



International Quantum Cascade Lasers School and Workshop
 Sunday 4 – Friday 9 September 2016
 Cambridge, UK

PROGRAMME

Dates and times of programmed sessions all subject to change

SUNDAY 4 SEPTEMBER 2016	
16:00 – 18:00	Registration
18:00 – 19:30	Welcome Reception
MONDAY 5 SEPTEMBER 2016	
09:00 – 09:15	Welcome and Opening Remarks
09:15 – 10:45	Tutorial Sessions 1 and 2 Chair: Mikhail Belkin (University of Texas at Austin, USA)
09:15 – 10:00	Physical principles of quantum cascade lasers Carlo Sirtori
10:00 – 10:45	Material systems for QC devices: design, growth and fabrication Gottfried Strasser
10:45 – 11:15	<i>Coffee and Poster Session 1</i>
11:15 – 12:45	Tutorial Sessions 3 and 4 Chair: Edmund Linfield (University of Leeds, UK)
11:15 – 12:00	Shaping the emission of quantum cascade lasers Alessandro Tredicucci
12:00 – 12:45	Linear and non-linear gain in quantum cascade laser active regions Jérôme Faist
12:45 – 13:45	<i>Lunch</i>
13:45 – 15:45	<i>Punting on the Backs / Walking tour of Cambridge</i>
15:45 – 16:15	<i>Tea</i>
16:15 – 17:45	Tutorial Sessions 5 and 6 Chair: Giles Davies (University of Leeds, UK)
16:15 – 17:00	Modelocking of quantum cascade lasers Sukhdeep Dhillon
17:00 – 17:45	THz QCL frequency combs and phased arrays through global antenna mutual coupling Qing Hu
17:45 – 18:15	<i>Refreshments and Poster Session 1</i>
18:15	<i>End of day one</i>
19:00	<i>Dinner</i>
TUESDAY 6 SEPTEMBER 2016	
09:00 – 10:30	Tutorial Sessions 7 and 8 Chair: Heinz-Wilhelm Hübers (German Aerospace Center, Germany)
09:00 – 09:45	Self-mixing effects in quantum cascade lasers: from theory to applications Paul Dean
09:45 – 10:30	Terahertz technology – a view from space Brian Ellison
10:30 – 11:00	<i>Coffee and Poster Session 1</i>
11:00 – 12:30	Tutorial Sessions 9 and Panel Discussion Chair: Miriam Vitiello (CNR Pisa, Italy)
11:00 – 11:45	Challenges and rewards of commercializing terahertz technology – past, present and future Don Arnone
11:45 – 12:30	Panel Discussion
12:30 – 13:30	<i>Lunch</i>
13:30 – 15:15	<i>Free time / laboratory visit</i>
15:15 – 17:15	Workshop Session 1 Chair: Sir Michael Pepper (University College London, UK)
15:15 – 15:30	Opening Remarks
15:30 – 16:15	Multimode quantum cascade laser as a self-pumped parametric oscillator (keynote) Tobias Mansuripur and Federico Capasso (Harvard University, USA)
16:15 – 16:45	Paper 98 THz quantum cascade: from high power devices to broadband amplifiers (invited) Karl Unterrainer
16:45 – 17:00	Paper 14 Towards room temperature operation: high barrier terahertz quantum cascade lasers Asaf Albo and Qing Hu
17:00 – 17:15	Paper 26 Superlattice gain in positive differential conductivity region David Winge, Martin Franckié and Andreas Wacker
17:15 – 18:30	<i>Refreshments and Poster Session 1</i>
18:30	<i>End of day two</i>
19:30	<i>Dinner</i>

