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COMCAS 2019

International Conference on Microwaves, Communications, Antennas and Electronic Systems

David Intercontinental Hotel
4-6 November 2019, Tel Aviv, Israel

CONFERENCE PROGRAM

www.comcas.org

IEEE COMCAS 2019

Welcome to IEEE COMCAS 2019

IEEE COMCAS 2019 continues the tradition of providing a multidisciplinary forum for the exchange of ideas, research results, and industry experience in areas such as Communications, Antennas, Radar, RF and Microwave Circuits and Systems, and Bio-medical Engineering.

Following the previous COMCAS conferences, we expect more than 1700 participants from about 40 countries around the world.

IEEE COMCAS 2019 will deal with issues including: Innovations in Technology, Recent Advancements and Future Trends in Digital Phased Arrays, MW Circuits Modelling and Simulation, Efficiency Enhancement and Advanced Linearization of Power Amplifiers, Antennas and Propagations Standards, Automotive Technology, Thermal Management, Advanced Packaging, 5G and "Internet of Things" Communications.

We welcome the IEEE Electronic Packaging Society (EPS) to COMCAS 2019 and thank them for providing a Packaging and Thermal Management program Track, which addresses issues of critical interest to the electronic industry, such as Design & Reliability, Heterogeneous Integration, WLP, Flip Chip, new Materials & Processes, and an in-depth exploration of thermal management challenges and opportunities.

IEEE COMCAS 2019 will host the IEEE Young Professionals event, WIE Session (Women in Engineering) and COMCAS WirelessApps session. Attractive workshops (invited sessions) and seminars are also very important part of the IEEE COMCAS 2019 and are included in the 3 day registration.

We welcome you; scientists, engineers, managers, and researchers from academia and industry to be part of this fascinating conference, share knowledge and interact with leading companies and experts. You will enjoy our warm hospitality and the beautiful Mediterranean coast of Tel Aviv.

Our sincere thanks go to the Conference's Patrons: Diamond: Keysight Technologies; Sapphire: Mini-Circuits, Interlligent, MTI Summit; Platinum: Analog Devices, GMI Kratos Eyal, STG, WIN Semiconductors, Starlight; Gold: Anokiwave, CIDEV Agencies, Dassault, EIM Group, Shirtech, Macom, Novocure, Huber+Suhner, Microsemi and Vectron, Teledyne, Eastronics; Distinguished Patrons: Elbit Systems/Elisra, Rafael, IAI/Elta, US Army RDECOM; and Media Supporters: Microwave Journal, Semisrael, MDI for their generous support.

We hope that you will enjoy the conference and find it helpful in both its technical content and the opportunities to network with colleagues in your own and related fields. We welcome your comments to help us improve COMCAS meetings in the future.

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In recognition of sustained and notable contributions to the IEEE International Conference on Microwaves, Communications, Antennas & Electronic Systems (COMCAS)

Dr. Benjamin Epstein
Mr. Harvey Kaylie
Dr. Stephen B. Weinstein

CERTIFICATES OF APPRECIATION

Prof. Avram (Avi) Bar Cohen
For his contribution as Keynote Speaker on "Wireless Power Beaming - the Future is Now"

Prof. Amir Boag
For his contribution as the Chair of the Technical Program Committee (TPC)

Prof. Larry Dunleavy
For his contribution as instructor of the Tutorial "Simulation-Based GaN PA Design: From Understanding Non-Linear Models to Complete PA Design Flows"

Dr. Aleksey Dyskin
For his contributions as Co-Chair (RF/MW/MMW) of the Technical Program Committee (TPC) and as the organizer of the Special Session "Young Professionals in Automotive"

Dr. Oren Eliezer
For his contribution as Co-Chair (RFICs) of the Technical Program Committee (TPC)

Dr. Benjamin Epstein
For his contribution as the Chair of the Publications and Electronic Submissions

Dr. Lars Foged
For his contribution as organizer of the Short Course "Stand on the Antennas and Propagation Standards"

Dr. Harvey Freeman
For his contribution as organizer of the Special Session "Future Communications Technologies & Developments Directed to Industry"

Prof. Caleb Fulton
For his contributions as Co-Chair (Microwave Systems, Radars) of the Technical Program Committee (TPC) and as the organizer of the Special Session "Advances in Mutual Coupling-Based Calibration in Digital Phased Array Systems"

Prof. Pavel Ginzburg
For his contribution as organizer of the Special Session "Metamaterials"

Prof. Richard D. Gitlin
For his contribution as Keynote Speaker on "Wireless Century Perspective: 5G/IoT and a Vision for 6G/IoE"

Prof. Amelie Hagelauer
For her contribution as the organizer of the "Women in Engineering" (WIE) session

Mr. Ted Heil
For his generous support as the president of Mini-Circuits

Dr. Sherry Hess
For her contribution as the co-organizer of the "Women in Engineering" (WIE) session

Prof. Vadim Issakov
For his contribution as Co-Chair (Special sessions) of the Technical Program Committee (TPC)

Prof. Irving Kalet
For his contribution as organizer of the Special Session "The Future of Wireless Communications"

Dr. Allen Katz
For his contribution as instructor of the Tutorial "Advances in the Linearization of Microwave and Millimeter-wave Power Amplifiers"

Dr. Vladimir Khaikin
For his contribution as organizer of the Special Session "Antennas in Radio Astronomy"

Prof. Amir Landesberg
For his contribution as Co-Chair (Biomedical Engineering) of the Technical Program Committee (TPC)

Mr. Antti Lautanen
For his contribution as the organizer of the WirelessApps Session

Prof. Andrea Massa
For his contribution as co-organizer of the Short Course "Unconventional Array Design"

Dr. Vikass Monebhurrun
For his contribution as organizer of the Short Course "Stand on the Antennas and Propagation Standards"

Prof. Giacomo Oliveri
For his contribution as co-organizer of the Short Course "Unconventional Array Design"

Prof. Yoram Palti
For his contribution as Keynote Speaker on "Tumor Treating Fields (TTFields) from Theory to Clinical Practice"

Prof. Zoya Popovic
For her contribution as instructor of the Tutorials "Wireless powering- from harvesting μW/cm2 to kW capacitive powering for vehicles" and "Supply-modulated power amplifiers for efficiency enhancement"

Prof. Theodore (Ted) S. Rappaport
For his contribution as Keynote Speaker on "Wireless beyond 100 GHz: Opportunities and Challenges for 6G and Beyond"

Prof. Sembiam Rengarajan
For his contribution as organizer of the Special Session "Slotted Arrays"

Dr. Vishal Riché
For his contribution as instructor of the Tutorial "MIMO radar and phased array systems"

Prof. Paolo Rocca
For his contribution as co-organizer of the Short Course "Unconventional Array Design"

Mr. Aviv Ronen
For his contribution as organizer of the Special Sessions on "Packaging & Thermal Management"

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For his generous support as the General Manager of Keysight Israel

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Prof. Almudena Suárez
For her contribution as instructor of the Tutorial "Stability Analysis of Microwave Circuits"

Dr. Avraham Suhami
For his contribution as Keynote Speaker on "Velocity Tomography Imaging and Tumor Treatment Planning"

Prof. Hua Wang
For his contribution as instructor of the Tutorial "Design of Broadband, Linear, and High-Efficiency Mm-Wave Power Amplifiers"

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For his contribution as organizer of the Special Sessions on "Packaging & Thermal Management"

Dr. Grigorios Zouros
For his contribution as organizer of the Special Session "Computational Electromagnetics Techniques for Nanoscale Modelling"

Dr. Doug N. Zuckerman
For his contributions as member of the Steering and Executive Committees

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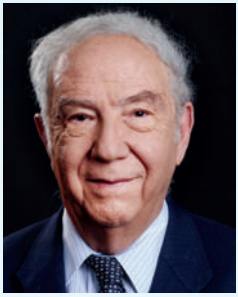
Dr. Avram Bar-Cohen
Raytheon – Space & Airborne Systems
USA

Prof. Richard D. Gitlin
University of South Florida
USA



Prof. Yoram Palti
NovoCure
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Prof. Theodore (Ted) S. Rappaport
NYU-Tandon
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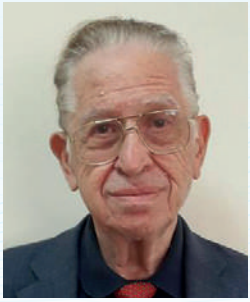
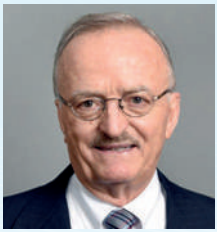


Dr. Avraham Suhami
Elscint Tomography
Israel

Invited Speakers

Dr. Natalia Antonyuk
Director Radar Technologies
Staal Group B.V.
Netherlands



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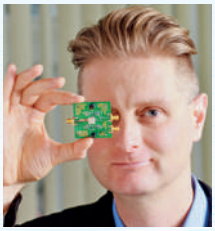

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National Acad. of Sciences
Ukraine

Prof. Giacomo Oliveri
University of Trento
Italy

Dr. Mario Pauli
Karlsruhe Inst. of Tech.
Germany

Prof. Zoya Popovic
University of Colorado
USA

Prof. Sembiam R. Rengarajan
California State University
USA

Dr. Vishal Riché
InnoSent GmbH
Germany

Invited Speakers

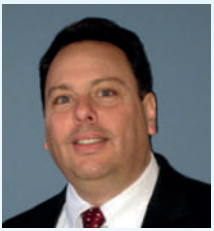
Prof. Paolo Rocca
University of Trento
Italy

Dr. Andrej Rumiantsev
MPI Corporation
Taiwan

Prof. Shlomo Shamai
Technion
Israel

Prof. Jeffrey H. Shapiro
MIT
USA

Prof. Hjalti H. Sigmarsson
The University of Oklahoma
USA



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USA

Dr. Mark E. Weber
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USA

Mr. Marc K. Weinstein
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USA

Hall	Grand Ballroom
09:20-09:55	*Plenary Session* Lifelong Learning in Nature and Machines **Dr. Hava T. Siegelmann**, DARPA, USA
09:55-10:30	*Plenary Session* Wireless Beyond 100 GHz: Opportunities and Challenges for 6G and Beyond **Prof. Theodore (Ted) S. Rappaport,** *NYU-Tandon, USA*
10:30-11:00	Coffee Break & Visit the Exhibition
11:00-11:30	*Plenary Opening Session* Welcome Address: **Shmuel Auster,** COMCAS General Chair **Amir Boag**, COMCAS TPC Chair **Magdalena Salazar Palma**, IEEE Region 8 Director 2019 **Avram Bar-Cohen**, IEEE EPS President 2019 **Harvey Freeman**, IEEE COMSOC President 2016/17 **Roberto Graglia,** IEEE APS President 2015
11:30-12:05	*Plenary Session* Tumor Treating Fields (TTFields) from Theory to Clinical Practice **Prof. Yoram Palti,** *NovoCure, Israel*
12:05-12:40	*Plenary Session* Wireless Power Beaming - the Future is Now **Dr. Avram Bar-Cohen,** *Raytheon - Space and Airborne Systems, USA*
12:40-14:00	Lunch & Visit the Exhibition

Hall	Grand A	Grand B	Grand C	Royal H	Royal I	Royal J	Room 3	Room 4	Room 5
14:00-15:50	Enhanced Communications Technologies for Future Networks	Circuits and Systems for Communication	Phased Array & Multistatic Radar Systems	Special Session - Slotted Arrays 1	Special Session - Antennas in Radio Astronomy	Signal Processing & Imaging 1	Simulation-Based GaN PA Design From Understanding Non-Linear Models to Complete PA Design Flows	Special Session - Computational Electromagnetics Techniques for Nanoscale Modeling	Short Course: Stand on the Antennas and Propagation Standards
15:50-16:10	Coffee Break & Visit the Exhibition								
16:10-18:00	Future Communications Technologies & Developments Directed to Industry	Integrated Sensors for Radar/Lidar Applications	Radar Systems and Applications I	Slotted Arrays 2	Reflector Antennas	Signal Processing & Imaging 2	Wireless Powering - from Harvesting μW/cm2 to kW Capacitive Powering for Vehicles	Computational Electromagnetics 2	Young Professionals in Automotive
18:00-21:00	Welcome Reception - Sponsored by KEYSIGHT TECHNOLOGIES INTERLLIGENT RF & Microwave Solutions								

