


# Introduction to the Spring 2024 Issue

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(Editorial)

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**ABSTRACT** Welcome to the spring 2024 issue of IEEE JOURNAL OF MICROWAVES! This month we bring you ten new papers plus the results of our recent author and reader surveys. We also discuss several important upcoming events for JMW and reiterate our call for papers to be included in our special issue on “Microwaves in Climate Change.” We conclude with a few items from our Editor’s Soapbox.

**INDEX TERMS** Opening editorial, JMW reader and author survey, cross-disciplinary special issues, editor’s soapbox.

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## I. JMW NEWS

Spring is a time for us to catch up with our prior year’s contributions and start preparing for our big summer release. As such, this issue contains only regular contributions while we collect regular and invited papers for our upcoming special issue on Microwaves in Climate Change [1].

Our monthly usage counts (views and downloads) topped 500 000 at the end of January, and as of March 1, now sit at 1576 per article published. The IEEEExplore cites per article count as of March 1 is 11.24 and this same *Web of Science* statistic had us at 8.35 cites per article, up slightly from last issue. These stats bode well for us and support our efforts to make IEEE Journal of Microwaves a truly outstanding publication. We are looking forward to our evaluation and ranking by Clarivate this July.

In this issue, we bring you ten papers covering topics from wearable devices to novel filters and some new analytic techniques for circuit simulators. We also present the questions and responses from our author and reader surveys which were handed out over the holidays. We are pleased with both the number of responses (ten percent of distribution) and the salient details. These can be found in Section II of this editorial introduction.

As mentioned in January, we are now working to add a new series of interdisciplinary special issues in 2025 that combine science and engineering. They all involve co-guest editors from other disciplines, including physics, chemistry, biology, and medicine, along with our own microwave engineering experts. So far we have one solid proposal we intend

to move forward with that combines electrical and mechanical engineering – which I believe could be a first for this microwave community! 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 soon, as we are finalizing our special issue calendar now. If all goes well, we will use these special issues to increase our production schedule to bi-monthly in 2025.

## II. AUTHOR AND READER SURVEY RESULTS

Over the holidays we sent out short two-minute surveys to all of our authors, reviewers, and anyone who had requested a copy of our Inaugural and/or 70th Anniversary print issues (known readers). We received 128 author responses and 290 reader and reviewer responses, almost exactly ten percent of the recipient pool. To make it easier to compile the results, the surveys were composed of seven (reader) and eight (author) questions with fixed multiple-choice responses. The questions and responses are all reproduced in simple chart form on the 15 figures that follow, which we have labeled as AQ1-AQ8 (author questions 1 to 8) and RQ1-RQ7 (reader questions 1 to 7).

### A. AUTHOR SURVEY QUESTIONS & RESPONSES

One of the most striking responses from the author survey is the overwhelming number of contributors who first heard about the journal through their colleagues rather than via targeted outreach or advertising (AQ1). Once authors were

aware of JMW, however (AQ2), traditional tools such as article searches, journal indexes, and article bibliographies, took over as the dominant means of journal visibility. It is interesting to note the dominance of journal indexes in this question response considering that JMW was only indexed on IEEEExplore during the first three years.

In examining the reasons for choosing JMW over other much more established outlets (AQ3), it is not surprising that authors picked scope and Open Access as their top choices. Strong secondary reasons included journal reputation, editorial board quality, *potential* impact factor, and positive feedback. Authors were not shy about projecting future value based on early experiences with JMW!

Contrary to some other publications, JMW does not emphasize speed of publication over other metrics (AQ4). Not surprisingly, authors did not rate this as their most important metric, although it is high on the list. Reviewer quality was number one and ease of submission and access to support were both very highly ranked – something we have always tried to emphasize and which it looks like we got right!

AQ5 re-emphasizes the two major reasons authors choose a particular journal – reputation and impact factor (directly correlated), but somewhat surprisingly, added scope. Authors want their papers to appear in places where readers will find their work. Speed of publication and popularity were second-tier selections, also a bit unexpected to this EiC.

When trying to assess the significance and origins of brand loyalty (AQ6) it was clear that reputation and quality were still number one, but some secondary markers pop out. The value of cross-disciplinary contributions and emphasis on improving quality over time were valued. Also surprising to this EiC was the low value placed on acceptance probability, speed, and advertising of accepted papers.

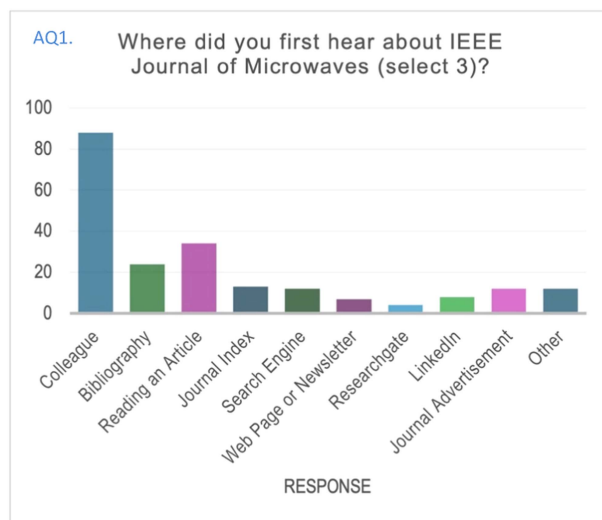
Question AQ7 asked what the responder would emphasize most over the coming two years. Again, not surprisingly, reputation, quality, and impact factor were at the top. However, broadening the reader and author base was also highly emphasized and more frequent issues with more papers was not. Publication speed also appears to be a bit more important for the future.

