


Introduction to the Winter 2024 Issue

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(Editorial)

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ABSTRACT Welcome to Volume 4 of IEEE JOURNAL OF MICROWAVES! In this issue, we bring you 11 quality papers: two invited and nine regular submissions. We also celebrate six of our Outstanding Reviewers of 2023 and announce our IEEE JOURNAL OF MICROWAVES 2022 Best Paper prize. Our author and reader pools continue to expand and our usage counts per article published now exceed 1530. All of our 232 published articles from 2021 to 2023 now appear on Clarivate's Web of Science and we are looking forward to possibly receiving an impact factor this July. Remember to take a look at our solicitation for papers that can fit into our *Microwaves in Climate Change* special issue, which we intend to release before the end of 2024.

INDEX TERMS Winter issue, opening editorial, 2023 outstanding reviewers, reviewer recognition, 2022 best paper prize.

I. JMW NEWS

As we begin our fourth year of IEEE JOURNAL OF MICROWAVES we are pleased to report that we are still on a very positive track. Our author pool is growing nicely – and now has exceeded 1000, our readers continue to increase their engagement - with article usage numbers now topping 470,000, and our reviewer list is holding steady. With the release of our October issue, we have published 232 articles, including 25 very popular special series pieces, a 512-page Inaugural print issue, and a 543-page MTT Society 70th Anniversary print volume – the two largest single journal issues ever distributed by the MTT Society!

In November, we finally completed the indexing process on Clarivate's *Web of Science* and all of our published papers can now be accessed from this popular database. By the time this introduction appears, we should also have our papers available on Elsevier's *Scopus* platform. 2024 may prove to be a very critical year for us as we are looking forward to potentially receiving an impact factor this coming July and we will be passing through our first IEEE Periodicals Review and Advisory Committee hearing this coming April.

Our monthly usage counts (views and downloads) per article published top 1530 and continue to rise every month. These numbers have kept us in the top three of all 230+ IEEE journals over our full three years. IEEEExplore citation counts per article now sit at 10 and *Web of Science* had us at 7.79 cites per article on December 27.

As we look forward to 2024 and to 2025, we have several exciting new developments coming up. Our *Microwaves in Climate Change* special issue [1] is shaping up nicely, with a few papers already in hand and many more promised before our deadline in late June. There is some chance that we will break the special issue into two, and release our early contributions in July and on-deadline papers in October. If you have particular topics you are interested in contributing, we are still accepting proposals for invited papers, so please contact us for evaluation and approval.

One of the original goals of JMW has always been to expand our outreach from the traditional microwave engineering community into the pure sciences. The field of microwaves is now so broad, that many of us on the Editorial Board feel that this is something that we can accomplish if we put some emphasis on doing so. As such, we are now working to add a new series of interdisciplinary special issues in 2025 that combine science and engineering and involve Guest Editors from physics, chemistry, biology, and medicine, along with our own microwave engineering experts. If you or a colleague have an interest in proposing one of these special issues, either as a cross-over from a science community yourself, or with a science community partner, please let us know your thoughts before April, as we will begin to finalize our special issue calendar at that time. If all goes well, we will use these special issues to increase our production schedule to bi-monthly in 2025.

Finally in this issue, we announce our Outstanding Reviewers of 2023 (Section III) and our 2022 IEEE JOURNAL OF MICROWAVES Best Paper Award (Section IV). We hope you will continue to support the journal and let us know how we are doing and what we can improve upon as we move forward.

II. JMW WINTER ISSUE CONTENT

Moving to our January issue content, we bring you 11 new articles this month. We open our issue with a wonderful invited review article from Kamran Ghorbani and colleagues at RMIT University and the Defence Science and Technology Group in Melbourne, Australia. The paper “Electromagnetic and Electronic Aerospace Conformal Load-bearing Smart Skins: A Review,” covers the development, use, and future potential of conformal structures based on load-bearing composite materials that incorporate a wide variety of both surface operational RF elements and embedded electronic devices. The paper is extremely comprehensive and has 179 references. This is a “must-read” for anyone interested in this rapidly evolving field.

Our second invited paper was originally intended for our special climate change issue but it came in so early that we decided to bundle it with our January release. “A UAV Based CMOS Ku-Band Metasurface FMCW Radar System for Low-Altitude Snowpack Sensing” describes a state-of-the-art CMOS-based FMCW radar operating at around 15 GHz and carried by a small UAV with a half-meter aperture. The system is designed for snow moisture and thickness measurements and has several unique design features that make it both compact and low power. It also makes full use of the available UAV footprint for maximizing antenna gain. Actual measurement data from a drone-borne platform flown in both Idaho and Alaska and complete signal processing methodology are included. The paper comes from Adrian Tang and colleagues at the NASA Jet Propulsion Laboratory and UCLA, California, with contributing partners from Stevens Institute of Technology, NJ, and Boise State University, Idaho.

