

UK Semiconductors 2024 Technical Programme

We are pleased to welcome our plenary speakers who will provide extended presentations on quantum dots as single photon sources, the impact of trap states in molecular and other disordered semiconductors and ultraclean assembly of van der Waals heterostructures. We are also proud to host the prize talk for the IOP Semiconductor Physics Group thesis prize, on probing strong electron correlations using semiconductor nanodevices.

In addition to the regular sessions of talks for each symposium, there will be talks providing an update on the UK Semiconductor Strategy and introducing the new Innovation and Knowledge Centres (IKCs): the CORNERSTONE Photonics Innovation Centre for silicon photonics and the REWIRE IKC for next generation semiconductor power devices using wide and ultra-wide bandgap semiconductors.

The eFutures Network are surveying the UK research and development capabilities in semiconductors, and as a part of this study they will be holding a drop-in session throughout the conference (located outside the Norfolk 210 Lecture Theatre) for delegates to give their views and contribute to the project. There will also be a summary and discussion session on Tuesday afternoon. Also on Tuesday there will be a forum hosted by Professor Peter Smowton of Cardiff University to examine ways to improve academic and industry interaction in the UK.

There is also a meeting on Monday afternoon for anyone interested in working with the EPSRC National Epitaxy Facility, outlining the capabilities of the Facility including recently commissioned equipment, and ways to access the Facility.

Delegates may attend any sessions they wish and are encouraged to do so. You are also welcome to attend the other events at the conference: the Phil Buckle Research Communication Competition will be at lunchtime on day one of the conference, and the IOP Semiconductor Group AGM will be at lunchtime on day two.

Plenary Lectures: *Richard Warburton, Paul Meredith, Roman Gorbachev*

IOP Semiconductor Physics Group Thesis Prize Talk: *Pedro Vianez*

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, Organic/Inorganic Hybrid Semiconductors and Perovskites

Symposium G: Wide-bandgap semiconductors

Symposium TMD: 2D Materials – incorporating the TMD-UK Meeting

Oral Presentations – Monday 8th July 2024

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
09:30	Registration and Refreshments, Atrium Level 2		
10:15	<p>Welcome and Introduction</p> <p style="text-align: center;"><u>Jon Heffernan</u></p> <p>EPSRC National Epitaxy Facility, Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK</p>		
10:30	<p>Plenary 1</p> <p style="text-align: center;">A semiconductor quantum dot in an open microcavity</p> <p style="text-align: center;"><u>Richard Warburton</u></p> <p>Department of Physics, University of Basel, Switzerland</p>		
11:20	<p>B-O-1</p> <p style="text-align: center;">High Thermal Stability 1.3 μm InAs/GaAs Quantum Dot Lasers</p> <p><u>Huiwen Deng</u>, Yangqian Wang, Manyu Dang, Hui Jia, Jaesong Park, Haotian Zeng, Mingchu Tang, Alwyn Seeds, Huiyun Liu</p> <p>Department of Electrical Engineering, University College London, London, UK</p>	<p>A-O-1</p> <p style="text-align: center;">Remote Spin Initialisation of Chiral Coupled InAs Quantum Dots in Glide-Plane Waveguide Devices</p> <p><u>Xuchao Chen</u>¹, S. Germanis¹, H. Siampour^{1,2}, R. Dost¹, D. J. Hallett¹, E. Clarke³, P. K. Patil³, M. S. Skolnick¹, A. Mark Fox¹</p> <p>¹Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK ²Centre for Quantum Materials and Technologies, School of Mathematics and Physics, Queen's University Belfast, Belfast BT7 1NN, UK ³EPSRC National Epitaxy Facility, Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK</p>	<p>C-O-1</p> <p style="text-align: center;">ULTRARAM: Advances in scaling and array fabrication</p> <p><u>Xiuxin Xia</u>¹, S. B. Tekin¹, P. D. Hodgson^{1,2}, Manus Hayne^{1,2}</p> <p>¹Department of Physics, Lancaster University, LA1 4YB, UK ²Quinas Technology Limited, Lancaster, LA1 4YB, UK</p>

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11:35	<p>B-O-2</p> <p>Demonstration of High Temperature Operation of O-band Co-doped InAs Quantum Dot Laser</p> <p><u>Pawan Mishra</u>¹, L. Jarvis¹, C. Hodges¹, A. Enderson¹, F. Albeladi¹, S.-J. Gillgrass¹, R. Forrest¹, C. P. Allford¹, H. Deng², M. Tang², H. Liu², S. Shutts¹, P. M. Smowton¹</p> <p>¹School of Physics and Astronomy, Cardiff University, Cardiff, UK ²Department of Electrical Engineering, University College London, London, UK</p>	<p>A-O-2</p> <p>Non-Linear Quantum Optics at a Topological Interface</p> <p><u>Luke Hallacy</u>¹, N. J. Martin¹, M. Jalali Mehrabad², D. Hallett¹, X. Chen¹, R. Dost¹, A. Foster¹, L. Brunswick¹, A. Fenzl¹, A. M Fox¹, M. Hafezi², M. S. Skolnick¹, L. R. Wilson¹</p> <p>¹Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK ²Joint Quantum Institute, University of Maryland, College Park, MD 20742, USA</p>	<p>C-O-2</p> <p>Physical Modelling of a Planar Step-Graded AlGaAs/GaAs Gunn Diode</p> <p><u>Christopher Walsh</u>, M. Missous</p> <p>Department of Electrical & Electronic Engineering, University of Manchester, Manchester, M13 9PL, UK</p>
11:50	<p>B-O-3</p> <p>On-Chip InAs QD Laser-based Single-Step Deep-Etch Waveguide Fabrication for PICs</p> <p><u>Fwoziah T. Albeladi</u>^{1,2}, S.-J. Gillgrass¹, P. Mishra¹, D. Qiao¹, N. Albittar¹, S. Power¹, S. Shutts¹, P M. Smowton¹</p> <p>¹School of Physics and Astronomy, Cardiff University, The Parade, Cardiff. CF24 3AA. UK. ²Physics Department, Faculty of Science, University of Jeddah, Jeddah 21589, Saudi Arabia</p>	<p>A-O-3</p> <p>Defects and strain effects on wurtzite ZnS</p> <p><u>Juliana M. Morbec</u></p> <p>School of Chemical and Physical Sciences, Keele University, UK</p>	<p>C-O-3</p> <p>Diffusive memristors based on mesoporous silica for neuromorphic computing</p> <p><u>Bohao Ding</u>¹, T. Zhang¹, L. Shao², A. L. Hector², Ruomeng Huang¹</p> <p>¹School of Electronics and Computer Science, University of Southampton, Southampton, UK ²School of Chemistry, University of Southampton, Southampton, UK</p>
12:05	<p>B-O-4</p> <p>Strain-driven Dislocation Filtering for Epitaxial Growth of InP on (001) Silicon</p> <p><u>Shangfeng Liu</u>¹, B.-P. Ratiu¹, H. Jia², Z. Yan¹, K. M. Wong¹, M. Martin³, M. Tang², T. Baron³, H. Liu², Q. Li¹</p> <p>¹School of Physics and Astronomy, Cardiff University, Cardiff, UK ²Department of Electronic & Electrical Engineering, University College London, London, UK ³University of Grenoble Alpes, CNRS, CEA-LETI, MINATEC, LTM, F-38054 Grenoble, France</p>	<p>A-O-4</p> <p>Resonance Fluorescence of Nanowire Quantum Dots</p> <p><u>Toby Rawlings</u>¹, A. Brash¹, C. Phillips¹, P. J. Poole², D. Dalacu², J. Iles-Smith³</p> <p>¹Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK ²National Research Council Canada, Ottawa, Ontario K1A 0R6, Canada ³Department of Physics and Astronomy, University of Manchester, Oxford Road, Manchester M13 9PL, UK</p>	<p>C-O-4</p> <p>Impact of Oxide Thickness & Doping Profile Variation on Nanosheet FETs Performance</p> <p><u>Murad. G. K. Alabdullah</u>^{1,2}, N. Seoane³, A. J. García-Loureiro³, K. Kalna¹</p> <p>¹NanoDeCo Group, Dept. of EEE, Faculty of Science & Engineering, Swansea University, Swansea, Wales, UK ²Electronic Techniques Department, Kirkuk Technical Institute, Northern Technical University, Kirkuk, Iraq ³CITIUS, University of Santiago de Compostela, Spain</p>

