

## **UK Semiconductors 2014 Technical Programme**

We are pleased to welcome four high-profile international plenary speakers who will provide extended presentations of general interest to delegates from all backgrounds of semiconductor research. All other invited talks and contributed submissions are arranged into specific symposia as listed below.

**Plenary Lectures: *Michael Kneissl, Jerome Faist, Brian Bennett, Hywel Morgan***

**Symposium A: Physics in Semiconductors**

**Symposium B: Optical Devices**

**Symposium C: Electronic Devices**

**Symposium D: Semiconductor Materials and Nanostructures**

**Symposium E: Mid-IR and THz Materials and Devices**

**Symposium F: Organic and Organic/Inorganic Hybrid Semiconductors**

**Symposium G: Wide-Gap Nitride Semiconductors**

**Symposium H: Semiconductors for Healthcare Technologies**

## Oral Presentations – Wednesday 9<sup>th</sup> July 2014

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
09:30		Registration and Refreshments, Atrium Level 2	
10:30	<p><b>Plenary 1</b>  <b>UV-LEDs – the long road towards shorter wavelengths</b></p> <p><u>Michael Kneissl</u><sup>1,2</sup>, Frank Mehnke<sup>1</sup>, Christian Kuhn<sup>1</sup>, Christoph Reich<sup>1</sup>, Martin Gutmann<sup>1</sup>, Tim Wernicke<sup>1</sup>, Tim Kolbe<sup>2</sup>, Neysha Lobo-Ploch<sup>2</sup>, Jens Raß<sup>2</sup>, Arne Knauer<sup>2</sup>, Viola Küller<sup>2</sup>, Carsten Netzel<sup>2</sup>, Ute Zeimer<sup>2</sup>, Michael Lapeyrade<sup>2</sup>, Sven Einfeldt<sup>2</sup>, Markus Weyers<sup>2</sup></p> <p><sup>1</sup>Institute of Solid State Physics, Technische Universität Berlin, Germany  <sup>2</sup>Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany</p>		
11:15	<p><b>G-O-1</b>  <b>Cathodoluminescence Hyperspectral Imaging Of Low Resistivity Large Bandgap AlGaN Layers</b></p> <p><u>Gunnar Kusch</u><sup>1</sup>, M. Nouf-Allehiani<sup>1</sup>, F. Mehnke<sup>2</sup>, P. R. Edwards<sup>1</sup>, T. Wernicke<sup>2</sup>, G. Naresh-Kumar<sup>1</sup>, A. Knauer<sup>3</sup>, V. Kueller<sup>3</sup>, M. Weyers<sup>3</sup>, M. Kneissl<sup>2,3</sup>, C. Trager-Cowan<sup>1</sup>, R. W. Martin<sup>1</sup></p> <p><sup>1</sup>Department of Physics, SUPA, University of Strathclyde, UK  <sup>2</sup>Institute of Solid State Physics, Technische Universität Berlin, Germany  <sup>3</sup>Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany</p>	<p><b>A-O-1</b>  <b>Nuclear spin-echo coherence in strained InGaAs quantum dots</b></p> <p><u>Evgeny A. Chekhovich</u><sup>1</sup>, M. Hopkinson<sup>2</sup>, M. S. Skolnick<sup>1</sup>, A. I. Tartakovskii<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>Department of Electronic and Electrical Engineering, University of Sheffield, UK</p>	<p><b>F-O-1</b>  <b>Nonlinear interactions in an organic polariton condensate</b></p> <p><u>Kostas S. Daskalakis</u>, S. A. Maier, R. Murray, S. Kéna-Cohen</p> <p>Department of Physics and Centre for Plastic Electronics, Imperial College London, UK</p>
11:30	<p><b>G-O-2</b>  <b>Electronic structure of the wide band gap Group II-IV nitride MgSiN<sub>2</sub></b></p> <p><u>James B. Quirk</u><sup>1</sup>, M. Råsander<sup>1</sup>, C. M. McGilvery<sup>1</sup>, R. Palgrave<sup>2</sup>, M.A. Moram<sup>1</sup></p> <p><sup>1</sup>Department of Materials, Imperial College London, UK  <sup>2</sup>Department of Chemistry, University College London, UK</p>		<p><b>F-O-2</b>  <b>A chemical sensor based on a photonic-crystal L3 nanocavity defined into a silicon-nitride membrane</b></p> <p><u>K. Deasy</u><sup>1,3</sup>, <u>Khalid N. Sedig</u><sup>1</sup>, S. Brittle<sup>1</sup>, T. Wang<sup>1</sup>, F. Davis<sup>2</sup>, T. H. Richardson<sup>1</sup>, D. G. Lidzey<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>Cranfield Biotechnology Centre, School of Engineering, Cranfield University, UK  <sup>3</sup>Light-Matter Interactions Unit, OIST Graduate University, Okinawa, Japan</p>

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11:45	<p>G-O-3  <b>Growth and Characterisation of stacking-fault-free <math>Sc_xGa_{1-x}N</math> films</b></p> <p><u>Lucy E. Goff</u><sup>1,2</sup>, L. H. C. Tsui<sup>1</sup>, C. A. Nicoll<sup>2</sup>, H. E. Beere<sup>2</sup>, I. Farrer<sup>2</sup>, D. A. Ritchie<sup>2</sup>, M. A. Moram<sup>1</sup></p> <p><sup>1</sup>Department of Materials, Imperial College London, UK  <sup>2</sup>Department of Physics, University of Cambridge, UK</p>	<p>A-O-2  <b>Electrically controllable on-chip single-photon router</b></p> <p><u>Chris Bentham</u><sup>1</sup>, I. E. Itskevich<sup>2</sup>, R. J. Coles<sup>1</sup>, B. Royall<sup>1</sup>, A. M. Fox<sup>1</sup>, M. S. Skolnick<sup>1</sup>, L. R. Wilson<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>School of Engineering, University of Hull, UK</p>	<p>F-O-3  <b>Charge Transport and Optical Gain Properties of Fluorene-based Copolymers</b></p> <p><u>Mohammad Yaqub Chaudhary</u>, Donal D.C. Bradley</p> <p>Centre for Plastic Electronics, Experimental Solid State Group, Department of Physics, Imperial College London, UK</p>
12:00	<p>G-O-4  <b>Investigation of unintentional indium incorporation into GaN barriers of InGaN/GaN quantum well structures</b></p> <p><u>Fabien Massabuau</u><sup>1</sup>, M. Davies<sup>2</sup>, M. Kappers<sup>1</sup>, C. Humphreys<sup>1</sup>, R. Oliver<sup>1</sup></p> <p><sup>1</sup>Department of Materials Science and Metallurgy, University of Cambridge, UK  <sup>2</sup>Photon Science Institute, University of Manchester, UK</p>	<p>A-O-3  <b>Resonantly Scattered Photons from a "Noisy" Quantum Dot in a Planar Cavity Antenna</b></p> <p>T. S. Santana<sup>1</sup>, Y. Ma<sup>1</sup>, <u>Ralph N. E. Malein</u><sup>1</sup>, E. Clarke<sup>2</sup>, B. D. Gerardot<sup>1</sup></p> <p><sup>1</sup>Institute of Photonics and Quantum Sciences, SUPA, Heriot-Watt University, Edinburgh, UK  <sup>2</sup>EPSRC National Centre for III-V Technologies, University of Sheffield, UK</p>	<p>F-O-4  <b>Low voltage, high performance solution processed phosphorescent green organic light emitting device with copper thiocyanate (CuSCN) as hole injection/transport layer</b></p> <p><u>Ajay Perumal</u>, H. Faber, N. Yaacob-Gross, P. Pattanasattayavong, P. Stavrinou, T. Anthopoulos, D. D. C. Bradley</p> <p>Department of Physics and Centre for Plastic Electronics, Imperial College London, UK</p>
12:15	<p>G-O-5  <b>Microstructural characterisation of InGaN/GaN multiple quantum wells grown on m-plane bulk GaN</b></p> <p><u>Fengzai Tang</u>, Tongtong Zhu, James T. Griffiths, Fabrice Oehler, Menno J. Kappers, Rachel A. Oliver</p> <p>Department of Materials Science and Metallurgy, University of Cambridge, UK</p>	<p>A-O-4  <b>Quantum dot optical registration with sub-nanometre precision for fabrication of integrated quantum information circuits</b></p> <p><u>James E. Dixon</u><sup>1</sup>, M. N. Makhonin<sup>1</sup>, B. Royall<sup>1</sup>, E. Clarke<sup>2</sup>, A. M. Fox<sup>1</sup>, M. S. Skolnick<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>EPSRC National Centre for III-V Technologies, University of Sheffield, UK</p>	<p>F-O-5  <b>The role of hot charge transfer states in polymer-fullerene organic photovoltaic devices, explored using Kinetic Monte Carlo methods</b></p> <p><u>Matthew L. Jones</u><sup>1</sup>, Nigel Clarke<sup>2</sup>, Reesha Dyer<sup>1</sup>, Chris Groves<sup>1</sup></p> <p><sup>1</sup>School of Engineering and Computing Sciences, Durham University, UK  <sup>2</sup>Department of Physics and Astronomy, University of Sheffield, UK</p>
12:30	Lunch, Exhibition and Poster Session for Symposia A, C, F, G, Atrium Level 2		
14:00	<p>Plenary 2  <b>Quantum cascade laser combs at mid-infrared and terahertz frequencies</b></p> <p><u>Jerome Faist</u></p> <p>Institute for Quantum Electronics, ETH Zürich, Switzerland</p>		