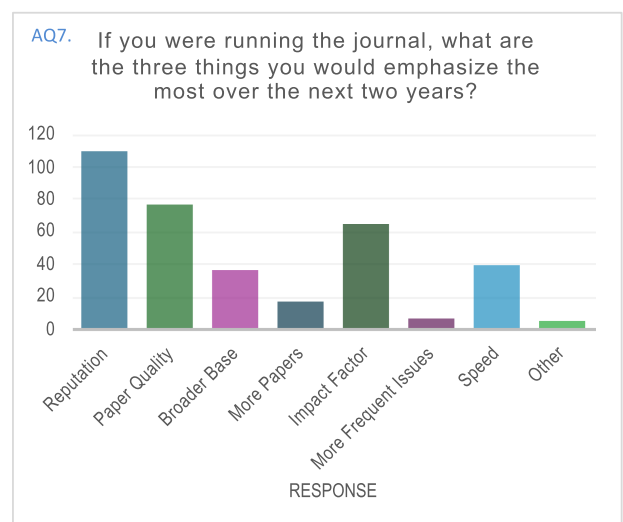
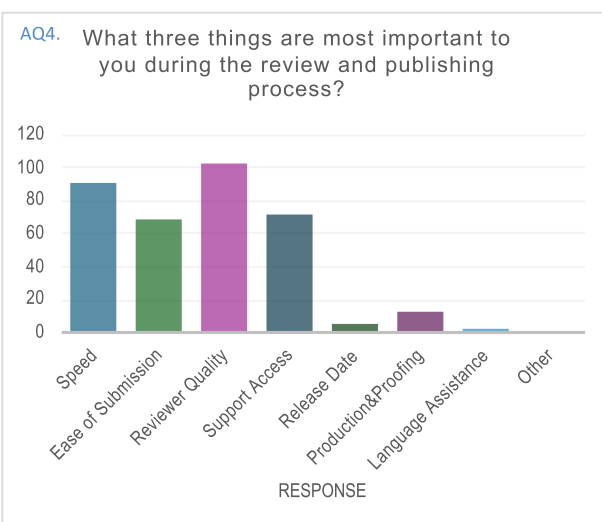
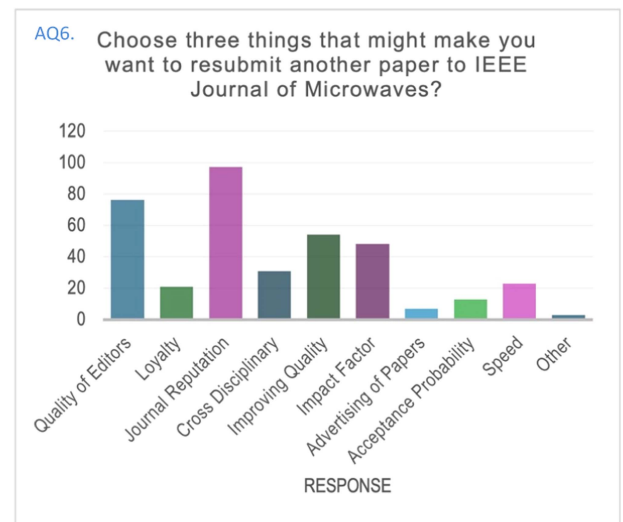
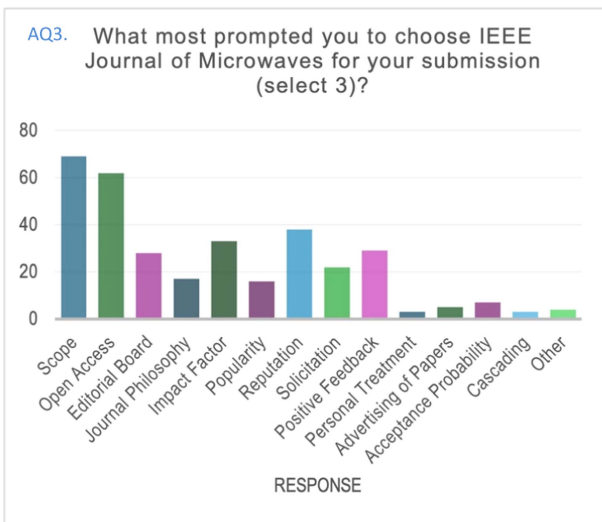
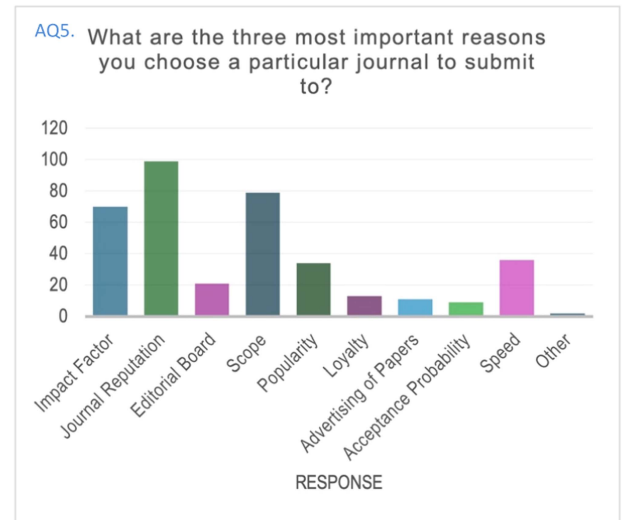
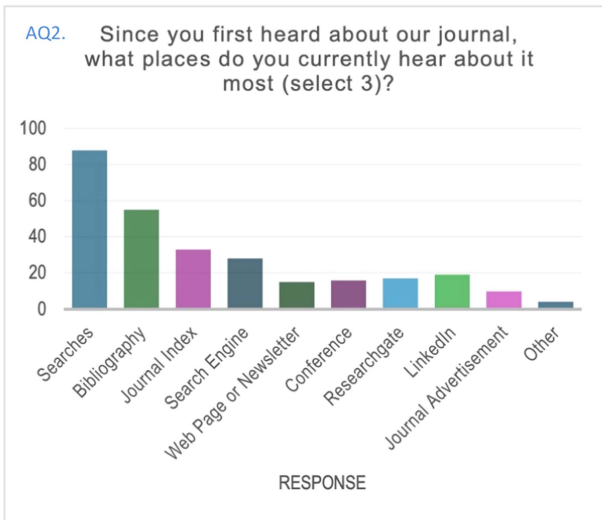
Finally, we asked authors (AQ8) to pick the five things they liked the most about the journal out of 11 choices. Open Access is a clear winner, as might be expected since the audience was preselected for this venue. However, the next five picks were nearly equally divided into reputation, popularity, editorial board quality, journal philosophy, and again, *projected* impact factor. Personalized attention from editors and our invited papers were also highly appreciated.

