2017 IEEE Fellows Elevation and Recognition

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Each year a select number of engineers are elevated to the level of Fellow of the IEEE. The number of Fellows elevated in any year cannot exceed one-tenth of one percent of the total voting membership. This highest grade of membership in the IEEE is conferred by the IEEE Board of Directors in recognition of an individual's outstanding record of accomplishments in any IEEE field of interest. The grade of IEEE Fellow was created in 1964 during the merger of the American Institute of Electrical Engineers and the Institute of Radio Engineers to form the IEEE.

This year, eight honorees were awarded the status of Fellow by the IEEE Microwave Theory and Techniques Society (MTT-S). Another ten new Fellows are members of the MTT-S but were awarded the level of Fellow by other Societies or Councils. In all, almost 300 Fellows were elevated throughout the IEEE this year. The total IEEE membership is more than 400,000 and represents over 160 countries. In alphabetical order, those awarded the level of Fellow by the MTT-S are

- William R. Deal, for contributions to solid-state submillimeter-wave and terahertz amplifiers
- Tian-Wei Huang, for contributions to the design and development of millimeter-wave complementary–metal-oxide-semiconductor (CMOS) RF integrated circuits (ICs)
- Kenji Itoh, for contributions to microwave harmonic mixers and applications to mobile terminal devices
- Agnieszka Konczykowska for contributions to the development of very-high-speed circuits
- Donald Y.C. Lie, for contributions to high-linearity and high-efficiency silicon (Si) RF power amplifiers (PAs) for broadband wireless applications
- Dimitrios Peroulis, for contributions to microelectromechanical systems (MEMS)-based tunable filters
- Vesna Radisic, for contributions to millimeter- and submillimeter-wave sources, amplifiers, and monolithic ICs
- Sorin P. Voinigescu, for contributions to Si and Si germanium (SiGe) microwave and millimeter-wave devices and ICs.

Here, we present short biographies of these new MTT-S Fellows in honor of their contributions to the Society. The MTT-S is a close-knit family, exploring an ever-widening space of using the terahertz region, millimeter waves, microwaves, and RF. Our Fellows have worked very hard and undoubtedly made many sacrifices for their work. Please join me in congratulating each of these new Fellows.

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For contributions to solid-state submillimeter-wave and terahertz amplifiers

William R. Deal received his B.S. degree in electrical engineering in 1996 from the University of Virginia, Charlottesville, United States. He earned both his M.S. and Ph.D. degrees in electrical engineering under the mentorship of Prof. Tatsuo Itoh at the University of California, Los Angeles, United States, in 1998 and 2000, respectively.

Prior to 2002, Dr. Deal worked at the startup companies Malibu Networks and Lucix on wireless Internet and microwave components. In 2002, he joined TRW in Redondo Beach, California, which was later acquired by Northrop Grumman. He is currently a Distinguished Engineer in Northrop Grumman's RF and Mixed Signal Department. He is active in the development of new monolithic microwave IC (MMIC) technologies, as well as inserting these technologies into applications related to the aerospace industry.

Much of his work has been focused on increasing the speed of indium phosphide (InP) ICs. As principal investigator of Northrop Grumman's Terahertz Electronics Program funded by the U.S. Defense Advanced Research Projects Agency (DARPA), Dr. Deal contributed to the first amplifiers operating at 1 THz (1,000 GHz). In the process of reaching this milestone, Dr. Deal's team demonstrated low-noise amplifiers (LNAs), PAs, receivers, and transmitters operating in the 235–1,000 GHz range using transistor-based technologies. His team has received several awards, including the 2017 George E. Smith Award for their paper "First Demonstration of Amplification at 1 THz Using 25-nm InP High Electron Mobility Transistor Process"; the 2012 Tatsuo Itoh Award for their paper "Demonstration of a 0.48-THz Amplifier Module Using InP HEMT Transistors"; and a 2014 Guinness World Record for the world's fastest IC amplifier. In 2009, Dr. Deal received the MTT-S's Outstanding Young Engineer Award. He has authored or coauthored more than 150 conference and journal papers and holds three patents.

Actively involved with the IEEE and the MTT-S, Dr. Deal has served as associate editor for *IEEE Microwave and Component Letters* since 2010 and is a coeditor for *IEEE Transactions on Terahertz Science and Technology*. He is also a member of the IEEE MTT-S International Microwave Symposium (IMS) Technical Program Review Committee (TPRC) and has served on various other IMS committees.