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14:45	<p>G-O-6  <b>Facet dependent incorporation of InGaN for light emission</b></p> <p><u>Ionut Girgel</u><sup>1</sup>, E. Le Boulbar<sup>1</sup>, P. R. Edwards<sup>2</sup>, D. W. E. Allsopp<sup>1</sup>, R. W. Martin<sup>2</sup>, P. A. Shields<sup>1</sup></p> <p><sup>1</sup>Department of Electronic and Electrical Engineering, University of Bath, UK  <sup>2</sup>Department of Physics, SUPA, Strathclyde University, Glasgow, UK</p>	<p>A-O-5  <b>Exploring far-from-equilibrium physics through exciton reactions on semiconducting carbon nanotubes</b></p> <p><u>Jeremy Allam</u><sup>1</sup>, M. T. Sajjad<sup>1</sup>, R. Sutton<sup>1</sup>, K. Litvinenko<sup>1</sup>, Z. Wang<sup>1</sup>, S. Siddique<sup>1</sup>, Q-H. Yang<sup>2</sup>, W. H. Loh<sup>3</sup>, T. Brown<sup>2</sup></p> <p><sup>1</sup>Advanced Technology Institute, University of Surrey, Guildford, UK  <sup>2</sup>School of Chemistry, University of Southampton, UK  <sup>3</sup>Optoelectronics Research Centre, University of Southampton, UK</p>	<p>F-O-6  <b>Solution Processing of Organic Photovoltaic Devices Using Non-Halogenated Solvents</b></p> <p><u>Jonathan Griffin</u><sup>1</sup>, A. J Pearson<sup>1</sup>, N. W. Scarratt<sup>1</sup>, H. Yi<sup>2</sup>, A. Iraqi<sup>2</sup>, A. R. Buckley<sup>1</sup>, D. G. Lidzey<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>Department of Chemistry, University of Sheffield, UK</p>
15:00	<p>G-O-7  <b>Study of electron mobility in (11-22) semi-polar GaN grown on nanorod templates</b></p> <p><u>Benbo Xu</u>, X. Yu, Y. Gong, K. Xing, B. Liu, J. Bai, T. Wang</p> <p>Department of Electronic and Electrical Engineering, University of Sheffield, UK</p>		<p>F-O-7  <b>Fabricating high performance inverted organic solar cells by the dip coating method</b></p> <p><u>Yaqub Rahaq</u>, Heming Wang</p> <p>Materials &amp; Engineering Research Institute, Sheffield Hallam University, UK</p>
15:15	<p>G-O-8  <b>Normally-Off AlInN/GaN HEMTs on Si Substrate using Fluorine Implant</b></p> <p><u>Zaffar H. Zaidi</u><sup>1</sup>, Kean B. Lee<sup>1</sup>, Ivor Guiney<sup>2</sup>, Hongtu Qian<sup>1</sup>, Sheng Jiang<sup>1</sup>, David J. Wallis<sup>2</sup>, Colin Humphreys<sup>2</sup>, Peter A. Houston<sup>1</sup></p> <p><sup>1</sup>Department of Electronic and Electrical Engineering, University of Sheffield, UK  <sup>2</sup>Department of Materials Science and Metallurgy, University of Cambridge, UK</p>	<p>A-O-6  <b>Coherence between defect-bound excitons in bulk GaAs</b></p> <p>Brian L. Wilmer<sup>1</sup>, Richard P. Mirin<sup>2</sup>, <u>Alan D. Bristow</u><sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, West Virginia University, Morgantown, WV, USA  <sup>2</sup>National Institute for Standards and Technology, Boulder, CO, USA</p>	<p>F-O-8  <b>Morphology and performance of P3HT:PCBM organic solar cells: A study of the effects of chlorine solvents and their co-solvents</b></p> <p><u>Burak Y. Kadem</u>, Aseel K. Hassan</p> <p>Material and Engineering research Institute (MERI), Sheffield Hallam University, UK</p>
15:30	<p>G-O-9  <b>Device simulation and optimization of i-GaN capped AlGaN/AlN/GaN HEMT</b></p> <p><u>Soroush Faramehr</u><sup>1</sup>, A. Al-Khalidi<sup>2</sup>, Ata. Khalid<sup>2</sup>, E. Wasige<sup>2</sup>, P. Igić<sup>1</sup>, K. Kalna<sup>1</sup></p> <p><sup>1</sup>Electronic Systems Design Centre, School of Engineering, Swansea University, UK  <sup>2</sup>School of Engineering, University of Glasgow, UK</p>	<p>A-O-7  <b>Anomalous Anticrossing of Neutral Exciton States in GaAs/AlGaAs Quantum Dots</b></p> <p><u>Santosh Kumar</u><sup>1,3</sup>, E. Zallo<sup>1</sup>, Y. H. Liao<sup>2</sup>, P. Y. Lin<sup>2</sup>, R. Trotta<sup>1,4</sup>, P. Atkinson<sup>1</sup>, J. D. Plumhof<sup>1</sup>, F. Ding<sup>1</sup>, B. D. Gerardot<sup>3</sup>, S. J. Cheng<sup>2</sup>, A. Rastelli<sup>1,4</sup>, O. G. Schmidt<sup>1</sup></p> <p><sup>1</sup>Institute for Integrative Nanosciences, IFW Dresden, Germany  <sup>2</sup>National Chiao Tung University, Hsinchu 300, Taiwan, Republic of China  <sup>3</sup>IPaQS, SUPA, Heriot-Watt University, Edinburgh, UK  <sup>4</sup>Institute of Semiconductor and Solid State Physics, Johannes Kepler University Linz, Austria</p>	<p>F-O-9  <b>The influence of palladium on the power conversion efficiency and stability of organic photovoltaic devices</b></p> <p><u>Chris Bracher</u><sup>1</sup>, Nick Scarratt<sup>1</sup>, Robert Masters<sup>2</sup>, Hunan Yi<sup>3</sup>, Andrew J. Pearson<sup>1</sup>, Ahmed Iraqi<sup>3</sup>, David G. Lidzey<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>Department of Materials Science and Engineering, University of Sheffield, UK  <sup>3</sup>Department of Chemistry, University of Sheffield, UK</p>

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15:45	<p>G-O-10  <b>Low temperature Ohmic contacts to AlGaN/GaN HFETs on Si substrates using <math>\text{SiCl}_4</math> based RIE recess etching</b></p> <p><u>Xu Li</u>, Gary Ternent, Abdullah Al-Khalidi, Konstantinos Floros, Edward Wasige, Iain Thayne</p> <p>School of Engineering, University of Glasgow, UK</p>	<p>A-O-8  <b>Impact ionization and large room temperature magnetoresistance in micrometre-size, high-mobility InAs channels</b></p> <p><u>Anton V. Velichko</u><sup>1</sup>, O. Makarovskiy<sup>1</sup>, N. Mori<sup>2</sup>, L. Eaves<sup>1</sup>, A. Krier<sup>3</sup>, Q. Zhuang<sup>3</sup>, A. Patane<sup>1</sup></p> <p><sup>1</sup>School of Physics and Astronomy, University of Nottingham, UK  <sup>2</sup>Graduate School of Engineering, Osaka University, Japan  <sup>3</sup>Physics Department, Lancaster University, UK</p>	<p>F-O-10  <b>High performance of organic solar cells with solution-processed vanadium pentoxide hole extraction layers</b></p> <p><u>Abdullah S. Alsulami</u>, D. G. Lidzey</p> <p>Department of Physics and Astronomy, University of Sheffield, UK</p>
16:00	Refreshments and Exhibition, Atrium Level 2		
16:30	<p>G-O-11  <b>Dynamic Investigation of Non-radiative Energy Transfer in InGaN/GaN Based Hybrid Organic/Inorganic Nanostructures for White Emitters</b></p> <p><u>Rick M. Smith</u>, B. Liu, J. Bai, T. Wang</p> <p>Department of Electronic and Electrical Engineering, University of Sheffield, UK</p>	<p>A-O-9  <b>Modelling of time dependence of the quantum dot state evolution controlled by electrical gate pulses in Si nanostructures</b></p> <p><u>Aleksey Andreev</u>, David Williams</p> <p>Hitachi Cambridge Laboratory, Cavendish Laboratory, Cambridge, UK</p>	<p>C-O-1  <b>Wide band, Ultra sensitive Quantum Well Hall Effect Integrated Circuits using InGaAs-AlGaAs-GaAs 2DEG</b></p> <p><u>Mohammadreza Sadeghi</u>, J. Sexton, C. Liang, M. Missous</p> <p>School of Electrical and Electronic Engineering, University of Manchester, UK</p>
16:45	<p>G-O-12  <b>Influence of nanorod diameter on InGaN/GaN nanorod based hybrid plasmonic nanolaser</b></p> <p><u>Yaoanan Hou</u>, R. Smith, Y. Zhang, J. Bai, T. Wang</p> <p>Department of Electronic and Electrical Engineering, University of Sheffield, UK</p>	<p>A-O-10  <b>Robust Exciton Population Inversion by Off-resonant Pumping in a Single Quantum Dot</b></p> <p><u>Feng Liu</u><sup>1</sup>, J. H. Quilter<sup>1</sup>, A. J. Brash<sup>1</sup>, M. Glässl<sup>2</sup>, A. M. Barth<sup>2</sup>, V.M. Axt<sup>2</sup>, A. J. Ramsay<sup>3</sup>, M. S. Skolnick<sup>1</sup>, A. M. Fox<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>Institut für Theoretische Physik III, Universität Bayreuth, Germany  <sup>3</sup>Hitachi Cambridge Laboratory, Cavendish Laboratory, Cambridge, UK</p>	<p>C-O-2  <b>Thermally Activated Resonant Tunnelling in GaAs/AlGaAs Triple Barrier Tunnelling Structures</b></p> <p><u>Craig P. Allford</u><sup>1</sup>, R. E. Legg<sup>1</sup>, R. A. O'Donnell<sup>1</sup>, P. Dawson<sup>2</sup>, M. Missous<sup>3</sup>, P. D. Buckle<sup>1</sup></p> <p><sup>1</sup>School of Physics and Astronomy, Cardiff University, UK  <sup>2</sup>School of Physics and Astronomy, University of Manchester, UK  <sup>3</sup>Department of Electrical and Electronic Engineering, University of Manchester, UK</p>
17:00	<p>G-O-13  <b>Characterisation of Inhomogeneous Electroluminescence in c-plane InGaN/GaN Quantum Well LED Structures Grown by MOCVD</b></p> <p><u>Christopher X. Ren</u><sup>1</sup>, M. J. Wallace<sup>2</sup>, M. J. Kappers<sup>1</sup>, P. R. Edwards<sup>2</sup>, R. W. Martin<sup>2</sup>, R. A. Oliver<sup>1</sup></p> <p><sup>1</sup>Department of Materials Science and Metallurgy, University of Cambridge, UK  <sup>2</sup>Department of Physics, Strathclyde University, Glasgow, UK</p>	<p>A-O-11  <b>Bright exciton-polariton solitons and trains in microwires</b></p> <p><u>Jasmin K. Chana</u><sup>1</sup>, M. Sich<sup>1</sup>, F. Fras<sup>2</sup>, E. Cancellieri<sup>1</sup>, D. N. Krizhanovskii<sup>1</sup>, A. V. Gorbach<sup>3</sup>, D. V. Skryabin<sup>3</sup>, M.S. Skolnick<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>Institut Neel, Grenoble, France  <sup>3</sup>University of Bath, UK</p>	<p>C-O-3  <b>Characterisation of commercial SiC power devices at cryogenic temperatures</b></p> <p><u>H. Chen</u><sup>1</sup>, <u>Peter M. Gammon</u><sup>1</sup>, V. A. Shah<sup>1,2</sup>, C. A. Fisher<sup>1</sup>, C. Chan<sup>1</sup>, S. Jahdi<sup>1</sup>, D. P. Hamilton<sup>1</sup>, M. R. Jennings<sup>1</sup>, M. Myronov<sup>2</sup>, D. R. Leadley<sup>2</sup>, P. A. Mawby<sup>1</sup></p> <p><sup>1</sup>School of Engineering, University of Warwick, UK  <sup>2</sup>Department of Physics, University of Warwick, UK</p>