Hall	Grand A	Grand B	Grand C	Royal H	Royal I	Royal J	Room 3	Room 4	Room 5
09:00-10:50	Innovative Responses to Communica-tions Challenges	Special Session - Power Amplifiers	Radar Systems and Applications II	Antenna Arrays	Biomedical Engineering 1 - Novel Technologies	Special Session - Quantum & Nano EM 1	Advances in the Linearization of Microwave & Millimeter-wave Power Amplifiers	WirelessApps	Women in Engineering
10:50-11:10	Coffee Break & Visit the Exhibition								
11:10-13:00	Packaging & Thermal Management	mmW Components	Tutorial: MIMO radar and phased array systems	MIMO and Adaptive Antenna Arrays	Biomedical Engineering 2 - Advanced Image Analyses	Special Session - Quantum & Nano EM 2	Supply-Modulated Power Amplifiers for Efficiency Enhancement	WirelessApps	Special Session - Metamaterials
13:00-14:20	Lunch & Visit the Exhibition								
14:20-16:10		Circuits and Techniques	Tutorial: Millimeter-wave Radar Systems	Antenna Analysis in Time Domain and Beamforming	Biomedical Engineering 3 - The Cardiac and Respiratory Systems	Future of Communica-tion	Design of Broadband, Linear, and High-Efficiency Mm-Wave Power Amplifiers	WirelessApps & Intellectual property	Packaging & Thermal Management 1
16:10-18:00	Interactive Forum (Poster Session) | Grand A								

Hall	Royal H	Royal I	Royal J	Room 3	Room 4	Room 5
09:00-10:50	Short Course: Unconventional Array Design 1	Passive Devices and Techniques	New Communication Techniques and Applications	Propagation and Modeling	Metamaterials 2	Packaging and Thermal Management 2
10:50-11:10	Coffee Break					
11:10-13:00	Short Course: Unconventional Array Design 2	LO Signal Generation and Distribution	Interference Mitigation and New Approaches in Communications System	Antenna Design & Manufacturing	Metamaterials 3	Packaging & Thermal Management 3
13:00-14:20	Lunch					
14:20-16:10	Short Course: Unconventional Array Design 3	Stability Analysis of Microwave Circuits	Signal Processing & Imaging 3	Scattering and Diffraction	Wireless Power Transfer	Packaging & Thermal Management 4
16:10-16:20	Coffee Break					
16:20-17:30	*Plenary Session* **Velocity Tomography Imaging and Tumor Treatment Planning** **Dr. Avraham Suhami,** *Elscint Tomography, Israel*					
	Plenary Session **Wireless Century Perspective: 5G/IoT and a Vision for 6G/IoE** **Prof. Richard D. Gitlin,** *University of South Florida, USA*					
17:30-18:00	Closing Session					

Welcome Reception sponsored by KEYSIGHT TECHNOLOGIES INTERLLIGENT RF & Microwave Solutions
November 4, Foyer, 18:00-21:00

Interactive Forum (Poster Session)
November 5, Grand A, 16:10-18:00

Young Professionals in Automotive
November 4, Hall 5, 16:10-18:00

Young Professionals Israel continues a great tradition of organising the most attractive events as a part of IEEE COMCAS conference. This time Young Professionals go Automotive, bringing you a YP in Automotive event. If you are interested in this fascinating field of industry and research and if you want to meet the automotive industry leaders and discuss with them the most relevant automotive developments, you surely need to attend the YP in Automotive. We proudly host Mr. Omer Keilaf, CEO, Innoviz Technologies, Mr. Kobi Morenko, CEO, Arbe, Mr. Avi Bakal, CEO, TriEye and Mr. Orr Davon, CEO, Hailo. The participation is free of charge and the walk-ins are most welcome!

Alpha Girls – What Does It Take to Break Into the C-Suite
November 5, Hall 5, 09:00-10:50

Inspired by the recent book Alpha Girls: The Women Upstarts Who Took on Silicon Valley's Male Culture and Made the Deals of a Lifetime by Julian Guthrie, this panel will discuss what it takes to move up the management chain and eventually into the C-suite* in a male-dominated tech world.
Alpha Girls is the story of four women who succeeded in Silicon Valley venture capital. Five tips extracted from the book will be discussed and debated: your family doesn't need you every second, humor works wonders, don't sit on the sidelines, find out about the locker room talk, and don't enable underachievement. Do these tips apply equally as well to men and women? Are there differences between academia and industry? Join the panel session to hear the wisdom shared by leading high tech women and share your own experiences.

**C-Suite: group of officers of a business organization who have the word "chief" in their titles.*

Unconventional Array Design for New Generation Communications and Sensing Systems

Andrea Massa, Giacomo Oliveri, Paolo Rocca, University of Trento, Italy

November 6, Royal H, 09:00-16:20

Antenna arrays are a key technology in several Electromagnetics applicative scenarios, including satellite and ground wireless communications, MIMO systems, remote sensing, biomedical imaging, radar, wireless power transmission, and radioastronomy. The objective of the short course is therefore to provide the attendees the fundamentals of Antenna Array synthesis, starting from intuitive explanations to rigorous mathematical and methodological insights about their behavior and design. Moreover, recent synthesis methodologies will be also discussed with particular emphasis on unconventional architectures for complex communications and radar systems within a new optimality framework.

MIMO Radar for Monitoring Applications

Vishal Riche (InnoSent GmbH, Germany)

November 5, Grand C, 11:10-12:30

Supply-Modulated Power Amplifiers for Efficiency Enhancement

Zoya Popović, University of Colorado at Boulder, USA

November 5, Room 3, 11:10-13:00

Supply modulation (envelope tracking) can improve PA efficiency if both the PA and the envelope modulator (dynamic supply) are efficient and the dynamic supply has a slew rate that corresponds to many times the signal bandwidth. For very wideband signals, continuous supply modulators in switching operation have degraded efficiency and other approaches are proposed with average (reduced slew rate) tracking. This in turn introduces nonlinearities and pre-distortion is required, which typically negatively impacts either efficiency or output power. The increasing demand for the same PA to amplify simultaneous signals over a wide RF bandwidth compounds the difficulty of obtaining efficiency and linearity simultaneously, over a range of output power levels. This tutorial will overview the benefits and challenges of supply-modulated efficient PAs through examples ranging from a hybrid 2-4 GHz octave-bandwidth PA for amplifying multiple widely spaced carriers, to X-band MMIC PAs with GaN MMIC discrete supply modulators, and a 18-25 GHz MMIC GaN PA for >200 MHz bandlimited noise signals with reduced slew-rate tracking and analog predistortion for gain linearization.

Wireless Powering- From Harvesting μW/CM2 to KW Capacitive Powering for Vehicles

Zoya Popović, University of Colorado at Boulder, USA

November 4, Room 3, 14:00-15:50

This tutorial overviews wireless power transfer for power levels from uW to kW. The ultra-low power density application is in far-field harvesting at GHz frequencies for unattended wireless sensors and IoT devices. Several examples will be shown, including harvesting sidelobes from a 4.3GHz altimeter radar antenna on a Boeing 737 aircraft for powering health-monitoring aircraft sensors. At the high power levels, near-field capacitive power transfer is chosen in the 6 MHz range for powering stationary vehicles and vehicles in motion. In this case, over 85% efficiency is achieved for 1kW of capacitive power transfer while meeting safety standards in the vicinity of the vehicle through a near-field phased array approach. Other approaches, such as power beaming and multi-mode shielded wireless powering will also be discussed.

Advances in the Linearization of Microwave and Millimeter-wave Power Amplifiers

Allen Katz, The College of New Jersey, USA

November 5, Room 3, 09:00-10:50

This talk provides the various tradeoffs involved in the decision to include linearization in the design of microwave and millimeter-wave power amplifiers. Emphasis will be placed on efficiently producing linear power over very wide (multi-GHz and octave) bandwidths and at frequencies to 100 GHz and above. The latest developments in power amplifier technology, including millimeter-wave GaN devices will be considered. The application of linearization to linear photonic transmission systems will also be considered.

Stand on the Antennas and Propagation Standards

Vikass Monebhurrun, SUPELEC, France; Lars Foged, MVG, Italy; Vince Rodriguez, Satimo, France

November 4, Room 5, 14:00-15:50

The IEEE Antennas and Propagation Standards Committee (AP-S/SC), sponsored by the IEEE Antennas and Propagation Society (AP-S), develops and maintains standards that are within the fields of antennas and propagation. The objective of the short course is to disseminate information about the standards developed for antennas, propagation and electromagnetics applications, and to encourage their use.

Non-Linear GaN Models and Model-Based RFMW PA Design

Larry Dunleavy, Modelithics, USA

November 4, Room 3, 14:00-15:50

An up-to-date survey of large signal (LS) and nonlinear models for power amplifier design will be presented, emphasizing on compact LS models for GaN models suitable for power amplifier design. Behavioral LS models will be presented along with advantages and disadvantages as compared to compact models. Important developments in related technologies that have had significant impact on large signal modeling, such as automated small and large signal network analyzers, wafer probe capability, and harmonic balance simulator software, will also be discussed.

Design of Broadband, Linear, and High-Efficiency Mm-Wave Power Amplifiers

by Hua Wang, Georgia Institute of Technology, USA

November 5, Room 3, 14:20-16:10

With 5G communication just around the corner, there is a rapidly increasing need for high-performance mm-Wave power amplifiers. However, these next-generation mm-Wave PAs are often expected to deliver nearly "perfect" performance. They should offer large output power to ensure sufficient link budget, broad bandwidth to support multi-standard communication or frequency reconfigurability/agility, high peak and back-off efficiency for energy saving, and also inherent linearity for Gbit/s complex modulations with minimum or even no digital pre-distortions (DPD). It is noteworthy that in conventional design notions a given PA design should simply take trade-offs among these performance aspects, instead of trying to achieve all of them. Interestingly, this somehow unreasonable quest for "perfect" mm-Wave PAs has recently stimulated a new wave of mm-Wave PA innovations at both circuit levels and architecture levels, which have substantially advanced the state of the art. In this talk, we will first present the design fundamentals of power amplifiers with an emphasis for wireless communication applications. The state of the art of mm-Wave PAs in different device technologies will be reviewed based on the "Georgia-Tech Power Amplifiers Performance Survey." We will next present several recent mm-Wave PA designs that feature various design techniques and innovations at both circuit-level (nonlinearity compensation, continuous-mode operations, broadband harmonic tuning) and architecture-level (such as Doherty and outphasing PAs). We will also showcase several mm-Wave PA/antenna co-design examples that exploit new antenna structures as a new design paradigm to further enhance mm-Wave PA output power and efficiency.

MONDAY, NOVEMBER 4

MO1: Plenary Keynote Presentations 1

Rooms: Grand Ballroom ABC 9:20-10:30

Chair: Douglas N. Zuckerman (IEEE ComSoc Past President)

9:20 ***Lifelong Learning in Nature and Machines***
Hava Siegelmann (DARPA, USA)

9:55 ***Wireless Beyond 100 GHz: Opportunities and Challenges for 6G and Beyond***
Theodore Rappaport (New York University & NYU WIRELESS, USA)

MO2A: Plenary Opening Session

Rooms: Grand Ballroom ABC 11:00-11:30

Welcome Address:
Shmuel Auster, *COMCAS General Chair*
Amir Boag, *COMCAS TPC Chair*
Magdalena Salazar Palma, *IEEE Region 8 Director 2019*
Avram Bar-Cohen, *IEEE EPS President 2019*
Douglas N. Zuckerman, *IEEE ComSoc Past President*
Roberto Graglia, *IEEE APS President 2015*

MO2B: Plenary Keynote Presentations 2

Rooms: Grand Ballroom ABC 11:30-12:40

Chair: Steve Weinstein (CTTC Group, USA)

11:30 ***Tumor Treating Fields (TTFields) from Theory to Clinical Practice***
Yoram Palti (NovoCure, Israel)

12:05 ***Wireless Power Beaming - the Future is Now***
Avi Bar Cohen (Raytheon, USA)

CS1: Enhanced Communications Technologies for Future Networks

Room: Grand A 14:00-15:50

Chair: Theodore Rappaport (New York University & NYU WIRELESS, USA)

14:00 ***Maximal Entropy Reduction Algorithm for SAR ADC Clock Compression***
Arkady Molev-Shteiman and Xiao-Feng Qi (Futurewei Technologies, Inc., USA)

14:20 ***Interference-Free Space-Time Block Codes with Directional Beamforming for Future Networks***
Kelvin Anoh (University of Bolton, United Kingdom (Great Britain); Bamidele Adebisi (Manchester Metropolitan University, United Kingdom (Great Britain); Sumaila Mahama (University of York, United Kingdom (Great Britain); Andrew Gibson (Manchester Metropolitan University, United Kingdom (Great Britain); Haris Gacanin (Nokia Bell Labs, Belgium)

14:40 ***SVM based method for multi-equalizer optimization***
Benjamin R Taub (Mellanox Technnologies, Israel)

15:00 ***A Direct-Conversion Digital Beamforming Array Receiver with 800 MHz Bandwidth/Channel at 28 GHz using Xilinx RF SoC***
Sravan Pulipati, Viduneth Ariyarathna, Udara Silva, Najath Mohomed Akram, Elias A. Alwan and Arjuna Madanayake (Florida International University, USA); Soumyajit Mandal (Case Western Reserve University, USA); Theodore Rappaport (New York University & NYU WIRELESS, USA)