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For contributions to the design and development of millimeter-wave CMOS RFICs

Tian-Wei Huang received his B.S. degree from National Cheng Kung University, Tainan, Taiwan, in 1987 and earned his M.S. and Ph.D. degrees in electrical engineering from the University of California, Los Angeles, United States, in 1990 and 1993, respectively.

Dr. Huang has made contributions to the development of monolithic millimeter-wave MMICs since 1993 when he joined the TRW (now Northrop Grumman) MMIC research and development (R&D) team, participating in the development of gallium arsenide (GaAs)- and InP-based millimeter-wave/subterahertz RFICs. From 1998 to 1999, he was engaged in research at Lucent Technologies on 28-GHz local multipoint distribution system designs for low-cost millimeter-wave system-in-packages. From 1999 to 2002, he was with Cisco Systems, where he developed the 802.11 Wi-Fi orthogonal frequency-division multiplexing system test by accelerating the system bit-error rate/eye-diagram test with the error-vector magnitude test. Later, during his academic career, he supervised graduate students in creating a theoretical model of eye-diagram generation, a breakthrough for avoiding significant amounts of pseudorandom binary sequence simulation time; this work was granted the 2009 IEEE Transactions on Advanced Packaging Best Paper Award.

Dr. Huang has been a professor in the Department of Electrical Engineering at National Taiwan University, Taipei, since August 2002. His early academic research identified two essential building blocks for millimeter-wave gigabit transceivers: a broadband modulator/demodulator and a high-linearity PA. He supervised graduate students in designing state-of-the art circuit blocks, such as a 15–75-GHz binary phase shift keying modulator, 0.8–77-GHz passive mixer, and 30–100-GHz active mixer, which established a millimeter-wave CMOS design environment and infrastructure for gigabit transceiver integration. His group created a gigabit in-phase quadrature (IQ) modulator, from 20–40-GHz direct-conversion, and implemented a 1,024-quadrature-amplitude-modulated (QAM) IQ modulator with a high-linearity PA that can be used as a CMOS transmitter for millimeter-wave multiple-gigabit-per-second links. His group also initiated millimeter-wave PA designs with the world's first millimeter-wave GaAs/CMOS linearizers. To boost the output power of CMOS millimeter-wave PAs, his group proposed several innovative PA topologies, such as a 60-GHz distributed active transformer PA and a three-dimensional (3-D) PA. Many CMOS PAs with record-setting output power have been demonstrated through these new power-combining topologies. His group also demonstrated the world's first millimeter-wave CMOS 4-Gb/s transceiver in 2007. In addition, since 2005 Dr. Huang has been involved in the development of IEEE 802.11 60-GHz gigabit Wi-Fi standards.

Dr. Huang has also been an invited speaker at many industry workshops with his lecture "The Inside Story of Gigabit Wi-Fi Standards and 60-GHz CMOS RFICs." And since 2015, as an MTT-S Distinguished Microwave Lecturer (DML), he has combined the topics of fifth-generation (5G) cellular gigabit applications and millimeter-wave 1,024-QAM transceiver design, promoting millimeter-wave gigabit research through more than 40 invited DML presentations.

Dr. Huang has published articles in more than 140 refereed journals and conference proceedings and coauthored the book *Millimeter-Wave Silicon Power Amplifiers and Transmitters* (Cambridge University Press, 2016). He holds 13 patents for 3-D PAs, baluns, and millimeter-wave linearizers. Since 2015, he has served as an associate editor for *IEEE Transactions on Microwave Theory and Techniques* and as a guest editor of several IMS/RFIC Symposium special issues. His contributions are acknowledged not only by the MTT-S but also by other Societies and working groups, such as the IEEE 802.11 Standards Committee. For instance, he received the IEEE Wi-Fi Standard Committee's award for outstanding contributions to IEEE 802.11ad 60-GHz wireless local area networks.

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For contributions to microwave harmonic mixers and their applications to mobile terminal devices

Kenji Itoh received his B.S degree in electrical engineering from Doshisha University, Japan, in 1983 and his Ph.D. degree in electrical engineering from Tohoku University, Japan, in 1997. He joined the Corporate R&D department of Mitsubishi Electric Corporation in 1983. From 1983 to 1997, he was engaged in R&D for microwave/millimeter-wave transmitters and receivers for satellite communication, land mobile communication, radar, and electronic warfare systems. He has participated in research areas such as mixers, oscillators, and frequency synthesizers, including direct-digital-synthesis and direct-conversion receivers. During his years in corporate R&D, Dr. Itoh conducted early research on a millimeter-wave even-harmonic mixer MMIC, which was presented at IMS1991 [1].

