



The 2018 IEEE MTT-S
International Microwave Symposium
10-15 June 2018, Philadelphia, PA



“Microwaves, Medicine, Mobility” Don't miss IMS2018 in Philadelphia!

The 2018 IMS Microwave Week is held, 10 - 15 June 2018, at the Pennsylvania Convention Center in Philadelphia. Register today for the IMS Microwave Week of conferences, including the Radio Frequency Integrated Circuits (RFIC) Symposium, International Microwave Symposium (IMS), and the Automatic Radio Frequency Techniques Group (ARFTG) Conference. Unique to the 2018 IMS Microwave Week, the International Microwave Bio-Conference (IMBioC) will be a co-located conference.

IMS Microwave Week – At a Glance

Sunday, 10 June 2018	Workshops, Short Courses RFIC Plenary, Joint Industry Show Case & Interactive Forum, RFIC Reception
Monday, 11 June 2018	Workshops, Short Courses, RF Bootcamp; Three Minute Thesis (3MT®) Competition RFIC Technical Sessions, Panel Session, IMS Historical Exhibit IMS Plenary, Welcome Reception
Tuesday, 12 June 2018	IMS, RFIC Technical Sessions and Interactive Forum; Student Design Competition IMS Exhibition, Historical Exhibit, Industry Workshops & MicroApps 5G Summit and Lunch Panel; Joint IMS/RFIC Panel Session Young Professionals (YoPros) Panel, Networking Event Amateur Radio (HAM) Talk and Networking Reception
Wednesday, 13 June 2018	IMS Technical Sessions, Panel, and Interactive Forums IMS Student Design and Student Paper Competition IMS Exhibition, Historical Exhibit, Industry Workshops & MicroApps Industry Hosted Reception; MTT-S Awards Banquet
Thursday, 14 June 2018	IMS Technical Sessions and Interactive Forums; Physicians Lunch Panel Session MTT-S Student Awards Luncheon; (Student) Career Counseling Fair (1:00 – 2:30 PM) IMS Exhibition, Historical Exhibit, Industry Workshops & MicroApps IMS Closing Ceremony; Also, IMBioC Opening Ceremony Women in Microwaves Panel Session and Networking Reception
Friday, 15 June 2018	Workshops, Short Courses ARFTG Conference and Exhibition; IMBioC Technical Sessions and Exhibition

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PENNSYLVANIA CONVENTION CENTER • PHILADELPHIA, PENNSYLVANIA, USA

Exhibition Dates: 12–14 June 2018 • Symposium Dates: 10–15 June 2018



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IMS2018 Keynote Speakers

Plenary Session Talk Monday, 11 June 2018



Stephen K. Klasko, MD, MBA
President and CEO, Thomas Jefferson
University and Jefferson Health

“The Hitchhiker’s Guide to the Healthcare Galaxy: The Actions That Changed the Healthcare Landscape in America from 2017-2027”

The author of the books, *We CAN Fix Healthcare* and *The Phantom Stethoscope*, President Klasko uses science fiction to challenge audiences to imagine an ideal future and identify what it takes to design that future today. He reviews twelve “disruptors” for the demise of the old healthcare system and shows how each is an opportunity to take the trends and incremental steps we see today and create the transformations and disruptions tomorrow.

Closing Session Talk Thursday, 14 June 2018



Nader Engheta, PhD
H. Nedwill Ramsey Professor
University of Pennsylvania

“Extreme Platforms for Extreme Functionality”

Platforms with unprecedented “extreme” electromagnetic features can now be constructed, providing ample opportunities for manipulating, tailoring, and sculpting waves and fields at various scale lengths. We have been exploring a series of phenomena related to the wave-matter interaction in platforms with extreme scenarios, such as near-zero-index materials and specially engineered materials that solve equations as waves go through them. These “extreme platforms” offer new opportunities for functional devices in the future.

Closing Session Talk Thursday, 14 June 2018



Dr. Nicholas J. Ruggiero II, MD
Thomas Jefferson University

“Renal Denervation for Uncontrolled Hypertension: Complexity After Symplicity”.

Renal denervation for uncontrolled hypertension was demonstrated to be extremely successful in many early trials. The large, randomized, pivotal US trial, Symplicity HTN 3, unfortunately showed no benefit in comparison to optimal medical therapy. These results bridled enthusiasm for this technology and accounted for many companies to desert the premise altogether. Fortunately, those who believe in the procedure are pressing forward and multiple new trials which are currently enrolling will ultimately determine the future of renal denervation.



The IMS Welcome Reception will be held on Monday, 11 June 2018 at the historic Reading Terminal Market Building in Philadelphia. The reception immediately follows the conclusion of the IMS Plenary Session. The plenary session attendees will be led, as a parade, to the Reading Terminal Market by the “Mummers”.