WEDNESDAY 7 SEPTEMBER 2016

08:30 – 10:15	Workshop Session 2 Chair: Paul Dean (University of Leeds, UK)	
08:30 – 09:15	Infrared near-field nanoscopy (keynote) Fritz Keilmann (Ludwig-Maximilians-Universität, Germany)	
09:15 – 09:30	Paper 53	Infrared nanospectroscopy and imaging in liquid Mingzhou Jin, Feng Lu and Mikhail Belkin
09:30 – 09:45	Paper 63	Quartz tuning fork with improved sensing performance for terahertz quartz-enhanced photoacoustic sensors Angelo Sampaolo, Pietro Patimisco, Marilena Giglio, Miriam Serena Vitiello, Gaetano Scamarcio, Frank K. Tittel and <u>Vincenzo Spagnolo</u>
09:45 – 10:00	Paper 12	Frequency instabilities of terahertz quantum-cascade lasers induced by optical feedback Heinz-Wilhelm Hübers, Heiko Richter, Rene Eichholz, Martin Wienold, Klaus Biermann, Lutz Schrottke and Holger T. Grahn
10:00 – 10:15	Paper 83	Laser feedback interferometry with THz QCLs: analysis of organic and biological materials Aleksandar Rakić, Yah Leng Lim, Thomas Taimre, Gary Agnew, Xiaoqiong Qi, Karl Bertling, She Han, Stephen Wilson, Andrew Grier, Zoran Ikonjić, Alexander Valavanis, Paul Dean, Jonathan Cooper, Suraj Khanna, Mohammad Lachab, Edmund Linfield, Giles Davies, Paul Harrison, Tarl Prow, Dragan Indjin and Peter Soyer
10:15 – 10:45	<i>Coffee and Poster Session 2</i>	
10:45 – 12:45	Workshop Session 3 Chair: Jérôme Faist (ETH Zurich, Switzerland)	
10:45 – 11:15	Paper 102	Integrated terahertz graphene modulator with 100% modulation depth (invited) <u>Qi Jie Wang</u> (Nanyang Technological University, Singapore), Guozhen Liang, Xiaonan Hu, Xuechao Yu, Youde Shen, Lianhe H. Li, Alexander Giles Davies, Edmund H. Linfield, Hou Kun Liang, Ying Zhang and Siu Fung Yu
11:15 – 11:30	Paper 62	Planar antenna arrays for the external high speed modulation of terahertz quantum cascade lasers David Jessop, Stephen Kindness, Long Xiao, Yuan Ren, Chris Ren, Philipp Braeuninger-Weimer, Hungyen Lin, J. Axel Zeitler, Stephan Hofmann, Harvey Beere, David Ritchie and Riccardo Degl'Innocenti
11:30 – 11:45	Paper 88	Terahertz master-oscillator power-amplifier quantum cascade lasers operating in single mode Huan Zhu, Fangfang Wang, Lianhe Li, Quan Yan, Chenren Yu, Jianxin Chen, Edmund Linfield, Giles Davies, Raffaele Colombelli, <u>Gangyi Xu</u> , Li He and Li Chen
11:45 – 12:00	Paper 38	Low divergent, high-power, single-mode terahertz wire lasers Katia Garrasi, Lianhe Li, Fabrizio Castellano, Edmund H. Linfield, A. Giles Davies and Miriam Serena Vitiello. <u>To be presented by Simone Biasco</u>
12:00 – 12:15	Paper 52	Random lasing at far-infrared frequency range Yongquan Zeng, <u>Guozhen Liang</u> , Shampy Mansha, Yidong Chong, Hou Kun Liang, Lianhe Li, Alexander Giles Davies, Edmund Harold Linfield, Ying Zhang and Qi Jie Wang
12:15 – 12:30	Paper 64	Fast room temperature detection of terahertz quantum cascade lasers with bow-tie antenna arrays loaded with graphene <u>Riccardo Degl'Innocenti</u> , Long Xiao, David Jessop, Stephen Kindness, Yuan Ren, Jack Alexander-Webber, Philipp Braeuninger-Weimer, Hannah Joyce, Hungyen Lin, J. Axel Zeitler, Stephan Hofmann, Harvey Beere and David Ritchie
12:30 – 12:45	Paper 69	Room temperature opto-mechanical detection of THz waves <u>Yanko Todorov</u> , Cherif Belacel, Stefano Barbieri, Ivan Favero and Carlo Sirtori
12:45 – 13:15	<i>Lunch (delegates to collect lunch boxes for the excursion trip)</i>	
13:15 – 17:15	<i>Excursion to the Imperial War Museum, Duxford</i>	
17:15	<i>End of day three Delegates free to make their own arrangements for dinner</i>	