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17:15	<p>G-O-14  <b>Improved Efficiency of InGaN Based Blue and Green Light Emitting Diodes Using Corrugated Interface Substrates</b></p> <p>T. J. Slight<sup>1</sup>, I. Titkov<sup>2</sup>, A. Sakharov<sup>3</sup>, W. Lundin<sup>3</sup>, A. Tsatsulnikov<sup>3</sup>, A. Nikolaev<sup>3</sup>, <u>Wyn Meredith</u><sup>1</sup>, E. Rafailov<sup>2</sup></p> <p><sup>1</sup>Compound Semiconductor Technologies Global, Glasgow, UK  <sup>2</sup>Aston University, Birmingham, UK  <sup>3</sup>Ioffe Institute, St Petersburg, Russia</p>	<p>A-O-12  <b>Picosecond Spatio-Temporal Solitons in Highly Nonlinear Polariton Waveguides</b></p> <p>Lloyd Tinkler<sup>1</sup>, P. M. Walker<sup>1</sup>, D. V. Skryabin<sup>2</sup>, A. I. Yulin<sup>3</sup>, B. Royall<sup>1</sup>, D. N. Krizhanovskii<sup>1</sup>, M. S. Skolnick<sup>1</sup>, I. Farrer<sup>4</sup>, D. A. Ritchie<sup>4</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>Department of Physics, University of Bath, UK  <sup>3</sup>Centro de Fisica Teorica e Computacional, Universidade de Lisboa, Portugal  <sup>4</sup>Cavendish Laboratory, University of Cambridge, UK</p>	<p>C-O-4  <b>A low damage inductively coupled plasma etch process of molybdenum with critical dimension of 30 nm suitable for compound semiconductor devices</b></p> <p><u>Menglin Cao</u>, X. Li, I. G. Thayne</p> <p>James Watt Nanofabrication Centre, School of Engineering, University of Glasgow, Scotland, UK</p>
17:30	<p>G-O-15  <b>Recombination dynamics investigation of green lasing from InGaN/GaN microdisks on Si substrates</b></p> <p><u>Modestos Athanasiou</u>, R. Smith, B. Liu, T. Wang</p> <p>Department of Electronic and Electrical Engineering, University of Sheffield, UK</p>	<p>A-O-13  <b>Soliton-Soliton interaction and Logic Gates in Cavity Polariton Circuits</b></p> <p><u>Emiliano Cancellieri</u>, D. Whittaker</p> <p>Department of Physics and Astronomy, University of Sheffield, UK</p>	<p>C-O-5  <b>3D Finite Element Monte Carlo Study of Scaled Triangular SOI FinFETs using 2D Schrödinger Quantum Corrections</b></p> <p>D. Nagy<sup>1</sup>, Muhammad A. Elmessary<sup>1,2</sup>, M. Aldegunde<sup>1</sup>, J. Lindberg<sup>1</sup>, W. G. Dettmer<sup>1</sup>, D. Peric<sup>1</sup>, A. J. Garcia Loureiro<sup>3</sup>, A. Martinez<sup>1</sup>, K. Kalna<sup>1</sup></p> <p><sup>1</sup>College of Engineering, Swansea University, Swansea, Wales, UK  <sup>2</sup>College of Engineering, Mansoura University, Egypt  <sup>3</sup>CITIUS, University of Santiago de Compostela, Galicia, Spain</p>
17:45	<p>G-O-16  <b>Modelling of Mn doped acceptor levels for GaN Intermediate Band Solar Cells: Effect of defect levels linewidth broadening</b></p> <p><u>Qiao-Yi Wang</u>, J. M. Rorison</p> <p>Department of Electrical and Electronic Engineering, University of Bristol, UK</p>	<p>A-O-14  <b>Exciton-polariton condensation in strongly confined open microcavities</b></p> <p>Feng Li<sup>1</sup>, S. Dufferwiel<sup>1</sup>, F. Fras<sup>1</sup>, A. Trichet<sup>2</sup>, P. M. Walker<sup>1</sup>, L. Giriunas<sup>1</sup>, M. N. Makhonin<sup>1</sup>, L. R. Wilson<sup>1</sup>, J. M. Smith<sup>2</sup>, D. N. Krizhanovskii<sup>1</sup>, M. S. Skolnick<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>Department of Materials, University of Oxford, UK</p>	<p>C-O-6  <b>Phonon scattering in Ultra-scaled Trigate FET</b></p> <p><u>Antonio Martinez</u><sup>1</sup>, R. Valin<sup>1</sup>, M. Aldegunde<sup>1</sup>, A. Price<sup>1</sup>, J. R. Barker<sup>2</sup></p> <p><sup>1</sup>College of Engineering, Swansea University, UK  <sup>2</sup>School of Engineering, University of Glasgow, UK</p>
18:00	End of Session		
18:30	Conference Reception & Drinks, Kelham Island Museum		
19:30	Operation of Steam Engine Followed by Conference Dinner		

## Oral Presentations – Thursday 10<sup>th</sup> July 2014

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre	Owen 1028 Lecture Theatre
From 09:00			Registration and Exhibition, Atrium Level 2	
09:30	<b>Plenary 3</b> <b>Antimonide-Based Compound Semiconductors for Low-Power Electronics</b> <u>Brian R. Bennett</u> , J. Brad Boos  Electronic Science and Technology Division, Naval Research Laboratory, Washington, DC, USA			
10:15		Refreshments and Exhibition, Atrium Level 2		
10:45	<b>B-O-1</b> <b>Towards high efficiency intermediate band solar cells with a 'Photon Ratchet'</b> <u>Nicholas P. Hylton</u> , M. Yoshida, A. Pusch, O. Curtin, A. R. Vaquero-Stainer, N. J. Ekins-Daukes, O. Hess, C. C. Phillips  Department of Physics, Imperial College London, UK	<b>D-O-1</b> <b>Tuning the bandgap of exfoliated InSe nanosheets by quantum confinement</b> <u>Garry W. Mudd</u> <sup>1</sup> , S. A. Svatek <sup>1</sup> , T. H. Ren <sup>1</sup> , A. Patanè <sup>1</sup> , O. Makarovsky <sup>1</sup> , L. Eaves <sup>1</sup> , P. H. Beton <sup>1</sup> , Z. D. Kovalyuk <sup>2</sup> , G. V. Lashkarev <sup>2</sup> , Z. R. Kudrynskyi <sup>2</sup> , A. I. Dmitriev <sup>2</sup>  <sup>1</sup> School of Physics and Astronomy, University of Nottingham, UK <sup>2</sup> Institute for Problems of Materials Science, Ukrainian Academy of Sciences, Kiev, Ukraine	<b>E-O-1</b> <b>MBE growth and properties of high Bi content GaSbBi alloys</b> <u>Mohana K. Rajpalke</u> <sup>1</sup> , W. M. Linhart <sup>1</sup> , M. Birkett <sup>1</sup> , K. M. Yu <sup>2</sup> , T. S. Jones <sup>3</sup> , M. J. Ashwin <sup>3</sup> , T. D. Veal <sup>1</sup>  <sup>1</sup> Stephenson Institute for Renewable Energy and Department of Physics, University of Liverpool, UK <sup>2</sup> Materials Sciences Division, Lawrence Berkeley National Laboratory, CA, USA <sup>3</sup> Department of Chemistry, University of Warwick, UK	<b>H-O-1</b> <b>Laser requirements for medical and biological photoacoustic imaging</b> <u>Paul Beard</u>  Department of Medical Physics & Bioengineering, University College London, UK
11:00	<b>B-O-2</b> <b>Characterisation of Laser Power Converter Parameters under High Illumination</b> <u>Scott D. Jarvis</u> , Jayanta Mukherjee, Stephen J. Sweeney  Advanced Technology Institute, University of Surrey, Guildford, UK	<b>D-O-2</b> <b>Semiconducting properties of graphene oxide</b> <u>Mark Lundie</u> <sup>1</sup> , Željko Šljivančanin <sup>2</sup> , Stanko Tomic <sup>1</sup>  <sup>1</sup> Joule Physics Laboratory, University of Salford, UK <sup>2</sup> Vinča Institute of Nuclear Sciences, University of Belgrade, Serbia	<b>E-O-2</b> <b>Analytical Solutions for the Luminescence of Mid Infrared Semiconductor Materials</b> <u>Mauro F. Pereira</u> , C. I. Oriaku  Materials and Engineering Research Institute, Sheffield Hallam University, UK	

