SIOE 2022

Semiconductor & Integrated Opto-electronics conference

12th – 14th of April 2022

Conference Locations (see map opposite)

Tues 12h April
Location: Queens Buildings site CF24 3AA (North and South Buildings)
Address: Queen's Buildings, 5 The Parade, Newport Road, CF24 3AA

Parking: NCP parking is available in the Knox Road car park (we cannot reimburse costs) or pay and display

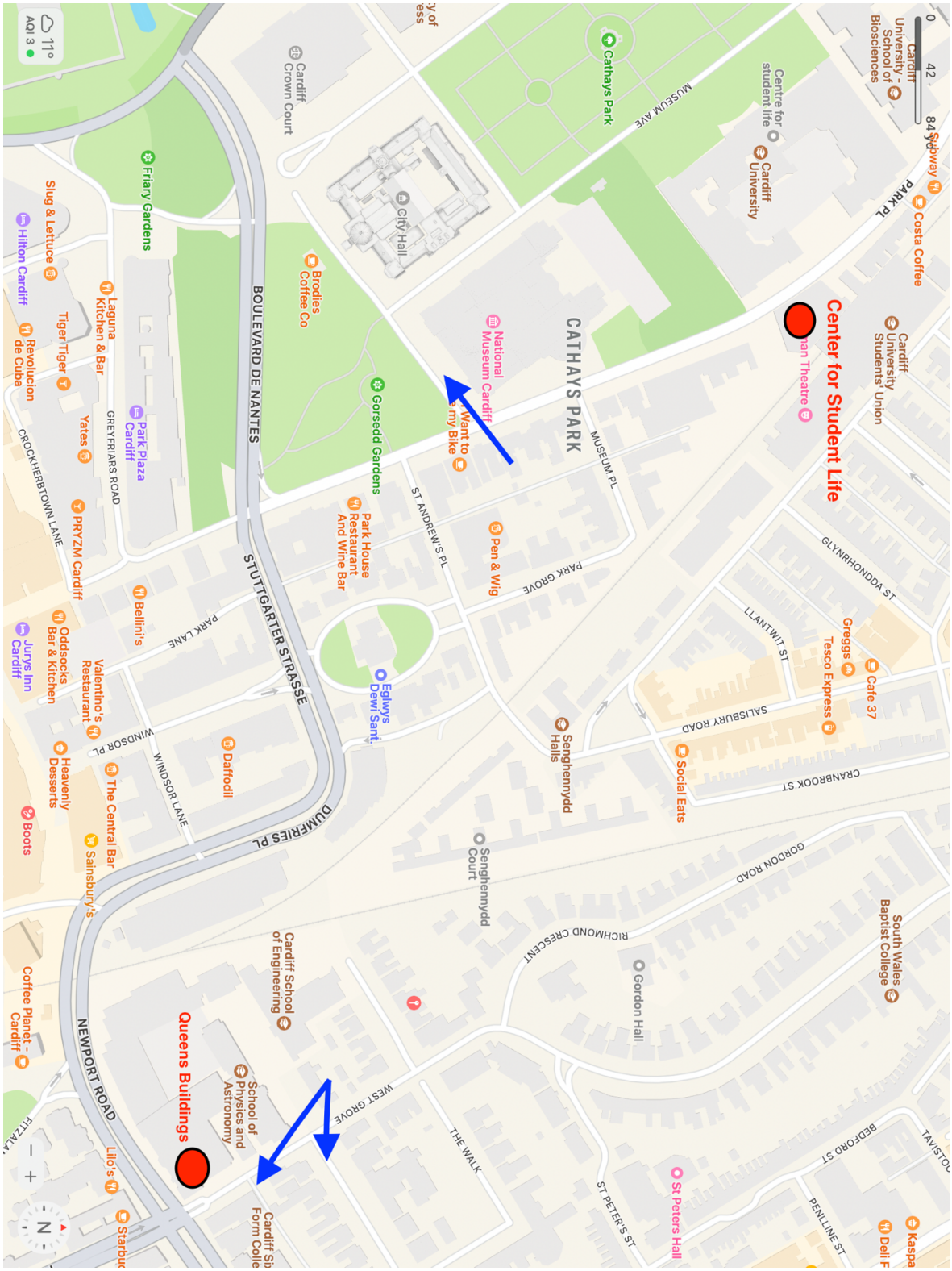
Registration location: North Building foyer.
Session 1 location: room N3-28 (third floor – 3 flights of stairs, turn left)
Poster session & Reception location: WX3.07 & 3.14

