The Proceedings of
The Ninth International Conference on
Intersubband Transitions in Quantum Wells

Low Wood Hotel, Ambleside, Cumbria, U.K.

9-14th September 2007

Edited by
D. Indjin, Z. Ikonic, P. Harrison and R. W. Kelsall,
School of Electronic and Electrical Engineering,
University of Leeds,
LS2 9JT,
U.K.
The Proceedings of the Ninth International Conference on Intersubband Transitions in Quantum Wells
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Paul Harrison,
School of Electronic and Electrical Engineering,
University of Leeds,
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**History and Background**

ITQW07 will be the key event in 2007 in the area of intersubband transitions in quantum wells and intersublevel transitions in quantum dots. It is aimed at bringing together researchers from academia, government and industrial laboratories for scientific interaction, the showcasing of new results in the fields and debate on future trends. The conference series has a history dating back to 1991 with the first meeting in Cargese, France, followed by meetings in Whistler, Canada (1993), Ginosar, Israel (1995), Tainan, Taiwan (1997), Bad Ischl, Austria (1999), Monterey, USA (2001), Evolene, Switzerland (2003) and Cape Cod, USA (2005).

ITQW is a workshop style meeting with a mixture of oral presentations and vibrant poster sessions. A tradition of ITQW is to have plenty of opportunity to mix and network outside of the lecture theatre with planned free time and social events.

**Scientific Topics**

- **Physics and Fundamental Properties:** Intersubband and intersublevel transitions; theoretical studies, optical and electronic characterisation.
- **Novel materials:** Group IV, magnetic, wide-bandgap, Sb-based, advanced low dimensional semiconductors, new computational tools and novel design ideas
- **Mid-infrared and THz detectors:** Quantum well infrared photodetectors (QWIPs), quantum dot infrared photodetectors (QDIPs), non-linear detectors, high sensitivity or phase sensitive detectors, single photon detection and detector arrays from intersubband and intersublevel transitions.
- **Mid-infrared and THz sources:** Theory, design, growth, fabrication, optical and electronic structure characterisation of quantum cascade lasers, optically pumped intersubband/intersublevel lasers
- **Applications:** Near-, mid- and far-infrared (terahertz) sensing and imaging, free space communications
Organising Committee

Chair: Paul Harrison
Co-chair: Rob Kelsall
Local Organiser: Dragan Indjin
Local Organiser: Edmund Linfield
Local Organiser: Zoran Ikonic
Alex Valavanis
Leon Lever
Craig Evans
Suraj Khanna

Programme Committee
Paul Harrison, Leeds, U.K.
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Jerome Faist, Neuchatel, Switzerland
Raffaele Colombelli, Paris, France
Alessandro Tredicucci, Pisa, Italy
Gaetano Scamarcio, Bari, Italy
Manfred Giehler, Berlin, Germany
Gottfried Strasser, Vienna, Austria
Andreas Wacker, Lund, Sweden
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H. C. Liu, Ottawa, Canada
Nobuo Suzuki, Tokyo, Japan
Chennupati Jagadish, Canberra, Australia

Advisory Committee
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Rob Kelsall, Leeds, U.K.
John Cockburn, Sheffield, U.K.
Chris Phillips, Imperial, UK
Manfred Helm, Dresden, Germany
Charly Unterrainer, Vienna, Austria
Hans Sigg, PSI, Switzerland
Carlo Sirtori, Paris, France
Claire Gmachl, Princeton, USA
Qing Hu, MIT, USA
H. C. Liu, Ottawa, Canada

Programme

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<td>M. D’Souza, University of Wisconsin-Madison</td>
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<td>J. Radovanovic, University of Belgrade,</td>
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<td>11.00 - 11.40</td>
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- **Boat trip from Low Wood Jetty**
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<td>Circular Photon Drag Effect in Quantum Wells</td>
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**ORALS**

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<td>09.00-09.40</td>
<td>THz QCL II</td>
<td>J. Darmo, Technische Universitaet, Wien (INVITED)</td>
<td>THz Quantum Cascade Lasers: THz Time-Domain Spectroscopy Study</td>
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<td>C. Walther, University of Neuchâtel</td>
<td>Long wavelength Terahertz Quantum Cascade Lasers emitting down to 1.2 THz.</td>
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<td>A. Wade, National High Magnetic Field Laboratory, Tallahassee, Florida</td>
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<td>Resonant Nonlinear Optics in Coupled Quantum Wells: From Lasers to Detectors.</td>
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<td>Wavelength conversion and All-Optical Switching in Quantum Cascade Lasers.</td>
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<td>14.00-</td>
<td>Quantum Dots</td>
<td>T3 E. A. Zibik,</td>
<td>University of Sheffield</td>
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<td>14.20</td>
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3 pm  Guided walk to country pub
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<td>Increasing the dot density in quantum dot infrared photodetectors via antimony-mediated dot formation.</td>
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<td>S. Menzel, University of Sheffield</td>
<td>Electron Capture and Relaxation in N-Type InAs/GaAs Quantum Dots.</td>
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<td>P3</td>
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<td>Quantum effects in optical spectra line shapes and electronic relaxation in quantum dots.</td>
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<td>P3</td>
<td>W. Sheng, Fudan University, Shanghai</td>
<td>Origins of linear polarization of intersubband transitions in InAs/GaAs self-assembled quantum dots: a new picture.</td>
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**Materials II**

