Editorial
Incoming EiC

WELCOME to our first issue in volume 9 of the IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY (TTST) with 11 regular papers and one letter. I have been selected by MTT-S Publications Committee as the Editor-in-Chief (EiC) with a three year term, 2019–2022. It is an honor to be trusted with this responsibility. "Expanding the use of the electromagnetic spectrum" is the transaction's mission statement. Researchers today have a number of ways to communicate their results and I will make every effort to make our journal the top choice for Terahertz (THz) scientists and technologists and to make our journal successful by working with the THz research community to publish articles of the highest quality.

I have had the privilege of being associated with the transactions from its birth. In a relatively short period, the TTST is at the forefront of important articles on THz science and technology, with a decent impact factor. This in no small part was due to the leadership vision and hard work of Dr. Peter Siegel who laid the foundation in his inaugural editorial [item 1) in the Appendix]. More recently, the outgoing EiC, Dr. Jan Stake, has worked tirelessly to strengthen the publication and provide great service to the community. I thank both of them, along with their editorial teams, for a job well done. Thanks to their pioneering efforts, we are today very grateful to have one single forum that brings together a diverse community that makes up terahertz scientists and technologists. For the duration of my tenure, I hope that we will see even more interdisciplinary articles and high impact articles from different disciplines that make use of THz technology.

As spelled out in the editorial from Prof. Jan Stake [item 2) in the Appendix], we have, in accordance with IEEE and MTT-S Publication Committee recommendations, greatly expended the Editorial Board for TTST. With a larger team, the goal is to reduce the time from submission to e-publication and, at the same time, allow for a more strategic leadership of the journal. For the term beginning in 2019, I am happy to share that we have 13 Associate Editors (AEs) and 3 Track Editors (TEs), respectively. The complete list of the Editorial Board can be found on the back of the cover page of the transactions and a brief biography for each member is presented at the end of this editorial. It is my privilege to be working with such dedicated and eminently qualified editors. For 2019, I would like to welcome Prof. EunMi Choi, Dr. Jeffrey Hesler, Prof. Tadao Nagatsuma, and Prof. Zach Taylor as AEs. Dr. Erick Grossman and Dr. Heinz-Wilhelm will serve as the two TEs, with Prof. Jan Stake kindly agreeing to serve as a TR for some additional period. I am also happy to report that we will continue to be supported by a very capable Editorial Administrator, Ms. Sharri Shaw. We also look forward to working with Shannon Campos as our IEEE Journals Coordinator and Prof. Scott Barker as the Chairman of the MTT-S Publications Committee.

Finally, along with the Editorial Staff, I am deeply grateful to numerous reviewers who are generous with their time and provide constructive feedback for the authors, while sharing their expertise. TTST is here to serve the THz community. During my term, I will do my best to ensure that we represent a high-quality journal and that TTST is the first choice for communicating important research findings. If you have ideas for improving the transactions or improving the review and publication process, please do not hesitate to contact me. Any feedback is welcome.

IMRAN MEHDI, *Editor-in-Chief*
Jet Propulsion Laboratory
California Institute of Technology
Pasadena, CA 91109 USA

APPENDIX
RELATED WORK

1) P. H. Siegel, "Inaugural Editorial," *IEEE Trans. THz Sci. Technol.*, vol. 1, no. 1, pp. 1–4, Sep. 2011.
2) J. Stake, "Outgoing EiC Editorial," *IEEE Trans. THz Sci. Technol.*, vol. 8, no. 6, pp. 1–3, Nov. 2018.

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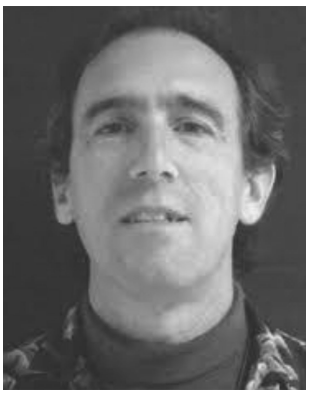
Imran Mehdi (S'83–M'91–SM'99–F'10) received the B.S.E.E., M.S.E.E., and Ph.D. degrees in electrical engineering from the University of Michigan, Ann Arbor, MI, USA, in 1985, 1986, and 1990, respectively.