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12:20	<p>B-O-5</p> <p>Molecular Beam Epitaxy of InGaAs/GaAsSb “W” Quantum Wells for Telecommunications Applications</p> <p><u>Matthew Bentley</u>^{1,2}, D. A. Duffy^{3,4,5}, I. P. Marko^{3,5}, A. R. J. Marshall², S. Rihani⁶, G. Berry⁶, M. Robertson⁶, J. Rawsthorne⁶, S. J. Sweeney^{3,4,5}, P. J. Carrington¹</p> <p>¹School of Engineering, Lancaster University, Bailrigg, Lancaster LA1 4YW, UK ²Department of Physics, Lancaster University, Lancaster LA1 4YB, UK ³Department of Physics and Advanced Technology Institute, University of Surrey, Guildford GU2 7XH, UK ⁴now with ZiNIR Ltd, Eastbourne, BN22 7QP, UK ⁵now with James Watt School of Engineering, University of Glasgow, Oakfield Avenue, Glasgow G12 8LT ⁶Huawei Technologies Research and Development, Ipswich Research Centre, Ipswich, IP5 3RE</p>	<p>A-O-5</p> <p>Measuring Exciton-Polariton Interactions at the Few Particle Level</p> <p><u>Paul M. Walker</u>¹, F. A. Benimetskiy¹, A. Ellul¹, S. Ravets², J. Bloch², M. S. Skolnick¹, D. N. Krizhanovskii¹</p> <p>¹Department of Physics, University of Sheffield, Sheffield, UK ²Centre de Nanosciences et de Nanotechnologies (C2N), Université Paris-Saclay - CNRS, Palaiseau, France</p>	<p>C-O-5</p> <p>Advanced Trench Gate Processing for Modern SiC Power MOSFETS</p> <p><u>Ben Jones</u>¹, A. Croot², J. Mitchell², J. Evans¹, F. Monaghan¹, M. Jennings¹, H. Ashraf², O. Guy¹</p> <p>¹Swansea University, Singleton Park, SA2 8PP, Swansea, UK ²KLA Corporation (SPTS Division), Ringland Way, NP18 2TA, Newport, UK</p>
12:35	Lunch and Exhibition Heartspace Atrium Level 2 Poster Session Norfolk Building Room 201, Symposia A, B, C, F		
13:00			Phil Buckle Research Communication Competition Norfolk 210 Lecture Theatre
14:00	<p>Plenary 2</p> <p>Mind the Gap – the Impact of Trap States on the Photovoltaic Thermodynamics of Molecular and Other Partially Disordered Semiconductors</p> <p><u>Paul Meredith</u>¹, Drew Riley¹, Greg Burwell¹, Stefan Zeiske², Austin Kay¹, Oskar Sandberg³, Nasim Zarrabi¹, Christian Kaiser¹, Ardalan Armin¹</p> <p>¹Sustainable Advanced Materials (Sêr SAM), Centre for Integrative Semiconductor Materials & Department of Physics, Swansea University Bay Campus, Swansea SA1 8EN, UK ²Department of Chemistry, Northwestern University, Evanston, IL 60208, USA ³Physics, Faculty of Science and Engineering, Åbo Akademi University, 20500 Turku, Finland</p>		

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14:50	<p>B-O-6</p> <p>GaSb/GaAs Quantum-Ring Vertical-Cavity Surface-Emitting Lasers Emitting at 1.3-μm</p> <p><u>Sam Jones</u>, P. D. Hodgson, M. Hayne</p> <p>Department of Physics, Lancaster University, Lancaster LA1 4YB, UK</p>	<p>D-O-1</p> <p>Emergence of the highest mobility holes in a 2D system epitaxially grown on a silicon wafer</p> <p><u>Maksym Myronov</u>¹, P. Waldron², S. Studenikin²</p> <p>¹Physics Department, The University of Warwick, Coventry CV4 7AL, UK ²National Research Council of Canada, Ottawa, Ontario, Canada</p>	<p>F-O-1</p> <p>Development of a versatile low-temperature AZO deposition process for optoelectronic applications</p> <p><u>Gregory Burwell</u>¹, N. Burrige¹, S. Ahmed¹, O. Sandberg², A. Armin¹, Paul Meredith¹</p> <p>¹Sustainable Advanced Materials (S\hat{e}r-SAM), Centre for Integrative Semiconductor Materials (CISM), Department of Physics, Swansea University Bay Campus, Swansea SA1 8EN, UK ²Physics, Faculty of Science and Engineering, Åbo Akademi University, 20500 Turku, Finland</p>
15:05	<p>B-O-7</p> <p>Telecoms Wavelength Single-Photon LEDs utilising GaSb Quantum Rings</p> <p><u>Gizem Acar</u>¹, P. Hodgson¹, L. Leguay², S. Jones¹, A. Schliwa², M. Hayne¹</p> <p>¹Department of Physics, Lancaster University, Lancaster LA1 4YB, UK ²Institute of Solid-State Physics, Technical University of Berlin, Berlin 10623, Germany</p>	<p>D-O-2</p> <p>Stochastic conductance behaviour in GeSn nanowires and devices</p> <p><u>Stuart N. Holmes</u>¹, Y. Gul², M. Sienkiewicz², G. Jaliel³, M. Myronov⁴, M. Pepper^{1,2}</p> <p>¹Department of Electronic and Electrical Engineering, UCL, London WC1E 7JE, UK ²London Centre for Nanotechnology, UCL, London WC1H 0AH, UK ³Cavendish Laboratory, University of Cambridge, Cambridge CB3 0HE, UK ⁴Department of Physics, University of Warwick, Coventry CV4 7AL, UK</p>	<p>F-O-2</p> <p>Dimethylammonium-incorporated mixed halide perovskite nanocrystals for stabilized red emission</p> <p><u>Shaoni Kar</u>^{1,2}, A. Marshall², B. M. Gallant³, K. Dey¹, Z. Yuan¹, D. Kubicki³, B. Wenger², H. J. Snaith¹</p> <p>¹Clarendon Laboratory, University of Oxford, UK ²Helio Display Materials, Oxford, UK ³School of Chemistry, University of Birmingham, UK</p>
15:20	<p>B-O-8</p> <p>Diode Area Melting and the Opportunities for Advanced Optoelectronics in Additive Manufacturing</p> <p><u>Kristian Groom</u>¹, S. Veetil¹, Z. Zhang¹, L. Zhou¹, J. Willmott¹, I. Wraith¹, M. Alsaddah², A. Aydin², A. Liang², R. Brown², H. Caglar², C. Majewski², K. Mumtaz²</p> <p>¹Department of Electronic & Electrical Engineering, University of Sheffield S1 3JD, UK ²Department of Mechanical Engineering, University of Sheffield S1 3JD, UK</p>	<p>D-O-3</p> <p>Superconductor-semiconductor nanowire hybrids with in situ-grown tunnel barriers</p> <p><u>Paloma Tejedor</u>¹, B. Galiana², G. Moraes³, E. J. H. Lee³</p> <p>¹Instituto de Ciencia de Materiales de Madrid (ICMM), Consejo Superior de Investigaciones Científicas (CSIC), Sor Juana Inés de la Cruz 3, 28049 Madrid, Spain ²Physics Department, Universidad Carlos III de Madrid, Av. de la Universidad, 30, 28911 Leganés, Madrid, Spain ³Departamento de Física de la Materia Condensada and Condensed Matter Physics Center (IFIMAC), Francisco Tomás y Valiente, 7, Universidad Autónoma de Madrid, 28049 Madrid, Spain</p>	<p>F-O-3</p> <p>Suppressed ion migration and compositional instabilities in mixed lead-tin halide perovskite materials and devices</p> <p><u>Krishanu Dey</u>¹, S. P. Senanayak², D. Ghosh³, P. Cameron⁴, M. S. Islam⁵, H. Sirringhaus¹, S. D. Stranks¹</p> <p>¹University of Cambridge, Cambridge CB3 0HE, UK ²National Institute of Science Education and Research, Odisha, 752050, India ³Indian Institute of Technology Delhi, Delhi 110016, India ⁴University of Bath, Bath BA2 7AY, UK ⁵University of Oxford, Oxford OX2 6NN, UK</p>