In 1997, after receiving his Ph.D., he was transferred to Mitsubishi's Department of Mobile Terminal Design, where he served as a business line manager. From 1997 to 2008, he was engaged in R&D for RF receivers and transmitters used in Wideband Code-Division Multiple-Access (W-CDMA) standard mobile terminals and the development of RFICs in personal digital cellular (PDC) terminals. He accomplished two early research breakthroughs in RF engineering used in mobile terminals: the world's first W-CDMA direct-conversion receiver and the highly integrated SiGe transceiver IC used in PDC terminals.. He realized the earliest fully W-CDMA-compliant receiver in 2000, applying the receiver to mass-produced mobile terminals in early 2002; this was also the first mass-produced W-CDMA direct-conversion receiver [2]. The SiGe PDC transceiver IC he developed has been used for mass-produced mobile terminals since 2001.

Since 2009, Dr. Itoh has been a professor with the Division of Electrical Engineering, Kanazawa Institute of Technology, Ishikawa, Japan, engaging in research on microwave circuits including mixers, oscillators, frequency synthesizers, and rectennas for wireless power transfer. He has focused on formulating a theory for the output power and distortion of diode mixers [3], [4]. Further, he coauthored two award-winning papers presented as part of the student competition at the IEEE Wireless Power Transfer Conference in 2014 [5] and 2016 [6].

Dr. Itoh received the Ohm Technology Award from the Promotion Foundation for Electrical Science and Engineering of Japan in 2002 and the MTT-S N. Walter Cox Award in 2014. He has served as an IMS TPRC member since 2002, an MTT-S Technical Coordinating Committee member (TCC-22) since 2003, an associate editor for *IEEE Transactions on Microwave Theory and Techniques* from 2004 to 2007, and an elected MTT-S Administrative Committee member from 2006 to 2008, in 2010, and again from 2012 to 2014.

References

[1] K. Itoh, A. Iida, Y. Sasaki, and S. Urasaki, "A 40 GHz band monolithic even harmonic mixer with an antiparallel diode pair," in *Proc. IEEE MTT-S Int. Microwave Symp. Digest*, June 1991, pp. 879–882.

[2] K. Itoh, T. Yamaguchi, T. Katsura, K. Sadahiro, T. Ikushima, R. Hayashi, F. Ishizu, E. Taniguchi, T. Nishino, M. Shimozawa, N. Suematsu, T. Takagi, and O. Ishida, "Integrated even harmonic type direct conversion receiver for W-CDMA mobile terminals," in *Proc. IEEE MTT-S Int. Microwave Symp. Digest*, June 2002, pp. 9–12.

[3] J. Hashimoto, K. Itoh, M. Shimozawa, and K. Mizuno, "Fundamental limitations on the output power of balanced mixers and even harmonic mixers in the modulator operation," *IEEE Trans. Microwave Theory Tech.*, vol. 62, no. 12, pp. 3085–3094, Dec. 2014.

[4] J. Hashimoto, K. Itoh, M. Shimozawa, and K. Mizuno, "Fundamental limitations on the output power and the third-order distortion of balanced mixers and even harmonic mixers," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-64, no. 9, pp. 2853–2862, Sept. 2016.

[5] M. Ito, K. Hosodani, K. Itoh, S. Betsudan, S. Makino, T. Hirota, K. Noguchi, and E. Taniguchi, "High efficient bridge rectifiers in 100 MHz and 2.4 GHz bands," in *Proc. IEEE Wireless Power Transfer Conf.*, Jeju, Korea, May 2014, pp. 64–67.

[6] T. Furuta, M. Ito, N. Nambo, K. Itoh, K. Noguchi, and J. Ida, "The 500 MHz band low power rectenna for DTV in the Tokyo area," in *Proc. IEEE Wireless Power Transfer Conf.*, Aveiro, Portugal, May 2016, pp. 1–3.

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For contributions to the development of very-high-speed circuits

Agnieszka Konczykowska received her M.S. and Ph.D. degrees, both in electrical engineering, from Warsaw University of Technology, Poland. In 1983, she joined the R&D center with France Telecom, then worked for Alcatel Research and Innovation, Marcoussis, France, focusing on software tools and computer-aided design methodologies for analog circuits, device modeling, and circuit design (classical circuits, switched-capacitor circuits, microwave circuits, optoelectronic circuits, and very-high-speed digital circuits). Presently, she works at the II–V Lab, a joint laboratory of Nokia Bell Labs, Thales Research and Technology, and the Commissariat à l'énergie atomique et aux énergies alternatives/Laboratoire d'électronique et de technologie de l'information (CEA/LETI) in Palaiseau, France.

