



# TeraNova Dissemination Activities

IST-511415

Period 3: 1<sup>st</sup> September 2006 – 31<sup>st</sup> August 2007

## PLENARY, KEYNOTE OR INVITED TALKS

Stefano Barbieri – Université Paris VII

*Beam Shaping and Ultrafast modulation of THz Quantum Cascade Lasers*, THz workshop. EUMW2007: European Microwave Week 2007. October 10, 2007, Munich, Germany.

Andrew Burnett – Leeds

*Can Science Secure Our Skies?* Presentation at Dana Centre Event, July 10th 2007.

Martyn Chamberlain – Durham University

*Scattering of Terahertz Radiation from Random Structures*, 31<sup>st</sup> Joint International Conference of Infrared and Millimetre Waves and the 14<sup>th</sup> IEEE Terahertz Electronics Conference, Shanghai, September 2006.

*Detection of Separation of Laminated Materials by Reflected THz Pulses*, ECNDT, Berlin, September 2006.

Juraj Darmo – TU Wien

*Gain and Loss in Terahertz Quantum Cascade Structures: Time-domain study*, The 15<sup>th</sup> International Conference on Non-equilibrium Carrier Dynamics in Semiconductors HCIS15, Tokyo, Japan, 23-27 July 2007.

Giles Davies, Wenhui Fan, Edmund Linfield & Prashanth Upadhyya - Leeds

*Terahertz time Domain Spectroscopy - Present and Future Modalities*, Cunningham, J., Wood, C., Burnett, A., Upadhyya, P. C., Fan, W. H., Linfield, E. H. and Davies, A. G., Proc. IEEE International Microwave Symposium, 1697-1699 (2007).

*Terahertz Research at the University of Leeds – From Quantum Cascade Lasers to Pulsed Broadband Spectroscopy*, Edmund H Linfield and a Giles Davies, GDR-E THz school/ Bordeaux- Bombannes June 1-2, 2007.

*Recent Developments in Quantum Cascade Lasers*, Edmund Linfield and Giles Davies, 13th International Symposium on Ultrafast Phenomena in Semiconductors (Vilnius, Lithuania), 26-29 August, 2007.

*The MBE Growth and Fabrication of Terahertz Quantum Cascade Lasers*, Edmund Linfield, 2nd International Workshop on Quantum Cascade Lasers (Brindisi, Italy), September 6-8, 2006.

Peter Haring Bolívar – University of Siegen

*New Concepts for THz Biomolecular Sensing Systems*, C. Debus, F. Voltolina and P. Haring Bolívar, 4ièmes Journées THz, Bombannes, F, 29-31st may (2007).

*Towards Cost-Efficient THz Biochip Technologies*, C. Debus, F. Voltolina and P. Haring Bolívar, 2007 IEEE Antennas and Propagation Society Meeting, Honolulu, Hawaii, June 10-15, 2007.



*Perspectives for High Sensitivity THz Biosensing*, P. Haring Bolivar, Academy Colloquium, Royal Dutch Society of Science and Arts, Amsterdam, 1-16 June 2007.

*New Approaches for High-sensitivity THz Biosensing Systems*, C. Debus, F. Voltolina, D. Surawicz and P. Haring Bolivar, International Symposium Topical Problems of Biophotonics, Nizhny Novgorod – Moscow – Nizhny Novgorod, Russia, 4-11 August, 2007.

*Biological Applications of THz Sensing*, P. Haring Bolívar, Infrared and Millimetre Wave Conference, Cardiff, 3-7 September 2007.

Peter Uhd Jepsen – COM-DTU, Denmark

*Ingredients Analysis of Aqueous Solutions and Food Products with THz Reflection Spectroscopy*, FiO/LS XXIII (OSA Annual Meeting), San Jose, September 2007.

*Terahertz Time-domain Spectroscopy of Crystalline and Aqueous Systems*, Annual Meeting of the Danish Physical Society, June 2007.