Our first regular submission this month is “A Novel Rotation-Based Standardless Calibration and Characterization Technique for Free-Space Measurements of Dielectric Material,” which comes to us from one of our most prolific contributors, the radar team led by Christian Waldschmidt at the University of Ulm, Germany. The paper considers a new free-space frequency domain quasi-optical calibration technique for material characterization in the millimeter-wave range. Thin and thick samples are considered and VNA style error correction techniques using both self-calibration and separate reference samples are employed to remove systematic errors. The error corrections require only transmission measurements, simplifying the sequence normally required for accurate guided or free space determination of dielectric constant and loss tangent.

A second contribution from the University of Ulm, in conjunction with researchers from Mercedes-Benz in Sindelfingen, Germany, discusses the correction of frame jitter and coupling errors in automotive-based MIMO radar networks to eliminate ghost target images. The technique works

with both low frequency and uncoupled networks and allows the necessary phase coherent processing of all signals in the network to realize increased angular resolution. The paper is titled, “Signal Model for Coherent Processing of Uncoupled and Low Frequency Coupled MIMO Radar Networks.”

Our next paper comes from a distinguished radar systems group at the University of Oklahoma, Norman, OK, which includes Jay McDaniel, Hjalti Sigmarsson, Mark Yeary, student Russell Kenney, and former student Brian Sun. The paper “Reduced Navigation Error Using a Multi-Sensor Fusion Technique and Its Application in Synthetic Aperture Radar,” presents a cheaper, smaller, and much lower power inertial measurement unit for locating and tracking moving objects with a global navigation satellite system. The authors demonstrate their improved navigational system by using it to make motion-compensated SAR images of moving vehicles at 15 GHz.

Frequent JMW contributor Nils Pohl and students Jonathan Bott and Florian Vogelang at Ruhr University, Bochum, Germany submitted, “A D-Band Phased-Array Chain Based on a Tunable Branchline Coupler and a Digitally Controlled Vector Modulator.” The authors describe a less component-heavy phased array module that replaces digital-to-analog converters (DACs) with coarse RF phase shifters that employ tunable varactor diodes. They demonstrate their improved circuit implementation at 125 GHz where they use 2, rather than 16 DACs to realize the same phase control.

Student Guoyi Xu and Edwin C. Kan contributed an interesting paper describing an enhanced calibration technique to eliminate random phase offsets from multiple receivers being employed for 3D localization or mapping. They demonstrate the technique at 1.8 GHz on backscattering RFID tags and obtain less than 2 degrees of phase error and 1.9 mm range resolution for their superheterodyne technique. The method has direct applications for IoT (Internet of Things) and other wireless location and mapping functions, as well as in interpreting the origins of system phase offset and noise. The paper is “Phase Offset Calibration in Multi-Channel Radio-Frequency Transceivers.”

In “RFSoc-FPGA Realization of a Code-Multiplexed Digital Receiver (CMDR) Using 1-ADC/Quad-Channel,” John Volakis, Kefayet Ullah, and Satheesh Bojja Venkatakrishnan of Florida International University, Miami, describe a new 4-channel digital receiver for 5G MIMO (multiple-input multiple-output) applications. The concept utilizes a single ultra-wide-band analog-to-digital converter (instead of one per channel) and code multiplexes several channels into one, saving complexity, cost, and power consumption. The resulting CMDR system operates at a clock frequency of 400 MHz with >20 dB ACI (adjacent channel interference), a record for reported channel multiplexing schemes. The new architecture has the potential for dramatically improving throughput in future 5G communications networks.

“Microwave Resonators Enhanced with 3D Liquid-Metal Electrodes for Microparticle Sensing in Microfluidic Applications,” comes from authors Y.C. Alatas, U. Tefek, B. Sari, and M.S. Hanay representing three different universities in Turkey.

They design and demonstrate a microfluidic particle sensor based on a 3D conducting electrode that is formed from low melting point Galinstan. The use of the volume-filling metal inserted into preformed, photolithographically fabricated cavities can create electrodes with highly uniform electric fields that span a large volume of the intervening microfluidic channel. This provides high sensitivity to passing particulates, and more definitive measurements of absolute particle size, than other two-dimensional techniques. Results are demonstrated on 20–30 micron polystyrene particles using an integrated resonator circuit with responses between 1 and 7 GHz.

“Free Space Dielectric Techniques for Diamond Composite Characterization,” from Jim Buckwalter (UC San Diego), Andrew Kummel (UC Santa Barbara), and students Chelsea Swank (UCSD) and Shu-Ming Chang (UCSB), looks at characterizing composite diamond substrates for high frequency (D-band) applications. They develop a free space measurement set-up using both Gaussian beam analysis and time domain techniques to derive accurate dielectric properties of high thermal conductivity diamond composites in the 120–160 GHz frequency range. The diamond substrates could be used to improve the performance of high-power millimeter-wave circuits, such as in radar and communications systems.

Finally, “A D-band Frequency-Doubling Traveling-Wave Amplifier Through Monolithic Integration of a SiC SIW and GaN HEMTs,” by IEEE Life Fellow James Hwang and student Lei Li at Cornell University, Ithaca, NY, and Patrick Fay from the University of Notre Dame, Indiana, presents a unique doubling all-solid-state traveling wave amplifier operating from 132 to 140 GHz with more than 250 mW of output power. They utilize GaN HEMT amplifiers power combined in a SiC substrate integrated waveguide to achieve their impressive performance.