THURSDAY 8 SEPTEMBER 2016

08:30 – 10:30	Workshop Session 4 Chair: Karl Unterrainer (TU Wien, Austria)	
08:30 – 09:00	Paper 108	Terahertz frequency synthesis using telecommunications wavelength frequency combs (invited) Alwyn Seeds, L. Ponnampalam, J. Freeman, C. Renaud, E. Linfield, G. Davies
09:00 – 09:15	Paper 9	Pulsed THz dual-comb spectroscopy using quantum cascade laser combs Yang Yang, David Burghoff, John Reno and Qing Hu
09:15 – 09:30	Paper 29	On-chip dual-comb source based on terahertz quantum cascade laser Markus Roesch, Giacomo Scalari, Gustavo Villares, Martin J. Süess, Lorenzo Bosco, Mattias Beck and Jerome Faist
09:30 – 09:45	Paper 7	Study of the frequency stability of a quantum cascade laser frequency comb Francesco Cappelli, Giulio Campo, Iacopo Galli, Giovanni Giusfredi, Saverio Bartalini, Davide Mazzotti, Pablo Cancio, Simone Borri, Borislav Honkov, Jérôme Faist and Paolo De Natale
09:45 – 10:00	Paper 40	Dispersion and mode control of broadband terahertz quantum cascade lasers Dominic Bachmann, Markus Rösch, Giacomo Scalari, Martin Süess, Mattias Beck, Jerome Faist, Karl Unterrainer and Juraj Darmo
10:00 – 10:15	Paper 58	Gain recovery time in a terahertz quantum cascade laser David R. Bacon, Joshua R. Freeman, Reshma A. Mohandas, Lianhe Li, Edmund H. Linfield, A. Giles Davies and Paul Dean
10:15 – 10:30	Paper 93	Short pulse generation from active mode-locked THz quantum cascade lasers Hanond Nong, Feihu Wang, Kenneth Maussang, Souad Moudmji, Raffaele Colombelli, Joshua Freeman, Iman Kundu, Lianhe Li, Edmund Linfield, Giles Davies, Juliette Mangeney, Jérôme Tignon and Sukhdeep Dhillon
10:30 – 11:00	<i>Coffee and Poster Session 2</i>	
11:00 – 13:00	Workshop Session 5 Chair: Carlo Sirtori (Paris 7, France)	
11:00 – 11:30	Paper 96	Recent advances in ultrastrong coupling with Landau polaritons (invited) Giacomo Scalari, Janine Keller, Gianlorenzo Paravicini-Bagliani, Curdin Maissen, Sara Cibella, Roberto Leoni, Mattias Beck and Jerome Faist
11:30 – 11:45	Paper 85	Room temperature strong light-matter coupling in 3D THz meta-atoms Bruno Paulillo, Jean-Michel Manceau, Lianhe Li, Alexander Giles Davies, Edmund Linfield and Raffaele Colombelli
11:45 – 12:00	Paper 70	Towards strong light-matter coupling at the single-resonator level with sub-wavelength mid-infrared plasmonic nano-antennas Raffaele Colombelli, Mario Malerba, Tommaso Ongarello, Bruno Paulillo, Jean-Michel Manceau, Francesco De Angelis, Gregoire Beaudoin and Isabelle Sagnes
12:00 – 12:15	Paper 82	Flat nonlinear optics: second-harmonic metasurfaces with record nonlinear response and continuous phase control Nishant Nookala, Jongwon Lee, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Frederic Demmerle, Gerhard Boehm, Kueifu Lai, Gennady Shvets, Markus-Christian Amann, Andrea Alu and Mikhail Belkin
12:15 – 13:00	Why we need programmable coherent THz radiation (keynote) Gabriel Aepli (ETH Zurich, Switzerland)	
13:00 – 14:00	<i>Lunch</i>	
14:00 – 16:00	Workshop Session 6 Chair: Gottfried Strasser (TU Wien, Austria)	
14:00 – 14:45	Terahertz quantum cascade lasers: photonic engineering solution for high-precision spectroscopy (keynote) Miriam S. Vitiello (CNR Pisa, Italy)	
14:45 – 15:00	Paper 57	Hybrid quantum cascade lasers Seungyong Jung, Jae Hyun Kim, Yifan Jiang, Karun Vijayraghavan and Mikhail A. Belkin
15:00 – 15:15	Paper 92	Carrier-leakage suppression and efficient carrier extraction via step-taper active-region mid-IR QCLs Jeremy Kirch, Chun-Chieh Chang, Colin Boyle, Kevin Oresick, Christopher Sigler, Luke Mawst, Don Lindberg, Thomas Earles and Dan Botez
15:15 – 15:30	Paper 104	Recent progress of ICLs for sensing applications Lars Hildebrandt, Michael Legge, Nicolas Koslowski, Marc Fischer, Michael von Edlinger, Julian Scheuermann, Steffen Becker, Lars Nähle, Wolfgang Zeller, Robert Weih, Johannes Koeth, Martin Kamp and Sven Höfling. Presented by Oliver Konig
15:30 – 16:00	<i>Late news paper</i>	
16:00 – 17:30	<i>Refreshments and Poster Session 2</i>	
17:30	<i>End of day four</i>	
18:30 – 19:00	<i>Organ recital</i>	
19:00 – 19:30	<i>Drinks reception</i>	
19:30	<i>Banquet</i>	