Dr. Konczykowska's early work was primarily in the domain of the IEEE Circuits and Systems Society. She worked on topological methods also referred to as *symbolic simulation techniques.* Her hierarchical circuit decomposition enabled the first symbolic simulation of very large circuits. In 1991, she initiated and organized the first Workshop on Symbolic Methods and Applications to Circuit Design, now a well-established international biannual technical event. She organized and was the first chair (1997–1999) of the French Chapter of the IEEE Circuits and Systems Society. She has been a member of the editorial board of the Wiley *International Journal on Circuit Theory and Applications* since 1992 and was guest editor of the special issue on analog tools for circuit design (1995).

Dr. Konczykowska was a member of the European Circuit Society Council (1993–1995), as well as the society's president (1995–1999). She served on the Scientific Program Committees for the European Conference on Circuit Theory and Design (1991–2001) and the Design, Automation and Test in Europe Conferences (1998–2002). She was also general vice-chair of the International Symposium on Circuits and Systems, held in Paris, France, in 2010.

Dr. Konczykowska's achievements in topological methods include contributions to block graph theory, the algebra of structural numbers, switched-capacitor circuits with symbolic switching schemes, device parameter extraction, and symbolic macro modeling of interconnects.

For the past 20 years, Dr. Konczykowska has made contributions in the domain of the MTT-S, primarily to the design of very-high-speed ICs. She has authored a number of pioneering and patented designs exhibiting the world's best-in-class performance. In 2010, she developed the power digital-to-analog convertor (DAC), facilitating very efficient realization of high-speed transmitters for multilevel formats. Transmitters based on her power DAC circuits enabled a series of record-breaking innovations, including the first all-electronic time-division multiplexing single-carrier and single-modulator 1.08-Tb/s transmitter for long-haul optical systems and a single-carrier, single-polarization intensity-modulation and direct-detection transceiver for intra-data center networks with up to 107-GBd four-level pulse-amplitude modulation transmission.

Since 2005, Dr. Konczykowska has participated on the IMS TPRC Digital Circuits at GHz Speeds Subcommittee as a member, vice-chair, and chair, organizing workshops and special sessions. Since 2016, she has been chair of the MTT-9 TCC on Digital Signal Processing. She was guest editor of the April 2009 *IEEE Microwave Magazine* special issue "Breaking the 100-Gb/s Barrier."

Dr. Konczykowska has coauthored one monograph book, contributed chapters to four books, published over 250 peer-reviewed journal and conference papers, been awarded seven patents, and delivered 27 invited presentations at either plenary or special sessions.

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For contributions to high-linearity and high-efficiency Si RF PAs for broadband wireless applications

Donald Y.C. Lie received his B.S.E.E. degree from National Taiwan University, Taipei, in 1987 and his M.S. and Ph.D. degrees in electrical engineering (minor in applied physics) from the California Institute of Technology, Pasadena, United States in 1990 and 1995, respectively. He has held technical and managerial positions at companies such as Rockwell International, Silicon-Wave (now Qualcomm), IBM, Microtune, SYS Technologies, and Dynamic Research Corporation (DRC).

He is currently the Keh-Shew Lu Regents Chair Professor in the Department of Electrical and Computer Engineering, Edward E. Whitacre Jr. College of Engineering, Texas Tech University, Lubbock, United States, and also an adjunct professor in the Department of Surgery at the Texas Tech University Health Sciences Center, supervising M.D./Ph.D students. He has been instrumental in bringing to his institution multimillion-dollar research funding and also designed real-world commercial communication products sold internationally. He was a visiting lecturer at the University of California, San Diego's Center of Wireless Communications from 2002 to 2007.

Dr. Lie is currently general chair of the IEEE Symposium on Very-Large-Scale Integration Design, Automation, and Testing (2015–2017) and serves on the executive/steering committees of the IEEE RFIC Symposium (including TPRC Subcommittee chair), the IEEE Topical Meetings on Si Monolithic ICs in RF Systems, the Midwest Symposium on Circuits and Systems, and the Texas Wireless Symposium. Dr. Lie has been honored with the U.S. Navy's Space and Naval Warfare Systems Center Pacific's Team Achievement Award (Spring 2007), three DRC Silver Awards of Excellence (2005–2007), IBM's first Chairman Patent Award (2001–2002) and Rockwell International's top engineering awards (1996–1998). He and his students have won 14 best graduate student paper awards and best paper awards in international conferences for 1994, 1995, 2006, 2008 (twice), 2010 (three times), 2011, 2012, 2013, 2014, 2015, and 2016.