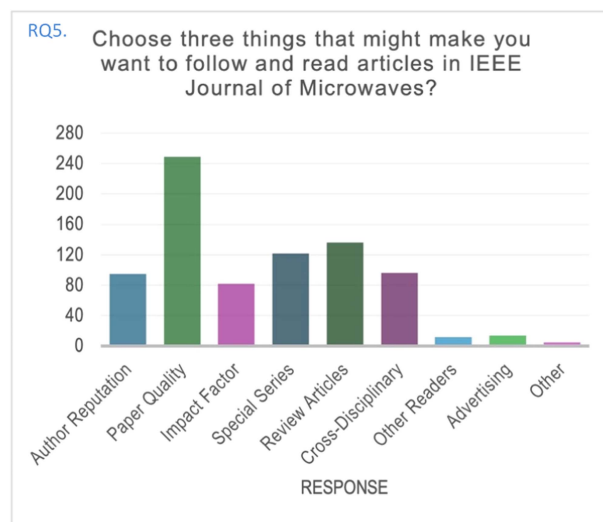
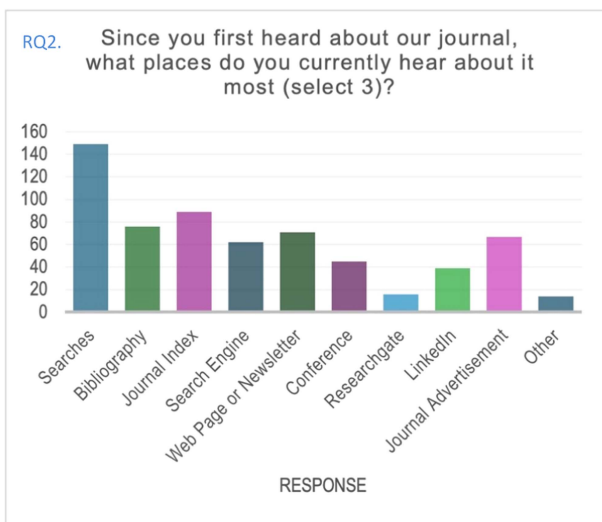
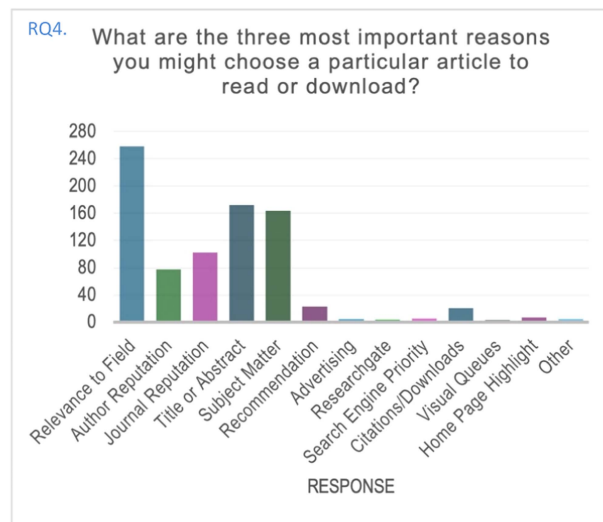
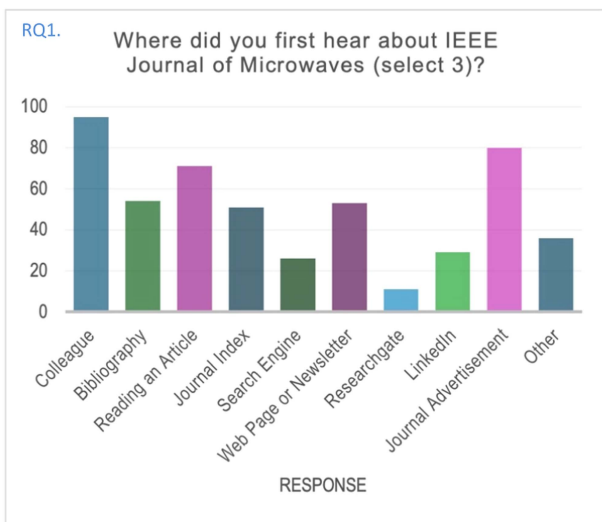
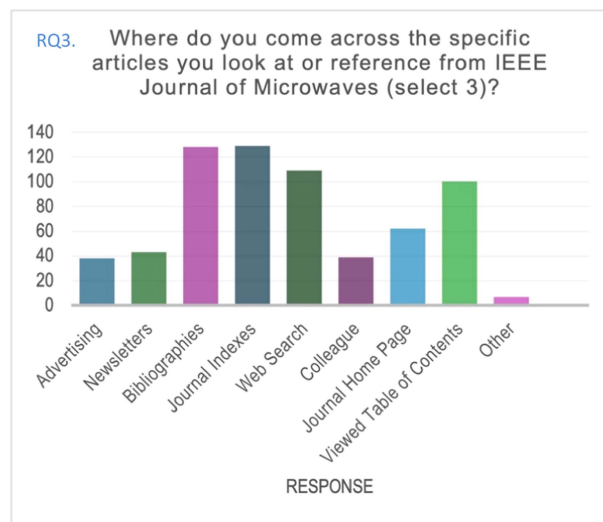
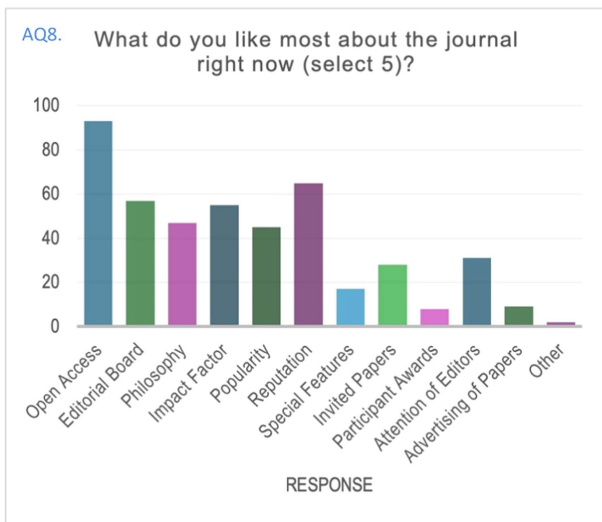
In looking through the long-hand responses to our question about what we should focus on over the next two years and asking for any additional comments, a few responses stood out. Keeping up paper quality was one. This of course, is number one on the list of things we as JMW editors are trying to accomplish. Lowering the open access fee was another. This is not in our control, and IEEE in general has low APC (article processing charges) compared to other journals. Placing the