FRIDAY 9 SEPTEMBER 2016

08:30 – 10:15	Workshop Session 7 Chair: Alessandro Tredicucci (NEST, Pisa, Italy)	
08:30 – 09:00	Paper 44	Continuous wave operation of far infrared InAs/AlSb quantum cascade lasers at room temperature (invited) Alexei Baranov, Michael Bahriz and Roland Teissier
09:00 – 09:15	Paper 4	Monolithic widely tunable mid-infrared quantum cascade lasers Yves Bidaux, Alfredo Bismuto, Camille Tardy, Stéphane Blaser, Romain Terazzi, Tobias Gresch, Antoine Müller and Jérôme Faist
09:15 – 09:30	Paper 6	Terahertz GaAs/AlAs quantum-cascade lasers Lutz Schrottke, Xiang Lu, Guillermo Rozas, Klaus Biermann and Holger T. Grahn
09:30 – 09:45	Paper 48	High-power GaAs/AlGaAs quantum cascade lasers with emission in the frequency range 4.7–5.6 THz Lianhe Li, Iman Kundu, Paul Dean, Edmund H. Linfield, and A. Giles Davies
09:45 – 10:00	Paper 11	High performance InGaAs-based terahertz quantum cascade lasers Michael Krall, Martin A. Kainz, Martin Brandstetter, Christoph Deutsch, Sebastian Schoenhuber, Don MacFarland, Tobias Zederbauer, Hermann Detz, Aaron Maxwell Andrews, Werner Schrenk, Gottfried Strasser and Karl Unterrainer
10:00 – 10:15	Paper 30	Real-time spectroscopy using broadband tunable external cavity QCLs with MOEMS diffraction gratings Lorenz Butschek, Jan Jarvis, André Merten, Jan Grahman, Stefan Hugger, Rolf Aidam, Christian Schilling, Quankui Yang, Frank Fuchs, Ralf Ostendorf and Joachim Wagner
10:15 – 11:00	<i>Coffee</i>	
11:00 – 12:45	Workshop Session 8 Chair: Gaetano Scamarcio (University of Bari, Italy)	
11:00 – 11:30	Paper 45	Remote gas sensing with commutable quantum cascade laser and detector on the same Chip (invited) Rolf Szedlak, Andreas Harrer, Benedikt Schwarz, Martin Holzbauer, Johannes Paul Waclawek, Donald Macfarland, Tobias Zederbauer, Hermann Detz, Aaron Maxwell Andrews, Werner Schrenk, Bernhard Lendl and Gottfried Strasser
11:30 – 11:45	Paper 97	Large tuning of single-mode terahertz quantum cascade lasers operating at 78 K Yuan Jin, Chongzhao Wu, John L Reno and Sushil Kumar
11:45 – 12:00	Paper 34	Neighbour multi-colour quantum cascade lasers for trace gas spectroscopy Filippos Kapsalidis, Martin J. Süess, Johanna M. Wolf, Mattias Beck, Morten Hundt, Béla Tuzson, Lukas Emmenegger and Jérôme Faist
12:00 – 12:15	Paper 32	Time-resolved analysis of vernier selection dynamics in coupled-cavity terahertz quantum-cascade lasers Iman Kundu, Feihu Wang, Xiaoqiong Qi, Sukhdeep Dhillon, Joshua Freeman, Alexander Valavanis, Li Chen, Lianhe Li, Dragan Indjin, Jérôme Tignon, Thomas Taimre, Aleksandar Rakic, Paul Dean, Edmund Linfield and Giles Davies
12:15 – 12:45	Paper 15	Quantum cascade lasers integrated on silicon (invited) Alexander Spott, Jon Peters, Michael Davenport, Eric Stanton, Chong Zhang, Charles Merritt, William Bewley, Igor Vurgaftman, Chul Soo Kim, Jerry Meyer, Jeremy Kirch, Luke Mawst, Dan Botez and John Bowers
12:45 – 13:00	<i>Wrap up session and closing remarks</i>	
13:00	<i>Lunch and depart</i>	

