Guest Editorial: Microwave Photonics

We are pleased to provide our readers a special issue on microwave photonics in the Journal of Lightwave Technology (JLT). Microwave photonics is an interdisciplinary field that studies the interaction between light wave and electrical wave for the generation, processing, control and distribution of microwave signals by means of photonics. For the last few years, extensive research activities have been carried out throughout the world and excellent research results have been achieved. This special issue is intended to provide a venue for our researchers to report their latest findings and results in microwave photonics, covering microwave photonic devices, sub-systems, systems, and networks. In particular, recent advances in integrated microwave photonics and microwave photonics techniques for 5G are highlighted.

This special issue has 9 invited articles and 47 contributed articles, with 10 from Americas, 26 from Asia-Pacific and 20 from Europe. The invited articles were selected from the top-scored, post-deadline or invited papers presented at the 2017 International Topical Meeting on Microwave Photonics (MWP 2017) held on October 23–26 in Beijing, China. All papers were reviewed with a rigorous selection process with the help and support from our dedicated reviewers. Integrated microwave photonics is the focus of this special issue. Seven out of the nine invited articles are directly related to integrated microwave photonics. Specifically, Zhang et al. reported a silicon-based photonic integrated optoelectronic oscillator, and Hao et al. reported an InP-based photonic integrated optoelectronic oscillator; both papers were post-deadline papers of MWP 2017. Lo et al. reported an InP-based monolithically integrated microwave synthesizer. Perez et al. reported a photonic integrated programmable true-time delay network for microwave photonics. A high-quality tunable microwave photonic filter based on integrated optical phase lock loop was reported by Balakier et al. A coherent LiDAR based on CMOS-compatible photonic integrated circuit was reported by Martin et al. Solutions to characterize wideband optical discrete or on-chip devices for microwave photonic system applications were reported by Zhang et al. The last two invited papers reported microwave systems using discrete components, including one by Zou et al. to demonstrate a microwave photonic system for high-speed railway applications, and the other by Onori et al. to demonstrate a broadband tunable microwave receiver based on photonic direct conversion.

As Guest Editors, we would like to take this opportunity to thank our authors for their efforts in preparing and submitting their high-quality papers to this special issue. We would also like to thank our dedicated reviewers for their efforts in evaluating the manuscripts in an expedited and quality manner, to ensure high quality of the articles for the special issue and to meet the tight schedule. We appreciate the support from the Editor-in-Chief, Peter Winzer, to offer us the opportunity to publish this special issue in JLT, and the tremendous efforts from the Publication Coordinator, Douglas Hargis, to make it possible to publish this special issue as scheduled.

We hope this special issue will give our readers and researchers up-to-date information about microwave photonics, with new insight in this exciting and fast growing field.

Jianping Yao, Guest Editor
School of Electrical Engineering
and Computer Science
University of Ottawa
Ottawa, ON K1N 6N5, Canada
jpyao@uottawa.ca

XiHua Zou, Guest Editor
Center for Information Photonics
and Communications
Southwest Jiaotong University
Chengdu 610031, China
zouxihua@swjtu.edu.cn

Hongwei Chen, Guest Editor
Department of Electronic Engineering
Tsinghua University
Beijing 100084, China
chenhw@mail.tsinghua.edu.cn

José Capmany, Guest Editor
Departamento de Comunicaciones
Universidad Politecnica de Valencia
Valencia 46022, Spain
jcapmany@iteam.upv.es

Digital Object Identifier 10.1109/JLT.2018.2864447

Jianping Yao (M’99–SM’01–F’12) received the Ph.D. degree in electrical engineering from the Université de Toulon et du Var, Toulon, France, in December 1997. He is a Distinguished University Professor and a University Research Chair with the School of Electrical Engineering and Computer Science, University of Ottawa, Ottawa, ON, Canada. From 1998 to 2001, he was with the School of Electrical and Electronic Engineering, Nanyang Technological University (NTU), Singapore, as an Assistant Professor. In December 2001, he joined the School of Electrical Engineering and Computer Science, University of Ottawa, as an Assistant Professor, where he became an Associate Professor in May 2003, and a Full Professor in May 2006. He was appointed the University Research Chair in Microwave Photonics in 2007. From July 2007 to June 2010 and July 2013 to June 2016, he was the Director of the Ottawa-Carleton Institute for Electrical and Computer Engineering. He was an IEEE MTT-S Distinguished Microwave Lecturer for 2013–2015. In June 2016, he was conferred the title of the Distinguished University Professor of the University of Ottawa. He has authored or co-authored more than 560 research papers including more than 330 papers in peer-reviewed journals and more than 230 papers in conference proceedings.

Dr. Yao is a registered Professional Engineer of Ontario. He is a Fellow of the Optical Society of America, the Canadian Academy of Engineering, and the Royal Society of Canada (RSC). He is an Editor-in-Chief for the IEEE PHOTONICS TECHNOLOGY LETTERS, a former Topical Editor for Optics Letters, a former Associate Editor for Science Bulletin, a Steering Committee Member for the IEEE/OSA JOURNAL OF LIGHTWAVE TECHNOLOGY, and an Advisory Editorial Board Member for Optics Communications. He was a Guest Editor for a Focus Issue on Microwave Photonics in Optics Express in 2013, a Lead-Editor for a Feature Issue on Microwave Photonics in Photonics Research in 2014, and a Guest Editor for a special issue on Microwave Photonics in the IEEE/OSA JOURNAL OF LIGHTWAVE TECHNOLOGY in 2018. He is currently the Chair for the IEEE Photonics Ottawa Chapter and the IEEE MTT-S Microwave Photonics Technical Committee. He has also been a Chair of a number of international conferences, symposia, and workshops. He was a recipient of the 2005 International Creative Research Award of the University of Ottawa and the 2007 George S. Glinski Award for Excellence in Research. He was also the recipient of the 2017–2018 Award for Excellence in Research of the University of Ottawa and the 2018 R.A. Fessenden Silver Medal from IEEE Canada.

