UK Semiconductors 2017 Technical Programme

This year's conference is being held in association with the UK Nitrides Consortium Summer Meeting (12th July) and the TMD-UK 2017 meeting (13th July). We are pleased to welcome our four international plenary speakers who will provide extended presentations on single photon emission from nitride nanowire quantum dots, microscale transfer-printing for semiconductor devices, InP-based quantum dots for classical & quantum optical communications, and 2D-materials & heterostructures. We also have an invited talk on telecoms-wavelength quantum ring LEDs and VCSELs and a number of invited talks on 2D-materials as part of the TMD-UK meeting. Oral presentations and posters are arranged into specific symposia as listed below (page numbers refer to the abstract book).

Plenary Lectures: ***Mark Holmes, Chris Bower, Johann Peter Reithmaier, Joshua Robinson***

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-Gap Nitride Semiconductors

Symposium TMD: 2D Materials – incorporating the TMD-UK 2017 Meeting

Oral Presentations – Wednesday 12th July 2017

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
09:30	Registration and Refreshments, Atrium Level 2		
10:30	Plenary 1 **Single photon emission from III-Nitride nanowire QDs** Mark J. Holmes[1], Satoshi Kako[2], Kihyun Choi[1], Munetaka Arita[2], Yasuhiko Arakawa[1,2] [1]Institute of Industrial Science, University of Tokyo, Japan [2]Institute for Nano Quantum Information Electronics, University of Tokyo, Japan		
11:20	G-O-1 **Blue luminescence from InGaN/GaN nano-pyramids prepared by selective area epitaxy technique** Shahab Norouzian Alam[1], Vitaly Z. Zubialevich[1], Michael Schmidt[1], Christopher Bryce[2], Robert W. Martin[2], Peter J. Parbrook[1] [1]Tyndall National Institute, University College Cork, Cork, Ireland [2]Department of Physics, SUPA, University of Strathclyde, Glasgow, G4 0NG, UK	A-O-1 **Deterministic giant photon phase shift from a charged quantum dot** P. Androvitsaneas[1], A. B. Young[1], J. M. Lennon[1], C. Schneider[2], S. Maier[2], J. J. Hinchliff[1], G. S. Atkinson[1], E. Harbord[1], M. Kamp[2], S. Höfling[2,3], J. G. Rarity[1], Ruth Oulton[1] [1]Quantum Engineering Technology Labs and Quantum Engineering Centre for Doctoral Training, H. H. Wills Physics Laboratory and Department of Electrical & Electronic Engineering, University of Bristol, BS8 1FD, UK [2]Technische Physik, Physikalisches Institut and Wilhelm Conrad Röntgen-Center for Complex Material Systems, Universität Würzburg, Am Hubland, D-97474 Würzburg, Germany [3]School of Physics and Astronomy, University of St Andrews, North Haugh, St Andrews, KY16 9SS, UK	C-O-1 **Room-temperature demonstration of a novel, non-volatile memory device based on III–V semiconductors** Ofogh Tizno, Andrew Marshall, Manus Hayne Department of Physics, Lancaster University, Lancaster, LA1 4YB, UK
11:35	G-O-2 **Dense GaN nanocolumn arrays by top-down approach using nanosphere lithography** V. Z. Zubialevich[1], P. Pampili[1,2], M. McLaren[3], M. Arredondo-Arechavala[3], Peter J. Parbrook[1,2] [1]Tyndall National Institute, University College Cork, T12 R5CP, Cork, Ireland [2]School of Engineering, University College Cork, Cork, Ireland [3]School of Mathematics and Physics, Queen's University Belfast, Belfast, BT7 1NN, Northern Ireland	A-O-2 **Measuring nuclear spin temperature and GaAs hyperfine constants in GaAs/AlGaAs quantum dots** Evgeny A. Chekhovich[1], A. Ulhaq[1], E. Zallo[2,3], F. Ding[2], O. G. Schmidt[2], M. S. Skolnick[1] [1]Department of Physics and Astronomy, University of Sheffield, Sheffield, S3 7RH, UK [2]Institute for Integrative Nanoscience, IFW Dresden, D-01069 Dresden, Germany [3]Paul-Drude-Institut fur Festkorperelektronik, 10117 Berlin, Germany	C-O-2 **Investigation of Temperature Performance of Junction Isolation Devices for Power Integrated Circuits** Stephanie Adeyemo, Petar Igić Electronic Systems Design Centre, College of Engineering, Swansea University, Swansea SA1 8EN, UK

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11:50	G-O-3 **Deep ultraviolet emission in hexagonal boron nitride grown by high-temperature molecular beam epitaxy** T. Q. P. Vuong[1], G. Cassabois[1], P. Valvin[1], E. Rousseau[1], A. Summerfield[2], Chris J. Mellor[2], Y.Cho[2], T. S. Cheng[2], J. D. Albar[2], L. Eaves[2], C. T. Foxon[2], P. H. Beton[2], S. V. Novikov[2], B. Gil[1] [1]Laboratoire Charles Coulomb, UMR5221 CNRS-Université de Montpellier, 34095 Montpellier, France [2]School of Physics and Astronomy, University of Nottingham, Nottingham NG7 2RD, UK	A-O-3 **Proximity induced superconducting properties in high mobility two-dimensional electron gas quantum well in InGaAs heterostructures** Kaveh Delfanazari[1,2], R. K. Puddy[2], P. Ma[2], T. Yi[2], M. Cao[2], Y. Gul[3], I. Farrer[2,4], D. A. Ritchie[2], H. J. Joyce[1], M. J. Kelly[1,2], C. G. Smith[2] [1]Electrical Engineering Division, University of Cambridge, Cambridge CB3 0FA, UK [2]Cavendish Laboratory, University of Cambridge, Cambridge CB3 0HE, UK [3]Department of Electronic and Electrical Engineering, University College London, London WC1E 7JE, UK [4]Department of Electronic and Electrical Engineering, University of Sheffield, Mappin Street, Sheffield, S1 3JD, UK	C-O-3 **Optimisation of Breakdown Voltage of Lateral Superjunction Multi-Gate Power MOSFET for sub-200V Applications** Olujide A. Adenekan, P. Holland, K. Kalna Nanoelectronic Devices Computational Group (NanoDeCo), College of Engineering, Swansea University Bay Campus, Fabian Way, Swansea, SA1 8EN, Wales, UK
12:05	G-O-4 **Monolithically integrated white light LED grown on (11-22) semipolar GaN** Nicolas Poyiatzis, J Bai, M. Athanasiou, L. Jiu, L. C Wang, Y. Gong, T. Wang Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK	A-O-4 **Backward Cherenkov radiation in a polariton microcavity wire** Max Sich[1], J. K. Chana[1,2], L. E. Tapia Rodriguez[1], D. V. Skryabin[2,3], Y. V. Kartashov[2,4,5], O. A. Egorov[3,6], P. M. Walker[1], E. Clarke[7], B. Royall[1], M. S. Skolnick[1], D. N. Krizhanovskii[1] [1]Department of Physics and Astronomy, The University of Sheffield, Sheffield, S3 7RH, UK [2]Department of Physics, University of Bath, Bath, BA2 7AY, UK [3]ITMO University, St. Petersburg, 197101, Russia [4]ICFO – Institut de Ciencies Fotoniques, Castelldefels, 08860, Spain [5]Institute of Spectroscopy, Russian Academy of Sciences, Troitsk, Moscow Region, 142190, Russia [6]Technische Physik der Universität Würzburg, Am Hubland, 97074, Würzburg, Germanyy [7]EPSRC National Centre for III-V Technologies, The University of Sheffield, Sheffield, S3 7RH, UK	C-O-4 **Narrow Bandgap Effects in Epitaxially Grown InSb MOS Capacitors** Oliver J. Vavasour[1], M. Ashwin[2], R. Jefferies[1], J. W. Roberts[3], P. R. Chalker[3], T. Ashley[1] [1]School of Engineering, University of Warwick, Coventry CV4 7AL, UK [2]Department of Physics, University of Warwick, Coventry CV4 7AL, UK [3]School of Engineering, University of Liverpool, L69 3GH, UK

