De Liberato  
*Cavity-mediated bound excitons (Extended)*
- 12:00 Cassia Naudet-Baulieu, Nicola Bartolo, Giuliano Orso and Cristiano Ciuti  
*Dark vertical conductance of cavity-embedded semiconductor heterostructures*

### 12:20-13:30 Buffet Lunch

### 14:00-15:55 Session 8: Polaritons 3

(Part of the Focused Workshop on Polaritons and Strong Coupling Phenomena)

Chair: Giacomo Scalari

- 14:00 Iacopo Carusotto  
*Intersubband polaritons: new perspectives towards Bose-Einstein condensation, quantum fluids of light, and quantum optics (Invited)*
- 14:30 Christopher J. Winta, Daniel C. Ratchford, Ioannis Chatzakis, Chase T. Ellis, Nikolai C. Passler, Jonathan Winterstein,  
Pratibha Dev, Ilya Razdolski, Joseph G. Tischler, Igor Vurgaftman, Michael B. Katz, Neeraj Nepal, Matthew T. Hardy,  
Jordan A. Hachtel, Juan Carlos Idrobo, Thomas L. Reinecke, Alexander J. Giles, D. Scott Katzer, Nabil D. Bassim,  
Rhonda M. Stroud, Martin Wolf, Alexander Paarmann and Joshua D. Caldwell  
*Controlling the Infrared Dielectric Function through Atomic-Scale Heterostructures (Extended)*
- 14:50 Pb Vigneron, Stefano Pirota, Iacopo Carusotto, Ni Tran, G Biasiol, Jean-Michel Manceau, Adel Bousseksou and Raffaele Colombelli  
*Quantum well infrared detectors in the strong light-matter coupling regime (Extended)*
- 15:10 Jacopo Nespolo and Iacopo Carusotto  
*A generalized Gross-Pitaevskii model for intersubband polariton lasing*
- 15:25 Jacques Hawecker, Pierre Baptiste Vigneron, Jean-Michel Manceau, Juliette Mangeney, J rome Tignon, Lianhe Li,  
Edmund Linfield, Giles Davies, Rafaele Colombelli and Sukhdeep Dhillon  
*Time resolved spectroscopy of THz intersubband polaritons at small k vector*
- 15:40 Chris Deimert, Paul Goulain, Jean-Michel Manceau, Adel Bousseksou, Wojciech Pasek, Taehyun Yoon, Na Young Kim,  
Raffaele Colombelli and Zbigniew Wasilewski  
*Room temperature THz intersubband transitions in continuously-graded AlGaAs parabolic quantum wells*

### 16:00-18:00 Session 9: Poster Session and Reception

Location: Anacapa Foyer, Anacapa Terrace, and Anacapa 5-8 (Exhibition is open).

List of poster titles and authors is appended.

## Wednesday, September 18<sup>th</sup>

### 08:45-09:30 Session 10: Plenary Talk - Jérôme Faist

Chair: Daniel Wasserman

- 08:45 Jérôme Faist  
*Phonon-polariton lasers: optical and Raman emission (Plenary Talk)*

### 09:30-10:30 Session 11: Frequency Combs 1

Chair: Alessandro Tredicucci

- 09:30 Katia Garrasi, Francesco Paolo Mezzapesa, Luca Salemi, Valentino Pistore, Sukhdeep Dhillon, Luigi Consolino, Saverio Bartalini, Paolo De Natale, Lianhe Li, Giles Davies, Edmund Linfield and Miriam Serena Vitiello  
*Quantum cascade lasers frequency combs at Terahertz frequencies*
- 09:45 Nikola Opačak, Gottfried Strasser and Benedikt Schwarz  
*Modelling the intra-cavity dynamics behind phase locking of quantum cascade laser frequency combs*
- 10:00 David Burghoff, Ningren Han, Filippos Kapsalidis, Nathan Henry, Mattias Beck, Jacob Khurgin, Jerome Faist and Qing Hu  
*Microelectromechanical control of the state of quantum cascade laser frequency combs*
- 10:15 Dmitry Kazakov, Marco Piccardo, Benedikt Schwarz, Maximilian Beiser, Yongrui Wang, Michele Tamagnone, Wei-Ting Chen, Alexander Zhu, Alexey Belyanin and Federico Capasso  
*Frequency comb generation in ring injection lasers by defect engineering*