He is currently a Senior Research Scientist with the Jet Propulsion Laboratory (JPL), California Institute of Technology, Pasadena, CA, USA. He joined JPL in 1990 and is currently a Group Supervisor leading research and development in submillimeter-wave applications in space. His responsibilities include developing THz components, technologies, and subsystems for current and future NASA missions. These devices and components were implemented on the ozone monitoring Microwave Limb Sounder (MLS) instrument, which is still operational, as well as the Microwave Instrument on Rosetta Orbiter (MIRO) instrument, which represents the first submillimeter-wave receiver operational in deep space. From 1999, he led the effort of developing broadband solid-state sources from 200 to 2500 GHz for the Heterodyne Instrument for Far Infrared (HIFI) on the Herschel Space Observatory, a cornerstone European Space Agency mission. His research interests include millimeter and submillimeter-wave devices and technology, nanotechnology, high-frequency instrumentation, 3-D submillimeter-wave, and development of compact, low-power heterodyne receivers for planetary missions.

Dr. Mehdi is the Editor-in-Chief for the IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY.

Sharri Shaw was born in Michigan, and currently resides in Boulder, CO, 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 from Aquinas College, Edacochin, India, in 2001, where she received her Secondary Level Teacher Certification.

From 2002 to 2005, she was a Teacher in Michigan. From 2006 to 2010, she was an Assistant Editor for the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES. She currently holds the same position with IEEE MICROWAVE MAGAZINE, and is the Publication's Administrator for the IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY.



Erich N. Grossman received the A.B. degree in physics from Harvard College, Cambridge, MA, USA, in 1980, and the Ph.D. degree in physics from the California Institute of Technology, Pasadena, CA, USA, in 1987.

His thesis work involved development of an ultra-low noise, heterodyne receiver for 2 THz astronomy. From 1988 to 1989, he was a Postdoctoral Fellow with the University of Texas at Austin, and in 1989, he joined the National Institute of Standards and Technology (NIST), Boulder, CO, USA, where he is now a Physicist with the Optoelectronics Division. His work at NIST focuses on infrared and sub-millimeter system development.

Heinz-Wilhelm Hubers received the Diploma degree in physics and the Ph.D. degree in physics from the University of Bonn, Bonn, Germany, in 1991 and 1994, respectively.

From 1991 to 1994, he was with Max-Planck Institute for Radioastronomy, Bonn, Germany. He then joined the Institute of Planetary Research, Deutsches Zentrum fur Luft- und Raumfahrt (German Aerospace Center), Berlin, Germany, in 2001, where he became the Head of the Department of Terahertz and Infrared Sensors. His research interests include terahertz technology, terahertz components such as lasers and detectors, and the associated physics, and applying terahertz technology to planetary research, astronomy, earth observation, and security.

Dr. Hubers is a member of the Deutsche Physikalische Gesellschaft (German Physical Society) and the Verein Deutscher Ingenieure (Association of German Engineers). He was the recipient of the Innovation Award for Synchrotron Radiation as well as the Lilienthal Award.

Jan Stake (SM'06) was born in Uddevalla, Sweden, in 1971. He received the M.Sc. degree in electrical engineering and the Ph.D. degree in microwave electronics from the Chalmers University of Technology, Göteborg, Sweden, in 1994 and 1999, respectively.

