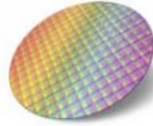




**SIOE 2024**



Semiconductor and Integrated Opto-Electronics Conference

# Programme

## Tuesday 2nd April

**Registration** Floor 2; 13.00 onwards

**Welcome Address** Stanley Thomas Lecture Theatre; 13.55 – 14.00

**Session 1: Growth and Materials** Stanley Thomas Lecture Theatre; 14.00 – 16.00

Refreshment Break 16.00 – 16.30; CSL, 4th Floor

**Session 2: Light Emitters** Stanley Thomas Lecture Theatre; 16.30 – 17.30

*Break and walk to venue 17.30 – 17.45*

**Session 3: Poster Session (including buffet and drinks) sponsored by IOP**

**Semiconductors and Compound Semiconductor Centre**

Transitional Research Hub; 17.45 – 19.45

## Wednesday 3rd April

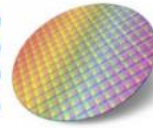
**Session 4: Detectors** Stanley Thomas Lecture Theatre; 08.30 – 10.00

**Session 5: Facilities** Stanley Thomas Lecture Theatre; 10.00 – 10.20

*Refreshment Break 10.20 – 11.00; CSL, 4th Floor*



**SIOE 2024**



**Semiconductor and Integrated Opto-Electronics Conference**

**Session 6: Moving Towards Integration** Stanley Thomas Lecture Theatre; 11.00 – 13.00

*Lunch 13.00 – 12.00; 4th Floor*

**Session 7: Material Characterisation** Stanley Thomas Lecture Theatre; 14.00 – 15.00

*Refreshment Break 15.00 – 15.30, 4th Floor*

**Session 8: Lasers and Applications I** Stanley Thomas Lecture Theatre; 15.30 - 17.00

**Careers Session** *4th Floor, 17.00 - 18.30*

*Walk to venue Break 18.30– 18.45*

**Conference Banquet Reception,** The Cornerstone ; 18.45 – 19.45

**Conference Banquet,** The Cornerstone ;19.45 Onwards

## **Thursday 4th April**

**Session 9: Lasers and Applications II** Stanley Thomas Lecture Theatre; 09.00 – 10.00

*Refreshment Break 10.00 – 10.30, 4th Floor*

**Session 10: Lasers and Applications III** Stanley Thomas Lecture Theatre;10.30 – 12.30

*Lunch 12.30 – 13.30; 4th Floor*

**End of conference**

## *Programme, Tuesday 2<sup>nd</sup> April*

### **Registration**

Centre for Student Life, Stanley Thomas Lecture Theatre; 13.00 onwards

### **Welcome Address**

Centre for Student Life, Stanley Thomas Lecture Theatre; 13.55 – 14.00

### **Session 1: Growth and Materials**

Centre for Student Life, Stanley Thomas Lecture Theatre; 14.00 – 16.00

#### **14.00 S24\_29 Antiphase boundary-free III-V materials epitaxially grown on on-axis Si (001) substrate by thin Si buffer**

X Zhang\*, H Jia, H Deng, H Liu and M Tang

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

#### **14.15 S24\_30 Molecular Beam Epitaxy Growth of GaAs and Ge Buffers on V-Groove Si** M Mtunzi<sup>1\*</sup>, H Jia<sup>1</sup>, Y Hou<sup>2,6</sup>, X Yu<sup>1</sup>, H Zeng<sup>1</sup>, J Yang<sup>1</sup>, I Skandalos<sup>2</sup>, W Li<sup>3</sup>, K El Hajraoui<sup>4</sup>, Q Ramasse<sup>4</sup>, M.G Masteghin<sup>5</sup>, F Gardes<sup>2</sup>, M Tang<sup>1</sup>, S Chen<sup>1</sup> and H Liu<sup>1</sup>

*<sup>1</sup>Department of Electronic and Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, United Kingdom. <sup>2</sup>Optoelectronics Research Centre, University of Southampton, Southampton, SO17 1BJ, United Kingdom. <sup>3</sup>Beijing Key Lab of Microstructure and Property of Advanced Materials, Faculty of Materials and Manufacturing, Beijing University of Technology, Beijing 100124, People's Republic of China. <sup>4</sup>SuperSTEM, SciTech Daresbury Science and Innovation Campus, Block J, Keckwick Lane, Daresbury, WA4 4AD, United Kingdom. <sup>5</sup>Department of Electrical and Electronic Engineering, University of Surrey, Guildford, Surrey, GU2 7XH, United Kingdom*