POSTER SESSION 1
Monday 5 and Tuesday 6 September 2016

P1.1	High power gain guided broad area quantum cascade lasers Iliia Sergachev, Richard Maulini, Alfredo Bismuto, Stephane Blaser, Tobias Gresch, Romain Terazzi and Antoine Muller
P1.2	Influence of intervalley scattering on performance of GaSb-based THz-QCLs <u>Hiroaki Yasuda</u>
P1.3	High power and single mode quantum cascade lasers <u>Yves Bidaux</u> , Alfredo Bismuto, Stéphane Blaser, Romain Terazzi, Tobias Gresch, Antoine Müller, Christopher Bonzon and Jérôme Faist
P1.4	Investigating the emission characteristics of THz quantum cascade random lasers Martin Brandstetter, <u>Sebastian Schoenhuber</u> , Thomas Hisch, Michael Krall, Martin A. Kainz, Hermann Detz, Aaron Maxwell Andrews, Gottfried Strasser, Stefan Rotter and Karl Unterrainer
P1.5	Origin of multiple lobes in the far-field distribution of terahertz quantum-cascade lasers with single-plasmon waveguides <u>Benjamin Röben</u> , Martin Wienold, Lutz Schrottke and Holger T. Grahn
P1.6	Simulating THz QCLs: trends from samples from different labs David Winge, Martin Franckie and <u>Andreas Wacker</u>
P1.7	Domain formation under operation in terahertz quantum cascade lasers <u>Tim Almqvist</u> , David O. Winge, Martin Franckie, and Andreas Wacker
P1.9	InAs based terahertz quantum cascade lasers <u>Martin A. Kainz</u> , Martin Brandstetter, Tobias Zederbauer, Michael Krall, Sebastian Schönhuber, Hermann Detz, Werner Schrenk, Aaron M. Andrews, Thomas Grange, Gottfried Strasser and Karl Unterrainer
P1.11	A novel patch-array antenna single-mode low electrical dissipation continuous wave terahertz quantum cascade laser <u>Lorenzo Bosco</u> , Christopher Bonzon, Keita Otani, Matthias Justen, Mattias Beck and Jerome Faist
P1.12	Improved resonant phonon-based THz QCL density matrix model <u>Boyu Wen</u> , Jeffrey Watchorn and Dayan Ban
P1.13	Random terahertz quantum cascade resonators <u>Simone Biasco</u> , Lianhe Li, Edmund H. Linfield, A. Giles Davies and Miriam S. Vitiello
P1.14	Strain-compensated AllnAs/InGaAs/InP quantum cascade lasers Kamil Pierściński, Piotr Gutowski, Dorota Pierścińska, Piotr Karbownik, Mikołaj Badura, Olga Serebrennikova, Iwona Sankowska, <u>Magdalena Morawiec</u> , Damian Radziejewicz, Beata Ściana, Ewa Dumiszewska, Marek Wesołowski, Marek Tłaczała, Włodzimierz Strupiński and Maciej Bugajski
P1.15	Investigation of thermal processes and degradation modes in quantum cascade lasers by application of CCD thermorefectance Dorota Pierścińska, <u>Kamil Pierściński</u> , Magdalena Morawiec, Piotr Gutowski, Piotr Karbownik and Maciej Bugajski
P1.16	Modelling of three-well extraction-controlled terahertz frequency quantum cascade lasers using an extended density matrix approach Y. Han, A. Grier, A. Valavanis, L. Li, L. Chen, J. Zhu, J. Freeman, P. Dean, A. Davies and E. Linfield