### 10:30-10:50 Coffee Break (Exhibition is open)

### 10:50-12:50 Session 12: Mid-IR Quantum-cascade lasers and interband cascade lasers

Chair: Jérôme Faist

- 10:50 Alexei Baranov, Hoang Nguyen-Van, Zeineb Loghmani, Laurent Cerutti, Jean-Baptiste Rodriguez, Julie Tournet, Gregoire Narcy, Guilhem Boissier, Gilles Patriarche, Michael Bahriz, Eric Tournié and Roland Teissier  
*InAs-based quantum cascade lasers directly grown on silicon (Invited)*
- 11:20 Seungyong Jung, Daniele Palaferri, Feng Xie, Yae Okuno, Christopher Pinzone, Kevin Lascola and Mikhail Belkin  
*Monolithic integration of mid-infrared quantum cascade lasers coupled with low-loss passive InGaAs waveguides*
- 11:35 Hedwig Knötig, Borislav Hinkov, Robert Weih, Sven Höfling, Werner Schrenk, Johannes Koeth, Johannes P. Waclawek, Bernhard Lendl and Gottfried Strasser  
*Continuous-Wave Operation of Ring Interband Cascade Lasers*
- 11:50 Colin Boyle, Jeremy Kirch, Luke Mawst, Yuri Flores and Dan Botez  
*Impact of Interface-Roughness Scattering-Induced Carrier Leakage on High-Power, Mid-IR QCL Performance*
- 12:05 Zhixin Wang, Yong Liang, Bo Meng, Yanting Sun, Giriprasanth Omanakuttan, Emilio Gini, Mattias Beck, Iliia Sergachev, Sebastian Lourdudoss, Jérôme Faist and Giacomo Scalari  
*Large Area Surface-Emitting Photonic Crystal Quantum Cascade Laser*
- 12:20 Matthew Suttinger, Rowel Go, Ahmad Azim, Enrique Sanchez, Jonathan Brescia, Dagan Hathaway and Arkadiy Lyakh  
*Enhanced Midwave Quantum Cascade Laser Average Power with High Duty Cycle Pulsed Operation*
- 12:35 Hua Li, Ziping Li, Wenjian Wan, Kang Zhou, Xiaoyu Liao, Sijia Yang, Chenjie Wang and Juncheng Cao  
*Compact terahertz multiheterodyne dual-comb spectroscopy based on self-detection quantum cascade lasers*

### 13:00-20:00 Excursion and/or Free Time ([www.itqw2019.com/social-program](http://www.itqw2019.com/social-program))

The conference excursion will be held in two parts:

**13:00-15:30** Visit the **Old Creek Ranch Winery** for a wine tasting and **boxed lunch**. The Old Creek Ranch Winery is Ventura County's only rural winery and is located on an 850-acre ranch. The original winery was built in the late 1800's on property formerly known as Rancho Ojai. Guests can enjoy wines while relaxing in the beautiful outdoor seating areas. (Note – if some attendees would like to skip the winery and go straight to the beach, one bus will continue directly to Ventura).

**15:30-20:00** The second part of the afternoon will be an **unstructured visit to Ventura**, a charming and historical California beach town about 15 miles from Ojai. After the buses drop off in Ventura, attendees are free to enjoy the beach and explore the town for several hours. Attractions include the Ventura Beach, Ventura Pier, bicycle path, Mission San Buenaventura, and Main Street which contains many stores, restaurants, and microbreweries. Local stores will rent bicycles, surfboards, and boogie boards. Buses will return to the Ojai Valley Inn at 18:00 and 20:00.