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre	Owen 1028 Lecture Theatre
11:15	<p>B-O-3  <b>Voltage Recovery in Direct-Si doped Quantum Dot Solar Cells</b></p> <p><u>Phu Lam</u><sup>1</sup>, S. Hatch<sup>1</sup>, J. Wu<sup>1</sup>, M. Tang<sup>1</sup>, V. G. Dorogan<sup>2</sup>, Yu. I. Mazur<sup>2</sup>, G. J. Salamo<sup>2</sup>, I. Ramiro<sup>1,3</sup>, A. Seeds<sup>1</sup>, H. Liu<sup>1</sup></p> <p><sup>1</sup>Department of Electronic and Electrical Engineering, University College London, UK  <sup>2</sup>Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville AR, USA  <sup>3</sup>Instituto de Energía Solar, ETSI Telecomunicación, Madrid, Spain</p>	<p>D-O-3  <b>Optics of two-dimensional semiconducting films in tunable photonic microcavities</b></p> <p><u>Stefan Schwarz</u><sup>1</sup>, S. Dufferwiel<sup>1</sup>, F. Withers<sup>2</sup>, A. Trichet<sup>3</sup>, M. Sich<sup>1</sup>, J. M. Smith<sup>3</sup>, D. N. Borisenko<sup>4</sup>, N. N. Kolesnikov<sup>4</sup>, E. A. Chekhovich<sup>1</sup>, M. S. Skolnick<sup>1</sup>, D. N. Krizhanovskii<sup>1</sup>, A. I. Tartakovskii<sup>1</sup></p> <p><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>2</sup>School of Physics and Astronomy, University of Manchester, UK  <sup>3</sup>Department of Materials, University of Oxford, UK  <sup>4</sup>Institute of Solid State Physics, Russian Academy of Sciences, Chernogolovka, Russia</p>	<p>E-O-3  <b>The effect of non-radiative processes on the performance of GaInAsSb/GaSb 2-3 μm mid-infrared lasers</b></p> <p><u>A. Barnabas</u>, Ikyo<sup>1,3</sup>, I. P. Marko<sup>1</sup>, K. Hild<sup>1</sup>, A. R. Adams<sup>1</sup>, S. Arafin<sup>2</sup>, M. C. Amann<sup>2</sup>, S. J. Sweeney<sup>1</sup></p> <p><sup>1</sup>Advanced Technology Institute and Department of Physics, University of Surrey, Guildford, UK  <sup>2</sup>Walter Schottky Institut, Technische Universität München, Garching, Germany</p>	<p>H-O-2  <b>Dual imaging markers based on paramagnetic, near-infrared colloidal semiconductor nanoparticles</b></p> <p><u>Lyudmila Turyanska</u><sup>1</sup>, F. Moro<sup>1</sup>, A. Patanè<sup>1</sup>, M. W. Fay<sup>2</sup>, T. D. Bradshaw<sup>3</sup>, R. Trueman<sup>4</sup>, P. Wigmore<sup>4</sup>, P. Clarke<sup>4</sup>, H. Faas<sup>4</sup>, A. M. Grabowska<sup>4</sup>, N. R. Thomas<sup>5</sup></p> <p><sup>1</sup>School of Physics and Astronomy, University of Nottingham, UK  <sup>2</sup>Nottingham Nanotechnology and Nanoscience Centre, University of Nottingham, UK  <sup>3</sup>School of Pharmacy, University of Nottingham, UK  <sup>4</sup>Faculty of Medicine &amp; Health Sciences, University of Nottingham, UK  <sup>5</sup>School of Chemistry, University of Nottingham, UK</p>
11:30	<p>B-O-4  <b>InAs/GaAsSb quantum dot solar cells</b></p> <p><u>Sabina Hatch</u><sup>1</sup>, Jiang Wu<sup>1</sup>, Kimberly Sablon<sup>2</sup>, Phu Lam<sup>1</sup>, Mingchu Tang<sup>1</sup>, Qi Jiang<sup>1</sup>, Huiyun Liu<sup>1</sup></p> <p><sup>1</sup>Department of Department of Electronic &amp; Electrical Engineering, University College London, UK  <sup>2</sup>United States Army Research Laboratory, Adelphi MD, USA</p>	<p>D-O-4  <b>Photoluminescence Studies of Single GaSb Quantum Rings</b></p> <p><u>Matt Young</u><sup>1</sup>, C. Woodhead<sup>1</sup>, J. Roberts<sup>1</sup>, Y. Noori<sup>1</sup>, E. P. Smakman<sup>2</sup>, P. M. Koenraad<sup>2</sup>, M. Hayne<sup>1</sup>, R. J. Young<sup>1</sup></p> <p><sup>1</sup>Department of Physics, Lancaster University, UK  <sup>2</sup>Department of Applied Physics, Eindhoven University of Technology, The Netherlands</p>	<p>E-O-4  <b>Terahertz frequency quantum cascade lasers with &gt;1 Watt output power</b></p> <p><u>Jingxuan Zhu</u>, L. H. Li, L. Chen, J. Freeman, P. Dean, A. Valavanis, A. G. Davies, E. H. Linfield</p> <p>School of Electronic and Electrical Engineering, University of Leeds, UK</p>	

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre	Owen 1028 Lecture Theatre
11:45	<p>B-O-5  <b>Dark current analysis for dilute nitrides and bismides in various sub-junction designs for 1.0 eV tandem solar cells</b></p> <p><u>Richard Ketlhwafetse</u>, Naci Balkan</p> <p>School of Computer Science and Electronic Engineering, University of Essex, UK</p>	<p>D-O-5  <b>Linearly polarized single mode emission in semiconductor nanowires</b></p> <p><u>Andrew P. Foster</u><sup>1</sup>, J. P. Bradley<sup>1</sup>, K. Gardner<sup>1</sup>, A. B. Krysa<sup>2</sup>, B. Royal<sup>1</sup>, M. S. Skolnick<sup>1</sup>, L. R. Wilson<sup>1</sup></p> <p><sup>1</sup>Department of Physics &amp; Astronomy, University of Sheffield, UK  <sup>2</sup>Department of Electronic &amp; Electrical Engineering, University of Sheffield, UK</p>	<p>E-O-5  <b>Extended density matrix model applied to tall barrier quantum cascade lasers</b></p> <p><u>Andrew Grier</u>, A. Valavanis, J. D. Cooper, P. Harrison, Z. Ikonić, D. Indjin</p> <p>Institute of Microwaves and Photonics, School of Electronic and Electrical Engineering, University of Leeds, UK</p>	<p>H-O-3  <b>Biophotonics applications of swept lasers</b></p> <p><u>Steve Matcher</u><sup>1</sup>, David Childs<sup>2</sup>, Dmitry Revin<sup>3</sup>, John Cockburn<sup>3</sup>, Ihtesham Rehman<sup>1</sup>, Richard Hogg<sup>3</sup></p> <p><sup>1</sup>Department of Materials Science and Engineering, University of Sheffield, UK  <sup>2</sup>Department of Electronic and Electrical Engineering, University of Sheffield, UK  <sup>3</sup>Department of Physics and Astronomy, University of Sheffield, UK</p>
12:00	<p>B-O-6  <b>Selective Passivation of Nitrogen Defect in GaInNAs Solar Cells</b></p> <p>M. Fukuda<sup>1</sup>, V. R. Whiteside<sup>1</sup>, J. C. Keay<sup>1</sup>, M. Al Khalfioui<sup>2</sup>, M. Leroux<sup>2</sup>, K. Hossain<sup>3</sup>, T. D. Golding<sup>3</sup>, <u>Ian R. Sellers</u><sup>1</sup></p> <p><sup>1</sup>Department of Physics &amp; Astronomy, University of Oklahoma, USA  <sup>2</sup>CRHEA-CNRS, Valbonne, France  <sup>3</sup>Amethyst Research Inc., Ardmore, Oklahoma, USA</p>	<p>D-O-6  <b>GaAs/AlGaAs core-shell nanowires with carrier mobilities and lifetimes approaching bulk limits</b></p> <p><u>Hannah J. Joyce</u><sup>1,2</sup>, Patrick Parkinson<sup>2</sup>, Callum J. Docherty<sup>2</sup>, Nian Jiang<sup>3</sup>, Jennifer Wong-Leung<sup>3</sup>, Qiang Gao<sup>3</sup>, H. Hoe Tan<sup>3</sup>, C. Jagadish<sup>3</sup>, Laura M. Herz<sup>2</sup>, Michael B. Johnston<sup>2</sup></p> <p><sup>1</sup>Centre for Advanced Photonics and Electronics, Department of Engineering, University of Cambridge, UK  <sup>2</sup>Department of Physics, University of Oxford, UK  <sup>3</sup>Department of Electronic Materials Engineering, Research School of Physics and Engineering, Australian National University, Canberra, Australia</p>	<p>E-O-6  <b>Discrete Vernier tuning with constant output power in terahertz quantum cascade lasers using coupled cavities</b></p> <p><u>Iman Kundu</u>, P. Dean, A. Valavanis, L. Chen, L. H. Li, J. E. Cunningham, E. H. Linfield, A. G. Davies</p> <p>School of Electronic and Electrical Engineering, University of Leeds, UK</p>	

