#### Connected Future Summit at IMS2022 Agenda: Tuesday, 21 June 2022 Denver CO

#### MORNING TRACKS https://ims-ieee.org/connectedfuturesummit

Session/Time	Title	Speaker
Session 1: "The Connected Future" 08:00 – 08:15	Welcome Address and Summit Opening Overview	<b>Upkar Dhaliwal,</b> Future Wireless Technologies, San Diego, CA and <u>IEEE MTT TC-23, 24, 27</u>
08:15 – 09:00	Keynote: Smart Cities and Our Connected Future	<b>Dessa Bokides,</b> Chief Operating Officer, NEOM "New Future" MegaCity, Saudi Arabia
09:00 – 09:30	Connected Transportation	Joyti Sharma, Senior Manager - Network Planning Technology, Architecture and Planning team, Verizon Wireless, Basking Ridge NJ
09:30 – 10:00	Unmanned Aerial Systems: Who owns the airspace?"	<b>Peter Burke</b> , Professor, University of California, Irvine, CA
10:00 – 10:15	Coffee Break	
Session 2: Spectrum, Standards, and Innovation 10:15 – 11:30	<b>Fireside Chat:</b> "Non- Terrestrial Networks: Cellular in space and High- Altitude Platforms for coverage"	<ul> <li>Moderators: Francesco Carobolante, IoTissimo and Upkar Dhaliwal, FWT</li> <li>Speakers: <ul> <li>Francesco Grilli, VP, Product Management, Qualcomm Inc;</li> <li>Carmel Ortiz, Vice President, Systems Innovation, Intelsat Corp</li> <li>Lizy Paul, 5G.MIL Program Director, Lockheed Martin Corp</li> </ul> </li> </ul>
11:30 – 12:00	Mobile Communications for the Next Decade – The Need for A Holistic Approach	Speaker: Reza Arefi, Emerging Spectrum Strategies and Planning, Intel Corp

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#### AFTERNOON TRACKS https://ims-ieee.org/connectedfuturesummit

Session/Time	Title	Speaker
Luncheon Panel w/RFIC: 12:10 – 13:20	Race to the Next G Ride the mmWave or Wave Goodbye!	Moderators: Francois Rivet (Bordeaux Institute of Technology) and Aida Vera Lopez (Intel) Panelists: • Khurram Muhammad, Samsung Research America, Dallas TX • Shariar Shahramian, Nokia-Bell Labs • Emilio Calvanese, CEA-France • Jon Strange, MediaTek Inc. • Omar Bakr, Tarana Wireless • Mike Noonen, MixComm • Reza Arefi, Intel Corp
Session 3: "NextG Next-Generation Technologies" 13:30 – 14:15	mmWave Beamforming Front-ends: Steering the Connected Future 6G Applications	<b>Dr. Naveen Yanduru,</b> Vice President and General Manager, Renesas Electronics, San Diego, CA
14:15 – 15:00	Reconfigurables for a Smart Society	<b>Holger Maune,</b> Chair of Microwave and Communication Engineering, Otto von Guericke University Magdeburg, Germany
15:00 – 15:20	Coffee Break	
Session 4: NextG, What Will 6G Bring? 15:20 – 16:00	Road to the Future of 6G Wireless Connectivity	<b>Charlie Zhang,</b> Senior Vice President, Samsung Research America, Dallas, TX
16:00 – 17:15	Panel Session: Will Flexibility and Digital Bottlenecks Break 6G?	Moderator: Arnaldo Oliveira, University of Aveiro, Aveiro Portugal Panelists: • Aarno Pärssinen, University of Oulu, Finland • Charlie Zhang, Samsung Research America • Christian Fager, Chalmers University of Technology, Swedeen • Raghu M. Rao, AMD Xilinx, Austin, TX • Timothy O'Shea,DeepSig, Virginia Tech, VA
Connected Future Summit Reception: 17:15 – 18:00		

#### **Connected Future Summit at IMS2022: Program and Speakers**

Tuesday, 21 June 2022

**Colorado Convention Center** 

#### Welcome Address (08:00 - 08:15)

- Upkar Dhaliwal, Future Wireless Technologies, San Diego, CA and IEEE MTT TC-23, 24, 27

#### **Session 1: The Connected Future**

#### Keynote – Smart Cities and Our Connected Future (08:15 – 09:00)



#### Dessa Bokides

#### Chief Operating and Financial Officer, NEOM Tech & DigitalCompany

For more than three decades Dessa Bokides has forged a formidable career with some of the most recognized organizations in the financial and technology sectors. As Chief Operating and Financial Officer at NEOM Tech & Digital Co., sheis responsible for setting the strategic financial and operational direction of the

company and ensuring that it has the people and technology in place to create lasting value.