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
15:35	Refreshments and Exhibition, Atrium Level 2		
15:55	<p>IOP Prize Talk</p> <p>Semiconductor nanodevices as a probe of strong electron correlations</p> <p><u>Pedro Vianez</u>¹, Y. Jin¹, M. Moreno², A. Anirban¹, A. Anthore³, W. K. Tan¹, J. Griffiths¹, I. Farrer⁴, D. Ritchie¹, A. Schofield⁵, O. Tsypliyatye⁶, C. J. B. Ford¹</p> <p>¹Semiconductor Physics Group, Cavendish Laboratory, University of Cambridge, Cambridge, UK ²Departamento de Física Aplicada, Universidad de Salamanca, Salamanca, Spain ³Université de Paris, C2N, Paris, France ⁴Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield, UK ⁵Department of Physics, Lancaster University, Lancaster, UK ⁶Institut für Theoretische Physik, Universität Frankfurt, Frankfurt, Germany</p>		
16:30	<p>B-O-9</p> <p>Purcell-Enhanced, Directional Light-Matter Interaction in a Waveguide-Coupled Nanocavity</p> <p><u>Nicholas J. Martin</u>, D. Hallett, E. Callus, L. Hallacy, M. Duda, L. Brunswick, R. Dost, P. Kok, M. S. Skolnick, L. R. Wilson</p> <p>Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK</p>	<p>IKC-1</p> <p>Introducing CORNERSTONE IKC</p> <p><u>Callum Littlejohns</u></p> <p>CORNERSTONE, University of Southampton, Optoelectronics Research Centre (ORC), Building 53, University Road, Southampton SO17 1BJ, UK</p>	<p>F-O-4</p> <p>Using ultrafast spectroscopy and numerical simulations to distinguish carrier transfer and interfacial recombination at perovskite-transport layer interfaces</p> <p><u>Edward Butler-Caddle</u>¹, K. D. G. Imalka Jaywardena², A. Wijesakara¹, R. L. Milot¹, James Lloyd-Hughes¹</p> <p>¹University of Warwick, Coventry CV4 7AL, UK ²University of Surrey, Guildford GU2 7XH, UK</p>
16:45	<p>B-O-10</p> <p>Directional Superradiance in Chiral Waveguide-Coupled Quantum Dots</p> <p><u>Aspen Fenzl</u>, D. Hallett, L. Hallacy, R. Dost, L. R. Wilson</p> <p>Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK</p>		<p>F-O-5</p> <p>Understanding the Dynamics of Nanoscale Surface Photovoltage in Wide Bandgap Perovskite Films</p> <p><u>Dong Kuk Kim</u>¹, A. Ramadan², S. Wood¹</p> <p>¹National Physical Laboratory, Hampton Road, Teddington TW11 0LW, UK ²University of Sheffield, Western Bank, Sheffield S10 2TN, UK</p>

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
17:00	<p>B-O-11</p> <p>InGaAs-AlGaAsSb Single Photon Avalanche Photodiode for 1550 nm wavelength</p> <p><u>Jonathan D. Taylor-Mew</u>¹, X. Collins², B. White², C. H. Tan¹, J. S. Ng¹</p> <p>¹Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield, UK ²Phlux Technology Ltd, Sheffield, UK</p>	<p>EPSRC National Epitaxy Facility User Meeting</p>	<p>F-O-6</p> <p>2D Hybrid Perovskite for Next Generation Optoelectronic Devices</p> <p><u>Karl Jonas Riisnaes</u>¹, R. Mastroia² A. Bacon¹, I. Lieontis¹, O. Lam¹, L. De Marco², M. Craciun¹, S. Russo¹</p> <p>¹Centre for Graphene Science, College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter EX4 4QL, UK ²Institute of Nanotechnology, via Monteroni, 73100, Lecce, Italy</p>
17:15	<p>B-O-12</p> <p>Determination of Electric Field Profile in GaAsSb/Al_{0.85}GaAsSb SACM APDs from the Electro-Absorption Effect in GaAsSb</p> <p><u>Yifan Liu</u>¹, X. Jin¹, J. P. R. David¹, H. Jung², S. Lee², S. Krishna²</p> <p>¹Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK ²Department of Electrical and Computer Engineering, Ohio State University, Columbus, Ohio, 43210, USA</p>		<p>F-O-7</p> <p>Strong Coupling in 2D Perovskite Microcavities: Towards Polariton Lasing</p> <p><u>Yan Chen</u>, P. Claronino, T. Thornber, T. Yang, A. Ramadan, D. Lidzey</p> <p>Department of Physics and Astronomy, University of Sheffield, Hicks Building, Hounsfield Road, Sheffield S3 7RH, UK</p>
17:30	<p>B-O-13</p> <p>Design of 25 Gb/s AlGaAsSb Avalanche Photodiodes</p> <p><u>Yiwen Zhang</u>, C. H. Tan, J. S. Ng</p> <p>Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK</p>		<p>F-O-8</p> <p>High speed spray coating of perovskite for solar cells</p> <p><u>Ibrahim A Albariqi</u>, D. Lidzey</p> <p>Department of Physics and Astronomy, University of Sheffield, Hicks Building, Sheffield S3 7RH, UK</p>
17:45	<p>B-O-14</p> <p>Characterisation of Al_xGa_{1-x}As_ySb_{1-y} diodes grown on GaSb</p> <p><u>Shouwei Zhao</u>¹, X. Jin¹, A. P. Craig², A. R. J. Marshall², X. Yi³, M. Modak³, G. S. Buller³, C. H. Tan¹, J. P. R. David¹</p> <p>¹Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK ²Physics Department, University of Lancaster, Lancaster, LA1 4YB, UK ³School of Engineering & Physical Sciences, Heriot-Watt's University, Edinburgh, EH14 4AS, UK</p>		<p>F-O-9</p> <p>Organic Memristors for Hardware Based Neuromorphic Computing</p> <p>A. Cookson^{1,2}, <u>James Ryan</u>^{1,2}</p> <p>¹Department of Chemistry, Swansea University, Singleton Park, Swansea SA2 8PP, UK ²Centre for Integrative Semiconductor Materials (CISM), Swansea University, Swansea SA1 8EN, UK</p>
18:00	<p>End of Session Conference Dinner at Furnace, Charter Square, Sheffield S1 4HS</p>		