## Thursday, September 19<sup>th</sup>

### 09:00-09:10 Session 13: Industry Presentation

Chair: Heinz-Wilhelm Hübers

- 09:00 Bob Shine, Dave Caffey and Jeremy Rowlette  
*Markets and Applications of Commercial Quantum Cascade Laser Based Systems (Industry Presentation)*

### 09:15-10:15 Session 14: Spectroscopy and Sensing

Chair: Heinz-Wilhelm Hübers

- 09:15 Pierre Jouy, Andreas Hugi, Markus Geiser, Raphael Horvath, Christopher Strand, Nico Pinkowski, Yiming Ding and Ronald K. Hanson  
*Dual comb spectroscopy with QCLs: shock tube applications and challenges for QCL frequency comb sources*
- 09:30 Florian Pilat, Benedikt Schwarz, Hermann Detz, Aaron Maxwell Andrews, Bettina Baumgartner, Bernhard Lendl, Gottfried Strasser and Borislav Hinkov  
*QCLD-based lab-on-a-chip for  $\mu$ -fluidic sensing*
- 09:45 Quankui Yang  
*Hetero-cascading Quantum Cascade Lasers and their Application in Realtime Spectroscopy*
- 10:00 Alexandra Werth, Yasin Kaya, Kalil Shaw, Noah Apthorpe, James Lee, Nsomma Alilonu, Sofia Inglessis and Claire Gmachl  
*Implementation of quantum cascade laser spectroscopy and multivariate analysis for noninvasive glucose monitoring*

### 10:15-10:50 Coffee Break (Exhibition is open)

### 10:50-12:20 Session 15: Frequency Combs 2

Chair: David Burghoff

- 10:50 Benedikt Schwarz, Johannes Hillbrand, Maximilian Beiser, Nikola Opacak, Aaron Maxwell Andrews, Hermann Detz, Gottfried Strasser, Anne Schade, Robert Weih and Sven Höfling  
*Towards monolithic and battery driven mid-infrared dual-comb spectrometers (Invited)*
- 11:20 Lukasz Sterczewski, Mahmood Bagheri, Clifford Frez, Chadwick Canedy, Igor Vurgaftman, Mijin Kim, Chul Soo Kim, Charles Meritt, William Bewley and Jerry Meyer  
*Injection locking of interband cascade laser frequency combs*
- 11:35 Bo Meng, Mattias Beck and Jérôme Faist  
*Mid-Infrared Frequency Comb from a Ring Quantum Cascade Laser*
- 11:50 Johannes Hillbrand, Aaron Maxwell Andrews, Hermann Detz, Harald Schneider, Gottfried Strasser, Federico Capasso and Benedikt Schwarz  
*Actively mode-locked mid-infrared quantum cascade laser*
- 12:05 Andres Forrer, David Stark, Martin Franckić, Tudor Olariu, Mattias Beck, Jérôme Faist and Giacomo Scalari  
*Injection locking and bi-stable operation of a homogeneous bound-to-continuum THz Quantum Cascade Laser spanning up to 1.65 THz*

### 12:20-13:30 Buffet Lunch

### 14:30-16:00 Session 16: Metasurfaces and Topological Photonics

Chair: Carlo Sirtori

- 14:30 Mercedeh Khajavikhan  
*Topological and Supersymmetric Laser Arrays (Invited)*
- 15:00 Leland Nordin, Kun Li, Andrew Briggs, Evan Simmons, Seth Bank, Viktor Podolskiy and Daniel Wasserman  
*Enhanced Emission from a Long Wavelength Infrared Emitter*
- 15:15 Yue Shen, Christopher Curwen, Luyao Xu and Benjamin Williams  
*THz time-domain characterization of amplifying quantum cascade metasurface*
- 15:30 Ali Basiri, Jing Bai, Xiahui Chen, Jiawei Zuo, Pouya Amrollahi, Joe Carpenter, Zachary Holman, Chao Wang and Yu Yao  
*Circularly Polarized Light Detection Based on Efficient Chip-Integrated Metasurface*

15:45 Nishant Nookala, Sander Mann, Stephen March, Seth Bank, John Klem, Igal Brener, Andrea Alù and Mikhail Belkin  
*Optical power limiting from intersubband polaritonic metasurfaces*