Looking forward, our April 2024 issue is already well populated with more than 20 manuscripts currently in review. Please don’t forget to consider a contribution to our special “Microwaves in Climate Change” issue by contacting our EiC with your proposed topic. We already have 16 excellent authors and topics in our current queue but are looking for another 10 or so additional submissions to complete the special issue.

III. 2023 OUTSTANDING REVIEWERS

Continuing a tradition we began last January [2], we now present a very special tribute to our *Outstanding Reviewers of 2023*. This past November, we asked authors and topic editors of papers published in volume 3 of JMW to search through their correspondence and nominate reviews that made a real difference to the quality of a particular manuscript or the ability of an editor to make a decision on the true merits of a submitted paper. Especially important to this EiC were the recommendations of authors – most of whom needed to do lots of extra work after receiving their reviewer comments. In all cases, reviewer identities were kept completely anonymous and the final evaluations of all nominees was completed by the EiC.

Out of some 230 reviewers who completed one or more paper evaluations for our 2023 articles, we selected six

outstanding individuals who submitted extremely helpful reviews, based either on author or on editor recommendations. This year our 2023 Outstanding Reviewers are: Professor **Ivan Arregui** from the Public University of Navarre (UPNA), Spain; Research Assistant **Thomas Bücher** at University of Wuppertal, Germany; Professor **José Luis Gómez Tornero** with the Universidad Politecnica de Cartagena, Spain; Professor **James Kelly** at Queen Mary University of London, U.K.; Graduate student **Matthias Linder** at Institute of Microwave Engineering, Ulm University, Germany; and Professor **Mario Lucido** with DIEI, University of Cassino and Southern Lazio, Italy.

Each of these individuals has received a special certificate of appreciation from the MTT Society and their names will appear in an upcoming issue of MICROWAVE MAGAZINE and in our MTT and JMW Newsletters. A very wholehearted “*Thank You and Well Done*,” from the entire IEEE JMW team!

IV. 2022 BEST PAPER PRIZE

In keeping with a tradition within the MTT Society to award a Best Paper prize at least one full year after the appearance of an article in the associated journal, we announce our IEEE JOURNAL OF MICROWAVES Best Paper award for 2022: “Electronically Steerable Antennas for Future Heterogeneous Communication Networks: Review and Perspectives,” by authors Tobias Chaloun, Luigi Boccia, Emilio Arneri, Michael Fischer, Vaclav Valenta, Nelson Fonseca, and Christian Waldschmidt [3]. After appearing in our October issue of 2022, this paper rose to the top of both our most viewed and most cited manuscripts for volume 2 articles. The paper is an extremely well organized, complete, and effectively documented review of beam steering antennas for 5G and 6G communications systems and related applications. It has 270 references and looks at all aspects of modern day communications antenna networks from ground, satellite, and new aerial (UAV) systems, to detailed component and antenna designs, and covers a frequency range from 2 GHz up to 100 GHz. Last author Christian Waldschmidt, at University of Ulm, is one of JMW’s most prolific contributors, and this contribution is certainly one of the best. A link to the paper can be found in the references. Congratulations to all the authors of this extremely nice paper and excellent contribution to IEEE JOURNAL OF MICROWAVES.

V. OUR EDITORIAL TEAM

Most of our twenty-four Topic Editors have been serving since April 2020, and they continue to contribute their time and expertise to keep the journal both relevant and of high quality. All of these notable individuals were chosen from the Chairs, Vice-Chairs, and key participants of the twenty-six active technical committees within the Microwave Theory and Technology Society.¹ In addition to technical expertise and

¹The 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/technical-committees-list/>).

academic, governmental, and industrial backgrounds, we also have significant publications experience and leadership skills on our Editorial Board, which includes three former and three current IEEE journal Editors-in-Chief, a former MTT-S Ad-Com President, and fourteen current and former IEEE journal Associate Editors. Many have Associate Editor experience on multiple journals. This year we have added a new Topic Editor, Professor Raafat Mansour of the University of Waterloo, Canada, who will cover MTT-S Technical Committee 9, *Microwave and Millimeter-Wave Solid State Circuits*, and MTT-S Technical Committee 5, *Filters*. Our efforts are also aided by a senior Administrative Editor, Kara McArthur, our young and enthusiastic assistant editor, Jackie Steele, and an experienced production editor, Joanna Gojlik. Photos and short bios of our team can be found at the end of this editorial.

ACKNOWLEDGMENT

For this issue, the EiC would like to acknowledge the ear and the support of IEEE Senior Product Manager, Bill Trippe, who has been helping with JMW's launch on Web of Science and Scopus, as well as with our process for realizing an impact factor through Clarivate sometime this year.