P1.17	Quasi-continuous tuning in coupled cavity terahertz quantum cascade lasers with an integrated photonic lattice <u>Iman Kundu</u> , Alexander Valavanis, Li Chen, Lianhe Li, Paul Dean, Edmund Linfield and Alexander Giles Davies
P1.18	Frequency selection in mid-IR quantum cascade lasers using built-in meta-surfaces <u>Pierre Laffaille</u> , Laurent Bouley, Adel Bousseksou, Gregoire Beaudoin, Isabelle Sagnes and Raffaele Colombelli
P1.19	Influence of nonparabolicity and external magnetic field on dipole matrix elements in quantum cascade laser structure <u>Aleksandar Demic</u> , Jelena Radovanovic and Vitomir Milanovic
P1.20	Efficient waveguided THz QCL delivery system utilising flexible dielectric-lined hollow metallic waveguides <u>Robert Wallis</u> , Riccardo Degl'Innocenti, David Jessop, Yuan Ren, Oleg Mitrofanov, Carlos Bledt, Jeffrey Melzer, James Harrington, Harvey Beere and David Ritchie
P1.21	Substrate-emitting ring quantum cascade laser array with distributed feedback metal gratings <u>Martin Holzbauer</u> , Rolf Szedlak, Donald Macfarland, Tobias Zederbauer, Hermann Detz, Aaron Maxwell Andrews, Werner Schrenk and Gottfried Strasser
P1.22	Reactive ion etching of ZnO epilayers for resonant tunneling diodes and quantum cascade structures <u>Borislav Hinkov</u> , Daniela Ristanic, Werner Schrenk, Maxime Hugues, Jean-Michel Chauveau and Gottfried Strasser
P1.23	Short-wave infrared intersubband polaritons in the GaN/AlN system <u>Thibault Laurent</u> , Jean-Michel Manceau, Eva Monroy, Caroline Lim, Stéphanie Rennesson, Fabrice Semond, Francois Julien and Raffaele Colombelli

P1.24	Long term reliability study and life time model of quantum cascade lasers Feng Xie, Hong-Ky Nguyen, Herve Leblanc, Larry Hughes and Kevin Lascola
P1.26	Towards high performance terahertz frequency quantum cascade lasers Lianhe Li, Li Chen, Joshua R. Freeman, Rui Dong, Paul Dean, <u>Edmund H. Linfield</u> , and A. Giles Davies
P1.27	Frequency tuning of third-order distributed feedback terahertz quantum cascade lasers by SiO₂ and PMMA <u>Behnam Mirzaei</u> , D.J. Hayton, David Thoen, Jian-Rong Gao, T. Y Kao, Qing Hu and John Reno
P1.28	Modeling coherent transport in QCLs without an artificially localized basis Andrew Pan, Benjamin Burnett and Benjamin Williams
P1.29	Hybrid waveguide terahertz quantum cascade laser <u>Tobias Fobbe</u> , Hanond Nong, Rüdiger Schott, Shovon Pal, Sergej Markmann, Negar Hekmat, Jingxuan Zhu, Yingjun Han, Lianhe Li, Paul Dean, Edmund Linfield, Giles Davies, Andreas Wieck and Nathan Jukam
P1.30	Peculiarities of focusing of THz QCL-s radiation <u>Ekaterina Orlova</u>