Xihua Zou is a Full Professor and the Deputy Dean with the Center for Information Photonics and Communications, Southwest Jiaotong University, Chengdu, China. He once was a Humboldt Research Fellow (2014–2016) with the Institute of Optoelectronics, University of Duisburg-Essen, Germany. He was also a visiting researcher and a joint training Ph.D. student (2007–2008) with the Microwave Photonics Research Laboratory, University of Ottawa, Canada, and a visiting scholar with the Ultrafast Optical Processing Research Group, INRS-EMT, Canada. He has authored or co-authored more than 80 academic papers in high-impact refereed journals. His current interests include microwave photonics, radio over fiber, and optical communications.

Prof. Zou currently serves as an Associate Editor for the IEEE JOURNAL OF QUANTUM ELECTRONICS (2016–present) and a Guest Editor for the IEEE/OSA JOURNAL OF LIGHTWAVE TECHNOLOGY. He has also been a Guest Editor for the IEEE JOURNAL OF QUANTUM ELECTRONICS and a Leading Guest Editor for the SPIE Optical Engineering of special issue on microwave photonics. He was a recipient of the Alexander von Humboldt Research Fellowship, National Outstanding Expert in Science and Technology of China, the Nomination Award for the National Excellent Doctoral Dissertation of China, and the Science and Technology Award for Young Scientist of Sichuan Province, China. He was also a recipient of the OSA 2018 Outstanding Reviewer Recognition and 2016 Outstanding Reviewer of Optics Communications.

Hongwei Chen received the Ph.D. degree in electronic engineering from Tsinghua University, Beijing, China, in 2006. He is currently a Full Professor with the Department of Electronic Engineering, Tsinghua University. He was also a visiting scholar (2011–2012) with the University of California Los Angeles (UCLA), Los Angeles, CA, USA. He is first author and co-author of more than 100 technical papers and invited talks. His research interests include microwave photonics, high-speed optical communication systems, and ultra-fast laser imaging. He has taken part in a number of national scientific research projects, including National Key Basic Research Program, high-tech projects, and National Natural Science Foundation research projects from China. He is a reviewer for top-rank IEEE/OSA/ SPIE journals and was invited to be a Technical Committee Member in high-level international conferences including OFC/CLEO/MWP. He was a recipient of the support of Program for New Century Excellent Talents from China Ministry of Education in 2010. He was also a recipient of the 2012 First batch of young top-notch talent program sponsored by Ministry of Organization, 2013 Excellent young scientist foundation of NSFC, and 2015 Young Scholar of Chang Jiang Scholars Program.
José Capmany (S’88–M’91–SM’96–F’08) was born in Madrid, Spain. He received the Ingeniero de Telecomunicacion degree from the Universidad Politécnica de Madrid (UPM), Madrid, Spain, in 1987, the Licenciado en Ciencias Físicas degree in 2009, and the Ph.D. degree in electrical engineering and in quantum physics from UPM and the Universidad de Vigo, Vigo, Spain, respectively.

Since 1991, he has been with the Departamento de Comunicaciones, Universidad Politecnica de Valencia (UPV), Valencia, Spain, where he started the activities on optical communications and photonics, founding the Photonics Research Labs Group (www.prl.upv.es). He was an Associate Professor from 1992 to 1995, and since 1996, he has been a Full Professor in photonics and optical communications. He was the Vice-Dean with the Telecommunications Engineering Scholle, UPV, from 1991 to 1996, and the Deputy Head of the Communications Department from 1997 to 2005. From 2005 to 2016, he was the Director with the Research Institute of Telecommunications and Multimedia (iTEAM), UPV (www.iteam.upv.es). He has authored or co-authored more than 550 papers in international refereed journals and conferences. His research activities and interests cover a wide range of subjects related to optical communications including microwave photonics, integrated optics, optical signal processing, fiber Bragg gratings, and more recently quantum cryptography and quantum-photonic information processing.

Dr. Capmany is a Fellow of the Optical Society of America. He is also a founder and the Chief Innovation Officer of the spin-off company VLC Photonics, Valencia, Spain, (www.vlphotonics.com) dedicated to the design of photonic integrated circuits and EPHHOX, Valencia, Spain, (www.ephoox.com) dedicated to MWP instrumentation. He was a reviewer for more than 30 SCI journals in the field of photonics and telecommunications. He was a member of the IEEE Photonics Society Board of Governors (2008–2010) and a Distinguished Lecturer for the 2013–2014 term. He was the General Chair for the 41st European Conference on Optical Communications (ECOC), Valencia, Spain, in 2015, and the IEEE International Topical Meeting on Microwave Photonics in 2009. He has been a member of the Technical Program Committees of more than 50 international conferences in the field of photonics including ECOC, the Optical Fiber Conference, the Integrated Optics and Optical Communications Conference, CLEO Europe, and the Optoelectronics and Communications Conference. He was an Associate Editor for the IEEE PHOTONICS TECHNOLOGY LETTERS (2010–2016) and the IEEE JOURNAL OF LIGHTWAVE TECHNOLOGY (2016–2018). He has also been a Guest Editor for the IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS, the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, and Optics Express feature issue on microwave photonics. He is the new Editor-in-Chief of the IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS. He was the 2012 King James I Prize Laureate on novel technologies, the highest scientific distinction in Spain, for his outstanding contributions to the field of microwave photonics and was a recipient of a European Research Council Advanced Grant, in 2016. He is also the recipient of the Extraordinary Doctorate Prize of the Universidad Politécnica de Madrid in 1992.