Created to power the world's first cognitive ecosystem, NEOM Tech & Digital Company is developing and implementing the foundational infrastructure as well as a network of AI enabled technological solutions to seamlessly connect the physical and digital worlds. NEOM, it's parent, is a planned giga-project in Saudi Arabia incorporating cutting edge, sustainable and advanced technologies to re-imagine and create the city of the future.

Before joining NEOM Tech & Digital Co., Bokides served as the COO and CFO of Galvanize, a technologylearning company. Her work lay the foundation for its sale to K-12, a public company, for \$165 million.

Throughout her career, Bokides has fulfilled several executive level financial and operational leadership roles for banking giants, including Goldman Sachs and Deutsche Bank. She has also been a C-suite executive for Fortune 500 companies, private equity-backed and startup firms. They include Global Corporate Treasurer forGMAC and Chairperson for GMAC Bank (now Ally Financial) during the financial crisis, CFO of the global logistics and real estate firm Prologis and Corporate Treasurer of the international e-commerce and business services company, Pitney Bowes.

Bokides received an MBA from Columbia University and a BA in Anthropology from Colorado College. She serves on the Board of PBS12 in Denver and is a founder of the Hidden Brain Drain Task Force, a coalition of companies committed to global talent innovation and issues affecting women and minorities.

#### Connected Transportation (09:00 - 09:30)



#### Joyti Sharma

## Senior Manager - Network Planning, Technology, Architecture and Planning Team, Verizon Wireless

Dr. Jyoti Sharma is responsible for defining architecture and strategy for Verizon's Network, Enterprise & Consumer products and services. Jyoti has over 20 years of industry experience in technology and telecommunication roles including: Wireless Systems engineering, System performance, and newtechnology introduction. Currently, she's focused on defining Technology

Strategy for Emerging Technologies including Thin Client and Vehicle-to-Everything (V2X) and representsVerizon on the 5G Automotive Association (5GAA) Board.

Jyoti is leading a cross functional team to demonstrate V2X Use cases over 5G ad MEC leveraging other products and services with partners across V2X ecosystem, Prior to her current role at Verizon, Jyoti worked atNokia, Alcatel-Lucent and Lucent in the Wireless R&D Organization defining base band algorithms, running simulations and writing requirements for 3G/4G/5G Wireless Networks and contributing to the 3GPP standards.

Jyoti is a Senior Member of IEEE and currently serves as the Chair of Women In Engineering at the IEEE North Jersey Section. She has worked as an Adjunct Professor at the Fairleigh Dickinson University and the DeVry University. Jyoti earned a Ph.D. in Electrical Engineering from the Indian Institute of Technology, Delhi, India, aMaster's in Telecommunications from the Asian Institute of Technology, Bangkok, Thailand and a Bachelor's inElectronics & Communications Engineering from the Delhi Institute of Technology, Delhi, India

#### Unmanned Aerial Vehicles (09:30 - 10:00)



#### **Professor Peter Burke**

University of California, Irvine

- Department of Electrical Engineering and Computer Science
- Department of Biomedical Engineering
- Department of Chemical Engineering and Materials Science

#### "Unmanned Aerial Systems: Who owns the airspace?"

The future will bring us autonomous flying taxis, unpiloted and humanoccupied vehicles. This will create a major buzz in society, and leads to the question of who owns and who controls the airspace? Today there are five times more UAV pilots than manned aircraft pilots in the USA, according to the FAA. But in order for this to become a reality,

microwave and communications engineers must be at the forefront of this technology. The drone industry is nearing a point of inflection that will require microwave and RF-based solutions to enable command, control, identification, integration with manned aircraft into the national airspace, and remote radar detection technologies of potential threats. Further developments of drones in RF are being developed for flying permanent or temporary (e.g. during natural disasters) 4G and 5G hotspots by several startups and subsidiaries of large marque tech. companies. The issues involve stakeholders and technologies from multiple disciplines of engineering and society, including ASTM, IEEE ComSoc, MTT-S, and other IEEE Societies. This talk covers recent state of the art, challenges, and opportunities in this growing field, and will drive the audience to appreciate this amazing of manned and unmanned aircraft integration.