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EDITORIAL BOARD

EDITOR-IN-CHIEF



PETER H. SIEGEL (Life Fellow, IEEE) received the B.A. degree in astronomy from Colgate University, in 1976, the M.S. degree in physics from Columbia University, in 1978, and the Ph.D. degree in electrical engineering (EE) from Columbia University in 1983. 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 at the 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 at 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 (SWAT) Team, a group of over 20 scientists and engineers developing THz technology for NASA's near and long-term space missions. This 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 MTT-S THz Technology Committee. He is currently an elected member of the MTT-S 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. Dr. Siegel has been recognized with 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 MTT-S Applications Award in 2018. He is honored to continue the responsibilities in 2022, as the Founding Editor-in-Chief of IEEE JOURNAL OF MICROWAVES, which he hopes will invigorate the microwave field. Among many other functions, he served as the Founding Editor-in-Chief for 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 non-profit society devoted to THz science and technology. Dr. Siegel is also an appointed Editorial Board member of IEEE Access through 2025.

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-Nrnberg, Erlangen, Germany, in 2013. He is currently an Adjunct Professor with Stanford University, Stanford, CA, USA, and has more than 15 years of professional industry experience in various R&D roles. He has co-authored more than 25 research papers, more than 20 patents, and a book on advanced microwave imaging methods.

Dr. Ahmed was the recipient of the University Academic Award of the Technical University of Munich in 2007, the Innovation Award of Rohde & Schwarz (R&S) in 2009 and 2018, and the IEEE MTT Microwave Prize Award of 2013. Moreover, he is the Chair of the IEEE N42.59 Standard for Measuring the Imaging Performance of Active 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 recent years, he has been advancing the qualifications of automotive radars, towards autonomous driving capabilities.

TC-11 TOPIC EDITOR: MICROWAVE LOW-NOISE TECHNIQUES



JOSEPH BARDIN (Fellow, IEEE) received the Ph.D. degree in electrical engineering from the California Institute of Technology in 2009. In 2010, he joined the Department of Electrical and Computer Engineering, University of Massachusetts, 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.

Dr. Bardin 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 the Faculty Member with the Department of Electrical and Computer Engineering, Villanova University Villanova, PA, USA, where he 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 interests include the characterization of semiconductor devices, such as PIN diodes and FETs in the microwave and RF control environment.

Dr. Caverly is currently the Editor-in-Chief of IEEE Microwave Magazine and an ex-officio member of the MTT-S AdCom. He 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 the Department of Electrical Engineering, 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, CA, 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, Honolulu, HI, USA; and a

Product Line Manager and Senior Technology Advisor with Chorum Technologies. From 2002 to 2018, he was the Janet and Mike Greene endowed Professor and Jenkins Garrett Professor of Electrical Engineering with the University of Texas – Arlington, Arlington, TX, USA. He is currently the Mary and Richard Templeton Centennial Chair Professor in 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.

Dr. Chiao was the recipient of the Lockheed Martin Aeronautics Company Excellence in Engineering Teaching Award, Tech Titans Technology Innovator Award, Research in Medicine award in the Heroes of Healthcare, IEEE Region 5 Outstanding Engineering Educator Award, IEEE Region 5 Excellent Performance Award, 2012-2014 IEEE MTT Distinguished Microwave Lecturer Award, 2017-2019 IEEE Sensors Council Distinguished Lecturer Award, and 2011 Edith and Peter O'Donnell Award in Engineering by The Academy of Medicine, Engineering and Science of Texas. He has been the Chair of several international conferences including 2018 IEEE International Microwave Biomedical Conference (IMBioC). He was the Chair of the IEEE MTT-S Technical Committee 10 Biological Effect and Medical Applications of RF and Microwave, Technical Program Chair of the 2019 IEEE International Wireless Symposium, and an Associate Editor for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES. He is the founding Editor-in-Chief of 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, Fuzhou, China, the master's degree in radio engineering from Southeast University, Nanjing, China, and the Ph.D. degree in electrical engineering from the University of Ottawa, Ottawa, ON, Canada. In 1993, he was an NSERC Postdoctoral Fellow with McGill University, Montreal, QC, Canada. He is currently with the Department of Electrical and Computer Engineering, Dalhousie University, Halifax, Nova

Scotia, Canada, where he is a Professor and the Head of the Department of Electrical and Computer Engineering. He has been an Adjunct or a Visiting Professor with the University of Nottingham, Nottingham, U.K.; École Nationale Supérieure des Télécommunications de Bretagne, Brest, France; Shanghai Jiao Tong University, Shanghai, China; Fuzhou University, Fujian, China; Hong Kong University of Science and Technology, Hong Kong; and University of Electronic Science and Technology of China, Chengdu, China. He has authored or coauthored more than 450 journal and conference papers in computational electromagnetics, RF/microwave electronics, antennas, and wireless technologies. He was one of the originators of the unconditionally stable methods that have been highly cited and used. His research interests include time-domain electromagnetic modeling techniques, antennas, wideband wireless communication and sensing systems, wireless power technology, bioelectricity and bioelectromagnetics. His team also developed several nonlinear ultra-wideband receivers and planar wireless power transfer transmitting and receiving structures. Dr. Chen was the Guest or Track Editor of IEEE Transactions on Microwave Theory and Techniques, IEEE Microwave Magazine, IEEE Journal of Electromagnetics, RF and Microwaves in Medicine and Biology, and International Journal of Numerical Modeling (Wiley) and an Associate Editor for IEEE Journal of Multiscale and Multiphysics Computational Techniques. He was also the founding Chair of the joint Signal Processing and Microwave Theory & Techniques Chapter of IEEE Atlantic Canada, Chair of the IEEE Canada Atlantic Section, and a Member of the Board of Directors for IEEE Canada during 2000–2001. He is currently an elected Member of the Ad-Com of the IEEE Microwave Theory and Technology Society. He was the recipient of the 2005 Nova Scotia Engineering Award, the 2006 Dalhousie Graduate Teaching Award, the 2007 and 2015 Dalhousie Faculty of Engineering Research Award, the 2013 IEEE Canada Fessenden Medal, and the Dalhousie University Distinguished Professorship. He is a Fellow of the Canadian Academy of Engineering and Engineering Institute of Canada.