Oral Presentations – Tuesday 9th July 2024

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
09:00	Registration and Refreshments, Atrium Level 2		
10:00	<p>D-O-4 Correlating Nano-Mechanics, Nano-Electrical and Nano-Chemical ID at the Nanoscale for Semiconductor Applications</p> <p><u>Peter Schön</u>, M. Febvre, P. De Wolf</p> <p>Bruker Nano Surfaces & Metrology</p>	<p>TMD-O-1 (Invited) Memristive and Quantum Hall effect in graphene enhanced by two-dimensional ferroelectric and multiferroic materials</p> <p>A. Dey¹, <u>Wenjing Yan</u>¹, N. Cottam¹, O. Makarovskiy¹, N. Balakrishan⁶, S. Xie¹, F. Yan⁷, V. Mišeikis^{2,3}, C. Colett^{2,3}, J. Kerfoot⁴, V. Korolkov⁴, L. Eaves¹, J. F. Linnartz⁵, A. Kool⁵, S. Wiedmann⁵, K. Wang⁷, A. Patané¹</p> <p>¹School of Physics and Astronomy, University of Nottingham, UK ²Center for Nanotechnology Innovation @NEST, Istituto Italiano di Tecnologia, Pisa, Italy ³Graphene Labs, Istituto Italiano di Tecnologia, Via Morego, Genova, Italy ⁴Park Systems UK Ltd, Medicity Nottingham, Nottingham, UK ⁵High Field Magnet Laboratory (HFML-EMFL), ED Nijmegen, The Netherlands ⁶School of Chemical and Physical Sciences, Keele University, UK ⁷Institute of Semiconductors, Chinese Academy of Science, Beijing, China</p>	<p>G-O-1 Gallium Oxide Power Electronics</p> <p><u>Nicholas Edwards</u>, M. Jennings, C. Fisher, A. Martinez Muniz, O. Guy, J. Evans, J. Mitchell</p> <p>Swansea University, Swansea, UK</p>
10:15	<p>D-O-5 Interfaces – the Next Challenge for Compound Semiconductor Devices</p> <p><u>Katie Hore</u></p> <p>Oxford Instruments Plasma Technology</p>		<p>G-O-2 WITHDRAWN Effect of Long Post Metallisation Annealing on β-Ga₂O₃/Al₂O₃/Metal Interface</p> <p><u>Jacob J. Asher</u>¹, J. Evans¹, J. J. Mitchell², D. Gillard³, S. Zeiske¹, S. Naserikarimvand¹, S. Whelan³, Z. Ch⁴, C. Fisher¹, E. Chikoidze⁴, O. J. Guy¹, A. Perez-Tomas⁵, M. R. Jennings¹</p> <p>¹Centre for Integrative Semiconductor Materials (CISM), Swansea University, Bay Campus, Fabian Way, Crymlyn Burrows, Swansea SA1 8EN, Wales, UK ²KLA Corporation ³University of Plymouth School of Geography and Environmental Science, Plymouh PL4 8AA, UK ⁴Groupe d'Etude de la Matière Condensée (GEMaC), Université Paris-Saclay, UVSQ – CNRS, 45 Av. des Etats-Unis, 78035 Versailles Cedex, France ⁵Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC & Barcelona Institute of Science and Technology, Barcelona, Spain</p>

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
10:30	<p>D-O-6</p> <p>Homogeneous and reproducible nanopatterning with Variable Shaped Beam lithography</p> <p><u>Mathias Haedrich</u>, I. Stolberg</p> <p>Vistec Electron Beam GmbH, Ilmstrasse 4, 07743 Jena, Germany</p>	<p>TMD-O-2</p> <p>Ferromagnetic van der Waals contacts for efficient spin injection</p> <p><u>Soumya Sarkar</u>, Y. Wang, M. Chhowalla</p> <p>Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, UK</p>	<p>G-O-3</p> <p>Low concentration etching of porous GaN - characterisation and trends of porosity and morphology</p> <p><u>Ben Thornley</u>, G. R. Suwito, J. Zhang, M. Sarkar, M. Kappers, R. Oliver</p> <p>Department of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Road, Cambridge CB3 0FS, UK</p>
10:45	<p>D-O-7</p> <p>Achieving Selectivity and Reduced Absorption for Low Loss Monolithic III-V Photonics Integration by Using Ion Implantation</p> <p><u>Pawan Mishra</u>¹, A. Enderson¹, L. Jarvis¹, F. Albeladi¹, S.-J. Gillgrass¹, N. Peng², M. Tang³, H. Liu³, S. Shutts¹, P. M. Smowton¹</p> <p>¹School of Physics and Astronomy, Cardiff University, Cardiff, UK ²Surrey Ion Beam Centre, University of Surrey, Guildford, Surrey, UK ³Department of Electrical Engineering, University College London, London, UK</p>	<p>TMD-O-3</p> <p>Operation of WS₂ 2D-transistors at millikelvin temperature</p> <p><u>Megan Powell</u>¹, H. Neill², V. Patil², A. Zotov¹, L. Ansari², P. Hurley², F. Gity², A. Rossi^{1,3}</p> <p>¹Department of Physics, SUPA, University of Strathclyde, Glasgow G4 0NG, UK ²MicroNano Systems Centre, Tyndall National Institute, University College Cork, T12 R5CP, Ireland ³National Physical Laboratory, Hampton Road, Teddington TW11 0LW, UK</p>	<p>G-O-4</p> <p>Achieving Ohmic Contacts on p-type GaN at Low Temperatures</p> <p><u>Noppasorn Suphannarat</u>¹, F. Adams¹, S. Ghosh¹, W. Michailow³, D. J. Wallis^{1,2}, M. J. Kappers¹, R. A. Oliver¹</p> <p>¹Department of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Road, Cambridge CB3 0FS, UK ²Centre for High Frequency engineering, Cardiff University, Cardiff CF24 3AA, UK ³Cavendish Laboratory, University of Cambridge, JJ Thomson Avenue, Cambridge CB3 0HE, UK</p>
11:00	Refreshments and Exhibition, Atrium Level 2		
11:30	<p>D-O-8</p> <p>Theory of the optoelectronic properties of direct-gap Ge polytype heterostructures</p> <p><u>Christopher A. Broderick</u>^{1,2,3}, X. Zhang⁴, M. E. Turiansky¹, C. G. Van de Walle¹</p> <p>¹Materials Department, University of California, Santa Barbara, California 93106, USA ²School of Physics, University College Cork, Cork T12 YN60, Ireland ³Tyndall National Institute, University College Cork, Lee Maltings, Dyke Parade, Cork T12 R5CP, Ireland ⁴School of Materials Science and Engineering, Northwestern Polytechnical University, Xi'an 710072, China</p>	<p>TMD-O-4 (Invited)</p> <p>Modelling excited states of charged defects in monolayer TMDs</p> <p><u>Johannes Lischner</u></p> <p>Imperial College London, London SW7 2AZ, UK</p>	<p>G-O-5</p> <p>Hydrogen Annealing 4H-SiC for Trench Filling Epitaxy</p> <p>K. Turner¹, G. Colston¹, K. Stokeley², A. Newton², A. B. Renz¹, P. M. Gammon¹, M. Antoniou¹, P. A. Mawby¹, <u>Vishal A. Shah</u>¹</p> <p>¹School of Engineering, The University of Warwick, Coventry, CV4 7AL, UK ²Oxford Instruments Plasma Technology, Bristol, BS35 4GG, UK</p>