#### **14.30 S24\_05 MOCVD growth of InAs/GaSb Type-II superlattices for infrared detectors** R Brown<sup>1</sup>, C Liu<sup>1,2</sup>, K.M Wong<sup>1</sup>, J.I Davies<sup>2</sup>, Q Li<sup>1\*</sup>

*<sup>1</sup>School of Physics and Astronomy, Cardiff University, United Kingdom <sup>2</sup>IQE plc. Cardiff, Wales, CF3 0LW, United Kingdom*

#### **14.45 S24\_20 Optical properties of GaAs<sub>1-x</sub>Bix MQW and In<sub>x</sub>Ga<sub>1-x</sub>As MQW structures**

N.A. Adham, F Harun\*, J.P.R David and R.D Richards

*University of Sheffield (UK), \*UniKL BMI (Malaysia)*

#### **15.00 S24\_27 Optoelectronic properties of Al<sub>x</sub>Ga<sub>1-x</sub>As<sub>y</sub>Sb<sub>1-y</sub> on GaSb**

S.W Zhao<sup>1</sup>, X Jin<sup>1</sup>, A.P Craig<sup>2</sup>, A.R.J Marshall<sup>2</sup>, X Yi<sup>3</sup>, M Modak<sup>3</sup>, G.S Buller<sup>3</sup>, C Hing Tan<sup>1</sup> and J.P.R David<sup>1</sup>

<sup>1</sup>Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, United Kingdom.

<sup>2</sup>Physics Department, University of Lancaster, Lancaster, LA1 4YB, United Kingdom. <sup>3</sup>School of Engineering & Physical Sciences, Heriot-Watt's University, Edinburgh, EH14 4AS, United Kingdom

**15.15 S24\_17 Effective dislocation filter layers for epitaxial growth of InP on silicon**

B-P Ratiu<sup>1</sup>, S Liu<sup>1</sup>, H Jia<sup>2</sup> and Z Yan<sup>1</sup>

<sup>1</sup>School of Physics and Astronomy, Cardiff University, UK. <sup>2</sup>Dept. of Electronic & Electrical Engineering, University College London, UK. <sup>3</sup>Univ. Grenoble Alpes, CNRS, CEA-LETI, MINATEC, LTM, F-38054 Grenoble, France

**15.30 S24\_34 Optically active InAs/InAlGaAs/InP (001) quantum dot laser materials enhanced by cyclic defect annealing**

C Dear<sup>1</sup>, H Jia<sup>1</sup>, J-S Park<sup>1</sup>, K El Hajraoui<sup>2</sup>, J Yuan<sup>1</sup>, H Deng<sup>1</sup>, M Tang<sup>1</sup>, Q Ramasse<sup>2</sup> and H Liu<sup>1</sup>

<sup>1</sup>Department of Electronic and Electrical Engineering, University College London, London

<sup>2</sup>SuperSTEM, Daresbury

**15.45 S24\_10 Molecular beam epitaxy of AlGaIn alloys with compositional fluctuations: Development of wavelength-switchable ultraviolet light emitting diodes**

P.G Roy<sup>1</sup>, S Sen<sup>2</sup> and Anirban Bhattacharyya<sup>1</sup>

<sup>1</sup>Institute of Radio Physics and Electronics, University of Calcutta, Kolkata 700009, INDIA. <sup>2</sup>Centre for Research in Nanoscience and Nanotechnology, University of Calcutta, Kolkata 700106, INDIA

*Refreshment break 16.00- 16.30; 4<sup>th</sup> Floor*

**Session 2: Light Emitters**

Centre for Student Life, Stanley Thomas Lecture Theatre; 16.30 – 17.30

**16.30 S24\_38 Advances in Room-Temperature Single-Photon LEDs Using GaSb/GaAs Quantum Rings**

G Acar<sup>1</sup>, L Leguay<sup>2</sup>, S Jones<sup>1</sup>, P Hodgson<sup>1</sup>, A Schliwa<sup>2</sup>, M Hayne<sup>1</sup>

<sup>1</sup>Department of Physics, Lancaster University, Lancaster LA1 4YB, UK. <sup>2</sup>Institute of Solid-State Physics, Technical University of Berlin, Berlin 10623, Germany

