


# Introduction to the Spring 2022 Issue

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(Editorial)

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**ABSTRACT** This is an introduction to our April 2022 issue of IEEE JOURNAL OF MICROWAVES. In this volume we bring you ten regular submissions – with no invited papers and no special editorial content. It is therefore a snapshot of what we are publishing without editorial intervention. We will evaluate the response to this “regular” issue by the only means currently at our disposal: the article usage count. This particular statistic continues to keep pace with our 2021 measure. We are happy to report that we have maintained our #3 ranking (out of 272 IEEE technical publications surveyed) in downloads/articles published for all of 2021 – not only the originally reported January-June timeframe. As we begin the application for inclusion in various scientific databases outside of IEEEExplore, we hope that this statistic will help us navigate the complex review process we will be undergoing in 2022. In addition to summarizing our regular manuscript contributions in this editorial, we mention some upcoming reviewer and author events and a Call for Papers for a very special 70<sup>th</sup> Anniversary of the MTT Society issue that we intend to release in January 2023.

**INDEX TERMS** Journal of Microwaves, spring issue, opening editorial, reviewing, Editorial Board.

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## I. INTRODUCTION

In this, our second issue in Volume 2 of IEEE JOURNAL OF MICROWAVES we bring you 10 new manuscripts that are all regular contributions. Our special series features and invited review content will start up again in July. Meantime, we are very pleased to report that our number-three spot in the ranking of all IEEE technical publications for usage/articles published was maintained throughout the full year, not only for the first six months of content, as was reported in our January 2022 issue [1]. For 2021, we averaged 1,348 downloads/article with a total usage count of 126,731.<sup>1</sup> We also have begun the process of applying to Clarivate for inclusion in their scientific database services (i.e., *Web of Science* in particular). If successful, we hope it will greatly increase our outreach into the broader science communities, which is a major goal of this EiC and of many others on our Editorial Board. Inclusion should also expand visibility for our authors beyond the traditional community that exclusively uses IEEEExplore.

Although we have been both fortunate and innovative in assembling a substantial and loyal author and reviewer pool, as is the case with many other more-established publications, we do occasionally suffer from a severe lack of response to our requests for paper reviews. This affects our timelines and justifiably upsets our authors. We are trying to mitigate these difficulties by taking greater advantage of our broad-based Editorial Board and their substantial professional networks, as well as our ongoing Journal Club review process [2], but we want to do more. As such we are instituting several “reviewer appreciation” activities. At the end of each calendar year we will select individuals who have gone above and beyond in the task of reviewing for IEEE JOURNAL OF MICROWAVES, and we will acknowledge these individual contributions through certificates of appreciation and announcements both within this Editorial series and in our IEEE Microwave Newsletter [3]. We are also holding a special *Reviewer’s Recruiting and Get to Know Our Journals* reception/event at the June 2022 International Microwave Symposium in Denver, Colorado [4]. This event is intended to bring in new reviewers for all of our MTT journals as well as to give attendees a chance to get to know our journal editors and EiC’s, our journal philosophies,

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<sup>1</sup>“Total Usage & Document Counts for Original Research Documents, by Publication Title for Journals & Magazines, Jan 1, 2021–Dec 31, 2021, Filtered by Journal & Magazines, orig-research, Published in 2021,” IEEE Analytics group. Received Jan. 15, 2022. Copy available from author.

our standards and target audiences, and our journal histories. You can get more information and a free ticket for the event by going to: <https://mtt.org/ims2022-journal-event/>.

After completing our first year of publication, we are now ready to implement a JMW Best Paper award. This award will begin in 2023 with papers published in 2021 and 2022. All authors/contributions will be eligible for consideration and the evaluation committee is completely independent from our Editorial Board. You will hear more about this in our fall issue.

Moving forward, our July issue is already filling up and we have just released a call for papers for a special 70<sup>th</sup> anniversary issue [5] celebrating the founding of the MTT Society in 1952 [6]. We are seeking both original research articles on topics of notable and widespread interest as well as overview and historic features on both events and individuals who have shaped our society and the microwave field in general. If you have an interest in contributing an article, please contact either our Special Issue Editor, Professor Ke Wu, or our Editor-in-Chief. The due date for initial manuscripts is October 3, 2022.

