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Introduction to the Summer 2021 Issue

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(Editorial)

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ABSTRACT This is an introduction to our Summer, and third issue of the IEEE JOURNAL OF MICROWAVES. We are pleased to bring you ten new technical articles: five invited and five contributed – covering a wide range of microwave topics detailed in the text to follow. We also include two of our continuing series pieces: *Microwaves are Everywhere,* which for this issue takes a broad look at the origins and applications of radio frequency identification (RFID); and *Microwave Pioneers,* which highlights the career and uncommon personal choices of Dr. Arye Rosen, who helped open our field to the now ubiquitous cross-disciplinary applications of microwaves in medicine. We are also extremely excited about the start of our new series, *Women in Microwaves*, which we are coupling to the IEEE History Center, and which details the careers of prominent female scientists and engineers in the microwave community. Our inaugural candidate for this new series is electromagnetics theorist and microwave planar circuits and antennas guru, Professor Linda Katehi, whose personal story will not fail to both interest and inspire you. Also in this introduction, we outline a new reviewing process we are starting up, *Journal Club Review*, that we hope will contribute to the training of young researchers, as well as add significant numbers of enthusiastic new participants to the ever expanding need for quality peer reviews. With the release of this third issue of IEEE JOURNAL OF MICROWAVES, we hope to cement our fledging following of dedicated authors and readers, and to begin to take our desired place amongst the quality journals hosted by the IEEE Microwave Theory and Techniques Society (MTT-S).

INDEX TERMS Journal of Microwaves, summer issue, opening editorial, Journal Club Review, Women in Microwaves series, editorial board.

I. INTRODUCTION AND SPECIAL EDITORIAL CONTENT

Our first two issues of the IEEE JOURNAL OF MICROWAVES served as an introduction to our community and set the standards we wish to achieve for the foreseeable future. Almost all the content was invited or solicited, as is necessary for a journal that has yet to find its footing or its following. With the release of this, our Summer Issue (Volume 1, Number 3), we have begun to cross over into the general microwave community – both for our reader base, as well as our contributing authors. Fully half of the research articles in this issue were contributed without invitation. The distribution of more than 2000 print copies of our January Inaugural issue to recipients in 79 countries has certainly helped get the word out, as have more than 57000 downloads from IEEEXplore for the 51 articles that comprise our first two issues.

This interest from the community is very encouraging but we are not resting on our initial success. With this issue we are introducing a new continuing editorial series that we are very excited to host in conjunction with the IEEE History Center,[1] *Women in Microwaves*, which is being spearheaded by IEEE Spectrum contributing writer, Professor Allison Marsh, from the University of South Carolina. The series is being kicked-off with a biographical piece on eminent electromagnetics

[1]The IEEE History Center, started in 1979 (https://ethw.org/IEEE_History_Center) archives materials on the ETHW (Engineering and Technology History Wiki - https://ethw.org/Main_Page) along with materials from many other engineering organizations. The transcripts of the Oral Histories that are generated in conjunction with our *Women in Microwaves* series can be found there at: https://ethw.org/Oral-History:List_of_all_Oral_Histories. In addition, these *Women in Microwaves* articles, as well as all our *Microwave Pioneer* pieces and our prior *Terahertz Pioneers* series from 2011–2015 with 26 additional subjects, are available from a fully linked listing at: https://ethw.org/Archives:THz_and_Microwave_Pioneers

theorist and microwave planar circuits and antennas pioneer Professor Linda Katehi, which is certain to capture your interest. We are also continuing our *Microwaves are Everywhere* series with a shallow dip into the enormous pool of radio frequency identification (RFID) applications and origins. Our *Microwave Pioneers* series highlights the career and unusual personal choices of Dr. Arye Rosen, who helped open our field to the now ubiquitous cross-disciplinary applications of microwaves in medicine. The *Breakthroughs in Microwaves* series is taking a hiatus, but will return in our Autumn issue coming out this November.

II. TECHINCAL RESEARCH CONTENT

As already mentioned, we have 10 research articles in this issue that cover a wide range of topics from 6G to graphene-based amplifiers. Our lead-off invited paper consists of a thorough overview of 5G and 6G beam forming networks by Y. Jay Guo, Maral Ansari, and Nelson Fonseca of the University of Technology, Sidney, Australia and the European Space Agency, Noordwijk, Netherlands. This is followed by a long awaited and nice review article from Arun Natarajan's group (Jain et al.) at Oregon State University, Corvalis, on software-defined radios. We next sneak in an unsolicited piece from Stavros Vakalis, Daniel Chen, and Jeffrey Nanzer, at Michigan State University, East Lansing, describing a significant breakthrough in millimeter-wave imaging throughput in a 652 frames per second, 38 GHz camera. For our third invited paper, EPFL, Lausanne, Switzerland's Juan Mosig teams up with Texas A&M's, Krzysztof Michalski, for an interesting and thorough new look at Hertzian dipoles above a ground plane – so pervasive in the near-field microwave imaging world.

Our fourth invited manuscript comes from Almudena Suarez et al. out of University of Cantabria in Spain, which contains a review of recent advances in oscillator analysis, and specifically stability criteria, and introduces some new numeric techniques. We follow Professor Suarez's paper with a regular contribution from University of Oklahoma, Norman, by Almuqati, Ariturk, and Sigmarsson, on substrate integrated waveguide resonators for constructing compact IC filters.

The last invited paper in our Summer issue covers some photonic applications of microwaves, and comes to us from Hao Chi, Chao Wang, and Jianping Yao out of Hangzhou Dianzi University, China, University of Kent, Canterbury, U.K. and University of Ottawa, Ontario, Canada, respectively. The paper describes photonic generation of chirped microwave pulses, which have many applications in circuits as well as radar, imaging, and communications systems.

The last three regular submissions discuss: a new compact power divider circuit (Chen et al. from Tunghai University, Taichung, China); a circuit topology model for non-symmetric reciprocal two ports with accompanying measurement examples from Hernandez-Escobar and colleagues from University of Málaga and Polytechnic University of Madrid, Spain; and a really nice experimental paper on a realized 10.6 GHz graphene FET amplifier with a record 4.2 dB of gain, by groups at Aachen University in Germany and Chalmers University in Gothenberg, Sweden (A. Hamed, M. Asad, M-D. Wei, A. Vorobiev, J. Stake, and R. Negra).

III. JOURNAL CLUB REVIEW

In an effort to help involve and train young researchers, substantially increase the quantity and technical scope of our existing reviewer pool, and improve the quality and time commitment inherent in performing technical manuscript peer reviews, our journal is testing out a bold new process which we call "*Journal Club Review*."