POSTER SESSION 2
Wednesday 7 and Thursday 8 September 2016

P2.1	Low flicker intensity-noise in quantum-cascade lasers with designed impurity-doping <u>Shohei Hayashi</u> , Tooru Hirohata, Kazunori Tanaka, Kazuue Fujita and Masamichi Yamanishi
P2.2	Hybrid intersubband surface plasmon polaritons in subwavelength planar plasmonic resonators <u>Miroslaw Zaluzny</u>
P2.3	Quantum-cascade laser for the terahertz array heterodyne spectrometer on SOFIA Heiko Richter, Martin Wienold, Klaus Biermann, Lutz Schrottke, Holger T. Grahn and <u>Heinz-Wilhelm Hübers</u>
P2.4	Fast spectral terahertz imaging through frequency tuning in a quantum-cascade laser <u>Till Hagelschuer</u> , Nick Rothbart, Heiko Richter, Martin Wienold, Lutz Schrottke, Holger T. Grahn and Heinz-Wilhelm Hübers
P2.5	Real-time, phase-sensitive terahertz imaging through self-mixing in a quantum-cascade laser <u>Martin Wienold</u> , Till Hagelschuer, Lutz Schrottke, Klaus Biermann, Holger T. Grahn and Heinz-Wilhelm Hübers
P2.6	Analysis of operating regimes of terahertz QCL frequency combs <u>Petar Tzenov</u> , David Burghoff, Qing Hu and Christian Jirauschek
P2.7	Bow-tie cavity for THz light <u>Annamaria Campa</u> , Luigi Consolino, Saverio Bartalini, Davide Mazzotti, Miriam Serena Vitiello and Paolo De Natale
P2.8	Multimode dynamics of a THz QCL: coherent and irregular regimes Lorenzo Columbo and Massimo Brambilla. <u>To be presented by Gaetano Scamarcio</u>
P2.9	Spectra characterisation of a Terahertz QCL through self-mixing J. Keeley, J. Freeman, A. Valavanis, R. Mohandas, K. Bertling, T. Taimre, Y. L. Lim, L. H. Li, D. Indjin, A. D. Rakić, E. H. Linfield, A. G. Davies, and P. Dean
P2.10	QCL-based dual comb heterodyne spectroscopy from diffusely scattering surfaces <u>M.G.Allen</u> , J.M.Brown, J.R.Dupuis, J.M.Hensley, P.Jouy, G. Villares, M. Beck, J.Faist, M.Geiser, and A.Hugi
P2.11	A proposal and simulation for phase-locked THz-QCLs array by mutual injection of the optical fields Ning Yang, Iman Kundu, Yan Xie, Weidong Chu, <u>Alexander Valavanis</u> and Edmund Linfield
P2.12	High performance quantum cascade detector array for CO2 detection <u>Andreas Harrer</u> , Benedikt Schwarz, Rolf Szedlak, Simone Schuler, Hermann Detz, Aaron Maxwell Andrews, Tobias Zederbauer, Donald Macfarland, Werner Schrenk and Gottfried Strasser
P2.13	Terahertz meta-atom quantum well photo-detectordeep Bruno Paulillo, <u>Stefano Pirotta</u> , Lianhe Li, Stéphane Guilet, Edmund Linfield, Giles Davies and Raffaele Colombelli
P2.14	Interferometry via thermal modulation in low duty cycle pulsed terahertz QCLs Gary Agnew, Andrew Grier, Thomas Taimre, Yah Leng Lim, Karl Bertling, Zoran Ikonić, Alexander Valavanis, Paul Dean, Jonathan Cooper, Suraj Khanna, Mohammad Lachab, Edmund Linfield, Giles Davies, Paul Harrison, <u>Dragan Indjin</u> and Aleksandar Rakić
P2.15	Cavity-induced slow gain recovery in pump-probe experiments of quantum cascade lasers Muhammad Anisuzzaman Talukder, <u>Paul Dean</u> , Edmund Linfield and A. Giles Davies
P2.18	Self-pulsations in QCLs <u>Nikola Vukovic</u> , Jelena Radovanovic, Vitomir Milanovic and Dmitri Boiko
P2.19	Integrated THz QCL local oscillators for the LOCUS atmospheric sounder <u>Alexander Valavanis</u> , Yingjun Han, Olivier Auriacombe, Thomas Rawlings, Rui Dong, Byron Alderman, Matthew Oldfield, Nick Brewster, Lianhe Li, Peter Huggard, Alexander Giles Davies, Brian Ellison and Edmund Linfield
P2.20	Noninvasive, in vivo monitoring of glucose concentrations using mid-infrared quantum cascade laser spectroscopy <u>Alexandra Werth</u> , Sabbir Liakat, Anqi Dong, Yezhezi Zhang and Claire Gmachl
P2.21	Coupled transmission line/Maxwell-Bloch simulation approach for analysis of active mode locking in terahertz quantum cascade lasers <u>Petar Tzenov</u> , David Burghoff, Michael Riesch, Qing Hu and Christian Jirauschek
P2.22	Origin of terminal voltage variations due to self-mixing in a terahertz frequency quantum cascade laser <u>Andrew Grier</u> , Paul Dean, Alexander Valavanis, James Keeley, Iman Kundu, Jonathan Cooper, Gary Agnew, Thomas Taimre, Yah Leng Lim, Karl Bertling, Aleksandar Rakić, Paul Harrison, Lianhe Li, Edmund Linfield, Zoran Ikonić, Giles Davies and Dragan Indjin
P2.23	Modelling of mode competition characteristics in coupled-cavity terahertz quantum cascade lasers using multi-mode reduced rate equations Xiaoqiong Qi, Iman Kundu, <u>Paul Dean</u> , Gary Agnew, Thomas Taimre, Dragan Indjin, Lianhe Li, Edmund Linfield, Giles Davies and Aleksandar Rakić
P2.24	Antenna-coupled two photon quantum well photodetector <u>Daniele Palaferri</u> , Yanko Todorov, Maria Amanti, Lianhe Li, Li Chen, Edmund Harold Linfield and Carlo Sirtori
P2.25	Self-detection mode of scattering-type near-field microscopy with mid-infrared quantum cascade lasers Clemens Liewald, <u>Gaetano Scamarcio</u> , Lorenzo Columbo, Massimo Brambilla and Fritz Keilmann
P2.26	Novel mid-infrared gas sensor based on mutually coupled quantum cascade lasers <u>Andreas Herdt</u> , Adonis Bogris, Dimitris Syvridis and Wolfgang Elsässer