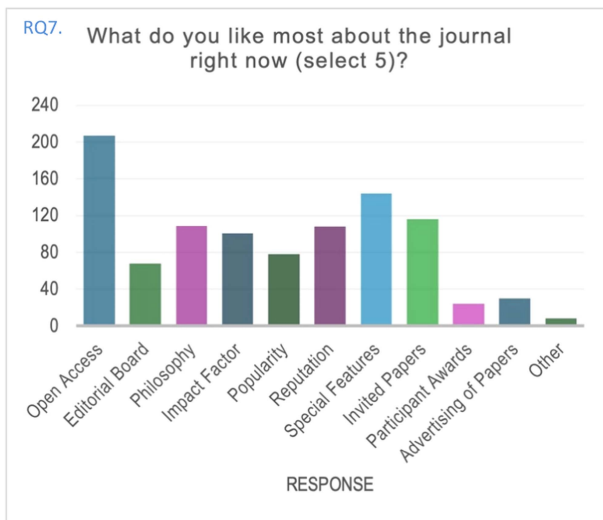
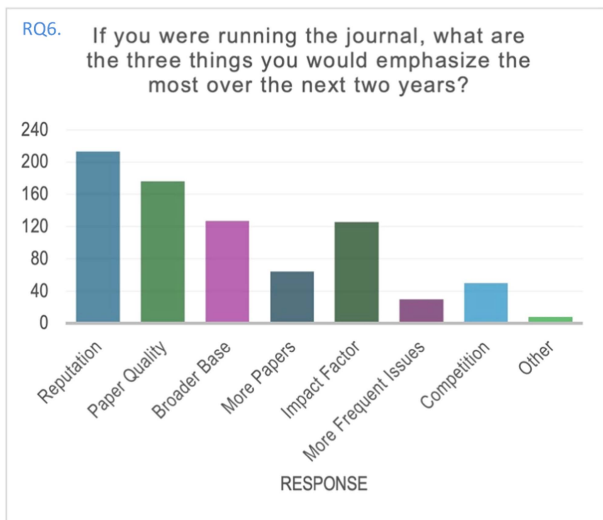
burden of the publishing expense on authors does not seem fair to this EiC when it is the readers who benefit and, at the same time, have the largest potential pool for dividing up the actual publishing and paper archiving costs. That being said, the profits per paper that IEEE derives from the APC cannot hope to cover the actual costs of maintaining a paper on an accessible archive in perpetuity. The whole OA cost model has to be questioned at this stage, but given that we are only a small cog in the publishing empire wheel, there is little we can do to make any significant changes, although this EiC is not shy about trying to do so. Meantime, if any authors are really in need of support to get a good quality paper into print, please discuss your case with our Editor-in-Chief. We will try to accommodate any reasonable hardships.

For authors, reviewer quality and reviewer responses were a major source of frustration. Having participated for almost 50 years in the engineering publishing world, this is no surprise to this EiC. Along with the complaints, there were of course bright spots, and the robust responses to our annual Outstanding Reviewers' Recognition program is one of these. If you have a complaint or concern about the reviews you receive you are always welcome to contact our Topic Editor or EiC directly. You should also realize that decisions regarding the acceptance or rejection of any particular paper are made by the TEs after taking into account all the reviews that have been received, and they do not necessarily weigh all the reviews equally. When responding to one or more reviewers after a revision round it is not necessary to fix everything a reviewer suggests, only to respond to the reviewer in a reasonable manner. It will be up to our Editors to decide whether that response is sufficient or whether an author really needs to accommodate a reviewer's criticism or suggested changes more responsively. Again, the peer review process is the most cantankerous part of publishing, but no one that this EiC has come across has a better model. You can check out what we have tried to do to help with the current reviewing model with what we call our "Journal Club Review" process in [2].









## B. READER SURVEY QUESTIONS & RESPONSES

Moving to the Reader and Reviewer survey responses, we asked similar but slightly modified questions. Given the differing perspectives of the two groups – even though we often take them as synonymous, it was satisfying to note that there were some significant response variations.

Starting with RQ1 which asked the same question regarding first contact with JMW as in the author survey, readers responded very strongly to advertising, newsletters, and web presence, in addition to word of mouth from a colleague. IEEEExplore, article bibliographies, and reading one or more articles also were highly ranked. Once readers were familiar with JMW (RQ2), article searches were the largest contribution to visibility, but unlike the author responses, advertising, search engines, web presence, newsletters, conferences, and even LinkedIn, were prominent places where readers found our journal referenced.

RQ3 asked where readers find our articles. Given the lack of presence of JMW papers on any journal indexes besides IEEEExplore, there were a large number of readers who used web searches and paper bibliographies. Surprisingly, *Viewed Table of Contents* was also very popular, even though we do not distribute these to readers on a routine basis (something which we are going to change starting with this issue). This high level of responses to viewed table of contents may have to do with our unique Flip-Book issue distributions – which do have a fully linked paper suite (you can get to these from our home page for every issue we have released to date), or it may simply be that users look to the TOC on IEEEExplore (which is not directly linked to the papers). It was also comforting to see that many people visit our home page to get article links and up-to-date journal information.

In asking why readers choose an article to read or download (RQ4), it isn't surprising that relevance to their field of interest as well as article title, abstract, and subject matter were the overwhelming choices. Author and journal reputation were also highly touted. All other markers, such as advertising, search engine priority, newsletter or home page highlighting, and visual cues, which many journals swear by, were in the noise!

Paper quality was the most important factor in readers' choices to follow particular articles (RQ5), but also our special series pieces, review articles, and cross-disciplinary papers had a notable preference. This is very helpful, and shows that our efforts in these special areas are bearing fruit!

When we asked what our readers would focus on over the coming two years (RQ6) we again saw reputation as paramount. These go along with quality and impact factor. However, we also note that keeping a broad base is important, and more frequent issues are not. Although competition is there as a marker, it is not the most important thing to readers – although it is very important to this EiC!