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre	Owen 1028 Lecture Theatre
12:15	<p>B-O-7</p> <p><b>Tunable spectral response of a Ga(AsN) superlattice diode by post-growth hydrogenation and thermal annealing</b></p> <p><u>Nilanthy Balakrishnan</u><sup>1</sup>, G. Pettinari<sup>2</sup>, A. Patanè<sup>1</sup>, O. Makarovskiy<sup>1</sup>, M. Hopkinson<sup>3</sup></p> <p><sup>1</sup>School of Physics and Astronomy, University of Nottingham, UK  <sup>2</sup>National Research Council, Institute for Photonics and Nanotechnologies, Rome, Italy  <sup>3</sup>Department of Electronic and Electrical Engineering, University of Sheffield, UK</p>	<p>D-O-7</p> <p><b>Self-Catalyzed Ternary Core-Shell GaAsP Nanowires Grown on Patterned and Un-Patterned Silicon Substrates by Molecular Beam Epitaxy</b></p> <p><u>Yunyan Zhang</u><sup>1</sup>, Jiang Wu<sup>1</sup>, Martin Aagesen<sup>2</sup>, Sabina Hatch<sup>1</sup>, Jeppe Holm<sup>2</sup>, Ana M. Sanchez<sup>3</sup>, Suguo Huo<sup>4</sup>, Huiyun Liu<sup>1</sup></p> <p><sup>1</sup>Department of Electronic and Electrical Engineering, University College London, UK  <sup>2</sup>Gasp Solar ApS, Taastrup, Denmark  <sup>3</sup>Department of Physics, University of Warwick, UK  <sup>4</sup>London Centre for Nanotechnology, University College London, UK</p>	<p>E-O-7</p> <p><b>Quantum Cascade Lasers Operating in External Ring Cavity Resonator</b></p> <p>D. Marchenko<sup>1</sup>, <u>Dmitry G. Revin</u><sup>2</sup>, M. Hemingway<sup>2</sup>, D. Vaitiekus<sup>2</sup>, A. B. Krysa<sup>3</sup>, C. Hamilton<sup>4</sup>, G. Robertson<sup>4</sup>, F. Harren<sup>1</sup>, J. W. Cockburn<sup>2</sup>, N. Hempler<sup>4</sup>, G. T. Maker<sup>4</sup>, G. P. A. Malcolm<sup>4</sup></p> <p><sup>1</sup>Institute for Molecules &amp; Materials, Department of Molecular &amp; Laser Physics, Radboud University, Nijmegen, Netherlands  <sup>2</sup>Department of Physics and Astronomy, University of Sheffield, UK  <sup>3</sup>EPSRC National Centre for III-V Technologies, University of Sheffield, UK  <sup>4</sup>M Squared Lasers Ltd., Glasgow, UK</p>	<p>H-O-4</p> <p><b>Novel compact laser sources for biomedical photonics: diagnostics and treatment</b></p> <p><u>Sergei G. Sokolovski</u>, K. Litvinova, E.U. Rafailov</p> <p>Optoelectronics and Biomedical Photonics Group, School of Engineering and Applied Science, Aston University, UK</p>
12:30	<p>B-O-8</p> <p><b>Characterisation of Bulk GaAsBi p-i-n diodes</b></p> <p><u>Robert D Richards</u>, Zhize Zhou, Danuta F Mendes, Faebian Bastiman, John P R David</p> <p>Department of Electronic and Electrical Engineering, University of Sheffield, UK</p>	<p>D-O-8</p> <p><b>Optical study on the suitability of defect filters for the emission of InAs QDs grown on Si substrates</b></p> <p><u>Jon Orchard</u><sup>1</sup>, Jiang Wu<sup>3</sup>, Thomas Ward<sup>2</sup>, Richard Beanland<sup>2</sup>, Huiyun Lui<sup>3</sup>, David Mowbray<sup>1</sup></p> <p><sup>1</sup>Department of Physics &amp; Astronomy, University of Sheffield, UK  <sup>2</sup>Department of Physics, University of Warwick, UK  <sup>3</sup>Department of Electronic &amp; Electrical Engineering, University College London, UK</p>	<p>E-O-8</p> <p><b>A Rapid Swept-Source Mid-Infrared Laser</b></p> <p><u>David T. D. Childs</u><sup>1</sup>, A. B. Krysa<sup>2</sup>, K. L. Kennedy<sup>2</sup>, D. G. Revin<sup>3</sup>, J. W. Cockburn<sup>3</sup>, R. A. Hogg<sup>1</sup>, S. J. Matcher<sup>4</sup></p> <p><sup>1</sup>Department of Electronic and Electrical Engineering, University of Sheffield, UK  <sup>2</sup>EPSRC National Centre for III-V Technologies, University of Sheffield, UK  <sup>3</sup>Department of Physics &amp; Astronomy, University of Sheffield, UK  <sup>4</sup>Department of Materials Science and Engineering, University of Sheffield, UK</p>	
12:45	Lunch, Exhibition and Poster Session for Symposia B, D, E, Atrium Level 2			
13:00	IOP Semiconductor Group AGM  Pennine Lecture Theatre			

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14:00	<b>Plenary 4</b> <b>Common Solid State Electronics Technologies for Healthcare</b> <u>Hywel Morgan</u>  Faculty of Physical Sciences and Engineering, and Institute for Life Science, University of Southampton, UK			
14:45	<b>B-O-9</b> <b>Optimisation of GaAs-Based Distributed Feedback Lasers operating ~ 1000nm</b>  <u>Hongchi Lei</u> <sup>1</sup> , K. M. Groom <sup>1</sup> , A. B. Krysa <sup>1</sup> , B. J. Stevens <sup>1</sup> , N. Babazadeh <sup>1</sup> , P.W. Fry <sup>1</sup> , G. Ternent <sup>2</sup> , S. Thoms <sup>2</sup> , D. T. D. Childs <sup>1</sup> , R. A. Hogg <sup>1</sup>  <sup>1</sup> Department of Electronic and Electrical Engineering, University of Sheffield, UK <sup>2</sup> School of Engineering, University of Glasgow, Glasgow, Scotland, UK	<b>D-O-9</b> <b>Zinc Nitride Nanocrystals – Synthesis and Characterisation</b>  <u>Peter N. Taylor</u> , Michael A. Schreuder, Tim M. Smeeton, Alastair J. D. Grundy, James A. R. Dimmock, Stewart E. Hooper, Jon Heffernan, Matthias Kauer  Sharp Laboratories of Europe Limited, Oxford, UK	<b>E-O-9</b> <b>Development of High Performance III-V Extended Short-Wavelength Infrared Unipolar Barrier Photodetectors within four months</b>  <u>Manish Jain</u> <sup>1</sup> , Gary W. Wicks <sup>1</sup> , Adam P. Craig <sup>2</sup> , Andrew R. J. Marshall <sup>2</sup> , Terry D. Golding <sup>1</sup> , Kenneth McEwan <sup>3</sup> , Christopher R. Howle <sup>3</sup>  <sup>1</sup> Amethyst Research Ltd, Glasgow, UK <sup>2</sup> Physics Department, Lancaster University, UK <sup>3</sup> Defence Science and Technology Laboratory, Porton Down, UK	<b>H-O-5</b> <b>Biomedical Optical imaging and sensing using CMOS sensors with on chip processing</b>  <u>Stephen P Morgan</u> , Diwei He, Barrie R Hayes-Gill  Electrical Systems and Optics Research Division, Faculty of Engineering, University of Nottingham, UK
15:00	<b>B-O-10</b> <b>Effect of Inhomogeneous Linewidth on Lasing Spectrum of Quantum Dot Laser Devices for O-band Optical Communication</b>  <u>Hifsa Shahid</u> <sup>1</sup> , D. T. D. Childs <sup>2</sup> , M. A. Majid <sup>3</sup> , B. J. Stevens <sup>2</sup> , R. A. Hogg <sup>2</sup> , E. Clarke <sup>2</sup> , P. Spencer <sup>4</sup> , R. Murray <sup>4</sup>  <sup>1</sup> Department of Electrical Engineering and Technology, University of Engineering & Technology Lahore, Pakistan <sup>2</sup> Department of Electronic and Electrical Engineering, University of Sheffield, UK <sup>3</sup> Computer, Electrical, and Mathematical Sciences & Engineering Division, King Abdullah University of Science & Technology (KAUST), Saudi Arabia <sup>4</sup> Department of Physics, Imperial College London, UK	<b>D-O-10</b> <b>Atomistic Study of InSb Quantum Dots</b>  <u>Andrew M. Sills</u> , P. Harrison, M. Califano  Institute of Microwaves and Photonics, School of Electronic and Electrical Engineering, University of Leeds, UK	<b>E-O-10</b> <b>GaAs and AlGaAs APDs with GaSb absorption regions in a novel separate absorption and multiplication structure using a hetero-lattice interface</b>  <u>Andrew R. J. Marshall</u> <sup>1</sup> , A. P. Craig <sup>1</sup> , C. J. Reyner <sup>2</sup> , D. L. Huffaker <sup>2,3</sup>  <sup>1</sup> Physics department, Lancaster University, UK <sup>2</sup> Department of Electrical Engineering, UCLA, Los Angeles, CA, USA <sup>3</sup> California NanoSystems Institute, UCLA, Los Angeles, CA, USA	

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15:15	<p>B-O-11  <b>Optical loss measurements at 780 nm for III-V semiconductor single-mode, polarisation-maintaining waveguides for cold atom sensors</b></p> <p><u>Jessica O. Maclean</u>, Mark T. Greenaway, Richard P. Campion, T. Mark Fromhold, Anthony J. Kent, Christopher J. Mellor</p> <p>School of Physics and Astronomy, University of Nottingham, UK</p>	<p>D-O-11  <b>Energy States of Eccentric PbSe/PbS Core/Shell Structure Quantum Dots</b></p> <p><u>Thomas Walsh</u>, Jacek Miloszewski, Stanko Tomić</p> <p>University of Salford, UK</p>	<p>E-O-11  <b>Mid-infrared InAs<sub>0.91</sub>Sb<sub>0.09</sub>-based nBn photodetectors with Al<sub>0.9</sub>Ga<sub>0.1</sub>As<sub>0.08</sub>Sb<sub>0.92</sub> barrier layers – grown on GaAs, using an Interfacial Misfit Array, and on native GaSb</b></p> <p><u>Adam P. Craig</u><sup>1</sup>, A. R. J. Marshall<sup>1</sup>, Z.-B. Tian<sup>2</sup>, S. Krishna<sup>2</sup></p> <p><sup>1</sup>Physics Department, Lancaster University, UK  <sup>2</sup>Center for High Technology Materials, Department of Electrical &amp; Computer Engineering, University of New Mexico, Albuquerque, NM, USA</p>	<p>H-O-6  <b>Use of Terahertz Waves for Medical Imaging</b></p> <p><u>Ian Grundy</u></p> <p>Teraview Ltd., Cambridge, UK</p>
15:30	<p>B-O-12  <b>High Power Semiconductor mode-locked Master Oscillator Power Amplifier</b></p> <p><u>Jehan Akbar</u><sup>1</sup>, Anthony E. Kelly<sup>2</sup></p> <p><sup>1</sup>Department of Physics, Hazara University Mansehra, Pakistan  <sup>2</sup>School of Engineering, University of Glasgow, UK</p>	<p>D-O-12  <b>Charge-carrier confinement in stacks of sub-monolayer InAs in GaAs: Zero- or two-dimensional?</b></p> <p><u>Sam Harrison</u><sup>1</sup>, M. Young<sup>1</sup>, M. Hayne<sup>1</sup>, P. D. Hodgson<sup>1</sup>, R. J. Young<sup>1</sup>, A. Schliwa<sup>2</sup>, A. Strittmatter<sup>2</sup>, A. Lenz<sup>2</sup>, U. W. Pohl<sup>2</sup>, D. Bimberg<sup>2</sup></p> <p><sup>1</sup>Department of Physics, Lancaster University, UK  <sup>2</sup>Institut für Festkörperphysik, TU Berlin, Germany</p>	<p>E-O-12  <b>InAsBi photodiode with a cut off wavelength of 3.95 μm</b></p> <p>Ian C. Sandall, Faebian Bastiman, Ben White, Robert Richards, John David, <u>Chee Hing Tan</u></p> <p>Department of Electronic &amp; Electrical Engineering, University of Sheffield, UK</p>	
15:45	Refreshments, Atrium Level 2			H-O-7