We hope more of you will decide to submit your research in the future and we promise to do our best to make sure your experience is at least satisfying, if not exceptional. We welcome feedback and direct communications with our authors as well as our readers, so do not hesitate to write to any of our Editorial Board members or to our EiC directly at any time!

## II. CONTENT

We open the IEEE JOURNAL OF MICROWAVES, volume 2, issue 2 with an excellent paper by the groups of Christian Waldschmidt and Reiner Thomä at University of Ulm and Technische Universität Ilmenau, respectively. In this article, “Coherent Measurements of a Multistatic MIMO Radar Network With Phase Noise Optimized Non-Coherent Signal Synthesis,” a new direct digital synthesis (DDS) technique is used to recover performance degradation inherent in non-coherent radar techniques currently employed in many widely spaced multiple-input multiple-output (MIMO) arrays. The DDS technique is demonstrated at 150 GHz, with the same detection and imaging performance as obtained with by traditional coherent radar arrays.

In a second radar application paper from Thomas Walter’s group at University of Ulm, near field data on moving targets in a scene are quickly and cleverly processed into range-velocity maps that can identify and track specific high value targets, such as pedestrians and cyclists, thus improving automotive radar safety measures. The paper is titled, “Radar Scenario Generation for Automotive Applications in the E Band.”

In, “A Broadband 77/ 79 GHz Transmitter With Dual VCOs and Third Harmonic Signal Extraction in a 28 nm CMOS Technology,” Nils Pohl’s group at Ruhr University Bochum, in collaboration with Infineon Technologies, Munich, Germany, present a broadband CMOS-based automotive transmitter front end with high power output (> 16 dBm), very low

phase noise (−98 to −102 dBc/Hz), and a VCO tuning range between 11 and 15%.

Our fourth manuscript, “A 90–98 GHz CMOS Transmitter Frontend for Concurrent Phase-Coded FMCW Radar Applications,” also involves millimeter-wave radar. This paper comes from Tel Elazar and Eran Socher at Tel Aviv University in Israel, and describes in great detail a 94 GHz FMCW radar transmitter system based on 65-nm CMOS circuitry. They note that their novel architecture enables dual function operation: radar and communications, opening up new operational modes for the intended application suite.

PIN diode switches are the subject of our next paper from graduate student Deepak N. Elluru and a team at the University of Alabama, USA, that includes S. Parasad Gogineni. The “Design of an Absorptive High-Power PIN Diode Switch for an Ultra-Wideband Radar,” describes a wideband (140–500 MHz), high-power handling (200 W), high-speed (<350 nsec) switch for VHF remote sensing radar systems. The unique application alone of mapping Antarctic ice sheet thickness is worth the read.

If you are a power beaming proponent (or a drone operator!) you will definitely want to read our sixth paper from Naoki Shinohara, Tomohiko Mitani, Mizuki Mase, Katsumi Kawai, and Nobuyuki Takabayashi at Kyoto University, Japan, on “Large-Scale Sequentially-Fed Array Antenna Radiating Flat-Top Beam for Microwave Power Transmission to Drones.” The authors present a 32% transmit-to-receive platform efficiency, magnetron-driven phased array, operating at 5.8 GHz. They kept a drone in the air for more than seven minutes with 280 W of input power – admittedly only at a distance of a bit less than a meter! Still, a potentially interesting technology.

Millimeter wave circuit designers are always on the lookout for better performing and more flexible substrate materials for laying out low loss transmission line circuits. Michael Höft, Antonio Malavé and Char Bartlett at University of Kiel, along with Martin Letz at Schott AG, Mainz, Germany present a “Structured-Glass Waveguide Technology for High-Performance Millimeter-Wave Components and Systems.” The new batch process substrate uses laser micromachining techniques that can sculpt out high aspect ratio channels with very low surface roughness. The authors demonstrate the technique on a high performance, low loss, 3D Chebychev filter at 88 GHz.

Y. Ethan Wang and colleagues at University of California Los Angeles, USA, contribute a paper describing a novel liquid crystal-based phase shifter with a high figure of merit for use in the 5G mobile bands below 6 GHz in their paper titled, “Sub-6 GHz High FOM Liquid Crystal Phase Shifter for Phased Array Antenna.” The phase shifter is designed, analyzed, and verified in a patch antenna array operating from 3.7 to 4.2 GHz that achieves a figure of merit of 106 degrees per dB.