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
11:45	<p>D-O-9</p> <p>MBE Growth of Optically Active Ge Shell on GaAs Nanowires</p> <p><u>Ziyue Yin</u>¹, H. Zeng¹, G. Boras¹, R. R. Juluri², A. M. Sanchez², H. Deng¹, H. Jia¹, M. Tang¹, H. Liu¹</p> <p>¹Department of Electronic and Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, UK</p> <p>²Department of Physics, University of Warwick, Coventry CV4 7AL, UK</p>		<p>G-O-6</p> <p>An investigation of the impact of SiO₂, SiN_x, AlN and BN surface coatings on InGaN/GaN microLED optical properties</p> <p><u>Yilun Zhou</u>, S. Ghataora, R. M. Smith</p> <p>Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, UK</p>
12:00	<p>D-O-10</p> <p>Controllable Branching of Self-Catalyzed AlGaAs Nanowires Grown via Molecular Beam Epitaxy</p> <p><u>Giorgos Boras</u>, H. Zeng, Z. Yin, H. Deng, H. Jia, M. Tang, H. Liu</p> <p>Department of Electronic and Electrical Engineering, University College London WC1E 7JE, UK</p>	<p>TMD-O-5</p> <p>Mirror twin boundaries in 3R-MX₂</p> <p><u>James G. McHugh</u>^{1,2}, X. Li^{1,2}, I. Soltero^{1,2}, V. I. Fal'ko^{1,2}</p> <p>¹Department of Physics and Astronomy, University of Manchester. Oxford Road, Manchester M13 9PL, UK</p> <p>²National Graphene Institute, University of Manchester. Booth St. E., Manchester, M13 9PL, UK</p>	<p>G-O-7</p> <p>GaN based detectors for proton beam calibration</p> <p><u>Maxime Hugues</u>¹, S. Prado De La Cruz¹, L. Lesourd¹, E. Frayssinet¹, S. Chenot¹, J.-Y. Duboz¹, J.-C. Grini², M. Vidal², P. Hofverberg², Joël Hérault²</p> <p>¹Université Côte d'Azur, CNRS, CRHEA, rue B. Gregory, 06560 Valbonne, France</p> <p>²Institut Méditerranéen de ProtonThérapie – Centre Antoine Lacassagne, Nice, France</p>
12:15	<p>D-O-11</p> <p>Investigating the 2 × 1 Surface Reconstruction of Bismuth on GaAs (001) using Surface X-Ray Diffraction</p> <p><u>Douglas A. Crackett</u>¹, G. R. Bell², D. Sterling², P. J. Mousley³, H. Hussain³, R. D. Richards¹</p> <p>¹Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, UK</p> <p>²Department of Physics, University of Warwick, Coventry, UK</p> <p>³Diamond Light Source, Harwell Science and Innovation Campus, Didcot, UK</p>	<p>TMD-O-6</p> <p>From alloys to heterostructures: influence of CVD growth temperature on resultant structures</p> <p><u>Ana Senkić</u>¹, Š. Mandić^{1,2}, N. Vujičić¹</p> <p>¹Centre for Advanced Laser Techniques, Institute of Physics, Bijenička cesta 46, 10000 Zagreb, Croatia</p> <p>²Faculty of Physics, University of Rijeka, Ulica Radmile Matejčić 2, 51000 Rijeka, Croatia</p>	<p>G-O-8</p> <p>Single photon emitters created by intentional carbon doping of hexagonal boron nitride grown on sapphire by high-temperature molecular beam epitaxy</p> <p><u>Christopher J. Mellor</u>¹, T. S. Cheng¹, J. Bradford¹, T. S. S. James¹, A. F. Collins¹, A. Rousseau², J. Plo², P. Valvin², C. Li³, A. N. Khlobystov⁴, I. Aharonovich⁵, B. Gil², G. Cassabois², P. H. Beton¹, S. V. Novikov¹</p> <p>¹School of Physics and Astronomy, University of Nottingham, Nottingham NG7 2RD, UK</p> <p>²Laboratoire Charles Coulomb, CNRS-Université de Montpellier, 34095, Montpellier, France</p> <p>³School of Physics and Astronomy, Monash University, Melbourne, Victoria 3800, Australia</p> <p>⁴School of Chemistry, University of Nottingham, Nottingham NG7 2RD, UK</p> <p>⁵School of Mathematical and Physical Sciences, University of Technology Sydney, Sydney, New South Wales, Australia</p>
12:30	<p>Lunch and Exhibition Heartspace Atrium Level 2 Poster Session Norfolk Building Room 201, Symposia D, E, G, TMD</p>		

13:00			IOP Semiconductor Group AGM
14:00	IOP Student Research Communication Competition Prize-giving		
14:05	Plenary 3 Recent Progress in Ultraclean Assembly of van der Waals Heterostructures <u>Roman Gorbachev</u> Department of Physics & Astronomy, University of Manchester, Manchester, UK		
14:55	Update on UK Semiconductor Strategy <u>John Goodenough</u> Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK	TMD-O-7 (Invited) Femtosecond Switching of Strong Light-Matter Interactions in Microcavities with Two-Dimensional Semiconductors <u>Armando Genco</u> ¹ , C. Louca ¹ , C. Cruciano ¹ , K. Song ⁶ , C. Trovatiello ⁴ , G. Di Blasio ¹ , G. Sansone ¹ , S. Randerson ³ , P. Claronino ³ , R. Jayaprakash ³ , K. Watanabe ⁵ , T. Taniguchi ⁵ , D. G. Lidzey ³ , O. Kyriienko ⁶ , S. Dal Conte ¹ , A. Tartakovskii ³ , G. Cerullo ^{1,2} ¹ Dipartimento di Fisica, Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133, Milan, Italy ² IFN, CNR, Piazza Leonardo da Vinci 32, 20133, Milan, Italy ³ Department of Physics and Astronomy, University of Sheffield, Sheffield, UK ⁴ Department of Mechanical Engineering, Columbia University, New York, USA ⁵ Advanced Materials Laboratory, National Institute for Materials Science, Tsukuba, Japan ⁶ Physics Department, University of Exeter, Exeter, UK	E-O-1 Back-Illuminated T2SL Resonant Cavity Enhanced Photodetector Utilising Metallic and DBR Mirrors <u>George F. Seager</u> , A. R. J. Marshall Physics Department, Lancaster University, Lancaster LA1 4YB, UK
15:10			E-O-2 Quantitative in silico design of strain-balanced InAs/InAs_{1-x}Sb_x type-II superlattices for mid-infrared photodetectors <u>Cónal Murphy</u> ^{1,2} , G. F. Seager ³ , E. P. O'Reilly ^{1,2} , A. R. J. Marshall ³ , C. A. Broderick ^{2,1} ¹ Tyndall National Institute, University College Cork, Lee Maltings, Dyke Parade, Cork T12 R5CP, Ireland ² School of Physics, University College Cork, Cork T12 YN60, Ireland ³ Physics Department, Lancaster University, Lancaster LA1 4YB, UK