**Peter J. Burke** received the Ph.D. degree in physics from Yale University, New Haven, CT, USA, in 1998. From1998 to 2001, he was a Sherman Fairchild Postdoctoral Scholar in physics with the California Institute of Technology, Pasadena, CA, USA. Since 2001, he has been a Faculty Member with the Department of ElectricalEngineering and Computer Science, University of California at Irvine, Irvine, CA, USA. His current research interests include EECS, BME, chemical and biomolecular engineering, materials science and engineering, and chemical and materials physics, and drones. He has a part 107 FAA certificate and is a Fellow of the IEEE.

#### Session 2: Spectrum, Standards and Innovation

# Fireside Chat – "Non-Terrestrial Networks: Cellular in space and High-AltitudePlatforms for coverage" (10:15 – 11:15)

Moderators: Upkar Dhaliwal, Future Wireless Technologies, and Francesco Carobolante, IoTissimo LLC



# Francesco Grilli, Vice President, Product Management Qualcomm Technologies, Inc.

Francesco Grilli is vice president of product management at Qualcomm Technologies, Inc. where he is responsible for the roadmap planning of Satellite Communication and Location technologies.

From 2011 through 2021 he was responsible for the Modem feature planning forall Qualcomm cellular based Modem products. From 2008 through 2011 Francesco was part of the Strategic IP Department at Qualcomm. From 1999 through 2008

Francesco represented Qualcomm at 3GPP meetings and participated to the development of the UMTS and the LTE standards. He served as RAN2 Vice-Chairman for four years. From 1998, when he joined Qualcomm, to 1999, Francesco contributed to the development of IS-801 — the first position-location standard for cellular systems.



#### Lizy Paul - Chair National Spectrum Consortium, 5G.MIL Program Director, Lockheed Martin Corporation

Lizy Paul is the Elected Chair of the National Spectrum Consortium. Lizy is also theDirector of 5G.MIL<sup>™</sup> Programs for Lockheed Martin Corporation. Prior to her current position with Lockheed Martin, she was the Director of Technical Strategyfor the Defense Communications Solutions at Collins Aerospace, a Raytheon Company. Paul has a MSEE from Johns Hopkins University and an MBA from University of Iowa. She holds 16 patents in RF Communications technologies. She has held Engineering leadership and research positions at Motorola, Ericsson and Hughes Network Systems.



#### Carmel Ortiz - Vice President, Systems Innovation, Intelsat Corporation

Carmel Ortiz has more than 30 years of experience in the telecommunications, satellite, and digital media industries. In her current role as Vice President of Systems Innovation at Intelsat, Carmel is responsible for the ideation, design, anddevelopment of large breakthrough technology initiatives that will reshape Intelsat's offerings. Prior to joining Intelsat, Carmel was the Vice President/Chief Systems Engineer of OneWeb, where she was responsible for the overall system engineering, design, and performance of the lowearth orbit (LEO) broadband communication system.

#### Spectrum MHz to THz (11:15 – 12:00)



#### Reza Arefi, Emerging Spectrum Strategies and Planning, Intel Corporation

**"Mobile Communications for the Next Decade – The Need for A Holistic Approach"** Research and development efforts are underway around the world to shape the technologies that could comprise the next generation (NextG) mobile communication systems for the next decade. In parallel, defining the overall framework and objectives of networks supporting the next generation technologies has also started in ITU-R as part of the development of IMT-2030. These efforts span a wide variety of interconnected and interdependent elements from new and

enhanced use cases and capabilities, and new technologies to support them, to new spectral vehicles and possible regulatory frameworks that could bring about new opportunities. The interdependency of these elements makes it essential for all stakeholders to take a harmonized and holistic approach to design and implementation of the next generation mobile systems.