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12:20	G-O-5 **Gallium Nitride Broadband Sources: Towards Sub-Cellular Resolution Optical Coherence Tomography** G. R. Goldberg[1], A. Boldin[1], S. M. L. Andersson[1], P. Ivanov[1], N. Ozaki[2], Richard J. E. Taylor[3], K. M. Groom[4], K. L. Kennedy[4], D. T. D. Childs[1], R. A. Hogg[1] [1]School of Engineering, The University of Glasgow, Rankine Building, G12 8LT, UK [2]Faculty of Systems Engineering, Wakayama University, 930 Sakaedani, Wakayama 640-8510, Japan [3]Department of Electrical Engineering and Information Systems, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo, 113-8656, Japan [4]Department of Electronic and Electrical Engineering, The University of Sheffield, S3 7HQ, UK	A-O-5 **Exciton-polaritons in a multi-orbital 2D Lieb lattice with spin-orbit coupling** Charles E. Whittaker[1], E. Cancellieri[1], P. M. Walker[1], D. R. Gulevich[2], H. Schomerus[3], D. Vaitiekus[1], B. Royall[1], E. Clarke[4], M. S. Skolnick[1], D. N. Krizhanovskii[1] [1]Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK [2]ITMO University, St. Petersburg 197101, Russia [3]Department of Physics, Lancaster University, Lancaster LA1 4YB, UK [4]EPSRC National Centre for III-V Technologies, University of Sheffield, Sheffield S1 3JD, UK	C-O-5 **Scaled $HfO_2/In_{0.53}Ga_{0.47}As$ MOSCAPs via inserting TiN capping layer for III-V low power device application** Yen-chun Fu, Xu Li, Uthayasankaran Peralagu, Dilini Hemakumara, David A. J. Millar, Matthew Steer, Iain G Thayne School of Engineering, University of Glasgow, Rankine Building, Oakfield Avenue, Glasgow, G12 8LT
12:35	Lunch, Exhibition and Poster Session for Symposia A, C, D, E, G Atrium Level 2		
13:00	IOP Student Research Communication Competition Seminar Room 223		
14:00	Plenary 2 **Transfer-Printed Microscale Semiconductors: Techniques and Applications** Chris Bower X-Celeprint Limited, Lee Maltings, Dyke Parade, Cork, Ireland		
14:50	Innovation-1 **Introduction to the Future Photonics Hub** Jon Heffernan Department of Electronic and Electrical Engineering, University of Sheffield, UK	A-O-6 **High Purcell Factor Generation of Coherent On-Chip Single Photons** Catherine L. Phillips[1], F. Liu[1,2], A. J. Brash[1], J. O'Hara[1], L. Martins[1], R. J. Coles[1], B. Royall[1], C. Bentham[1], E. Clarke[3], I. Itskevich[4], L. R. Wilson[1], M. S. Skolnick[1], A. M. Fox[1] [1]Department of Physics and Astronomy, University of Sheffield, Sheffield, S3 7RH, UK [2]JARA-Institute for Quantum Information, RWTH Aachen University, Aachen, Germany [3]EPSRC National Centre for III-V Technologies, Sheffield S1 3JD, UK [4]School of Engineering and Computer Science, University of Hull, Hull, HU6 7RX, UK	C-O-6 **Characterization of InSb/AlInSb Heterostructure Schottky Diodes** Fadwa Alshaeer[1], Philip D Buckle[1], Shiyong Zhang[2], Edmund Clarke[2] [1]School of Physics and Astronomy, Cardiff University, Queen's Buildings, The Parade, Cardiff, CF24 3AA, UK [2]EPSRC National Centre for III-V Technologies, North Campus, University of Sheffield, Sheffield, S3 7HQ, UK

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15:05	Innovation-2 **Introduction to the Compound Semiconductor Applications Catapult** Andy Sellars Compound Semiconductor Applications Catapult, Office 204, Regus, Falcon Drive, Cardiff Bay, Cardiff CF10 4RU, UK	D-O-1 **Progress on optical fabrication and characterisation of SU-8 disc modulated mode-gap photonic crystal cavities** Stephen A. Lennon[1], Luke P. Nuttall[1], Frederic S. F. Brossard[2], Benjamin P. L. Reid[1], Jiang Wu[3], Jonathan Griffiths[4], Edmund Clarke[5], Robert A. Taylor[1] [1]Clarendon Laboratory, Department of Physics, University of Oxford, Oxford, OX1 3PU, UK [2]Hitachi Cambridge Laboratory, Hitachi Europe Ltd, Cambridge, CB3 0HE, UK [3]Department of Electronic and Electrical Engineering, University College London, Torrington Place, London, WC1E 7JE, UK [4]Cavendish Laboratory, University of Cambridge, J. J. Thomson Avenue, Cambridge, CB3 0HE, UK [5]EPSRC National Centre for III-V Technologies, University of Sheffield, Sheffield S1 3JD, UK	C-O-7 **Modeling of a K Band Submilliwatt Power Consumption Resonant Tunneling Diode based Amplifiers** Saad G. Muttlak, O. S. Abdulwahid, J. Sexton, M. Missous School of Electrical & Electronic Engineering, University of Manchester, Manchester, M13 9PL, UK
15:20	Innovation-3 **Introduction to IP Group** Aidong Xu IP Group plc, 24 Cornhill, London EC3V 3ND, UK	D-O-2 **Broadband Emission Enhancement of the Extraction of Light from Solid-State Emitters by Metallic Nano-rings** Oliver J. Trojak[1], Jin Dong Song[2], Luca Sapienza[1] [1]Department of Physics and Astronomy, University of Southampton, SO17 1BJ, UK [2]Center for Opto-Electronic Materials and Devices Research, Korea Institute of Science and Technology, Seoul 136-791, South Korea	C-O-8 **RF performance of $In_{0.53}Ga_{0.47}As$ /AlAs Asymmetric spacer layer tunnel diodes** Yuekun Wang[1], K. N. Zainul Ariffin[1], Kawa Ian[2], M. J. Kelly[3], Mohamed Missous[1] [1]School of Electrical and Electronic Engineering, University of Manchester, UK [2]Integrated Compound Semiconductors Ltd, Manchester, UK [3]Department of Engineering, University of Cambridge, UK
15:35	Innovation-4 **Huawei – Join Us, and Together Let's Run the World** Chengbo Guan Huawei UK, Ipswich Research Centre, Martlesham Heath, Ipswich, UK	D-O-3 **Chiral effects in InGaAs quantum dots coupled to nanophotonic waveguides** David M. Price[1], C. Bentham[1], R. J. Coles[1], B. Royall[1], E. Clarke[2], D. L. Hurst[1], P. Kok[1], A. M. Fox[1], M. S. Skolnick[1], M. N. Makhonin[1] [1]Department of Physics and Astronomy, University of Sheffield, Sheffield, S3 7RH, UK [2]EPSRC National Centre for III-V Technologies, Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, S1 3JD, UK	C-O-9 **55-80 GHz Detector based Asymmetric Spacer Tunnel Diode (ASPAT)** Omar S. Abdulwahid[1], S. G. Muttlak[1], J. Sexton[1], K. W. Ian[2], M. J. Kelly[3], M. Missous[1] [1]School of Electrical and Electronic Engineering, the University of Manchester, UK [2]Integrated Compound Semiconductors, Manchester, UK [3]Department of Engineering, University of Cambridge, Cambridge, UK

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15:50	G-O-6 **An overview: Nitrides Research Progress in Malaysia** Norzaini Zainal[1], Z. Hassan[1], A. Shuhaimi[2] [1]Institute Nano Optoelectronics Research and Technology, Universiti Sains Malaysia, 11800, Minden, Penang, Malaysia [2]Low Dimensional Materials Research Centre, Department of Physics, Faculty of Science, Universiti Malaya, Kuala Lumpur, Malaysia	D-O-4 **Experimental Demonstration of Epitaxial Regrowth on Transfer Printed Membranes** Kenneth J. Schmieder[1], Matthew P. Lumb[2,1], Michael K. Yakes[1], Shawn Mack[1], Sergey I. Maximenko[1], Laura Ruppalt[1], Michael A. Meeker[1], Chase T. Ellis[1], Mitchell F. Bennett[3,1], Joseph G. Tischler[1], Robert J. Walters[1] [1]US Naval Research Laboratory, Washington, DC, USA [2]George Washington University, Washington, DC, USA [3]Sotera Defense Solutions, Annapolis Junction, MD, USA	E-O-1 **THz transport in a semiconductor superlattice driven by an acoustic wave** A. Apostolakis, M. K. Awodele, K. N. Alekseev, F. V. Kusmartsev, Alexander G. Balanov Department of Physics, Loughborough University, Loughborough LE11 3TU, UK
16:05	Refreshments and Exhibition, Atrium Level 2		
16:30	G-O-7 **Origin of the hillocks on GaN-based p-i-n diodes** An Bao[1], F. S. Choi[1], S. Usami[2], F. Tang[1], H. Amano[1], R. A. Oliver[1] [1]Department of Materials Science and Metallurgy, University of Cambridge, UK [2]Department of Electrical Engineering and Computer Science, Nagoya University, Japan	D-O-5 **Quantum simulation of acoustic-driven transport in weakly coupled semiconductor superlattices** Feiran Wang[1], M. T. Greenaway[2], A. G. Balanov[2], T. M. Fromhold[1], A. J. Kent[1] [1]School of Physics and Astronomy, University of Nottingham, Nottingham NG7 2RD, UK [2]Department of Physics, Loughborough University, Leicestershire LE11 3TU, UK	E-O-2 **Investigation of free-space terahertz radiation from a LT-GaAs-on-quartz large-area photoconductive emitter** David R. Bacon[1], Andrew D. Burnett[2], Matthew Swithenbank[1], Christopher Russell[1], Lianhe Li[1], Christopher D. Wood[1], John Cunningham[1], Edmund H. Linfield[1], A. Giles Davies[1], Paul Dean[1], Joshua R. Freeman[1] [1]School of Electronic and Electrical Engineering, University of Leeds, Woodhouse Lane, Leeds LS9 2JT, UK [2]School of Chemistry, University of Leeds, Woodhouse Lane, Leeds LS9 2JT, UK