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
15:25	<p>IKC-2 Innovation and Knowledge Centre (IKC) REWIRE – High Voltage Power Electronics</p> <p><u>James Pomeroy</u>, Martin Kuball</p> <p>IKC REWIRE, University of Bristol, UK</p>	<p>TMD-O-8 The Dynamics of Surface Plasmon Polaritons Explored Through s-SNOM Fourier Analysis of WS₂ Nanophotonic Antennas</p> <p><u>Alexander J. Knight</u>¹, X. Hu¹, S. Randerson¹, Y. Wang², C. K. Cheung³, R. Gorbachev³, A. I. Tartakovskii¹</p> <p>¹Department of Physics and Astronomy, University of Sheffield, Sheffield, UK ²School of Physics, Engineering and Technology, University of York, York, UK ³Department of Physics and Astronomy, University of Manchester, Manchester, UK</p>	<p>E-O-3 Sensitive photonic terahertz detection using quantum physics</p> <p><u>Wladislaw Michailow</u>, R. Xia, R. Chen, M. Tan, H. E. Beere, D. A. Ritchie</p> <p>Cavendish Laboratory, University of Cambridge, CB3 0HE Cambridge, UK</p>
15:40		<p>TMD-O-9 Realization of Z₂ topological photonic insulators based on bulk transition metal dichalcogenides</p> <p><u>Tommi Isoniemi</u>¹, P. Bouteyre¹, X. Hu¹, F. Benimetskiy¹, Y. Wang², M. S. Skolnick¹, D. N. Krizhanovskii¹, A. I. Tartakovskii¹</p> <p>¹Department of Physics and Astronomy, University of Sheffield, UK ²School of Physics, Engineering and Technology, University of York, UK</p>	<p>E-O-4 AlGaIn/GaN based IMPATT devices for THz applications: a review</p> <p><u>Veronica Zhan Gao</u></p> <p>Optoelectronic Systems and Microtechnology, Universidad Politécnica de Madrid, Spain</p>
15:55	Refreshments, Atrium Level 2		
16:15	<p>D-O-12 Facile Seeded Heteroepitaxy of GaAs on Ge through a graphene layer</p> <p><u>Vitaly Babenko</u>^{1,2}, B. Ramsay¹, S. Hofmann², L. Hirst¹</p> <p>¹Department of Engineering, University of Cambridge, Cambridge, CB3 0FA, UK ²Department of Materials Science & Metallurgy, University of Cambridge, Cambridge, CB3 0FS, UK</p>	<p>TMD-O-10 (Invited) Photonic crystals made from quasi-bulk WS₂ as a new tunable platform for photonics: from polaritons to topological edge states</p> <p><u>Paul Bouteyre</u>¹, T. Isoniemi¹, X. Hu¹, F. Benimetskiy¹, S. Randerson¹, P. G. Zotev¹, Y. Wang², D. N. Krizhanovskii¹, A. I. Tartakovskii¹</p> <p>¹Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK ²Department of Physics, University of York, York YO10 5DD, UK</p>	<p>How do we improve academic and industry interaction in the UK?</p> <p><u>Peter Smowton</u></p> <p>Institute for Compound Semiconductors & School of Physics and Astronomy, Cardiff University, Translational Research Hub, Maindy Road, Cathays, Cardiff CF24 4HQ, UK</p>

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
16:30	<p>D-O-13</p> <p>Anomalous absorption edge shift in intermixed Al_xIn_yGa_{1-x-y}As quantum wells</p> <p>Tommy Murphy^{1,2}, C. A. Broderick^{2,1}, F. H. Peters^{2,1}, E. P. O'Reilly^{1,2}</p> <p>¹Tyndall National Institute, University College Cork, Lee Maltings, Dyke Parade, Cork T12 R5CP, Ireland ²School of Physics, University College Cork, Cork T12 YN60, Ireland</p>		
16:45	<p>D-O-14</p> <p>Investigation of the indium-flush technique on InAs/InAlGaAs/InP (001) quantum dots for 1.55 μm laser applications</p> <p>Calum Dear¹, J. Yuan¹, H. Jia¹, J.-S. Park¹, Y. Hou^{2,3}, K. El Hajraoui^{4,5}, H. Zeng¹, H. Deng¹, M. Tang¹, Q. Ramasse^{4,6}, H. Liu¹</p> <p>¹University College London, London WC1E 7JE, UK ²University of Southampton, Southampton SO17 1BJ, UK ³Swansea University, Swansea SA1 8EN, UK ⁴SuperSTEM, Daresbury WA4 4AD, UK ⁵University of York, York YO10 5DD, UK ⁶University of Leeds, Leeds LS2 9JT, UK</p>	<p>TMD-O-11</p> <p>Second harmonic generation enhancement in hybrid Mie-plasmonic modes in metasurfaces made from WS₂ dielectric nanoantennas on gold</p> <p>Yadong Wang¹, X. Hu¹, P. G. Zotev¹, P. Bouteyre¹, Y. Wang², A. I. Tartakovskii¹</p> <p>¹Department of Physics and Astronomy, University of Sheffield, Sheffield, UK ²Department of Physics, University of York, York YO10 5DD, UK</p>	<p>Semiconductors: Future UK R&D eFutures Landscaping Session</p> <p><u>Elizabeth Petticrew</u></p> <p>Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK</p>
17:00	<p>D-O-15</p> <p>Molecular Beam Epitaxy Growth Of GaAs On {113}-Faceted Ge And (111)-Faceted V-Groove Silicon</p> <p>Makhayeni Mtunzili¹, H. Jia¹, Y. Hou^{2,3}, L. Bao², M. Gallucci Masteghin⁴, H. Deng¹, H. Zeng¹, J.-S. Park¹, Y. Wang¹, F. Gardes², M. Tang¹, Alwyn Seeds¹, H Liu¹</p> <p>¹Department of Electronic and Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, UK ²Optoelectronics Research Centre, University of Southampton, Southampton SO1 7 IBJ, UK ³Department of Electronic and Electrical Engineering, Bay Campus, Swansea University, Swansea, SA1 8EN, UK ⁴Advanced Technology Institute, University of Surrey, Guildford GU2 7XH, UK</p>	<p>TMD-O-12</p> <p>Exfoliation of large-area monolayers using template stripped gold</p> <p>L. Nagireddy^{1,2}, Neil R. Wilson², M. C. Richter¹, K. Hricovini¹, J. Lloyd-Hughes², M. D. Watson³, N. D. M Hine², S. J. Magorrian²</p> <p>¹Laboratoire de Physique des Matériaux et des Surfaces, Université de Cergy-Pontoise, 5 mail Gay-Lussac, 95031 Cergy-Pontoise, France ²Department of Physics, University of Warwick, Coventry CV4 7AL, UK ³Diamond Light Source, Harwell Science and Innovation Campus, Didcot, OX11 0DE, UK</p>	