In 1997, he was a Research Assistant with the University of Virginia, Charlottesville, VA, USA. From 1999 to 2001, he was a Research Fellow with the Millimetre Wave Group, the Rutherford Appleton Laboratory, Didcot, U.K. He then joined Saab Combitech Systems AB as a Senior RF/Microwave Engineer till 2003. From 2000 to 2006, he held various academic positions with the Chalmers University of Technology, and from 2003 to 2006, he was also the Head of the Nanofabrication Laboratory, Department of Microtechnology and Nanoscience (MC2). During 2007, he was a visiting Professor with the Submillimeter Wave Advanced Technology (SWAT) Group, Caltech/JPL, Pasadena, CA, USA. He is currently the Professor and the Head of the Terahertz and Millimetre Wave Laboratory, Chalmers University of Technology. He is also the cofounder of Wasa Millimeter Wave AB, Göteborg, Sweden. His research interests include graphene electronics, high-frequency semi-conductor devices, THz electronics, submillimeter wave measurement techniques (ªTHz metrology°), and THz applications in biology and medicine.

Dr. Stake was the Editor-in-Chief for the IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY from 2016–2018.

EunMi Choi received the B.S. degree from Ewha Womans University, Seoul, South Korea, in 2000, the M.S. degree from Pohang University of Science and Technology, Pohang, South Korea, in 2002, and the Ph.D. degree from the Massachusetts Institute of Technology (MIT), Cambridge, MA, USA, in 2007, all in physics.

She is currently an Associate Professor with the Department of Physics and School of Electrical and Computer Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, South Korea. She joined UNIST in 2010 as an Assistant Professor and has led the THz Vacuum Electronics and Electrodynamics (TEE) Laboratory as a Principle Investigator since then. Her main contribution in the field includes high power vacuum electronics development (gyrotrons, TWTs, etc.) and its application for remote detection of radioactive materials experimentally, and energy recirculating microfabricated vacuum electronics amplifier source development. Her research interests include spans from development of electron beam-based high power millimeter and THz sources, ultra compact THz sources at 300 GHz and beyond by means of microfabrication techniques, and exotic electromagnetic waves generation, to their possible applications in novel technique in remote detection of radioactive materials, next generation communications beyond 5G, and plasma interaction with exotic electromagnetic waves.

Dr. Choi was the recipient of Service Merit Medal by Korea Government for her contribution in Excellent National R&D achievement in 2018.

William Deal (M'96–SM'06) received the B.S. degree in electrical engineering from the University of Virginia, Charlottesville, VA, USA, in 1996, and the M.S. and Ph.D. degrees from the University of California, Los Angeles, Los Angeles, CA, USA, in 1998 and 2000, respectively.

He is currently a Senior Department Staff Engineer with Northrop Grumman's RF Product Center, Redondo Beach, CA, USA. He leads several MMIC development efforts, including Northrop Grumman's contract for the DARPA THz Electronics program, as well as developing his own microwave and millimeter wave designs. He has authored or coauthored more than 75 journal and conference papers, as well as five book chapters.

Dr. Deal was the recipient of the Outstanding Young Engineer Award in 2009.

Jeffrey L. Hesler received the B.S.E.E. degree from Virginia Tech, Blacksburg, VA, USA, in 1989, and the M.S.E.E. and Ph.D. degrees from the University of Virginia, Charlottesville, VA, USA, in 1991 and 1996, respectively.

He is the Chief Technology Officer of Virginia Diodes and has a visiting position with the University of Virginia. His career is focused on the creation of new technologies that are making possible the full exploitation of the Terahertz frequency band for scientific, defense, and industrial applications. He has authored or coauthored more than 150 technical papers in journals and international conferences proceedings, given talks at THz-focused workshops at conferences such as IMS & EuMW.

Dr. Hesler is a member of IEEE TC MTT-4 (THz Technology and Applications) and is a reviewer for a variety of THz related journals. Terahertz systems based on his innovative designs are now used in hundreds of research laboratories throughout the world.

Emma Pickwell-MacPherson (SM'14) received the B.A/M.Sci. degree in natural sciences and the Ph.D. degree in physics from Cambridge University, Cambridge, U.K., in 2001 and 2005, respectively.