**16.45 S24\_08 Eco-Friendly Colloidal Quantum Dots Light Emitting Diode Arrays with Microscale Pixel Patterning through Non-Lithographic Processes**

R Liu, C Kant, J Hong, O Diyar, S William, O Alexander, and B Hou

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

**17.00 S24\_43 Nanowire characterisation**

N. Almalki

Cardiff School of Physics and Astronomy, Cardiff University, Maindy Road, Cardiff CF24 4HQ

**17.15 S24\_37 Novel GaSb Quantum Ring Light Emitting Diodes (QR-LED) with Distributed Bragg Transmitter (DBT) Operating at Telecommunication Wavelength**



Semiconductor and Integrated Opto-Electronics Conference

G Acar\*<sup>1</sup>, S Jones<sup>1</sup>, P Hodgson<sup>1</sup>, F Alvarado-Cesar<sup>2</sup>, R Beanland<sup>2</sup> and M Hayne<sup>1</sup>

<sup>1</sup>Department of Physics, Lancaster University, Lancaster LA1 4YB, UK. <sup>2</sup>Department of Physics, University of Warwick, Coventry CV4 7AL, UK

*Break and walk to venue*

**Session 3: Posters & Reception Sponsored by Compound Semiconductor  
Centre and IOP Semiconductor**

Spark, 17.45 – 19.45

**S24\_12 Towards Four Wave Mixing in Silicon Waveguides Using Distributed Bragg Reflector Cavities for Quantum Applications**

S Bala, J Blatcher, J Pugh and M Cryan

*School of Electrical, Electronic and Mechanical Engineering, University of Bristol, Woodland Road, Bristol, United Kingdom, BS8 1UB*

**S24\_35 Emission Polarisation Switching in Single CuInZnS<sub>3</sub> Quantum Dots**

N Alhazmi, V Singh, O Evans, A Stewart, W Solari, A Osypiw, B Hou, and W Langbein

*School of Physics and Astronomy, Cardiff University, Cardiff CF24 2AA*

**S24\_44 Characterisation of Silicon-Nitride Waveguides for Silicon-based Photonic Integrated Circuits of Silicon-Nitride Waveguides for Silicon-based Photonic Integrated Circuits**

Yun Long<sup>1</sup>, Pawan Mishra<sup>1</sup>, Fwoziah Albeladi<sup>1</sup>, Dun Qiao<sup>1</sup>, Richard Forrest<sup>1</sup>, Ilias Skandalos<sup>2</sup>, Frederic Gardes<sup>2</sup>, Peter M Smowton<sup>1</sup>

<sup>1</sup> Cardiff School of Physics and Astronomy, Cardiff University, Maindy Road, Cardiff CF24 4HQ

<sup>2</sup> Optoelectronics Research Centre, University Rd, Southampton SO17 1BJ

S24\_54 Laura Michael

S24\_55 Joseph Francis

S24\_56 Ben Jakobs

S24\_57 Kate Wong



Semiconductor and Integrated Opto-Electronics Conference

## Programme, Wednesday 5<sup>th</sup> April

### Session 4: Detectors

Centre for Student Life, Stanley Thomas Lecture Theatre; 08.30 – 10.30

#### 8.30 S24\_26 Characterisation of GaAs/GaAsBi heterostructure photodiodes

S Gao, X Tao, X Jin, Y Liu, N.J. Bailey, C Hing Tan, J.P R. David and R.D Richards

*Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, U.K*

#### 8.45 S24\_42 Low excess noise Al<sub>0.75</sub>Ga<sub>0.25</sub>AsSb on InP

X Jin<sup>1</sup>, Q Tian<sup>1</sup>, H.I.J Lewis<sup>1</sup>, X Yi<sup>2</sup>, S Xie<sup>3,5</sup>, B Liang<sup>4</sup>, D.L. Huffaker<sup>4,6</sup>, C Hing Tan<sup>1</sup> and J.P. R. David<sup>1</sup>

<sup>1</sup>*Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, S1 3JD, UK.* <sup>2</sup>*Institute of Photonics and Quantum Sciences, Heriot-Watt University, Edinburgh, EH14 4AS, UK.* <sup>3</sup>*School of Physics and Astronomy, Cardiff University, Cardiff, CF24, UK.* <sup>4</sup>*California NanoSystems Institute, University of California, Los Angeles, California, 90095, USA.* <sup>5</sup>*Microsemi ltd, Shanghai, 200001, China (Present address).* <sup>6</sup>*Electrical Engineering Department, The University of Texas at Arlington, Texas, USA (Present address)*

