

Guest Editorial

JQE Special Virtual Issue Dedicated to the 23rd European Conference on Integrated Optics

THIS Special Issue is associated with the European Conference on Integrated Optics (ECIO), held on May 4–6, 2022, in Milan, Italy. This conference was the 23rd in a series that started in London in 1981. After the virtual edition of 2020 and the cancellation of the 2021 edition due to the COVID-19 pandemic emergency, the 2022 ECIO conference was hosted fully in presence by Politecnico di Milano and was attended by about 250 participants. The scientific sessions of the conference were opened by two plenary speakers, Prof. Volker Sorger of George Washington University, USA, and Prof. Paul Prucnal of Princeton University, USA, who presented recent developments on integrated photonics for machine learning, high-performance computing, and neural networks.

The key message from ECIO 2022 is that “Although optical communications continue to be the main driver for integrated photonics, new applications are emerging in computing and neural networks” as stated by G. Pitruzzello on *Nature Photonics* <https://www.nature.com/articles/s41566-022-01049-0>.

The conference program included four keynote speakers, 18 invited speakers, 52 regular talks, 67 poster presentations, and 14 exhibitors. The conference covered leading-edge topics in integrated optics, from advanced optical materials and photonic platforms for new wavelength ranges to emerging applications in the field of communications, (bio)sensing, ranging, computing, and quantum optics.

The speakers of the conference were given the opportunity to submit their work for publication in this Special Issue. The published articles in IEEE JOURNAL OF QUANTUM ELECTRONICS cover many different subjects in the field, such as the investigation of the optical properties of novel materials

and waveguide structures, flip-chip bonding and hybrid integration of passive/active photonic chips for integrated laser sources, novel photodetector concepts for light monitoring on a chip, nonreciprocal and magnetic devices integrated into optical waveguides, and unconventional on-chip interconnect networks.

The Guest Editors are thankful to the Editor-in-Chief, Prof. Hon Ki Tsang, for providing the opportunity to dedicate this Special Issue to ECIO 2022, to all authors and reviewers, and to the IEEE Photonics Society staff for supporting and managing the entire workflow.

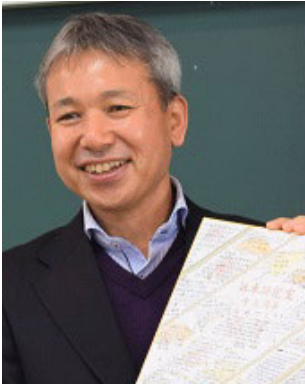
FRANCESCO MORICHETTI, *Guest Editor*
Dipartimento di Elettronica, Informazione
e Bioingegneria
Politecnico di Milano
20133 Milan, Italy

ANDREA MELLONI, *Guest Editor*
Dipartimento di Elettronica, Informazione
e Bioingegneria
Politecnico di Milano
20133 Milan, Italy

KIICHI HAMAMOTO, *Guest Editor*
Department of Advanced Energy Science
and Engineering
Kyushu University
819-0395 Fukuoka, Japan



Francesco Morichetti received the M.Sc. degree in 2001 and the Ph.D. degree in 2008. He is currently an Associate Professor with Politecnico di Milano, where he is also the Head of the Photonics Devices Laboratory. He is the author/coauthor of three chapters of international books, 90 peer-reviewed publications in international journals, more than 200 publications in proceedings of international conferences, and ten international patents in the field of integrated optics. His main interests are in optical devices and photonic integrated circuits for applications in the field of optical communications, interconnects, and sensing. His recent research interests are in programmable photonic circuits and the development of automated control and calibration techniques for reconfigurable optics. He has been involved in leading roles in several EU projects (FP6, FP7, and H2020). Since 2010, he has been a member of the Scientific Panel of Spotlight on Optics (Optica).



Kiichi Hamamoto (Senior Member, IEEE) received the B.Eng. and M.Eng. degrees in electrical engineering from Waseda University, Tokyo, Japan, in 1986 and 1988, respectively, and the Dr. (Sc. Techn.) degree in electrical engineering from the Swiss Federal Institute of Technology (ETH-Zürich), Zürich, Switzerland, in 2000. In 1988, he joined the NEC Opto-Electronics Laboratories, where he did research on optoelectronic devices, including optical switches, semiconductor optical amplifiers, laser diodes, and photonic integrated circuits. From 1996 to 1997, he was a Guest Researcher with ETH-Zürich. He was also a Guest Researcher with the Technical University of Denmark (DTU) in 2003. He has been a Full Professor with Kyushu University, Japan, since 2005. His current research interests are photonic-integrated circuits for bio-sensors, space-division-multiplexing devices, and high-speed direct modulation laser diodes. He is a fellow of Optica and IEICE. He received the MOC Contribution Award in 2019. He has been the General Co-Chairs of MOC2018, Taipei, Taiwan, OECC/PSC2019, Fukuoka, Japan, and MOC2024, Kaohsiung, Taiwan.



Andrea Melloni (Member, IEEE) is currently a Full Professor with the Chair in Electromagnetic Fields, Politecnico di Milano, Italy, the Leader of the Photonic Devices Group, and the Director of Polifab, the facility for micro and nano technologies with Politecnico di Milano. He is the author of more than 400 publications, 18 patents, and three book chapters. His field of research is in integrated optical devices for optical communication, sensing, and optical processing. Currently, he is focusing on adaptive control, stabilization, and testing of large photonic integrated circuits. He is a fellow of OSA.