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16:00	<p>B-O-13  <b>Monolithically integrated single and dual polarization mode convertors with semiconductor lasers</b></p> <p><u>Muhammad A. Naeem</u><sup>1</sup>, K. Abid<sup>1</sup>, J. Akbar<sup>2</sup></p> <p><sup>1</sup>University of the Punjab, Lahore, Pakistan  <sup>2</sup>Hazara University, Mansehra, Pakistan</p>	<p>D-O-13  <b>Direct Observation of Confined States in Highly-Uniform GaAs/AlGaAs Quantum Dots</b></p> <p><u>Yu-Chen Chang</u>, A. J. Robson, Q. D. Zhuang, M. Hayne</p> <p>Department of Physics, Lancaster University, UK</p>	<p>C-O-7  <b>Comparison of phonon scattering in nanowire field effect transistors with Si and GaAs cores using the Non-Equilibrium Green's Function formalism</b></p> <p><u>Anna Price</u>, Antonio Martinez</p> <p>Electronic Systems Design Centre, College of Engineering, Swansea University, UK</p>	<p>H-O-8  <b>Introduction to EPSRC Roadmapping Discussion Forum</b></p> <p><u>Huw Summers</u></p> <p>College of Engineering, Swansea University, UK</p>
16:15	<p>B-O-14  <b>InAs/GaAs Quantum-Dot Superluminescent Light-Emitting Diodes Monolithically Grown on Si Substrates</b></p> <p><u>Siming Chen</u><sup>1</sup>, M. Tang<sup>1</sup>, Q. Jiang<sup>1</sup>, J. Wu<sup>1</sup>, V. G. Dorogan<sup>2</sup>, M. Benamara<sup>2</sup>, Y. I. Mazur<sup>2</sup>, G. J. Salamo<sup>2</sup>, A. Seeds<sup>1</sup>, Huiyun Liu<sup>1</sup></p> <p><sup>1</sup>Department of Electronic and Electrical Engineering, University College London, UK  <sup>2</sup>Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville, AK, USA</p>	<p>D-O-14  <b>N-pair induced temperature insensitivity of the band gap of a dilute GaNSb semiconductor</b></p> <p><u>Wojciech M. Linhart</u><sup>1</sup>, M. K. Rajpalke<sup>1</sup>, M. Birkett<sup>1</sup>, L. Buckle<sup>2</sup>, T. Ashley<sup>3</sup>, T. S. Jones<sup>4</sup>, M. J. Ashwin<sup>4</sup>, T. D. Veal<sup>1</sup></p> <p><sup>1</sup>Stephenson Institute for Renewable Energy and Department of Physics, University of Liverpool, UK  <sup>2</sup>QinetiQ Ltd., Malvern, UK  <sup>3</sup>Department of Engineering, University of Warwick, UK  <sup>4</sup>Department of Chemistry, University of Warwick, UK</p>	<p>C-O-8  <b>WN and TiN metal gate workfunction variability in InGaAs FinFETs</b></p> <p><u>Natalia Seoane</u><sup>1</sup>, G. Indalecio<sup>2</sup>, A. Garcia-Loureiro<sup>2</sup>, M. Aldegunde<sup>1</sup>, K. Kalna<sup>1</sup></p> <p><sup>1</sup>Electronic Systems Design Centre, College of Engineering, Swansea University, Swansea, UK  <sup>2</sup>CITIUS, University of Santiago de Compostela, Spain</p>	<p>H-O-9  <b>EPSRC Roadmapping Discussion Forum</b></p>
16:30	<p>B-O-15  <b>High-power superluminescent diodes with ultra-low spectral modulation</b></p> <p><u>Omar M.S. Ghazal</u>, K. M. Groom, B. J. Stevens, N. Babazadeh, D. T. D. Childs, R. A. Hogg</p> <p>Department of Electronic and Electrical Engineering, University of Sheffield, UK</p>	<p>D-O-15  <b>Combining Beam-Exit Cross-Sectional Polishing and X-ray Diffraction for the Analysis of GaIn(NSb)As/GaAs Quantum Wells</b></p> <p>A. Robson<sup>1</sup>, <u>Kylie O'Shea</u><sup>1</sup>, S. Guillou<sup>2</sup>, Q. D. Zhuang<sup>1</sup>, O. V. Kolosov<sup>1</sup>, M. Hayne<sup>1</sup></p> <p><sup>1</sup>Department of Physics, Lancaster University, UK  <sup>2</sup>Oclaro Inc., Caswell, UK</p>	<p>C-O-9  <b>Fabrication of Rectifying p-n Junction Diodes from Heterogeneous n-CdS and p-ZnTe Semiconductors</b></p> <p><u>Olajide I. Olusola</u>, H.I. Salim, I. M. Dharmadasa</p> <p>Electronic Materials and Sensors Group, Materials and Engineering Research Institute, Sheffield Hallam University, UK</p>	

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre	Owen 1028 Lecture Theatre
16:45	<p>B-O-16 <b>III-V based detectors for underwater communication</b>   <u>Jeng Shiu Cheong</u>, J. S. L. Ong, J. S. Ng, A. B. Krysa, J. P. R. David   Department of Electronic and Electrical Engineering, University of Sheffield, UK</p>	<p>D-O-16 <b>Non-Destructive Mapping of Doping Concentrations in High Current Density Resonant Tunnelling Diodes</b>   <u>Kristof J.P. Jacobs</u><sup>1</sup>, B. J. Stevens<sup>2</sup>, T. Mukai<sup>3</sup>, D. Ohnishi<sup>3</sup>, R. A. Hogg<sup>1</sup>   <sup>1</sup>Department of Electronic &amp; Electrical Engineering, University of Sheffield, UK  <sup>2</sup>EPSRC National Centre for III-V Technologies, Department of Electronic &amp; Electrical Engineering, University of Sheffield, UK  <sup>3</sup>Sensing Technology R&amp;D Project, R&amp;D Headquarters, Rohm Co. Ltd., Kyoto, Japan</p>		
17:00		Conference Close		

## Poster Presentations – Wednesday 9<sup>th</sup> July, Atrium Level 2

### Symposium A: Physics in Semiconductors

A-P-1

**Towards 1D-1D Coulomb drag in etched quantum wires defined in undoped GaAs/AlGaAs quantum wells**  
Deepyanti Taneja, A. F. Croxall, F. Sfigakis, B. Zheng, J. Waldie, I. Farrer, H. E. Beere, D. A. Ritchie  
Cavendish Laboratory, University of Cambridge, UK

A-P-2

**Valley Polarization Assisted Spin Polarization in a Silicon Based Two-dimensional Electron System**

V. T. Renard<sup>1</sup>, B. A. Piot<sup>2</sup>, Y. Niida<sup>3,4</sup>, D. Tregurtha<sup>4</sup>, A. Fujiwara<sup>5</sup>, Y. Hirayama<sup>3</sup>, X. Waintal<sup>1</sup>, G. Fleury<sup>6</sup>, Kei Takashina<sup>4</sup>

<sup>1</sup>SPSMS, UMR-E 9001, CEA-INAC/UJF-Grenoble 1, France

<sup>2</sup>LNCMI-Grenoble, CNRS-UJF-UPS-INSA, France

<sup>3</sup>Graduate School of Science, Tohoku University, Japan

<sup>4</sup>Department of Physics, University of Bath, UK

<sup>5</sup>NTT Basic Research Laboratories, NTT Corporation, Japan

<sup>6</sup>SPEC-IRAMIS, CEA Saclay, France

A-P-3

**Analytical expressions for the nonlinear absorption of anisotropic semiconductors**

Mauro F. Pereira

Materials and Engineering Research Institute, Sheffield Hallam, University, UK

A-P-4

**Analysis of Single Photon Micropillar Optical Switch using Semi-Analytical Model**Stewart T. Carswell<sup>1,2</sup>, C. Y. Hu<sup>1</sup>, A. B. Young<sup>1</sup>, R. Oulton<sup>1,2</sup>, C. Schneider<sup>3</sup>, S. Höfling<sup>3,4</sup>, M. Kamp<sup>3</sup>, J. G. Rarity<sup>1</sup><sup>1</sup>Merchant Venturers School of Engineering, University of Bristol, UK<sup>2</sup>H.H. Wills Physics Laboratory, University of Bristol, UK<sup>3</sup>Technische Physik, Universität Würzburg, Germany<sup>4</sup>School of Physics and Astronomy, St Andrews University, UK

A-P-5

**Monolithic Integration of a Quantum Emitter with a Compact On-chip Beam-splitter**Nikola Prtljaga<sup>1</sup>, R. J. Coles<sup>1</sup>, J. O'Hara<sup>1</sup>, B. Royall<sup>1</sup>, E. Clarke<sup>2</sup>, A. M. Fox<sup>1</sup>, M. S. Skolnick<sup>1</sup><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK<sup>2</sup>Department of Electronic and Electrical Engineering, University of Sheffield, UK

A-P-6

**Dynamic nuclear polarization in InPAs/InP nanowire quantum dots**Tillmann Godde<sup>1</sup>, A. Per-Lennart<sup>1,3</sup>, G. Bulgarini<sup>2</sup>, M. E. Reimer<sup>2</sup>, D. Dalacu<sup>4</sup>, J. J. Finley<sup>3</sup>, M. S. Skolnick<sup>1</sup>, V. Zwiller<sup>2</sup>, E. A. Chekhovich<sup>1</sup>, A. I. Tartakovskii<sup>1</sup><sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK<sup>2</sup>Kavli Institute of Nanoscience Delft, Delft University of Technology, The Netherlands<sup>3</sup>Walter Schottky Institute, Technische Universität München, Germany<sup>4</sup>Institute for Microstructural Sciences, National Research Council, Ottawa, Canada