This talk provides a high-level view of the above developments, the challenges and the opportunities facing the development of the next generation mobile systems for 2030 and beyond, looks at lessons learned from the development of previous generations, and focuses on specific potential pitfalls arising from lack of a holistic approach that might hinder innovation and lead to lost opportunities.

**Reza Arefi** leads Emerging Spectrum Strategies and Planning at Intel. In his role, he develops market-driven spectrum and regulatory strategies that support Intel's existing and future products. Reza has been actively contributing to standards, industry and international spectrum regulations since 1998, often in leadership roles. Reza's ITU-R leadership roles have led to development of several ITU-R Reports and Recommendations, latest of which is the now widely used Recommendation ITU-R M.2101 on modeling of 4G/5G systems for use in spectrum sharing studies. He currently chairs the Joint Working Group 3K-3M on Clutter Loss in ITU-R SG3. In addition, he has served as Intel Corporation's delegate to several World Radio Conferences. He represents Intel in FCC's Technological Advisory Council (TAC) and is a member of CSMAC.

Currently, Reza is an Executive Board member and Vice President of Global mobile Suppliers Association (GSA) and a member of GSA's Spectrum Group Management Team. He is also a vice chair of Next G Alliance's Spectrum Working Group, focused on defining 6G spectrum priorities for North America.

Reza holds several patents in the areas of mm-wave technologies and spectrum sharing – advancements that have proven to be critical to the realization of 5G. He is a Senior Member of IEEE and a member of IEEE-SA. He holds an EE bachelor's degree from Sharif University of Technology and a master's degree from West Virginia University. Reza is presently focused on identifying optimal spectral vehicles and necessary regulatory developments to enable the next generation mobile use cases, including innovative consumer, enterprise and industrial solutions.

# Lunchtime Panel Session w/RFIC – "Race to the Next G -- Ride them mWave or Wave Goodbye!" (12:10 – 13:20)

Moderators: Francois Rivet (Bordeaux Institute of Technology) and Aida Vera Lopez (Intel)



Khurram Muhammad



Shariar Shahramian



Emilio Calvanese



John Strange

#### Panelists:

- Khurram Muhammad, Samsung Research America
- Shariar Shahramian, Nokia-Bell Labs
- Emilio Calvanese, CEA-France
- John Strange, MediaTek Inc.
- Omar Bakr, Tarana Wireless
- Mike Noonen, MixComm
- Reza Arefi, Intel Corporation

**Abstract:** Who could have imagined a decade ago that mmWave would be a candidate for wireless communications, namely 5G? With major investments from network operators, system architectsand chip makers to make it happen, should we even question mmWave 5G practicality and economics? And if mmWave does dominate 5G, would that mean the road is paved for THz in 6G? Thispanel will re-examine the technology and economics of 5G millimeter-wave deployment and assess the potential use of THz technologies in next-generation 6G wireless communications. The panelists will include experts from various industry sectors and academia.



Omar Bakr



Mike Noonan



#### **Session 3: Next-Generation Technologies**

#### Beamsteering Front-Ends for 6G (13:30 PM - 14:15)



#### Dr. Naveen Yanduru, Vice President and General Manager, Renesas Electronics

#### "mmWave Beamforming Front-ends: Steering the Connected Future 6G Applications"

**Abstract:** Phased Arrays will form the cornerstone for 6G applications including sensing, wireless communications, connected cars and AR/VR. Beamforming antenna solutions with power efficient and superior RF performance will be critical to harness the spectral efficiency of phased arrays through spatial multiplexing. In this talk we will showcase various silicon-based mmWave beamformer ICs along with future directions including load and supply modulation techniques to further the state of the art.

**Naveen Yanduru** is currently the Vice President and General Manager of the RF Business Unit at Renesas. Before Renesas, he has held various technical and management roles at Texas Instruments, Samsung, Psemi and Qualcomm. He has designed, led and managed teams in the design of various connectivity and cellular RF Front-Ends, Transceivers and SoCs. Naveen has 23 US patents, has over 25 IEEE publications and served as Distinguished Lecturer for IEEE-CAS. He has a PhD from the University of Texas at Dallas.