**16:00-16:20 Coffee Break (Exhibition is open)**

**16:20-17:35 Session 17: New Intersubband Materials**

Chair: Gottfried Strasser

- 16:20 Arnaud Jollivet, Maria Tchernycheva, Enrico Di Russo, Lorenzo Rigutti, Miguel Montes Bajo, Julen Tamayo Arrola, Adrian Hierro, Borg Vinter, Nolwenn Le Biavan, Maxime Hugues, Jean-Michel Chauveau and Francois Julien  
*Room temperature excitonic transitions induced by intersubband absorption in m-plane ZnO/ZnMgO quantum wells.*
- 16:35 Thomas Grange, David Stark, Giacomo Scalari, Jérôme Faist, Luca Persichetti, Monica De Seta, Luciana Di Gaspare, Giovanni Capellini, Douglas Paul, Michele Ortolani, Stefan Birner and Michele Virgilio  
*Comparing III-V and group-IV terahertz quantum cascade lasers using non-equilibrium Green's functions*
- 16:50 Trang Nguyen, Alexander Senichev, Brandon Dzuba, Yang Cao, Michael Manfra and Oana Malis  
*Non-polar strain-balanced AlGaN/InGaN superlattices for infrared optoelectronic devices*
- 17:05 Monica De Seta, Michele Montanari, Chiara Ciano, Luca Persichetti, Luciana Di Gaspare, Michele Virgilio, Giovanni Capellini, Marvin Zoellner, Oliver Skibitzki, David Stark, Giacomo Scalari, Jerome Faist, Douglas J. Paul, Thomas Grange, Stefan Birner, Oussama Moutanabbir, Samik Mukherjee, Leonetta Baldassarre and Michele Ortolani  
*High-quality n-type Ge/SiGe multilayers for room temperature THz emission*
- 17:20 David Stark, Luca Persichetti, Michele Montanari, Chiara Ciano, Luciana Di Gaspare, Monica De Seta, Marvin Zoellner, Oliver Skibitzki, Giovanni Capellini, Michele Ortolani, Leonetta Baldassarre, Michele Virgilio, Thomas Grange, Stefan Birner, Kirsty Rew, Douglas Paul, Jérôme Faist and Giacomo Scalari  
*Si-based n-type Quantum Cascade Structures for THz Emission*

**19:00-22:00 Banquet**

Banquet will be held at the Ojai Valley Inn and Spa in the Hacienda Ballroom.

Award for Best Student Poster will be presented by the conference chairs along with DRS Daylight Solutions.

**Friday, September 20<sup>th</sup>**

**09:00-10:30 Session 18: Detection**

Chair: Daniel Wasserman

- 09:00 David Ting  
*Type-II superlattice unipolar barrier infrared detectors (Invited)*
- 09:30 Azzurra Bigioli, Djamal Gacemi, Daniele Palaferri, Yanko Todorov, Angela Vasanelli and Carlo Sirtori  
*Mixing properties of room temperature patch-antenna receivers in a mid-infrared (9  $\mu$ m) heterodyne system*
- 09:45 Changyun Yoo, Mengchen Huang, Jonathan Kawamura, Ken West, Boris Karasik, Loren Pfeiffer and Mark Sherwin  
*Tunable Antenna-Coupled Intersubband Terahertz (TACIT) Mixers*
- 10:00 Borislav Hinkov, Arnaud Jollivet, Hanh T. Hoang, Stefano Pirodda, Maria Tchernycheva, Raffaele Colombelli, Maxime Hugues, Nolwenn Le Biavan, Miguel Montes Bajo, Adrian Hierro, Jean-Michel Chauveau, Gottfried Strasser and Francois H. Julien  
*Quantum cascade detectors based on non-polar ZnO/ZnMgO quantum wells*
- 10:15 Johannes Hillbrand, Sandro Dal Cin, Aaron Maxwell Andrews, Hermann Detz, Erich Gornik, Benedikt Schwarz and Gottfried Strasser  
*High bandwidth quantum cascade detectors*

**10:30-10:50 Coffee Break**

Award for Best Student Presentation will be presented by the conference chairs along with DRS Daylight Solutions.