#### 9.00 S24\_29 Etch depth dependence on the dark current density of long-wave infrared InAs/GaSb photodiode

P O'Dowd Phanis<sup>\*1</sup>, D Kwan<sup>1,2</sup>, C Maxey<sup>2</sup>, M Kesaria<sup>1</sup>

<sup>1</sup>*School of Physics and Astronomy, Cardiff University, the Parade, Cardiff, CF24 3AA, UK, Present address:* <sup>2</sup>*Leonard UK, First Avenue, Millbrook Industrial Estate, Southampton SO15 0LG.*

#### 9.15 S24\_09 Infrared photodetectors based on pBn InGaAs/GaAsSb type-II superlattice on InP for detection in extended wavelength range

P Cao<sup>a, b</sup>, H Peng<sup>a, b</sup>, T Wang<sup>a, b</sup>, W Zheng<sup>a, b</sup>, N Davison<sup>c</sup> and Q Zhuang<sup>c</sup>

<sup>a</sup>*Laboratory of Solid-State Optoelectronics Information Technology, Institute of Semiconductors, Chinese Academy of Sciences, Beijing 100083, China.* <sup>b</sup>*State Key Laboratory on Integrated Optoelectronics, Institute of Semiconductors, Chinese Academy of Sciences, Beijing 100083, China.* <sup>c</sup>*Physics Department, Lancaster University, Lancaster UK LA1 4YB*

#### 9.30 S24\_03 ITO Bolometer with Metamaterial Perfect Absorber

K.J. Thornton<sup>\*</sup>, P Dong, S.F.J. Blair, J.S. Male, C.P. Reardon, Y Wang and T.F. Krauss

*Photonics Research Group, School of Physics, Engineering and Technology, University of York, York, YO10 5DD*

#### 9.45 S24\_18 Colloidal quantum dots photovoltaic light-emitting field-effect transistors

H Ji, P.M. Smowton and B Hou

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

### Session 5: Facilities

Centre for Student Life, Stanley Thomas Lecture Theatre; 10.00 – 11.00

#### 10.00 S24\_32 National Epitaxy Facility enabling semiconductor research in the UK

Z.K. Bishop<sup>1\*</sup>, E. Clarke<sup>1</sup>, E.M. Sala<sup>1</sup>, I. Farrer<sup>1</sup>, R.A. Oliver<sup>2</sup>, H. Liu<sup>3</sup>, M.S. Skolnick<sup>4</sup>, and J. Heffernan<sup>1</sup>

<sup>1</sup>Department of Electronic and Electrical Engineering, University of Sheffield. <sup>2</sup>Department of Materials Science and Metallurgy, University of Cambridge. <sup>3</sup>Department of Electronic and Electrical Engineering, University College London. <sup>4</sup> Department of Physics and Astronomy, University of Sheffield

10.10 ICS

*Refreshment break 10.20 – 11.00; 4<sup>th</sup> Floor*

## **Session 6: Moving Towards Integration**

Centre for Student Life, Stanley Thomas Lecture Theatre; 11.00 – 13.00

### **11.00 S24\_36 Optimisation of photonic crystal slab cavities for high Q-factor at target eigenfrequencies**

A Nilabh<sup>a\*</sup>, N Monim<sup>a</sup>, W Langbein<sup>b</sup> and F Masi<sup>a</sup>

<sup>a</sup>School of Biosciences, Cardiff University, Cardiff CF10 3AT. <sup>b</sup> School of Physics and Astronomy, Cardiff University, Cardiff CF10 3AT

### **11.15 S24\_07 Towards the fabrication of a Phase Change Material (PCM)-based phase shifter: Simulation, Design, and Fabrication**

A Shoa, F Gardes, I Zeimpekis, T.D Bucio and M Banakar

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

### **11.30 S24\_11 Design of a C-band InP based Mach-Zehnder Modulator**

Z Chen<sup>1,2\*</sup>, C.E Smith<sup>1</sup>, V Rodrigues<sup>1</sup>, X Dai<sup>1</sup>, P Pagnod-Rossiaux<sup>1</sup>