#### Reconfigurable Electronics, Materials and Systems (14:15 – 15:00)



Prof. Dr. Holger Maune Chair of Microwave and Communication Engineering, Otto von Guericke University Magdeburg

#### "Reconfigurables for aSmart Society"

**Abstract:** Reconfigurable systems will facilitate a "smart society," in which our communications systems will sense, track, and adapt in real time a massive number of communication nodes, both fixed and mobile. Enhanced and new hardware concepts and innovative technologies forsmart user devices, terminals and base stations are crucial for the

deployment of these new platforms and services, allowing applications such as serving multiple users with afixed antenna configuration and keeping antenna beams aligned at all times in the case of mobile users.

This talk gives an overview of reconfigurability in the RF frontend to realize smart systems that can adapt to the requirements set by future communication systems, either ground or satellite based. Different approaches forarray antennas, reconfigurable intelligent surfaces (RIS) and technologies for their respective implementation will be discussed. Technologies such as semiconductor, micromechanics (MEMS), and functional materials such as liquid crystals (LC) will also be highlighted

**Holger Maune** received the Dipl.-Ing., Dr.-Ing., and the Habilitation (venia legend) degrees in communications engineering from the Technische Universität Darmstadt, Darmstadt, Germany, in 2006, 2011, and 2020, respectively. Since 2021, he has been Full Professor of electrical engineering and holds the Chair of Microwave and Communication Engineering at the University of Magdeburg, Magdeburg, Germany. His research interests include reconfigurable smart radio frequency (RF) systems based on electronically tunable microwave components such as phase shifters, adaptive matching networks, tunable filters, duplexer, and multiband antennas. Their integration into system components such as adaptively matched power amplifiers, reconfigurable RF frontends or fully integrated electronically beam-steering transceiver antenna arrays is in the focus of the work. The tunable microwave components are based on novel approaches and innovative functional materials and technologies such as ferroelectric (BST) thin- and thick films and microwave liquid crystals (LC). Beyond novel concepts and system design, his main interest is on modeling and precise high-frequency characterization. Moreover, dedicated functional tests such as intermodulation and harmonic distortion are of major interest for system integration.

### Session 4 – 6G: the Promise and the Challenge

6G Wireless (15:20 - 16:00)



#### Charlie Zhang - Senior Vice President, Samsung Research America

#### "Road to the Future of 6G Wireless Connectivity"

**Abstract:** With the recent history and experience on 5G as our guide, we will share our perspective and shed some light on the state of the art for5G as well as the initial 6G vision of bringing the next hyper-connected experience to every corner of life. We intend to provide a holistic view from an industry perspective that includes megatrends driving technologyevolution towards 6G, new services envisioned and enabled, as well as technical requirements to realize these new services. The expected technical requirement on throughput, architecture and security will likely

be a major step up compared to 5G requirements, and it is therefore critical for the research community tostart early and develop technologies to overcome these challenges. While 6G technologies are still in its early days, a few emerging directions are taking shape and gaining momentum in academia and industry alike, including the support of a new spectrum such as Terahertz (THz) band, novel antenna technologies, evolutionof duplex technology and network topology, spectrum sharing, AI as a native part of the protocol design, etc.

**Charlie Jianzhong Zhang** is Senior Vice President and head of the Standards and Mobility Innovation Team at Samsung Research America, where he leads research, prototyping, and standards for 5G/6G and future multimedia networks. He is also currently serving as the Chair of the Board with FiRa Consortium, which is dedicated to the development of seamless user experiences using the secured fine ranging and positioning capabilities of interoperable UWB technologies. From 2009 to 2013, he served as the Vice Chair of the 3GPP RAN1 working group and led development of LTE and LTE-Advanced technologies such as 3D channel modeling, UL-MIMO, CoMP, Carrier Aggregation for TD-LTE. He received his Ph.D. degree from the Universityof Wisconsin, Madison. Dr. Zhang is a Fellow of IEEE.