**10:50-12:20 Session 19: New Physics**

Chair: Mark Sherwin

- 10:50 Ileana-Cristina Benea-Chelmus, Francesca Fabiana Settembrini, Giacomo Scalari and Jerome Faist  
*Electric field correlation measurements on the electromagnetic vacuum state (Invited)*

- 11:20 Takuma Tsurugaya, Kenji Yoshida and Kazuhiko Hirakawa  
*Ultranarrow intersublevel transitions in carbon nanotube quantum dots*
- 11:35 Jacob Khurgin  
*Malleable Polaritons: Wannier Exciton-Plasmon Coupling*
- 11:50 Haoliang Qian, Shilong Li and Zhaowei Liu  
*Large optical nonlinearities in metallic quantum wells*
- 12:05 Aniela Dunn, Caroline Poyser, Aleksandar Demic, Paul Dean, **Alexander Valavanis**, Dragan Indjin, Mohammed Salih,  
Iman Kundu, Lianhe Li, Andrey Akimov, Alexander Giles Davies, Edmund Linfield, John Cunningham and Anthony Kent  
*High-speed modulation of a terahertz-frequency quantum-cascade laser using coherent acoustic phonon pulses*

**12:20 Closing Remarks**

## Poster Session

- 1 Eleanor Nuttall, Yingjun Han, Nick Brewster, Matthew Oldfield, Lianhe Li, Alexander Giles Davies, Edmund Linfield, Brian Ellison, Paul Dean, Daniel Stone, Julia Lehman and Alexander Valavanis  
*Analysis of deuteration reactions using self-mixing in a terahertz quantum-cascade laser*
- 2 Esam Zafar, Olivier Auriacombe, Thomas Rawlings, Nick Brewster, Matthew Oldfield, Yingjun Han, Lianhe Li, Edmund Linfield, Alexander Giles Davies, Brian Ellison, Paul Dean and Alexander Valavanis  
*Electromagnetic modelling of a terahertz-frequency quantum-cascade laser integrated with dual diagonal feedhorns*
- 3 Yezhezi Zhang, Alex Song, Deborah Sivco and Claire Gmachl  
*Loss Compensation Scheme Using Metamaterials with a Quantum Cascade Structure*
- 4 Sara Kacmoli, Yezhezi Zhang, Mei Chai Zheng, Abanti Basak, Deborah Sivco and Claire Gmachl  
*Low Inversion Active Region Design for Quantum Cascade Superluminescent Emitters*
- 5 Ming Lyu, Loren Pfeiffer, Ken West and Claire Gmachl  
*Long-wave Infrared ( $\lambda \sim 14\text{-}20\mu\text{m}$ ) GaAs/Al<sub>0.33</sub>Ga<sub>0.67</sub>As Quantum Cascade Lasers*
- 6 Paris Blaisdell-Pijuan, Claire Gmachl, Sankaran Sundaresan, and Bruce Koel  
*Broadband Mid-Infrared Scattering of Highly Porous Alumina Catalytic Support*
- 7 Borislav Hinkov, Jakob Hayden, Rolf Szedlak, Pedro Martin-Mateos, Borja Jerez, Pablo Acedo, Bernhard Lendl and Gottfried Strasser  
*High frequency modulation of mid-IR ring and ridge DFB Quantum Cascade Lasers*
- 8 Moritz Wenclawiak, Benedikt Limbacher, Christian Georg Derntl, Aaron Maxwell Andrews, Gottfried Strasser, Karl Unterrainer and Juraj Darmo  
*Superradiant meta-atoms strongly coupled to intersubband transitions*
- 9 Johannes Hillbrand, Dominik Auth, Marco Piccardo, Federico Capasso, Gottfried Strasser, Stefan Breuer and Benedikt Schwarz  
*Frequency comb dynamics of ultrafast quantum dot lasers*
- 10 Chao Xu, Siyi Wang, Hosung Kim, Zbigniew Wasilewski and Dayan Ban  
*A 3.3 THz patch antenna terahertz photodetector*
- 11 Boyu Wen, Chao Xu, Siyi Wang, Sm Shazzad Rassel, Manasa Kaniselvan, Chris Deimert, Zbigniew Wasilewski and Dayan Ban  
*Novel 4-well THz QCL with hybrid injection/extraction channels*
- 12 Kai Xi Wang, Stephen Hughes and Dayan Ban  
*Influence of electron-phonon scattering in quantum dot cascade lasers*
- 13 Martin Franckie, Johannes Popp, Michael Haider, Christian Jirauschek and Jerome Faist  
*Numerical Optimization of Mid-IR QCL Frequency Combs*
- 14 Tudor Olariu, Mattias Beck, Jerome Faist and Giacomo Scalari  
*Dispersion measurements of Terahertz Quantum Cascade Fabry-Perot cavities and VECSELS*
- 15 Ileana-Cristina Benea-Chelmus, Yannick Salamin, Francesca Fabiana Settembrini, Yuriy Fedoryshyn, Wolfgang Heni, Delwin L. Elder, Larry Dalton, Juerg Leuthold and Jerome Faist  
*Integrated ultrasensitive broadband terahertz field detectors in silicon photonics*
- 16 Bagolini, Montanari, Ciano, Persichetti, Di Gaspare, Capellini, Zoellner, Skibitzki, Stark, Scalari, Faist, Paul, Grange, Birner, Baldassarre, Ortolani, De Seta and Michele Virgilio  
*Optically pumped n-type Ge/SiGe asymmetric coupled quantum wells for THz emission*
- 17 Laurent Boulley, Adel Bousseksou, Thomas Maroutian, Raffaele Colombelli, Andrey Babichev, Anton Egorov and Grigorii Sokolovskii  
*Tunable Mid-Infrared Metasurfaces on III-V semiconductors*
- 18 Claire Abadie, Stefano Pirotta, Lianhe Li, Xavier Lafosse, Bruno Paulillo, Edmund Linfield, Alexander Giles Davies and Raffaele Colombelli  
*THz sub-wavelength detectors and lasers based on LC resonators*
- 19 F Joint, G Gay, Pierre-Baptiste Vigneron, T Vacelet, Stefano Pirotta, R Lefevre, Y Jin, Lianhe Li, Ag Davies, Eh Linfield, Y Delorme and Raffaele Colombelli  
*Highly Sensitive and Compact THz heterodyne receiver based on HEB and QCL at 2.7 THz*