<sup>1</sup> 3SP Technologies, Route de Villejust, 91625 Nozay Cedex, France. <sup>2</sup> LTCI, Télécom Paris, Institut Polytechnique de Paris, 19 place Marguerite Perey, Palaiseau, 91120, France. <sup>3</sup> Center for High Technology Materials, University of New Mexico, Albuquerque, New Mexico, USA

### **11.45 S24\_21 Optically Controlled RF Reflective Switches**

J Yang, Y Zhang and M Cryan

*School of Electrical, Electronic and Mechanical Engineering, University of Bristol*

### **12.00 S24\_02 Analysis of Barrier-Well Tunnel Diodes for Improved Curvature Coefficient**

C Walsh and M Missous

Department of Electrical & Electronic Engineering, The University of Manchester, Manchester, M13 9PL, United Kingdom

### **12.15 S24\_06 Photonic integrated circuits for biosensing**

S. Ibrahim<sup>1,2</sup>, D. Davies-Armstrong<sup>1,2</sup>, S. Naserikarimvand<sup>3</sup>, S. Whelan<sup>4</sup>, O. J. Guy<sup>3</sup>, A. J. Bennett<sup>1,2</sup>, J. P. Hadden<sup>1,2</sup>

<sup>1</sup>School of Engineering, Cardiff University, Queens Building, The Parade, Cardiff, CF24 3AA, UK. <sup>2</sup>Translational Research Hub, Cardiff University, Maindy Road, Cathays, Cardiff, CF24 4HQ, UK. <sup>3</sup>Department of Chemistry, School of Engineering and Applied Sciences, Faculty of Science and Engineering, Swansea University, Swansea SA2 8PP, UK.

### **12.30 S24\_46 Achieving Reduced Absorption for Low Loss Passive Photonics Components by Using Ion Implantation**

Abigail Anderson<sup>1</sup>, Pawan Mishra<sup>1</sup>, Lydia Jarvis<sup>1</sup>, Fwoziah Albeladi<sup>1</sup>, Sara-Jayne Gillgrass<sup>1</sup>, Nianhua Peng<sup>2</sup>, Mingchu Tang<sup>3</sup>, Huiyun Liu<sup>3</sup>, Samuel Shutts<sup>1</sup>, and Peter M. Snowton<sup>1</sup>

<sup>1</sup> School of Physics and Astronomy, Cardiff University, The Parade, Cardiff. CF24 3AA. United Kingdom.

<sup>2</sup> Surrey Ion Beam Centre, University of Surrey, Guildford, Surrey, United Kingdom.

<sup>3</sup> Department of Electrical Engineering, University College London, London, United Kingdom.

### 12.45 S24\_24 A study of the effects of Micro-Transfer Printing on the Performance of SAM Avalanche Photodiodes

Y Alimi<sup>1</sup>, B Guilhabert<sup>2</sup> and M Strain<sup>2</sup>

<sup>1</sup>Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, S1 3JD, UK. <sup>2</sup>Institute of Photonics, Dept. of Physics, University of Strathclyde, Technology and Innovation Centre, 99 George Street, Glasgow, G1 1RD

*Lunch 13.00 – 14.00; 4<sup>th</sup> Floor*

## Session 7: Material Characterisation

Centre for Student Life, Stanley Thomas Lecture Theatre; 14.00 – 15.00

### 14.00 S24\_47 QuickSEs Enabling Rapid Feedback to Epitaxy

J. Baker<sup>1</sup>, C. P. Allford<sup>1</sup>, S. Gillgrass<sup>1</sup>, J. I. Davies<sup>2</sup>, S. Shutts<sup>1</sup>, P. M. Snowton<sup>1,3</sup>

<sup>1</sup> Future Compound Semiconductor Manufacturing Hub, Cardiff University, UK.

<sup>2</sup> IQE plc, Cardiff, UK.

<sup>3</sup> Institute for Compound Semiconductors, Cardiff University, UK.