It is a truism for most scholarly journals that the need for peer-review of manuscripts exceeds the availability of qualified reviewers. We have also heard from many trainee researchers (graduate students, postdoctoral scholars, etc.) that they would benefit from more opportunities to peer-review manuscripts under the guidance of more experienced researchers. In an attempt to address both these concerns, IEEE JOURNAL OF MICROWAVES has begun rolling out a new peer-review mechanism that we call "*Journal Club Review.*"

For this process, a designated trainee (such as a student, post-doc, or staff member) who is part of an existing research group or team serves as an independent reviewer of record for our refereed manuscript. In this new process, the trainee – after being pre-appointed by his/her supervisor or academic advisor, downloads and reads the submitted manuscript and then moderates a discussion with other members of the group or team about the strengths and weaknesses of the paper. The designated trainee either summarizes and discusses the paper with the Journal Club members without distributing it, or may decide to allow other members of the discussion group to see and read the manuscript ahead of time. In either instance, strict confidentiality of both the authors and the materials is maintained through prior acknowledgement of IEEE review practices described below. After the presentation and discussion, wherein the group presumably reaches a consensus on the merits or demerits of the manuscript, the reviewer of record consolidates the group's plus his/her comments in a formal written review, has it approved by the team leader, supervisor, or academic mentor, and submits it to our journal through our normal reviewer gateway. The author of the final written review is considered the reviewer of record and receives credit for the completion of the review. The more experienced leader or supervisor of the group, must concur with the final review, and serves as a supporting expert and backstop for the review's quality and accuracy. In accordance with IEEE policy, requiring at least three independent peer-reviewers, any manuscript will have only one Journal Club Review as part of its complement of three independent reviews.

Although we are not requiring that this new review process take the form of a presentation or multiple input process (an advisor and student can simply collaborate on a review sequence, as is often already done), we believe that, by exposing

and involving several young investigators in a group presentation or meeting, we are adding a large multiplicative training and quality factor to the process, which can ultimately greatly increase the number of qualified senior reviewers in the future. The process will also help popularize the concept, at an early career stage, that voluntary peer review is an essential part of a professional academic career path – for the ultimate benefit of engineering and science as a whole.

The issue of confidentiality is immensely important for manuscript authors and for the success of the peer review process. As stated in the IEEE Publication Services and Products Board Operations Manual 2021,[2] "*Information contained in an article under review is confidential and shall not be shared with others, nor shall reviewers use non-public information contained in an article to advance their own research or financial interests.*" *Additionally*,[3] "*IEEE requires that referees treat the contents of articles under review as confidential information not to be disclosed to others before publication. It is expected that no one with access to an article under review will make any inappropriate use of the special knowledge that access provides*." We insist that all participants of the group discussion and Journal Club review process acknowledge and agree to the above statements before receiving a manuscript for review.

So far we have contacted more than 100 research groups to solicit participation in this new process, and have received more than 50 positive responses. If you would like to learn more or find out if you can participate, please contact our IEEE JOURNAL OF MICROWAVES Editor-in-Chief directly.

IV. LOOKING TO THE FALL

Our Autumn issue of IEEE JOURNAL OF MICROWAVES is already filling up, and we expect to have a good mix of invited and regular contributed papers for you in November. We also expect to have all four of our editorial series pieces, *Women in Microwaves, Microwave Pioneers, Microwaves are Everywhere, and Breakthroughs in Microwaves*, in our Autumn issue.

Meanwhile, those authors who have contributed articles that fall in between our regular issue deadlines, will see their papers appear in final production form (and now, in many standard databases) on IEEEXplore under the EARLY ACCESS Tab. Links to the Early Access manuscripts will remain the same as those that are assigned when the papers are combined, paginated, and posted into our regular issues.

The EiC speaks for the entire Editorial Board and all of our Administrative and Production Editors, in thanking our authors, our reviewers, and all of you readers, for your persistent and growing support for our new journal and its innovative and extensive outreach. We all hope you continue to enjoy and to benefit from our efforts to *Expand Science, Technology and Connectivity across the Globe*.

V. OUR EDITORIAL TEAM

In an effort to truly span all the disciplines that make up our microwave community, our Topic Editors have been assembled from the Chairs, Vice-Chairs or key participants of all twenty-six active technical committees[4] within the Microwave Theory and Techniques Society. In addition to technical expertise and academic, governmental, and industrial backgrounds, we also have significant publications experience and leadership skills on our Editorial Board, which includes two former and three current IEEE journal Editors-in-Chief, a former MTT-S AdCom President, and eleven current and former IEEE journal Associate Editors. Our technical efforts are aided by a senior administrative editor with experience on several IEEE journals, a veteran production editor, and a science-trained (PhD in bioengineering) assistant editor.

Together we bring an unprecedented level of technical and operational expertise, as well as a personal approach to the journal, to our contributing authors, to our valued reviewers, and to all our readers. You will find photos and short bios of our entire team at the end of this editorial introduction to Volume 1, Issue 3 of IEEE JOURNAL OF MICROWAVES.

ACKNOWLEDGMENT

The EiC would like to single out several individuals within the IEEE Publications communities who have continued to go above and beyond in support of our efforts within this journal: Sonal Parikh, Louis Vacca, Alison Larkin, Dena Hoffman, Laura Creighton – thank you again for your dedication and extra efforts! On setting up and implementing our new Journal Club review process we want to acknowledge advice, support, and suggestions from Ross Stone and members of the TAB committee, IEEE legal representative, Jonathan Wiggins, Dawn Melley, and Michael Jensen. Also, Dr. Maryam Ali, our invaluable Assistant Editor, came up with much of the Journal Club description and processes we are currently implementing. We would also like to thank MTT's Anding Zhu and Ramesh Gupta for their help with web content, outreach, and publicity for the journal. Finally, and to repeat, this EiC would not still be here, if it weren't for the continuous support of Maryam Ali, our Assistant Editor, Kara McArthur, our Administrative Editor, and Joanna Gojlik, our Production Editor, as well as the continued trust and backing of the full MTT-S Administrative Committee, and especially its current President, Greg Lyons.

[2]IEEE Publication Services and Products Board Operations Manual 2021, IEEE Publications, 445 Hoes Lane, Piscataway, NJ, Section 8.2.1 C.4, page 99, Feb. 19, 2021. Available online: https://pspb.ieee.org/images/files/files/opsmanual.pdf.

[3]Ibid, Section 8.2.2 A.4, page 103.

[4]The current 26 MTT technical committees are listed on the IEEE Journal of Microwaves web page: https://mtt.org/publications/journal-of-microwaves/, under: Editorial Board (at the very bottom of the page), and they are detailed on the MTT Society web pages under Technical Coordination Committees (https://mtt.org/tcfdc).