Wed 13th and Thurs 14th April
Sessions location: Centre for Student Life: Sir Stanley Thomas Lecture Theatre
Refreshments location: Centre for Student life, 4th floor

Address: Centre for Student Life, Park Place, Cardiff, CF10 3AT

Parking: On-street pay and display on Museum Avenue (we cannot reimburse costs)

Banquet location: Cardiff Castle, Castle Street, CF10 3RB



Arrows indicate on street parking

Programme

Tuesday 12th April

Registration North building, Foyer; 12.30 onwards

Welcome Address and Guidance North building, N3.28; 13.25 – 13.30

Session 1: Growth North building, N3.28; 13.30 – 15.30

Refreshment Break 15.30 – 16.15; N3.23

Session 2: Materials Development North building, N3.28; 16.15 – 17.45

Break 17.45 – 18.00

Session 3: Poster Session I and IET Reception *(including buffet and drinks)*
West Extension Building WX3.07/WX3.14; 18.00 – 20.00

Wednesday 13th April

Invited Speaker: Kei May Lau CSL, Stanley Thomas Lecture Theatre; 08.30 – 09.00

Session 4: Device Development I CSL, Stanley Thomas Lecture Theatre; 09.00 – 10.00

Refreshment Break 10.00 – 10.30; CSL, 4th Floor

Session 5: Device Development II CSL, Stanley Thomas Lecture Theatre; 10.30 – 12.30

Huawei Lunch 12.30 – 13.30; CSL, 4th Floor

Session 6: Advanced Sources I CSL, Stanley Thomas Lecture Theatre; 13.30 – 15.00

Break 15.00 – 15.30; 4th Floor CSL

Session 7: Advanced Sources II CSL, Stanley Thomas Lecture Theatre; 15.30 – 16.45

Careers Session CSL, 16.45– 17.45

Conference Banquet Reception, CSC and IOP Cardiff Castle; 18.00 – 19.00

Conference Banquet, Huawei Cardiff Castle;19.00 Onwards

Thursday 14th April

Session 8: Components for Integration / Integration Platforms

CSL, Stanley Thomas Lecture Theatre; 08.45 – 10.30

Refreshment Break 10.30 – 11.00; CSL, 4th Floor

Session 9: VCSELs CSL, Stanley Thomas Lecture Theatre;11.00 – 12.30

Huawei Lunch 12.30 – 13.30; CSL, 4th Floor

End of conference

Programme, Tuesday 12th April

Registration

North Building Foyer; 12.30 onwards

Welcome address

North Building N3.28; 13.25 – 13.30

Session 1: Growth

North Building N3.28; 13.30 – 15.30

13.30 A22_07 **Growth of InAs/InAsSb Type-II superlattices on Si substrates by MOCVD**

Richard Brown[1], B Ratiu[1], H Jia[2] , M Tang[2] , H Liu[2]and Q Li[1]

[1]School of Physic and Astronomy, Cardiff University, Cardiff, UK; [2] Department of Electronic and Electrical Engineering, University College London

13.45 A22_26 **Developing W-type Quantum Wells toward mid-infrared light sources**

Zhongming Cao, S Skalsky, and Q Zhuang

Department of Physics, Faculty of Science and Technology, Lancaster University, Lancaster, LA1 4YB, UK

14.00 A22_17 **Effect of interfacial schemes on the structural and optical quality of a 5 µm type-II InAs/GaSb superlattice**

Dhafer O. Alshahrani[1], J.J Jiménez[2,3], D Kwan[1], V Srivastava[1], F M Morales[2,3] and M Kesaria[1]

[1]School of Physics and Astronomy, Cardiff University, UK, [2]Department of Materials Science and Metallurgical Engineering and Inorganic Chemistry, Faculty of Sciences, University of Cádiz, 11510 Puerto Real, Cádiz, Spain, [3]IMEYMAT: Institute of Research on Electron Microscopy and Materials, University of Cádiz, 11510 Puerto Real, Cádiz, Spain

14.15 A22_35 **In-situ annealing for high crystal quality GeSn growth by solid-source molecular beam epitaxy**

Hui Jia, J Yang and H Liu

Department of Electronic & Electrical Engineering, University College London, Torrington Place, London, WC1E 7JE, UK.