CS2: Future Communications Technologies & Developments Directed to In dustry

Room: Grand A 16:10-18:00

Chair: Steve Weinstein (CTTC Group, USA)
Panel organized by Harvey Freeman

16:10 ***Future Technologies and Developments Directed to Industry***
Harvey Freeman (HAF Consulting, Inc., USA)

DC1: Circuits and Systems for Communication
Room: Grand B 14:00-15:50

Chair: Aleksey Dyskin (Technion - Israel Institute of Technology, Israel)

14:00 ***High System Gain E-Band Link in a Wideband Aircraft-to-Ground Data Transmission***
Ingmar Kallfass (University of Stuttgart, Germany)

14:30 ***Pre-PA Delay-Line Based FIR Filter for Self-Interference Cancellation in Full Duplex Wireless Systems***
Nimrod Ginzberg (Technion, Israel); Dror Regev (Toga Networks A Huawei Company, Israel); Emanuel Cohen (Technion Institute of Technology, Israel)

14:50 ***Analysis and Design of an Asymmetric Doherty Power Amplifier at 2.6 GHz using GaAs pHEMTs***
Valentin Grams, Andres Seidel and Paul Stärke (Technische Universität Dresden, Germany); Jens Wagner (Technische Universität Dresden & Chair for Circuit Design and Network Theory, Germany); Frank Ellinger (Technische Universität Dresden, Germany)

15:10 ***Optimisation of a Doherty power amplifier based on dual-input characterisation***
Anna Piacibello (University of Roma Tor Vergata, Italy); Roberto Quaglia (Cardiff University, United Kingdom (Great Britain); Vittorio Camarchia, Chiara Ramella and Marco Pirola (Politecnico di Torino, Italy)

15:30 ***A Dual-Gate Downconverter for H-Band Employing an Active Load***
Christopher Grötsch (University of Stuttgart, Germany); Sandrine Wagner and Laurenz John (Fraunhofer IAF, Germany); Ingmar Kallfass (University of Stuttgart, Germany)

DC2: Integrated Sensors for Radar/Lidar Applications

Room: Grand B 16:10-18:00

Chair: Ingmar Kallfass (University of Stuttgart, Germany)

16:10 ***High Resolution Radar Imaging for Breast Cancer Detection: Trends and Challenges***
Matteo Bassi and Daniel Oloumi (Infineon Technologies AG, Villach, Austria); Andrea Bevilacqua (University of Padova, Italy)

16:40 ***Two quantum effects applied to optical imaging***
Radek Lapkiewicz (University of Warsaw, Poland)

17:00 ***A Highly-Integrated 60 GHz Receiver for Radar Applications in 28 nm Bulk CMOS***
Radu Ciocoveanu (Infineon Technologies AG / Friedrich-Alexander University Erlangen-Nuremberg (FAU), Germany); Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany); Vadim Issakov (Infineon Technologies AG, Germany)

17:20 ***mm-wave and UWB CMOS 65nm SoC for radar applications***
Nadav Mazor and Naftali Chayat (Vayyar, Israel)

17:40 ***Monolithic 3D-LiDAR Architecture Based on CMOS Silicon-Photomultiplier (SiPM)***
Ayal Eshkoli (Technion, Israel); Yael Nemirovsky (Technion_Israel institute of Technology, Israel); Amikam Nemirovsky (Technion, Israel)

T1: Simulation-Based GaN PA Design: From Understanding Non-Linear Models to Complete PA Design Flows

Room 3 14:00-15:50

14:00 ***Simulation-Based GaN PA Design: From Understanding Non-Linear Models to Complete PA Design Flows***
Larry Dunleavy (Modelithics, USA)

T2: Wireless Powering - from Harvesting µW/cm2 to kW Capacitive Powering for Vehicles

Room 3 16:10-18:00

Chair: Oren Eliezer (Apogee Semiconductor, USA)

16:10 ***Wireless powering- from harvesting µW/cm2 to kW capacitive powering for vehicles***
Zoya Popović (University of Colorado at Boulder, USA)

SR1: Phased Array and Multistatic Radar Systems

Room: Grand C 14:00-15:50

Chair: Markus Gardill (InnoSenT GmbH, Germany)

14:00 ***Multistatic MIMO OFDM Radar for Drone Detection***
Mario Pauli (Karlsruhe Institute of Technology, Germany)

14:30 ***Meteorological Phased Array Radar Research at NOAA's National Severe Storms Laboratory***
Mark Weber (NOAA OAR National Severe Storms Laboratory, USA)

15:00 ***Novel approaches to expand detection coverage of fixed Unattended Ground Sensor systems***
Nino Srour (US Army Research Laboratory, USA)

15:30 ***Array-Level Approach to Nonlinear Equalization***
Nicholas Peccarelli (Advanced Radar Research Center & University of Oklahoma, USA)

SR2: Radar Systems and Applications I

Room: Grand C 16:10-18:00

Chair: Mario Pauli (Karlsruhe Institute of Technology, Germany)

16:10 ***Present state and future trends in automotive radar***
Rudolf Lachner (Rudolf Lachner Consulting, Germany)

16:40 ***Signal Analysis and Radar Cooperation using Automotive Radar System Architectures***
Markus Gardill (InnoSenT GmbH, Germany)

17:10 ***Recent Advances in Joint Radar-Communications Processing***
Kumar Vijay Mishra (The University of Iowa, USA)

17:40 ***Ambiguity Function Based Radar Waveform Classification and Unsupervised Adaptation Using Deep CNN Models***
Pavel Itkin and Nadav Levanon (Tel Aviv University, Israel)

CEM1: Special Session - Computational Electromagnetics Techniques for Nanoscale Modeling

Room 4 14:00-15:50

Chairs: Nikolaos L. Tsitsas (Aristotle University of Thessaloniki, Greece)
Grigorios Zouros (National Technical University of Athens, Greece)

14:00 ***Terahertz Range Elementary Dipole Excitation of a Thin Dielectric Disk Sandwiched between Two Graphene Covers: Integral Equation Analysis***
Alexander I. Nosich (IRE NASU, Ukraine)

14:30 ***Bright and Dark Supermodes of Twin Dielectric Nanowire Photonic Molecule Excited by a Modulated Electron Beam***
Dariia O. Herasymova (Institute of Radio-Physics and Electronics NASU, Ukraine)

14:50 ***Scattering by an all-dielectric metasurface including a periodic arrangement of arbitrary scatterers***
Dimitrios K. Gerontitis and Nikolaos L. Tsitsas (Aristotle University of Thessaloniki, Greece)

15:10 ***Highly-directive systems inspired by physical bounds on scattering processes***
Iñigo Liberal (Public University of Navarre, Spain)

15:30 ***A Technique for Nanoscale Modeling of Uniaxial Spheroids***
Georgios Kolezas and Grigorios Zouros (National Technical University of Athens, Greece); Gerasimos Pagiatakis (School of Pedacogical & Technological Education (ASPETE), Greece); John Roumeliotis (National Technical University of Athens, Greece)

CEM2: Computational Electromagnetics 2

Room 4 16:10-18:00

Chairs: Ozgur Ergul (Middle East Technical University, Turkey)
Roberto D. Graglia (Politecnico di Torino, Italy)

16:10 ***High-Order Modeling for Computational Electromagnetics***
Roberto D. Graglia (Politecnico di Torino, Italy)

16:40 ***MFIE-Based Formulation Using Double-Layer Modeling for Perfectly Conducting Objects***
Sadri Guler, Hande Ibili and Ozgur Ergul (Middle East Technical University, Turkey)

17:00 ***Comparison of Two Convergent Numerical Methods for Solving the Problem of Wave-Scattering by a Dielectric Rod with a Conformal Strip of Graphene***
Sergii V. Dukhopelnykov (Usikov Institute for Radiophysics and Electronics NASU & V. N. Karazin Kharkiv National University, Ukraine)

17:20 ***Combining Physical Optics and Method of Equivalent Currents to create unique near-field propagation and scattering technique for automotive radar applications***
Gregory Skidmore, Tarun K Chawla, Gary Bedrosian (Remcom, Inc., USA)

17:40 ***Method of Analytical Regularization Based on the Static Part Inversion in the H-Wave Scattering by a PEC Strip Grating on Top of a Dielectric Substrate***
Fedir Yevtushenko (Institute of Radio-Physics and Electronics NASU, Ukraine); Sergii V. Dukhopelnykov (Usikov Institute for Radiophysics and Electronics NASU & V. N. Karazin Kharkiv National University, Ukraine)

STA: Short Course: Stand on the Antennas and Propagation Standards
Room 5 14:00-15:50

14:00 ***Stand on the Antennas and Propagation Standards***
Vikass Monebhurrun (SUPELEC, France); Lars Foged (Microwave Vision Italy, Italy); Vince Rodriguez (NSI-MI Technologies, LLC. & University of Mississippi, USA)

AP1: Special Session - Slotted Arrays 1
Room: Royal H 14:00-15:50

Chair: Sembiam R. Rengarajan (California State University, USA)

14:00 ***Advances in Slotted Waveguide Array Antenna Technology***
Sembiam R. Rengarajan (California State University, USA)

14:30 ***Millimeter-wave Two-dimensional Broadband Planar Array Composed of Partially Parallel-feeding Two-line Slotted Waveguides fed by Tournament Feeding Circuit***
Kunio Sakakibara (Nagoya Institute of Technology, Japan)

14:50 ***Progress of Perpendicular-Corporate Feed for a Multi-Layer Parallel-Plate Slot Array Antenna***
Jiro Hirokawa, Hisanori Irie and Takashi Tomura (Tokyo Institute of Technology, Japan)

15:10 ***Overview of RLSA Antenna Design and Optimization Techniques developed at the University of Siena***
Santi Concetto Pavone (Università degli Studi di Catania, Italy); Matteo Albani (University of Siena, Italy)

15:30 ***Compensation for Asymmetrical Slot Fields in the Design of SIW Slot Arrays***
Soumya Sheel (Queensland University of Technology, Australia)

AP2: Slotted Arrays 2
Room: Royal H 16:10-18:00

Chair: Sembiam R. Rengarajan (California State University, USA)

16:10 ***A 1-D Steerable Beam Slotted Waveguide Antenna Employing Non-Conventional Aperiodic Array Architecture for mm-wave Line-Of-Sight MIMO***
Marianna Ivashina and Thomas Eriksson (Chalmers University of Technology, Sweden); Robert Rehammar (Bluetest AB & Chalmers University of Technology, Sweden); Shi Lei (China Academy of Space Technology, Sweden); Carlo Bencivenni (Gapwaves AB, Sweden); Rob Maaskant (CHALMERS, Sweden)

16:30 ***Overview of High Frequency Electronics Integration Concepts for Gap waveguide based High Gain Slot Antenna Array***
Ashraf Uz Zaman (Chalmers University of Technology, Sweden); Abbas Vosoogh (Metasum AB, Sweden); Jian Yang (Chalmers University of Technology, Sweden)

16:50 ***Method-of-Moment analysis of slender elliptic slots***
Giuseppe Mazzarella, Giorgio Montisci and Alessandro Fanti (University of Cagliari, Italy)

17:10 ***Gain Optimization Methods for SIW Leaky-Wave Antennas With Transverse Slots***
Thomas Vaupel (Fraunhofer FHR, Germany)

17:30 ***Accurate Equivalent Circuit Model for Centred Inclined Coupling Slots in Planar Slotted Waveguide Array Feeds***
Soumya Sheel (Queensland University of Technology, Australia)

RA1: Special Session - Antennas in Radio Astronomy
Room: Royal I 14:00-15:50

Chairs: Vladimir Khaikin (The Special Astrophysical Observatory, RAS, Russia)
Di Li (National Astronomical Observatories, Chinese Academy of Sciences, P.R. China)

14:00 ***From ALMA to Super-ALMA***
Gianpietro Marchiori, Francesco Rampini, Massimiliano Tordi, Matteo Spinola and Riccardo Bressan (EIE Group Srl, Italy)

14:30 ***FAST A+: A Cost Effective Plan for Expanding FAST***
Di Li (National Astronomical Observatories, Chinese Academy of Sciences, P.R. China); Ran Duan (NAOC, P.R. China)

14:50 ***Astronomical Technologies and Satellite Communications***
Massimiliano Tordi, Gianpietro Marchiori, Gianpietro De Lorenzi and Francesco Rampini (EIE Group Srl, Italy); Rosario Cimmino (EIE Group Srl, USA); Matteo Spinola (EIE Group Srl, Italy)

15:10 ***The Suffa project and high capacity channels for deep space communications systems incorporating cryogenic elements***
Vyacheslav Vdovin (Nizhniy Novgorod State Technical University & IAP RAS, Russia); Yurii Artemenko (Lebedev Physical Institute RAS, USA)

15:30 ***Simulation and Analysis of Radiation Pattern of Multi-Reflector Radio Telescope Using the MLPO Algorithm***
Michael Lebedev and Vladimir Khaikin (The Special Astrophysical Observatory, RAS, Russia); Christine Letrou (TELECOM SudParis, France); Amir Boag (Tel Aviv University, Israel)