After completing her thesis in 2005, she was with TeraView, Ltd., as a Medical Scientist until moving to Hong Kong in 2006. During 2006–2009, as an Assistant Professor, she set up a Terahertz Laboratory with the Department of Electronic Engineering, The Chinese University of Hong Kong (CUHK), Hong Kong. From September 2009 to September 2012, she was with the Hong Kong University of Science and Technology, Hong Kong, as a Visiting Assistant Professor and returned to the Department of Electronic Engineering, CUHK, in September 2012. In October 2017, she joined the Department of Physics, Warwick University, Coventry, U.K.

Dr. Pickwell-MacPherson has represented Hong Kong on the International Organizing Committee for the Infrared and Millimeter Wave and Terahertz Wave (IRMMW-THz) Conference Series since 2009. She was the General Conference Chair of the 2015 IRMMW-THz Conference held at CUHK. She was the recipient of a Royal Society Wolfson Merit Award.

Tadao Nagatsuma (F'15) received the B.S., M.S., and Ph.D. degrees in electronic engineering from Kyushu University, Fukuoka, Japan, in 1981, 1983, and 1986, respectively.

From 1986 to 2007, he was with Nippon Telegraph and Telephone Corporation (NTT), Atsugi, Japan. Since 2007, he has been a Professor with Graduate School of Engineering Science, Osaka University, Suita, Japan, and the Director of Co-Creative Education Division, Office for Industry-University Co-Creation, Osaka University. His research interests include millimeter-wave and terahertz photonics/electronics and their applications to wireless communications, sensing, and measurement.

Dr. Nagatsuma is a Fellow of the Institute of Electronics, Information and Communication Engineers (IEICE), Japan, and a Fellow of the Electromagnetics Academy.

Joachim Oberhammer (M'06–SM'12) was born in Bruneck, Italy, in 1976. He received the M.Sc. degree from the Graz University of Technology, Graz, Austria, in 2000, and the Ph.D. degree from the KTH Royal Institute of Technology, Stockholm, Sweden, in 2004, both in electrical engineering.

He was a Postdoctoral Research Fellow with Nanyang Technological University, Singapore, in 2004, and with Kyoto University, Japan, in 2008. Since 2005, he has been leading radio-frequency/microwave/terahertz micro-electromechanical systems research with KTH. He was an Associate Professor with KTH in 2010 and has been the Professor in microwave and THz microsystems with KTH since 2015. He was also a Guest Researcher with Nanyang Technological University, Singapore, in 2007; and a Guest Researcher with NASA-Jet Propulsion Laboratory, USA, Pasadena, CA, in 2014. He is the author and coauthor of more than 100 reviewed research papers and holds 4 patents.

Dr. Oberhammer was a TPRC member of the IEEE Transducers 2009 and 2015, the IEEE International Microwave Symposiums 2010–2016, the IEEE Micro Electro Mechanical Systems 2011 and 2012, and the IEEE Radio and Wireless Week 2015 and 2016. He has been a Steering Group Member of the IEEE MTT-S and AP-S Chapters Sweden since 2009. He was the Steering Group Member of the Young Academy of Sweden 2014–2016, and has been the Representative of Sweden/Norway/Finland in the European Microwave Association since 2016. In 2004, 2007, and 2008, he was the recipient of the Ericsson Research Foundation, a grant by the Swedish Innovation Bridge, and a scholarship by the Japanese Society for the Promotion of Science, respectively. He has also been the recipient of six Best Paper Awards (five of which at IEEE conferences), and four IEEE Graduate Fellowship Awards (by MTT-S and by AP-S) since 2009. In 2013, he was the recipient of an ERC Consolidator Grant by the European Research Council.

Helena Rodilla (M'17) was born in Salamanca, Spain, in 1982. She received the B.S. and Ph.D. degrees in physics from the University of Salamanca, Salamanca, Spain, in 2006 and 2010, respectively.