EDITORIAL BOARD

EDITOR-IN-CHIEF

PETER H. SIEGEL (Life Fellow, IEEE) received the B.A. degree in astronomy from Colgate University, Hamilton, NY, USA, in 1976, and the M.S. degree in physics and the Ph.D. degree in electrical engineering from Columbia University, New York City, NY, USA, in 1978 and 1983, respectively. He has held appointments as a Research Fellow and Engineering Staff with the NASA Goddard Institute for Space Studies, New York City, NY, USA, from 1975 to 1983, a Staff Scientist with the National Radio Astronomy Observatory, Central Development Labs, Charlottesville, VA, USA, from 1984 to 1986, a Technical Group Supervisor and Senior Research Scientist with Jet Propulsion Laboratory (JPL), National Aeronautics and Space Administration (NASA), Pasadena, CA, USA, from 1987 to 2014, and a Faculty Associate in electrical engineering and Senior Scientist in biology with the California Institute of Technology (Caltech), Pasadena, CA, USA, from 2002 to 2014. At JPL, he founded and led for 25 years, the Submillimeter Wave Advanced Technology Team, a group of more than 20 scientists and engineers developing THz technology for NASA's near and long-term space missions. These included delivering key components for four major satellite missions and leading more than 75 smaller research and development programs for NASA and the U.S. Department of Defense. At Caltech, he was involved in new biological and medical applications of THz, especially low-power effects on neurons and most recently millimeter-wave monitoring of blood chemistry. He was an IEEE Distinguished Lecturer and the Vice-Chair and Chair of the IEEE MTTS THz Technology Committee. He is currently an elected Member of the MTTS AdCom. He has more than 300 articles on THz components and technology and has given more than 250 invited talks on this subject throughout his career of 45 years in THz. His current appointments include the CEO of THz Global, a small research and development company specializing in RF bio-applications, a Senior Scientist Emeritus of biology and electrical engineering with Caltech, and a Senior Research Scientist Emeritus and a Principal Engineer with the NASA Jet Propulsion Laboratory. He was the recipient of 75 NASA technology awards, ten NASA team awards, the NASA Space Act Award, three individual JPL awards for technical excellence, four JPL team awards, and the IEEE MTTS Applications Award in 2018. He is honored to take up the responsibility as the Founding Editor-in-Chief of the IEEE JOURNAL OF MICROWAVES, which he hopes will invigorate the microwave field. Among many other functions, he was the Founding Editor-in-Chief of the IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY, from 2010 to 2015, and the Founder, in 2009, Chair through 2011, and elected General Secretary since 2012, of the International Society of Infrared, Millimeter, and Terahertz Waves (IRMMW-THz), the world's largest society devoted exclusively to THz science and technology.

TOPIC EDITORS (ALPHABETICALLY)

TC-3 & TC-24 TOPIC EDITOR: MICROWAVE MEASUREMENTS & MICROWAVE/MM-WAVE RADAR, SENSING, AND ARRAY SYSTEMS

SHERIF S. AHMED (Senior Member, IEEE) received the M.Sc. degree in microwave engineering from The Technical University of Munich, Munich, Germany, in 2007, and the Ph.D. (Dr. Ing.) degree from The University of Erlangen Nuremberg, Erlangen, Germany, in 2013. He is currently an Adjunct Professor with Stanford University, Stanford, CA, USA, and assembles more than 15 years of professional industry experience in various R&D roles. He has coauthored more than 25 research papers, more than 20 patents, and a book on advanced microwave imaging methods. Moreover, he is the Co-Chair of the US ANSI standard committee for Measuring the Imaging Performance of mmWave Systems for Security Screening of Humans. His R&D focus extends to microwave and mmWave imaging, stand-off THz sensing, multistatic radars, advanced signal-processing techniques, terahertz technology, and last but not least, automotive radar design and characterization. Over the past decade, he pioneered the body scanner technology with the first fully-electronic multistatic millimeter wave imaging systems, which are being deployed worldwide today at airport checkpoints. In the recent years, he has been advancing the qualifications of automotive radars, towards autonomous driving capabilities. He was the recipient of the University Academic Award of the Technical University of Munich in 2007, the Innovation Award of Rohde & Schwarz in 2009 and 2018, and the IEEE MTT Microwave Prize Award of 2013.

TC-11 TOPIC EDITOR: MICROWAVE LOW-NOISE TECHNIQUES

JOSEPH BARDIN (Senior Member, IEEE) received the Ph.D. degree in electrical engineering from the California Institute of Technology, Pasadena, CA, USA, in 2009. In 2010, he joined the Department of Electrical and Computer Engineering, University of Massachusetts Amherst, Amherst, MA, USA, where he is currently a Full Professor. His research group currently focuses on low temperature integrated circuits with applications in radio astronomy and the quantum information sciences. In 2017, he joined the Google Quantum AI Team as a Visiting Faculty Researcher and, in addition to his university appointment, he is currently a Staff Research Scientist with this team. He was the recipient of the 2011 DARPA Young Faculty Award, the 2014 NSF CAREER Award, the 2015 Office of Naval Research YIP Award, the 2016 UMass Amherst College of Engineering Barbara H. and Joseph I. Goldstein Outstanding Junior Faculty Award, the 2016 UMass Amherst Award for Outstanding Accomplishments in Research and Creative Activity, and the 2020 IEEE MTT-S Outstanding Young Engineer Award.

TC-20 TOPIC EDITOR: HF-VHF-UHF TECHNOLOGIES AND APPLICATIONS

ROBERT H. CAVERLY (Life Fellow, IEEE) received the Ph.D. degree in electrical engineering from The Johns Hopkins University, Baltimore, MD, USA, in 1983. Since 1997, he has been a Faculty Member with the Department of Electrical and Computer Engineering, Villanova University, Villanova, PA, USA and is currently a Full Professor. Previously, he was a Professor for more than 14 years with the University of Massachusetts Dartmouth, Dartmouth, MA, USA. He has authored or coauthored more than 100 journal and conference papers and is the author of two books, *Microwave and RF Semiconductor Control Device Modeling* and *CMOS RFIC Design Principles* from Artech House. His research focused on the characterization of semiconductor devices including PIN diodes and FETs in the microwave and RF control environment. He is the current Editor-in-Chief of the *IEEE Microwave Magazine* and a Member of the MTT-S AdCom and was the General Chair of the 2020 IEEE Radio and Wireless Week.

TC-28 TOPIC EDITOR: BIOLOGICAL EFFECTS AND MEDICAL APPLICATIONS

J.-C. CHIAO (Fellow, IEEE) received the B.S. degree from Electrical Engineering Department, National Taiwan University, Taipei, Taiwan, in 1988, and the M.S. and Ph.D. degrees in electrical engineering from the California Institute of Technology, Pasadena, PA, USA, in 1991 and 1995, respectively. He was a Research Scientist with the Optical Networking Systems and Testbeds Group, Bell Communications Research, an Assistant Professor of electrical engineering with the University of Hawaii, Manoa, HI, USA, and Product Line Manager and Senior Technology Advisor with Chorum Technologies. From 2002 to 2018, he was Janet and Mike Greene endowed Professor and Jenkins Garrett Professor of electrical engineering with the University of Texas at Arlington, Arlington, TX, USA. He is currently a Mary and Richard Templeton Centennial Chair Professor of electrical and computer engineering with Southern Methodist University, Dallas, TX, USA.