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
17:15	<p>D-O-16 Lateral tunnel epitaxy of large-area uniform III-V membranes on Si-photonics silicon-on-insulator substrates</p> <p>Z. Yan¹, W. Zhang², M. Ebert², <u>Bogdan-Petrin Ratiu</u>¹, G. T. Reed², D. J. Thomson², Q. Li¹</p> <p>¹School of Physics and Astronomy, Cardiff University, Cardiff CF24 3AA, UK ²Optoelectronics Research Centre, University of Southampton, Southampton SO17 1BJ, UK</p>	<p>TMD-O-13 Synthesis of Iron selenide layers via salt-assisted chemical vapour deposition</p> <p><u>Nilanthy Balakrishnan</u>, L. J. Adams</p> <p>School of Chemical and Physical Sciences, Keele University, Keele, ST5 5BG, UK</p>	
17:30	<p>D-O-17 Site-control of InAs quantum dots by droplet epitaxy in MOVPE</p> <p><u>Guoliang Zhou</u>¹, E. M. Sala^{1,2}, Y. I. Na¹, P. Fry^{1,2}, J. Heffernan^{1,2}</p> <p>¹Department of Electronic and Electrical Engineering, University of Sheffield, North Campus, Broad Lane, Sheffield S3 7HQ, UK ²EPSRC National Epitaxy Facility, University of Sheffield, North Campus, Broad Lane, Sheffield S3 7HQ, UK</p>	<p>TMD-O-14 Wafer-scale high performance graphene devices fabricated with standard semiconductor fabrication processes</p> <p><u>Robert Wallis</u>, T. Badcock, A. Meersha, K. Walsh, Z. Laghfour, N. Conway</p> <p>Paragraf Limited, 7-8 West Newlands, Somersham, Cambridgeshire PE28 3EB, UK</p>	
17:45	<p>D-O-18 Low excess noise Al_{0.75}Ga_{0.25}AsSb on InP</p> <p><u>Ziyu Mao</u>¹, X. Jin¹, Q. Tian¹, H. I. J. Lewis¹, X. Yi², S. Xie^{3,5}, B. Liang⁴, D. L. Huffaker^{4,6}, C. H. Tan¹, J. P. R. David</p> <p>¹Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK ²Institute of Photonics and Quantum Sciences, Heriot-Watt University, Edinburgh EH14 4AS, UK ³School of Physics and Astronomy, Cardiff University, Cardiff CF24, UK ⁴California Nano Systems Institute, University of California, Los Angeles, California, 90095, USA ⁵Microsemi Ltd, Shanghai, 200001, China (Present address) ⁶Electrical Engineering Department, The University of Texas at Arlington, Texas, USA (Present address)</p>	<p>TMD-O-15 PdSe₂: a van der Waals narrow gap semiconductor with strong in-plane anisotropy</p> <p><u>Daniel Wolverson</u></p> <p>Centre for Nanoscience and Nanotechnology and Department of Physics, University of Bath, Bath, BA2 7AY, UK</p>	
18:00	Conference Close		

Poster Presentations

Symposium A: Physics in Semiconductors

A-P-1

Interaction Induced Localisation in a 2D Exciton-Polariton Lieb Lattice

Seth Lovett¹, Anthony Ellul¹, Paul M. Walker¹, Maurice S. Skolnick¹ and Dmitry N. Krizhanovskii¹

¹Department of Physics, University of Sheffield, S3 7RH, Sheffield, UK

A-P-2

A Details Investigation On The Electrical Defects Into Erbium Doped IN₂O₃ Thin Film

Faisal S. Al mashary^{a,*}, Jorlandio F. Felix^b, Aniruddha Mondal^c, Sanjib Mondal^c, Anupam Ghosh^d, Mohamed Henini^e, Dler A. Jameel^f

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^b Instituto de Física, Universidade de Brasília, Núcleo de Física Aplicada, 70910-900, Brasília, DF, Brazil

^c Department of Physics, National Institute of Technology Durgapur, Durgapur 713209, India

^d Indian Institute of Technology Kharagpur, Kharagpur –721302, India

^e School of Physics and Astronomy, University of Nottingham, Nottingham, NG7 2RD, United Kingdom

^f Department of General Science, College of Basic Education, University of Zakho, Kurdistan Region-Iraq

A-P-3

Using Catalyzed Atomic Layer Deposition to Enable Conformal Depositions in High Aspect Ratio Structures for Semiconductor Manufacturing

Tyler J. Myers

Forge Nano, 12300 Grant St., Thornton, CO 80241, USA

Symposium B: Optical Devices

B-P-1

Micro-Transfer Printing of InGaAs/InP Avalanche Photodiode on Si Substrate

Yasaman Alimi¹, Benoit Guilhabert², Dimitars Jevtics², Elisa M. Sala³, Michael J. Strain², Kristian Groom¹, Jon Heffernan^{1,3}

¹Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, S1 3JD, United Kingdom

²Institute of Photonics, Department of Physics, University of Strathclyde, Glasgow, G1 1RD, United Kingdom

³EPSRC National Epitaxy Facility, University of Sheffield, Sheffield, S1 3JD, United Kingdom

B-P-2

Investigation of high temperature InGaAs/AlGaAsSb avalanche photodiodes

L. Li, J. Petticrew, B. White, X.Collins, J.S. Ng, C.H. Tan*

Department of Electronic and Electrical engineering, University of Sheffield, Sheffield, UK.

B-P-3

A k·p interface model for InAs/GaSb Type-II superlattices simulation by nextnano³

Chen Liu^{1,2}, Anh-Luan Phan³, Takuma Sato⁴, Julian Zanon⁵, Manoj Kesaria^{1*}, Iwan Davies²

¹School of Physics and Astronomy, Cardiff University, United Kingdom

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³Department of Electronics Engineering, University of Rome Tor Vergata, Rome, Italy

⁴nextnano GmbH, Munich, Bavaria, Germany

⁵Applied Physics and Science Education, Eindhoven University of Technology, Eindhoven, Netherlands

B-P-4

$\text{Al}_x\text{In}_{1-x}\text{As}_y\text{Sb}_{1-y}$ avalanche photodiode lattice matched to GaSb for detection beyond 2 μm at room temperature

Qingyu Tian¹, Xiao Jin¹, Wenguang Zhou^{2,3}, Xin Yi^{4*}, Adam Craig⁵, Mrudul Modak³, Andrew Marshall⁵, Yingqiang Xu^{2,3}, Guowei Wang^{2,3*}, John P. R. David¹, Gerald S. Buller³

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³Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, Beijing 100049, China

⁴Institute of Photonics and Quantum Sciences, School of Engineering and Physical Sciences, Heriot-Watt University, David Brewster Building, Edinburgh, EH14 4AS, UK

⁵Department of Physics, University of Lancaster, Lancaster, LA1 4WA, UK

B-P-5

Inverse Design of a Photonic Crystal Cavity as a Platform for High Q-Factor Whispering Gallery Modes