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16:45	G-O-8 **Mechanism of Turn-Off Operation in E-mode p-channel MOSHFET in GaN** Ashwani Kumar, Maria Merlyne De Souza Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, S1 3JD, UK	D-O-6 **Theory of $GaAs_{1-x}Bi_x/GaN_yAs_{1-y}$ type-II quantum wells on GaAs: strain-balanced heterostructures for photonics and photovoltaics** Christopher A. Broderick[1,2], Wanshu Xiong[2], Shirong Jin[3], Igor P. Marko[3], Zoe L. Bushell[3], Konstanze Hild[3], Peter Ludewig[4], Wolfgang Stolz[4], Kerstin Volz[4], Judy M. Rorison[2], Eoin P. O'Reilly[1,5], Stephen J. Sweeney[3] [1]Tyndall National Institute, Lee Maltings, Dyke Parade, Cork T12 R5CP, Ireland [2]Department of Electrical and Electronic Engineering, University of Bristol, Bristol BS8 1UB, UK [3]Advanced Technology Institute and Department of Physics, University of Surrey, Guildford GU2 7XH, UK [4]Materials Science Center and Faculty of Physics, Philipps-Universit□at Marburg, 35032 Marburg, Germany [5]Department of Physics, University College Cork, Cork T12 YN60, Ireland	E-O-3 **GaSb based mid-infrared photonic materials and devices monolithically grown onto silicon** Peter D. Hodgson[1], E. Delli[1], E. Repiso[2], A. Craig[2], A. Marshall[2], A. Krier[2], P. J. Carrington[1] [1]Department of Engineering, Lancaster University, Bailrigg, Lancaster, LA1 4YW, UK [2]Department of Physics, Lancaster University, Lancaster LA1 4YB, UK
17:00	G-O-9 **Impact of Donor and Interface Traps on GaN Cap Thickness in 1 µm Gate Length GaN/AlGaN/AlN/GaN HEMT** Khald Ahmeda[1], B. Ubochi[1], A. Al-Khalidi[2], E. Wasige[2], K. Kalna[1] [1]Nanoelectronic Devices Computational Group, College of Engineering, Swansea University, Bay Campus, Swansea, SA1 8EN, UK [2]School of Engineering, University of Glasgow, Glasgow G12 8LP, UK	D-O-7 **Hole Trapping in GaAsBi/GaAs MQWs: Lessons from Dilute Nitrides** Robert D Richards, Thomas B. O. Rockett, Yuchen Liu, Faezah Harun, John P. R. David Department of Electronic and Electrical Engineering, The University of Sheffield, Sheffield S1 3JD, UK	E-O-4 **Direct growth of InGaAs/GaAs quantum dot infrared photodetectors on Si substrate by MBE** Daqian Guo[1], Yuriy I. Mazur[2], Yurii Maidaniuk[2], Mourad Benamara[2], Mykhaylo P. Semtsiv[3], W. Ted Masselink[3], Gregory J. Salamo[2], Huiyun Liu[1], Jiang Wu[1] [1]Department of Electronic and Electrical Engineering, University College London, London WC1E 7JE, UK [2]Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville, Arkansas 72701, USA [3]Physics Department, Humboldt University Berlin, Newtonstraße 15, 12489 Berlin, Germany
17:15	G-O-10 **Buffer Trapping and DC/RF Dispersion in GaN HEMTs** Brendan Ubochi, K. Ahmeda, K. Kalna Nanoelectronic Devices Computational Group (NanoDeCo), College of Engineering, Swansea University Bay Campus, Fabian Way, Swansea, SA1 8EN, Wales, UK	D-O-8 **Anisotropic surface diffusion measurements of In on InGaAs enabled by droplet epitaxy** Michael K. Yakes[1], Margaret A. Stevens[2], Stephanie Tomasulo[1], Sergey Maximenko[1], Thomas E. Vandervelde[2] [1]Naval Research Laboratory, Washington, DC 20375 USA [2]Department of Electrical Engineering, Tufts University, Medford, Massachusetts 02155, USA	E-O-5 **A novel approach to the device-level simulation of quantum dot infrared photodetectors** A. Khalili, Ariel Cedola, F. Cappelluti Department of Electronics and Telecommunications, Politecnico di Torino, Torino, Italy

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17:30	G-O-11 **Thermal performance of AlGaN/GaN HEMTs on SiC substrates** Maria Vasilevska, A. Al-Khalidi, E. Wasige High Frequency Electronics Group, School of Engineering, University of Glasgow, Glasgow, G12 8LT, UK	D-O-9 **Ten-fold enhancement of photoluminescence emission from InAs nanowires passivated with InP** Pamela Jurczak[1], Yunyan Zhang[1], Jiang Wu[1], Huiyun Liu[1] 1Department of Electronic and Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, UK	E-O-6 **The Linewidth of Intersubband Lasers** Mauro F. Pereira Materials and Engineering Research Institute, Sheffield Hallam University, Sheffield, UK
17:45	G-O-12 **Low Ohmic Contact Resistance for AlGaN/GaN HEMTs with high Al Concentration & Si-HP [111] Substrate** Steven J. Duffy[1], J. C. Gerbedoen[2], M. Bouchilaoun[4], M. Mattalah[2], B. Benbakhti[1], W. Zhang[1], M. Boucherta[2], K. Kalna[3], H. Maher[4], A. Soltani[2,4] [1]Department of Electronics and Electrical Engineering, Liverpool John Moores University, Liverpool, UK [2]Institute of Electronics, Microelectronics and Nanotechnology, University of Lille 1, Villeneuve d'Ascq, France. [3]Nanoelectronic Devices Computational Group, College of Engineering, Swansea University, Swansea, UK [4]Laboratoire Nanotechnologies & Nanosystèmes, University of Sherbrooke, Sherbrooke, QC Canada	D-O-10 **Fabrication of core-shell nanostructures via silicon on insulator dewetting and germanium condensation** Abdelmalek Benkouider[1,2], M. Naffouti[1,3], T. David[1], L. Favre[1], M. Cabie[4], A. Ronda[1], I. Berbezier[1], M. Abbarchi[1] [1]Aix Marseille Université, CNRS, Université de Toulon, IM2NP UMR 7334, 13397, Marseille, France [2]Electronics & Computer Science, University of Southampton, Southampton SO17 1BJ, UK [3]Laboratoire de Micro-optoélectronique et Nanostructures, Université de Monastir 5019 Monastir, Tunisia [4]Aix Marseille Université, CP2M, 13397, Marseille, France	E-O-7 **Comparative Study between Type I and Type II Sb-Lasers Operating in the Mid-Infrared** Timothy Eales[1], Igor P. Marko[1], Daniel Flintoft[1], Barnabas A. Ikyo[1], Stephan Sprengel[2], Markus.-C. Amann[2], Stephen J. Sweeney[1] [1]Advanced Technology Institute, University of Surrey, Guildford GU2 7XH, UK [2]Walter Schottky Institut, Technische Universität München, Am Coulombwall 3, 85748 Garching, Germany
18:00	End of Session		
18:30	Conference Dinner Crystal Bar 23-32 Carver Street, Sheffield S1 4FS		

Oral Presentations – Thursday 13th July 2017

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
09:00	Registration and Refreshments, Atrium Level 2		
09:30	Plenary 3 **1.5 µm InP-based quantum dot materials for high-performance classical and quantum optical communication** Johann Peter Reithmaier Technische Physik, Institute of Nanostructure Technologies and Analytics (INA), Center of Interdisciplinary Nanostructure Science and Technology (CINSaT), University of Kassel, Heinrich-Plett Str. 40, 34132 Kassel, Germany		
10:15	Refreshments and Exhibition, Atrium Level 2		
10:45	B-O-1 (Invited) **GaSb/GaAs quantum-ring LEDs and VCSELs operating at telecoms wavelengths** Peter D. Hodgson[1], A. J. Robson[1,2], Q. D. Zhuang[1], T. Wilson[1], L. Danos[3], S. McDougall[4], T. Slight[4], K. Kennedy[5], S. Kumar[5], M. Hayne[1,2] [1]Department of Physics, Lancaster University, Lancaster LA1 4YB, UK [2]Lancaster Material Analysis Ltd, Lancaster University, Lancaster, LA1 4YB, UK [3]Department of Chemistry, Lancaster University, Lancaster LA1 4YB, UK [4]CST Global Ltd, 4 Stanley Blvd, Hamilton International Technology. Park., Glasgow G72 0BN, UK [5]EPSRC National Centre for III-V Technologies, Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, S3 7HQ, UK	TMD-O-1 (Invited) **2D nanoscale electronics and optoelectronics** Thomas Mueller Vienna University of Technology, Institute of Photonics, Gußhausstraße 27-29, 1040 Vienna, Austria	F-O-1 **Novel composite photoactive layers for light harvesting in hybrid organic-inorganic solar cell to enhance the stability of devices** Yaqub Rahaq, Heming Wang Materials & Engineering Research Institute, Sheffield Hallam University, City Campus, Howard Street, Sheffield, S1 1WB, UK
11:00			F-O-2 **Spray-cast multilayer perovskite solar cells with an active-area of 1.5 cm^2** James E. Bishop[1], David K. Mohamad[1], Michael Stringer[1], Alex Smith[2], David G. Lidzey[1] [1]Department of Physics & Astronomy, University of Sheffield, Hicks Building, Hounsfield Road, Sheffield S3 7RH, UK [2]CREST, University of Loughborough, Holywell Park, Loughborough University Science and Enterprise Parks, LE11 3TU, UK