*Terahertz Time-domain Spectroscopy of Crystalline and Aqueous Systems*, KNAW Meeting on Terahertz Science, Amsterdam, 14-16 June 2007.

*Terahertz Activities in Denmark*, Réunion du GDR Européen, Bombannes, France, 1-2 June 2007.

*Terahertz Time-domain Spectroscopy of Crystalline and Aqueous Systems*, French THz Days, Bombannes, France, 29-31 May 2007.

*Terahertz Time-domain Spectroscopy of Crystalline and Aqueous Systems*, CLEO, Baltimore, May 2007.

*Drugs & Alcohol: Prediction of Solid-state Vibrational Modes and Analysis of Aqueous Solutions with THz Spectroscopy*, International Bunsen Discussion Meeting, Bad Honnef, 1-4 April 2007.

*Determination of Alcohol Concentration in Aqueous Solutions and Food Analysis using Reflection Terahertz Time-Domain Spectroscopy*, OTST 2007, Orlando, Florida, March 14-16 2007 (contributed talk, given by Uffe Møller)

*Ab-initio Prediction of Terahertz Vibrational Modes in Crystalline Systems*, SPIE Optics East, Boston, Massachusetts, October 2006.

*The Physical Principles of Chemical Recognition in Terahertz Spectral Imaging*, MICCAI 2006, Copenhagen, October 2006.

Michael Nagel- RWTH Aachen

*Characterization of Wire Pair Negative Index Metamaterials at Terahertz Frequencies*. IRMMW/THz2007, Cardiff, Wales, 02-07 September 2007

Paul Planken –TU Delft

*THz Near-Field Measurements on Metal Structures*, Symposium on "Prospects on High Resolution Imaging", 3 November 2006, Delft, The Netherlands.

*Apertureless Wide Band Terahertz Near-Field Microscopy* (invited, talk given by A. Adam), NFO-9 (Ninth international conference on near-field optics, nanophotonics and related techniques), 10-15 September 2006, Lausanne Switzerland.

*Terahertz Near-Field Measurements on Metal Objects with Sub-Wavelength Spatial Resolution* (invited, talk given by A. Adam) 4ème journées TeraHertz, 29 -31 May, 2007, Bombannes, France.



*Near-Field Microscopy of THz Fields Near Metal Structures*, Optical Terahertz Science and Technology conference, 2007, Orlando, Florida USA.

Masterclass on “*Terahertz Near-Field Measurements*”, KNAW (Royal Academy of Sciences) Colloquium, Amsterdam, June 14-16, 2007.

*Terahertz Near Field Techniques for Field Enhancements Measurements and Near Field Imaging*, A.J.L. Adam, Academy Colloquium "TeraHertz Science", 14-16 June 2007, Amsterdam, The Netherlands.

*Course on THz Emitters*, A.J.L. Adam. European Summer School on New Trends in Terahertz Imaging, NTTI 2007, 9-13 July 2007, Paris Observatory, France.

Giacomo Scalari – ETH Zurich

*Recent Progress on Long Wavelength Quantum Cascade Lasers between 1-2 THz*, LEOS 2007, 21-25 October 2007. Lake Buena Vista, Florida.

*Terahertz Quantum Cascade Lasers Based on Intra-well Optical Transitions*, 2<sup>nd</sup> Int. Workshop on Quantum Cascade Lasers, Bari, Italy, 6-9<sup>th</sup> Sept. 2006.

Carlo Sirtori - Université Paris VII

*THz Frequency Shifting Using Quantum Cascade Lasers*, Journées Scientifiques de l' ONERA: “Sources Optiques Paramétriques Pour L’Infrarouge” February 5-6, 2007, Clamart, France.

Alessandro Tredicucci- SNS Pisa

*Controlling the Emission of THz Quantum Cascade Lasers*, 2<sup>nd</sup> International Workshop on Quantum Cascade Lasers”, Marina di Ostuni, Italy; September 6 – 9, 2006.