M. Singh,^{1,*} N.J. Martin,¹ and L.R. Wilson¹

¹Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK

B-P-6

Photonic Crystal L3 Cavity Based Gigahertz Quantum Dot Single-Photon Source

Marius Cizauskas^{1,*}, Luke Brunswick¹, Vitalie Nedelea², Alex Greilich², Tommi Isoniemi¹, Ian Farrer³, Mark Fox¹, and Maurice Skolnick¹

¹Department of Physics and Astronomy, University of Sheffield, Sheffield, United Kingdom

²Department of Physics, Technical University of Dortmund, Dortmund, Germany

³Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom

B-P-7

Exploring toroidal light pulses application in semiconductor devices: resonating cavity design and photodetection

Yaonan Hou,¹ Zengxia Mei,² Menno Kappers,³ Chaoyuan Jin,⁴ Rachel Oliver³

¹Electronic and electrical engineering, Swansea University, Bay Campus, SA1 8EN, Swansea, UK

²Songshan Lake Materials Laboratory, Dongguan, Guangdong 523808, China

³Department of Materials Science and Metallurgy, University of Cambridge, Cambridge CB3 0FS, UK

⁴College of Information Science and Electronic Engineering, Zhejiang University, Hangzhou 310027, China

B-P-8

Numerical comparison between inverted and conventional architectures for CdTe-based graded bandgap solar cells

Tahereh Zargar¹, Ashafaque Alam¹, Tayebeh Mousavi¹

¹ Department of Engineering, King's College London, WC2R 2LS London, U.K.

Symposium C: Electronic Devices

C-P-1

Advancing Wafer-Level Packaging with Photonic Debonding

Vikram Turkani

Pulseforge, 400 Parker Dr – Suite 1110 Austin, TX 78728 USA

C-P-2

Proof of concept of the Field Effect Inverter: A Non-CMOS III-V Semiconductor Unipolar Logic Device in InAs/InGaAs/AlSb/GaSb

J. J. Hall¹, P. D. Hodgson^{1,2} and M. Hayne^{1,2}

¹Department of Physics, Lancaster University, Lancaster, LA1 4YB, United Kingdom

²Quinas Technology, Department of Physics, Lancaster University, Lancaster LA1 4YB, United Kingdom

C-P-3

Bias-Stress Effects in PE-ALD Poly-Crystalline ZnO-TFTs

Ben D. Rowlinson¹, Jiale Zeng¹, and Harold M.H. Chong¹

¹School of Electronics and Computer Science, University of Southampton, SO17 1BJ, UK

C-P-4

VO₂-based memristor for neuromorphic computing

Bingkai Ding,^a Kai Sun,^{a,b} C. H. (Kees) de Groot,^a and Ruomeng Huang^a

^aSchool of Electronics and Computer Science, University of Southampton, Southampton, United Kingdom

^bSchool of Physics and Astronomy, University of Southampton, Southampton, United Kingdom

Symposium D: Semiconductor Materials and Nanostructures

D-P-1

Independently electro-mechanically tunable photonic crystal cavities coupled to a single-mode waveguide

L. Brunswick*, L. Hallacy, A. Foster, R. Dost and L. R. Wilson

Department of Physics and Astronomy, University of Sheffield, UK

D-P-2

Tin content suppression by boron doping during epitaxy of germanium-tin (Ge_{1-x}Sn_x) alloy on a silicon wafer

Areej Aljaghwan, Maksym Myronov

Physics Department, The University of Warwick, Coventry CV4 7AL, UK

D-P-3

A quantitative study of the segregation of antimony in InAs/AlSb triple barrier resonant-tunneling heterostructures

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D-P-4

Time-of-Flight Elastic Recoil Detection Analysis and Rutherford Backscattering Spectrometry to Characterise Al_xGa_{1-x}As_{1-y}Bi_y Avalanche Photodetectors

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D-P-5

Non-destructive Methods for Determination of Refractive Index from Reflectance Interference Fringes

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D-P-6

Areal strain mapping of suspended germanium microstructures:

Qualification of the Raman derived strain with High Resolution Electron Backscattering Diffraction (HR-EBSD)

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D-P-7

Hafnium oxide: A thin film passivating dielectric with controllable etch resistance

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D-P-8

Electroluminescence of GaAsBi/GaAs MQWs

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D-P-9

Characterisation of GaAs/GaAsBi heterojunction photodiodes

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Chee Hing Tan, John P. R. David and Robert D. Richards

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D-P-10

Scalable Synthesis and In-situ Characterization of Two-Dimensional Semiconductor / Graphene Heterostructures

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D-P-11

Aerosol-Jet Printed Solid-Phase Quantum Dot Ion Sensors

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D-P-12

Optical Studies of GaSb based Quantum Wells Grown on Silicon

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Symposium E: Mid-IR and THz Materials and Devices

E-P-1

Examining low-temperature atmospheric plasma polymerization for enhanced passivation of type-II superlattice photodiodes

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E-P-2

Utilizing High-K based dielectric coating for enhanced passivation of type-II superlattice photodiodes

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E-P-3

Type-II InAs/InAsSb Strain Balanced Superlattice Mid-Infrared Light Emitting Diodes

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Symposium F: Organics, Hybrids and Perovskites

F-P-1

Starch-enhanced perovskite triboelectric nanogenerators

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Symposium G: Wide-bandgap Semiconductors

G-P-1

Towards Low Ohmic Resistance Contacts for Millimetre-wave AlGaIn/GaN HEMTs Through Transfer-Length Patterning

Joel Iloke, Afesomah Ofiare, Abdullah Al-Khalidi, and Edward Wasige

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G-P-2

Vertical GaN FinFET with linearly doped drift layer for high power switching applications

Sahalu Hassan, Ziang Cheng, Joel Iloke, Abdullah Al-Khalidi, and Edward Wasige

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G-P-3

Depletion Width Modulated n-Ga₂O₃/p-GaN Light Effect Transistor for UV Photonics

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G-P-4

Density Functional Theory Calculations of the Bandstructure for Cubic Boron Arsenide

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G-P-5

Epitaxial Trench Refill of 4H-SiC by Chlorinated Chemistry

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Symposium TMD: 2D Materials (TMD-UK Meeting)

TMD-P-1

Clean assembly of van der Waals heterostructures using silicon nitride membranes

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TMD-P-2

Room temperature strong light-matter interaction in highly anisotropic van der Waals excitonic material ZrSe₃

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TMD-P-3

Tuneable photoluminescence from monolayer MoS₂

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TMD-P-4

Nanophotonic Structures made from Layered van der Waals Materials

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TMD-P-5

Interaction between pentacene molecules and monolayer transition metal dichalcogenides

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TMD-P-6

Topological Edge States in WS₂ Inverted Nanograting Structures

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TMD-P-7

Curvature-Enhanced Localised Emission from Dark States in Wrinkled Monolayer WSe₂ at Room Temperature

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TMD-P-8

Measurement of spatial homogeneity in 2D materials – An international round-robin comparison

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TMD-P-9

Anisotropic Exciton Polariton Propagation in ZrSe₃

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TMD-P-10

A Comparative Study of Epitaxial and Bridgman-Grown GaSe: Understanding Optical Properties and Defects

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