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
11:15	B-O-2 **Near-threshold high spin amplification in a spin laser** Ben Cemlyn[1], E. Harbord[2], N. Li[1], I. Henning[1], M. Adams[1], R. Oulton[2], V.-M. Korpijärvi[3], M. Guina[3] [1]School of Computer Science and Electronic Engineering, University of Essex, Wivenhoe Park, CO3 3SQ [2]School of Physics, H. H. Wills Physics Laboratory, Tyndall Avenue, University of Bristol, Bristol BS8 1TL and Merchant Venture's School of Engineering, University of Bristol, Woodland Road, Bristol BS8 1UB [3]Optoelectronics Research Centre (ORC), Tampere University of Technology, P.O. Box 692, FIN-33101 Tampere, Finland	TMD-O-2 **Monolayer optical memory cells based on artificial trap-mediated charge storage and release** Sangyeon Pak[1], Juwon Lee[1], A-Rang Jang[1], Stephen M. Morris[1], Seung Nam Cha[1], Jung Inn Sohn[1], Jong Min Kim[2] [1]Department of Engineering Science, University of Oxford, Oxford OX1 3PJ, UK [2]Department of Engineering, University of Cambridge, Cambridge CB3 0FA, UK	F-O-3 **Optimized organometal halide perovskite solar cell fabrication through control of nanoparticle crystal patterning** D. K. Mohamad[1], Benjamin G. Freestone[1], R. Masters[2], M. Reinhardt[3], S. Canning[4], C. Rodenburg[2], D. G. Lidzey[1] [1]Department of Physics & Astronomy, University of Sheffield, Hicks Building, Hounsfield Road, Sheffield, S3 7RH, UK [2]Department of Materials Science and Engineering, The University of Sheffield, Mappin Street, Sheffield, UK [3]Ossila Ltd., Kroto Innovation Centre, Broad Lane, Sheffield, UK [4]Department of Chemistry, University of Sheffield, Sheffield, UK
11:30	B-O-3 **Design and Simulation of Distributed Bragg Reflectors for Telecoms Wavelength Vertical Cavity Surface Emitting Lasers** Thomas J. Wilson[1], P. D. Hodgson[1], A. J. Robson[1,2], L. Danos[3], M. Hayne[1,2] [1]Department of Physics, Lancaster University, Lancaster, LA1 4YB, UK [2]Lancaster Material Analysis, Lancaster University, Lancaster, LA1 4YB, UK [3]Department of Chemistry, Lancaster University, Lancaster, LA1 4YB, UK	TMD-O-3 **Vertical stacked graphene-WS2-graphene cross-bar structures for photodetector applications** Yingqiu Zhou, H. Tan, Y. Fan, Y. Sheng, W. Xu, Hefu Huang, J. Warner Department of Materials, University of Oxford, Parks Road, Oxford, OX1 3PH, UK	F-O-4 **Time-Resolved Photoluminescence Mapping for Hybrid Perovskite Solar Cells** Claire Greenland, S. Lilliu, M. Wong-Stringer, D. G. Lidzey University of Sheffield, Department of Physics and Astronomy, Hicks Building, Hounsfield Road, Sheffield, S3 7RH, UK
11:45	B-O-4 **Analysis of Photonic Crystal Surface Emitting Lasers with External In-Plane Feedback** Guangrui Li[1], J. Sarma[1], P. S. Ivanov[1], R. J. E. Taylor[2], D. T. D. Childs[1], R. A. Hogg[1] [1]School of Engineering, the University of Glasgow, Rankine Building, Glasgow, G12 8LT, UK [2]Department of Electrical Engineering and Information Systems, the University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo, 113-8656, Japan	TMD-O-4 (Invited) **Quantum optics with deterministically positioned quantum emitters in a two-dimensional semiconductor** **Brian D. Gerardot** Institute of Photonics and Quantum Sciences, SUPA, Heriot-Watt University, Edinburgh UK	F-O-5 **Highly oriented (202) mixed halide perovskite for enhanced solar cell performance** Xiaoyao Song[1], P. B. Pillai[1], T. Batten[2], M. M. De Souza[1] [1]Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, S1 3JD, UK [2]Renishaw plc, Gloucestershire, GL12 8JR, UK

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
12:00	B-O-5 **Quantum Dot Lasers Monolithically Grown on Exact (100) Si substrate** Mingchu Tang, Jiang Wu, Siming Chen, Mengya Liao, Alwyn Seeds, Huiyun Liu Department of Electronics and Electrical Engineering, University College London, London, WC1E 7JE, UK		F-O-6 **Efficient Perovskite Photovoltaic Devices Using Doped PCDTBT as a Hole-Transport Material** Michael Wong-Stringer[1], James E. Bishop[1], Joel A. Smith[1], David K. Mohamad[1], Andrew J. Parnell[1], Vikas Kumar[2], Conny Rodenburg[2], David G. Lidzey[1] [1]Department of Physics & Astronomy, University of Sheffield, Hicks Building, Hounsfield Road, Sheffield, S3 7RH, UK [2]Department of Chemical and Biological Engineering, University of Sheffield, Mappin St, Sheffield, S1 3JD, UK
12:15	B-O-6 **Quantum Dot Size Anisotropy Effects in State-of-the-Art Quantum Dot Lasers** Iain M. E. Butler[1,2], Wei Li[3], S. A. Sobhani[1], N. Babazadeh[1], I. M. Ross[3], D. T. D. Childs[1], R. A. Hogg[1], K. Nishi[4], K. Takemasa[4], M. Sugawara[4] [1]School of Engineering, University of Glasgow, Glasgow, G12 8LT, UK [2]School of Mathematics and Physics, Queen's University Belfast, Belfast, BT7 1NN, UK [3]Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield, S3, UK [4]QD Laser Inc, Keihin Bldg. 1F, 1-1 Minamiwataridacho, Kawasaki-ku, Kawasaki, Kanagawa 210-0855, Japan	TMD-O-5 **Exciton-Polariton Valley Dynamics in Atomically Thin Semiconductors** S. Dufferwiel[1], Tom P. Lyons[1], D. D. Solnyshkov[2], A. A. P. Trichet[3], F. Withers[4,5], S. Schwarz[1], G. Malpuech[2], J. M. Smith[3], K. S. Novoselov[4], M. S. Skolnick[1], D. N. Krizhanovskii[1], A. I. Tartakovskii[1] [1]Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK [2]Institut Pascal, Blaise Pascal University, 24 avenue des Landais, 63177 Aubiere, France [3]Department of Materials, University of Oxford, Parks Road, Oxford OX1 3PH, UK [4]School of Physics and Astronomy, University of Manchester, Manchester M13 9PL, UK [5]Centre for Graphene Science, CEMPS, University of Exeter, Exeter, EX4 4QF, UK	F-O-7 **Substrate-Induced Shifts and Screening in the Fluorescence Spectra of Self-Assembled Organic Monolayers** James Kerfoot[1], Vladimir V. Korolkov[1], Takashi Taniguchi[2], Kenji Watanabe[2], Peter H. Beton[1] [1]School of Physics & Astronomy, University of Nottingham, Nottingham NG7 2RD, UK [2]National Institute for Materials Science, 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
12:30	B-O-7 **Continuous-wave InAs/GaAs QD superluminescent diodes on Si Substrates by FIB Post Fabrication** Mengya Liao, Siming Chen, Jiang Wu, Mingchu Tang, Suguo Huo, Alwyn Seeds, Huiyun Liu Department of Electronic and Electrical Engineering, University College London, Torrington Place, London, WC1E 7JE, UK	TMD-O-6 **Strong-coupling of WSe_2 in ultra-compact plasmonic nanocavities at room temperature** Marie-Elena Kleemann[1], Rohit Chikkaraddy[1], Evgeny M. Alexeev[2], Dean Kos[1], Cloudy Carnegie[1], Will Deacon[1], Alex Casalis de Pury[1], Christoph Grosse[1] , Bart de Nijs[1], Jan Mertens[1], Alexander I Tartakovskii[2], Jeremy J Baumberg[1] [1]NanoPhotonics Centre, Cavendish Laboratory, University of Cambridge, Cambridge CB3 0HE, UK [2]Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK	F-O-8 **Conformational Control as a Tool to Enhance the Device Characteristics of Blue Copolymer Light-Emitting Diodes: Enhancing CIE Coordinates, Efficiency and Stability** Iain Hamilton[1], Nathan Chander[1], Minwon Suh[1], Nathan Cheetham[1], Xuhua Wang[1], Paul Stavrinou[2], Michael Cass[3], Donal D. C. Bradley[2,4], Ji-Seon Kim[1] [1]Department of Physics and Centre for Plastic Electronics, Imperial College London, London SW7 2AZ, UK [2]Department of Engineering Science, University of Oxford, Parks Road, Oxford, OX1 3PJ, UK [3]Cambridge Display Technology, Unit 12 Cardinal Park, Godmanchester, Cambridgeshire PE29 2XG, UK [4]Department of Physics and Division of Mathematical, Physical and Life Sciences, University of Oxford, 9 Parks Road, Oxford, OX1 3PD, UK
12:45	Lunch, Exhibition and Poster Session for Symposia B, F, TMD-UK Atrium Level 2		
13:00	IOP Semiconductor Group AGM		
14:00	IOP Student Research Communication Competition Prizegiving		
14:05	Plenary 4 **Graphene and Beyond: Creating and Exploring Atomically-Thin Materials and Heterostructures** Joshua Robinson Department of Materials Science & Engineering; The Center for 2D and Layered Materials; The Center for Atomically Thin Multifunctional Coatings; and The 2D Crystal Consortium, Pennsylvania State University, University Park, PA 16802		