RA2: Reflector Antennas
Room: Royal I 16:10-18:00

Chairs: Di Li (National Astronomical Observatories, Chinese Academy of Sciences, P.R. China)
Gianpietro Marchiori (EIE Group Srl, Italy)

16:10 ***Results of the radio optical modeling and application of the new radio holography method of the RATAN-600 radio telescope surface diagnosis***
Vladimir Khaikin (The Special Astrophysical Observatory, RAS, Russia); Mikhail Lebedev, Nina Ovchinnikova and Anatoly Ripak (Special Astrophysical Observatory of Russian Academy of Sciences, Russia)

16:30 ***Aperture field recovery of a reflector radio telescope using Phase shifting holography***
Anatoly Ripak (Special Astrophysical Observatory of Russian Academy of Sciences, Russia); Vladimir Khaikin (The Special Astrophysical Observatory, RAS, Russia); Mikhail Lebedev (Special Astrophysical Observatory of Russian Academy of Sciences, Russia); Gary Junkin (Autonomous University of Barcelona, Spain)

16:50 ***Radiation Characteristics of Gregorian Antennas with Resonant Size Reflectors***
Oleg I Sukharevsky, Sergey Nechitaylo and Vitaliy Vasilets (Ivan Kozhedub Kharkiv National University of Air Forces, Ukraine)

17:10 ***Design and Analysis of Single Beam Parabolic Reflector Antenna in LTCC for Millimeter Wave Automotive Radar***
Dong Park (Member, Korea)

SP1: Signal Processing & Imaging 1
Room: Royal J 14:00-15:50

Chair: Arie Yeredor (Tel-Aviv University, Israel)

14:00 ***Cyber Attacks on Internet of Things Sensor Systems for Inference***
Rick Blum (Lehigh University, USA)

14:30 ***Multi-level Off grid DOA estimation of sparse arrays Using OMP algorithm***
Neela Pavani, Swathi Vakkalagadda and Pushyami Padidam (National Institute of Technology, Andhra Pradesh, India); Kishore Kumar Puli (National Institute of Technology Andhra Pradesh, India)

14:50 ***Advanced Real-Time Strategies for Direction Finding in Rapidly Changing Scenario***
Paolo Rocca (University of Trento, Italy); Mohammad Hannan (ELEDIA Research Center, University of Trento, Italy); Giacomo Oliveri (University of Trento & ELEDIA Research Center, Italy)

15:10 ***Estimation of the Channel and I/Q Imbalances with ZCZ Sequences and Superimposed Training***
Israel Alejandro Arriaga-Trejo (Consejo Nacional de Ciencia y Tecnología & Autonomous University of Zacatecas, Mexico)

15:30 ***Mode Selection of Wideband Acoustic Signals Using Time-Frequency (Warping) Analysis for Single Hydrophone. Comparison with Array Filtering in Variable Medium***
Boris Katsnelson (University of Haifa, Israel)

SP2: Signal Processing & Imaging 2
Room: Royal J 16:10-18:00

Chairs: Alon Eilam (Technion - Israel Institute of Technology, Israel)
Giacomo Oliveri (University of Trento & ELEDIA Research Center, Italy)

16:10 ***Advanced Microwave Imaging with Compressive Processing - Concepts, Methods, and Applications***
Andrea Massa (University of Trento, Italy); Nicola Anselmi (ELEDIA Research Center, Italy); Giacomo Oliveri (University of Trento & ELEDIA Research Center, Italy); Marco Salucci (ELEDIA Research Center, Italy)

16:40 ***Moving Target Detection and Imaging Using a Single-Channel SAR***
Ariel Gaibel (Tel Aviv University & IDF, Israel); Amir Boag (Tel Aviv University, Israel)

17:00 ***Up-conversion MMW imaging system based on Glow Discharge Detector row attached to commercial contact image sensor***
Lidor Kahana (Ariel University, Israel)

17:20 ***Pure Play Ultrasonic 3D Positioning System with Unsynchronized Beacons and Receivers***
Guy Dascalu, Omer Movshovits and Alon Eilam (Technion - Israel Institute of Technology, Israel)

17:40 ***Performance Analysis of Imaging Algorithms for Landmine Detection***
Rishitha Chitteti, Vishnuvardhan Reddy Y and Lakshmi Durga Edara (National Institute of Technology, Andhra Pradesh, India); Kishore Kumar Puli (National Institute of Technology Andhra Pradesh, India)

General Track

YP: Young Professionals in Automotive
Room 5 16:10-18:00

16:10 ***Opening remarks***
Aleksey Dyskin (Technion - Israel Institute of Technology, Israel)

16:15 ***Our vision to autonomous driving***
Omer Keilaf (Innoviz Technologies, Israel)

16:45 ***Bringing the power of radar to autonomous driving***
Noam Arkind (Arbe Robotics, Israel)

17:15 ***Invisible Light, Invisible Data: Leveraging SWIR to Solve the Visibility Challenge for ADAS and AV***
Avi Bakal (TriEye, Israel)

CS3: Innovative Responses to Communications Challenges

Room: Grand A 9:00-10:50

Chair: Steve Weinstein (CTTC Group, USA)

9:00 ***Enhancing Tracking Accuracy with Exploitation of Mobile Unit Orientation and Antenna Pattern***
Gaddi Blumrosen (Bar Ilan University, Israel)

9:20 ***MMW coherence detection for the 5th generation of cellular communication***
Moti Ben Laish (Ben Gurion University of the Negev, Israel); Daniel Rozban (Ariel University & Ariel University, Israel); Amir Abramovich (Ariel University, Israel); Yitzhak Yitzhaky and Natan Kopeika (Ben-Gurion University of the Negev, Israel); Avihai Aharon (Ariel University & Ben-Gurion University, Israel)

9:40 ***Broadcast Approach for the Information Bottleneck Channel***
Shlomo (Shitz) Shamai (The Technion, Israel); Avi Steiner (Technion, Israel)

10:00 ***Gaussian Diamond Primitive Relay with Oblivious Processing***
Asif Katz (Technion - Israel Institute of Technology, Israel); Michael Peleg (Rafael ltd. & Technion - Israel Institute of Technology, Electrical Engineering, Israel); Shlomo (Shitz) Shamai (The Technion, Israel)

CS4: Future of Wireless Communications

Room: Royal J 14:20-16:10

Chair: Irving Kalet

14:20 ***Gaussian Diamond Primitive Relay with Oblivious Processing***
Shlomo Shamai (Technion, Israel)

14:40 ***Millimeter and Tera-Hertz Waves – New Spectrum for Wireless Communications***
Yossi Pinchasi (Ariel University, Israel)

15:00 ***Polar Codes: Overview, Recent Research and Challenges***
Yejun He (Shenzhen University, China)

15:20 ***A Look at 6G***
Yitzhak “Irving” Kalet (Ariel University, Israel)

DC3: Special Session on Power Amplifiers
Room: Grand B 9:00-10:50

Chair: Oren Eliezer (Apogee Semiconductor, USA)

9:00 ***Efficient and Linear GaN Power Amplifiers for Broadband High PAPR Signals***
Zoya Popović (University of Colorado at Boulder, USA)

9:35 ***Reconfigurable Power Amplifiers***
Charles Campbell (Qorvo, USA)

10:10 ***CMOS Power Amplifiers and Transmitters: The Evolution from 'Digital-Friendly' RF to 'Digital' RF***
Jeffrey Walling (Qualcomm, San Diego, CA, USA)

DC4: mmW Components
Room: Grand B 11:10-13:00

Chair: Frank Ellinger (Technische Universität Dresden, Germany)

11:10 ***Energy-efficient RF- and Millimeter-Wave ICs and Frontends for Communications***
Frank Ellinger (Technische Universität Dresden, Germany)

11:40 ***Trends in MW Front-End technologies***
Wolfgang Boesch (Graz University of Technology & Institute of Microwave and Photonic Engineering, Austria)

12:10 ***A 300 GHz Quadrature Down-Converter S-MMIC for Future Terahertz Communication***
Iulia Dan, Christopher Grötsch and Benjamin Schoch (University of Stuttgart, Germany); Sandrine Wagner, Laurenz John and Axel Tessmann (Fraunhofer IAF, Germany); Ingmar Kallfass (University of Stuttgart, Germany)

12:30 ***Low-Power K-Band LNA in 45 nm SOI CMOS***
Vadim Issakov (Infineon Technologies AG, Germany); Radu Ciocoveanu (Infineon Technologies AG / Friedrich-Alexander University Erlangen-Nuremberg (FAU), Germany)

DC5: Circuits and Techniques
Room: Grand B 14:20-16:10

Chair: Vadim Issakov (Infineon Technologies AG, Germany)

14:20 ***An X-Band Quasi-Circulator GaAs MMIC***
Laila F. Marzall, Zoya Popović (University of Colorado at Boulder, USA)

14:40 ***Thermal-aware GaN/Si MMIC design for space applications***
Chiara Ramella and Marco Pirola (Politecnico di Torino, Italy); Andrea Reale, Paolo Colantonio (University of Roma Tor Vergata, Italy); Vittorio Camarchia (Politecnico di Torino, Italy); Anna Piacibello and Rocco Giofrè, Matthias Auf der Maur, Mariarcangela Ramundo (Università degli Studi di Roma - Tor Vergata, Italy)

15:00 ***A Novel Double Balanced Architecture with VSWR Immunity for High Efficiency Power Amplifier***
Geneviève Baudoin and Olivier Venard (ESYCOM - ESIEE, France); Kimon Vivien (ESIEE Paris, France)

15:20 ***18-24 GHz compact single stage amplifier with 13 ± 0.5 dB gain, OP3dBc of +19 dBm and 19% PAE for radar applications in Tower 180 nm CMOS***
Samuel Jameson, Nadav Buadana, Eli Szulc, Avraham Sayag, Isaac Sarusi, Ofer Shaham and Amitay Wolfman (Rafael, Israel)

15:40 ***Non-Linear Diode Rectifier Analysis for Multi-Tone Wireless Power Harvesting***
Ana Lopez-Yela, Alberto López Yela (University Carlos III of Madrid, Spain); Zoya Popović (University of Colorado at Boulder, USA); Daniel Segovia-Vargas (Universidad Carlos III de Madrid, Spain)

T3: Advances in the Linearization of Microwave and Millimeter-wave Power Amplifiers

Room 3 9:00-10:50

9:00 ***Advances in the Linearization of Microwave and Millimeter-wave Power Amplifiers***
Allen Katz (The College of New Jersey, USA)

T4: Supply-Modulated Power Amplifiers for Efficiency Enhancement

Room 3 11:10-13:00

Chair: Oren Eliezer (Apogee Semiconductor, USA)

11:10 ***Supply-modulated power amplifiers for efficiency enhancement***
Zoya Popović (University of Colorado at Boulder, USA)

T5: Design of Broadband, Linear, and High-Efficiency Mm-Wave Power Amplifiers

Room 3 14:20-16:10

14:20 ***Design of Broadband, Linear, and High-Efficiency Mm-Wave Power Amplifiers***
Hua Wang (Georgia Institute of Technology, USA)

SR3: Radar Systems and Applications II
Room: Grand C 9:00-10:50

Chair: Vishal Riche (InnoSent GmbH, Germany)

9:00 ***Aspects of automotive radar systems***
Wolfgang Boesch (Graz University of Technology & Institute of Microwave and Photonic Engineering, Austria)

9:30 ***Test and Evaluation of Cognitive EA systems - Requirements for future test systems***
Dan Pleasant (Keysight Technologies, USA)

9:50 ***Contactless Gas Mixture Measurements Using Distributed and Synchronized Low-Cost Millimeter-Wave FMCW Radar Sensors***
Andreas Och (DICE GmbH & Co KG, Austria & Friedrich-Alexander University of Erlangen-Nuremberg, Germany); Jochen Schrattenecker (Intel Austria GmbH, Austria); Stefan Schuster (Voestalpine Stahl Gmbh & Institute for Communications and Information Engineering, Austria); Patrick Hölzl (DICE GmbH & Co KG, Austria); Philipp Freidl (Infineon Technologies Austria AG, Austria); Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany)

10:10 ***No-contact High-Frequency Large-Bandwith GPR scanner for floor investigation***
Massimiliano Pieraccini and Lapo Miccinesi (University of Florence, Italy)

10:30 ***Partially coherent radar***
Vitali Kozlov, Rony Komissarov, Dmitry Filonov and Pavel Ginzburg (Tel Aviv University, Israel)

RD1: Tutorial: MIMO radar and phased array systems
Room: Grand C 11:10-13:00

Chair: Mario Pauli (Karlsruhe Institute of Technology, Germany)

11:10 ***MIMO radar for monitoring applications***
Vishal Riche (InnoSent GmbH, Germany)

12:30 ***Advances in mutual coupling-based calibration in digital phased array systems***
Caleb Fulton (University of Oklahoma, USA)