From 2006 to 2010, she was with the Electronics Group, Department of Applied Physics, University of Salamanca, Spain, where her research interest was semiconductor physics. From 2011 to 2013, she was Postdoctoral Researcher with the Microwave Electronics Laboratory, MC2, Chalmers University of Technology, Sweden, where she worked on very low-noise InP HEMTs for cryogenic low noise amplifiers. Since 2013, she has been with the Terahertz and Millimeter Wave Laboratory, MC2, Chalmers University of Technology, Göteborg, Sweden, where she became an Assistant Professor in 2015 and the Docent in 2017. Her current research interests include the use of millimeter wave and terahertz technology in life science applications, sensing and on wafer terahertz probe measurements.

Alexander P. Shkurinov received the graduate and Ph.D. degrees in physics from the M. V. Lomonosov Moscow State University (MSU), Moscow, Russia, in 1985 and 1988, respectively.

Since 2015, he has been a Professor with MSU. His research interests include the development and application of femtosecond laser techniques, time-resolved spectroscopy, nonlinear optics and THz techniques, and spectroscopy. The results obtained were published in more than 100 scientific papers in peer-reviewed journals.

Dr. Shkurinov was the recipient of the Medal of Honor of Prof. Rozhdestvensky by the Russian Optical Society for his contribution into the development of optical science and technology.

Zackary Taylor received the B.S. degree in electrical engineering from the University of California, Los Angeles, Los Angeles, CA, USA (UCLA), and the M.S. and Ph.D. degrees in electrical engineering from University of California, Santa Barbara, Santa Barbara, CA, USA, under the mentorship of Elliott Brown where he performed THz imaging research with applications in remote sensing and concealed weapons detection.

Toward the end of his Ph.D. work, he became involved in medical imaging which was a natural application of remote in clutter dominated environments. He completed a postdoc at UCLA in the Department of Bioengineering under Warren Grundfest where he believed that having the term "bio" in his department affiliation would help build bridges with clinicians at the UCLA School of Medicine. He spent nine years embedded in the departments of Ophthalmology, Surgery, Otolaryngology, and Pathology at UCLA attempting to learn clinical vocabulary and applying remote sensing concepts to a myriad of unmet diagnostic needs. He recently moved to Aalto University, Helsinki, Finland, where he is an Assistant Professor with the Department of Electronics and Nanoengineering. His current THz-related research interests include spectroscopic imaging of corneal water content surface tissue water content, quasioptical techniques and design, and on wafer probe measurements at a room and cryogenic temperatures.

Ullrich R. Pfeiffer (M'02–SM'06) received the Diploma and Ph.D. degrees in physics from the University of Heidelberg, Heidelberg, Germany, in 1996 and 1999, respectively.

In 1997, he was a Research Fellow with the Rutherford Appleton Laboratory, Chilton, U.K. From 1999 to 2001, he was a Postdoctoral Researcher with the University of Heidelberg, working on real-time electronics for particle physics experiments with the European Organization for Nuclear Research (CERN), Geneva, Switzerland. From 2001 to 2006, he was with the IBM T. J. Watson Research Center, New York, NY, USA, where his research involved RF circuit design, power amplifier design at 60 and 77 GHz, high-frequency modeling, and packaging for millimeter-wave communication systems. He has authored or coauthored more than 100 publications and has been the Principal Inventor and co-inventor of more than 10 U.S. and international issued patents relating to RF, millimeter-wave, terahertz communication/imaging circuits, and sensors. His research interests include silicon RFICs for mmWave/THz communication, radar, and imaging systems.