He has authored or coauthored and edited numerous peer-reviewed technical journal and conference papers, book chapters, proceedings and books. He holds 16 patents in RF MEMS, MEMS optical, liquid crystal, nano-scale fabrication, and wireless medical sensor technologies. His research works have been covered by media extensively including *Forbes, National Geographic* magazine, National Public Radio, and CBS Henry Ford Innovation Nation.

He was the recipient of the Lockheed Martin Aeronautics Company Excellence in Engineering Teaching Award, the Tech Titans Technology Innovator Award, the Research in Medicine Award in the Heroes of Healthcare, the IEEE Region 5 Outstanding Engineering Educator Award, the IEEE Region 5 Excellent Performance Award, the 2012-2014 IEEE MTT Distinguished Microwave Lecturer Award, the 2017-2019 IEEE Sensors Council Distinguished Lecturer Award, and the 2011 Edith and Peter O'Donnell Award in Engineering by The Academy of Medicine, Engineering and Science of Texas. He is the Chair of various international conferences, including 2018 IEEE International Microwave Biomedical Conference. He was the Chair for the IEEE MTT-S Technical Committee 10 Biological Effect and Medical Applications of RF and Microwave, Technical Program Chair of 2019 IEEE International Wireless Symposium, and an Associate Editor for the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES. He is the founding Editor-in-Chief of the IEEE JOURNAL OF ELECTROMAGNETICS, RF, AND MICROWAVES IN MEDICINE AND BIOLOGY.

TC-23 & TC-25 TOPIC EDITOR: WIRELESS COMMUNICATIONS & WIRELESS POWER TRANSFER AND ENERGY CONVERSION

ZHIZHANG (DAVID) CHEN (Fellow, IEEE) received the B.Eng. degree in radio engineering from Fuzhou University, Fujian, China, the MSc. degree in radio engineering from Southeast University (formerly Nanjing Institute of Technology), Nanjing, China, and the Ph.D. degree in electrical engineering from the University of Ottawa, Ottawa, ON, Canada. He is currently a Professor and the former Head of the Department of Electrical and Computer Engineering, Dalhousie University, Halifax, NS, Canada. He is a Fellow of the Canadian Academy of Engineering and the Engineering Institute of Canada. He is a registered Professional Engineer and was a consultant for local companies.

He is active in teaching, research, and professional services. He is teaching various undergraduate and graduate courses in the areas of communication systems, RF/Microwave electronics/systems, antennas, and electromagnetics. He has authored or coauthored more than 450 refereed journal/conference papers and 26 industrial reports, one book, contributed to two books, edited one research monograph and one conference proceeding, and filed eight patent applications in the areas of computational electromagnetics and RF/microwave circuit and system design, some of his publications have been cited extensively in SCI literatures. He was one of the key originators in developing new numerical algorithms and in designing a new class of compact RF circuits and systems for wireless communications. He is a Sole or Principal Investigator of more than twenty-eight grants from both government and industry, including a NSERC Discovery Accelerator Supplement Grant, NSERC Strategic Project Grants on Ultra-wideband Impulse Radios and novel RF-front ends, a research contract in developing structure composite microwave materials for radar applications (2011–2013), and an Atlantic Innovation Fund on generic smart RF transceivers.

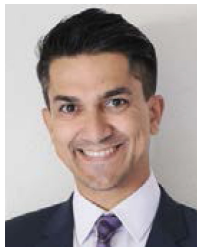
TC-12 TOPIC EDITOR: MICROWAVE HIGH-POWER TECHNIQUES

STEVE C. CRIPPS (Life Fellow, IEEE) received the master's and Ph.D. degrees from Cambridge University, Cambridge, U.K., in 1970. After working for several years with the Pioneering Gallium Arsenide Group at Plessey Research, he emigrated to the U.S., where he worked for 15 years in various engineering and management positions with Watkins Johnson, Loral, and Celeritek. In 1996, he returned to the U.K., is currently an Independent Consultant before taking on an academic post with Cardiff University, Cardiff, U.K., where he is currently a Distinguished Research Professor. He has authored various best-selling books on RFPA design and is a regular contributor to *IEEE Microwave Magazine* with his popular Microwave Bytes column. He was the 2008 recipient of the IEEE Microwave Application Award.

TC-22 & TC-10 TOPIC EDITOR: MICROWAVE PHOTONICS & SIGNAL GENERATION AND FREQUENCY CONVERSION

AFSHIN S. DARYOUSH (Fellow, IEEE) is currently a Professor of electrical and computer engineering with Drexel University, Philadelphia, PA, USA, where he has developed courses in devices, circuits, and subsystems employed in microwaves, photonics, and antennas. He also conducts research in microwave photonics applied to telecommunications and biomedical engineering that resulted in more than 300 technical articles, ten patents, and eight book chapters. He became a Member of the Franklin Institute's Committee on Science and the Arts in 2011. He was the recipient of Drexel University's Graduate Teaching Award in 2000, the IEEE Philadelphia Section's Franklin Key Award in 2015, and the Drexel University's Alumni Award in 2018. After receiving the Microwave Prize in 1986, his 13 articles have been recognized as the best student papers in various IEEE conferences. He has also organized various IEEE conferences since 1993, particularly is the TPC Chair for Radio Wireless Symposium 2008 and the Chair for the Radio and Wireless Week 2009, Microwave Photonics 2010, Benjamin Franklin Symposium on Microwave and Antenna Sub-Systems 2014, and International Microwave Symposium 2018.

TC-29 TOPIC EDITOR: MICROWAVE AEROSPACE SYSTEMS

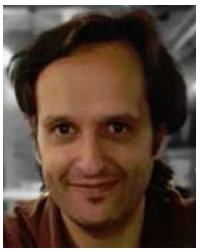


NELSON J. G. FONSECA (Senior Member, IEEE) received the M.Eng. degree in electrical engineering from Ecole Nationale Supérieure d'Electrotechnique, Electronique, Informatique, Hydraulique et Télécommunications, Toulouse, France, in 2003, the M.Sc. degree in electrical engineering from the Ecole Polytechnique de Montreal, QC, Canada, in 2003, and the Ph.D. degree in electrical engineering from the Institut National Polytechnique de Toulouse, Université de Toulouse, Toulouse, France, in 2010.

He is currently an Antenna Engineer for the Antenna and Sub-Millimetre Wave Section, European Space Agency (ESA), Noordwijk, The Netherlands. Since November 2020, he has been holding an honorary appointment as a Professional Fellow with the University of Technology Sydney, Ultimo, NSW, Australia. He has authored or coauthored more than 230 papers in peer-reviewed journals and conferences and has more than 50 patents issued or pending. His current research interests include multiple beam antennas for space missions, beam-former theory and design, ground terminal antennas, transfer of technology from and to terrestrial systems, including 5G networks, and novel manufacturing techniques.