*Frequency Tuning of THz Quantum Cascade Lasers*, The 7<sup>th</sup> Pacific Rim Conference on Lasers and Electro-Optics (CLEO / Pacific Rim 2007), Seoul, Korea; August 26 – 31, 2007.

*Frequency Tuning of THz Quantum Cascade Lasers*, Workshop of the GDR-E “Semiconductor sources and detectors of THz radiation”, Bombannes, France; June 1 – 2, 2007.

*Emission Properties of THz Quantum Cascade Lasers*, Photonics West 2007, San Jose, USA; January 20 – 25, 2007.

*Il Laser a Cascata Quantica: da un Cristallo Artificiale Progettato a Tavolino, la Sorgente per la Fotonica nel Medio e Lontano Infrarosso*, Nanoforum 2006, Milano, Italy; September 27 – 28, 2006.

*Controlling the Emission of THz Quantum Cascade Lasers*, 2nd EPS-QEOD Europhoton Conference, Pisa, Italy; September 10 – 15. 2006.

Karl Unterrainer - TU Wien

*Phase-resolved Stimulated Emission from THz Quantum Cascade Lasers*, 2<sup>nd</sup> Int. Workshop on Quantum Cascade Lasers, Bari, Italy, 6-9<sup>th</sup> Sept. 2006.

*A THz Study of Relaxation and Dephasing*. International Workshop on Terahertz Sensing and Security Applications, Thessalonika, Greece, 10-13<sup>th</sup>, Sept. 2006.

*THz Time-Domain Spectroscopy of THz Quantum Cascade Laser: Phase and Amplitude Resolved Stimulated Emission*, International Bunsen Discussion Meeting: Exploring THz spectroscopy, Bad Honnef, Deutschland, 1.4 - 4.4.2007.



*Terahertz Quantum-Cascade Lasers: Micro Cavity Effects, Doping Dependence and Loss*, Réunion du GDR-E "Semiconductor Sources and Detectors of Terahertz radiation", Bombannes, Bordeaux, France, 1.-3. 6. 2007.

Markus Wächter – RWTH Aachen

*Propagation Dynamics of Guided THz Signals in Straight and Bended Metallic Slit Waveguides*, IRMMW/THz2007, Cardiff, Wales, 02-07 September 2007.

## OTHER CONFERENCE PRESENTATIONS

*Terahertz Near-Field Measurements of Field Enhancement Near Metal Objects* (A. Adam), Joint 31<sup>st</sup> International Conference on Infrared and Millimetre Waves and 14<sup>th</sup> International Conference on Terahertz Electronics September 18-22, 2006, Shanghai, China:

*LT-GaAs Based Photoconductive Antenna Arrays for Pulsed and CW Operation*, M. Awad, M. Nagel and H. Kurz, Joint 31<sup>st</sup> International Conference on Infrared and Millimetre Waves and 14<sup>th</sup> International Conference on Terahertz Electronics September 18-22, 2006, Shanghai, China.

*Low-Index Discontinuity THz Waveguides*, M. Nagel, A. Marchewka, and H. Kurz, Joint 31<sup>st</sup> International Conference on Infrared and Millimetre Waves and 14<sup>th</sup> International Conference on Terahertz Electronics September 18-22, 2006, Shanghai, China.

*Investigation of THz Sommerfeld Wires for Cavity Applications*, M. Wächter, M. Nagel, and H. Kurz, Joint 31<sup>st</sup> International Conference on Infrared and Millimetre Waves and 14<sup>th</sup> International Conference on Terahertz Electronics September 18-22, 2006, Shanghai, China.

*Terahertz Quantum Cascade Lasers: Novel Resonators and Line-width Properties*, (L. Mahler), CLEO 2007, Baltimore, USA; May 6 – 11, 2007.

*Line-width Enhancement Factor of a THz Quantum Cascade Laser*, (R. P. Green), WOCSDICE 2007, Venice, Italy; May 20 – 23, 2007.