A-P-7

**Low-power pulse modulation based on exciton quantum beat in a GaAs/AlAs multiple quantum well**Osamu Kojima<sup>1</sup>, Takashi Kita<sup>1</sup>, Kouichi Akahane<sup>2</sup><sup>1</sup>Department of Electrical and Electronic Engineering, Graduate School of Engineering, Kobe University, Japan<sup>2</sup>National Institute of Information and Communications Technology, Tokyo, Japan

A-P-8

**Modelling Current Crowding Effect in the ZnO Nanowires**Olga Kryvchenkova<sup>1</sup>, K. Kalna<sup>2</sup>, R. J. Cobley<sup>1</sup><sup>1</sup>Multidisciplinary Nanotechnology Centre, College of Engineering, University of Swansea, UK<sup>2</sup>Electronic Systems Design Centre, College of Engineering, University of Swansea, UK

A-P-9

**III-Bismide alloys for spintronic applications**Robert A. Simmons, Shirong Jin, Stephen J. Sweeney, Steven K. Clowes

Advanced Technology Institute and Department of Physics, University of Surrey, Guildford, UK

A-P-10

**Probing the graphene-plasmon interaction via ultrafast pump-probe studies in CVD graphene-metal nanostructures**Adam M. Gilbertson, T. Roschuk, T. Sidiropoulos, V. Shautsova, Y. Chen, V. Giannini, S. A. Maier, R. Oulton, L. F. Cohen

Physics Department, Imperial College London, UK

A-P-11

**Quantum Dots, Qubits & Quantum Logic Gates**Miranda Turvey

Open University, Milton Keynes, UK

## Symposium C: Electronic Devices

C-P-1

### New Submicron Low Gate Leakage $\text{In}_{0.52}\text{Al}_{0.48}\text{As}$ - $\text{In}_{0.7}\text{Ga}_{0.3}\text{As}$ pHEMT for Low Noise Applications

Fauzi Packeer, Warsuzarina Mat Jubadi, Mohamed Missous

Microelectronics and Nanostructures Group, School of Electrical and Electronic Engineering, University of Manchester, UK

C-P-2

### Dependencies of Peak Current Density on Barrier and Spacer Thickness in InGaAs/AlAs Resonant Tunneling Diode

Mohamad A. Md Zawawi, Mohamed Missous

School of Electrical and Electronic Engineering, University of Manchester, UK

C-P-3

### Physical Modelling and Optimization of 0.25 $\mu\text{m}$ $\text{In}_{0.7}\text{Ga}_{0.3}\text{As}/\text{In}_{0.3}\text{Al}_{0.7}\text{As}$ pHEMT Device for X-band MMIC Low Noise Amplifiers

Warsuzarina Mat Jubadi, KaWa Ian, M. Packeer, M. Missous

School of Electrical and Electronic Engineering, University of Manchester, UK

## Symposium F: Organic and Hybrid Organic/Inorganic Semiconductors

F-P-1

### An ionic liquid-gated polymer thin film transistor

Saud A. Algarni<sup>1</sup>, Talal M. Althagafi<sup>1</sup>, Patrick J Smith<sup>2</sup>, Martin Grell<sup>1</sup>

<sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK

<sup>2</sup>Department of Mechanical Engineering, University of Sheffield, UK

F-P-2

### Device Degradation and Lifetime of OPVs Utilising Different Hole Transport Layers

Edward Bovill<sup>1</sup>, Jon Griffin<sup>1</sup>, Tom Glen<sup>2</sup>, David Lidzey<sup>1</sup>

<sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK

<sup>2</sup>Department of Physics, University of Cambridge, UK

F-P-3

### Fabrication and Scale-up of High Performance Low Band-gap Polymer Solar Cells by Spray-coating in Air

Nicholas Scarratt<sup>1</sup>, Tao Wang<sup>1</sup>, Jonathan Griffin<sup>1</sup>, Andrew J. Pearson<sup>1</sup>, Andrew Brook<sup>1</sup>, James Kingsley<sup>3</sup>, Hunan Yi<sup>2</sup>, Ahmed Iraqi<sup>2</sup>, David G. Lidzey<sup>1</sup>

<sup>1</sup>Department of Physics and Astronomy, University of Sheffield, UK

<sup>2</sup>Department of Chemistry, University of Sheffield, UK

<sup>3</sup>Ossila Ltd., Sheffield, UK

## Symposium G: Wide Gap Nitrides

G-P-1

### Characterisation of gross-well width fluctuations in InGaN/GaN multiple quantum well structures by X-ray techniques

Z. Deng, Q. Avenas, Fabien Massabuau, M. Kappers, C. Humphreys, R. Oliver

Department of Materials Science and Metallurgy, University of Cambridge, UK

G-P-2

**Effect of O<sub>2</sub> Plasma Pre-treatment in Al<sub>2</sub>O<sub>3</sub> Passivation using Atomic-Layer-Deposited on GaN Based Metal-Oxide-Semiconductor Capacitor**

Sung-Jin Cho<sup>1</sup>, J. W. Roberts<sup>2</sup>, X. Li<sup>1</sup>, G. Ternent<sup>1</sup>, K. Floros<sup>1</sup>, I. Thayne<sup>1</sup>, P. Chalker<sup>2</sup>, E. Wasige<sup>1</sup>

<sup>1</sup>School of Engineering, University of Glasgow, Glasgow, UK

<sup>2</sup>School of Engineering, University of Liverpool, Liverpool, UK

G-P-3

**Effect of annealing time and temperature on Ohmic contacts to AlN/GaN HEMT structure with in-situ SiN passivation**

Abdullah Al-Khalidi, K. Gallacher and E. Wasige

High Frequency Electronics Group, School of Engineering, University of Glasgow, UK

G-P-4

**A vertical GaN-pin power diode grown on patterned-sapphire substrate**

Shao-Yen Chiu, K. Y. Chen, Y. T. Tseng, T. H. Huang

Institute of Electronics Engineering, National Tsing Hua University, Taiwan, R. O. C.

G-P-5

**Quantum well emission in blue LEDs at very low bias voltages**

Silvino Presa<sup>1</sup>, Grzegorz Kozlowski<sup>1</sup>, Pleun Maaskant<sup>1</sup>, Menno Kappers<sup>2</sup>, Colin Humphreys<sup>2</sup>, Brian Corbett<sup>1</sup>

<sup>1</sup>Tyndall National Institute, University College Cork, Ireland

<sup>2</sup>Department Materials Science and Metallurgy, University of Cambridge, UK

G-P-6

**Analysis of Various Device Simulators for AlGaN/GaN HEMTs**

Yashvardhan S. Rajawat<sup>1,2</sup>, Shweta Goel<sup>1</sup>, Akshay Verma<sup>3</sup>, Harshul Gupta<sup>3</sup>, Nidhi Chaturvedi<sup>1</sup>

<sup>1</sup>CSIR-Central Electronics Engineering Research Institute, Pilani, India

<sup>2</sup>Centre For Nanotechnology Research, VIT University, Vellore, India

<sup>3</sup>Birla Institute Of Technology and Science, Pilani, India

G-P-7

**Boron effect on the structural properties of In<sub>x</sub>Ga<sub>1-x</sub>N matched to GaN for optoelectronic devices: A first-principles study**

Abdenacer Assali<sup>1,2</sup>, M. Bouslama<sup>1</sup>, H. Abid<sup>3</sup>, M. Ghaffour<sup>1</sup>

<sup>1</sup>Laboratoire Matériaux (LABMAT) ENSET d'Oran, Oran, Algeria

<sup>2</sup>Unité de Recherche Photonique (URPO), Centre de Développement des Technologies Avancées (CDTA), Algiers, Algeria

<sup>3</sup>Applied Materials Laboratory, Research Center, University of Sidi Bel Abbes, Algeria

G-P-8

**Dependence of GaN HEMTs Performance on the Passivated Dielectric Properties**

Harshul Gupta<sup>2</sup>, Akshay Verma<sup>2</sup>, Nitin Chaturvedi<sup>2</sup>, Yashvardhan S. Rajawat<sup>1,3</sup>, Nidhi Chaturvedi<sup>1</sup>

<sup>1</sup>CSIR- Central Electronics Engineering Research Institute, Pilani, India

<sup>2</sup>Birla Institute of Technology and Science, Pilani, India

<sup>3</sup>Centre for Nanotechnology Research, VIT-University, Vellore, India

## Poster Presentations – Thursday 10<sup>th</sup> July, Atrium Level 2

### Symposium B: Optical Devices

B-P-1

#### **Optimisation of CdTe electrodeposition voltage for development Of CdS/CdTe solar cells**

D. G. Diso<sup>1,2</sup>, Fijay Fauzi<sup>2</sup>, O. K. Echendu<sup>2</sup>, I. M. Dharmadasa<sup>2</sup>

<sup>1</sup>Department of Physics, Kano University of Science & Technology, Nigeria

<sup>2</sup>Electronic Materials & Sensors Group, Materials and Engineering Research Institute, Sheffield Hallam University, UK

B-P-2

#### **GaAsBiN: a potential new material for multi-junction solar cells and related applications**

Scott Jarvis<sup>1</sup>, S. J. Sweeney<sup>1</sup>, K. Hild<sup>1</sup>, S. R. Jin<sup>1</sup>, Z. Batool<sup>1</sup>, Z. Bushell<sup>1,2</sup>, P. Ludewig<sup>2</sup>, N. Knaub<sup>2</sup>, W. Stolz<sup>2</sup>, K. Volz<sup>2</sup>

<sup>1</sup>Advanced Technology Institute and Department of Physics, University of Surrey, Guildford, UK

<sup>2</sup>Materials Science Center and Faculty of Physics, Philipps-Universität Marburg, Germany

B-P-3

#### **Photoluminescence upconversion for high efficiency intermediate band solar cells**

Anthony R. Vaquero-Stainer, N. P. Hylton, M. Yoshida, A. Pusch, N. J. Ekins-Daukes, O. Hess, C. C. Phillips  
Physics Department, Imperial College London, UK