TC-24 & TC21 TOPIC EDITOR: MICROWAVE/MM-WAVE RADAR, SENSING, AND ARRAY SYSTEMS & TERAHERTZ TECHNOLOGY AND APPLICATIONS


KEN B. COOPER (Senior Member, IEEE) received the A.B. degree in physics from Harvard College, Cambridge, MA, USA, in 1997, and the Ph.D. degree in physics from the California Institute of Technology, Pasadena, CA, USA, in 2003. Following postdoctoral research in superconducting microwave qubits, he has been an RF Microwave Engineer with Jet Propulsion Laboratory (JPL), since 2006, where he has been recognized with the Lew Allen Award for Excellence, the Ed Stone Award for an Outstanding Research Publication,

a NASA Exceptional Technology Achievement Medal, and Principal and Senior Research Scientist designations for the development of active THz sensors, systems, and techniques. His work with JPL has included the development of scanning 340 GHz and 670 GHz imaging radars for concealed object detection, a compact 95 GHz Doppler radar and 270/560 GHz spectrometer for cometary jet observation, and differential absorption radars at 170 GHz and 560 GHz for humidity sounding on Earth and Mars.

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 the 1970s. After working for several years with the Pioneering Gallium Arsenide (GaAs) Group, Plessey Research, he emigrated to the United States, where he worked for 15 years in various engineering and management positions with Watkins Johnson, Loral, and Celeritek. In 1996, he returned to the United Kingdom, as 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 several bestselling books on RFP design and is a regular contributor to IEEE Microwave Magazine with his popular "Microwave Bytes" column. Dr. Cripps was the recipient of the 2008 IEEE Microwave Application Award.

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



AFSHIN S. DARYOUSH (Fellow, IEEE) received the BS degree in electrical engineering and applied physics (EEAP) in 1981 from Case Western Reserve University, Cleveland, Ohio. His MS and PhD were in electrical and computer engineering and were awarded from Drexel University, Philadelphia, Pennsylvania in 1984 and 1986 respectively. He 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 which resulted in more than 300 technical articles, 27 patents, and ten book chapters. Since 2011, he has been a member of the Franklin Institute's Committee on Science and the Arts and serves as chair of the Electrical Engineering cluster. Dr. Daryoush was the recipient of Drexel University's Graduate Teaching Award in 2000, the IEEE Philadelphia Section's Franklin Key Award in 2015, the Drexel University's Alumni Award in 2018, and the College of Engineering Innovation Award in 2020. He was inducted into the National Academy of Inventors in 2023. After receiving the Microwave Prize in 1986, 13 joint articles of his students have been recognized as the best student papers in various IEEE conferences. He has also organized various IEEE conferences since 1993, particularly serving as the TPC Chair of Radio Wireless Symposium 2008 (RWS 2008) and the Chair of the Radio and Wireless Week 2009 (RWW2009), Microwave Photonics 2010 (MWP 2010), Benjamin Franklin Symposium on Microwave and Antenna Sub-Systems 2014 (BenMAS 2014), and International Microwave Symposium 2018 (IMS 2018). He is also co-chair of the MTT-S. TC-22 and chair of the Philadelphia joint chapter of AS/MTT societies.

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 (ENSEEIH), Toulouse, France, in 2003, the M.Sc. degree in electrical engineering from the Ecole Polytechnique de Montreal, Montreal, QC, Canada, in 2003, and the Ph.D. degree in electrical engineering from Institut National Polytechnique de Toulouse – Université de Toulouse, Toulouse,

France, in 2010. After working as an Antenna Engineer successively for Thales Alenia Space, Toulouse, France, the Centre National d'Etudes Spatiales (CNES), Toulouse, France, and the European Space Agency (ESA), Noordwijk, The Netherlands, he recently joined Anywaves, Toulouse, France, as Innovation Manager. From 2020 to 2023, he also has held an Honorary

Appointment as Professional Fellow with the University of Technology Sydney, Sydney, NSW, Australia. He has authored or coauthored more than 300 papers in peer-reviewed journals and conferences and has more than 50 patents issued or pending. His 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. Dr. Fonseca was an Associate Editor for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES from 2020 to 2022 and a co-Guest Editor of two issues focused on microwave aerospace systems in the IEEE MICROWAVE MAGAZINE in 2022 and 2023. He is currently an Associate Editor for *IET Microwaves, Antennas and Propagation* and IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION and a Topic Editor of IEEE JOURNAL OF MICROWAVES. He was successively vice-Chair (2020–2021) and Chair (2022–2023) of the IEEE MTT-S Technical Committee 29 (TC-29) on Microwave Aerospace Systems. He was a Board Member of the European School of Antennas and Propagation from 2019 to 2023. He was also the EurAAP Regional Delegate representing Benelux for the term 2021–2023. Dr. Fonseca was the recipient of several 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, the Best Applied Technology Antenna Paper Award at EuCAP 2022 and multiple ESA Technical Improvement Awards.