14.30 A22_29 **Bi Flux Modification of Self Assembled InAs Quantum Dots Growth on <001> GaAs by MBE**

Matthew R Carr[1], N.J Bailey[1], D.F Reyes[2], S Flores[2], V Braza[2], J.P.R. David[1] and R.D Richards[1]

[1]Electronic and Electrical Engineering Department, The University of Sheffield, UK, [2]Department of Materials Science and Metallurgical Engineering, The University of Cádiz, Spain

14.45 A22_42 **Heteroepitaxial Growth of Low Defect Density Thin Germanium Buffer Layer on Si Substrate**

Manyu Dang, J Yang, M Tang and H Liu

Department of Electronic and Electrical Engineering, University College London, Torrington Place, WC1E 7JE

15.00 A22_59 **A thermally removable SiOx surface protecting layer on Si (100) for molecular beam epitaxy (Growth and fabrication including quantum dot materials and device**

Yaonan Hou[1], H Jia[2], M Tang[2], A.B Mosberg[3], Q Ramasse[4], I Skandalos[1], Y Noori[1], J Yang[2], H Liu[2] and F Gardes[1]

[1]Optoelectronics Research Centre, University of Southampton, University Road, Southampton, SO17 1BJ, United Kingdom; [2]Department of Electronic and Electrical Engineering, University College London, Torrington Place, London, WC1E 7JE, United Kingdom; [3]SuperSTEM, SciTech Daresbury Science and Innovation Campus, Block J, Keckwick Lane, Daresbury, WA4 4AD, United Kingdom

15.15 A22_50 **Tunnel epitaxy of GaAs and InP on 220nm SOI platform**

Bogdan-Petrin Ratiu[1], O Abouzaid[1], W Zhang[2], M Ebert[2], Graham Reed[2], D Thomson [2], Q Li[1]

[1]School of Physics and Astronomy, Cardiff University, CF24 3AA, UK; [2]Optoelectronics Research Centre, University of Southampton, SO17 1BJ, UK

Refreshment Break 15.30 – 16.15; N3.23

Session 2: Materials Development

North Building N3.28; 16.15 – 17.45

16.15 A22_46 **Improved performance of 1.3 m quantum dot by a novel method**

Huiwen Deng, M Tang, A Seeds and H Liu

Department of Electronic and Electrical Engineering, University College London, London, WC1E 7JE, UK

16.30 A22_57 **2D Material based Optoelectronics by Electroplating**

Yasir J Noori[1,2], N Abdelazim[1], S Thomas[3], G Reid[3], P.N Bartlett[3], N Klein[4], R Beanland[5], Y Hou[2], I Skandalos[2] F Gardes[2] and K Groot[1]

[1]Electronics and Computer Science, University of Southampton, UK; [2]Optoelectronics Research Centre, University of Southampton, UK; [3]School of Chemistry, University of Southampton, UK; [4]Department of Materials, Imperial College, UK5Department of Physics, University of Warwick, UK

16.45 A22_12 **Electron transport properties in III - V nitride semiconductors and derivative alloy based on simple band structure models of single-electron Monte Carlo simulation**

Mengxun Bai and J.M Rorison

Department of Electrical Engineering, University of Bristol, Bristol, BS8 1UB, UK

17.00 A22_25 **Carrier collection efficiency in GaAsBi photovoltaics**

Thomas B. O Rockett[1], N. A Adham[1], F Harun[1,2], J.P. R David[1], and R.D. Richards[1]

[1]Department of Electronic and Electrical Engineering, University of Sheffield, UK; [2]Department of Electronics Technology, British Malaysian Institute, Universiti Kuala Lumpur, Malaysia