Finally, we asked readers to select the five things they liked most about the journal (RQ7) and the responses differed somewhat from our authors. Readers really liked Open Access – not surprising, but they also picked our special features as the second most likable product, with invited papers a close second. Philosophy, reputation, and impact factor follow. There was even a small but significant positive response to our reviewer and best paper awards, things which we implemented right from the start of our publication and of which we are very proud.

In looking through the reader long-hand responses to our question about improvements and focus for the coming years we found that a large number of people commented on keeping up paper quality – something authors also highly touted. There were some comments about distinguishing the MTT Transactions from JMW. This is something that this EiC worries a lot about. Essentially, we have the same scope and the same reader base. So far, the only things that distinguish the two publications, in terms of philosophy at least, are the content we nurture at JMW, which so far has been more focused

on interdisciplinary research, special features, and overview and review papers. However, these are strictly based on the particular preference of the current EiC and are not carved in stone. How we in the microwave community, or IEEE as a whole, believe we will be able to distinguish OA from traditional hybrid and subscription journals in the future is still an open and very controversial question. We at JMW, of course, have our own preferences, but whether or not these will carry the day is not at all clear.

Finally, there seemed to be significant interest in diversity within our reader comments, which we take very seriously through our special series features, Women in Microwaves and Breakthroughs in Microwaves. We also cater to new researchers through our Microwave Pioneers and Microwaves are Everywhere feature articles.

We would like to thank all of you who responded to our surveys, and we hope we can improve JMW so that we meet even more of your expectations. As always, we encourage impromptu messages, suggestions, and comments whenever you feel you have something to say. Our EiC is always ready and willing to start up a dialog or discussion at any time. Please feel free to contact us anytime.

### III. JMW SPRING ISSUE CONTENT

We begin our spring issue with an in-practice article on improved Satcom terminal design. The paper is, “Integrated Wideband Multiplexer Design for Multiple-Use SATCOM/Terrestrial Terminals”. In it, the authors Chad Bartlett and Michael Höft at University of Kiel, Germany, and consultant Uwe Rosenberg, use advanced filters to realize a compact wideband communications multiplexer operating from 20 to 30 GHz. The measured performance agrees well with simulations and the circuit is targeted for next-generation SatCom terminals boasting lower cost and higher performance solutions.

A major market for microwave applications in the health sciences is flexible and wearable circuits. Our next paper from corresponding author Youssef Tawk and colleagues at the American University of Beirut, Lebanon presents a set of stretch-tunable filters operating in the 1–4 GHz region that can be printed on polyethylene terephthalate (PET) and integrated with a flexible RTV silicon substrate. The authors then implement a fully interrogable circuit containing the new filter structures in an armband and place it around the biceps of more than 30 human subjects. As the arm flexes and the filters stretch, the reflection coefficient is monitored and then correlated with the extent of muscular contraction. The muscle flexure force is also measurable. This is a novel use of flexible circuitry as well as a clever technique for translating electrical changes into mechanical motion. The authors propose the wearable circuit for applications ranging from monitoring muscle health in the elderly to measuring muscle fatigue in athletes and quantifying recovery from injuries. The paper is titled, “Wearable Flexible Radio Frequency Filtering System for Muscle Contraction Sensing Monitoring”.

In a second paper involving human interactions with microwaves, Aristotle University of Thessalonika’s Serafeim Iakovids and Professor Theodoros Samaras, along with colleagues from the Agenzia Nazionale per le Nuove Tecnologie, l’Energia e lo Sviluppo Economico Sostenibile (ENEA), Roma, Italy, contribute an article on modeling and measuring skin dosimetry at 27.5 GHz (high end of the new 5G RF bands). The authors evaluate absorption effects due to the changing dielectric properties of multiple skin layers and consider age, total body water valuation, and the variations induced by the process of hair growth cycles. The studies were conducted on mice and detailed absorption data is presented over many variables. One conclusion is that variations in skin layer thickness over time dominate any variations in said dielectric properties. The title of the article is “Murine Skin Dosimetry under Millimeter Wave Exposure”.

“A Computer Controlled Phase and Magnitude Self-Calibration Methodology for Phased Array Antennas” from Zain Shafiq, Dimitris Anagnostou, and Symon Podilchak of Edinburgh University, Scotland, U.K., addresses the problem of quickly and accurately providing the correct magnitude and phase signal feeds to active antenna arrays. They develop and demonstrate a computer-controlled circuit-based calibration system that produces optimized phase and magnitude imbalances of 0.1 dB and 3 degrees respectively. By building the calibration circuitry directly into the array feed the authors believe they have demonstrated the first built-in automatic calibration system for phased array systems.

Sebastian Paul and Joerg Schoebel from the Technical University of Braunschweig, Germany, submitted a very nice analytic paper on an improved method for electromagnetic field simulators they designate as the scattering element method (SEM). It is similar in concept to the transmission line matrix method but uses a wave approach that greatly improves dispersion properties thus allowing much larger unit cell dimensions in breaking up the geometry. The authors compare their new SEM approach to the transmission line method with excellent results. The paper is appropriately titled “Introducing the Scattering Element Method”.

Full-duplex communications systems take advantage of simultaneously transmitting and receiving over the same frequency spectrum (STAR), thus doubling the data throughput over typical duplexed circuits. However, this puts added stress on all the front-end components. In “STAR Front-End using Two Circulators in A Differential Connection” corresponding author Arjuna Madanayake and colleagues at Florida International University, Miami, and Dimitra Psychogiou from the University of Cork, Ireland, report on an improved circulator for a full-duplex system. The new component design offers extended bandwidth (3–8 GHz) with 30 dB of isolation.

Prolific JMW contributor, Nils Pohl, along with students and colleagues at Ruhr University, Bochum, Germany, and Klaus Aufinger of Infineon Technologies AG, discuss quadrature voltage-controlled oscillators (QVCO) at E-band. They develop and demonstrate a QVCO centered at 67 GHz with 3.9 GHz of bandwidth, 13 dBm output power, and phase

noise below  $-105$  dBc/Hz at 1 MHz offset frequency. The paper “Investigation of Coupling Mechanisms for Efficient High Power and Low Phase Noise E-Band Quadrature VCOs in 130nm SiGe” also describes a nice technique to measure the relative phase error of quadrature signals with a vector network analyzer.