Dr. Lie served as a guest editor for *IEEE Journal of Solid-State Circuits*, associate editor and special topics editor for *IEEE Microwave and Wireless Components Letters*, associate editor-in-chief for *Open Journal of Applied Biosensors*, guest editor for *Biosensors*, and guest editor for *IEEE Transactions on Microwave Theory and Techniques*.

Dr. Lie has served as a consultant with several commercial IC design companies and an international research institute and also participated in patent and trade secrets cases with some of the world's largest business litigation firms. In 2009, he cofounded NoiseFigure Research, Inc., a company that focuses on state-of-the-art RF system-on-chip (SoC) technologies. He has authored/coauthored some 200 peer-reviewed technical papers and book chapters and holds seven U.S. patents. Dr. Lie's group at Texas Tech University has won four DARPA subcontracts and published three of the most-downloaded "Top 100" papers on highly efficient RF Si PA design in IEEE *Xplore* for September 2012, June 2012, and September 2009 (ranked 80th, 88th, and 21st, respectively). His research interests are in power-efficient RF/analog IC and SoC design and testing, especially Si PA design, and interdisciplinary and clinical research on medical electronics, biosensors, oncology, and biosignal processing. Dr. Lee is a member of the American Society of Clinical Oncology and the American Association for the Advancement of Science.

Select Publications

[1] R. Wu, Y.-T. Liu, J. Lopez, C. Schecht, Y. Li, and D. Y. C. Lie, "High-efficiency silicon-based envelope-tracking power amplifier design with envelope shaping for broadband wireless applications," *IEEE J. Solid-State Circuits*, vol. 48, no. 9, pp. 2030–2040, Sept. 2013.

[2] Y. Li, J. Lopez, C. Schecht, R. Wu, and D. Y. C. Lie, "Design of high efficiency monolithic power amplifier with envelope-tracking and transistor resizing for broadband wireless applications," *IEEE J. Solid-State Circuits*, vol. 47, no. 9, pp. 2007–2018, Sept. 2012.

[3] Y. Li, J. Lopez, R. Wu, and D. Y. C. Lie, "A fully monolithic BiCMOS envelope-tracking power amplifier with on-chip transformer for broadband wireless applications," *IEEE Microwave Wireless Compon. Lett.*, vol. 22, no. 6, pp. 288–290, June 2012.

[4] Y. Li, J. Lopez, P. H. Wu, W. Wu, R. Wu, and D. Y. C. Lie, "A SiGe envelope-tracking power amplifier with an integrated CMOS envelope modulator for mobile WiMAX/3GPP LTE transmitters," *IEEE Trans. Microwave Theory Tech.*, vol. 59, no. 10, pp. 2525–2536, Oct. 2011.

[5] J. Lopez, Y. Li, D. Y. C. Lie, J. D. Popp, K. Chen, S. Wu, T. Yang, and J.-K. Ma, "Design of highly-efficient wideband RF polar transmitters using the envelope-tracking technique," *IEEE J. Solid-State Circuits*, vol. 44, no. 9, pp. 2276–2294, Sept. 2009.

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For contributions to MEMS-based tunable filters

Dimitrios Peroulis received his Diploma degree (five-year studies) from the National Technical University of Athens, Greece, in July 1998. He earned his master's and Ph.D. degrees in electrical engineering from the University of Michigan, Ann Arbor, United States, in 1999 and 2003, respectively. In August 2003, he joined Purdue University, West Lafayette, Indiana, United States, as an assistant professor in the School of Electrical and Computer Engineering (ECE). He is currently a professor in the ECE department and deputy director of the Birck Nanotechnology Center at Purdue.

Dr. Peroulis has focused on reconfigurable RF electronics since the late 1990s. As a doctoral student, he pioneered tunable MEMS devices, filters, and antennas by accounting for critical electromechanical tradeoffs and nonideal fabrication issues. His doctoral work has been collectively cited over 1,100 times. In addition, he was bestowed the 2002–2003 Rackham Graduate School Pre-Doctoral Fellowship (a university-wide distinction). His student conference publications also won three student paper awards at IEEE international conferences within the MTT-S and IEEE Antennas and Propagation Society (AP-S) communities in 2001 and 2002.