*Controlling the Emission of THz Quantum Cascade Lasers*, (J. Xu), Joint 31<sup>st</sup> International Conference on Infrared and Millimetre Waves and 14<sup>th</sup> International Conference on Terahertz Electronics September 18-22, 2006, Shanghai, China.

*Designing THz Quantum Cascade Lasers for High Current Injection*, (J Xu), MSS 13, Genova, Italy; July 15 – 20, 2007.

*Terahertz Quantum Cascade Lasers With Quasi-Periodic Resonators*, (L. Mahler), MSS 13, Genova, Italy; July 15 – 20, 2007.

*Terahertz Transfer onto a Telecom Optical Carrier*, (S. Dhillon), CLEO 2007, Baltimore, USA; May 6 – 11, 2007.

*Integrated Horn Antenna for Microstrip Waveguide THz Quantum Cascade Lasers*, (S Barbieri), Baltimore, USA; May 6 – 11, 2007.

*Dispersion-free and Low-Loss Propagation of THz Signals in a Metallic Slit Waveguide*, M. Wächter, M. Nagel, H. Kurz, Cleo Europe/EQUEC 2007, 17-22 June, Munich, Germany.

*Wire Pair Negative-Index Material at Terahertz Frequencies*. M. Awad, H. Kurz, M. Nagel, Cleo Europe 2007, 17-22 June, Munich, Germany.



*Enhanced Photoconductive Terahertz Antenna Array Devices*, M. Awad, M. Nagel, H. Kurz, IRMMW/THz2007, Cardiff, Wales, 02-07 September 2007.

*Electromagnetic Modelling of the DNA Monolayer in THz Bio-chips*. M. Neshat, D. Saeedkia, M. Nagel, S. Safavi-Naeini, IRMMW/THz2007, Cardiff, Wales, 02-07 September 2007.

*GHz Modulation of THz Quantum Cascade Lasers*, Stefano Barbieri, ITQW 2007. September 2007, Ambleside (UK).

*THz Sensing of Doping Concentration in Epitaxial Semi-Conductors and 2-D Electron Gases: Theory and Experiment*. D.P. Kelly, J. Darmo, K. Unterrainer, CLEO-Europe Conference, Munich, Germany 18.06.2007 – 22.06.2007.

*Gain and Loss in Terahertz Quantum Cascade Laser*, J. Kröll, J. Darmo, K. Unterrainer, S.S. Dhillon, C. Sirtori. X. Marcadet, M. Calligaro, CLEO-Europe Conference, Munich, Germany 18.06.2007 – 22.06.2007.

*Thermally Activated Absorption Features in Terahertz Semiconductor Heterostructures*, J. Kröll, J. Darmo, K. Unterrainer, S.S. Dhillon, C. Sirtori. X. Marcadet, M. Calligaro, CLEO/QELS Conference, Baltimore, USA 06.05.2007 – 11.05.2007.

*Design Limitations in THz-QCLs Caused by Thermally Activated Absorption Losses*, J. Kröll, J. Darmo, K. Unterrainer, S. S. Dhillon, C. Sirtori, X. Marcadet and M. Calligaro, Conference: Optical terahertz science and technology, Orlando, USA, 18-21.März.2007.

*Broadband Terahertz Time-Domain and Raman Spectroscopy and Their Use in The Analysis of Compounds of Security Relevance*, A. D. Burnett, W. Fan, P. Upadhy, J. E. Cunningham, H. G. M. Edwards, J. Kendrick, T. Munshi, M. Hargreaves, E. H. Linfield, A. G. Davies. ICVAS 4 2007, June 10 -15 2007, Corfu, Greece.

*Broadband Terahertz Time-Domain and Raman Spectroscopy of Explosives*, A. D. Burnett, W. Fan, P. Upadhy, J. E. Cunningham, H. G. M. Edwards, J. Kendrick, T. Munshi, M. Hargreaves, E. H. Linfield, A. G. Davies. SPIE Vol. 6549, 65490D [6549-04] (April 9, 2007).