TC-5 TOPIC EDITOR: FILTERS



ROBERTO GÓMEZ-GARCÍA (Fellow, 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 has been an Associate Professor with the Department of Signal Theory and Communications, University of Alcalá, Alcalá de Henares, Spain. He has been for several research stays with the C2S2 Department, XLIM Research Institute, University of Limoges, Limoges, France; Telecommunications Institute, University of Aveiro, Aveiro, Portugal, 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, and was an Invited Professor with the Gdansk University of Technology, Gdansk, Poland, during 2019–2020. He has authored or co-authored about 145 papers in international journals and 180 papers in international conferences in his research areas, 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, software-defined radio and radar architectures for telecommunications, remote sensing, and biomedical applications. Dr. Gómez-García was a member of the Technical Review Board for several IEEE and EuMA conferences. He is a member of the IEEE MTTs Filters (MTT-5), IEEE MTT-S RF MEMS and Microwave Acoustics (MTT-6), IEEE MTT-S Wireless Communications (MTT-23), IEEE MTT-S Biological Effects and Medical Applications of RF and Microwave (MTT-28), and IEEE CAS-S Analog Signal Processing Technical Committees. He was the recipient of the 2016 IEEE Microwave Theory and Technology Society (MTT-S) Outstanding Young Engineer Award. He was an IEEE CAS-S Distinguished Lecturer during 2020–2021. He was an Associate Editor for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES from 2012 to 2016, IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I: REGULAR PAPERS from 2012 to 2015, IEEE ACCESS, *IET Microwaves, Antennas, and Propagation*, and *International Journal of Microwave and Wireless Technologies*. He was a Senior Editor of IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS from 2016 to 2017 and the MTT-S Newsletter Working Group Chair. He was Guest Editor of several special/focus issues and sections in IEEE and IET journals. In addition to his role on IEEE JOURNAL OF MICROWAVES, he is the Editor-in-Chief of IEEE MICROWAVE AND WIRELESS TECHNOLOGY LETTERS (2022–2024) and an Associate Editor of IEEE JOURNAL OF ELECTROMAGNETICS, RF AND MICROWAVES IN MEDICINE AND BIOLOGY.

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 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 primary research interests include the design and implementation of MEMS and acoustic devices, components, and subsystems for RF front ends. In addition, his research interests include 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 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 the 2018 International Microwave Symposium. He was an Associate Editor for IEEE TRANSACTIONS ON ULTRASONICS, FERROELECTRICS, AND FREQUENCY CONTROL and Journal of Microelectromechanical Systems, and also the Technical Committee Chair of MTT-6 RF-MEMS and Microwave Acoustics of the IEEE Microwave Theory and Technology 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 with 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 (cryogenic) conditions, and modeling, design, fabrication and test of advanced technologies for high-frequency RF sample-and-hold and analog digital conversion circuits based on fully-depleted silicon-on-insulator transistors and CCD structures. His 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, including cryogenic and quantum systems. He joined the Department of Electrical and Computer Engineering, Auburn University, Auburn, AL, USA, as an Assistant Professor in 2010 and was promoted to a Professor in 2019. In addition to his research group with Auburn University, he is currently the Director of the Alabama Micro/Nano Science and Technology Center. In 2022, he joined the Google Quantum AI Team as a Visiting Faculty Researcher. He is also the Auburn University IEEE Student Chapter Faculty Advisor and is the Chair of MTT-7 Technical Committee on Microwave Superconductivity and Quantum Technologies.

TC-21 TOPIC EDITOR: TERAHERTZ TECHNOLOGY AND APPLICATIONS


DMITRY KHOKHLOV received the M.S., Ph.D., and Doctor of Science (Russian analog of the Habilitation 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, and 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 Basic Research. Since 2015, he has also been the Head of the Expert Council on International Research Projects of the same Foundation. He has been active in teaching and he has developed several lecture courses for undergraduate and graduate students and supervised more than 30 M.Sc. students and about 15 Ph.D. dissertations. He authored or co-authored 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 several other areas. He is also the Principal Investigator of more than 15 research grants from different Russian national agencies.