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
14:55	B-O-8 **Extended short-wave IR single photon avalanche photodiodes for imaging systems for obscured environments** Adam P. Craig[1], M. Jain[2], X. Collins[1], T. Golding[2], A. R. J. Marshall[1] 1Physics Department, Lancaster University, Lancaster LA1 4YB, UK [2]Amethyst Research Ltd., Kelvin Campus, West of Scotland Science Park, Glasgow G20 0SP, UK	TMD-O-7 (Invited) **Topological and Dirac materials: Bulk, 2D crystals and Nanomaterials** Geetha Balakrishnan Department of Physics, University of Warwick, Coventry CV4 7AL, UK	F-O-9 **Strong coupling in a microcavity containing the biomolecule β-carotene** R. T. Grant[1], Rahul Jayaprakash[1], D. Coles[1], A. Musser[1], S. De Liberato[2], I. D. W. Samuel[3], G. A. Turnbull[3], J. Clark[1], D. G. Lidzey[1] [1]Department of Physics and Astronomy, The University of Sheffield, Hicks Building, Hounsfield Road, Sheffield S3 7RH, UK [2]Department of Physics and Astronomy, University of Southampton, Southampton, SO17 1BJ, UK [3]Organics Semiconductor Centre, SUPA, School of Physics & Astronomy, University of St Andrews, St Andrews, Fife KY 16 9SS, UK
15:10	B-O-9 **Sensitivity of High-Speed Optical Receivers with InAs Avalanche Photodiodes** Vladimir Shulyak, J. S. Ng Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK		F-O-10 **Anti-Stokes emission in a strongly-coupled organic semiconductor microcavity** Kyriacos Georgiou[1], R. Jayaprakash[1], A. Askitopoulos[2], David M. Coles[1], M. Cavazzini[3], P. G. Lagoudakis[2], D. G. Lidzey[1] [1]Physics and Astronomy, University of Sheffield, UK. [2]Physics and Astronomy, University of Southampton, UK. [3]IFN, ISMAC and ISTM – CNR Milano, Italy
15:25	B-O-10 **Excess noise factors of thin $Al_{0.85}Ga_{0.15}As_{0.56}Sb_{0.44}$ diodes** Lucas Pinel, C. H. Tan, S. Dimler, X. Zhou, S. Zhang, J. S. Ng Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK	TMD-O-8 **Towards controlled scalable CVD of Hexagonal Boron Nitride** Vitaly Babenko, Ruizhi Wang, Sabina Caneva, Robert S Weatherup, Philipp Braeuninger-Weimer, Marie-Blandine Martin, Stephan Hofmann Engineering Department, Cambridge University, 9 JJ Thomson Ave, Cambridge CB3 0FA, UK	F-O-11 **Inkjet printed nanocavities on photonic crystal template** F. S. F. Brossard[1], V. Pecunia[2,3], Andrew J. Ramsay[1], J. Griffiths[2], M. Hugues[4,5], H. Sirringhaus[2] [1]Hitachi Cambridge Laboratory, Cavendish Laboratory, Cambridge CB3 0HE, UK [2]University of Cambridge, Cavendish Laboratory, Cambridge CB3 0HE, UK [3]Institute of Functional Nano & Soft Materials (FUNSOM), Jiangsu Key Laboratory for Carbon-Based Functional Materials & Devices, Soochow University, 215123, Jiangsu, PR China. [4]Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK [5]CNRS-CRHEA, Sophia Antipolis, Rue Bernard Grégory, F-06560 Valbonne, France

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
15:40	B-O-11 **Temporal and Temperature Stability of $Al_{0.85}Ga_{0.15}As_{0.56}Sb_{0.44}$ Avalanche Photodiodes** Salman Abdullah, X. Zhou, S. Zhang, J. S. Ng, C. H. Tan Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK	TMD-O-9 **Inkjet printing of black phosphorus** Tom Albrow-Owen, Guohua Hu, Richard C. T. Howe, Zongyin Yang, Tien-Chun Wu, Tawfique Hasan Cambridge Graphene Centre, University of Cambridge, Cambridge CB3 0FA, UK	
15:55	Refreshments, Atrium Level 2		
16:15	B-O-12 **High efficiency "Quantum Ratchet" intermediate band solar cells** Anthony Vaquero-Stainer[1], Nicholas Hylton[1], Megumi Yoshida[1], Andreas Pusch[1], Kenneth Kennedy[2], Edmund Clarke[2], Saurabh Kumar[2], Mark Frogley[3], Gianfelice Cinque[3], Ortwin Hess[1], Ned Ekins-Daukes[1], Chris Phillips[1] [1]Physics Department, Imperial College London, Blackett Laboratory, Prince Consort Road, London SW7 2AZ, UK [2]EPSRC National Centre for III-V Technologies, University of Sheffield, Sheffield S3 7HQ, UK [3]Diamond Light Source, Harwell Science and Innovation Campus Didcot, Oxfordshire OX11 0DE, UK	TMD-O-10 (Invited) **New materials for van der Waals heterostructures** Roman Gorbachev School of Physics and Astronomy, University of Manchester, Manchester M13 9PL, UK National Graphene Institute, University of Manchester, Manchester M13 9PL, UK	D-O-11 **Impact ionisation in AlGaAsSb for Sb-based avalanche photodiodes** Xiao Collins, T. Roblin, A. P. Craig and A. R. J Marshall Physics Department, Lancaster University, Lancaster, LA1 4YB, UK
16:30	B-O-13 **GaAs solar cells monolithically grown on Si substrates by MBE using dislocation filter layers** Arthur Onno[1], Mingchu Tang[1], Lars Oberbeck[2], Jiang Wu[1], Huiyun Liu[1] [1]Dept. of Electronic and Electrical Engineering, University College London, London WC1E 7JE, UK [2]TOTAL New Energies R&D Division, 24 cours Michelet, 92069 Paris La Defense Cedex, France		D-O-12 **Strained type II InAs/InAsSb superlattice structures on InAs for use in mid-infrared LEDs** James Keen[1], D. Lane[1], M. Kesaria[2], A. Marshall[1], A. Krier[1] [1]Physics Department, Lancaster University, Lancaster, LA1 4YB, UK [2]Electronic and Electrical Engineering Department, University of Sheffield, Sheffield, S3 7HQ, UK

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
16:45	B-O-14 **InAs and GaInAsSb based Thermophotovoltaic Devices for Low Temperature Waste Heat Energy Recycling** Qi Lu[1], A. R. J. Marshall[1], A. Krier[1], X. Zhou[2], A. Krysa[2], C. H. Tan[2] [1]Physics Department, Lancaster University, Lancaster LA1 4YB, UK [2]Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S3 7HQ, UK	TMD-O-11 **From the growth to the exploitation of two-dimensional In_xSe_y** Nilanthy Balakrishnan[1], Zakhar R. Kudrynskyi[1], Zakhar D. Kovalyuk[2], Laurence Eaves[1], Peter H. Beton[1], Amalia Patanè[1] [1]School of Physics and Astronomy, University of Nottingham, Nottingham, UK [2]Institute for Problems of Materials Science, NAS of Ukraine, Chernivtsi, Ukraine	D-O-13 **InAs(Sb)/InAlAs based quantum wells grown using metamorphic buffer Layers on GaAs substrates for the mid-infrared spectral range** Eva Repiso[1], P. J. Carrington[2] , P. D. Hodgson[2], Q. Lu[1], A. Marshall[1], A. Krier[1] [1]Department of Physics, Lancaster University, Lancaster LA1 4YB, UK [2]Department of Engineering, Lancaster University, Bailrigg, Lancaster, LA1 4YW, UK
17:00	B-O-15 **InGaAs nanowire avalanche photodiodes with a separate-absorption-multiplication structure for single photon counting** Xiao Meng[1], A. C. Farrell[2], D. L. Huffaker[1,2] [1]School of Physics and Astronomy, Cardiff University, The Parade, Cardiff CF243AA, UK [2]Electrical Engineering Department, University of California at Los Angeles, Los Angeles, CA 90095, USA	TMD-O-12 **Angle resolved photoemission studies of the rhenium dichalcogenides** Lewis S Hart[1], James L Webb[1], Sara Dale[1], Simon J. Bending[1], Marcin Mucha-Kruczynski[1], Daniel Wolverson[1], Chaoyu Chen[2], José Avila[2], Maria C. Asensio[2] [1]Centre for Nanoscience and Nanotechnology, Department of Physics, University of Bath, Bath BA2 7AY, UK [2]Synchrotron SOLEIL, Saint Aubin, and Université Paris-Saclay, BP 48 91192 Gif-sur-Yvette, France	D-O-14 **Determination of the transport lifetime limiting scattering rate in $InSb/Al_xIn_{1-x}Sb$ quantum wells using optical surface microscopy** Christopher J. McIndo[1], David G. Hayes[1], Andreas Papageorgiou[1], Laura A. Hanks[1,2], George V. Smith[1], Craig P. Allford[1], Shiyong Zhang[3], Edmund Clarke[3], Philip D. Buckle[1] [1]School of Physics and Astronomy, Cardiff University, Queen's Buildings, The Parade, Cardiff CF24 3AA, UK [2]Physics Department, Lancaster University, Lancaster, LA1 4YB, UK [3]EPSRC National Centre for III-V Technologies, North Campus, University of Sheffield, Sheffield S3 7HQ, UK
17:15	B-O-16 **Electro-mechanical control of an on-chip beam splitter containing an embedded single photon source** Z. K. Bishop[1], Andrew P. Foster[1], B. Royall[1], C. Bentham[1], E. Clarke[2], M. S. Skolnick[1], L. R. Wilson[1] [1]Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK [2]EPSRC National Centre for III-V Technologies, University of Sheffield, Sheffield S3 7HQ, UK	TMD-O-13 **Imaging of interlayer coupling in van der Waals heterostructures using a bright-field optical microscope** Evgeny M. Alexeev[1], A. Catanzaro[1], O. V. Skrypka[1], P. K. Nayak[2], S. Ahn[2], S. Pak[3], J. Lee[3], J. I. Sohn[3], K. S. Novoselov[4], H. S. Shin[2], A. I. Tartakovskii[1] [1]Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK [2]Department of Energy Engineering and Department of Chemistry, Ulsan National Institute of Science and Technology (UNIST), 50 UNIST-gil, Ulsan 44919, Republic of Korea [3]Department of Engineering Science, University of Oxford, Oxford OX1 3PJ, UK [4]School of Physics and Astronomy, University of Manchester, Manchester M13 9PL, UK	