RD2: Tutorial: Millimeter-wave radar systems
Room: Grand C 14:20-16:10

Chair: Mario Pauli (Karlsruhe Institute of Technology, Germany)

14:20 ***Millimeter-wave radar systems***
Vadim Issakov (Infineon Technologies AG, Germany)

MM1: Special Session - Metamaterials
Room 5 11:10-13:00

Chairs: Pavel Ginzburg (Tel Aviv University, Israel)
Irina Munina (St. Petesburg Electrotechnical University LETI, Russia)

11:10 ***Superdirective dielectric spherical multilayer antennae***
Alexey A. Shcherbakov (ITMO University & Moscow Institute of Physics and Technology, Russia); Konstantin Ladutenko, Igor Sushencev and Pavel Belov (ITMO University, Russia)

11:35 ***Limitations of Nonlinear Electromagnetic Isolators***
David Fernandes (University of Coimbra - Instituto de Telecomunicações, Portugal); Mario Silveirinha (Universidade de Lisboa - Instituto de Telecomunicações, Portugal)

12:00 ***Antenna-Filter-Antenna Based Transmitarray with Beamsteering Capability***
Irina Munina (St. Petesburg Electrotechnical University LETI, Russia); Dmitry E Zelenchuk (Queen's University of Belfast, United Kingdom (Great Britain); Pavel A. Turalchuk (St. Petesburg Electrotechnical University LETI, Russia)

12:20 ***Optically switchable scanning antenna***
Dmitry Filonov (Tel Aviv University, Israel); Anna Mikhailovskaya and Dmitry A Dobrykh (ITMO University, Russia); Alexey P. Slobozhanyuk (ITMO University & Australian National University, Russia); Pavel Ginzburg (Tel Aviv University, Israel)

12:40 ***Volumetric Metamaterials versus Curved Impedance Surfaces in Scattering Applications***
Sergei Kosulnikov, Dmitry Filonov and Pavel Ginzburg (Tel Aviv University, Israel)

AP3: Antenna Arrays
Room: Royal H 9:00-10:50

Chairs: Andrea Massa (University of Trento, Italy)
Andrey Zhuravlev (Bauman Moscow State Technical University, Russia)

9:00 ***Optimal Trade-Off Phased-Arrays for Future Generation Radars and Communication Systems***
Andrea Massa (University of Trento, Italy); Nicola Anselmi (ELEDIA Research Center, Italy); Giorgio Gottardi (ELEDIA Research Center, University of Trento, Italy); Robert Mailloux (University of Trento, Italy); Giacomo Oliveri (University of Trento & ELEDIA Research Center, Italy); Lorenzo Poli (ELEDIA Research Center, University of Trento, Italy); Paolo Rocca (University of Trento, Italy)

9:30 ***On the Optimal Positioning of Antennas in the Microwave Personnel Screening System with Inverse Synthetic Aperture***
Andrey Zhuravlev and Vladimir Razevig (Bauman Moscow State Technical University, Russia); Ge Dong (Tsinghua University, P.R. China)

9:50 ***Spatial Suppression of Jamming Signals in Extreme Conditions***
Yefim S. Poberezhskiy (Consultant, Communications & Signal Processing, USA); Gennady Y. Poberezhskiy (Raytheon Space and Airborne Systems, USA

10:10 ***Computational Analysis of Nanoantenna Arrays for Nanoparticle Detection***
Goktug Isiklar and Ozgur Ergul (Middle East Technical University, Turkey)

10:30 ***Optimization of Thinned Antenna Phased Arrays for Low Sidelobe Level***
Rotem Gal Katzir (Ben Gurion University of the negev, Israel); Reuven Shavit (Ben-Gurion University, Israel)

AP4: MIMO and Adaptive Antenna Arrays
Room: Royal H 11:10-13:00

Chairs: Eran Greenberg (RAFAEL, Israel)
Pavel Vilner (Technion & Mellanox, Israel)

11:10 ***Sparse Optimization of Device-Embedded Antenna Arrays for Beamforming Applications***
Daniel Silverstein and Yehuda Leviatan (Technion, Israel)

11:30 ***Active Cancellation Limitation Analysis for Full Duplex Systems with a Single Antenna***
Pavel Vilner (Technion & Mellanox, Israel); Emanuel Cohen (Technion Institute of Technology, Israel)

11:50 ***LOS Classification of UAV-to-Ground Links in Built-Up Areas***
Eran Greenberg, Amitay Bar and Edmund Klodzh (Rafael, Israel)

12:10 ***Excitation Faults Detection in Relatively Large Planar Array Antennas, Measured in Short Antenna Ranges***
Alexander Georgiev Toshev (Pro Patria Electronics, Hungary)

AP5: Antenna Analysis in Time Domain and Beamforming

Room: Royal H 14:20-16:10

Chairs: Amedeo Capozzoli (Università di Napoli Federico II, Italy)
Paolo Rocca (University of Trento, Italy)

14:20 ***Space-Time Coding through Time-Modulated Arrays - State-of-the-Art and Recent Trend/Advances***
Paolo Rocca (University of Trento, Italy); Lorenzo Poli (ELEDIA Research Center, University of Trento, Italy); Shiwen Yang (University of Electronic Science and Technology of China (UESTC), P.R. China)

14:50 ***Temporal Switching for Wideband Impedance Matching and Non-reciprocity***
Yakir Hadad (Tel-Aviv University, Israel); Amir Shlivinski (Ben-Gurion University of the Negev, Israel)

15:10 ***A New Analytical and Numerical Method for Describing the Response of a Linear Antenna for Pulse Excitation Submission***
Józef Małecki (Polish Naval Academy, Poland); Anna Witenberg (UTP University of Science and Technology, Poland); Maciej Walkowiak (University of Science and Technology in Bydgoszcz, Poland)

15:30 ***Echo generation by SVO***
Amedeo Capozzoli, Claudio Curcio and Angelo Liseno (Università di Napoli Federico II, Italy)

15:50 ***SVO optimality in Near-Field Antenna Characterization***
Amedeo Capozzoli, Claudio Curcio and Angelo Liseno (Università di Napoli Federico II, Italy)

QEM1: Special Session - Quantum & Nano EM 1
Room: Royal J 9:00-10:50

Chairs: Dmitri Mogilevtsev (Institute of Physics, National Academy of Sciences of Belarus, Belarus)
Jeffrey H Shapiro (Massachusetts Institute of Technology, USA)

9:00 ***The Quantum Illumination Story***
Jeffrey H. Shapiro (Massachusetts Institute of Technology, USA)

9:30 ***Quantum Noise Radar: Assessing Quantum Correlations***
Dmitri Mogilevtsev (Institute of Physics, National Academy of Sciences of Belarus, Belarus); Gregory Slepyan and Amir Boag (Tel Aviv University, Israel); Alexander Mikhalychev, Ilya Karuseichyk, Ilya Peshko and Alexander Nizovtsev (IPNASB, Belarus)

10:00 ***Quantum emission between the weak and strong coupling regimes***
Iñigo Liberal (Public University of Navarre, Spain)

10:30 ***Interaction of Nano-Rectenna with Thermal Light: Quantum-Optical Theory for Solar Cell Applications***
Timor Gilad, Amir Boag, and Gregory Slepyan (Tel Aviv University, Israel)

QEM2: Special Session - Quantum & Nano EM 2
Room: Royal J 11:10-13:00

Chair: Gregory Slepyan (Tel Aviv University, Israel)

11:10 ***Merging the Quantum Realm with Induced Electromagnetic Fields***
Dor Gabay and Amir Natan (Tel Aviv University, Israel); Ali Yilmaz (University of Texas at Austin, USA); Amir Boag (Tel Aviv University, Israel)

11:30 ***Metallic and dielectric nanoantennae to control field-matter interaction in nanophotonics***
Sergey Gaponenko (National Academy of Sciences of Belarus, Belarus)

11:50 ***Quantum Antenna Emission as a Strong Coupling with Photonic Reservoir***
Alexei Komarov and Gregory Slepyan (Tel Aviv University, Israel)

12:10 ***Electrically Driven Vacuum Rabi Oscillations as a Potential Quantum-Optical Device***
Ilay Levie and Gregory Slepyan (Tel Aviv University, Israel)

BM1: Biomedical Engineering 1 - Novel Technologies

Room: Royal I 9:00-10:50

Chairs: Amir Landesberg (Technion, Israel)
Yoav Schechmann (Technion, Germany)

9:00 ***Synthetic Biology - when biology and electronics meet***
Ramez Daniel (Israel Institute of Technology, Israel)

9:30 ***Design of a Compact "Multi-Media" UWB Antenna for Microwave Medical Imaging***
Steve Kruppa (Elscint Tomography, Israel)

9:50 ***SAW and BAW Wireless Resonator Temperature Sensors for Surgery***
Sergey Bogoslovsky (JSC RADAR MMS, Russia); Gennady Sapozhnikov (JSC Radar mms, Russia); Ivan Antsev (JSK Radar mms, Russia); Sergei Zhgoon and Alexander Shvetsov (National Research University MPEI, Russia)

10:10 ***Innovative Machine Learning Techniques for Biomedical Imaging***
Marco Salucci and Davide Marcantonio (ELEDIA Research Center, Italy); Maokun Li (Tsinghua University, P.R. China); Giacomo Oliveri (University of Trento & ELEDIA Research Center, Italy); Paolo Rocca and Andrea Massa (University of Trento, Italy)

10:30 ***Optimization of transmitted power of horn antenna for biomedical applications***
Shailendra Rajput, Konstantin Komoshvili, Stella Aronov, Ayan Barbora, Praveen Patnaik, Jacob Levitan and Asher Yahalom (Ariel University, Israel)

BM2: Biomedical Engineering 2 - Advanced Image Analyses

Room: Royal I 11:10-13:00

Chairs: Ramez Daniel (Israel Institute of Technology, Israel)
Yoav Schechmann (Technion, Israel)

11:10 ***Deep Learning for Analysis and Synthesis of Dense and Multicolor Localization Microscopy***
Yoav Schechmann (Technion, Israel)

11:40 ***Parameter-free MRI Reconstruction from Sub-Nyquist Acquisition***
Efrat Shimron (Technion, Israel)

12:00 ***Comparison of Image Reconstruction Algorithms using Compressive Sensing***
Praizy Diana, Pala Sonia and Shashipriya Polepally (National Institute of Technology, Andhra Pradesh, India); Kishore Kumar Puli (National Institute of Technology Andhra Pradesh, India)

12:20 ***Electric field array detector for millimeter wave assistance on brain tumor resection***
Vera Carolina Cardoso, Hugo Dinis and Paulo Mendes (University of Minho, Portugal)

12:40 ***Efficient Probes for Ultra-high-field Magnetic Resonance Microscopy Based on Coupled Ceramic Resonators***
Stanislav Glybovski, Sergei Kurdjumov and Pavel Belov (ITMO University, Russia); Elizaveta Nenasheva (Ceramics Co. Ltd, Russia); Andrew Webb (Leiden University Medical Center, The Netherlands); Marine Moussu and Marc Dubois (Institut Fresnel, France); Stefan Enoch (CNRS & Institut Fresnel, France); Redha Abdeddaim (Aix Marseille University, France); Luisa Ciobanu and Boucif Djemai (DRF/I2BM/Neurospin/UNIRS, France)

BM3: Biomedical Engineering 3 - The Cardiac and Respiratory Systems
Room: Royal I 14:20-16:10

Chair: Amir Landesberg (Technion, Israel)
Ramez Daniel (Israel Institute of Technology, Israel)

14:20 ***Detection of Peripheral Artery Stenosis Utilizing Wavelet Coherence Analysis***
Amit Livneh (Technion-Israel Institute of Technology, Israel)

14:50 ***Early Diagnosis of Internal Hemorrhage via Deep Neural Network Inference of Radio Signals***
Shye Shapira (InnerSight, Israel); Ofir Tal (Innersight, Israel)

15:10 ***Development of hardware-software microscopy complex for the study of buccal epithelial cells***
Anastasiya Rumyantseva, George Kolokolnikov, Andrey Samorodov and Alexander Volkov (Bauman Moscow State Technical University, Russia)

15:30 ***Mathematical modeling of varicose veins ultrasound heating***
Anna Borde and Gennady Savrasov (Bauman Moscow State Technical University (BMSTU), Russia)

15:50 ***Novel Electronic Devices for the Management of Heart Failure***
Amir Landesberg (Technion, Israel)

PT0: Packaging & Thermal Management

Room: Grand A 11:10-13:00

Chairs: Aviv Ronen (Rafael, Israel)
Gennady Ziskind (Ben-Gurion University of the Negev, Israel)

11:10 ***Introductory Remarks***
Avram Bar-Cohen (Raytheon, USA), Aviv Ronen (Rafael, Israel), Yoav Peles (UCF, USA), David Ratner (Rafael, Israel), Gennady Ziskind (BGU, Israel)