In “Impact of 3D Printing Infill Patterns On The Effective Permittivity of 3D Printed Substrates”, contributed by Sean Roche and Jeevan Persad at the University of West Indies, Trinidad and Tobago, we have an extremely comprehensive and detailed treatment of 3D printing for use in creating inexpensive and mass-produced circuits in the 1–10 GHz range. The authors go into extreme experimental and analytic detail in characterizing the 3D printed structures with varying fill-factors and pattern generation and the impact on the realized dielectric permittivity. Anyone planning to use this technique for building up microwave transmission lines will benefit from reading this thorough analytic paper.

Complex waveguide bandpass filters employing high-order elliptic functions are the topic of the next paper from corresponding author Sai-Wai Wong at Shenzhen University, China, and colleagues from Xiamen University, China, University of Birmingham, U.K., University of Technology, Sydney, Australia, and the Institute for Advanced Studies in Ningbo, China. “Single and Multiple-Band Bandpass Filters Using Bandstop Resonator Sections” describes a design and analysis technique for realizing wide bandwidth bandstop filters composed of multiple waveguide resonator sections. In addition, the filters can be realized using 3D printing techniques making them suited for monolithic fabrication. The authors demonstrate impressive performance from 3rd and 6th order filters in the 30 GHz frequency range.

Looking forward to July, our regular paper count is already above 20 and is steadily climbing. We may also have a preliminary impact factor to report, and we will most certainly relay any feedback we receive from our IEEE PRAC review taking place in mid-April. We hope you will continue to read, contribute to, and communicate with us as we continue to try to make JMW your journal of choice in the microwave community.

#### IV. OUR EDITORIAL TEAM

Most of our twenty-four Topic Editors have now been serving JMW for just over four years. They continue to do their best to keep up our standards and to suggest changes that improve our outreach, our quality, and our influence. This year we began a very fruitful discussion sequence within our monthly board meetings that we call the “Editor’s Soapbox.” Each month one of our Topic Editors takes the floor for 15 to 20 minutes to talk about anything they are interested in communicating to the full board that involves JMW. Although not necessarily intended, these individual comment opportunities have tended to focus on new ideas as well as on existing policies that might be tapped to increase our outreach and take better advantage of our status as both a new journal – with nothing to lose – and one that has the unique advantage of an OA label. The

Editor’s Soapbox has already resulted in our interdisciplinary special issue series, as well as greater media use, and a future program to develop author-contributed videos to accompany paper abstracts. We hope to continue to innovate and to change as we move out of our formative years and into a period where we will compete as a stand-alone journal serving the widest swath of our community.

We will be looking to add new TE’s this coming year, so if you have an interest in contributing to this unique experiment in creating and sustaining a new journal for our community, do not hesitate to contact our EiC. As in every issue we release, you will find bios of all of our contributing editors at the end of each Editorial Intro.

#### ACKNOWLEDGMENT

The EiC would like to acknowledge and thank our assistant editor, Jackie Steele, for her impressive work on our social media outreach and for helping create and analyze our reader and reviewer surveys.

#### REFERENCES

- [1] “Call for Papers—IEEE Journal of Microwaves Special Issue on Microwaves in Climate Change,” *IEEE J. Microwaves*, vol. 3, no. 4, pp. 1269–1269, Oct. 2023.
- [2] P. H. Siegel, “Introduction to the summer 2021 issue,” *IEEE J. Microwaves*, vol. 1, no. 3, pp. 670–678, Jul. 2021, doi: [10.1109/JMW.2021.3089177](https://doi.org/10.1109/JMW.2021.3089177).

#### 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, the M.S. degree in physics, and the Ph.D. degree in electrical engineering (EE) from Columbia University, New York, NY, USA, in 1978 and 1983, respectively. From 1975 to 1983, he held appointments as a Research Fellow and Engineering Staff with the NASA Goddard Institute for Space Studies, New York City, NY, USA, a Staff Scientist with the National Radio Astronomy Observatory, Central Development Labs, Charlottesville, VA, USA, from 1984 to 1986, a Technical Group Supervisor and Senior Research Scientist with the Jet Propulsion Laboratory (JPL), National Aeronautics and Space Administration (NASA), Pasadena, CA, USA, from 1987 to 2014, and a Faculty Associate of electrical engineering and Senior Scientist in biology with the California Institute of Technology (Caltech), Pasadena, CA, USA, from 2002 to 2014. He has founded and led the Submillimeter Wave Advanced Technology (SWAT) Team, a Group of more than 20 Scientists and Engineers developing THz technology for NASA’s near and long-term space missions with JPL, for 25 years. 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 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 was the recipient of 75 NASA Technology awards, ten NASA Team awards, 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. From 2010 to 2015, he was the Founding Editor-in-Chief for IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY, and the Founder in 2009, Chair through 2011, and has been elected General Secretary since 2012, of the International Society of Infrared, Millimeter, and Terahertz Waves (IRMMW-THz), world's largest non-profit society devoted to THz science and technology. He is also an appointed Editorial Board Member of IEEE ACCESS through 2025 and an Elected Member of the MTT-S AdCom.

## 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-Nürnberg, 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 coauthored more than 25 research papers, more than 20 patents, and a book on

advanced microwave imaging methods. His research interests include microwave and mmWave imaging, stand-off THz sensing, multistatic radars, advanced signal-processing techniques, terahertz technology, and automotive radar design and characterization. He has 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.

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. He is also the Chair of the IEEE N42.59 Standard for Measuring the Imaging Performance of Active mmWave Systems for Security Screening of Humans.

### 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, Pasadena, CA, USA, 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. 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. His research interests include

low-temperature integrated circuits with applications in radio astronomy and the quantum information sciences.

Dr. Bardin was the recipient of the 2011 DARPA Young Faculty Award, 2014 NSF CAREER Award, 2015 Office of Naval Research YIP Award, 2016 UMass Amherst College of Engineering Barbara H. and Joseph I. Goldstein Outstanding Junior Faculty Award, 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. He was a Professor with the University of Massachusetts Dartmouth, Dartmouth, MA, USA, for more than 14 years. 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 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 of electrical and computer engineering with Southern Methodist University, Dallas, TX, USA. He has authored or coauthored and edited numerous peer-reviewed technical journal and conference papers, book chapters, proceedings, and books. He holds 16 patents in RF MEMS, MEMS optical, liquid crystal, nano-scale fabrication, and wireless medical sensor technologies. His research works have been covered by media extensively including Forbes, National Geographic magazine, National Public Radio, and CBS Henry Ford Innovation Nation.