Dr. Pfeiffer has been a Distinguished Lecturer for the IEEE Solid-State Circuits Society and the President of the German Association for Electrical Engineering and Information Technology e.V. (FTEI). Since 2008, he has been the High-frequency and Communication Technology Chair at the University of Wuppertal, Germany. In 2007, he was the recipient of a European Young Investigator Award and the Lead the THz electronics group, Institute of High-Frequency and Quantum Electronics, University of Siegen, Germany. He was the co-recipient of the 2004 and 2006 Lewis Winner Award for Outstanding Paper at the IEEE International Solid-State Circuit Conference, the co-recipient of the 2006 IBM Pat Goldberg Memorial Best Paper Award, the 2008 EuMIC Best Paper Award, the 2010 EuMC Microwave Prize, the 2012 Jan Van Vessem Award for Outstanding European Paper at the 2012 IEEE International Solid-State Circuit Conference, the 2014 EuCAP Best Paper Award, and the 2017 Microwave Prize.

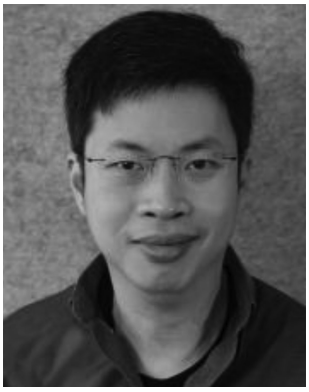
Vincent P. Wallace (M'02) studied physics at the University College London, London, U.K. He received the Ph.D. degree in medical physics from the Royal Marsden Hospital, London, U.K., in 1997.

He was a Postdoctoral Researcher with the Beckman Laser Institute and Medical Clinic, University of California, Irvine, CA, USA. He then joined TeraView Ltd., to develop biomedical applications of terahertz technology. In 2007, he took up an academic position with the University of Western Australia, Crawley, WA, Australia. His research interests include cancer diagnosis, burn assessment, biomedical optics, and terahertz technology.

Benjamin Williams (S'02–M'03–SM'10) received the B.S. degree in physics from Haverford College, Haverford, PA, USA, in 1996, and the M.S. and Ph.D. degrees in electrical engineering and computer science from the Massachusetts Institute of Technology (MIT), Cambridge, MA, USA, in 1998 and 2003, respectively.

From 2003 to 2006, he was a Postdoctoral Associate with the Research Laboratory of Electronics, MIT. During this time, he developed some of the first terahertz quantum cascade lasers. Since 2007, he has been a member of the Department of Electrical and Computer Engineering, University of California, Los Angeles, Los Angeles, CA, USA, where he is currently a Professor and a Henry Samueli Fellow. His research interests include terahertz and mid-infrared quantum cascade lasers, intersubband and intersublevel devices in semiconductor nanostructures, and terahertz metamaterials, metasurfaces, and plasmonics.

Dr. Williams was the recipient of the Apker Award from the American Physical Society in 1996, the Young Investigator Award from the Defense Advanced Research Projects Agency in 2008, the Early Career Award from the National Science Foundation in 2012, and the Presidential Early Career Award for Scientists and Engineers.



Withawat Withayachumnankul (SM'16) received the bachelor's and master's degrees in electronic engineering from the King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand, in 2001 and 2003, respectively, and the Ph.D. degree in electrical engineering (with a special commendation) from the University of Adelaide, Adelaide, S.A., Australia, in 2010.

From 2010 to 2013, he was an ARC Australian Postdoctoral Fellow with the University of Adelaide. In 2015, he was a Research Fellow with the Japan Society for the Promotion of Science (JSPS), Tokyo Institute of Technology, Tokyo, Japan. He has been a Visiting Researcher with Osaka University, Japan, in recent years. He is currently a Senior Lecturer and Postgraduate Coordinator with the University of Adelaide, and the founding leader of the Terahertz Engineering Laboratory. He has authored or coauthored more than 70 journal publications, and has supervised 6 Ph.D. students to completion, all with a commendation. His research interests include terahertz components, antennas, radar, communications, and metrology.

Dr. Withayachumnankul was the Chair of the IEEE South Australia Joint Chapter on Microwave Theory and Techniques and Antennas and Propagation during 2017–2018. He is a lead investigator for three Australian Research Council (ARC) grants, totaling to more than AUD 1M.