He was the Chair of the 38th ESA Antenna workshop in 2017, and as the Co-chair of the 2018 IET Loughborough Antennas & Propagation conference. He is currently an Associate Editor for the *IET Microwaves, Antennas and Propagation* and for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, and the Topic Editor of IEEE JOURNAL OF MICROWAVES. He is also the Co-Vice Chair of the newly founded IEEE MTT-S Technical Committee 29 on Microwave Aerospace Systems. Since January 2019, he is a Board Member of the European School of Antennas and Propagation (ESoA) and is also a coordinator of the ESA/ESoA course on Antennas for Space Applications, for which he was voted best lecturer by the participants of the 2020 edition. He is the elected EurAAP Regional Delegate representing Benelux for the term 2021–2023. He was the recipient of various prizes and awards, including the Best Young Engineer Paper Award at the 29th ESA Workshop on Antennas in 2007, the ESA Teamwork Excellence Award in 2020, and multiple ESA technical improvement awards.

TC-5 TOPIC EDITOR: FILTERS



ROBERTO GÓMEZ-GARCÍA (Senior Member, IEEE) received the Dipl.-Eng. degree in telecommunication engineering and the Ph.D. degree in electrical and electronic engineering from the Polytechnic University of Madrid, Madrid, Spain, in 2001 and 2006, respectively. Since 2006, he was an Associate Professor with the Department of Signal Theory and Communications, University of Alcalá, Alcalá de Henares, Spain. He is for various research stays, with the C2S2 Department, XLIM Research Institute, University of Limoges, Limoges, France, the Telecommunications Institute, University of Aveiro, Aveiro, Portugal, the U.S. Naval Research Laboratory, Microwave Technology Branch, Washington, DC, USA, and Purdue University, West Lafayette, IN, USA. He is also an Adjunct Part-Time Professor with the University of Electronic Science and Technology of China, Chengdu, China, was an Invited Professor with Gdansk University of Technology, Poland, during 2019–2020. He has authored or coauthored more than 100 papers in international journals and more than 140 papers in international conferences in his areas of current research, which include the design of fixed/tunable high-frequency filters and multiplexers in planar, hybrid, and monolithic microwave-integrated circuit technologies, multifunction circuits and systems, and software-defined radio and radar architectures for telecommunications, remote sensing, and biomedical applications.

He was a Member for the Technical Review Board for various IEEE and EuMA conferences. He is also a Member of the IEEE MTTS Filters (MTT-5), the IEEE MTT-S RF MEMS and Microwave Acoustics (MTT-6), the IEEE MTT-S Wireless Communications (MTT-23), the IEEE MTT-S Biological Effects and Medical Applications of RF and Microwave (MTT-28), and the IEEE CAS-S Analog Signal Processing Technical Committees. He was the recipient of the 2016 IEEE Microwave Theory and Techniques Society (MTT-S) Outstanding Young Engineer Award. He is an IEEE CAS-S Distinguished Lecturer (2020–2021). From 2012 to 2016, he was an Associate Editor for the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES and from 2012 to 2015, IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I: REGULAR PAPERS. From 2016 to 2017, he was a Senior Editor of the *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*. He was the Guest Editor of various Special or Focus Issues and Sections in IEEE and IET Journals. He is currently an Associate Editor for the *IEEE Microwave and Wireless Components Letters, IEEE Journal of Electromagnetics, RF and Microwaves in Medicine and Biology, IEEE Access*, *IET Microwaves, Antennas, and Propagation*, and the *International Journal of Microwave and Wireless Technologies*, and the MTT-S Newsletter Working Group Chair.

TC-6 TOPIC EDITOR: RF MEMS AND MICROWAVE ACOUSTICS

SONGBIN GONG (Senior Member, IEEE) received the B.S. degree in electrical engineering from the Huazhong University of Science and Technology, Wuhan, China, in 2004, and the Ph.D. degree in electrical engineering from the University of Virginia, Charlottesville, VA, USA, in 2010. He is currently an Associate Professor and an Intel Alumni Fellow with the Department of Electrical and Computer Engineering and Holonyak Micro and Nanotechnology Laboratory, University of Illinois at Urbana–Champaign, Urbana, IL, USA.

His research primarily focuses on the design and implementation of MEMS and acoustic devices, components, and subsystems for RF front ends. In addition, his research explores hybrid microsystems based on the integration of MEMS devices with circuits or photonics for signal processing. He was the recipient of the 2014 Defense Advanced Research Projects Agency Young Faculty Award, the 2017 NASA Early Career Faculty Award, the 2019 Dean's Award for Excellence in Research at UIUC, and the 2019 IEEE Ultrasonics Early Career Investigator Award. Along with his students and postdocs, he was also the recipient of the best paper awards from the 2017 and 2019 IEEE International Frequency Control Symposium and the 2018 and 2019 IEEE International Ultrasonic Symposium and the 2nd place in the Best Paper Competition at 2018 International Microwave Symposium. He is an Associate Editor for the IEEE T-UFFC and JMEMS, and also the Technical Committee Chair of MTT-6 RF-MEMS and Microwave Acoustics of the IEEE Microwave Theory and Techniques Society.

TC-7 TOPIC EDITOR: MICROWAVE SUPERCONDUCTIVITY AND QUANTUM TECHNOLOGIES

MICHAEL C. HAMILTON (Senior Member, IEEE) received the B.S.E.E. degree from Auburn University, Auburn, AL, USA, in 2000, and the M.S.E.E. and Ph.D. degrees in electrical engineering from The University of Michigan, Ann Arbor, MI, USA, in 2003 and 2005, respectively. From 2006 to 2010, he was a Member of Technical Staff at MIT-Lincoln Laboratory, where he worked on instrument-level and system-level projects for next-generation geostationary imaging for weather satellite systems, testing and modeling of highly-scaled and environmentally-optimized CMOS devices subjected to extreme environmental conditions, and modeling, design, fabrication and test of advanced technologies for high-frequency RF sample-hold and analog-digital conversion circuits based on Fully-Depleted Silicon- On-Insulator transistors and CCD structures. His current research interests include superconducting electronics technologies, micro/nano fabrication, packaging and integration of high-speed systems, signal and power integrity of densely integrated systems, application of micro and nanostructures for enhanced performance of RF and microwave systems, and packaging for extreme environments (both high and low temperature). In 2010, he joined the Electrical and Computer Engineering Department of Auburn University as an Assistant Professor and was promoted to Professor in 2019. He is the Director of the Alabama Micro/Nano Science and Technology Center, which is a Micro/Nano Technology Center, Auburn University funded by the State of Alabama. He is the Auburn University IEEE Student Chapter Faculty Advisor. He is on the IEEE MTT-S Education Committee, the Vice-Chair of MTT-7 Technical Committee on Microwave Superconductivity and Quantum Technologies Committee, and Producer or Moderator of the IEEE MTT-S Webinar Series.