*Complementary Spectroscopic Studies of Materials of Security Interest*, Andrew Burnett, Wenhui Fan, Prashanth Upadhy, John Cunningham, Howell Edwards, Tasnim Munshi, Michael Hargreaves, Edmund Linfield, and Giles Davies. Proc. SPIE Vol. 6402, 64020B (Sep. 28, 2006).

*Temperature-Dependent Far-Infrared Spectra of Explosives and Drugs Measured by Terahertz Time-Domain Spectroscopy*, W. H. Fan, A. Burnett, P. C. Upadhy, J. Cunningham, E. H. Linfield and A. G. Davies. IRMMW-THz 2006, 18-22 September 2006, Shanghai, China.

*Cryogenic Excitation and Detection of Terahertz Radiation in Microstrip Circuits*, Cunningham, J., Wood, C., Upadhy, P. C., Linfield, E. H., and Davies, A. G., Proc. IRMMW-THz 2006, 232 (2006).

*Broadband THz Spectroscopy and its Security Applications*, Andrew Burnett, Wenhui Fan, Prashanth Upadhy, John Cunningham, Howell Edwards, Tasnim Munshi, Michael Hargreaves, Edmund Linfield, and Giles Davies. Terahertz sensing and security applications, September 10 - 13 2006, Thessaloniki, Greece.

*Long Wavelength Terahertz Quantum Cascade Lasers Emitting Down to 1.2 THz*, C. Walther, M. Fischer, G. Scalari, R. Terazzi, N. Hoyler, J. Faist, ITQW 2007, September 2007, Ambleside (UK).

*Study and Improvement of THz Quantum Cascade Laser Beam-pattern for Different Waveguides Configurations.*, M.I. Amanti, C. Walther, M. Fischer, N. Hoyler, L. Sirigu, G. Scalari, J. Faist, ITQW 2007. September 2007, Ambleside (UK).

*Surface Plasmon Polariton-based Coaxial Probe for Terahertz Near-field Microscopy*, D. Surawicz, P. Haring Bolívar, H.-J. Shin and B. Mizaiakoff, Conference on Lasers and Electro-optics and Quantum Electronics and Laser Science Conference '07, OSA Technical Digest Series, Baltimore, USA, Mai 6-11 (2007).



*Frequency Selective Surfaces for High-Sensitivity Terahertz Sensors*, C. Debus and P. Haring Bolivar, *Conference on Lasers and Electro-optics and Quantum Electronics and Laser Science Conference '07*, OSA Technical Digest Series, Baltimore, USA, Mai 6-11 (2007).

*Terahertz Time-Domain Spectroscopy: A New Way to Determine Alcohol Concentrations in Aqueous Solutions*, Annual Meeting of the Danish Physical Society, June 2007 (contributed talk, given by Uffe Møller).

*Precise Ab-initio Calculation of Terahertz-frequency Vibrational Modes in Molecular Crystals*, OTST 2007, Orlando, 14-16 March 2007 (contributed talk).

*Dual-Colour, Power-Scalable DFB Fibre Laser system for kHz-line-width Terahertz Generation*, OTST 2007, Orlando, Florida, March 14-16 2007 (Finn Eichhorn).