17.15 A22_24 **Laser patterned broadband metasurface absorber for solar thermal applications**

Shen Li[1], S Wills[2], E Smith[2], N.A. Fox[2] and M.J Cryan[1]

[1]Department of Electrical and Electronic Engineering, University of Bristol; [2]School of Chemistry, University of Bristol

17.30 A22_39 **Complex frequency analysis of transverse electric surface plasmon polariton modes in graphene-based structures**

Zeeshan Ahmad, E.A Muljarov and Sang Soon Oh

School of Physics and Astronomy, Cardiff University, Cardiff CF24 3AA, United Kingdom

Break 17.45 – 18.00

Session 3: Posters & IET Drinks Reception

West Extension Building, WX3.07/3,14; 18.00 – 20.00

A22_53 **Design of low-loss GaAs based optical waveguides incorporating low-index AlOx layers**

Fwoziah T Albeladi[1,2], S Gillgrass[1], T.R Albiladi[1,3], C Allford[1], L. Jarvis[1], S. Shutts[1] and P.M Smowton[1]

[1]School of Physics and Astronomy, Cardiff University, The Parade, Cardiff CF24 3AA, United Kingdom

[2] Physics Department, Faculty Of Science, University Of Jeddah, Jeddah 21589, Saudi Arabia; [3] Physics And Astronomy Department, Faculty Of Science, King Saud University, Riyadh 11451, Saudi Arabia

A22_01 **Photovoltaics and energy storage**

Hifsa Shahid[a], S Mohsin[b], K Umair[a] Ahmeda and A Ahmad[a]

[a]Electrical Engineering Department, University of Engineering & University of Engineering & Technology Lahore (NewCampus), Punjab,54890, Pakistan; [b]Chemical Engineering Department University of Engineering & University of Engineering & Technology Lahore(New Campus),Punjab, 54890,Pakistan.

A22_08 **Design and Simulation of Fully Integrated X-band Rectennas Using Novel Tunnel Diodes**

Christopher Walsh, S.G Muttlak and M Missous

Department of Electrical & Electronic Engineering, University of Manchester

A22_19 **10-fold reduction in noise for a 100 element parallel arrayn of quantum well hall effect sensors**

Alexander Lindley

Department of Electrical & Electronic Engineering, University of Manchester

A22_31 **Optimising GaAs Photonic Crystal Cavities and Waveguides for use in Lab-On-Chip Optical Biosensors**

Nadhia Monim,W Langbein and F Masia

School of Biosciences, Cardiff University, UK

A22_14 **Nanoscale Property Characterisation of Semiconductor Integrated Optoelectronic Materials & Devices**

V Panchal, M Unger, P De Wolf and Boume Boudjelida
Bruker Nano Sur

A22_15 **Theoretical modelling of a type-II InAs/GaSb superlattice for long-wavelength infrared detectors**

Paradesisa E O'Dowd Phanis, D.C.M Kwan, D.O Alshahrani, M Kesaria
School of Physics and Astronomy, Cardiff University, UK

A22_16 **Simulations of Geiger-mode Avalanche Photodiodes for multiple photon detection**

Guanwei Huang, J.D Taylor-Mew, J. D. Petticrew, and J.S.Ng
Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield, UK.

A22_61 **SNOM characterisation of TI thin film Bi2Te3**

Daniel Johnson, C Knox, B Gholizadeh, J Freeman, B Hickey, E Linfield, S Sasaki and J Boland
Photon Science Institute, School of Electrical and Electronic Engineering, Faculty of Science and Engineering, University of Manchester, Oxford Road, Manchester, M13 9PL, UK Condensed Matter Group, School of Physics and Astronomy, E. C. Stoner Laboratory, University of Leeds, Leeds, LS2 9JT, UK

A22_62 **Solution-Processed Quantum Dot Devices for the Internet of Things**

Diyar Mousa Othman[1], J Weinstein[2], Q Lyu[3] and B Hou[1],
[1]School of Physics and Astronomy, Cardiff University, Cardiff CF24 3AA, UK; [2]Department of Chemistry, The University of Sheffield, Sheffield, S10 2TN, UK ; [3]Ipswich Research Center, Huawei Technologies Research & Development (UK) Ltd. Ipswich IP5 3RE, UK