	Pennine Lecture Theatre	Peak Lecture Theatre	Norfolk 210 Lecture Theatre
17:30	B-O-17 **Emission properties of quantum dots within a confined-Tamm Plasmon cavity** Matthew Parker[1], Edmund Harbord[1], Martin Lopez Garcias[2], John Rarity[2], Ruth Oulton[1,2] [1]School of Physics, H H Wills Physics Laboratory, University of Bristol, Tyndall Avenue, Bristol, BS8 1TL, UK [2]Department of Electrical and Electronic Engineering, University of Bristol, Merchant Ventures Building, Woodland Road, Bristol, BS8 1UK, UK	TMD-O-14 **Optimizing Photoluminescence Enhancement in Vertical Stacked 2D WS_2:hBN:MoS_2 Through Interlayer Distance and Exciton Generation Rate** Wenshuo Xu[1], Yuewen Sheng[1], Daichi Kozawa[2], Volodymyr B. Koman[2], Yu Liu[3], Shanshan Wang[1], Xiaochen Wang[1], Tian Jiang[3], Michael S. Strano[2], Jamie H. Warner[1] [1]Department of Materials, University of Oxford, Parks Road, Oxford OX1 3PH, UK [2]Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139, USA [3]College of Opto-Electronic Science and Engineering, National University of Defense Technology, Kaifu District, Changsha 410073, Hunan, China	
17:45	B-O-18 **Spatio-Temporal Continuum Generation in Polariton Nonlinear Waveguides** Paul M. Walker[1], C. E. Whittaker[1], M. Sich[1], B. Royall[1], I. Farrer[2], D. A. Ritchie[3], M. S. Skolnick[1], D. N. Krizhanovskii[1] [1]Department of Physics and Astronomy, University of Sheffield, Sheffield, S3 7RH, UK [2]Department of Electronic and Electrical Engineering, University of Sheffield, S3 7HQ, UK [3]Cavendish Laboratory, University of Cambridge, CB3 0HE, UK	TMD-O-15 **Interlayer radiative recombination in TMDCs heterostructures** Mark Danovich, David Ruiz-Tijerina, Vladimir I. Falko National Graphene Institute, University of Manchester, Booth St E, Manchester M13 9PL, UK	
18:00	Conference Close		

Poster Presentations – Wednesday 12th July, Atrium Level 2

Symposium A: Physics in Semiconductors

A-P-1

Telecom wavelength quantum dots for single photon sources

Edmund Harbord[1], Petros Androvitsaneas[1], Edmund Clarke[2], Ruth Oulton[1,3]
[1]School of Physics, H H Wills Physics Laboratory, University of Bristol, Tyndall Avenue, Bristol, BS8 1TL
[2]EPSRC National Centre for III-V Technologies, Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield S3 7HQ, UK
[3]Department of Electrical and Electronic Engineering, University of Bristol, Merchant Ventures Building, Woodland Road, Bristol, BS8 1UK, UK

A-P-2

Calculation of recombination times of charge carriers in highly doped p-Ge

Ekaterina E. Orlova[1,2]
[1]Institute of Microwaves and Photonics, School of Electrical and Electronics Engineering, University of Leeds, Leeds LS2 9JT, UK
[2]Institute for Physics of Microstructures RAS, Nizhny Novgorod, GSP-105, 603950, Russia

Symposium C: Electronic Devices

C-P-1

Plasma Processing of III-V Materials for Energy Efficient Electronics Applications

Iain Thayne, Xu Li, David Millar, Sankar Peralagu, Sung-Jin Cho, Matthew Steer, Yen-Chun Fu, Dilini Hemakumara, Konstantinos Floros, David Moran
James Watt Nanofabrication Centre, School of Engineering, University of Glasgow, Glasgow G12 8LT, UK

C-P-2

Low Leakage Currents in AlGaN/GaN High Electron Mobility Transistors by Employing a High Stress in ICP-CVD SiN_x Surface Passivation

Sung-Jin Cho[1], X. Li1, I. Guiney2, K. Floros1, D. A. J. Moran1, D. Hemakumara1, D. J. Wallis2, C. Humphreys2, I. G. Thayne1
[1]School of Engineering, University of Glasgow, Glasgow G12 8LT, UK
[2]Department of Materials Science & Metallurgy, University of Cambridge, Cambridge CB3 0FS, UK

C-P-3

20/40 GHz Frequency Doubler Varistor Mode using New Type of Diode (ASPAT)

Mohd Rashid Redza Abdullah[1], J. Sexton[1], Kawa Ian[2], M.J. Kelly[3], Mohamed Missous[1]
[1]School of Electrical and Electronic Engineering, The University of Manchester, UK
[2]Integrated Compound Semiconductors, Manchester, UK
[3]Department of Engineering, University of Cambridge, UK

C-P-4

Transparent Thin-Film Transistors Based on Sputtered Electric Double Layer

Wensi Cai, Jiawei Zhang, Xiaochen Ma, Aimin Song
School of Electrical & Electronic Engineering, University of Manchester, Manchester, M13 9PL, UK

C-P-5

Significant effect of semiconductor thickness on the reverse current of Schottky diodes

Joshua Wilson, Jiawei Zhang and Aimin Song
School of Electrical and Electronic Engineering, University of Manchester, Manchester, UK

Symposium D: Semiconductor Materials and Nanostructures

D-P-1

Tailoring magnetic properties of Mn-Cr chalcogenide alloys and heterostructures

James L Webb[1], Richard Moug[2], Nitat Sripongpun[1], Daniel Wolverson[1]
[1]Centre for Nanoscience and Nanotechnology, University of Bath, Bath BA2 7AY, UK
[2]Heriot-Watt University, Edinburgh Campus, Edinburgh EH14 4AS, UK

D-P-2

Investigation of the growth parameters of hydrothermal ZnO nanowires for scale up applications

Naif Alshehri[1,2], Aled R Lewis$_1$, Cameron Pleydell-Pearce$_3$, Thierry G. G. Maffeis[1]
[1]Multidisciplinary Nanotechnology Centre at Swansea University, Swansea, UK
[2]College of science physics department at Albaha University, Albaha, Saudi Arabia
[3]Advanced Imaging of Materials, Engineering, Swansea University, Swansea, UK

D-P-3

Optical constants and critical points of dilute bismide alloys studied by spectroscopic ellipsometry

Zoe L. Bushell[1], R. M. Joseph[1], J. L. Keddie[1], S. J. Sweeney[1], L. Nattermann[2], P. Ludewig[2], W. Stolz[2], K. Volz[2], C. A. Broderick[3], E. P. O'Reilly[3]
[1]Advanced Technology Institute & Department of Physics, University of Surrey, Guildford, GU2 7XH, UK
[2]Material Science Center and Faculty of Physics, Philipps-Universität Marburg, 35032 Marburg, Germany
[3]Tyndall National Institute, Lee Maltings, Dyke Parade, Cork T12 R5CP, Ireland

D-P-4

Selective Excitation of Bulk $GaAs_{1-x}Bi_x$ to Assess the Effects of Short and Long-range Disorder on Minority Carrier Transport Properties

Tom Wilson[1], N. P. Hylton[1], D. Alonso-Álvarez[1], A. Mellor[1], Y. Harada[1,2], P. Pearce[1], R. D. Richards[3], J. P. R. David[3], N. J. Ekins-Daukes[1]
[1]Physics Department, Imperial College London, Blackett Laboratory, Prince Consort Road, London SW7 2BZ, UK
[2]Department of Electrical and Electronic Engineering, Kobe University, Japan
[3]Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK

D-P-5

SiGeSn: a novel group IV alloy for use as a 1 eV sub-cell in multi-junction solar cells

Phoebe Pearce[1], Tom Wilson[1], Andrew Johnson[2], Nicholas Ekins-Daukes[1]
1Blackett Laboratory, Department of Physics, Imperial College London, London SW7 2AZ, UK
2IQE PLC, Pascal Close, St. Mellons, Cardiff CF3 0LW, UK

D-P-6

Optical characteristics of InAlAs/GaAlAs/GaAs quantum dots

Baolai Liang[1], Diana L. Huffaker[1,2]
[1]California Nanosystem Institute, University of California - Los Angeles, CA 90095, USA
[2]School of Physics and Astronomy, Cardiff University, Cardiff, UK

D-P-7

Optimization of Deep Trench Isolation Etch on Shallow Trench Isolation Topology Structure

Jimmy Pang Siaw Lung, Chai Yu Chen, Oh Sang Hun, You Hyuk Joon
X-FAB Sarawak Sdn. Bhd., 1 Silicon Drive, Sama Jaya Free Industrial Zone, 93350 Kuching, Sarawak, Malaysia

D-P-8

Case Study of MIM Fluorine Crystallized-Shape Defect

Tong Tze Kang, Liew Sung Feng, Huong Chung Yew
X-FAB Sarawak Sdn. Bhd., 1 Silicon Drive, Sama Jaya Free Industrial Zone, 93350 Kuching, Sarawak, Malaysia

D-P-9

Optimisation of InAs/GaAs Quantum Dot lasers grown by MOVPE

Brett A. Harrison[1], T. S. Roberts[2], A. Krysa[1], E. Clarke[1], P. Fry[1], X. Chen[2], D. J. Mowbray[3], G. Duggan[4], J. Heffernan[1,2]
[1]EPSRC National Centre for III-V Technologies, Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield, S3 7HQ, UK
[2]Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield, S1 3JD, UK
[3]Department of Physics and Astronomy, University of Sheffield, Sheffield, S3 7RH, UK
[4]Lumerical Solutions Inc., Suite 1700 – 1095 W. Pender St. Vancouver, BC V6E 2M6, Canada