### 14.15 S24\_31 Time-of-Flight Elastic Recoil Detection Analysis and Rutherford Backscattering Spectrometry to Characterise Al<sub>x</sub>Ga<sub>1-x</sub>As<sub>1-y</sub>Bi<sub>y</sub> Avalanche Photodetectors

C. McAleese<sup>1</sup>, M. K. Sharpe<sup>1</sup>, M. R. Carr<sup>2</sup>, J. P. R. David<sup>2</sup> and R. D. Richards<sup>1</sup>

<sup>1</sup>Ion Beam Centre, Advanced Technology Institute, University of Surrey, Guildford, GU2 7XH, UK. <sup>2</sup>Electronic and Electrical Engineering Department, The University of Sheffield, Sheffield, S1 3JD, UK

### 14.30 S24\_04 Extended defects characterisation of 50 mm GaN wafer using electron channelling contrast imaging in a scanning electron microscope

K. Nicholson<sup>1</sup>, D. Muir<sup>2</sup> and N. Gunasekar<sup>1</sup>

<sup>1</sup> School of Physics and Astronomy, Cardiff University, Cardiff CF24 3AA, United Kingdom

<sup>2</sup> School of Earth and Environmental Sciences, Cardiff University, Cardiff CF10 3AT, United Kingdom

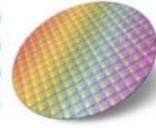
### 14.45 S24\_14 Holographic measurement of the gain of semiconductor waveguides

L. Zens,<sup>1</sup> V. Besaga,<sup>2</sup> J. Möller,<sup>1</sup> N. C. Gerhardt,<sup>1</sup> and M. R. Hofmann<sup>1</sup>

<sup>1</sup>Ruhr-University Bochum, Universitaetsstr. 150, 44801 Bochum, Germany. <sup>2</sup>Friedrich Schiller Universität Jena, Abbe Center of Photonics, Albert-Einstein-Straße 6, 07745 Jena, Germany

*Refreshment break 15.00 – 15.30; 4<sup>th</sup> Floor*





**Session 8: Lasers and Applications I**

Centre for Student Life, Stanley Thomas Lecture Theatre; 15.30 – 17.00

**15.30 S24\_13 Room Temperature Lasing from GaAs/InGaAs/InGaP Quantum Well Nanowires**

B Temu, Z Yan, B-P Ratiu, K. M Wong, S Soon Oh and Q Li

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

**15.45 S24\_48**

M. Alsayyadi

*EPSRC Future Compound Semiconductor Manufacturing Hub, School of Physics and Astronomy, Cardiff University, Cardiff, UK, CF24 3AA*

**16.00 S24\_16 Optimizing Distributed-Feedback Quantum Cascade Lasers: Comprehensive Insights into Spatial Hole Burning and Linewidth Enhancement Factor Impact**

S. Zaminga<sup>1\*</sup>, L. Columbo<sup>2</sup>, C. Silvestri<sup>3</sup>, M. Gioannini<sup>2</sup>, and F. Grillot<sup>1,4</sup>

*<sup>1</sup>LTCI Télécom Paris, Institut Polytechnique de Paris, Palaiseau, 91120, France. <sup>2</sup>Dipartimento di Elettronica e Telecomunicazioni, Politecnico di Torino, Torino, Italy. <sup>3</sup>School of Electrical Engineering and Computer Science, The University of Queensland, Brisbane, Australia. <sup>4</sup>Center for High Technology Materials, University of New-Mexico, Albuquerque, NM 87106, USA*

**16.15 S24\_15 Mid-Infrared InAs/GaInSb W-Quantum Well based Interband Cascade Lasers**

M. Bentley<sup>\*1</sup>, P. Ghosh<sup>1</sup>, P. J. Carrington<sup>2</sup>, Q. Zhuang<sup>1</sup>

*<sup>1</sup>Department of Physics, Lancaster University, LA1 4YB. <sup>2</sup>School of Engineering, Lancaster University, LA1 4YW*

**16.30 S24\_23 Hybrid Integration of Mid-IR Quantum Cascade Lasers on Ge-on-Si Platform**

L Zhou<sup>1</sup>, K M Groom<sup>1</sup>, D.G Revin<sup>1</sup>, C.J Mitchell<sup>2</sup>, G Mashanovich<sup>2</sup>, J Heffernan<sup>1</sup>

*<sup>1</sup>Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, S1 3JD, UK.*

*<sup>2</sup>Optoelectronics Research Centre, University of Southampton, Southampton, SO17 1BJ, UK*

**16.45 S24\_22 Diode Area Melting and the Opportunities for Advanced Optoelectronics in Additive Manufacturing**

K Groom<sup>1</sup>, S. Veetil<sup>1</sup>, Z. Zhang<sup>1</sup>, L. Zhou<sup>1</sup>, J. Willmott<sup>1</sup>, I. Wraith<sup>1</sup>, M. Alsaddah<sup>2</sup>, A. Aydin<sup>2</sup>, A.Liang<sup>2</sup>, R. Brown<sup>2</sup>, H. Caglar<sup>2</sup>, C. Majewski<sup>2</sup>, K. Mumtaz<sup>2</sup>