Programme, Wednesday 13th April

Invited Speaker

08.30 INVITED **Lasers and photodetectors on SOI by selective lateral epitaxy** **Kei May Lau; The Hong Kong University of Science and Technology**

Session 4: Device Development I

Centre for Student Life, Stanley Thomas Lecture Theatre; 08.30 – 09.00

09.00 A22_55 **Predicting limitations to the performance of p-modulation doped InAs/InGaAs quantum dot lasers and modulators**

Ben Maglio[1], L Jarvis[1], M Tang[2], Huiyun Liu[2], P.M Smowton[1]

[1]School of Physics & Astronomy, Cardiff University, The Parade, Cardiff, CF24 3AA, U.K.; [2]Department of Electronic and Electrical Engineering, University College London, Malet Place, London, WC1E 7JE, United Kingdom

09.15 A22_41 **Short-wave infrared $A_{l0.11In0.9As0.83Sb0.17}$ Photodiodes**

Yuting Ji, J Petticrew, L.W Lim, C.H Tan, and J.S Ng

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

09.30 A22_13 **Telecoms-wavelength LEDs: Combining GaSb quantum rings and Bragg (anti)reflectors for enhanced emission**

Gizem Acar, S Jones, P Hodgson and M Hayne

Department of Physics, Lancaster University, Lancaster LA1 4YB, UK

09.45 A22_52 **1550 nm quantum dot lasers grown on n-InP substrates**

Zhongming Cao, P Siddham, H Gordon-Moys, J Nabialek, R Forrest, B Salmond, M Alsayyadi, Q Li, S Shutts, P.M Smowton, *

School of Physics and Astronomy, Cardiff University, Cardiff CF24 3AA, United Kingdom

Refreshment Break 10.00 – 10.30, Centre for Student Life, 4th Floor

Session 5: Device Development II

Centre for Student Life, Stanley Thomas Lecture Theatre; 10.30 – 12.30

10.30 A22_04 **Asymmetric-Strained InGaAs/GaAsSb Type-II Superlattice Photodiodes for SWIR detection**

Jonathan Petticrew[1], Y Ji[1], I.S Han[1], B White[2], C.H Tan[1], M Hopkinson[1], and J.S Ng[1]

[1]Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield, UK., [2] Formerly at [1], now at Phlux Technology Ltd., Sheffield, UK.

10.45 A22_05 **A GaAsSb/AlGaAsSb separate absorption and multiplication avalanche photodiode for infrared light detection up to 1.7 µm**

Ye Cao, T Osman, J.S Ng, and C.H Tan
Department of Electronic & Electrical Engineering, University of Sheffield, Sheffield, UK

11.00 A22_20 **Influence of the Interfacial Misfit Array for 10 µm InAs/GaSb Type-II Superlattice Diodes on GaAs substrates**

Dominic C.M Kwan[1], J.J Jiménez[2,3], V Srivastava[1], F.M Morales[2,3], M Kesaria[1],
[1]School of Physics and Astronomy, Cardiff University, UK; [2] Department of Materials Science and Metallurgical Engineering and Inorganic Chemistry, Faculty of Sciences, University of Cádiz, 11510 Puerto Real, Cádiz, Spain; [3]IMEYMAT: Institute of Research on Electron Microscopy and Materials, University of Cádiz, 11510 Puerto Real, Cádiz, Spain; [4]Present address: Electrical Engineering Department, The University of Texas at Arlington, the USA.

11.15 A22_22 **Simulation of the electric field profiles of InAs triple mesa designs**

Jonty D Veitch and C.H Tan
Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, UK

11.30 A22_23 **Micro-LEDs with a mode control emission wavelength**

Guillem Martinez de Arriba, P Feng, C Xu, C Zhu, J Bai and T Wang
Department of Electronic and Electrical Engineering, The University of Sheffield, Sheffield S1 3JD, United Kingdom

11.45 A22_32 **Inhomogeneous and Linewidth Broadenings in InAsP Quantum Dot Lasers with two Different Compositions**

Mohammed S Al-Ghamdi, R.Z Bahnam and I.B Karomi
Department of Physics, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia; University of Mosul, College of Education for Pure Science Mosul, Iraq 41002