#### Panel Session: "Will Flexibility and Digital Bottlenecks Break 6G?" (16:00 - 17:15)



Aarno Pärssinen



**Charlie Zhang** 



**Christian Fager** 



Raghu M. Rao



Tim O-Shea

#### Moderator: Arnaldo Oliveira, University of Aveiro, Aveiro Portugal

#### **Panelists:**

- **Aarno Pärssinen**, Professor, Research Area Lead in 6G Flagship,Centre for Wireless Communications, University of Oulu
- Charlie Jianzhong Zhang, Senior Vice President of Samsung Research America
- Christian Fager, Head of Microwave Electronics Laboratory, Department of Microtechnology and Nanoscience, Chalmers University of Technology
- Raghu M. Rao, Director, Wired and Wireless Group at AMD Xilinx
- Timothy O'Shea, CTO, DeepSig, Research Assistant Professor atVirginia Tech

Abstract: Use cases envisioned for 6G and their associated performance metrics will require new approaches and technologies to achieve the needed efficiency and flexibility. The ever-increasing bandwidths, bit rates and network densification necessitate higher degrees of digitization and, more recently, the adoption of AI/ML techniques to cope with the complexity and adaptability. Besides theimportant advantages of digitization in terms of flexibility and integration, several efficiency and performance bottlenecks still remain, leading to the question: "Should we do more in the RF/analog domain due to digital performance bottlenecks?"

This panel will join experts from industry and academia to discuss various challenges in the development of 6G systems. It will focus on the open issues and opportunities towards 6G, mostly from the digital point of view. Topics to be discussed include digital signal processing challenges; architectures for ultra-reliable and low-latency communications; efficiency, linearization, autonomy and sustainability aspects; as well as analog and digital signal processing tradeoffs, in particular for ultra-wideband signals.

#### **Connected Future Summit Organizing Committee**

Connected Future Summit General Chair, Session Chair,



Upkar Dhaliwal Future Wireless Technologies https://www.linkedin.com/in/upkar/

Upkar Dhaliwal C.Eng. MIET, SMIEEE, MSc UCL, General Chair 5G Summit San Diego 2019, IEEE TTM 2018 Local Arrangements, IEEE San Diego SectionSenior Past. Chair, IEEE COM-SOC Region 6 NA Board Past Member, IEEE IOT-J Steering ExCOM, SDN-I, 5G-I, Past Roles Included: CEO, Future Wireless Technologies, Biz Dev: Cognition Systems, Phluido, AgShift, Big Data Federation, Assured Wireless

Upkar Dhaliwal is a Parallel Entrepreneur and Wireless Technology subject matter expert on Mobility, He has hands on wireless and internet experience undertaking Application, Intellectual Property, Business Development and Technical advisor support on Present and Future Wireless Technologies and its product development for startups, OEMs, private equity and with most of Market Leaders.

A Professional Chartered Engineer of <u>Engineering Council UK</u>, He is a SeniorWireless & RF System Architect Executive, an industry expert serving on

numerous industrial/technical/policy bodies with US National Policy influences and technical societies with specialized knowledge and technical leadership for many Start up, Internet Giants and the investment community. He has worked at BBC, Marconi, Thorn-EMI Electronics, Samsung, Qualcomm, STMicroelectronics until taking up more innovative roles.

At present, working on beyond 4G charting towards 5G in terms of UxV, Cognitive Radios, Distributed MeshSensor Radios and beyond LTE-Advance into the World of Big Data and Internet of Things IoT that will drive the next generation of Internet. Volunteering in many IEEE roles.

He grew up in West London England and studied for Bachelors & Masters Degrees in Engineering, Leeds and University College London Universities respectively, leading to early career experiences & contributions in device modeling, circuit design and subsystem developments where he led worldwide engineering teams insome World Class Firsts. Some new Firsts are still being implemented in MANET connected devices, Hybrid CloudServices and Predictive Insight Big Data.



#### Francesco Carobolante, Principal, IoTissimo® LLC

Francesco Carobolante is Principal at IoTissimo, where he helps global organizations and young companies develop technology and business strategies to compete in today's fast-changing high-tech world. His 10- years' experience as Vice President Engineering at Qualcomm, combined with many years in senior leadership roles for major semiconductor firms and start-ups, enabled him to develop leading edge products for Mobile, Computing, Audio and Communication.