*<sup>1</sup>Dept. of Electronic & Electrical Engineering, University of Sheffield, S1 3JD. <sup>2</sup>Dept. of Mechanical Engineering, University of Sheffield, S1 3J*

*Break and walk to venue*

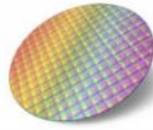
**Conference Banquet Reception**

The Conerstone 18.45 – 19.45

**Conference Banquet**



**SIOE 2024**



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The Conerstone; 19.45 onwards

## *Programme, Thursday 4<sup>th</sup> April*

### **Session 9: Lasers and Applications II**

Centre for Student Life, Stanley Thomas Lecture Theatre; 9.00 – 10.30

#### **9.00 S24\_49 High Temperature Operation of O-band InAs Quantum Dot Laser**

Pawan Mishra<sup>1</sup>, Lydia Jarvis<sup>1</sup>, Chris Hodges<sup>1</sup>, Abigail Enderson<sup>1</sup>, Fwoziah Albeladi<sup>1</sup>, Sara-Jayne Gillgrass<sup>1</sup>, Richard Forrest<sup>1</sup>, Craig P. Allford<sup>1</sup>, Mingchu Tang<sup>2</sup>, Huiyun Liu<sup>2</sup>, Samuel Shutts<sup>1</sup>, and Peter M. Smowton<sup>1</sup>

<sup>1</sup> School of Physics and Astronomy, Cardiff University, The Parade, Cardiff. CF24 3AA. United Kingdom.

<sup>2</sup> Department of Electrical Engineering, University College London, London, United Kingdom.

#### **09.15 S24\_50 Improving the performance of p-doped QD lasers and modulators**

L Jarvis<sup>1</sup>, B.C. Maglio<sup>2</sup>, F Albeladi<sup>1</sup>, S-J Gillgrass<sup>1</sup>, C.P. Allford<sup>1</sup>, MTang<sup>3</sup>, H Liu<sup>3</sup>, S Shutts<sup>1</sup>, and P.M. Smowton<sup>1,\*</sup>

<sup>1</sup>. School of Physics and Astronomy, Cardiff University, The Parade, Cardiff. CF24 3AA. United Kingdom. <sup>2</sup>.

Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, AK 99775, United States of America. <sup>3</sup>.

Department of Electrical Engineering, University College London, London, United Kingdom.

#### **09.30 S24\_25 1.3 $\mu\text{m}$ Optically Pumped Quantum Dot Photonic Crystal Laser Designed at Bounded States in the Continuum**

D. Lei, J Wang, N. C. Panoiu, H Liu

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

#### **9.45 S24\_52 1390nm Dilute Nitride VCSELs on 150mm GaAs**

I.F Obuseli<sup>1</sup>, C.P Allford<sup>1</sup>, S. Gillgrass<sup>1</sup>, A. Clark<sup>3</sup>, K. Nunna<sup>3</sup>, J.I Davies<sup>2</sup> and P.M Smowton<sup>1</sup>

<sup>1</sup> EPSRC Future Compound Semiconductor Manufacturing Hub, School of Physics and Astronomy, Cardiff University, Cardiff, UK, CF24 3AA

<sup>2</sup> IQE NC, Gallimore Dairy Road, Greensboro, NC 27409, USA

<sup>3</sup> IQE plc, Pascal Close, St. Mellons, Cardiff, UK, CF3 0LW

#### **10.00 S24\_41 GaSb/GaAs Quantum-Ring Vertical-Cavity Surface-Emitting Lasers Approaching 1.3- $\mu\text{m}$ Emission**

S. Jones, P. D. Hodgson, and M. Hayne

Department of Physics, Lancaster University, Lancaster LA1 4Y

#### **10.15 S24\_28 Bidirectional Widely Tuneable 1310 nm MEMS VCSEL**

M Payandeh \*, H.K Sahoo and E Semenova

Department of Electrical and Photonic Engineering, Technical University of Denmark, 2800 Kgs. Lyngby, Denmark

*Refreshment break 10.30 – 11.00; 4<sup>th</sup> Floor*

## **Session 10: Lasers and Applications III**

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

### **11.00 S24\_52 1st Order Gratings for Laterally Coupled DFB lasers Fabricated with E-Beam and Focused Ion Beam Lithography**

