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**Virtual special issue dedicated to the 10th International Conference on Materials for Advanced Technologies (ICMAT), Symposium C: Semiconductor Photonics**

This Special Issue is associated with the 10th International Conference on Materials for Advanced Technologies (ICMAT), Symposium C: Semiconductor Photonics held on 23-28 June, 2019 at Marina Bay Sands in Singapore. Organised through the Materials Research Society of Singapore (MRS-S), ICMAT has been held since 2001 and has attracted strong interest amongst the global materials science and engineering research communities. The 10th conference in the ICMAT series attracted over 3,500 delegates with a number of keynote and plenary presentations notably including four Nobel Laureates in Physics and Chemistry. The ICMAT conference consists of a number of topical symposia. Symposium C was organized jointly with Australian MRS and co-chaired by Professors Dao-Hua ZHANG, C. JAGADISH, Stephen SWEENEY, Boon S. OOI, Hao GONG and Weijun FAN. The Symposium focused on recent developments in materials for applications in photonic devices covering systems including III-V and II-VI semiconductors, group IV alloys for silicon compatibility, oxides and perovskites for solar cell and emitter applications, quantum dot based devices and in general a wide variety of organic and inorganic materials spanning applications from the ultra-violet through to the mid-infrared. In total, 20 invited and 53 oral and 19 poster papers were presented over the four days of technical sessions.

All presenters at the symposium were provided with the opportunity to submit papers for this special issue. As a result, this issue contains 14 papers (full list below) covering a cross-section of the topics presented at the conference. As the papers span several published editions of the journal, they are referred to collectively as a virtual special issue. Many of the papers focus on the development of visible and ultra-violet emitters and detectors utilizing, for example, nitride and oxide-based systems. At the opposite end of the spectrum, papers focus on narrow gap III-V alloys as well as GeSn alloys; an emerging system for silicon compatible mid-infrared photonic devices. Plasmonic, resonant and metamaterials also feature for applications including biosensing and long wavelength photodetection. Quantum dots, rods and related nanostructures based on a variety of materials systems are discussed in terms of their basic properties and applications, for example in display technologies. Collectively, these papers provide an insight into the areas of interest at the conference.

The Guest Editors of this special issue are extremely grateful to the Editor-in-Chief, Prof. Hon Ki Tsang, for his support and encouragement in producing this issue. We also thank all of the authors and reviewers as well as the entire journal production team at the IEEE Photonics Society for their help and support in preparing this ICMAT special issue.

Guest Editors:
Prof. Stephen John Sweeney (University of Surrey, UK)
Prof. Weijun Fan (Nanyang Technological University, Singapore)
Prof. Boon S. Ooi (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)
Prof. Dao Hua Zhang (Nanyang Technological University, Singapore)

## APPENDIX

## RELATED WORKS

1) L. Chen et al., "A quantum dot polarizer for liquid crystal displays with much improved efficiency and viewing angle," IEEE J. Quantum Electron., vol. 55, no. 6, Dec. 2016, Art. no. 7000206, doi: 10.1109/ jqe.2019.2948998.

2) Z. Zhou et al., "Highly polarized active fluorescent enhancement polymer film with quantum rods aligned by ink-jet printing," IEEE J. Quantum Electron., vol. 55, no. 6, Dec. 2019, Art. no. 710026, doi: 10.1109/ jqe.2019.2947569.

3) J. Tong, F. Suo, L. Qian, and D. H. Zhang, "Asymmetric split H-shape resonator array for enhancement of midwave infrared photodetection," IEEE J. Quantum Electron., vol. 55, no. 6, Dec. 2019, Art. no. 4000406, doi: 10.1109/jqe.2019.2947616.

4) L. Qian, J. Tong, W. Fan, J. S. Pan, and D. H. Zhang, "Growth of direct bandgap Ge1−x Snx alloys by modified magnetron sputtering," IEEE J. Quantum Electron., vol. 56, no. 1, Feb. 2020, Art. no. 7100104, doi: 10.1109/jqe.2019.2956347.