11:20 ***Two-Phase Electronics Cooling***
Bryan Muzyka (Advanced Cooling Technologies, USA)

11:40 ***Vertically Algined Carbon Nantubes for Thermal Packaging Applications***
Yaniv Cohen and Asaf Ya'akobovitz (Ben Gurion University of the Negev, Israel)

12:00 ***Database for Life Cycle Temperatures and Cooling System Operation Frequencies***
Amiad Asias (Rafael, Israel)

12:20 ***Additive Manufacturing of Electronics***
Ziv Cohen (NanoDimension, Israel)

12:40 ***Development of a PCM-Based Thermal Capacitor with AM Lattice Heat Spreader***
Michael Koenig (Rafael, Israel)

PT1: Packaging & Thermal Management 1

Room 5 14:20-16:10

Chairs: Yoav Peles (University of Central Florida, USA)
Gennady Ziskind (Ben-Gurion University of the Negev, Israel)

14:20 ***Thermal Challenges for Future Military Platforms***
Mark Spector (ONR, USA)

14:50 ***Modeling the Thermal Performance of a Packaged MEMS Thermal Sensor at Wide Pressure Range for IoT Applications***
Moshe Avraham, Dima Shlenkevitch, Sara Stolyarova, Tanya Blank, Yael Nemirovsky, Ayal Shabtay (Technion, Israel)

15:10 ***PCB Surface Finish Impact to Losses at High Frequencies***
Alexander Ippich (Isola, Germany)

15:30 ***Thermal Aspects of High Power Microelectronics Systems Implementation in Aviation Applications***
Adi Amir (Rafael, Israel)

15:50 ***GlassTomer™ - Innovative Hermetic Seal for Lightweight Connectors***
Leeor Gorstein (Hermetron, Israel)

WIE: Women in Engineering
Room 5 9:00-10:50

Organizers: Prof. Amelie Hagelauer (University of Bayreuth, Germany),
Dr. Sherry Hess (AWR Group NI, USA)

9:00 ***Welcome Message***
Prof. Amelie Hagelauer (University of Bayreuth, Germany)

9:10 ***Invited talk***
Prof. Yonina Eldar (Weitzmann Institute of Science, Israel)

9:50 ***Panel: Alpha Girls-What Does It Take to Break Into the C-Suite***
Moderator: Dr. Sherry Hess (AWR Group NI, USA)
Panelists: Prof. Zoya Popovic (University of Colorado, USA),
Prof. Almudena Suarez (University of Cantabria, Spain),
Prof. Vadim Issakov (University of Magdeburg, Germany),
Natasha Antonyuk (Staal Technologies BV, Netherlands)

10:40 ***Concluding Remarks***
Dr. Sherry Hess (AWR Group NI, USA)

IF: Interactive Forum

Room: Grand A 16:10-18:00

Chairs: Aleksey Dyskin (Technion - Israel Institute of Technology, Israel)
Reuven Shavit (Ben-Gurion University, Israel)

1. *A System Stability Analysis for a Time-Delayed Four Meander Line Antenna Legs Birdcage for Helicon Excitation with Titanium Alloy and Copper Legs*
   Ofer Aluf (Netanya, Israel)

2. *Improved THz Reception by Non-Conventional Structure of Planar Dipole Antenna with Superconducting Josephson Junction Detector*
   Eldad Holdengreber, Moshe Mizrahi, Vitaly Khavkin, Shmuel E. Schacham and Eliyahu Farber (Ariel University, Israel)

3. *Computationally Efficient Electrodynamic Method for Analysis of Microlenses*
   Igor V Donets and Alexander M. Lerer (Southern Federal University, Russia); Li Zimeng (Guangzhou Compass Antenna Design and Research, P.R. China); Svetlana Tsvetkovskaya (Don State Technical University, Russia); Michael Mazuritsky (Southern Federal University, Russia)

4. *Dual-Wideband Patch-Slot Loop Textile Antenna for WBAN/WiFi/LTE Applications*
   Kuo-Sheng Chin (Chang Gung University, Taiwan); Eric S. Li (National Taipei University of Technology, Taiwan); Roger Lu (National Chung-Shan Institute of Science and Technology, Taiwan); Hung-Wei Lo and Yu-You Lin (Chang Gung University, Taiwan)

5. *Effectiveness of Various 5G Modulation Techniques in Different Weather Conditions*
   Yosef Golovachev (Ariel University & Jerusalem College of Technology, Israel); Aaron Mazor (Jerusalem College of Technology, Israel); Gad A. Pinhasi and Yosef Pinhasi (Ariel University, Israel)

6. *Small Antenna for Small Spacecraft*
   Ely Levine (AFEKA, Academic College of Engineering, Israel); Haim Matzner (HIT-Holon Institute of Technology, Israel)

7. *Observation of photonic Jackiw-Rebbi states in chains of all-dielectric bianisotropic particles*
   Dmitry V. Zhirihin (ITMO University, Russia); Alexey Gorlach (Belarusian State University, Belarus); Alexey P. Slobozhanyuk (ITMO University & Australian National University, Russia); Alexander Khanikaev (The City College of New York, USA); Maxim Gorlach (ITMO University, Russia)

8. *A Plasmonic Behavior of Slotted Nano-Structured Huygens Metasurface on Silicon for Photovoltaic Applications*
   Êmille Lorrane Patrício (University of Campinas, Brazil); Luiz C. Kretly (Unicamp, Brazil)

9. *The Use of metamaterial Tripolar Array for UWB Antenna Optimization*
   Humberto Xavier de Araujo (Universidade Federal do Tocantins, Brazil); Geyse da Silva and Rhayssa Oliveira (UFT, Brazil); Carlos Eduardo Capovilla (UFABC, Brazil); Luiz C. Kretly (Unicamp, Brazil)

10. *Terahertz Antenna for 5G Cellular Communication Systems: A Holistic Review*
Uri Nissanov (South Africa)

11. *Realization of Novel Digitization Circuits in SDRs and CRs*
Yefim S. Poberezhskiy (Consultant (Communications & Signal Processing), USA); Gennady Y. Poberezhskiy (Raytheon Space and Airborne Systems, USA)

12. *Novel Conception of Loss Tangent Media Measurement with Laser-Driven Gallium Arsenide Switches*
Maxim Kulygin (Institute of Applied Physics, Russia)

13. *A 70W High Efficiency Power Amplifier for Base Station Applications*
Meir Alon and Sigmond Singer (Tel Aviv University, Israel)

14. *UWB-Based Positioning System for Supporting Lightweight Handheld Ground-Penetrating Radar*
Piotr Kaniewski, Tomasz Kraszewski and Przemyslaw Pasek (Military University of Technology, Poland)

15. *Search of Binary Codes Compressed to Several Sub-pulses*
Hiroshi Takase and Masanori Shinriki (Nippon Institute of Technology, Japan)

16. *Influence of Electrical Properties of Media on Reconstruction of Microwave Holograms Recorded by Subsurface Radar*
Vladimir Razevig and Sergey Ivashov (Bauman Moscow State Technical University, Russia); Margarita Chizh (Bauman Moscow State Technical University & Remote Sensing Laboratory, Russia); Andrey Zhuravlev (Bauman Moscow State Technical University, Russia); Lorenzo Capineri (University of Florence, Italy)

17. *Monolithic High Power 300 Watt, S-Band, HMIC PIN Diode Limiter*
Timothy Boles, James Brogle, Joseph Bukowski and Paolo Brosera (MACOM Technology Solutions, USA)

18. *Quasi-Differential Operation of Capacitive Tuners for Aperture Tuning Applications*
Oguzhan Oezdamar (University of Erlangen-Nuremberg, Germany); Valentyn Solomko (Infineon Technologies, Germany); Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany); Amelie Hagelauer (University of Bayreuth, Germany); Anthony Thomas (Infineon Technologies, Germany)

19. *An 8 Way Power Combined 28GHz Direct Downconversion Receiver for 5G RF Beamformers*
Ritabrata Bhattacharya (Cadence Design Systems, India); Alex Tiker (Cadence Design Systems, Israel); Ashish Gupta and Vikas Aggarwal (Cadence Design Systems, India); Taranjit Kukal (Cadence, India); Sankaran Aniruddhan (Indian Institute of Technology Madras, India)

20. *Circuit Model of Choke Coils for Approximating Frequency-Dependent Winding Losses*
Andreas Marquardt (Sumida Components GmbH, Germany); Michael Schmidhuber (SUMIDA Components & Modules GmbH, Germany); Guido Dietl (University of Applied Sciences Landshut, Germany)

21. An analysis of the power balance in systems described by S parameters
Vladimir Vulfin (Ben-Gurion University of the Negev, Israel); Nastya Verhovsky (Electromagnetics Infinity, Israel); Shai Sayfan-Altman (ANSYS inc., Israel); Reuven Ianconescu (Shenkar College of Engineering and Design, Israel)

22. U-Slot Dual-band Frequency Reconfigurable Patch Antenna Tuned With Commercial Ferroelectric BST capacitors
Ts Kalkur (University of Colorado, Colorado Springs, USA)

23. Low Phase Noise NLTL Comb Generator
Chandu Sirimalla and Jack Redus (Macom, USA); Paolo Brosera (MACOM Technology Solutions, USA)

24. Study of a Method for Effective Noise Suppression in Passive Personnel Screening Systems
Andrey Zhuravlev (Bauman Moscow State Technical University, Russia)

25. Spurious Detection and Cancellation Method for Millimeter Wave Heterodyne Transceiver Architecture
Zhou Du and Kimmo Aronkytö (Nokia Bell Labs, Finland)

26. Waveguide Excitation Using On-Chip Antenna for Wireline Data Links
Mukul Mishra (University of Texas at Dalas, USA); Neha Vijayakumar, Rashaunda Henderson, Het Trivedi, Ibunkunoluwa Momson and Michael Gomez (University of Texas at Dallas, USA); Nafiseh Aflakian (Southern Methodist University, USA); Zhe Chen (University of Texas at Dallas, USA); Kenneth O (The University of Texas at Dallas, USA); Duncan MacFarlane (Southern Methodist University, USA)

27. Optical Pumping of Graphene-Based Heterostructures with Black-Arsenic-Phosphorus Absorbing-Cooling Layer for Terahertz Lasing
Maxim Ryzhii (University of Aizu, Japan); Victor Ryzhii and Taiichi Otsuji (Tohoku University, Japan); Vladimir Mitin (University at Buffalo, USA); Michael Shur (Rensselaer Polytechnic Institute, USA)

28. Catalytic Gas Sensor Based on Micro Machined CMOS Transistor
Dima Shlenkevitch, Moshe Avraham, Sara Stolyarova and Tanya Blank (Technion, Israel); Yael Nemirovsky (Technion_Israel institute of Technology, Israel)

29. Case Study: Implementing an Industrial IoT solution for a Multihead Weighing Machine (MWM)
Dor Ma'ayan and Itai Dabran (Technion, Israel)

30. Ad-hoc network recovery after severe disaster
Arie Reichman (Ariel University & Ayecka Communication Systems, Israel); Shahaf Wayer (Ariel University, Israel)

31. A Possibility: Beyond the Channel Capacity in the Low SNR Regime
Bingli Jiao, Dongsheng Zheng and Mingxi Yin (Peking University, P.R. China); Yuli Yang (University of Chester, United Kingdom (Great Britain)

32. *UAV-assited Wireless Powered Sensor Network over Rician Shadowed Fading Channels*
Stefan Panić (Tomsk Polytechnic University & University of Priština, Serbia); Tharindu Ponnimbaduge Perera and Dushantha Nalin K. Jayakody (National Research Tomsk Polytechnic University, Russia); Caslav Stefanovic (Faculty of Natural Sciences and Mathematics, Kosovska Mitrovica, Serbia); Bojan Prlinčević (Higher Technical Professional School Zvecan, Serbia)

33. *Directivity Enhancement of Tight Couplers*
Oz Sorkin, Eldad Holdengreber, Moshe Averbukh, Shmuel E. Schacham and Eliyahu Farber (Ariel University, Israel)

34. *A 1.8mW, 60GHz Mixer First I/Q Receiver in 28nm CMOS*
Duha Gharaba (Technion & Intel, Israel); Emanuel Cohen (Technion Institute of Technology, Israel)

35. *Characterization of Diamond Colors via Microwave Spectroscopy*
Yossi Rabinowitz, Asher Yahalom, Yosef Pinhasi, Haim Cohen and Ariel Etinger (Ariel University, Israel)

36. *mmW wireless communication system based on QPSK modulation format using photomixer and coherent detection*
Asemahegn Asi Wudu (Ariel University, Israel); Daniel Rozban (Ariel University & Ariel University, Israel); Amir Abramovich (Ariel University, Israel)

37. *Back To Back Wide-Band CPW-To-Waveguide Transition with RF MEMS Shunt Switch in W-Band*
Apaar Kapoor (IIT Delhi, India); Shiban K Koul (Indian Institute of Technology Delhi, India); Ananjan Basu and Pranav Shrivastava (Indian Institute of Technology, Delhi, India)