Symposium E: Mid-IR and THz Materials and Devices

E-P-1

Terahertz generation mechanism in nanograting electrode photomixers

Reshma A. Mohandas[1], Joshua R. Freeman[1], Michelle Natrella[2], Mark C. Rosamond[1], Lalitha Ponnampalam[2], Alwyn J. Seeds[2], P. J. Canard[3], M. J. Robertson[3], D. G. Moodie[3], A.Giles Davies[1] , Edmund H. Linfield[1], Paul Dean[1]
[1]Institute of Microwaves & Photonics, University of Leeds, Leeds, LS2 9JT, United Kingdom
[2]University College London, London, WC1E 6BT, United Kingdom
[3]CIP Technologies, Adastral Park, Martlesham Heath, Ipswich, Suffolk, IP5 3RE, United Kingdom

E-P-2

Detector-free gas spectroscopy, with integrated frequency monitoring, through self-mixing in a terahertz quantum-cascade laser

Alex Valavanis, R. Chhantyal Pun, P. Rubino, J. Keeley, I. Kundu, L. H. Li, A. G. Davies, P. Dean, E. H. Linfield
School of Electronic and Electrical Engineering, University of Leeds, Leeds LS2 9JT, UK

E-P-3

Physical Modelling and Experimental Validation of Double Barrier $In_{0.8}Ga_{0.2}As$/AlAs Resonant Tunnelling Diodes

Khairul Nabilah Zainul Ariffin, S. G. Muttlak, J. Sexton, M. Missous
School of Electrical and Electronic Engineering, The University of Manchester, Manchester, UK

E-P-4

Investigation of low energy Be implantation in InAs photodiodes

Leh Woon Lim, Jonathan Petticrew, Andrey Krysa, Chee Hing Tan
Department of Electrical and Electronic Engineering, University of Sheffield, George Porter Building, Wheeldon Street, Sheffield, S3 7HQ, UK

E-P-5

Modelling and measurement of bandgap behaviour in MWIR InAs/$InAs_{0.82}Sb_{0.18}$ strained-layer superlattices

Veronica Letka, A. Craig, A. R. J. Marshall
Physics Department, Lancaster University, Lancaster LA1 4YB, UK

E-P-6

Wavelength Dependence of the Auger Coefficient in Type I Lasers Emitting in the Mid Infrared

Timothy Eales[1], Igor P. Marko[1], Barnabas A. Ikyo[1], Alf R. Adams[1], Shamsul Arafin[2], Stephan Sprengel[2], M.-C. Amann[2], Jerry R. Meyer[3], Stephen J. Sweeney[1]
[1]Advanced Technology Institute, University of Surrey, Guildford GU2 7XH, UK
[2]Walter Schottky Institut, Technische Universität München, Am Coulombwall 3, 85748 Garching, Germany
[3]US Naval Research Laboratory, 4555 Overlook Avenue SW, Washington DC 20375 USA

Symposium G: Wide-gap Nitrides

G-P-1

Porosity in Nitride LEDs

Peter Griffin, Tongtong Zhu, Yingjun Liu, Vasant Kumar, Rachel Oliver
Department of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Road, Cambridge, CB3 0FS, UK

G-P-2

Greatly Improved Crystal Quality of (11-20) Non-polar GaN Overgrown on Regularly Arrayed Micro-rod Templates

L. Jiu, Y. Gong, Z. Li, Y. Zhang, Tao Wang
Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK

G-P-3

Nanoporous GaN with controlled morphology fabricated by electrochemical etching towards efficient water splitting

Y. Hou, Z. Ahmed Syed, L. Wang, Z. Li, Y. Zhang, L. Jiu, J. Bai, Tao Wang
Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK

G-P-4

InGaN MQW solar cells grown on semi-polar (11-22) GaN templates

J. Bai, Y. Gong, Z. Li, Tao Wang
Department of Electronic and Electrical Engineering, University of Sheffield, Mappin Street, Sheffield S1 3JD, UK

Poster Presentations – Thursday 13th July, Atrium Level 2

Symposium B: Optical Devices

B-P-1

Breakdown Probability & Timing Simulation Model for Silicon Single Photon Avalanche Diodes

Jon Petticrew[1], S. Dimler[1], X. Zhou[1], A. P. Morrison[2], C. H. Tan[1], J. S. Ng[1]
[1]Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK
[2]Department of Electrical & Electronic Engineering, University College Cork, Cork, Ireland

B-P-2

Spatial Selective Growth of III/V Nanowire Photodetectors on Silicon

Yasir J. Noori, A. Alhodaib, Xiao Collins, C. Woodhead, A. Krier, R. J. Young, A. R. J. Marshall
Department of Physics, Lancaster University, UK

B-P-3

Comparative Study of Multi Quantum Well Photodetector Characterization based on GaInNAs for 1.0µm Wavelength

Mohammad Syahmi Bin Nordin[1], A. R. Mohmad[2], F. Sarcan[3], A. Boland-Thoms[1], A. Erol[3], A. J. Vickers[1]
[1]School of Computer Science and Electronics Engineering, University of Essex, CO4 3SQ, UK
[2]Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, 43650, Malaysia
[3]Istanbul University, Istanbul University Science Faculty Physics Department, Vezneciler, 34314 Istanbul, Turkey

B-P-4

Investigation into the current loss in Si-doped InAs/GaAs quantum dot solar cells

Dongyoung Kim, M. Tang, J. Wu, H. Liu
Department of Electronic and Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, UK

B-P-5

Type II GaSb/GaAs quantum ring intermediate band solar cells

Denise Montesdeoca[1], P. D. Hodgson[1,2], P. J. Carrington[2], A. Marshall[1], A. Krier[1]
[1]Physics Department, Lancaster University, Lancaster, UK
[2]Engineering Department, Lancaster University, Lancaster, UK

B-P-6

An Optical Bandgap Matched Temperature Controlled Indoor Light Transmission System for Photovoltaic Energy Production

Hifsa Shahid[1], Z. Mehmood[1], M. Sadaf[1], S. Ijaz[1], A. Rauf[2]
[1]Department of Electrical Engineering & Technology, University of Engineering & Technology Lahore (KSK Campus), Punjab, Pakistan
[2]Department of Electrical Engineering, National University of Sciences and Technology, Islamabad, Pakistan

B-P-7

Implementation of Optical Temperature Controller for Indoor Concentrating Photovoltaics

Hifsa Shahid[1], Z. Mehmood[1], A. Rauf[2], K. Ramzan[1], M. I. Qureshi[1]
[1]Department of Electrical Engineering & Technology, University of Engineering & Technology Lahore (KSK Campus), Punjab, Pakistan
[2]Department of Electrical Engineering, National University of Sciences and Technology, Islamabad, Pakistan

Symposium F: Organics, Organic/Inorganic Hybrids and Perovskites

F-P-1

Raman spectroscopy characterisation of laser induced degradation in methyl ammonium lead iodide perovskite layers

Tim Batten[1], X. Song[2], P. B. Pillai[2], M. M. De Souza[2]
[1]Renishaw plc, Wotton-under-Edge, Gloucestershire GL12 8JR, UK
[2]Department of Electronic and Electrical Engineering, University of Sheffield, Mappin Street, Sheffield S1 3JD, UK

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

TMD-P-1

Reflectance and Raman characterisation of mechanically exfoliated ReS_2 flakes

Tim Batten[1], L. Hart[2], D. Wolverson[2]
[1]Renishaw plc, Wotton-under-Edge, Gloucestershire GL12 8JR, UK
[2]University of Bath, Claverton Down Rd, Bath BA2 7AY, UK

TMD-P-2

Transport and Magnetization Studies of some Transitional Metal Dichalcogenides

Sourabh Barua, M. R. Lees, P. A. Goddard, and G.Balakrishnan
Department of Physics, University of Warwick, Coventry, CV4 7AL, UK

TMD-P-3

Hybrid graphene-nanocrystal heterostructures via Langmuir-Blodgett deposition

Andrés Black[1,2], Jonathan Roberts[3], María Acebrón[2], Ramón Bernardo-Gavito[3], Ghazi Alsharif[3], Fernando J. Urbanos[1], Beatriz H. Juárez[2,4], Daniel Granados[2], Benjamin J. Robinson[3], Amadeo L. Vázquez de Parga[1,2], Robert J. Young[3]
[1]IMDEA Nanociencia, Madrid, Spain
[2]Departamento Física de la Materia Condensada, Universidad Autónoma de Madrid, Madrid, Spain
[3]Physics Department, Lancaster University, Lancaster, UK
[4]Departamento de Química Física Aplicada, Universidad Autónoma de Madrid, Madrid, Spain

TMD-P-4

Wafer-scale epitaxial growth of single-orientated multi-layer hexagonal boron nitride and realization of MoS_2/h-BN heterostructure

A-Rang Jang[1,2], Sangyeon Pak[1], Hyeon Suk Shin[2], Jung Inn Sohn[1], Jong Min Kim[3]
[1]Department of Engineering Science, University of Oxford, Oxford OX1 3PJ, UK
[2]Department of Chemistry, Ulsan National Institute of Science and Technology (UNIST), Ulsan 44919, Republic of Korea
[3]Electrical Engineering Division, Department of Engineering, University of Cambridge, Cambridge CB3 0FA, UK

TMD-P-5

Controlled formation of an isolated miniband in bilayer graphene on an almost commensurate √3 x √3 substrate

Damien J. Leech, M. Mucha-Kruczyński
Department of Physics, University of Bath, Claverton Down, Bath BA2 7AY, UK

TMD-P-6

Hexagonal Boron Nitride Grown on Graphite by High Temperature Molecular Beam Epitaxy