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 also 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, NS,

Canada, where he is also a Professor and the Head with the Department of Electrical and Computer Engineering. He was 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, 2006 Dalhousie Graduate Teaching Award, 2007 and 2015 Dalhousie Faculty of Engineering Research Award, 2013 IEEE Canada Fessenden Medal, and the Dalhousie University Distinguished Professorship. He is also 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. He was a Postdoctoral Researcher in superconducting microwave qubits. Since 2006, he has been an RF Microwave Engineer with Jet Propulsion Laboratory (JPL), Pasadena, CA, USA. 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. He was the recipient of the Lew Allen Award for Excellence, Ed Stone Award for an Outstanding Research Publication, NASA Exceptional Technology Achievement Medal, and Principal and Senior Research Scientist designations for the development of active THz sensors, systems, and techniques.

**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, respectively. He was with Pioneering Gallium Arsenide (GaAs) Group, Plessey Research, Plymouth, U.K., for several years. He has held various engineering and management positions with Watkins Johnson, Palo Alto, CA, USA, Loral, and Celeritek, Santa Clara, CA, USA, respectively, for 15 years. 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 RFPA 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.

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 B.S. degree in electrical engineering and applied physics (EEAP) from Case Western Reserve University, Cleveland, OH, USA, in 1981, the M.S. and Ph.D. degrees in electrical and computer engineering from Drexel University, Philadelphia, PA, USA, in 1984 and 1986, respectively. He is currently a Professor of electrical and computer engineering with Drexel University, where he has developed courses in devices, circuits, and sub-systems 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 as also a Chair of the Electrical Engineering cluster.

Dr. Daryoush was the recipient of Drexel University's Graduate Teaching Award in 2000, IEEE Philadelphia Section's Franklin Key Award in 2015, Drexel University's Alumni Award in 2018, and College of Engineering Innovation Award in 2020, was inducted into the National Academy of Inventors in 2023, Microwave Prize in 1986, and after which 13 joint articles of his students were the recipient of the Best Student papers in various IEEE conferences. Since 1993, he has also organized various IEEE conferences, particularly 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 cochair of the MTT-S' TC-22 and chair of the Philadelphia joint chapter of AP/MTT societies.

Dr. Daryoush was the recipient of Drexel University's Graduate Teaching Award in 2000, IEEE Philadelphia Section's Franklin Key Award in 2015, Drexel University's Alumni Award in 2018, and College of Engineering Innovation Award in 2020, was inducted into the National Academy of Inventors in 2023, Microwave Prize in 1986, and after which 13 joint articles of his students were the recipient of the Best Student papers in various IEEE conferences. Since 1993, he has also organized various IEEE conferences, particularly 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 cochair of the MTT-S' TC-22 and chair of the Philadelphia joint chapter of AP/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 the 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 the Institut National Polytechnique de Toulouse – Université de Toulouse, Toulouse, France, in 2010.

He was with Thales Alenia Space, Toulouse, France, Centre National d'Etudes Spatiales (CNES), Toulouse, France, and the European Space Agency (ESA), Noordwijk, The Netherlands, respectively, as an Antenna Engineer. He 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.

From 2020 to 2022, he was an Associate Editor for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES and a co-Guest Editor of two issues focused on microwave aerospace systems in the IEEE MICROWAVE MAGAZINE in 2022 and 2023. He is also 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. From 2019 to 2023, he was also a Board Member of the European School of Antennas and Propagation. From 2021 to 2023, he was the EurAAP Regional Delegate representing Benelux. 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, ESA Teamwork Excellence Award in 2020, Best Applied Technology Antenna Paper Award at EuCAP 2022, and the 2024 IEEE Journal of Microwaves Best Paper Award.

#### TC-5 TOPIC EDITOR: FILTERS



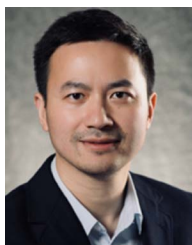
**ROBERTO GÓMEZ-GARCÍA** (Fellow, IEEE) received the Dipl.-Eng. degree in telecommunication engineering and the Ph.D. degree in electrical and electronic engineering from the Polytechnic University of Madrid, Madrid, Spain, in 2001 and 2006, respectively. Since 2006, he has been an Associate Professor 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 coauthored 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 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. From 2012 to 2016, he was also an Associate Editor for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, 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*. From 2016 to 2017, he was a Senior Editor of IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS and the MTT-S Newsletter Working Group Chair. He was the 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 also the Editor-in-Chief of IEEE MICROWAVE AND WIRELESS TECHNOLOGY LETTERS (2022–2024) and an Associate Editor for IEEE JOURNAL OF ELECTROMAGNETICS, RF AND MICROWAVES IN MEDICINE AND BIOLOGY.

He was a member of the Technical Review Board for several IEEE and EuMA conferences. He is also a member of the IEEE MTT-S 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.

#### 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 research interests include the design and implementation of MEMS and acoustic devices, components, subsystems for RF front ends, and 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, 2017 NASA Early Career Faculty Award, 2019 Dean's Award for Excellence in Research at UIUC, and 2019 IEEE Ultrasonics Early Career Investigator Award, and 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. In 2010, he joined the Department of Electrical and Computer Engineering, Auburn University, Auburn, AL, USA, as an Assistant Professor 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 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, has been in positions from Junior Research Fellow up to Full Professor, since 1997, and has been 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 is also 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.

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


**RAAFAT MANSOUR** (Fellow, IEEE) is currently a Professor of Electrical and Computer Engineering with the University of Waterloo, Waterloo, ON, Canada, and holds Tier 1 - Canada Research Chair (CRC) in Micro-Nano Integrated RF Systems. He has held an NSERC Industrial Research Chair (IRC) for two terms (2001-2005) and (2006-2010). Before joining the University of Waterloo, in January 2000, he was with COM DEV Cambridge, Ontario, Canada, and during 1986–1999, he held various technical and management positions with

COM DEV's Corporate R&D Department. He also holds 44 US and Canadian patents and more than 420 refereed IEEE publications. He is a coauthor of a 23-chapter Book published by Wiley and has contributed seven chapters to five other books. He has founded the Centre for Integrated RF Engineering (CIRFE) with 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). Prof. Mansour 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. He is also a Fellow of the Canadian Academy of Engineering (CAE) and Engineering Institute of Canada (EIC).