5) Q. Chen, Z. Song, D. Zhang, H. Sun, and W. Fan, "Effect of size on the electronic structure and optical properties of cubic CsPbBr3 quantum dots," IEEE J. Quantum Electron., vol. 56, no. 1, Feb. 2020, Art. no. 7000207, doi: 10.1109/jqe.2019.2949639.

6) F. Suo, J. Tong, and D. H. Zhang, "Dark current analysis of InAsSbbased hetero-p-i-n mid-infrared photodiode," IEEE J. Quantum Electron., vol. 56, no. 1, Feb. 2020, Art. no. 4400106, doi: 10.1109/jqe. 2019.2952388.

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8) J. Agrawal, T. Dixit, I. A. Palani, and V. Singh, "Development of reliable and high responsivity ZnO-based UV-C photodetector," IEEE J. Quantum Electron., vol. 56, no. 1, Feb. 2020, Art. no. 4000105, doi: 10.1109/ jqe.2019.2957584.

9) A. Tripathi, J. Agrawal, T. Dixit, and V. Singh, "Trap assisted persistent photo-conductivity in solution-processed CuO thin film," IEEE J. Quantum Electron., vol. 56, no. 1, Feb. 2020, Art. no. 7000105, doi: 10.1109/ jqe.2019.2952385.

10) S. Chattaraj, J. Zhang, S. Lu, and A. Madhukar, "On-chip integrated single photon source-optically resonant metastructure based scalable quantum optical circuits," IEEE J. Quantum Electron., vol. 56, no. 1, Feb. 2020, Art. no. 9300109, doi: 10.1109/jqe.2019.2952387.

11) Z. Song et al., "Band structure of strained Ge1−x Snx alloy: A fullzone 30-band k · p model," IEEE J. Quantum Electron., vol. 56, no. 1, Apr. 2020, Art. no. 7100208, doi: 10.1109/JQE.2019.2947710.

12) C. Xing et al., "Performance improvement of AlGaN-based deep ultraviolet light-emitting diodes with step-like quantum barriers," IEEE J. Quantum Electron., vol. 56, no. 1, Feb. 2020, Art. no. 3300106, doi: 10.1109/jqe.2019.2956344.

13) L. Qian et al., "GeSn/GaAs hetero-structure by magnetron sputtering," IEEE J. Quantum Electron., vol. 56, no. 2, Apr. 2020, Art. no. 4000105, doi: 10.1109/jqe.2019.2963057.

14) A. M. Soehartono, L. Y. M. Tobing, A. D. Mueller, K.-T. Yong, and D. H. Zhang, "Resonance modes of tall plasmonic nanostructures and their applications for biosensing," IEEE J. Quantum Electron., vol. 56, no. 2, Apr. 2020, Art. no. 7200107, doi: 10.1109/jqe.2019. 2958362.

**Stephen John Sweeney** is a full Professor of Physics at the University of Surrey. He received BSc and PhD degrees in physics from the Universities of Bath and Surrey in 1995 and 1999, respectively. His group focuses on the development of novel and low dimensional semiconductor materials and photonic devices operating from the visible through to the mid-infrared. He also serves as Chief Technology Officer for ZiNIR Ltd. His previous roles include Lead Scientist for Marconi Optical Components and he has held Visiting Professor positions at Arizona State University, Philipps University, Marburg, Kyoto Institute of Technology and the University of Wollongong. He has published >300 journal and conference papers, 16 book chapters and 14 patents. He is Associate Editor for IEEE Journal of Quantum Electronics and Editor of Springer-Nature Journal of Materials Science: Materials in Electronics. He was an EPSRC Leadership Fellow from 2009-2015, was President of the British Science Association (Physics & Astronomy) in 2015, served as Head of the Physics Department at the University of Surrey from 2015-2018 and was a JSPS Invitational Fellow in 2019. He is a Fellow of SPIE and the Institute of Physics (UK) and a Senior Member of the IEEE.

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