- 20 Heinrich A.M. Leymann, Jacopo Nespolo and Iacopo Carusotto  
*Coulomb induced nonlinear response of intersubband transitions*
- 21 Li Wang, Tsung-Tse Lin, Ke Wang, Thomas Grange and Hideki Hirayama  
*Experimental and theoretical study of piezoelectric polarization in GaN/AlGaIn terahertz quantum cascade lasers*
- 22 Joosun Yun and Hideki Hirayama  
*Level broadening by dipole scattering in AlGaIn/ AlGaIn superlattice structures*
- 23 Hiroaki Yasuda, Norihiko Sekine, Akifumi Kasamatsu and Iwao Hosako  
*Epitaxial growth of InGaSb layers on GaSb substrates for fabrication of InGaSb-based THz-QCLs*
- 24 Hayashi, Saito and Sekine  
*Optical Heterodyne Detection of Quasi-CW Terahertz-wave from THz-QCL*
- 25 Ziping Li, Wenjian Wan, Kang Zhou, Xiaoyu Liao, Juncheng Cao and Hua Li  
*On-chip dual-comb semiconductor-based terahertz sources under double microwave injections*
- 26 Michael Riesch and Christian Jirauschek  
*Modeling and Simulation of Mode Locking in Quantum Cascade Lasers*
- 27 Anthony Kim, Christopher Curwen, Luyao Xu, John Reno and Benjamin Williams  
*Terahertz polarization imaging using quantum cascade laser*
- 28 David Burghoff, Ningren Han and Jae Ho Shin  
*Performing coherent dual comb spectroscopy with an incoherent signal*
- 29 Owen Dominguez, Leland Nordin, Junchi Lu, Daniel Wasserman and Anthony Hoffman  
*Multimode, mid-infrared optical antennas with a near-monochromatic response*
- 30 Irfan Khan, Evan P. Gies, Ryan K. Roeder and Anthony J. Hoffman  
*Far-Infrared Optical Modes in ZnO Nanoparticles*
- 31 Volker Sorger, Hasan Göktas, Gökhan and Rishi Maiti  
*Electrical-Driven Light Emitting Tunnel Junction*
- 32 Denizhan Ekin Önder, Alex Arash Sand Kalaei, Andreas Wacker, Emmanuel Dupont and David O. Winge  
*Oscillating E-field Domains in Quantum Cascade Lasers with Chaotic Bias Output*
- 33 Alsu Zubairova, Martin Wienold and Heinz-Wilhelm Hübers  
*QCL-pumped terahertz gas laser at 66  $\mu\text{m}$*
- 34 Natalie Rozman, Nicholas Caira, Kebin Fan and Willie Padilla  
*High-Quality Factor Bound-States-in-the-Continuum Modes for THz Biosensing*
- 35 Francesco Pisani  
*Simulative Investigation of Graphene Intersubband Polaritons*
- 36 Sebastian Schoenhuber, Martin A. Kainz, Benedikt Limbacher, Dominik Theiner, Michael Jaidl, Aaron Maxwell Andrews, Hermann Detz, Gottfried Strasser, Juarj Darmo and Karl Unterrainer  
*Optical Tuning of Terahertz Quantum Cascade Random Lasers*
- 37 Zeineb Loghmari, Roland Teissier, Michael Bahriz and Baranov Alexei  
*Dual single-frequency far infrared (17.5 and 19.5  $\mu\text{m}$ ) emission from InAs-based distributed feedback double metal waveguide quantum cascade laser*
- 38 Andrew Paulsen and Qing Hu  
*Integrated Silicon Horn used in a THz-QCL Amplifier*
- 39 B. J. Pandey, K. P. Clark, F. Abbas, E. Fuchs, K. Lascola, D. Hinojos, K. Hodges, D. I. Robbins, J.-F. Veyan, Q. Gu and K. Roodenko  
*Infrared Scanning Near-Field Optical Microscopy for Thermal Profiling of Quantum Cascade*
- 40 Sebastian Gies, Raktim Sarma, Michael Goldflam, John Klem, and Igal Brener  
*Light-matter interaction in the near-infrared between a plasmonic metasurface and InAs/AlSb semiconductor heterostructures*
- Jacob Khurgin and Velat Kilic (Withdrawn)  
*Detecting and unraveling THz fields with graphene and deep learning*
- Jinchuan Zhang, Dongbo Wang and Ning Zhuo (Withdrawn)  
*Improved performance of InP-based 2.1  $\mu\text{m}$  InGaAsSb quantum well lasers by direct Sb doping*
- Zenghui Gu, Jinchuan Zhang and Fengqi Liu (Withdrawn)  
*Broadband and continuous spectrum generation in quantum dot cascade lasers*