In the mid-2000s, Prof. Peroulis identified RF MEMS as a unique enabling technology for creating a new class of tunable low-power (microwatt-level power is required for tuning) RF front-end filters, called *evanescent-mode tunable filters*. Prof. Peroulis was the MEMS leader of the Purdue University team that simultaneously demonstrated widely tunable (> octave) evanescent-mode filters with unprecedented quality factors (Q > 500–1,000) for high frequencies (> 1 GHz). Previous technologies had achieved either very high quality factors (high selectivity) at the cost of very limited tuning range (< 1%) or very high tuning range (> octave) at the cost of low quality factors (poor selectivity).

Prof. Peroulis has headed a plethora of government and industry programs in this field that led to further technology advancements. Specifically, he demonstrated for the first time that evanescent-mode filters can be scaled from subgigahertz to over 100 GHz while maintaining their high quality characteristics and wide tuning range. Moreover these filters demonstrate high linearity (> 60 dBm), application-important power handling (> 1–10 W), inherent temperature stability, and minimal power consumption (microwatts). These unique characteristics are critical for 5G communications systems and beyond. A number of companies (including BAE Systems, National Instruments, Raytheon, Northrop Grumman, and Rockwell Collins) have used this technology in their own government and commercial demonstrations. Prof. Peroulis also created an array of unique tunable filter architectures that can reconfigure their function (e.g., switch from bandpass to bandstop mode), order, center frequency, bandwidth, and notches, while being fully controllable and reconfigurable in real time [1]–[4].

Prof. Peroulis has coauthored over 300 journal and conference papers, and his work has been recognized in this field in many ways. In 2008, he received the U.S. National Science Foundation CAREER award. In 2012 he received the Outstanding Paper Award from the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society (Ferroelectrics Section), and in 2014 he received the Outstanding Young Engineer Award from the MTT-S. He is a Purdue University Faculty Scholar and has also received ten teaching awards, including the 2010 HKN C. Holmes MacDonald Outstanding Teaching Award and the 2010 Charles B. Murphy Award, Purdue's highest undergraduate teaching honor. His students in the field of MEM-based filters have been awarded five student paper awards at IEEE conferences (three of them at the IMS). Four of his doctoral students became faculty members in the United States and abroad, while several others now have leading positions in academic, industry, and government research labs.

References

[1] D. Peroulis, E. Naglich, M. Sinani, and M. Hickle, "Tuned to resonance: Transfer-function-adaptive filters in evanescent-mode cavity-resonator technology," *IEEE Microwave Mag.*, vol. 15, no. 5, pp. 55–69, July/Aug. 2014.

[2] P. Blondy and D. Peroulis, "Handling RF power: The latest advances in RF-MEMS tunable filters," *IEEE Microwave Mag.*, vol. 14, no. 1, pp. 24–38, Jan./Feb. 2013.

[3] M. Abu Khater, Y.-C. Wu, and D. Peroulis, "Tunable cavity-based diplexer with spectrum-aware automatic tuning," *IEEE Trans. Microwave Theory Tech.*, vol. 65, no. 3, pp. 934–944, Mar. 2017.

[4] D. Psychogiou, R. Gomez-Garcia, and D. Peroulis, "Fully adaptive multiband bandstop filtering sections and their application to multifunctional components," *IEEE Trans. Microwave Theory Tech.*, vol. 64, no. 12, pp. 4405–4418, Nov. 2016.

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For contributions to millimeter- and submillimeter-wave sources, amplifiers, and monolithic ICs

Vesna Radisic received her Dipl. Ing. degree from the University of Belgrade, Serbia, in 1991; her M.S. degree from the University of Colorado at Boulder, United States, in 1993; and her Ph.D. degree from the University of California, Los Angeles, United States in 1998, all in electrical engineering. Since 2002, she has been with Northrop Grumman Aerospace Systems, where she is currently a principal scientist and lead for the Engineered RF Materials group. Prior to joining Northrop Grumman, she was a senior design engineer with OpNext, Thousand Oaks, California, where she designed components for 40-Gb/s and 10-Gb/s fiber-optic ICs. From 1999 to 2001, she was a research staff member at the HRL Laboratories, Malibu, California, where she led MMIC submillimeter-wave circuit development, including LNAs, oscillators, doublers, and ultrawide-band amplifiers. She has authored or coauthored more than 65 journal and conference publications.