A second contribution from Michael Höft and graduate student Abdulrahman Widaa at Kiel University, Germany involves a miniaturized dielectric-resonator-based bandpass filter that can be mass produced. “Miniaturized Dual-Band

Dual-Mode TM-Mode Dielectric Filter in Planar Configuration,” demonstrates design methods and a wide band dual pole filter circuit between 2 and 8 GHz.

Our final contributed manuscript in this issue is from Russel Kenney, Jorge L. Salazar-Cerreno and Jay McDaniel at Oklahoma State University, USA and is entitled, “Two-Dimensional Beam Pattern Synthesis for Phased Arrays With Arbitrary Element Geometry via Magnitude Least Squares Optimization.” This paper discusses a very useful and fast algorithm for optimizing desired beam patterns from an arbitrary array geometry by varying individual element excitations. It is particularly desirable for real-time beam-forming applications or in instances where the array geometry might be changing over time, as in the case with mobile sensors. The authors demonstrate the validity and efficacy of the algorithm on a real phased array system measured in an anechoic chamber.

This concludes our paper queue for volume 2, issue 2 of JMW. We hope you enjoy, download, and cite these manuscripts. We will return in July with an equally exciting set of regular papers, as well as several invited and special series articles that we know you will appreciate.

### III. OUR EDITORIAL TEAM

I believe we have assembled one of the strongest and most experienced Editorial Board teams in recent memory, if not in the entire history of the MTT Society. Our 24 Topic Editors have been selected from the Chairs, Vice-Chairs, and key participants of all 26 active technical committees<sup>2</sup> 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 three former and three current IEEE journal Editors-in-Chief, a former MTT-S AdCom President, and 12 current and former IEEE journal Associate Editors. Our technical efforts are aided by senior Administrative Editor, Kara McArthur, and a very experienced Assistant Editor, Sharri Shaw, who has been working on MTT journals for more than 15 years, including the IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY, where we overlapped for five years between 2010 and 2015. Our veteran IEEE Production Editor, as many of you who have published with us now know, is Joanna Gojlik. We all meet regularly to discuss our philosophy, exchange ideas, bring in new authors and readers, and work tirelessly to make this journal the best it can be! You can find photos and short bios of our entire team at the end of this editorial introduction.

<sup>2</sup>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/technical-committees-list/>).

### ACKNOWLEDGMENT

As we move boldly into our second year of production we continue to benefit from key support staff within the IEEE publications community. We would like to especially commend several people who have really helped out this past quarter, going above and beyond what is normally asked of them: Our Manuscript Central trainer and guru, Sonal Parikh, for helping to refine and update our 2022 paper handling processes. Louis Vacca, who continues to generate our Flip-Books and makes sure that our requested Inaugural print issue copies keep getting distributed to those who request them. Anding Zhu, who uploads all of our web and social media content faster than I can generate it and, who this month, helped us set up and post the survey form for our upcoming *Reviewer’s Recruiting and Get to Know Our Journals* event at the Denver MTT IMS this June. Finally, a special acknowledgment to ME Brennan for handling our application for inclusion of JMW in Clarivate’s database services. We are very grateful!

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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, 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 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, National Aeronautics and Space Administration, Pasadena, CA, USA, from 1987 to 2014; and a Faculty Associate in electrical engineering and a 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. 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 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.

Dr. Siegel has been recognized with 75 NASA technology awards, ten NASA team awards, NASA Space Act Award, three individual JPL awards for technical excellence, four JPL team awards, and IEEE MTT-S Applications Award in 2018. He is honored to continue the responsibilities in 2022 as the Founding Editor-in-Chief IEEE JOURNAL OF MICROWAVES, which he hopes will invigorate the microwave field. Among many other functions, he was the Founding Editor-in-Chief of 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.

## 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.

Dr. Ahmed was the recipient of the University Academic Award of the Technical University of Munich in 2007, Innovation Award of Rohde & Schwarz (R&S) in 2009 and 2018, and IEEE MTT Microwave Prize Award of 2013. Moreover, he is the Co-Chair on the U.S. 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.