TC-21 TOPIC EDITOR: TERAHERTZ TECHNOLOGY AND APPLICATIONS

DMITRY KHOKHLOV received the M.S., Ph.D., and Doctor of Science (Russian analog of the Habilitaet degree in Germany) degrees from M.V. Lomonosov Moscow State University, Moscow, Russia, in 1980, 1982, and 1992, respectively. Since 1982, he has been with the Department of Physics, M.V. Lomonosov Moscow State University, in positions from Junior Research Fellow up to Full Professor, since 1997, the Head of the Chair of General Physics, and Condensed Matter Physics, since 2006. In 2008, he was elected as Correspondent Member of the Russian Academy of Sciences. Since 2013, he has been the Head of the Expert Council on Condensed Matter Physics of the Russian Foundation for the Basic Research. Since 2015, he is also the Head of the Expert Council on International Research Projects of the same Foundation.

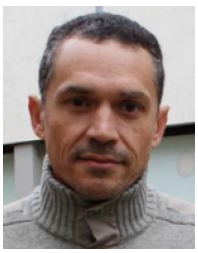
He is active in teaching and he has developed various lecture courses for undergraduate and graduate students and supervised more than 30 M.Sc. students and about 15 Ph.D. dissertation. He authored or coauthored more than 350 research/conference papers, edited one research monograph and filed two patents. His research interests include physics of narrow-gap semiconductors, development of sensitive detectors of terahertz radiation, photoelectric phenomena under terahertz excitation, organic semiconductors, and various other areas. He has been a Principal Investigator of more than 15 research grants from different Russian national agencies.

SPECIAL SERIES TOPIC EDITOR

ALLISON MARSH (Senior Member, IEEE) received the B.S. degree in engineering from Swarthmore College, Swarthmore, PA, USA, and the Ph.D. degree in the history of science, medicine, and technology from Johns Hopkins University, Baltimore, MD, USA. She is currently an Associate Professor of history and the Co-Director of the Ann Johnson Institute for Science, Technology & Society, University of South Carolina, Columbia, SC, USA. Her research focuses on how the general public comes to understand complex engineering ideas through informal education, specifically in museum settings. She sees history as a Trojan horse to get people interested in learning more about how engineering affects society. Before coming to the University of South Carolina, she was Curator and the Winton M. Blount Research Chair of the Smithsonian National Postal Museum.

She is the contributing Editor to IEEE SPECTRUM and writes the monthly Past Forward column. In 2014, she won the IEEE-USA, Award for Distinguished Literary Contributions furthering Public Understanding and Advancement of the Engineering Profession for work publicizing the Smithsonian's orphaned engineering collections. She is a vocal advocate for women in STEM and is pioneering the Women in Microwaves oral history project in conjunction with the IEEE History Center.

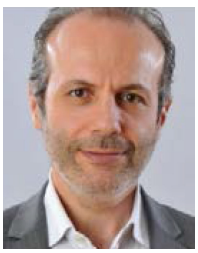
TC-1 TOPIC EDITOR: FIELD THEORY AND COMPUTATIONAL EM



FRANCISCO MESA (Fellow, IEEE) received the B.Sc. and Ph.D. degrees in physics from the University of Seville, Seville, Spain, in 1998 and 1991, respectively. From 1992 to 1997, he was an Assistant Professor with the Department of Applied Physics, University of Seville, where he was promoted to an Associate Professor in 1997 and Full Professor in 2010. Between 1992 and 2004, he enjoyed four stays in US universities, the first one at the Polytechnic Institute of Brooklyn, Brooklyn, NY, USA, and three more with the University of Houston, Houston, TX, USA. From July to December 2019, he was a Visiting Researcher with KTH (Royal Institute of Technology), Stockholm, Sweden. Since 1988, he has been a Member of the Microwave Group, University of Seville. During the first years of his research he worked on computational electromagnetism and on the diverse theoretical aspects of wave propagation involving these structures. Later, he worked on the modeling of metamaterials and periodic planar structures, contributing to the development of analytic (or quasi-analytic) equivalent circuits to characterize such structures and to find physically insightful explanations of some exotic phenomena. More recently he has worked on higher symmetries applied to electromagnetic propagation and on the design of geodesic lenses.

Since January 2014, he has been an IEEE Fellow proposed by the IEEE MTT Society. From 2013 to 2016, he was an Associate Editor for the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, and he is a Member of IEEE MTT-S Technical Committee MTT-1 (Field Theory and Computational EM).

TC-26 TOPIC EDITOR: RFID, WIRELESS SENSORS, AND IOT



PAOLO MEZZANOTTE (Member, IEEE) was born in Perugia, Italy, in 1965. He received the Ph.D. degree from the University of Perugia, Perugia, Italy, in 1997. Since 2007, he has been an Associate Professor with the University of Perugia, where he has been involved in teaching the classes Radiofrequencies Engineering and Systems and Circuits for IoT. Since 2014, he has been the Vice Head of the Department of Engineering, University of Perugia. His current h-index is 24 and research activities are testified by more than 170 publications in the most important specialized journals and at the main conferences of the microwave scientific community. His current research interests include the development of microwave circuits on bio-compatible substrates and the enabling technologies for IoT. From January 2017 to December 2019, he was the Chair of the IEEE Technical Committee MTT-24- RFID Technologies. He is an Associate Editor for the *ACES journal*.

TC-13 TOPIC EDITOR: MICROWAVE CONTROL TECHNIQUES

CHRISTOPHER D. NORDQUIST (Senior Member, IEEE) received the B.S., M.S., and Ph.D. degrees in electrical engineering from Pennsylvania State University, University Park, PA, USA, in 1997, 1998, and 2002, respectively.

At Penn State from 1995 to 1998, he was an Undergraduate and Graduate Research Assistant and from 1998 to 2001, a National Defense Science and Engineering Graduate Fellow, where he explored heterogeneous integration of compound semiconductor devices through self-assembly. In 2002, he joined Sandia National Laboratories, Albuquerque, NM, USA, where he is currently a Distinguished Member of Technical Staff in the RF/Optoelectronics Department. He has coauthored more than 80 journal and conference publications and holds nine patents in his areas of current research, which include the design, fabrication, integration, and application of emerging micromachined and solid-state RF and microwave devices. In this context of exploring new approaches that target key future needs, he has explored the application of a broad range of advanced technology sets including Si, GaAs, InP, GaN, MEMS, and advanced materials.

He is a Senior Member of the IEEE Electron Device and Microwave Theory and Techniques Societies. He is currently the Chair of the IEEE MTT-13 Technical Committee on Microwave Control Materials and is on the Editorial Board of the IEEE JOURNAL OF MICROWAVES. He is also the Technical Program Co-Chair for the 2018 IEEE International Microwave Workshop in Advanced Materials, on the IEEE CSICS program committee from 2004 to 2006, as a Reviewer for various IEEE journals, and was a key contributor to Sandia's 2011 R&D100 award-winning Microresonator Filters and Frequency References team.