TC-9 & TC-5 TOPIC EDITOR: MICROWAVE AND MILLIMETER-WAVE SOLID-STATE DEVICES & FILTERS


RAAFAT MANSOUR (Fellow, IEEE) is a Professor of Electrical and Computer Engineering at the University of Waterloo and holds Tier 1 - Canada Research Chair (CRC) in Micro-Nano Integrated RF Systems. He held an NSERC Industrial Research Chair (IRC) for two terms (2001–2005) and (2006–2010). Prior to joining the University of Waterloo in January 2000, Dr. Mansour was with COM DEV Cambridge, Ontario, over the period 1986–1999, where he held various technical and management positions in COM DEV's Corporate

R&D Department. Professor Mansour holds 44 US and Canadian patents and more than 420 refereed IEEE publications to his credit. He is a co-author of a 23-chapter Book published by Wiley and has contributed 7 chapters to five other books. Professor Mansour founded the Centre for Integrated RF Engineering (CIRFE) at the University of Waterloo <https://uwaterloo.ca/centre-integrated-rf-engineering/>. It houses a clean room and a state-of-the-art RF test and characterization laboratory. He was as the Technical Program Chair of the 2012 IEEE International Microwave Symposium (IMS). Professor Mansour is a Fellow of the IEEE, a Fellow of the Canadian Academy of Engineering (CAE), a Fellow of the Engineering Institute of Canada (EIC). He was the recipient of the 2014 Professional Engineers Ontario (PEO) Engineering Medal for Research and Development and the 2019 IEEE Canada A.G.L. McNaughton Gold Medal Award.

SPECIAL SERIES TOPIC EDITOR


ALLISON MARSH (Senior Member, IEEE) received the B.S. degree in engineering from Swarthmore College 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 with Smithsonian National Postal Museum.

Dr. Marsh 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 a Full Professor in 2010. Between 1992 and 2004, he enjoyed four stays in U.S. universities, the first one with the Polytechnic Institute of Brooklyn, New York City, NY, USA, and three more with the

University of Houston, Houston, TX, USA. From July to December 2019, he was a Visiting Researcher with the 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. Prof. Mesa has been an IEEE Fellow proposed by the IEEE MTT Society since January 2014. He was an Associate Editor for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES from 2013 to 2016, and a member of the 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 on radio frequencies engineering and systems and circuits for IoT. Since 2014, he has been the Vice Head of the Department of Engineering, University of Perugia. His present h-index is 24. His research activities are testified by more than 170 publica-

tions 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 enabling technologies for IoT. He is an Associate Editor for ACES Journal. From January 2017 to December 2019, he was the Chair of the IEEE Technical Committee MTT-24- RFID Technologies.

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 Pennsylvania State University, he was an Undergraduate and Graduate Research Assistant from 1995 to 1998 and the National Defense Science and Engineering Graduate Fellow from 1998 to 2001, 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 with the Department of RF/Optoelectronics. His research interests and activities 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 has co-authored more than 80 journal and conference publications and holds nine patents in these areas.

Dr. Nordquist is a Senior Member of the IEEE Electron Device and Microwave Theory and Technology Societies. He is currently the Chair of the IEEE MTT-13 Technical Committee on Microwave Control Materials and is on the Editorial Board of IEEE JOURNAL OF MICROWAVES. He was 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, a reviewer for several 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 (H-i 28, i10 82, and has 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.

Dr. Roselli was a member of the Board of Directors of ART Srl, Urbino, Italy, from 2008 to 2012. He is a member of the list of experts of the Italian Ministry of Research; the past Chair of the IEEE Technical Committees MTT-24-RFID; Vice Chair of 25-RF Nanotechnologies, 26-Wireless Power Transfer, ERC Panel PE7, and Advisory Committee of the IEEE-WPTC; and 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 an Associate Editor for IEEE Microwave Magazine. He is involved with the boards of several 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 TECHNOLOGY LETTERS.

Dr. Roselli was a member of the Board of Directors of ART Srl, Urbino, Italy, from 2008 to 2012. He is a member of the list of experts of the Italian Ministry of Research; the past Chair of the IEEE Technical Committees MTT-24-RFID; Vice Chair of 25-RF Nanotechnologies, 26-Wireless Power Transfer, ERC Panel PE7, and Advisory Committee of the IEEE-WPTC; and 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 an Associate Editor for IEEE Microwave Magazine. He is involved with the boards of several 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 TECHNOLOGY LETTERS.

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



KAMAL K. SAMANTA (Senior Member, IEEE) received the graduation degree in science (physics), and Engineering (ECE) the double master's degree in management (R&D), and technology (mmW), and the Ph.D. degree in microwave engineering from the University of Leeds, Leeds, U.K. He has extensive experience of about 25 years and led a multidisciplinary government. He performed 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 μ W (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. He was the Chief/Senior Principal/Lead R&D Engineer, Scientist, and Consultant. He was with Thales Aerospace, U.K. (Radar, EW, and ESM systems), European Aeronautics Defense and Space (EADS) Astrium (Airbus), U.K., (GaN, HPA, Satellite Comm), Indian Space Research Organization, ISRO, (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 >75 peer-reviewed publications (first/sole-authored) and has delivered more than 45 invited talks, including keynotes/panels at IEEE MTT-S conferences. His research interests 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.