## PUBLICATIONS

- [1] *THz Near-field Measurements of Metal Structures*, A. J. L. Adam, J. M. Brok, P. C. M. Planken, M. A. Seo, D. S. Kim, Accepted for publication in *Comptes Rendues Physique*.
- [2] *Measurement and Calculation of the Near-field of a Terahertz Apertureless Scanning Optical Microscope*, A. J. L. Adam, N. C. J. van der Valk, and P. C. M. Planken, *J. Opt. Soc. Am.* **B 24**, 1080 (2007).
- [3] *Frequency-dependent Radiation Patterns Emitted by Terahertz Plasmons on Finite Length Cylindrical Metal Wires* J. A. Deibel, N. Berndsen, K. Wang, D. M. Mittleman, N. C. J. van der Valk, and P. C. M. Planken, *Opt. Express* **14**, 8772 (2006).
- [4] *Shape Resonance Omni-directional Terahertz Filters with Near-unity Transmittance*. J. Lee, M. Seo, D. Park, D. Kim, S. Jeoung, Ch. Lienau, Q-Han Park, and P. Planken, *Opt. Express*. **14**, 1253 (2006).
- [5] *Propagation of Terahertz Radiation Through Random Structures: A Novel Theoretical Approach And Experimental Validation*, J.R. Fletcher, G.P. Swift, De Chang Dai, J.A. Levitt and J.M. Chamberlain. *Journal of Applied Physics*. Vol **101** (1) 013102-11.
- [6] *Pulsed THz Signal Reconstruction*, J.R. Fletcher, G.P. Swift, DeChang Dai and J.M. Chamberlain P.C. Upadhyya. *Journal of Applied Physics*, *In Press*.
- [7] *Molecular Spectroscopy with TeraHertz Quantum Cascade Lasers*, H.-W. Hübers, S. G. Pavlov, H. Richter, A. D. Semenov, L. Mahler, A. Tredicucci, H. E. Beere, and D. A. Ritchie, *J. Nanoelectron. Optoelectron.* **2**, 101 (2007).
- [8] *Frequency Characterization of a Terahertz Quantum-cascade Laser*, N. Beverini, G. Carelli, A. De Michele, A. Moretti, L. Mahler, A. Tredicucci, H. E. Beere, and D. A. Ritchie, *IEEE Trans. Instrum. Meas.* **56**, 262 (2007).
- [9] *Tuneable Terahertz Quantum Cascade Lasers with an External Cavity*, J. Xu, J. M. Hensley, D. B. Fenner, R. P. Green, L. Mahler, A. Tredicucci, M. G. Allen, F. Beltram, H. E. Beere, and D. A. Ritchie, *Appl. Phys. Lett.*, *in Press*.
- [10] *Amplification of THz Radiation in Quantum Cascade Structures*, C. Mauro, R. P. Green, A. Tredicucci, F. Beltram, H. E. Beere, and D. A. Ritchie, *J. Appl. Phys.* *In Press*.
- [11] *THz Transfer Onto a Telecom Optical Carrier* S. Dhillon, C. Sirtori, J. Alton, S. Barbieri, A. de Rossi, H. Beere, and D. Ritchie, *Nature Photonics*, **1**:411, 2007.
- [12] *13 GHz Direct Modulation of THz Quantum Cascade Lasers* Barbieri, W. Mainault, S. Dhillon, C. Sirtori, J. Alton, N. Breuil, H. Beere, and D. Ritchie. *Accepted for publication. Appl. Phys. Lett* **91**, 143510 (2007).