Chris J. Mellor[1], Y. Cho[1,2], A. Summerfield[1], A. Davies[1,3], T. S. Cheng[1], E. F. Smith[3,4], A. N. Khlobystov[3,4], C. T. Foxon[1], L. Eaves[1], P. H. Beton[1], S. V. Novikov[1]
1School of Physics and Astronomy, University of Nottingham, Nottingham NG7 2RD, UK
2 School of Electrical and Computer Engineering, Cornell University, Ithaca, New York 14853, USA
3School of Chemistry, University of Nottingham, Nottingham NG7 2RD, UK
4Nottingham NMRC, University of Nottingham, Nottingham NG7 2RD, UK

TMD-P-7

Strain-dependent coupled photoluminescence behaviors in epitaxially-grown MoS_2-WS_2 van der Waals heterobilayers

Sangyeon Pak[1], Juwon Lee[1], A-Rang Jang[1], Stephen M. Morris[1], Seung Nam Cha[1], Jung Inn Sohn[1], Jong Min Kim[2]
[1]Department of Engineering Science, University of Oxford, Oxford OX1 3PJ, UK
[2]Department of Engineering, University of Cambridge, Cambridge CB3 0FA, UK

TMD-P-8

Photoluminescence and Raman characterisation of CVD grown WS_2 flakes using different precursors

Pawel Palczyński, Francesco Reale, Cecilia Mattevi
Department of Materials, Imperial College London, Exhibition Road, London SW7 2AZ, UK

TMD-P-9

Phonon properties of single emitters in hexagonal Boron Nitride

Andrew J. Ramsay[1], I. J. Luxmoore[2]
[1]Hitachi Cambridge Laboratory, Hitachi Europe Ltd., Cambridge CB3 0HE, UK
[2]College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter EX4 4QF, UK

TMD-P-10

Study of collective ground states in heavily doped MoS_2 compounds

Mohammed Bin Subhan[1], Matthew Watson[2], Zhongkai Liu[3], Andrew Walters[2], Moritz Hoesch[2], Chris Howard[1]
[1]Department of Physics and Astronomy, UCL, Gower Street, London WCIE 6BT, UK
[2]Diamond Light Source, Harwell Campus, Didcot OX11 0DE, UK
[3]School of Physical Science and Technology, Shanghai Tech University, Shanghai 200031, China

TMD-P-11

Valley-Polarised Tunnelling Currents in a Vertical Heterostructure of Monolayer and Bilayer Graphene

Joshua J. Thompson[1], D. J. Leech[1], M. Mucha-Kruczynski[1,2]
[1]Department of Physics, University of Bath, Claverton Down, Bath BA2 7AY, UK
[2]Centre for Nanoscience and Nanotechnology, University of Bath, Claverton Down, Bath BA2 7AY, UK

TMD-P-12

Effect of Strain on 2D Heterostructures for Flexible Electronics

Martin Tweedie, Yuewen Sheng, Wenshuo Xu, Jamie Warner
Department of Materials, University of Oxford, Parks Road, Oxford, OX1 3PH

TMD-P-13

Plasma thinning of sulphur chalcogen-containing TMDs using a ICP-RIE

Chris S. Woodhead, Y. J Noori, A. Robson, Y. Cao, J. Roberts, R. Bernardo-Gavito, R. J. Young
Physics Department, Lancaster University, Lancaster, Lancashire LA1 4YB, UK

TMD-P-14

Novel MoS_2/glassy-graphene heterostructures for photoresponsive devices

Hao Xu[1], Wei Liu[1,2], Xiaoyu Han[3], Jiang Wu[1], Dongyoung Kim[1], Xiao Dai[4], Juntong Zhu[4], Zhengxiao Guo[3], Guifu Zou[4], Huiyun Liu[1]
[1]Department of Electrical and Electronic Engineering, University College London, Torrington Place, London WC1E 7JE, UK
[2]London Centre for Nanotechnology, University College London, London WC1H 0AH, UK
[3]Department of Chemistry, University College London, 20 Gordon St, Bloomsbury, London WC1H 0AJ, UK
[4]College of Physics, Optoelectronics and Energy and Collaborative Innovation Centre of Suzhou Nano Science and Technology, Soochow University, Suzhou 215006, China

TMD-P-15

Atomic Structure and Dynamics of Defects in 2D Transition Metal Dichalcogenide Bilayers

Si Zhou, Shanshan Wang, Wenshuo Xu, Jamie H. Warner
Department of Materials, University of Oxford, 16 Parks Road, Oxford, OX1 3PH, UK

TMD-P-16

Extreme Nano-Plasmonic Cavities for Coupling to TMDs

Alex Casalis de Pury[1], Marie-Elena Kleemann[1], Ruizhi Wang[2], Christoph Grosse[1], Bart de Nijs[1], Jeremy J. Baumberg[1]
[1]NanoPhotonics Centre, Cavendish Laboratory, University of Cambridge, Cambridge CB3 0HE, UK
[2]Department of Engineering, University of Cambridge, Cambridge CB3 0FA, UK

TMD-P-17

Optical properties of graphene/hBN heterostructures

Marcin Mucha-Kruczynski[1,2], D. S. L. Abergel[3,4], J. R. Wallbank[5], V. I. Fal'ko[5,6]
[1]Department of Physics, University of Bath, Claverton Down, BA2 3FL, UK
[2]Centre for Nanoscience and Nanotechnology, University of Bath, Claverton Down, Bath BA2 3FL, UK
[3]Nordita, KTH Royal Institute of Technology and Stockholm University, Roslagstullsbacken 23, SE-106 91 Stockholm, Sweden
[4]Center for Quantum Materials, KTH and Nordita, Roslagstullsbacken 11, SE-106 91 Stockholm, Sweden
[5]National Graphene Institute, University of Manchester, Booth St E, Manchester M13 9PL, UK
[6]School of Physics and Astronomy, University of Manchester, Oxford Road, Manchester M13 9PL, UK

TMD-P-18

Electronic contribution to Raman spectrum of superconducting monolayer graphene

Aitor García-Ruiz[1,2], Marcin Mucha-Kruczynski[1,3], Vladimir I. Falko[4,5]
[1]Department of Physics, University of Bath, Claverton Down, Bath BA2 7AY, UK
[2]Centre for Doctoral Training in Condensed Matter Physics, University of Bath, Claverton Down, Bath BA2 7AY, UK
[3]Centre for Nanoscience and Nanotechnology, University of Bath, Claverton Down, Bath BA2 7AY, UK
[4]National Graphene Institute, University of Manchester, Booth St E, Manchester M13 9PL, UK
[5]School of Physics and Astronomy, University of Manchester, Oxford Road, Manchester M13 9PL, UK

TMD-P-19

Synthesis, atomic and electronic characterization of $Mo_{1-x}W_xS_2$ alloys

Xue Xia, Neil Wilson
Department of Physics, University of Warwick, Coventry CV4 7AL, UK

TMD-P-20

Anomalous optical response in atomically thin InSe

Viktor Zólyomi, Samuel J. Magorrian, Vladimir I. Fal'ko
National Graphene Institute, University of Manchester, Manchester, Booth Street East, M13 9PL, UK

TMD-P-21

Two-Band Tight-Binding Model Of Indium/Gallium Selenide Laminates Parameterised From First Principles

Samuel J. Magorrian, V. Zólyomi, V. I. Fal'ko
National Graphene Institute, University of Manchester, Booth St E, Manchester M13 9PL, UK

TMD-P-22

Quantum light emission from metal-monolayer hybrid structures

Laxmi Narayan Tripathi[1], O. Iff[1], S. Betzold[1], S. Höfling[1,2], C. Schneider[1]
1Technische Physik, Physikalisches Instität and Wilhelm Conrad Röntgen-Center for Complex Material Systems, Universitat Würzburg, Am Hubland, D-97074 Würzburg, Germany
[2]SUPA, School of Physics and Astronomy, University of St Andrews, St Andrews, KY16 9SS, UK

TMD-P-23

Optical stability of colour centres in hexagonal boron nitride under red excitation

Luca Sortino[1], S. Dufferweil[1], I. Luxmoore[2], A. I. Tartakovskii[1]
[1]Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK
[2]College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter EX4 4QF, UK

TMD-P-24

Fabrication of van der Waals heterobilayers

Alessandro Catanzaro, Evgeny M. Alexeev, Alexander I. Tartakovskii
Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK

TMD-P-25

Optical properties of transition metal dichalcogenide alloys

Oleksandr V. Skrypka, A. Catanzaro, E. M. Alexeev, A. I. Tartakovskii
Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK

TMD-P-26

Low frequency Raman in few atomic layer semiconductors

Robert C. Schofield[1], A. Catanzaro[1], O. V. Skrypka[1], E. M. Alexeev[1], N. Balakrishnan[2], A. Patané[2], R. V. Gorbachev[3], M. Hamer[3], A. I. Dmitriev[4], G. V. Lashkarev[4], N. N. Kolesnikov[5], Jung Inn Sohn[6], Hyeon Suk Shin[7], A. I. Tartakovskii[1]
[1]Department of Physics and Astronomy, University of Sheffield, Sheffield S3 7RH, UK
[2]School of Physics and Astronomy, University of Nottingham, Nottingham NG7 2RD, UK
[3]School of Physics and Astronomy, University of Manchester, Oxford Road, Manchester M13 9PL, UK
[4]I. M. Frantsevich Institute for Problems of Material Science, NASU, Kiev-142, Ukraine
[5]Institute of Solid State Physics, Russian Academy of Sciences, Chernogolovka, Russia
[6]Department of Engineering Science, University of Oxford, Oxford OX1 3PJ, UK
[7]Department of Energy Engineering and Department of Chemistry, Ulsan National Institute of Science and Technology, Republic of Korea