TC-8 TOPIC EDITOR: RF NANOTECHNOLOGY

LUCA ROSELLI (Fellow, IEEE) joined the University of Perugia, Perugia, Italy, in 1991. In 2000, he founded the spin-off WiS Srl, Foligno, Italy. He was involved in electronic technologies for the Internet of Things for six years. He is currently a Qualified Full Professor with the University of Perugia, where he teaches applied electronics and coordinates the High Frequency Electronics Laboratory.

He has authored more than 280 papers, which include H-i 28, i10 82, and more than 3000 citations in Google Scholar and *Green RFID Systems* (Cambridge Univ. Press, 2014). His current research interests include HF electronic systems with special attention to RFID, new materials, and wireless power transfer.

From 2008 to 2012, he was a Member of the Board of Directors of ART Srl, Urbino, Italy. He is also a Member of the list of experts of the Italian Ministry of Research, the Past Chair of the IEEE Technical Committees MTT-24-RFID, the Vice Chair of 25-RF Nanotechnologies, 26-Wireless Power Transfer, the ERC Panel PE7, and the Advisory Committee of the IEEE-WPTC, and the Chairman of the SC-32 of IMS. He is also the Co-Chair of the IEEE Wireless Sensor Network Conference. He organized the VII Computational Electromagnetic Time Domain in 2007 and the first IEEE Wireless Power Transfer Conference in 2013. He is also an Associate Editor for the *IEEE Microwave Magazine*. He is involved on the boards of various international conferences. He is also a Reviewer for many international journals, including Proceedings of the IEEE, IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, and IEEE MICROWAVE AND WIRELESS COMPONENTS LETTERS.

TC-16 TOPIC EDITOR: MICROWAVE AND MILLIMETER-WAVE PACKAGING, INTERCONNECTS, AND INTEGRATION

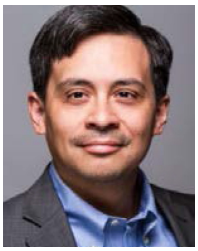
KAMAL K. SAMANTA (Life Fellow, IEEE) graduated in science (physics), and engineering (ECE) before the dual master's in management (R&D), and technology (mmW), which followed the Ph.D. degree in Microwave Engineering from the University of Leeds, Leeds, U.K. He has got extensive experience of about 25 years and led multidisciplinary government. Scientific, and industrial research and technology/product development activities for a wide range of industries, including satellite/space, defense/security, atomic reactor/green energy, high power, semiconductor, and wireless communications, covering frequency MHz to THz and power from μW (MMICs) to megawatts (SSPAs). His developed products (space-qualified and military- and consumer-grade) include advanced multilayer/3D components (with antennas/filters), devices, circuits (GaN/GaAs/Si, MMICs/MCM), and systems. His roles have included that of Chief/Senior Principal/Lead R&D -Engineer, -Scientist and -Consultant. The organizations he has worked for include Thales Aerospace, U.K. (Radar, EW and ESM systems), European Aeronautics Defense and Space Astrium (Airbus), U.K., (GaN, HPA, Satellite Comm), Indian Space Research Organization, (satellite payload circuits, Tx/Rx), IPR, Department of Atomic Energy (2MW, 64 active phased array system), Milmega (GaN SSPAs), and RFMD and Filtronics Comp Semiconductor (MF MMICs: pt-to-pt radios, PAs). He is currently with Sony Europe B V, U.K. as the Chief Technologist- microwave and mmW, and Technical Lead for the next-generation front-end modules (5G/beyond). He has authored or coauthored more than 75 peer-reviewed publications (first/sole authored) and has delivered more than 45 invited talks (including keynotes/panels) in IEEE MTTS conferences in his areas of research, which include multidisciplinary and multiphysics research and development of novel active/passive devices, multilayer/3D miniaturized components, monolithic integrated circuits (GaAs/SiGe/GaN/InP, PAs), and cost-effective multichip and system-on-package modules, and leading industrial solutions.

He was the recipient of the Commonwealth Fellowship, the Best International Researcher Award, and the Engineering Excellence Award from the IET, London, (2004 and 2005). He is a Fellow of IET and the Chair or a Member of IEEE MTT-S Technical Committees – MTT-16 (packaging or integration), MTT-14 (integrated circuits), MTT-12 (high power) and TC-5 (filters). He sits on the TPC of the major IEEE MTT-S conferences and was the Guest Editor for Special Issues of the *IEEE Microwave Journals/Magazine*. He was or is an Associate Editor for the IEEE MWCL (2013–2018), *IEEE Microwave Magazine*, IET MAP, and IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES.

TC-27 TOPIC EDITOR: CONNECTED AND AUTONOMOUS SYSTEMS

HASAN SHARIFI (Senior Member, IEEE) received the bachelor's and master's degrees in electrical engineering, and the Ph.D. degree in microelectronics and nanotechnology from Purdue University, West Lafayette, IL, USA, in 1994, 1997, and 2007, respectively. He is currently the Manager of RF and EO/IR Subsystems Department, HRL Laboratories, Malibu, CA, USA. Before joining HRL, he was a Research Staff Member with Birck Nanotechnology Center, Purdue University from 2005 to 2009, working on CMOS-based RF integrated circuits and advanced heterogeneous integration and packaging. He has authored or coauthored more than 60 journal and refereed conference papers and holds more than 35 issued patents. His research topics include design, fabrication and integration of RF/millimeter wave components and subsystems for next generation phased-array radar, EW and communication systems, and low-cost, high performance EO/IR imaging sensors. He was the recipient of a number of awards, including special and extraordinary merit awards from Purdue University and HRL Labs. He was a Technical Program Committee and Editor of the IEEE Silicon Monolithic Integrated Circuits in RF Systems Conference. He is a Member of Microwave Theory and Techniques and Advanced Packaging societies.