**SPECIAL SERIES TOPIC EDITOR**


**ALLISON MARSH** (Senior Member, IEEE) received the B.S. degree in engineering from Swarthmore College, Swarthmore, PA, USA, and the Ph.D. degree in the history of science, medicine, and technology from Johns Hopkins University, Baltimore, MD, USA. She was a Curator and the Winton M. Blount Research Chair with Smithsonian National Postal Museum. 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.

Dr. Marsh is the Contributing Editor to *IEEE Spectrum* and writes the monthly *Past Forward* column. She was the recipient of 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 in 2014. She is also 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 was on 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, on the diverse theoretical aspects of wave propagation involving these structures, 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, and on higher symmetries applied to electromagnetic propagation and on the design of geodesic lenses.

Since January 2014, he has been an IEEE Fellow proposed by the IEEE MTT Society. From 2013 to 2016, he was an Associate Editor for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, 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 publications

in the most important specialized journals and at the main conferences of the microwave scientific community. His research interests include the development of microwave circuits on bio-compatible substrates and enabling technologies for IoT. He is also 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. From 1995 to 1998, he was an Undergraduate and Graduate Research Assistant with the Pennsylvania State University 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 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 research interests include HF electronic systems with special attention to RFID, new materials, and wireless power transfer.

From 2008 to 2012, he was a member of the Board of Directors of ART Srl, Urbino, Italy. He is also a member of the list of experts of the Italian Ministry of Research, the past Chair of the IEEE Technical Committees MTT-24-RFID, 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 the Co-Chair of the IEEE Wireless Sensor Network Conference. In 2007, he organized the VII Computational Electromagnetic Time Domain and the first IEEE Wireless Power Transfer Conference in 2013. He is also an Associate Editor for IEEE MICROWAVE MAGAZINE. He is involved with the boards of several international conferences. He is 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  $\mu$ 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), Milmege

(GaN SSPAs), and RFMD and Filtronics Comp Semiconductor (MF MMICs: pt-to-pt radios, PAs). He is currently with Sony Europe B V, U.K., as the Chief Technologist, microwave and mmW, and Technical Lead for the next-generation front-end modules (5G/beyond). He has authored or coauthored more than 75 peer-reviewed publications (first/sole-authored) and has delivered more than 45 invited talks, including keynotes/panels at IEEE MTTs 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 is 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. From 2005 to 2009, he was a Research Staff Member with Birck Nanotechnology Center, Purdue University, West Lafayette, IN, USA, where he worked on CMOS-based RF integrated circuits and advanced heterogeneous integration and packaging. He is currently a Manager

with 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 and low-cost, high-performance EO/IR imaging sensors. He has authored or coauthored more than 75 journal and refereed conference papers and holds more than 40 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 Technology and Advanced Packaging societies.

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



**ALBERTO VALDES-GARCIA** (Fellow, IEEE) received the B.S. degree (with 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 Ghps WLAN and WPAN: From Theory to Practice* (Wiley, 2011). His research interests include mm-wave systems for communications and imaging applications.

Dr. Valdes-Garcia was the recipient of the 2005 Best Doctoral Thesis Award presented by the IEEE Test Technology Technical Council, 2007 National Youth Award for Outstanding Academic Achievements, presented by the President of Mexico, 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. In 2015, he was inducted into the IBM Academy of Technology, and was the recipient of an IBM Master Inventor in 2016 and 2019, and 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). From 2006 to 2009, he was with the IEEE 802.15.3c 60 GHz Standardization Committee. Since 2009, he has been a Technical Advisory Board Member with the Semiconductor Research Corporation, where he was the Chair of the Integrated Circuits and Systems Sciences Coordinating Committee, in 2011 and 2012, respectively. Since 2016, he has been a member 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 (with Hons.) in radio engineering from the Nanjing Institute of Technology (now Southeast University), Nanjing, China, in 1982, the D.E.A. degree (with Hons.) in optics, optoelectronics, and microwave engineering from the Institut National Polytechnique de Grenoble (INPG), Saint-Martin-d'Hères, France, in 1984, and the Ph.D. degree (with Hons.) in optics, optoelectronics, and microwave engineering from the University of Grenoble, Grenoble, France, in 1987. He is currently the

Endowed Industrial Research Chair with Future Wireless Technologies and a Professor of electrical engineering with the École Polytechnique de Montréal (University of Montreal), Montreal, QC, Canada, where he is also the Director with 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.

Dr. 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, 2013 Award of Merit of Federation of Chinese Canadian Professionals, 2014 IEEE MTT-S Microwave Application Award, 2014 Marie-Victorin Prize (Prix du Québec), 2015 Prix d'Excellence en Recherche et Innovation of Polytechnique Montréal, 2015 IEEE Montreal Section Gold Medal of Achievement, 2019 IEEE MTT-S Microwave Prize, 2021 EIC Julian C. Smith Medal, 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, Royal Society of Canada, and 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. During 1988–1990, he was a Research Engineer with Optimization Systems Associates Inc., Dundas, ON, Canada, developing advanced optimization software for microwave modeling and design. In 1990, he joined the Department of Electronics, Carleton University, Ottawa, ON, Canada, where he is currently a Chancellor's Professor. He is 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), and more than 300 publications in his research interests which include modeling, optimization, and neural networks for high-speed/high-frequency electronic design.

Dr. Zhang is a Fellow of the Canadian Academy of Engineering and the Engineering Institute of Canada. During 2020–2022, he was an Associate Editor for IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, 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 the B.S. degree in journalism/public relations from Cal Poly San Luis Obispo, CA, USA, and the master's degree in international communication from ISCOM, Paris, France. In July 2023, she joined IEEE JOURNAL OF MICROWAVES as an administrative and media editor. Her research interests include 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 the Graduate degree 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 also 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. She was also 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. She has managed a large portfolio of journals/ transactions/magazines over

the years, including the flagship IEEE journal PROCEEDINGS OF THE IEEE since 2007 and the IEEE Computer Society's flagship magazine *Computer* since 2021. She has extensive experience in journals copyediting, proofreading, layout, and overall journals production.