JQE Special Virtual Issue Dedicated to the 21st European Conference on Integrated Optics (ECIO)

THIS Special Issue is associated with the European Conference on Integrated Optics (ECIO), held on April 24–26, 2019, in Ghent, Belgium. This conference was the 21st in a series that started in London in 1981. The conference, hosted by Ghent University, was attended by about 240 participants. The conference was launched by the keynote speakers, Dr. Chris Doerr of Acacia Communications and Dr. Mark Thompson of the University of Bristol, who presented recent developments on photonic integrated components and circuits for coherent communications and quantum computing, respectively. The conference boasted 27 excellent invited speakers, covering diverse subjects in the booming field of photonic integration, along with 44 regular oral papers and 71 poster presentations.

The oral presenters of the conference were given the opportunity to submit papers for this special issue. As a result, this Special Issue now contains 15 papers that cover a diverse range of subjects in the field. Due to varied submission and review timeline, they appeared in different published journal issues, as shown in the Appendix. Most papers focus on basic components and circuits, based on both mainstream material platforms such as silicon-on-insulator, silicon nitride, and indium phosphide as well as on more specialized materials such as rare earth doped oxides. Noteworthy are the papers with focus on InP-membrane devices exploiting high-index-contrast concepts, the paper on MEMS approaches in silicon photonics, particularly for low-power reconfigurable circuits, and the paper on the use of new approaches for heterogeneous integration of InP on silicon by means of micro-transfer-printing.

The guest editors are thankful to the Editor-in-Chief Prof. Hon Ki Tsang, for providing the opportunity to dedicate this special issue to ECIO2019, to all authors and reviewers, and to the IEEE Photonics Society staff for supporting and managing the entire work flow.

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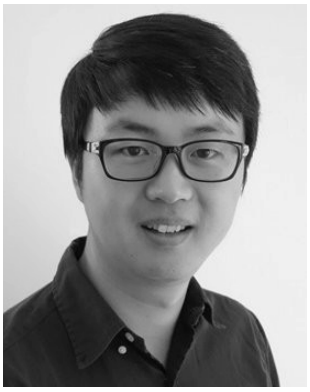
APPENDIX
RELATED WORK

1) J. C. Norman *et al.*, "The importance of p-doping for quantum dot laser on silicon performance," *IEEE J. Quantum Electron.*, vol. 55, no. 6, pp. 1–11, Dec. 2019.
2) K. Shortiss, M. Dernaika, M. Shayesteh, and F. H. Peters, "The effect of relaxation oscillations in integrated optical comb demultiplexers based on injection locking," *IEEE J. Quantum Electron.*, vol. 55, no. 6, pp. 1–6, Dec. 2019, doi: 10.1109/jqe.2019.2942053.
3) Z. Wang *et al.*, "Optical frequency comb generation using CMOS compatible cascaded Mach–Zehnder modulators," *IEEE J. Quantum Electron.*, vol. 55, no. 6, pp. 1–6, Oct. 2019, doi: 10.1109/JQE.2019.2948152.
4) S. F. G. Reniers, Y. Wang, K. A. Williams, J. J. G. M. Van Der Tol, and Y. Jiao, "Characterization of waveguide photonic crystal reflectors on indium phosphide membranes," *IEEE J. Quantum Electron.*, vol. 55, no. 6, pp. 1–7, Dec. 2019.
5) I. Degli-Eredi and M. J. R. Heck, "Experimental demonstration of a novel microwave photonics ring modulator with reduced driving power," *IEEE J. Quantum Electron.*, vol. 56, no. 1, pp. 1–11, Feb. 2020, doi: 10.1109/jqe.2019.2952581.
6) R. Loi *et al.*, "Edge-coupling of O-band InP etched-facet lasers to polymer waveguides on SOI by micro-transfer-printing," *IEEE J. Quantum Electron.*, vol. 56, no. 1, pp. 1–8, Feb. 2020, doi: 10.1109/jqe.2019.2958365.
7) C. Porzi, G. J. Sharp, M. Sorel, and A. Bogoni, "Silicon photonics high-order distributed feedback resonators filters," *IEEE J. Quantum Electron.*, vol. 56, no. 1, pp. 1–9, Feb. 2020, doi: 10.1109/jqe.2019.2960560.
8) Z. Zhang, Y. Wang, and H. K. Tsang, "Ultracompact 40-channel arrayed waveguide grating on silicon nitride platform at 860 nm," *IEEE J. Quantum Electron.*, vol. 56, no. 1, pp. 1–8, Feb. 2020, doi: 10.1109/jqe.2019.2951034.
9) Y. Tong, W. Zhou, X. Wu, and H. K. Tsang, "Efficient mode multiplexer for few-mode fibers using integrated silicon-on-insulator waveguide grating coupler," *IEEE J. Quantum Electron.*, vol. 56, no. 1, pp. 1–7, Feb. 2020, doi: 10.1109/jqe.2019.2950126.
10) N. Quack *et al.*, "MEMS-enabled silicon photonic integrated devices and circuits," *IEEE J. Quantum Electron.*, vol. 56, no. 1, pp. 1–10, Feb. 2020, doi: 10.1109/jqe.2019.2946841.
11) J. J. G. M. Van Der Tol, Y. Jiao, J. P. Van Engelen, V. Pogoretskiy, A. A. Kashi, and K. Williams, "InP membrane on silicon (IMOS) photonics," *IEEE J. Quantum Electron.*, vol. 56, no. 1, pp. 1–7, Feb. 2020, doi: 10.1109/jqe.2019.2953296.
12) D. Benedikovic *et al.*, "Comprehensive study on chip-integrated germanium pin photodetectors for energy-efficient silicon interconnects," *IEEE J. Quantum Electron.*, vol. 56, no. 1, pp. 1–9, Feb. 2020, doi: 10.1109/jqe.2019.2954355.
13) A. Ruiz-Caridad *et al.*, "Erbium-doped Yttria-stabilized Zirconia thin layers for photonic applications," *IEEE J. Quantum Electron.*, vol. 56, no. 2, pp. 1–7, Apr. 2020, doi: 10.1109/jqe.2019.2955943.
14) R. C. Guzman, J. C. Cuello, A. Zarzuelo, M. C. Lo, M. Ali, and G. Carpintero, "100 GHz multiple colliding pulse generation from cleaved facet-free multi-section semiconductor laser diode," *IEEE J. Quantum Electron.*, vol. 56, no. 2, pp. 1–8, doi: 10.1109/jqe.2019.2959528.
15) Y. Li, H. Zhao, A. Raza, S. Clemmen, and R. Baets, "Surface-enhanced Raman spectroscopy based on plasmonic slot waveguides with free-space oblique illumination," *IEEE J. Quantum Electron.*, vol. 56, no. 1, pp. 1–8, doi: 10.1109/JQE.2019.2946839.