38. *A Comparison Criterion Among Different Planar Nanoantennas for Rectenna Application Design: The Cases for Dipole, Bowtie, Spiral and Log-Periodic*
Nelmo Cyriaco Silva and Luiz Kretly (UNICAMP, Brazil)

39. *RRP: Reinforced Routing Policy Architecture for MANET routing*
Aviel Glam (Rafael Advance Defense Systems Ltd., Israel); Barak Farbman (Rafael & Technion - Israel Institute of Technology, Israel); Ariel Shleifer (Ben Gurion uni, Israel)

40. *Studying an Optimal Approach to Distribute Signals through Fiber-Wireless Fronthaul Network*
Mikhail Belkin (MIREA - Russian Technological University, Moscow, Russian Federation); Tatiana Bakhvalova and Alexander Sigov (MIREA - Russian Technological University, Russia)

41. *Advanced Wafer Level Adhesive and Encapsulation Solutions*
Ruud de Wit (Henkel, The Netherlands)

42. *Enhanced Cooling of Electronic Chips Using Combined Diamond Coating and Microfluidics*
Gilad Yossifon (Technion, Israel)

CS5: New Communication Techniques and Applications

Room: Royal J 9:00-10:50

Chair: Jay A. Weitzen (University of Massachusetts Lowell & Airvana, USA)

9:00 ***Case study: Implementing a Personal Area Network MAC Protocol for Inaudible Sound Waves***
Itai Dabran (Technion, Israel); Alon Eilam (Technion - Israel Institute of Technology, Israel); Guy Menhel and Yuval Ron (Technion, Israel); Guy Shofen (Sonarax, Israel)

9:20 ***Improving the accuracy and quality of wireless coverage measurements using Autonomous Drones and Wheeled Robots***
Jay A Weitzen (University of Massachusetts Lowell & Airvana, USA); Joshua Watts, Rachel Wakim, Emi Aoki, Sivly Lay, and Naye Yoni (University of Massachusetts Lowell, USA)

9:40 ***Location-Domain Channel Representation for Estimating Distributed MIMO Channels***
Arkady Molev-Shteiman and Xiao-Feng Qi (Futurewei Technologies, Inc., USA); Laurence Mailaender (Huawei Technologies & Alcatel-Lucent, USA)

10:00 ***An Efficient Traffic Control Management in the Smart City***
Itai Dabran and Ben Hunter (Technion, Israel)

10:20 ***Handling traffic loads in a smart junction by social priorities***
Nadav Voloch (Ben Gurion University of the Negev, Israel); Orly Barzilai, Orna Lavi Steiner, Zohar Fine, Eran Brayer, and Idan Proshtisky (The College of Academic Studies, Or Yehuda, Israel)

CS6: Interference Mitigation and New Approaches in Communications System

Room: Royal J 11:10-13:00

Chair: Raymond Shen (Keysight Technologies, USA)

11:10 ***A Study of Interference Distributions in Millimeter Wave Cellular Networks***
Alireza Alizadeh and Mai Vu (Tufts University, USA);
Theodore Rappaport (New York University & NYU WIRELESS, USA)

11:40 ***Coexistence Testing of 5G with Radar/Satellite***
Raymond Shen (Keysight Technologies, USA)

12:00 ***User-Centric Approaches for Next-Generation Self-Organizing Wireless Communication Networks Using Machine Learning***
Chetana V. Murudkar and Richard D. Gitlin (University of South Florida, USA)

12:20 ***An Investigation of Flexible Waveform Numerologies for 5G V2I Cellular Networks from a Physical Layer Perspective***
Viktor Stoynov, Dimitriya Mihaylova, Zlatka Valkova-Jarvis, Georgi Iliev and Vladimir K. Poulkov (Technical University of Sofia, Bulgaria)

12:40 ***Intrusion Detection System Model Implementation against DDOS attacks***
Maria Nenova and Kiril Kassev (Technical University of Sofia, Bulgaria)

DC6: Passive Devices and Techniques
Room: Royal I 9:00-10:50

Chair: Andrea Bevilacqua (University of Padova, Italy)

9:00 ***Moving Beyond S-Parameter Files: Advanced Scalable and 3D EM Models for Passive Devices***
Larry Dunleavy (Modelithics, USA)

9:30 ***Recent Advances in mm-wave Characterization, Calibration and de-embedding techniques***
Andrej Rumiantsev (MPI Corporation, Germany)

10:00 ***Integration of Filters into Phased Array Antenna Panels***
Hjalti Sigmarsson (University of Oklahoma, USA)

10:30 ***Two Planar Devices for Extracting Capacitance per Unit Length***
Nina B. Popovic (University of Colorado at Boulder & National Institute of Standards and Technology, USA); Eric Marksz (University of Maryland, USA); Aaron Hagerstrom, James Booth, Edward Garboczi, Nathan Orloff and Christian Long (National Institute of Standards and Technology, USA)

DC7: LO Signal Generation and Distribution
Room: Royal I 11:10-13:00

Chair: Vadim Issakov (Infineon Technologies AG, Germany)

11:10 ***Low-Phase Noise Bipolar VCOs for Integrated 5G Front-ends***
Andrea Bevilacqua (University of Padova, Italy)

11:40 ***Challenges in the analysis of innovative oscillator-based circuits for radar, RFID and reconfigurable systems***
Almudena Suarez (University of Cantabria, Spain)

12:10 ***Transformer-Coupled Octa-Core 60 GHz Push-Push VCO in a 45-nm RF-SOI CMOS Technology***
Johannes Rimmelspacher (Infineon Technologies AG, Germany); Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany); Vadim Issakov (Infineon Technologies AG, Germany)

12:30 ***Considerations on 120GHz LO Signal Generation and Distribution for Highly-Integrated Multi-Channel Radar Transceivers***
Andrea Bilato (University of Padova & Infineon Technologies AG, Italy); Andrea Bevilacqua (University of Padova, Italy); Vadim Issakov (Infineon Technologies AG, Germany)

T6: Stability Analysis of Microwave Circuits
Room: Royal I 14:20-16:10

14:20 ***Stability analysis of microwave circuits***
Almudena Suarez (University of Cantabria, Spain)

WPT: Wireless Power Transfer
Room 4 14:20-16:10

Chair: Vadim Issakov (Infineon Technologies AG, Germany)

14:20 ***Metasurface for Wireless Power Transfer to Multiple Receivers***
Mingzhao Song, Pavel Belov, and Polina Kapitanova (ITMO University, Russia)

14:50 ***An RF Voltage Detector with Low Harmonic Feedback for Antenna Tuning Switches***
Oguzhan Oezdamar (University of Erlangen-Nuremberg, Germany); Amelie Hagelauer (University of Bayreuth, Germany); Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany); Valentyn Solomko (Infineon Technologies, Germany)

15:10 ***Practical Issues with Unloaded Resonant Inductive WPT Link Operating in Load-Independent Regime***
Yotam Frechter and Yegal Darhovsky (BGU, Israel); Alon Kuperman (Ben-Gurion University of the Negev, Israel)

15:30 ***Efficient Modeling of DC- RF module of Space Solar Power Satellite with Improved Antenna design and Metasurface***
Amit Baghel and Shashank Kulkarni (IIT Guwahati, India); Sisir Kumar Nayak (Indian Institute of Technology Guwahati, India)

15:50 ***Square Slotted Patch Antenna for 2.45 GHz Far-field Wireless Power Transfer***
Shashank Kulkarni and Amit Baghel (IIT Guwahati, India); Sisir Kumar Nayak (Indian Institute of Technology Guwahati, India)

AP6: Propagation and Modeling
Room 3 9:00-10:50

Chairs: Dmitry Chizhik (Nokia Bell Labs, USA)
Eran Greenberg (RAFAEL, Israel)

9:00 ***Directional Gain Measurements at 28 GHz for 90% Indoor Coverage***
Dmitry Chizhik (Nokia Bell Labs, USA)

9:20 ***Over-the-City UAVs Swarm Communications Channel Model***
Eran Greenberg, Edmund Klodzh (Rafael, Israel)

9:40 ***Propagation and Time-of-Arrival of VLF Pulses in the Earth-Ionosphere Waveguide***
Sherman Marcus (Technion - Israel Institute of Technology, Israel); Eran Greenberg (RAFAEL, Israel); Ariel Epstein (Technion - Israel Institute of Technology, Israel)

10:00 ***Modelling Large-Scale Signal Fading in Urban Environment Based on Fuzzy Inference System***
Segun I Popoola (Manchester Metropolitan University & Covenant University, United Kingdom (Great Britain); Aderemi A. Atayero (Covenant University, Nigeria); Bamidele Adebisi (Manchester Metropolitan University, United Kingdom (Great Britain); Abigail O Jefia (Covenant University, Nigeria); Kingsley Ogbeide (Landmark University, Nigeria); Andrew Gibson (Manchester Metropolitan University, United Kingdom (Great Britain)

AP7: Antenna Design & Manufacturing
Room 3 11:10-13:00

Chairs: Pavel Ginzburg (Tel Aviv University, Israel),
Meisong Tong (Tongji University, P.R. China)

11:10 ***Design of Advanced Reflectarrays for Future Satellite Applications***
Andreas Ericsson, Min Zhou, Stig Sørensen, Niels Vesterdal, Michael F. Palvig, Oscar Borries, Jakob Rosenkrantz de Lasson, Tonny Rubæk, Peter Meincke and Erik Jørgensen (TICRA, Denmark)

11:30 ***Selective Metallization of Graphene-based Polymers for Volumetric 3D-printed Antennas***
Pavel Ginzburg and Dmitry Filonov (Tel Aviv University, Israel)

11:50 ***An Optimized Design for Compact Patch Antenna Using Artificial Electromagnetic Structure***
Meisong Tong, Meng Meng Li, Guochun Wan, and Li Zhang (Tongji University, P.R. China)

12:10 ***A Novel Sensor Based on Microstrip Patch Antenna for Detecting Different Gases in Circular Pipe***
Meisong Tong, Yun Jie Mao, Qing Xu and Xu Shi (Tongji University, P.R. China)

12:30 ***An Improved Broadband Circularly Polarized Cross-Dipole Antenna With An AMC Reflector***
Wei HE, Yejun He, Long Zhang, and Sai-Wai Wong (Shenzhen University, P.R. China)

RCS: Scattering and Diffraction
Room 3 14:20-16:10

Chairs: Raphael Kastner (Tel Aviv University, Israel)
Piergiorgio L.E. Uslenghi (University of Illinois at Chicago, USA)

14:20 ***Exact Geometrical Optics Scattering by Metallic Structures with Sharp Edges Subjected to Multiple Plane Waves Illumination***
Piergiorgio L.E. Uslenghi (University of Illinois at Chicago, USA)

14:50 ***RCS Resonances for Canonical Structures***
Yury Shestopalov (University of Gävle, Sweden)

15:10 ***Method of Total Fields for Diffraction Problems between Different Media***
Husnu Deniz Basdemir (Cankaya University, Turkey)

15:30 ***Reactive Surfaces as Half-Duals of PECs/PMCs***
Raphael Kastner (Tel Aviv University, Israel)

15:50 ***Depolarization Diversity***
Alan Frid (Shamoon College of Engineering, Israel);
Yehuda Ben-Shimol, Nathan Blaunstein (Ben-Gurion University of the Negev, Israel)

MM2: Metamaterials 2
Room 4 9:00-10:50

Chairs: Constantine A. Balanis (Arizona State University, USA)
Ozgur Ergul (Middle East Technical University, Turkey)

9:00 ***Circular Metasurfaces for Curvilinear Radiating Elements***
Constantine A. Balanis (Arizona State University, USA)

9:30 ***Analysis of Composite Structures Involving Near-Zero-Index Materials***
Yesim Koyaz, Hande Ibili, Bariscan Karaosmanoglu, and Ozgur Ergul (Middle East Technical University, Turkey)

9:50 ***Metasurfaces for Radar Cross-Section Reduction***
Constantine A. Balanis and Anuj Y. Modi (Arizona State University, USA)

10:10 ***Numerical Modeling of Tunable Multilayer Graphene-Based Metasurfaces and Metadevices for Nanophotonics***
Alexander M. Lerer (Southern Federal University, Russia)

10:30 ***4D Scatterers based on Optically Reconfigurable Volumetric RF Metamaterials***
Dmitry Filonov (Tel Aviv University, Israel);
Dmitry A Dobrykh and Anna Mikhailovskaya (ITMO University, Russia);
Pavel Ginzburg (Tel Aviv University, Israel)

MM3: Metamaterials 3
Room 4 11:10-13:00

Chairs: Kumar Vijay Mishra (The University of Iowa, USA)
Giacomo Oliveri (University of Trento, USA)