- [13] *Thermal Properties of THz Quantum Cascade Lasers Based on Different Optical Waveguide Configuration*, M. Vitiello, G. Scamarcio, V. Spagnolo, J. Alton, S. Barbieri, C. Worrall, H. Beere, D. Ritchie, C. Sirtori, *Appl. Phys. Lett.* **89**, 021111 (2006).
- [14] *Subband Electronic Temperatures and Electron-Lattice Relaxation in THz Quantum Cascade Lasers with Different Conduction Band Offsets*, M. Vitiello, G. Scamarcio, V. Spagnolo, C. Worrall, H. Beere, D. Ritchie, C. Sirtori, J. Alton, S. Barbieri, *Appl. Phys. Lett.* **89**, 131114 (2006).
- [15] *Low Threshold THz QC Lasers With Thin Core Regions*, Y. Chassagneux, J. Palomo, R. Colombelli, S. Barbieri, Dhillon, C. Sirtori, H. Beere, J. Alton, and D. Ritchie, *Electron. Lett.* **43**, 205 (2007).
- [16] *Metallic Slit Waveguide for Dispersion-Free Low-Loss Terahertz Signal Transmission*. M. Wächter, M. Nagel, H. Kurz, *Appl. Phys. Lett.* **90**, 061111 (2007).
- [17] *Metallic Wave-Impedance Matching Layers for Broad-Band Optical Systems*, J. Kröll, J. Darmo and K. Unterrainer, *Optics Express*, **15** (2007), 67552-6560.
- [18] *Terahertz Optical Activity of Sucrose Single Crystals*, J. Kröll, J. Darmo and K. Unterrainer, *Vibrational Spectroscopy*, **43** (2007), 324-329.
- [19] *Longitudinal Spatial Hole Burning in Terahertz Quantum Cascade Lasers*, J. Kröll, J. Darmo, K. Unterrainer, S.S. Dhillon, C. Sirtori, X. Marcadet, and M. Calligaro, *Appl. Phys. Lett.* **90** (2007), 231116.
- [20] *Terahertz Quantum-cascade Laser Dynamics in Time-Domain* J. Kröll, J. Darmo, S. Dhillon, X. Marcadet, M. Calligaro, C. Sirtori, and K. Unterrainer, AIP Conference Proceedings 893, "28th International Conference on the Physics of Semiconductors", p. 1435.
- [21] *Theoretical Aspects of Time-domain Spectroscopy of Semiconductor Terahertz Gain Medium* J. Darmo, J. Kröll, and K. Unterrainer, , AIP Conference Proceedings 893, "28th International Conference on the Physics of Semiconductors", p. 515.
- [22] *Monolithic Integration of Low-Temperature-Grown GaAs with a Two-Dimensional Electron Gas*, Cunningham, J., Upadhy, P. C., Tiang, C. K., Lachab, M., Khanna, S., Linfield, E. H., and Davies, A. G., *Semiconductor Science and Technology* **22**, 811-813 (2007).
- [23] *Excitation-Density-Dependent Generation Of Broadband Terahertz Radiation In An Asymmetrically Excited Photoconductive Antenna*, Prashanth C. Upadhy, Wenhui Fan, Andrew Burnett, John Cunningham, A. Giles Davies, Edmund H. Linfield, James Lloyd-Hughes, Enrique Castro-Camus, Michael B. Johnston, and Harvey Beere. *Optics Letters*, Vol. **32**, Issue 16, pp. 2297-2299.
- [24] *Far-Infrared Spectroscopic Characterization of Explosives for Security Applications Using Broadband Terahertz Time-Domain Spectroscopy*, W. H. Fan, A. Burnett, P. C. Upadhy, J. Cunningham, E. H. Linfield, and A. G. Davies. *Applied Spectroscopy*, Volume **61**, Number 6, June 2007, pp. 638-643(6).
- [25] *Advanced Optoelectronics in III-V Semiconductor Compounds*, M. Först, M. Nagel, M. Awad, M. Wächter, T. Dekorsy, and H. Kurz, *Phys. Stat. Sol. (b)* **244**, 2971-2987 (2007).
- [26] *Horn Antennas for Terahertz Quantum Cascade Lasers*, M.I. Amanti, M. Fischer, C. Walther, G. Scalari, and J. Faist, *Electron. Lett.* **43**, 573.
- [27] *Quantum Cascade Lasers Operating from 1.2 to 1.6 THz*, Christoph Walther, Milan Fischer, Giacomo Scalari, Romain Terazzi, Nicolas Hoyler, and Jérôme Faist, *Appl. Phys. Lett.* **91**, 131122 (2007).
- [28] *Strong Confinement in Terahertz Intersubband Lasers by Intense Magnetic Fields*, G. Scalari, C. Walther, L. Sirigu, M. L. Sadowski, H. Beere, D. Ritchie, N. Hoyler, M. Giovannini, J. Faist, *Phys. Rev. B* **76**, 115305 (2007).