Roel Baets (Fellow, IEEE) received the M.Sc. degree from Ghent University (UGent), the M.Sc. degree from Stanford University, and the Ph.D. degree from UGent. He is a Full Professor with UGent, where he leads a mixed IMEC team. He has also held part-time faculty positions at the Delft University of Technology and the Eindhoven University of Technology. For more than 35 years, he was involved in the fields of integrated photonics and multiple material platforms, including silicon and silicon nitride III–V. He has made diverse scientific contributions to this field and its applications, and spin-off creations in telecom, datacom, and sensing. He has led major research projects in silicon photonics in Europe, and founded ePIXfab, the globally first Multi-Project-Wafer service for silicon photonics and now the European Silicon Photonics Alliance. In recent years, his research has focused on medical and environmental sensing applications of silicon photonics. He is an ERC Grantee of the European Research Council and a Methusalem Grantee of the Flemish Government. He is a fellow of the European Optical Society (EOS) and The Optical Society (OSA). He is also a member of the Royal Flemish Academy of Belgium for Sciences and the Arts. He is currently the Director-at-Large of the Board of Directors, The Optical Society (OSA). He was a recipient of the 2011 MOC Award, the 2018 PIC-International Lifetime Achievement Award, and the the 2020 John Tyndall Award.

Gunther Roelkens received the degree in electrical engineering from Ghent University, Belgium, in 2002, and the Ph.D. degree from the Department of Information Technology (INTEC), Ghent University, in 2007, where he is currently a Full Professor. In 2008, he was a Visiting Scientist with the IBM T. J. Watson Research Center, New York. From 2010 to 2016, he was a Professor with the Eindhoven University of Technology. His research interests include the heterogeneous integration of III–V semiconductors and other materials on the top of silicon waveguide circuits, and electronic/photonic co-integration. He is pioneering the use of micro-transfer printing for heterogeneously integrated photonic integrated circuits. He has received the ERC Starting Grant (MIRACLE), to start up research in the field of integrated mid-infrared photonic integrated circuits. He has supervised 22 Ph.D. theses. He is currently leading a group of 20 Ph.D. and post-doctoral students. He was a recipient of the Andreas De Leenheer Award for the Outstanding Young Researcher and Laureate of the Royal Flemish Academy of Belgium of Sciences and Arts–Engineering in 2018.



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