For the latest on IMS and Microwave Week visit www.ims2018.org

Technical Sessions, Tuesday, 12 June 2018

Time	Room Number, Location								
	201A	201B	201C	202AB	203AB	204A	204B	204C	Exhibition Area
08:00 - 09:40			Session Tu1C Advances in Combiners and Dividers	Session Tu1D Novel MW and MMW Materials, Devices, and Radiating Structures			Session Tu1G Resonator-based Sensors	Session Tu1H Advanced Structures using Additive Manufacturing Process	
09:40 - 10:10	AM Coffee Break, Grand Hall and Exhibition Hall								
10:10 - 11:50			Session Tu2C Recent Developments in Passive Circuits	Session Tu2D Advances in Modeling and Design Optimization	Session Tu2E Focus Session Radio to Terahertz Waves toward Nanoscale Sensing, Imaging and Characterization of Biological Samples		Session Tu2G Advances in Near-Range Radar Sensors	Session Tu2H 3D-Printed Waveguide Structures	IMS Student Paper Competition
11:50 - 13:30	IMS/RFIC Panel Can a residential wireless Gbs internet connection compete with wired alternative?								
13:30 - 15:10		Session Tu3B Nonlinear Circuit Analysis, Modeling, and Distortion Compensation	Session Tu3C Advances in Millimeter-Wave Integrated Waveguide Components and Transitions	Session Tu3D Advances in Numerical Modelling for Multi-Scale and Multi-Physics Applications	Session Tu3E Advances in Microwave and Terahertz Applications in Nanotechnology	Session Tu3F Biomedical Radar	Session Tu3G Advances in Backscattering and RFID Circuits	Session Tu3H Novel Package-PCB Integration Concepts	
15:10 - 15:55	PM Coffee Break (15:10 - 15:40), Exhibition Hall								
15:55 - 17:15		Session Tu4B Focus Session Non-Doherty Load Modulated Power Amplifiers	Session Tu4C Integrated Wave-guide Structures and Techniques	Session Tu4D Novel Theoretical Approaches in MW Structure Analysis & Design	Session Tu4E Nano-Scale Devices and Antennas		Session Tu4G Advances in Chipless and RFID Sensors	Session Tu4H Novel Interconnects for W- and D-band	TUIF1: Interactive Forum #1
Technical Track Key: Field, Device and Circuit Tech. Passive Components Active Components Systems & Applications Emerging Technical Areas Focus or Special Sessions									

Also on Tuesday: 5G Summit; Industry Workshops; YoPros Panel and Networking Event; Amateur Radio Talk and Networking Reception; Prof. Herczfeld Celebration Event

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Technical Sessions, Wednesday, 13 June 2018

Time	Room Number Location									
	201A	201B	201C	202AB	203AB	204A	204B	204C	Exhibition Area	
08:00 – 09:40	Session We1A 5G sub-systems: from predistortion to complete link	Session We1B VHF-UHF Components and Analog Signal Processing	Session We1C Planar Multiplexers and Multi-Band Filters	Session We1D Advanced Behavioral Models of Devices and Systems	Session We1E Advanced MEMS Filters, Resonators, and Waveguides	Session We1F Si-based MMW-THz Circuits	Session We1G Enabling Array Components and Beam Forming Architectures	Session We1H High Performance Power Amplifiers		
09:40 – 10:10	AM Coffee Break, Grand Hall and Exhibition Hall									
10:10 – 11:50	Session We2A Multi GHz all Digital and Mixed Signal Circuit and Systems	Session We2B Advances in Mixers and Frequency Multipliers	Session We2C Filter Tuning, Synthesis, and Innovative Coupling Realizations	Session We2D Trapping Phenomena in GaN HEMTs	Session We2E Ferrite, Ferroelectric, and Phase-Change Components	Session We2F THz and mm-Wave Amplification Multiplication and Control Innovations	Session We2G Phased Array Systems and Applications	Session We2H High Power Doherty Power Amplifiers	WEIF1: Interactive Forum #2	IMS Exhibition, MicroApps Seminars
11:50 – 13:30	IMS Panel Body Wearable Technology; is it still relevant and what's its future?									
13:30 – 15:10	Exhibit Hall Only Time; No Technical Sessions									
15:10 – 15:55	PM Coffee Break (15:10 - 15:40), Exhibition Hall									
15:55 – 17:15	Session We3A Novel Microwave Circuits and Systems Applications	Session We3B Focus Session Emerging RF switch technologies for 5G and defense applications			Session We3E Microwave Acoustic Components for Wireless Applications	Session We3F Terahertz and mm-wave Technologies and Applications	Session We3G Broadband Radar Systems and Technologies	Session We3H Special Session Women in Microwaves: Research on Biomedical Applications	WEIF2: Interactive Forum #3	
Technical Track Key:	Field, Device and Circuit Tech.	Passive Components	Active Components	Systems & Applications	Emerging Technical Areas	Focus or Special Sessions				