Creator of many industry "firsts" and recipient of Best of Innovation Award Honoree at 2015 Consumer Electronic Show, Carobolante is a renowned innovator and market development leader with extensive track record in

establishing strategic technology partnerships across multiple industry sectors.

He authored over 90 US patents, and has been invited keynote speaker and expert panelist at several premier international conferences. He also serves on the Board of technology startups and volunteers his time by providing mentoring to technology incubators and universities.

He received Master of Science in Electrical Engineering (MSEE) degrees from both University of Padova, Italy and UCLA, California.



#### Nuno Borges Carvalho, University of Aveiro, Portugal

Nuno Borges Carvalho is a Full Professor and Senior Research Scientist with the Institute of Telecommunications, University of Aveiro, Portugaland an IEEE Fellow. His main research interests include software-definedradio front-ends, wireless power transmission, nonlinear distortion analysis in microwave/wireless circuits and systems, and measurement of nonlinear phenomena. He has been involved in the design of dedicated radios and systems for newly emerging wireless technologies. He has coauthored four books and has been a reviewer and author of over 400 papers in magazines and conferences. He is the Editor in Chief of the Cambridge Wireless Power Transfer Journal, an associate editor of

the IEEE Microwave Magazine, former associate editor of the IEEE Transactions on Microwave Theory and Techniques and IET Microwaves Antennas and Propagation Journal and is the co-inventor of six patents. He is a Distinguished Lecturer for the RFID-Council and was a Distinguished Microwave Lecturer for the IEEE MicrowaveTheory and Techniques Society. In 2022 he is the IEEE-MTT President-Elect.



#### Debabani Choudhury, Intel

Debabani Choudhury is with Intel Labs, the research division of Intel Corporation, USA, where she directs the R&D on platform integration and various RF/mmWave/sub-THz technologies/ architectures for the next- generation communication and sensing applications. She was with the NASAJet Propulsion Laboratory (JPL), working on terahertz (THz) devices and components for space-based heterodyne receiver applications. At Hughes Research Laboratories, HRL Labs and Millitech Corporation, she developed various RF/mm-wave/terahertz (THz) technologies for space, defense, government, and automotive applications. Debabani holds a PhD in ElectricalEngineering. She has a broad range of expertise in RF, mmWave, and THz devices, circuits, antennas, arrays, system, packaging, heterogeneous

integration, EM and various platform integration technologies. Debabani Choudhury was elected as IEEE Fellow in 2011, has more than 40 patents/patent applications and numerous publications. She received several NASA Recognition awards for her work on heterodyne-receivers, devices, local oscillators, multipliers, guided structures/IC modules developed for space and defense applications. She also received multiple Intel Gordon Moore awards for research excellence at Intel Labs. She is a recipient of the IEEE Journal of Solid State Circuits (JSSC) 2019 Best Paper Award.



#### Aida L Vera Lopez, Intel

Dr. Aida Vera López works as a wireless standards research engineer at Intel Corporation, focusing on 5G new radio RF topics, within the 3GPP Technical Specification Group Radio Access Network 4 (RAN4). Prior to this, she worked invarious groups at Intel as part of the Engineering Leadership Program.

She received her Bachelor of Science degree (summa cum laude) in Electrical Engineering from the University of Puerto Rico in Mayagüez; and her Master of Science and Doctorate of Philosophy degrees in Electrical and Computer

Engineering from the Georgia Institute of Technology. Her research background includes mm-wave antennadesign, package integration and material characterization at high frequencies. In the past, Dr. Vera López served as Publications Co-Chair for the Radio & Wireless Week Conference (RWS). Last year, she was Vice- Chair of the Connected Future Summit at IMS.



#### Arnaldo S.R. Oliveira, University of Aveiro, Portugal

Arnaldo S. R. Oliveira received the B.Sc. and M.Sc. degrees in electronics and telecommunications, and in 2007 the Ph.D. degree in electrical engineering from the University of Aveiro, Aveiro, Portugal. He is currently a Researcher with the Telecommunications Institute, University of Aveiro. Since 2001, he has been teaching computer architecture, digital systems design, programming languages, and embedded systems with the University of Aveiro, where he is currently an Assistant Professor. He participates in severalnational and European funded research projects. He is the author or coauthor of more than 100 journal and international conference papers. Hisresearch interests include reconfigurable digital systems, software definedradio, and next generation radio access networks.