### 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 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 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

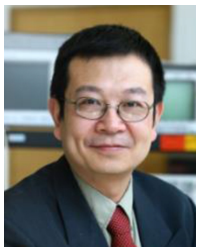


**J.-C. CHIAO** (Fellow, IEEE) received the B.S. degree from the Department of Electrical Engineering, National Taiwan University, Taipei, Taiwan, in 1988, and the M.S. and Ph.D. degrees in electrical engineering from the California Institute of Technology, Pasadena, CA, USA, in 1991 and 1995, respectively. 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, 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 College of Physics and Information Engineering, Fuzhou University, on leave from the Department of Elec-

trical and Computer Engineering, Dalhousie University, Halifax, NS, Canada, where he is a Professor and the former 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, Plouzané, France; Shanghai Jiao Tong University, Shanghai, China; Fuzhou University; 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 current research interests include time-domain electromagnetic modeling techniques, antennas, wideband wireless communication and sensing systems, and wireless power technology. His team also developed several nonlinear ultra-wideband receivers and planar wireless power transfer transmitting and receiving structures.

Dr. Chen was a Guest 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 a Track Editor of IEEE TRANSACTIONS ON MICROWAVE AND TECHNIQUES, a Topic Editor of IEEE JOURNAL OF MICROWAVES, and an elected member of the Ad-Com of IEEE Antennas and Propagation Society. He was the recipient of the 2005 Nova Scotia Engineering Award, 2006 Dalhousie graduate teaching award, 2007 & 2015 Dalhousie Faculty of Engineering Research Award, 2013 IEEE Canada Fessenden Medal, and Dalhousie University 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, Ed Stone Award for an Outstanding Research Publication,

and a Principal designation 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) 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. In 2011, he became a member of the Franklin Institute's Committee on Science

and the Arts.

Dr. Daryoush was the recipient of the 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 serving as the TPC Chair of Radio Wireless Symposium 2008 (RWS 2008) and the Chair of the Radio and Wireless Week 2009 (RWW 2009), Microwave Photonics 2010 (MWP 2010), Benjamin Franklin Symposium on Microwave and Antenna Sub-Systems 2014 (BenMAS 2014), and International Microwave Symposium 2018 (IMS 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, 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.

He is currently an Antenna Engineer for the Antenna and Sub-Millimetre Wave Section, European Space Agency, Noordwijk, The Netherlands. Since November 2020, he has held an Honorary Appointment as Professional Fellow with the University of Technology Sydney, Sydney, NSW, Australia. He has authored or coauthored more than 250 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 the Chair of the 38th ESA Antenna Workshop in 2017, and Co-Chair of the 2018 IET Loughborough Antennas & Propagation Conference (LAPC 2018). He is currently an Associate Editor for *IET Microwaves, Antennas and Propagation* and IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, and a Topic Editor of IEEE JOURNAL

OF MICROWAVES. He is also the Chair of the newly founded IEEE MTT-S Technical Committee 29 (TC-29) on Microwave Aerospace Systems. He has been a Board Member of the European School of Antennas and Propagation since January 2019, and is also the 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 an elected EurAAP Regional Delegate representing Benelux for the term 2021–2023. He 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, 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 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 coauthored more than 100 papers in international journals and more than 140 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 MTT5 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 Techniques 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 and IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I: REGULAR PAPERS from 2012 to 2015. He was a Senior Editor of IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS from 2016 to 2017. 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 new Editor-in-Chief of IEEE MICROWAVE AND WIRELESS COMPONENTS LETTERS, an Associate Editor of IEEE JOURNAL OF ELECTROMAGNETICS, RF AND MICROWAVES IN MEDICINE AND BIOLOGY, IEEE ACCESS, *IET Microwaves, Antennas, and Propagation*, and *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 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 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 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-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 the 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 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 several other areas. He is also the 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 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

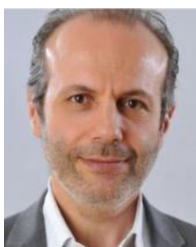


**FRANCISCO MESA** (Fellow, IEEE) received the B.Sc. and Ph.D. degrees in physics from the University of Seville, Seville, Spain, in 1998 and 1991, respectively. From 1992 to 1997, he was an Assistant Professor with the Department of Applied Physics, University of Seville, where he was promoted to an 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 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 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 coauthored 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 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 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-9 TOPIC EDITOR: MICROWAVE AND MILLIMETER-WAVE SOLID-STATE DEVICES