12.00 A22_38 **Design and Optimisation of Tapered Waveguides**

Tahani R Albiladi[(1,2)*], D.M Beggs[(1)], F.T AlBeladi[(1,3)] S Shutts[(1)] and P.M Smowton[(1)]
[(1)] School of Physics and Astronomy, Cardiff University, Queen's Building, The Parade, Cardiff, Wales, UK, CF24 3AA; [(2)] Physics and Astronomy Department, Faculty of Science, King Saud University, Riyadh 11451, Kingdom of Saudi Arabia; [(3)] Physics Department, Faculty of Science, University of Jeddah, Jeddah 21589, Kingdom of Saudi Arabia.

12.15 A22_39 **Highly manufacturable Photonic Molecules by laterally coupling Tamm plasmons**

Talal Alshammari, R Oulton and E Harbord
Department of Electrical & Electronic Engineering, University of Bristol, BS8 1FD, UK

Huawei Lunch 12.30 – 13.30; Centre for Student Life, 4th Floor

Session 6: Advanced Sources I

Centre for Student Life, Stanley Thomas Lecture Theatre; 13.30 – 15.00

13.30 A22_18 **Control of InAs/InP Quantum Dots Morphology via Droplet Epitaxy in MOVPE for Telecom C-band Quantum Information Technologies** T Alshammari, Elisa M Sala[1,2], M Godsland[2], Y. I Na[2], A Trapalis[1,2], and J Heffernan[1,2]

[1]EPSRC National [1]Epitaxy Facility, The University of Sheffield, Broad Lane, S3 7HQ Sheffield, United Kingdom, [2]Department of Electronic and Electrical Engineering, The University of Sheffield, Broad Lane, S3 7HQ Sheffield, United Kingdom

13.45 A22_27 **Long-Wavelength Semipolar (11−22) InGaN/GaN LEDs with Multi- Gb/s Data Transmission Rates for VLC**

Jack I.H. Haggar, Y Cai, S.S Ghataora, J Bai and T Wang

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

14.00 A22_33 **Solid state single photon sources: a road map for maximizing brightness in low Q micropillars**

David Dlaka[1], P Androvitsaneas[3], A Young[1][2], E Harbord[1][2] and Ruth Oulton[1][2]

[1]Quantum Engineering Technology Laboratories, H. H. Wills Physics Laboratory [2]Department of Electrical and Electronic Engineering, University of Bristol, Bristol BS8 1FD, United Kingdom; [3]School of Engineering, Queen's Buildings, Cardiff University, Cardiff CF24 3AA, United Kingdom

14.15 A22_44 **Electronic Timing Control Of Mode-Locked Diode-Lasers**

Niklas Schulz, N Surkamp, C Brenner and M.R Hofmann

Lehrstuhl f¨ur Photonik und Terahertztechnologie, Ruhr-Universit¨at Bochum, Germany

14.30 A22_48 **Co-doping 1.3µm InAs Quantum Dot Lasers with P-type modulation doping and direct N-type doping**

Lydia Jarvis[1], B Maglio[1], S Shutts[1], A Enderson[1], H Deng[2], M Tang[2], H Liu[2], P.M Smowton[1]

[1]EPSRC Future Compound Semiconductor Manufacturing Hub, School of Physics and Astronomy, Cardiff University, The Parade, Cardiff, UK; [2]Department of Electronic and Electrical Engineering, University College London, Torrington Place, UK

14.45 A22_51 **Soliton modelocking in chi-2 microresonators**

Danila N Puzyrev, A Villois, V.V Pankratov, and D.V Skryabin

Department of Physics, University of Bath, Bath, BA2 7AY, UK

Refreshment Break 15.00 – 15.30, Centre for Student Life, 4th Floor

Session 7: Advanced Sources II

Centre for Student Life, Stanley Thomas Lecture Theatre; 15.00 – 15.30

15.30 A22_11 **High reflection tolerance of silicon-based epitaxial quantum dot lasers by direct modulation**

Shihao Ding[1], B Dong[1], H Huang[1], J.E Bowers[2], and F Grillot[1,3]