B. Salmond<sup>1</sup>, T. Peach<sup>2</sup>, D. Read<sup>1,3</sup>, D. John<sup>3</sup>, B. Mitchell<sup>3</sup>, B. Thibeault<sup>3</sup>, T. Richter<sup>4</sup>, A. Nadzeyka<sup>4</sup>, P. Mazarov<sup>4</sup>, F. Meyer<sup>4</sup>, J. Fridmann<sup>4</sup>, Y. Yu<sup>4</sup>, W. Meredith<sup>5</sup>, M. Wale<sup>6</sup>, P. Smowton<sup>1,2</sup> and S. Shutts<sup>1,2</sup>

<sup>1</sup>School of Physics and Astronomy, Cardiff University, Cardiff CF24 3AA, UK. <sup>2</sup>Institute for Compound Semiconductors (ICS), Translational Research Hub, Maindy Road, Cardiff CF24 4HQ, UK. <sup>3</sup>Department of Electrical and Computer Engineering, University of California Santa Barbara, Santa Barbara, CA 93106, USA. <sup>4</sup>Raith GmbH, Konrad-Adenauer-Allee 8, 44263 Dortmund, Germany. <sup>5</sup>Compound Semiconductor Centre Ltd, St Mellons, Cardiff CF3 0LW. <sup>6</sup>Department of Electronic and Electrical Engineering, University College London, London WC1E 7JE

### **11.15 S24\_53 Thermal Performance of VCSELs on Germanium Substrates**

J. Baker<sup>1</sup>, C. P. Allford<sup>1</sup>, S. Gillgrass<sup>1</sup>, J. I. Davies<sup>2</sup>, S. Shutts<sup>1</sup>, P. M. Smowton<sup>1,3</sup>

<sup>1</sup> Future Compound Semiconductor Manufacturing Hub, Cardiff University, UK.

<sup>2</sup> IQE plc, Cardiff, UK.

<sup>3</sup> Institute for Compound Semiconductors, Cardiff University, UK.

### **11.30 S24\_33 Semiconductor Lasers Subject to Frequency Modulated Optical Injection**

K. A. Shore<sup>(1)</sup>, Y. Fan<sup>(2)</sup> and Y. Hong<sup>(1)</sup>

<sup>(1)</sup> Bangor University, School of Computer Science and Electronic Engineering, LL57 1UT, Wales, UK. <sup>(2)</sup> Hangzhou Institute of Technology, Xidian University, Hangzhou, 311200, China;

### **11.45 S24\_30 Time-dependent flip-flop spiking memory in RTD neurons**

G. Donati\*, D. Owen-Newns, J. Robertson and A. Hurtado

*Institute of Photonics, Dept. of Physics, University of Strathclyde, Glasgow, UK*

### **12.00 S24\_01 Chaos-Based Photonic Information-Processing Platforms: Capabilities and Challenges**

K. A. Shore<sup>(1)</sup>, P. Li<sup>(2,3)</sup> and Y. C. Wang<sup>(2)</sup>

<sup>(1)</sup> Bangor University, School of Computer Science and Electronic Engineering, LL57 1UT, Wales, UK <sup>(2)</sup> Guangdong Provincial Key Laboratory of Photonics Information Technology, School of Information Engineering, Guangdong University of Technology, Guangzhou 510006, China <sup>(3)</sup> Key Laboratory of Advanced Transducers and Intelligent Control System, Ministry of Education, Taiyuan University of Technology, Taiyuan

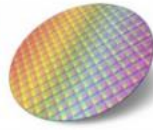
### **12.15 S24\_19 Optical VCSEL-based Spiking Neural Networks for High-Speed Target Detection and Tracking**

J. Robertson,<sup>1\*</sup> P. Kirkland,<sup>2</sup> G. Di Caterina,<sup>2</sup> and A. Hurtado<sup>1</sup>

<sup>1</sup>Institute of Photonics, Dept. of Physics, University of Strathclyde, Glasgow, UK, <sup>2</sup>Dept of Electronic and Electrical Engineering, University of Strathclyde, Glasgow, UK



**SIOE 2024**



**Semiconductor and Integrated Opto-Electronics Conference**

*Lunch 12.30 – 13.30; 4<sup>th</sup> Floor*

**Conference Ends**