**DAVID S. RICKETTS** (Senior Member, IEEE) received the B.S. and M.S. degrees in electrical engineering from Worcester Polytechnic Institute, Worcester, MA, USA, and the Ph.D. degree in electrical engineering from Harvard University, Cambridge, MA, USA. He is currently a Full Professor of electrical and computer engineering with North Carolina State University, Raleigh, NC, USA. Prior to moving to academia, he spent more than eight years in industrial R&D in the development of integrated circuits in mixed-signal, RF and power

management applications. His work has appeared in *Nature* and in numerous IEEE conferences and journals and was selected for the 2008 *McGraw-Hill Yearbook of Science and Engineering*. He is the author of two books: *The Designer's Guide to Jitter in Ring Oscillators* and *Electrical Solitons*. His research interests include physics, material science and circuit design, investigating the ultimate capabilities of microelectronic devices, and how these are harnessed by differing circuit topologies to produce the highest performing systems.

Prof. Ricketts is a Track Editor of IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, a Topic Editor of IEEE JOURNAL OF MICROWAVES, and the Chair of the MTT Technical Committee 9 on Microwave Devices. He was the recipient of the NSF CAREER Award, DARPA Young Faculty Award, and George Tallman Ladd Research Award. In addition as an educator, he was the recipient of the 2009 Wimmer Faculty Teaching Fellow at Carnegie Mellon University, the 2013 Harvard University Bok Center Teaching Award, and the 2021 William F. Lane Outstanding Teaching Award at NCSU. Since 2015, he has taught experiential hands-on workshops on building a QAM Radio and a FMCW RADAR across the globe at all of the main microwave conferences.

**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-128, 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 COMPONENTS 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 COMPONENTS 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  $\mu$ 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 magazine. 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

and communication systems as well as low-cost, high-performance EO/IR imaging sensors. Before joining HRL, he was a Research Staff Member with Birk Nanotechnology Center, Purdue University, West Lafayette, IN, USA, from 2005 to 2009, where he worked 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. He was the recipient of a number of awards, including special and extraordinary merit awards from Purdue University and HRL Labs. He was the Technical Program Committee and Editor of the IEEE Silicon Monolithic Integrated Circuits in RF Systems Conference. He is 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, NY, USA. He holds more than 75 issued U.S. patents and has authored or coauthored more than 100 peer-reviewed publications. He is the Co-Editor of the book *60 GHz Technology for Gbps WLAN and WPAN: From Theory to Practice* (Wiley, 2011). His research interests include mm-wave systems for communications and imaging applications.

Dr. Valdes-Garcia 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, 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) is 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 IEEE 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 73 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 50 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 Techniques 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, and the 2021 EIC Julian C. Smith Medal. He was also an IEEE MTT-S Distinguished Microwave Lecturer and is a Fellow of the Canadian Academy of Engineering and the 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. 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. He is an Associate Editor for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES. He was an Associate Editor for the *International Journal of RF and Microwave Computer-Aided Engineering* during 2010–2018 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



**SHARRI SHAW** currently resides in Grand Rapids, MI, USA. She received the B.A. degree in English and a minor in psychology from Saginaw Valley State University, University Center, MI, USA, in 1994, and the master's degree in education with initial certification (M.Ed.) program in 2001 from Aquinas College, Grand Rapids, MI, USA, where she received the Secondary Level Teacher Certification. From 2002 to 2005, she was a teacher in Michigan. From 2006 to 2010, she was an Assistant Editor for IEEE TRANSACTIONS ON

MICROWAVE THEORY AND TECHNIQUES. She currently holds the same position with *IEEE Microwave Magazine*, and is the Publications Administrator for IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY. She started her additional new role as an Assistant Editor for IEEE JOURNAL OF MICROWAVES in November 2021.

#### 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

Access journal. Past positions include the Managing Editor of Cambridge University Press's *International Journal of Technology Assessment in Health Care* and the 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 includes writing, editing, and evaluation research for national and international nonprofits.

#### 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/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.