11:10 ***Metamaterial-by-Design - A Paradigm for the Industrial Synthesis of EM Manipulation Devices***
Giacomo Oliveri (University of Trento & ELEDIA Research Center, Italy); Angelo Gelmini and Giorgio Gottardi (ELEDIA Research Center, University of Trento, Italy); Marco Salucci (ELEDIA Research Center, Italy)

11:30 ***Microwave Response of a Microstrip Circuit Embedding Carbon Nanotube Films***
Antonio Maffucci (University of Cassino and Southern Lazio & National Institute of Nuclear Physics, INFN-LNF, Italy); Marco Donald Migliore (University of Cassino, Italy); Fulvio Schettino (Università degli Studi di Cassino, Italy); Daniele Pinchera (University of Cassino, Italy); Alesia Paddubbskaya (Belarusian State University, Belarus); Sarah Sibilia (University of Cassino and Southern Lazio, Italy)

11:50 ***Retrieval of Polarizability Matrix for Metamaterials***
Quang Nguyen (United States CCDC Army Research Laboratory, USA); Kumar Vijay Mishra (The University of Iowa, USA); Amir I Zaghloul (US Army Research Laboratory & Virginia Tech, USA)

12:10 ***Simple way of Frequency Tuning using Pin Diode of Transmission type Digital Metasurface***
Amit Baghel and Shashank Kulkarni (IIT Guwahati, India); Sisir Kumar Nayak (Indian Institute of Technology Guwahati, India)

UA1: Short Course: Unconventional Array Design 1
Room: Royal H 9:00-10:50

9:00 ***Short Course: Unconventional Array Design for New Generation Communications and Sensing***
Andrea Massa (University of Trento, Italy); Giacomo Oliveri (University of Trento & ELEDIA Research Center, Italy); Paolo Rocca (University of Trento, Italy)

UA2: Short Course: Unconventional Array Design 2
Room: Royal H 11:10-13:00

UA3: Short Course: Unconventional Array Design 3
Room: Royal H 14:20-16:10

PT2: Packaging & Thermal Management 2

Room 5 9:00-10:50

Chairs: Avram Bar-Cohen (Raytheon, USA)
Aviv Ronen (Rafael, Israel)

9:00 ***Pushing the Borders of Fan out Wafer Level Packaging***
Horst Theuss (Infineon Technologies AG, Germany)

9:30 ***CT Detectors - Design Challenges***
Raffy Goshen (Philips, Israel)

9:50 ***Flip Chip Ball Grid Array (FCBGA) package development for a high band width switch***
Nuphar Lipkin (Mellanox, Israel)

10:10 ***Packaging for Electro-optical Devices***
Galit Zilberman (Elbit Systems, Israel)

10:30 ***Design for Reliability for Microelectronic Packages Manufactured in Low Volumes***
Jonathan Rothschild and Tatyana Schwierz-Iosefzon (Rafael, Israel)

PT3: Packaging & Thermal Management 3

Room 5 11:10-13:00

Chairs: Nuphar Lipkin (Mellanox, Israel)
Galit Zilberman (Elbit Systems, Israel)

11:10 ***Role of Electronic Packaging in 5G***
Ivan Ndip (Fraunhofer IZM, Germany)

11:40 ***High Precision Dry and Fluxless Die Eutectic Bonding Process***
Lior Miller (Rafael, Israel)

12:00 ***Understanding Variation in High Performance MEMS Resonators***
Dean Spicer (Teledyne Micralyne, Canada)

12:20 ***High Conductivity Die Attach and Shielding Solutions for RF Devices***
Ruud de Wit (Henkel, The Netherlands)

12:40 ***Thermal Simulations of Pulsed GaN HEMT Devices***
Raoul Guggenheim and Lior Rodes (Rafael, Israel)

PT4: Packaging & Thermal Management 4

Room 5 14:20-16:10

Chairs: David Ratner (Rafael, Israel)
Gennady Ziskind (Ben-Gurion University of the Negev, Israel)

14:20 ***Thermal Management of Heterogeneous Microsystems***
Yogendra Joshi (Georgia Institute of Technology, USA)

14:50 ***CVD diamond films for thermal management applications***
Shusmitha Kyatam and Debarati Mukherjee (Instituto de Telecomunicações, Portugal); Armindo Silva (Universidade de Aveiro, Portugal); Luis Nero Alves (DETI, Universidade of Aveiro, Instituto de Telecomunicações & Instituto de Telecomunicações, Portugal); Shlomo Rotter (Smart Diamond Technologies, Lda, Portugal); Miguel Neto, Filipe Oliveira and Rui Silva (University of Aveiro, Portugal); Hugo Neto (PICadvanced, Portugal); Joana C Mendes (Instituto de Telecomunicações, Portugal)

15:10 ***Supercritical CO2 as cooling fluid for high power devices***
Anatoly Parahovnik and Yoav Peles (University of Central Florida, USA)

15:30 ***Enhancing the efficiency of Electronic Cooling Devices by Bio-coatings***
Ali Kosar, Veysel Kaya and Ozlem Kutlu (Sabanci University, Turkey)

15:50 ***Intel First Coreless Package Qualification***
Roman Rechter (Intel Corporation, Israel)

SP3: Signal Processing & Imaging 3

Room: Royal J 14:20-16:10

Chairs: Sergey Ivashov (Bauman Moscow State Technical University, Russia)
Luiz Kretly (UNICAMP, Brazil)

14:20 ***Submillimeter-wave Imaging: Applications and Technologies***
Erich Grossman (NIST, USA)

14:50 ***Machine Learning for Detecting Anomalies in SAR Data***
Yuval Haitman, Stanley R. Rotman and Itay Berkovich (Ben-Gurion University of the Negev, Israel)

15:10 ***Detection of Water Inclusions in Honeycomb Composite Products by a Holographic Radar***
Sergey Ivashov (Bauman Moscow State Technical University, Russia); Margarita Chizh (Bauman Moscow State Technical University & Remote Sensing Laboratory, Russia); Andrey Zhuravlev and Vladimir Razevig (Bauman Moscow State Technical University, Russia)

15:30 ***A Variable Step Perturb and Observe Algorithm for Maximum Power Point Tracking Based on Modified Newton-Raphson Method***
Jorge Carvalho (University of Campinas, Brazil); Luiz C. Kretly (Unicamp, Brazil)

15:50 ***Comparison of Different NDT Methods in Diagnostics of Rocket Cryogenic Tanks Thermal Protection Coating***
Sergey Ivashov, Vladimir Razevig and Andrey Zhuravlev (Bauman Moscow State Technical University, Russia); Timothy Bechtel (Franklin & Marshall College, USA); Margarita Chizh (Bauman Moscow State Technical University & Remote Sensing Laboratory, Russia)

KN3: **Plenary Keynote Presentations 3**
Rooms: Grand Ballroom ABC 16:20-17:30
Chairs: Amir Landesberg (Technion, Israel)

16:20 ***Velocity tomography imaging and tumor treatment planning***
Avraham Suhami (Elscint, Israel)

16:55 ***Wireless Century Perspective: 5G/IoT (Internet of Things) and a Vision for 6G/IoE (Internet of Everything)***
Richard D. Gitlin (University of South Florida, USA)

CL: **Closing Plenary Session**
Rooms: Grand Ballroom ABC 17:30-18:00

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Tuesday, November **5**

Room 4

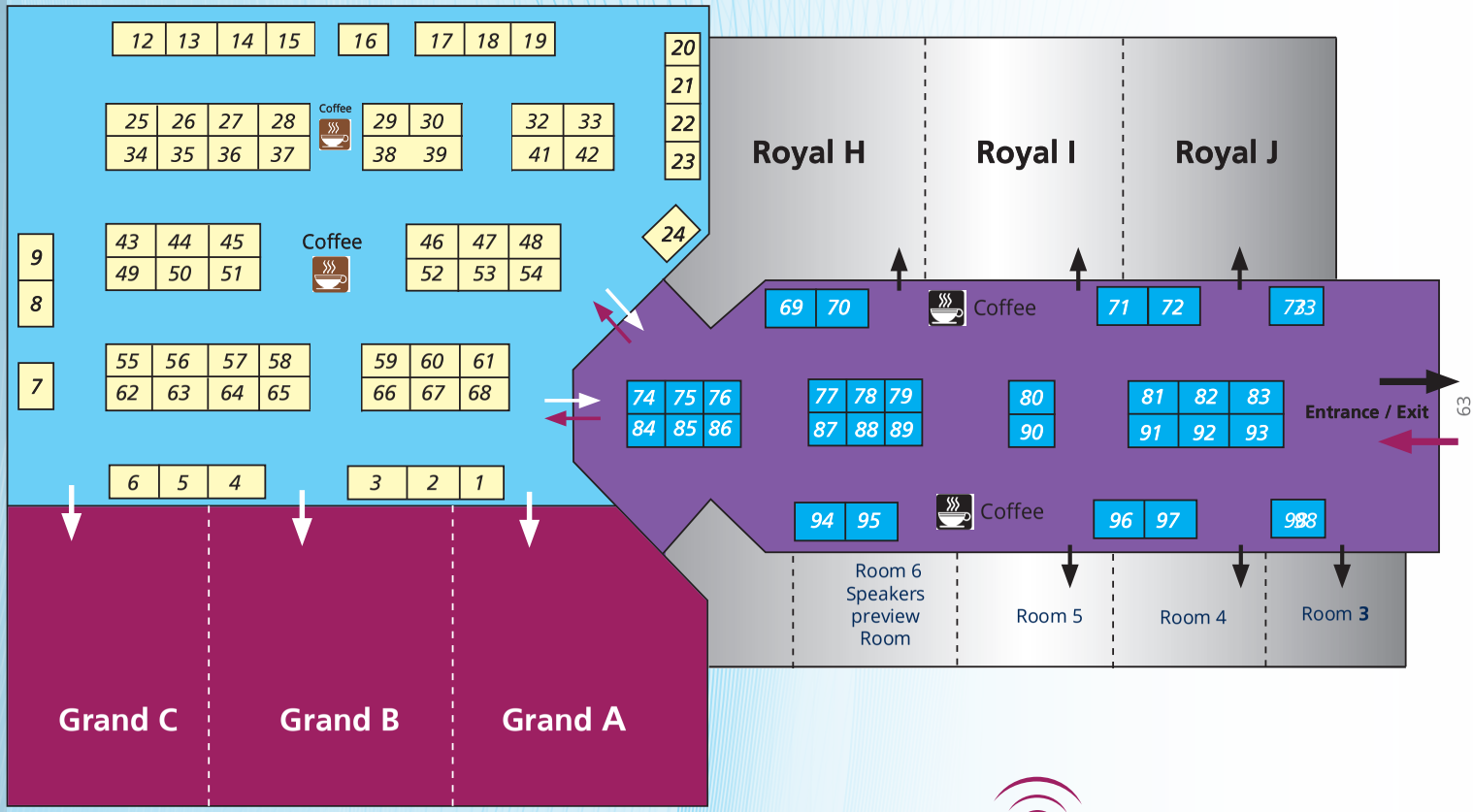
09:30	**The (R)evolution of Spectrum and Signal Analysis: From a Hardware to a Signal Centric Approach** Giovanni D'Amore, *Keysight Technologies*
10:00	**Bits-to-Beams Signal Chain - RF Technology Evolution for 5G mmWave Radios** Kerem Ok, *Analog Devices*
10:30	**Introduction to 5G New Radio** Shlomi Cohen, *Keysight Technologies*
11:00	**Calibration and Evaluation of Core ICs for Antenna Beam Forming Applications** Dr. Solon J. Spiegel, *RIO SYSTEMS*
11:30	**Automotive Radar Simulation Flow at 77 GHz Using HFSS FEM, IE, and SBR+ Solvers** Vladimir Vulfin, *EM Infinity and ANSYS*
12:00	**Physical and Virtual Testing Synergic Approach to ADAS Radar Performance Verification and Optimization** Fumia Giovanni, *IDS Ingegneria dei Sistemi*
12:30	**Streamlining Radio Communication Link Design From Spec to Production** Joel Kirshman, *AWR Group, NI*

IEEE COMCAS WirelessApps Sessions

Tuesday, November **5**

Room 4

13:00	**Electrical Modeling Across Chip, Package, and Board for Maximum Fidelity** Yuval Shay, *Cadence*
14:15	**Next Challenges in the Comint and Elint World** Gil Elram, *Keysight Technologies*
15:00	**The Future is Light! Discussing the Rapidly Evolving Technology Landscape in SATCOM** Chad Trevithick, *HUBER+SUHNER*
15:30	**Implementing Chip, Package, and Board Using a Co-Design Environment** Yuval Shay, *Cadence*
16:00	**Emulation of RCS Measurements Using Field Generators in WIPL-D Software Suite Environment** Branko Mrdakovic, *WIPL-D*
16:30	**Two-Phase Electronics Cooling** Bryan Muzyka, *Advanced Cooling Technologies*
17:00	**Using Intellectual Property to Protect Your Innovations in a Global Marketplace** Marc K. Weinstein, *Oblon*



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