TC-14 TOPIC EDITOR: MICROWAVE AND MM-WAVE INTEGRATED CIRCUITS



ALBERTO VALDES-GARCIA (Senior Member, IEEE) received the B.S. degree (Hons.) in electronic systems engineering from the Monterrey Institute of Technology, Toluca, Mexico, in 1999 and the Ph.D. degree in electrical engineering from Texas A&M University, College Station, TX, USA, in 2006. In 2000, he joined Motorola Broadband Communications, Nogales, Mexico, as an RF Design Engineer. In 2006, he joined IBM Research, Yorktown Heights, NY, USA, where he is currently a Principal Research Staff Member, Manager of the RF Circuits and Systems Group. In 2013, he was an Adjunct Assistant Professor with Columbia University, New York City, NY, USA. He holds more than 65 issued U.S. patents and has authored or coauthored more than 100 peer-reviewed publications. His current research work is on mm-wave systems for communications and imaging applications. He is the Co-Editor of the book *60 GHz Technology for Gbps WLAN and WPAN: From Theory to Practice* (Wiley, 20011). He is the winner of the 2005 Best Doctoral Thesis Award presented by the IEEE Test Technology Technical Council. He was the recipient of the 2007 National Youth Award for Outstanding Academic Achievements, presented by the President of Mexico, a co-recipient of the 2010 George Smith Award presented by the IEEE Electron Devices Society, the 2017 Lewis Winner Award for Outstanding Paper presented by IEEE International Solid-State Circuits Conference, and the 2017 IEEE JOURNAL OF SOLID-STATE CIRCUITS Best Paper Award. Within IBM, he was twice the co-recipient of the Pat Goldberg Memorial Award to the best paper in computer science, electrical engineering, and mathematics published by IBM Research (2009 and 2017). He was inducted into the IBM Academy of Technology in 2015 and was recognized as an IBM Master Inventor in 2016 and 2019. From 2006 to 2009, he was with the IEEE 802.15.3c 60 GHz standardization Committee. Since 2009, he has been a Technical Advisory Board Member with the Semiconductor Research Corporation, where he was the Chair of the Integrated Circuits and Systems Sciences Coordinating Committee, in 2011 and 2012, respectively. Since 2016, he has been a Member for the IEEE MTT-S Microwave and Millimeter-wave Integrated Circuits Technical Committee, where he has been the Chair since 2020. In 2013, he was selected by the National Academy of Engineering for its Frontiers of Engineering Symposium.

TC-4 TOPIC EDITOR: MICROWAVE PASSIVE COMPONENTS AND TRANSMISSION LINE STRUCTURES

KE WU (Fellow, IEEE) is currently the Endowed Industrial Research Chair of future wireless technologies and Professor of electrical engineering with École Polytechnique (University of Montreal), Montreal, QC, Canada. He is the Director of the Poly-Grames Research Center. He was also the Canada Research Chair of RF and millimeter-wave engineering and the Founding Director of the Center for Radiofrequency Electronics Research of Quebec. He held or holds visiting or honorary professorships with various universities around the world. He has graduated more than 70 Ph.D. and 94 M.Sc. Students. He has authored or coauthored more than 1300 refereed papers, and a number of books and book chapters and filed more than 50 patents. He was the General Chair of the 2012 IEEE MTT-S International Microwave Symposium. He was the 2016 President of the IEEE Microwave Theory and Techniques Society (MTT-S). He was also the inaugural North-American representative in the General Assembly of the European Microwave Association. He was the recipient of many awards and prizes, including the inaugural IEEE MTT-S Outstanding Young Engineer Award, the 2004 Fessenden Medal of the IEEE Canada, the 2009 Thomas W. Eadie Medal from the Royal Society of Canada, the Queen Elizabeth II Diamond Jubilee Medal, the 2013 Award of Merit of Federation of Chinese Canadian Professionals, the 2014 IEEE MTT-S Microwave Application Award, the 2014 Marie-Victorin Prize (Prix du Quebec), 2015 Prix d'Excellence en Recherche et Innovation of Polytechnique Montréal, the 2015 IEEE Montreal Section Gold Medal of Achievement, and the

2019 IEEE MTT-S Microwave Prize. He was an IEEE MTT-S Distinguished Microwave Lecturer. He is a Fellow of the Canadian Academy of Engineering and Royal Society of Canada.

TC-2 TOPIC EDITOR: DESIGN AUTOMATION

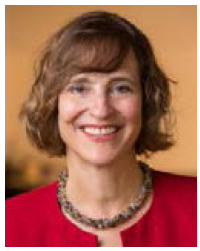
QIJUN ZHANG (Fellow, IEEE) received the Ph.D. degree in electrical engineering from McMaster University, Hamilton, ON, Canada, in 1987. During 1988—1990, he was a Research Engineer with Optimization Systems Associates Inc., Dundas, ON, Canada, developing advanced optimization software for microwave modeling and design. In 1990, he joined the Department of Electronics, Carleton University, Ottawa, ON, Canada, where he is currently a Chancellor's Professor. He is the author of the book *Neural Networks for RF and Microwave Design* (Boston: Artech House, 2000), the Co-Editor of *Modeling and Simulation of High-Speed VLSI Interconnects* (Boston: Kluwer, 1994), and the Co-Editor of *Simulation-Driven Design Optimization and Modeling for Microwave Engineering* (London, U.K.: Imperial College Press, 2013). His research interests include modeling, optimization, and neural networks for high-speed/high-frequency electronic design and has more than 300 publications in these area.

He is a Fellow of the Canadian Academy of Engineering. He is an Associate Editor for the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES. From 2010 to 2018, he was an Associate Editor for the *International Journal of RF and Microwave Computer-Aided Engineering*, and the General Chair of the IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization in 2015. He is the Chair of the Technical Committee on Design Automation (MTT-2) of the IEEE Microwave Theory and Techniques (MTT) Society.

ASSISTANT EDITOR

MARYAM ALI received the B.S. degree in chemical engineering from the California Institute of Technology, Pasadena, PA, USA, the M.S. degree in chemical engineering from Auburn University, Auburn, AL, USA, and the Ph.D. degree in biomedical engineering from The University of Texas at Austin, Austin, TX, USA. She completed a certificate in medical writing with the University of California, San Diego Extension, San Diego, CA, USA, in 2020. She was a Postdoctoral Scholar with the University of California, Davis, Davis, CA, USA. Her research background is in cell-surface interactions and ocular diseases. In addition, she is an Assistant Editor of the IEEE JOURNAL OF MICROWAVES, she is a Medical Writer with Medtronic. She is a Member of the American Medical Writers Association.

ADMINISTRATIVE EDITOR



KARA MCARTHUR received the B.A. degree in sociology and completed graduate work in healthcare ethics from Rice University, Houston, TX, USA. She is currently on two Institutional Review Boards (IRBs), an oncology IRB and a community IRB in the Dominican Republic. She is an American Medical Writers Association certified Medical Editor and Writer. She has more than 20 years of experience in scholarly publishing, including the Founding Managing Editor of the Engineering in Medicine and Biology Society's first Gold Open Access journal. Her past positions include the Managing Editor of the Cambridge University Press's *International Journal of Technology Assessment in Health Care* and Director of communications for the Department of Medicine, Baylor College of Medicine, Houston, TX, USA. She has more than 20 peer-reviewed research publications. Her freelance work include writing, editing, and evaluation research for national and international nonprofits

PRODUCTION EDITOR

JOANNA GOJLIK received the B.A. degree in journalism or professional writing from The College of New Jersey, Ewing, NJ, USA, the M.A. degree in liberal studies from the University of North Carolina Greensboro, Greensboro, NC, USA, and the Professional Certificate in editing from New York University, New York City, NY, USA. She is a Journals Production Manager with IEEE. Since 2004, she has been with the IEEE Publications Operations Department. Over the years, she has managed a large portfolio of journals/transactions/magazines, including the flagship IEEE journal proceedings of the IEEE since 2007. She has extensive experience in journals copyediting, proofreading, layout, and overall journals production.