B-P-4

#### **Preparation of ZnS thin film for Application in Photovoltaic device Fabrication**

Muhammad L. Madugu, I. M. Dharmadasa

Materials and Engineering Research Institute, Sheffield Hallam University, UK

B-P-5

#### **Split-Gate Silicon Field-Effect Sensors for Color-Sensing Applications**

Kamran Abid<sup>1</sup>, M. Azhar Naeem<sup>1</sup>, Jehan Akbar<sup>2</sup>, Faiz Rahman<sup>3</sup>

<sup>1</sup>Department of Electrical Engineering, University of the Punjab, Lahore, Pakistan

<sup>2</sup>Department of Physics, Hazara University, Mansehra, Pakistan

<sup>3</sup>Department of Electrical Engineering & Computer Science, Ohio University, USA

B-P-6

#### **Design Rules for Photonic Crystal Surface Emitting Lasers**

Alex J. Crombie<sup>1</sup>, R. J. E. Taylor<sup>1</sup>, P. S. Ivanov<sup>1</sup>, B. J. Stevens<sup>2</sup>, D. Childs<sup>1</sup>, R. A. Hogg<sup>1</sup>

<sup>1</sup>Department of Electronic and Electrical Engineering, University of Sheffield, UK

<sup>2</sup>EPRSC National Centre for III-V Technologies, Department of Electronic and Electrical Engineering, University of Sheffield, UK

B-P-7

#### **A Comparison of Gain Spectrum Measurement Techniques For Semiconductor Lasers**

Hifsa Shahid<sup>1</sup>, D. T. D. Childs<sup>2</sup>, M. A. Majid<sup>3</sup>, B. J. Stevens<sup>2</sup>, R. A. Hogg<sup>2</sup>, E. Clarke<sup>2</sup>, P. Spencer<sup>4</sup>, R. Murray<sup>4</sup>

<sup>1</sup>Department of Electrical Engineering & Technology, University of Engineering & Technology Lahore, Pakistan

<sup>2</sup>Department of Electronic & Electrical Engineering, University of Sheffield, UK

<sup>3</sup>Photonics Laboratory, Computer, Electrical, and Mathematical Sciences & Engineering (CEMSE) Division, King Abdullah University of Science & Technology (KAUST), Saudi Arabia

<sup>4</sup>Physics Department, Imperial College London, UK

B-P-8

**Study of Factors Limiting Fundamental Transverse Mode Output in Electrically Pumped Vertical External Cavity Surface Emitting Lasers**

Xiao Jin, P. Ivanov, D. T. D. Childs, N. Babazadeh, R. A. Hogg

Department of Electronic and Electrical Engineering, University of Sheffield, UK

B-P-9

**Simulation Analysis of GaAs/InGaAs/InGaAsP Strain-Balanced Multi-Quantum Well Lasers**

Ian G. Tooley<sup>1</sup>, D. T. D. Childs<sup>1</sup>, B. J. Stevens<sup>2</sup>, R. A. Hogg<sup>1</sup>

<sup>1</sup>Department of Electronic & Electrical Engineering, University of Sheffield, UK

<sup>2</sup>EPSRC National Centre for III-V Technologies, Department of Electronic & Electrical Engineering, University of Sheffield, UK

B-P-10

**Simulation of Quantum Dot Superluminescent Light Emitting Diodes for Optical Coherence Tomography Applications**

Shampa Guin<sup>1</sup>, J. Sarma<sup>2</sup>, N. R. Das<sup>1</sup>, R. A. Hogg<sup>2</sup>

<sup>1</sup>Institute of Radiophysics and Electronics, University of Calcutta, India

<sup>2</sup>Department of Electronic and Electrical Engineering, University of Sheffield, UK

B-P-11

**Carrier Escape and the Ideality Factor in Quantum Dot P-N Junctions**

Peter Spencer<sup>1</sup>, Edmund Clarke<sup>2</sup>, Ray Murray<sup>1</sup>

<sup>1</sup>Physics Department, Imperial College London, UK

<sup>2</sup>EPSRC National Centre for III-V Technologies, University of Sheffield, UK

B-P-12

**Performance Studies of a Proposed Ge-GeSn-Ge Heterojunction Phototransistor and Comparison with InGaAs-based Phototransistor**

Rikmantra Basu<sup>1</sup>, Vedatrayee Chakraborty<sup>2</sup>, Bratati Mukhopadhyay<sup>2</sup>, P. K. Basu<sup>2</sup>

<sup>1</sup>EEE Department, BITS Pilani, Rajasthan, India

<sup>2</sup>Institute of Radio Physics and Electronics, University of Calcutta, India

## Symposium D: Semiconductor Materials and Nanostructures

D-P-1

**Electrodeposition and characterisation of CdS thin film using  $(\text{NH}_4)_2\text{S}_2\text{O}_3$  as the sulphur source**

N. A. Abdul-Manaf, A. R. A. Weerasinghe, I. M. Dharmadasa

Electronic Materials and Sensors Group, Materials and Engineering Research Institute, Sheffield Hallam University, UK

D-P-2

**Tight binding approach to strained nitride nanostructures**

A. Meziani<sup>1</sup>, L. Semra<sup>1</sup>, A. Telia<sup>1</sup>, A. Soltani<sup>2</sup>

<sup>1</sup>Electronics Department, Engineering Sciences Faculty, Constantine1 University, Algeria

<sup>2</sup>IEMN, Sciences and Technologies of Lille University, France

D-P-3

**InAs/GaAs Quantum Dots By Metal-Organic Vapour Phase Epitaxy**

Tim S. Roberts<sup>1</sup>, B. J. Stevens<sup>2</sup>, D. T. D. Childs<sup>1</sup>, N. Babazadeh<sup>1</sup>, E. Clarke<sup>2</sup>, R. A. Hogg<sup>1</sup>

<sup>1</sup>Department of Electronic & Electrical Engineering, University of Sheffield, UK

<sup>2</sup>EPSRC National Centre for III-V Technologies, Department of Electronic & Electrical Engineering, University of Sheffield, UK

## D-P-4

**Quantum wells, wires and dots (QWWAD): development of an open-source simulation suite for semiconductor nanostructures**Alex Valavanis<sup>1</sup>, J. D. Cooper<sup>1</sup>, A. Grier<sup>1</sup>, P. Harrison<sup>2</sup><sup>1</sup>School of Electronic and Electrical Engineering, University of Leeds, UK<sup>2</sup>Materials and Engineering Research Institute, Sheffield Hallam University, UK

## D-P-5

**Temperature Dependence of the Properties of Grey Tin Nanocrystal**Mohammad G. Merdan<sup>1</sup>, Mudar A. Abdul Srattar<sup>2</sup>, Ahmed M. Abdulateef<sup>3</sup><sup>1</sup>College of Science, Babylon University, Hilla, Iraq<sup>2</sup>Ministry of Science and Technology, Baghdad, Iraq<sup>3</sup>College of Science, University of Kerbala, Kerbala, Iraq

## D-P-6

**Negative biexciton binding energy in CdSe/CdTe core/shell type II quantum dots**Jacek Miloszewski<sup>1</sup>, Stanko Tomic<sup>1</sup>, Thomas Walsh<sup>1</sup>, David J. Binks<sup>2</sup><sup>1</sup>University of Salford, UK<sup>2</sup>University of Manchester, UK

## D-P-7

**Growth of CdTe thin film by electrodeposition method using cadmium nitrate precursor**Hussein I. Salim, A. Abdul Manaf, I.M. Dharmadasa

Electronic Materials and Sensors Group, Materials and Engineering Research Institute, Sheffield Hallam University, UK

## D-P-8

**Application of Semiconductor nanoparticles for Environmental Photochemistry**Souad Elfeky<sup>1,2</sup><sup>1</sup>National Institute of Laser Enhanced Sciences, Cairo University, Egypt<sup>2</sup>Department of Chemistry, University of Bath, UK

## D-P-9

**Plasma and ion beam solutions for surface synthesis, modification and patterning**Alexander Hörold, Alfonz Luca, Frank Richter, Margit Sarstedt

Business Unit MicroSystems, Roth &amp; Rau AG, Hohenstein-Ernstthal, Germany

## D-P-10

**TEM Study of the Combined Effect of InGaAs/GaAs Dislocation Filter Layers and Annealing in Defects Reduction in GaAs Grown on Si Substrates**Wei Li<sup>1</sup>, S. Chen<sup>2</sup>, J. Wu<sup>2</sup>, H. Liu<sup>2</sup>, R. A. Hogg<sup>1</sup>, I. M. Ross<sup>1</sup><sup>1</sup>Department of Electronic and Electrical Engineering, University of Sheffield, UK<sup>2</sup>Department of Electronic and Electrical Engineering, University College London, UK**Symposium E: Mid-infrared and THz Materials and Devices**

## E-P-1

**Optimized THz photoconductor devices operating at 800 nm and 1550 nm excitation wavelengths**Yuekun Wang<sup>1</sup>, M. Missous<sup>1</sup>, Daniel M. Hailu<sup>2</sup>, Alireza Zandieh<sup>2</sup>, Ehsan Fathi<sup>2</sup>, Daryoosh Saeedkia<sup>2</sup><sup>1</sup>School of Electrical and Electronic Engineering, University of Manchester, UK<sup>2</sup>TeTechS Inc., Waterloo, Ontario, Canada

E-P-2

**An InAs/QDIP Multispectral Detector**

Ian C. Sandall, Ben White, Xinxin Zhou, Chee Hing Tan

Department of Electronic and Electrical Engineering, University of Sheffield, UK

E-P-3

**A Sub-THz Parameter Extraction of Low Loss 3D Compact Multilayer MMIC Coplanar Waveguides**

Emerson P. Sinulingga, Peter B. Kyabaggu, Ali A. Rezaadeh

Microwave and Communication Research Group, University of Manchester, UK

E-P-4

**GaInSb/GaSb Quantum Wells for Mid-infrared Emitters Grown on GaAs using Interface Misfit Epitaxy**

Jonathan Hayton, A. Krier, A.R.Marshall

Physics Department, Lancaster University, UK

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**Temperature dependence of radiation thermometry of InAs photodiodes**

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**Manybody Effects in THz Intersubband Polaritons**

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**Efficient simulation of electron-electron scattering in transport and optics of THz quantum cascade lasers**

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**Planar InAs p-i-n photodiodes fabricated using ion implantation**

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**Rapid Thermal Annealing and Enhanced Mid-infrared Photoluminescence in InAsN**

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