Dr. Radisic was a corecipient of the 2012 MTT-S Tatsuo Itoh Best Paper Award for a publication in *IEEE Microwave and Wireless Components Letters* and of the 2007 Northrop Grumman Space Technology Innovation Award for 300-GHz InP high-electron-mobility transistor (HEMT) technology. She was also honored with the MTT-S Outstanding Young Engineer Award in 2007 and won third place in the Student Paper Competition at IMS1998 in Baltimore, Maryland.

Dr. Radisic served as cochair of MTT-S Women in Microwaves for 2015 and 2016, has been a member of the technical committee MTT-6 (Microwave and Millimeter-Wave ICs) since 2016, and was chair of the MTT-S Los Angeles Coastal Chapter for 2010, 2011, and 2012.

Dr. Radisic's pioneering research work has significantly advanced the state of the art of active solid-state submillimeter-wave technology [1]–[5]. Her major technical contributions include novel integration and packaging of submillimeter-wave imaging pixels [1], demonstrations of InP HEMT and heterojunction bipolar transistor PAs from 220 to 650 GHz [2]–[4], and high-efficiency amplifiers for wireless applications [5]. Demonstration of significant power output and power added efficiency at frequencies above 200 GHz has enabled the potential use of solid-state devices and ICs in high-resolution imaging, high-data-rate communications, and driver amplifiers for terahertz systems.

References

[1] V. Radisic, K. Leong, C. Zhang, K. K. Loi, and S. Sarkozy, "Demonstration of a micro-integrated sub-millimeter-wave pixel," *IEEE Trans. Microwave Theory Tech.*, vol. 61, no. 8, pp. 2949–2955, Aug. 2013.

[2] V. Radisic, D. W. Scott, A. Cavus, and C. Monier, "220-GHz high-efficiency InP HBT power amplifiers," *IEEE Trans. Microwave Theory Tech.*, vol. 62, no. 12, pp. 3001–3005, Oct. 2014.

[3] V. Radisic, K. M. K. H. Leong, S. Sarkozy, X. B. Mei, W. Yoshida, P. H. Liu, W. R. Deal, and R. Lai, "220-GHz solid-state power amplifier modules," *IEEE J. Solid State Circuits*, vol. 47, no. 10, pp. 2291–2297, Oct. 2012.

[4] V. Radisic, K. M. K. H. Leong, X. B. Mei, S. Sarkozy, W. Yoshida, and W. R. Deal, "Power amplification at 0.65 THz using InP HEMTs," *IEEE Trans. Microwave Theory Tech.*, vol. 60, no. 3, pp. 724–729, Mar. 2012.

[5] V. Radisic, Y. Qian, and T. Itoh, "Novel architectures for high efficiency amplifiers for wireless applications," *IEEE Trans. Microwave Theory Tech.*, vol. 46, no. 11, pp. 1901–1909, Nov. 1998.

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For contributions to Si and SiGe microwave and millimeter-wave devices and ICs

Sorin P. Voinigescu received the M.Sc. degree in electronics from the Polytechnic Institute of Bucharest, Romania, in 1984 and the Ph.D. degree in electrical and computer engineering from the University of Toronto, Canada, in 1994.

Since 2002, he has been with the Edward S. Rogers Sr. Department of Electrical and Computer Engineering at the University of Toronto, where he currently serves as professor. His research and teaching interests focus on atomic-scale electronic devices and their application in ICs and SoCs at frequencies beyond 300 GHz. He is the author of several frequently cited papers on Si and SiGe microwave and millimeter-wave devices [1], [2] and ICs [3]–[5] and of a well-regarded book, *High-Frequency Integrated Circuits* (Cambridge University, 2013). During 2008–2009 and 2015–2016, Dr. Voinigescu spent sabbatical leaves conducting research on technologies and circuits for millimeter-wave radio, radar, and sensors and on 1-Tb/s fiber-optic systems with Fujitsu Laboratories of America, Sunnyvale, California, United States; Nippon Telegraph and Telephone's Device Research Laboratories, Atsugi, Japan; Robert Bosch GmbH, Gerlingen, Germany; and the University of New South Wales, Sydney, Australia. In 2009–2010, he cofounded and was chief technology officer (CTO) of Peraso Technologies, which commercializes millimeter-wave radio WiGig and backhaul transceivers.

In 2000, Dr. Voinigescu cofounded and was CTO of Quake Technologies, Ottawa, Canada, which introduced the first commercial single-chip 10-Gb/s SONET and 10-G Ethernet transceivers (in 2001 and 2002, respectively); the company was acquired by Applied-Micro Circuits Corporation in 2006 after 23 quarters of continuous revenue growth. From 1994 to 2000, he was with NORTEL, Ottawa, where he was responsible for projects in high-frequency characterization and statistically scalable compact model development for Si, SiGe [1], [3], and III–V devices. From 1984 to 1991, he worked as a microwave semiconductor device and circuits research engineer at the Research Institute for Electronic Components, Bucharest, and as assistant professor in the electronics department of the Polytechnic Institute of Bucharest.