[1]LTCI, Télécom Paris, Institut Polytechnique de Paris, 91120 Palaiseau, France; [2]Institute for Energy Efficiency, University of California, Santa Barbara, California 93106, USA; [3]Center for High Technology Materials, The University of New-Mexico, Albuquerque, NM 87106, USA

15.45 A22_36 **Effect of off-axis GaAs substrate on the characteristics of 1.1um InAs/GaAs quantum dot laser grown by MOVPE**

Chufan Wang, B Harrison, N Babazadeh and J Heffernan

Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK

16.00 A22_37 **Room-temperature band-edge lasing using monolithically integrated InGaAs nanowires grown on silicon-on-insulator**

Cristian Messina, Y Gong, O Abouzaid, B-P Ratiu, Sang Soon Oh and Q Li

School of Physics and Astronomy, Cardiff University

16.15 A22_10 **Intensity Noisy Squeezing in Interband Cascade Laser**

Shiyun Zhao[1] and F Grillot[1,2]

[1]LTCI, Télécom Paris, Institut Polytechnique de Paris, 91120 Palaiseau, France; [2]Center for High Technology Materials, The University of New-Mexico, Albuquerque, NM 87106, USA

16.30 A22_43 **One-dimensional Quantum Dot Photonic Crystal Laser Monolithically Grown on CMOS-compatible Si Substrates**

Mingchu Tang[1], T Zhou[1,2], S Chen[1], Z Zhang[2] and H Liu[1]

[1] Department of Electronic and Electrical Engineering, University College London, London, WC1E 7JE, United Kingdom; [2] School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen, Guangdong, 518172, P.R. China

16.45 A22_60 **EMLs from 10Gb/s to 100Gb/s**

Dr. Xin Chen

Huawei Technologies Research & Development (UK) Limited, Phoenix House, (B55) Adastral Park, Martlesham Heath, Ipswich

Careers Session

Centre for Student Life; 16.45 – 17.45

Conference Banquet Reception sponsored by CSC and IOP Wales

Cardiff Castle; 18.00 – 19.00

Conference Banquet; sponsored by Huawei

Cardiff Castle; 19.00 onwards

Programme, Thursday 14th April

Session 8: Components for Integration / Integration Platforms

Centre for Student Life, Stanley Thomas Lecture Theatre; 8.45 – 10.30

08.45 A22_28 **Anchor undercutting and high throughput transfer printing of device size high reflective SiNx/SiO2 DBR**

Philippe R Bantsi, H Worthy, S Chen and R.M. Smith

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

09.00 A22_49 **High volume automated optical testing of InP modulator chips for coherent optical transmission applications**

Kieran U McGovern, Y Shi, D Smith, P Tucker, F Matelski and N.D Whitbread

Lumentum Technology UK Ltd., Caswell, Towcester, NN12 8EQ, UK,

09.15 A22_54 **Modelling electroabsorption modulators for retroreflective free space optical communication**

Ben Maglio[1], A. C. MacGillivray[2], C Quintana[3], Y Thueux[3], M Watson[4], D Jakonis[5], Q Wang[5], D Platt[5], J.F. Holzman[2] and P.M Smowton[1]

[1]School of Physics & Astronomy, Cardiff University, The Parade, Cardiff, CF24 3AA, U.K.; [2]School of Engineering, The University of British Columbia, Kelowna, BC, V1V 1V7, Canada; [3]Airbus Operations Ltd., Filton, Bristol BS34 7PA, U.K; [4]AVoptics Ltd., Yeovil, Somerset, BA22 8RR, U.K; [5]RISE Research Institutes of Sweden AB, Electrum, 236, 16440 Kistra, Sweden

09.30 A22_56 **Group IV compounds for CMOS photonics (Optical detectors, modulators, amplifiers and switches.**

Frederic Gardes, T.D Bucio, I Chakraborty, I Skandalos, M Lorenzo, T Rutirawut, Y Noori and Y Hou

Optoelectronics Research Centre, University of Southampton, Southampton SO17 1BJ, UK

09.45 A22_58 **Monolithic III-V/SiN co-integration through a butt-coupling scheme towards O-band applications (All-optical and opto-electronic integrated circuits**

Ilias Skandalos, T Rutiwarut, T.B Bucio, Y Hou, Y Noori, M Tang, S Chen, H Liu and F.Y Gardes

Optoelectronics Research Centre, University of Southampton, Southampton SO17 1BJ, UK

10.00 A22_03 **InAs Diodes Fabricated by Sulphur and Silicon Ion Implantation: Towards Back-Side Illuminated InAs Avalanche Photodiode Focal Plane Arrays**

Tarick Osman, V Shulyak, C.H Tan and J.S Ng

Department of Electronic & Electrical Engineering, University of Sheffield, UK.