P2.27	Nonlinear frequency mixing in quantum cascade lasers: towards broadband wavelength shifting and THz up-conversion Sarah Houver, Armand Lebreton, Raffaele Colombelli, Lianhe Li, Edmund Linfield, Alexander Giles Davies, Jerome Tignon and Sukhdeep Dhillon
P2.28	Spectroscopic study of difference-frequency nonlinear susceptibility in mid-infrared quantum cascade lasers Yifan Jiang, Seungyong Jung, Jae Hyun Kim, Karun Vijayraghavan and Mikhail A. Belkin
P2.29	Mode selection and tunability of a terahertz quantum cascade laser via injection seeding Sergej Markmann, Hanond Nong, Shovon Pal, Tobias Fobbe, Negar Hekmat, Sven Scholz, Arne Ludwig, Lianhe Li, Paul Dean, Edmund H. Linfield, A. Giles Davies, Sukhdeep Dhillon, Jérôme Tignon, Xavier Marcadet, Claudia Bock, Ulrich Kunze, Andreas D. Wieck, and Nathan Jukam
P2.30	Trace gas instruments using QCL's and ICL's: Noise and performance; environmental measurements and diverting disasters J. Barry McManus, David D. Nelson, Mark S. Zahniser, Dylan Jervis, Christoph Dyroff, Scott Herndon, Tara Yakovitch, Rob Roscioli, Joanne Shorter, Mike Agnese
P2.31	High frequency modulation of mid-infrared quantum cascade lasers Alireza Mottaghizadeh, Zahra Asghari, Maria Amanti and Carlo Sirtori

The poster sessions are presented in conjunction with BM1205 COST Action