#### Kate A. Remley, NIST

Kate A. Remley is the Leader of the Metrology for Wireless Systems Project in the Communications Technology Laboratory at the National Institute ofStandards and Technology in Boulder, CO. Her research activities includedevelopment of calibrated measurements for microwave and millimeter- wave wireless devices and standardized over-the-air test methods for thewireless industry. Dr. Remley is a Fellow of the IEEE and was the recipient ofthe Department of Commerce Bronze and Silver Medals, an ARFTG BestPaper Award, the NIST Schlichter Award, and is a member of the OregonState University Academy of Distinguished Engineers. She was the Chair of the MTT-11 Technical Committee on Microwave Measurements (2008-

2010), the Editor-in-Chief of IEEE Microwave Magazine (2009-2011), and Chair of the MTT Fellow Evaluating Committee (2017-2018). She was a Distinguished Lecturer for the IEEE Electromagnetic Compatibility Society (2016-2017) and is the Co-Technical Program Chair for IMS2022.

#### Chonggang Wang, InterDigital Communications

Dr. Chonggang Wang is a Principal Engineer at InterDigital Communications. He has20+ years of experience in the fields of wireless communications, networking, and computing, including research, development, and standardization. His current research interests include 6G cellular systems, blockchain and distributed ledgertechnologies, decentralized and pervasive intelligence, cybersecurity, and quantum internet. He participates in industry standardization activities with ETSI, IETF/IRTF, oneM2M, IEEE, and 3GPP. He is the founding Editor-in-Chief of IEEE Internet ofThings Journal and is currently the Editor-in-Chief of IEEE Network - The Magazine

of Global Internetworking. He is a Fellow of the IEEE for his contributions to internet of things enabling technologies.



#### Hung-Yu Wei, National Taiwan University

Hung-Yu Wei is a Professor in Department of Electrical Engineering and Graduate Institute of Communications Engineering, National Taiwan University. Currently, he serves as Associate Chair in Department of Electrical Engineering.He received the B.S. degree in electrical engineering from National Taiwan University in 1999. He received the M.S. and the Ph.D. degree in electrical engineering from Columbia University in 2001 and 2005 respectively. He was a summer intern at Telcordia Applied Research in 2000 and 2001. He was withNEC Labs America from 2003 to 2005. He joined Department of Electrical Engineering at the National Taiwan University in July 2005. His research

interests include wireless networks, IoT, fog/edge computing, and game theoretical models for communications networks. He has been actively participating in NGMN, IEEE 802.16, 3GPP, IEEE P1934, and IEEE P1935 standardization. He serves as Vice Chair of IEEE P1934 Working Group to standardize fog computing and networking architecture. He serves as Secretary for IEEE Fog/Edge Industry Community. He was the Chair of IEEEVTS Taipei Chapter during 2016-2017. He serves as Associate Editor for IEEE Systems Journal and IEEE Internetof Things Magazine. He is currently the Chair of IEEE P1935 working group for edge/fog management and orchestration standard.



#### Dylan Williams, NIST

Dylan F. Williams joined the Electromagnetic Fields Division of the National Institute of Standards and Technology in 1989 where he develops electrical waveform and microwave metrology. He has published over 140 technical papers and is a Fellow of the IEEE. He is the recipient of the Department of Commerce Bronze and Silver Medals, the Astin Measurement Science Award, two Electrical Engineering Laboratory's Outstanding Paper Awards, three Automatic RF Techniques Group (ARFTG) Best Paper Awards, the ARFTG Automated Measurements Technology Award, the IEEE Morris E. Leeds Award, the European Microwave Prize and the 2013 IEEE Joseph F. Keithley Award.

Dylan also served as Editor of the IEEE Transactions on Microwave Theory and Techniques from 2006 to 2010, as the Executive Editor of the IEEE Transactions on Terahertz Science and Technology, and as the 2017 President of the IEEE Microwave Theory and Techniques Society. He is the Co-Technical Program Chair for IMS2022.