10.15 A22_09 **Advances in Time/Frequency Division Multiplexing for magnetic imaging arrays using Quantum Well Hall Effect Sensors**

Ruslan Murshudov, C.W Liang, J Sexton and M Missous
University of Mancherster

Refreshment Break 10.30 – 11.00, Centre for Student Life, 4th Floor

Session 9: VCSELs

Centre for Student Life, Stanley Thomas Lecture Theatre; 11.00-12.30

11.00 A22_06 **Modeling of High-Speed Graded Distributed Bragg Reflectors Vertical Cavity Surface Emitting Laser for Optical Communication Systems**
Saad G. Muttlak[1], I Kostakis[2] and M Missous[1]
[1]Department of Electrical and Electronic Engineering, the University of Manchester, United Kingdom; [2]Integrated Compound Semiconductors, Manchester, United Kingdom

11.15 A22_21 **Electrical properties of GaAs/AlGaAs DBRs and ohmic contacts for GaSb/GaAs quantum-ring VCSELs**
Sam Jones, P.D. Hodgson, D Lane and M Hayne
Department of Physics, Lancaster University, Lancaster LA1 4YB

11.30 A22_30 **Gain Measurements on VCSEL Material Using Segmented Contact Technique**
Curtis Hentschel[1], C.P Allford[1], S-J Gillgrass[1], J Nabialek[1], R Forrest[1], J Baker[1], J Meiklejohn[1], D Powell[2], W Meredith[2], M Haji[3], J.I Davies[4], S Shutts[1] and P.M Smowton[1]
[1]EPSRC Future Compound Semiconductor Manufacturing Hub, School of Physics and Astronomy, Cardiff University, Cardiff, UK; [2]Compound Semiconductor Centre, UK; [3]National Physical Laboratory, Teddington, UK; [4]IQE plc, Cardiff, UK.

11.45 A22_34 **VCSEL-based Photonic Synapses**
Joshua Robertson, J.A Alanis, M Hejda, D Owen-Newns and A Hurtado
Department of Electronic & Electrical Engineering, University College London, Torrington Place, London, WC1E 7JE, UK

12.00 A22_45 **VCSEL Quick Fabrication for Characterisation of Epitaxial Material Designed for Atomic Sensing Applications**
Jack Baker[1], S Gillgrass[1], T Peach[2], C.P Allford[1], C Hentschel[1], J.I Davies[3], S Shutts[1], P.M Smowton[2]
[1] Future Compound Semiconductor Manufacturing Hub, Cardiff University, UK; [2] Institute for Compound Semiconductors, Cardiff University, UK; [3] IQE plc, Cardiff, UK.

12.00 A22_47 **Optoelectronic spiking neuron based on a resonant tunnelling diode and a VCSEL**
M Hejda[1], E Malysheva[2], Dafydd Owen-Newns[1], Q.R.A Al-Taai[3], E Wasige[3], J Louren[4], J.M. L. Figueiredo[4], V Dolores-Calzadilla[2], B Romeira[5] and A Hurtado[1]

[1]Institute of Photonics, SUPA Dept of Physics, University of Strathclyde, Glasgow, *UK;* [2]*Institute for Photonic Integration, Eindhoven University of Technology, Eindhoven, NL;* [3]*Electronics and Nanoscale Engineering, James Watt School of Engineering, University of Glasgow, Glasgow, UK;* [4]*Centra-Ci˜encias and Departamento de F´ısica, Faculdade de Ci˜encias, Universidade de Lisboa, Lisboa, PT;* [5]*International Iberian Nanotechnology Laboratory,UltrafastBio-and Nanophotonics Group,Braga,PT*

Conference Close