**Chair:** C. Gmachl

**Posters II**

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**POSTERS**

**Refreshments**
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<tr>
<td>P3 8</td>
<td>J. Bai, Institute of Technology, Georgia, U.S.A.</td>
<td>Performance Analysis of Mid-Infrared Quantum Cascade Lasers with Enhanced Optical Nonlinearity.</td>
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<td>P3 9</td>
<td>A. Lisauskas, Goethe University, Frankfurt, Germany</td>
<td>Internal Mixing in Active Semiconductor Devices for Room-Temperature Generation of Tuneable Continuous-Wave Terahertz Radiation.</td>
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<tr>
<td>P4 0</td>
<td>I. Karabulut, University of Selcuk</td>
<td>The Second-Order Nonlinear Optical Susceptibilities of an Asymmetric Rectangular Quantum Well.</td>
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<td>P4 1</td>
<td>L. Nevou, Université, Paris-Sud, France</td>
<td>Second-harmonic generation of $\lambda \sim 1 \mu m$ enhanced by intersubband transitions of GaN/AlN quantum wells.</td>
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<tr>
<td>P4 2</td>
<td>B. Passmore, University of Arkansas</td>
<td>Near-Infrared wavelength intersubband transitions in hexagonal and cubic GaN/AlN short period superlattices.</td>
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<td>P4 3</td>
<td>A. Ishida, Shizuoka University, Japan</td>
<td>Normal Incident Intersubband Absorptions in EuTe/PbTe Superlattices.</td>
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<tr>
<td>P4 4</td>
<td>A. Valavanis, University of Leeds</td>
<td>n-type Si/siGe quantum cascade structures.</td>
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<td>P4 5</td>
<td>A. Valavanis, University of Leeds</td>
<td>Intervalley mixing and intersubband transitions in n-type Si/SiGe quantum wells.</td>
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<td>P4 6</td>
<td>A. Nafidi, Institute of Physics, New York</td>
<td>Band structures and new magneto-transport properties in HgTe/CdTe superlattices.</td>
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<tr>
<td>P4 7</td>
<td>E. Benveniste, University Paris Diderot</td>
<td>Experimental and theoretical study of intersubband electroluminescent diodes based on different material systems.</td>
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<tr>
<td>P4 8</td>
<td>A. Hugi, University of</td>
<td>Room temperature continuous wave operation of an external</td>
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<td>Session Time</td>
<td>Authors and Affiliations</td>
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<td>17.40-19.00</td>
<td>J. Semmel, Würzburg University</td>
<td>Edge Emitting InP based Quantum Cascade Microlasers with Deeply Etched Bragg Mirrors.</td>
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<td>P5 2</td>
<td>M. Mahneult, Université Denis Diderot, Paris</td>
<td>Far Field Beam Patterns of Terahertz Quantum Cascade Lasers.</td>
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<tr>
<td>P5 3</td>
<td>L. Mahler, Scuola Normale Superiore, Pisa</td>
<td>Terahertz quantum cascade lasers with quasi-periodic resonators.</td>
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<tr>
<td>17.40-19.00</td>
<td>G. Fasching, Vienna University</td>
<td>Whispering-Gallery Quantum-Cascade Lasers in the Terahertz Frequency Regime.</td>
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<td>P5 4</td>
<td>J. Plumridge, Imperial College, London</td>
<td>Quantum Metamaterials for Plasmonics and Strong Coupling.</td>
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<tr>
<td>P5 5</td>
<td>J. N Hovenier, Delft University</td>
<td>Beam patterns of distributed feedback surface-plasmon THz quantum cascade lasers.</td>
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<td>P5 6</td>
<td>M. Carras, QCL Laboratory</td>
<td>Broadband loss measurements in passive and active mid-infrared waveguides using Fabry-Pérot resonances.</td>
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<tr>
<td>P5 7</td>
<td>P. Aivaliotis, University of Sheffield</td>
<td>Experimental and theoretical investigation of the spectral Stark shift in quantum dots-in-a-well infrared photodetectors.</td>
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<tr>
<td>P5 8</td>
<td>A. Gomez, University of Paris</td>
<td>Magneto-transport measurements in Quantum Cascade Detectors.</td>
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<tr>
<td>P6 0</td>
<td>S. K. Haywood, University of Hull</td>
<td>A Strain-compensated Mid-infrared Quantum Well Photodetector Operating at Zero</td>
</tr>
<tr>
<td>Session</td>
<td>Speaker</td>
<td>Institution</td>
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<td>P6 1</td>
<td>M. R. Matthews</td>
<td>Imperial College, London</td>
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<tr>
<td>P6 2</td>
<td>A. Nedelcu</td>
<td>Thales Research and Technology</td>
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<td>P6 3</td>
<td>E.O. Karabulut</td>
<td>University of Selcuk</td>
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<td>P6 4</td>
<td>V. Berger</td>
<td>University of Paris</td>
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<tr>
<td>P6 5</td>
<td>H. Schneider</td>
<td>Forschungszentrum, Dresden</td>
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<tr>
<td>P6 6</td>
<td>K. Nontapot</td>
<td>Virginia Tech.</td>
</tr>
<tr>
<td>P6 7</td>
<td>A. Udal</td>
<td>University of Technology, Tallin</td>
</tr>
<tr>
<td>P6 8</td>
<td>G. Bahir</td>
<td>Technion Institute-Israel</td>
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<td>P7 0</td>
<td>G. Bahir</td>
<td>Technion Institute-Israel</td>
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<tr>
<td>P7 1</td>
<td>J. Freeman</td>
<td>University of Cambridge</td>
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**Gala Dinner**

7 pm
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<th>Time</th>
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<tr>
<td>09.00-13.00</td>
<td>Informal meetings and final networking opportunity. Some social activities (to be confirmed).</td>
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