Dr. Voinigescu serves as a member of the IEEE International Roadmap for Devices and Systems and on the Executive Committee (ExCom) of the IEEE Bipolar/BiCMOS Circuits and Technology Meeting. He was a guest editor of *IEEE Journal of Solid-State Circuits* in 2015 and 2017 and *IEEE Transactions on Microwave Theory and Techniques* in 2012. From 2003 to 2013, he served on the TPRC and ExCom of the IEEE Compound Semiconductor IC Symposium and was conference chair in 2012. He received NORTEL's President Award for Innovation in 1996, and in 2013 he was recognized with the Information Technology Association of Canada's Lifetime Career Award for his contributions to the Canadian semiconductor Industry.

References

[1] S. P. Voinigescu, S. W. Tarasewicz, T. MacElwee, and J. Ilowski, "An assessment of the state-of-the-art 0.5 µm bulk CMOS technology for RF applications," in *Proc. IEEE Int. Electron Devices Meeting*, 1995, pp. 721–724.

[2] A. M. Mangan, S. P. Voinigescu, M. T. Yang, and M. Tazlauanu, "De-embedding transmission line measurements for accurate modelling of IC designs," *IEEE Trans. Electron. Devices*, vol. ED-53, no. 2, pp. 235–241, 2006.

[3] S. P. Voinigescu, M. C. Maliepaard, J. L. Showell, G. Babcock, D. Marchesan, M. Schroter, P. Schvan, and D. L. Harame, "A scalable high frequency noise model for bipolar transistors with application to optimal transistor sizing for low-noise amplifier design," *IEEE J. Solid-State Circuits*, vol. 32, no. 9, pp. 1430–1438, 1997.

[4] T. Yao, M. Q. Gordon, K. K. W. Tang, K. H. K. Yau, M.-T. Yang, P. Schvan, and S. P. Voinigescu, "Algorithmic design of CMOS LNAs and PAs for 60-GHz radio," *IEEE J. Solid-State Circuits*, vol. 42, no. 5, pp. 1044–1057, May 2007.

[5] T. O. Dickson, K. H. K. Yau, T. Chapattis, A. Mangan, R. Beerkens, P. Westergaard, M. Tazlauanu, M. T. Yang, and S. P. Voinigescu, "The invariance of the characteristic current densities in nanoscale MOSFETs and its impact on algorithmic design methodologies and design porting of Si(Ge) (Bi)CMOS high-speed building blocks," *IEEE J. Solid-State Circuits*, vol. 41, no. 8, pp. 1830–1845, Aug. 2006.

MTT-S Member Life Fellows Elevated by Other Societies

We also wish to recognize our members who have been elevated to Fellow by other Societies or Councils. Currently, there are 39 Societies and seven Councils in the IEEE. People raised to the level of Fellow by other Societies, while being members of the MTT-S, are listed in an alphabetical order within each Society or Council and by alphabetical order of the Society or Council.

- *Filiberto Bilotti* by the AP-S, for contributions to metamaterials for electromagnetic and antenna applications
- *Payam Heydari* by the IEEE Solid-State Circuits Society, for contributions to Si-based millimeter-wave ICs and systems
- *Akimasa Hirata* by the IEEE Electromagnetic Compatibility Society, for contributions to safety assessment and standardization of human exposure to electromagnetic fields
- *Kenichi Kagoshima* by the AP-S, for contributions to antennas for satellite communication and mobile wireless access systems
- *Steven Koester* by the IEEE Electron Devices Society (EDS), for contributions to group-IV electronic and photonic devices
- *Cyril Luxey* by the AP-S, for the development of small antennas, multiantenna system integration, and high-performance millimeter-wave systems
- *Daniel Oates* by the IEEE Council on Superconductivity, for contributions to high-temperature superconductors and applications to RF receiver technology
- *Tomas Palacios* by the EDS, for contributions to Ga nitride electron devices and two-dimensional materials
- *Charles Rhoads* by the AP-S, for leadership in low-cost and high-performance array-antenna technologies
- *Zhongxiang Shen* by the AP-S, for contributions to 3-D frequency-selective structures and slot antennas.

Again, please join me in congratulating each of these new Fellows.