- [29] *Population Inversion by Resonant Tunnelling in Quantum Wells*, G. Scalari, R. Terazzi, N. Hoyler, M. Giovannini, J. Faist, *Appl. Phys. Lett.*, **91**, 032103 (2007).
- [30] *Precise Ab-Initio Prediction of Terahertz Vibrational Modes in Crystalline Systems*, P. Uhd Jepsen and S. J. Clark, *Chem. Phys. Lett.* **442**, 275 (2007).
- [31] *Investigation of Aqueous Alcohol Solutions with Reflection Terahertz Time-Domain Spectroscopy*, P. Uhd Jepsen, U. Møller, and H. Merbold, *Opt. Express (Accepted, October 2007)*.
- [32] *Phase-resolved Measurements of Stimulated Emission in a Laser*, Josef Kröll, Juraj Darmo, Sukhdeep S. Dhillon, Xavier Marcadet, Michel Calligaro, Carlo Sirtori & Karl Unterrainer, *Nature* **449**, 698-702 (2007).

## CONTRIBUTIONS TO BOOKS

### Martyn Chamberlain - Durham

Chamberlain J M. *Applied Terahertz Science: The Technology of the Future, and Always Will Be?* In R.E. Miles, X-C Zhang, H. Eisele, A. Krotkus (Eds). Terahertz Frequency Detection of Materials and Objects, Springer, pp 11-176., 2007.

### Giles Davies & Edmund Linfield - Leeds

Davies, A.G.; Linfield, E.H. *Molecular and Organic Interactions*. In R E Miles, X.-C Zhang, H Eisele, A. Krotkus (Ed) Terahertz Frequency Detection and Identification of Materials and Objects. Springer. pp. 91-104, 2007.

Linfield, E.H.; Cunningham, J.; Davies, A.G. *THz Spectroscopy and Imaging*. Future trends in microelectronics. Wiley pp.359-368. 2007.

### Peter Uhd Jepsen – COM-DTU

D. Cooke, D. Turchinovich, U. Møller, F. Eichhorn, P. Uhd Jepsen, “*Nyt lys på ukendt land: Terahertz Teknologi*”, in *Optiske Horisonter, en rejse på kommunikationsteknologiens vinger* (ISBN: 87-92062-01-6), pp. 67-91, COM•DTU, Odense (2007). Textbook for high-school students, distributed to all high-schools in Denmark.

## PATENTS

### Martyn Chamberlain – Durham

“*Terahertz Pulse Reconstruction*” UK Patent GB0708491.6.



## PUBLIC RELATIONS

### Presentations

Peter Swift - Durham

Presentation at the House of Commons, London, November 2007, for MPs on the work of Young UK Scientists.

### Press Articles

Alessandro Tredicucci – SNS, Pisa

Newspaper articles:

- Il sole 24ore, 7/9/2006
- Il Secolo XIX, 19/7/2007
- La Stampa, 18/7/2007

Carlo Sirtori – Université Paris VII

Comment and review articles on “THz transfer onto a telecom optical carrier”, To be published in:

- IEEE Spectrum Magazine
- Laser Focus World
- La Recherche

### Radio/TV Brocasts

Paul Planken –TU Delft

On November 16, 2006 on 09.30 hr, our THz imaging work was featured in a TELEAC/NOT "School TV" series on Medical Imaging.

Alessandro Tredicucci – SNS, Pisa

Radio Interview: AGR Circuit, July 16, 2007.



## CONFERENCES ORGANIZED

Peter Uhd Jepsen – COM-DTU

Chairman (together with Gwyn Williams, Jefferson Lab) of the 2007 OSA Topical Meeting on Optical Terahertz Science and Technology (OTST 2007) in Orlando, Florida.

Paul Planken – TU Delft

Co-organizer of a KNAW colloquium on terahertz science in Amsterdam, June 2007.

## TRADE FAIRS & EXHIBITIONS

Femtolasers GmbH

Represented *TeraNova* at 'Laser 2007' - World of Photonics, Messe Muenchen, 15-18 June 2007

## SOCIETIES

Paul Planken – TU Delft

Co-founder and 'Chair' of the European Optical Society focus group on 'Terahertz Radiation'.