# Conference Schedule

Time	Sunday, 15-Sep	Monday, 16-Sep	Tuesday, 17-Sep	Wednesday, 18-Sep	Thursday, 19-Sep	Friday, 20-Sep	
08:30 - 09:00		Session 1: Welcome and Plenary Talk 8:30 - 9:30	Session 6: Polaritons I 8:30 - 10:25	Session 10: Plenary Talk 8:45 - 9:30	Session 13: Industry Talk (9:00 - 9:10)	Session 18: Detection 9:00 - 10:30	
09:00 - 09:30							Session 2: Nanoscopy 9:30 - 10:30
09:30 - 10:00		Coffee (10:30 - 10:50)		Coffee (10:30 - 10:50)	Coffee (10:30 - 10:50)		
10:00 - 10:30			Session 3: Terahertz Quantum Cascade Lasers 10:50 - 12:20				Session 7: Polaritons II 10:50 - 12:15
10:30 - 11:00		Lunch 12:20 - 13:30		Lunch 12:20 - 13:30	Excursion 13:00 - 20:00		
11:00 - 11:30			Session 4: Terahertz Quantum Cascade Laser Dynamics and Locking 13:30 - 15:00			Session 8: Polaritons III 14:00 - 15:55	Session 16: Metasurfaces and Topological Photonics 14:30 - 16:00
11:30 - 12:00		Session 9: Poster Session 16:00 - 18:00		Session 17: New Intersubband Materials 16:20 - 17:35			
12:00 - 12:30			Welcome Reception 18:00 - 20:00		Session 5: 2D Materials 19:00 - 20:30	Banquet 19:00 - 22:00	
12:30 - 13:00		Banquet 19:00 - 22:00					
13:00 - 13:30			Banquet 19:00 - 22:00				
13:30 - 14:00		Banquet 19:00 - 22:00					
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