Dr. Samanta was the recipient of the Commonwealth Fellowship, Best International Researcher Award, and Engineering Excellence Award from IET, London, (2004/2005). He is a Fellow of IET and Life Fellow of IETE, and a Chair/member of IEEE MTT-S Technical Committees: MTT-16 (packaging/integration), MTT-14 (integrated circuits), MTT-12 (high power), and TC-5 (filters). He is on the TPC of major IEEE MTT-S conferences and was a Guest Editor of special issues published in IEEE microwave journals and magazines. He was/is an Associate Editor for IEEE MICROWAVE AND WIRELESS COMPONENTS LETTERS during 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 the areas of microelectronics and nanotechnology from Purdue University, West Lafayette, in 1994, 1997, and 2007, respectively. He is currently a Manager of the Department of RF and EO/IR Subsystems, HRL Laboratories, Malibu, CA, USA. His research interests include design, fabrication, and integration of RF/millimeter wave components and subsystems for next-generation phased-array radar, EW

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



ALBERTO VALDES-GARCIA (Fellow, 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

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2010 George Smith Award presented by the IEEE Electron Devices Society, 2017 Lewis Winner Award for Outstanding Paper presented by IEEE International Solid-State Circuits Conference, and 2017 IEEE JOURNAL OF SOLID-STATE CIRCUITS Best Paper Award. Within IBM, he has been twice a 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. He was with the IEEE 802.15.3c 60 GHz Standardization Committee, from 2006 to 2009. 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 of the IEEE MTT-S Microwave and Millimeter-Wave Integrated Circuits Technical Committee, where he was the Chair in 2020–2021. 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) received the B.Sc. degree (Hons.) in radio engineering from Nanjing Institute of Technology (now Southeast University) in 1982, the D.E.A. degree (Hons.) and the Ph.D. degree (Hons.) in optics, optoelectronics, and microwave engineering, all from the Institut National Polytechnique de Grenoble (INPG) and University of Grenoble, France, respectively in 1984 and 1987. He is currently the Endowed Industrial Research Chair in Future Wireless Technologies and Professor of Electrical Engineering with the École

Polytechnique de Montréal (University of Montreal), Montreal, QC, Canada, where he is also the Director of the Poly-Grames Research Center. He was the Canada Research Chair in RF and millimeter-wave engineering and the Founding Director of the Center for Radiofrequency Electronics Research of Quebec. He held/holds visiting/honorary professorships with various universities around the world and has graduated more than 80 Ph.D. and 95 M.Sc. students. He has authored or coauthored more than 1400 refereed papers, and a number of books and book chapters and filed more than 80 patents. Prof. Wu was the General Chair of the 2012 IEEE MTT-S International Microwave Symposium and the 2016 President of the IEEE Microwave Theory and Technology Society (MTT-S). He was an 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 IEEE Canada, the 2009 Thomas W. Eadie Medal from the Royal Society of Canada, 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), the 2015 Prix d'Excellence en Recherche et Innovation of Polytechnique Montréal, the 2015 IEEE Montreal Section Gold Medal of Achievement, the 2019 IEEE MTT-S Microwave Prize, the 2021 EIC Julian C. Smith Medal, the 2022 IEEE MTT-S Outstanding Educator Award, and the 2022 IEEE AP-S John Kraus Antenna Award. He was also an IEEE MTT-S Distinguished Microwave Lecturer and is a Fellow of the Canadian Academy of Engineering, the Royal Society of Canada, and the National Academy of Science and Engineering of Germany.

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. He was a Research Engineer with Optimization Systems Associates Inc., Dundas, ON, Canada, during 1988–1990, 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 an Author of the book *Neural Networks for RF and*

Microwave Design (Boston, MA, USA: Artech House, 2000), a co-editor of *Modeling and Simulation of High-Speed VLSI Interconnects* (Boston, MA, USA: Kluwer, 1994), and a 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 the area. Dr. Zhang is a Fellow of the Canadian Academy of Engineering and the Engineering Institute of Canada. He was an Associate Editor for the *IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES* during 2020–2022, an Associate Editor for the *International Journal of RF and Microwave Computer-Aided Engineering* during 2010–2018, and General Chair of the IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization in 2015.

ASSISTANT EDITOR



JACKIE STEELE received a B.S. degree in journalism/public relations from Cal Poly San Luis Obispo, CA, USA, and a master's degree in international communication from ISCOM, Paris, France. She joined *IEEE JOURNAL OF MICROWAVES* as an administrative and media editor in July 2023. Her experience includes copywriting, strategic communications and social media management in technology, and innovation-focused environments.

ADMINISTRATIVE EDITOR



KARA MCARTHUR received the B.A. degree in sociology and completed graduate work in health-care ethics from Rice University, Houston, TX, USA. She is currently on two Institutional Review Boards, 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 as the Founding Managing Editor of the *Engineering in Medicine and Biology Society's* first Gold Open

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PRODUCTION EDITOR



JOANNA GOJLIK received the B.A. degree in journalism/professional writing from The College of New Jersey, Ewing, NJ, USA, the M.A. degree in liberal studies from the University of North Carolina at Greensboro, Greensboro, NC, USA, and the Professional Certificate in editing from New York University, New York, NY, USA. Since 2004, she has been with the IEEE Publications Operations Department, where she is currently a Journals Production Manager. Over the years, she has managed a large portfolio of journals/ trans-

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