Also on Wednesday: Industry Workshops; Prof. Haddad Celebration Event Industry Hosted Reception; MTT-S Awards Banquet

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Technical Sessions, Thursday, 14 June 2018

Time	Room Number Location									
	201A	201B	201C	202AB	203AB	204A	204B	204C	Exhibition Area	
08:00 – 09:40	Session Th1A Advanced Technologies for Non-Planar Filters and Duplexers	Session Th1B Advanced Rectifiers and Energy Harvesters for Wireless Power Transfer	Session Th1C Electromagnetic Biosensing	Session Th1D IMS/ARFTG Advanced High Frequency Large Signal Measurement Techniques	Session Th1E Recent Advances in Terahertz and Photonics	Session Th1F RF Transceiver Architecture for MIMO and Beam Steering		Session Th1H Doherty and Load-Modulated Power Amplifiers		IMS Exhibition, MicroApps Seminars
09:40 – 10:10	AM Coffee Break, Grand Hall and Exhibition Hall									
10:10 – 11:50	Session Th2A Synthesis and Design of Non-Planar Filters and Multiplexers	Session Th2B Recent Developments in Wireless Power Transfer Techniques	Session Th2C Hyperthermia Treatment and Implants Wireless Powering	Session Th2D IMS/ARFTG Session Innovative mm-wave calibration and measurement techniques	Session Th2E Focus Session Integrated Microwave Photonics for Millimeter-wave and 5G Applications	Session Th2F Focus Session 5G Millimeter-Wave Beamformers and Phased-Arrays		Session Th2H Millimeter Wave Broadband Power Amplifiers	THIF1: Interactive Forum #4	
11:50 – 13:30	IMS Panel 5G mmW PA/FEM: Si or III-V who will win the race?						IMS Physicians Panel (12:00 - 14:00) Utilization of RF/Microwave in Medicine			
13:30 – 15:10	Session Th3A New Tuning Concepts for 3-D, Planar, and Integrated Filters and Duplexers	Session Th3B Focus Session Techniques and Components for High-Power Microwave Technology	Session Th3C Biomedical Devices	Session Th3D Advances in CMOS Microwave and Millimeter Wave Signal Sources	Session Th3E Advances in Semiconductor Monolithic Integrated Circuit Technology	Session Th3F THz and mm-Wave Sensing and Communication Systems		Session We3H Advances in Low Noise Technology	IMS Student Career Fair	
15:10 – 15:55										

Technical Track Key:

Field, Device and Circuit Tech.

Passive Components

Active Components

Systems & Applications

Emerging Technical Areas

Focus or Special Sessions

Also on Thursday: Industry Workshops; IMS Closing and IMBioC Opening Ceremony and Reception, Women in Microwaves Panel

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Workshops, Short Courses

Day	Morning (08:00 – 11:50)	Afternoon (13:30 – 17:15)
Sunday, 10 June 2018	WSA: RFIC Design in CMOS FinFET and FD-SOI	
	WSB: ICs for Quantum Computing and Quantum Technologies	
	WSC: 5G mm-Wave Power Amplifiers, Transmitters, Beamforming Techniques and Massive MIMO	
	WSD: eXtreme-bandwidth: architectures for RF and mmW transceivers in nanoscale CMOS	
	WSE: Integrated mm-wave & THz sensing technology for automotive, industrial and healthcare	
	WSF: Advanced integrated RF filtering circuits and techniques	
	WSG: Synthesizer Design and Frequency Generation/Synchronization Schemes for High-Performance Wireless Systems	
	WSH: High-performance WLAN transceiver Design and Calibration Techniques	
	WSI: High Efficiency Power Amplification for Emerging Wireless Communications Solutions from Devices to Circuits and Systems	
	WSJ: Millimeter-wave Systems; Manufacturing, Packaging and Built-in Self Test	
		WSK: Towards Direct Digital RF Transceivers
	WSL: Ultra Low-Power Transceiver SoC Designs for IoT Applications	
Monday, 11 June 2018	SMA: Practical computer modeling for electromagnetic medical device design	
	WMH: Microwave and Millimeter-wave Radiometers: Component Technologies, System Architectures, and Emerging Applications	
	WMA: Wireless Technologies for Implantable and Wearable Systems	
	WMB: Microwave to THz imaging technologies for biomedical applications	
	WMC: 3D-/4D-/Inkjet-Printed RF Components and Modules for IoT, 5G and Smart Skin Applications	
	WMD: Power Amplifier Technologies for 5G Communications Systems	
	WME: Digital Pre-Distortion and Post-Correction from DC to mmWave for Wireline and Optical Communications	
	WMF: Microwaving cells: from biological effects to innovative techniques for cell analysis	
	WMG: Recent Advances in Efficiency and Linearity Enhancement Techniques for RF Power Amplification	
	WMJ: Advanced Applications of Nonlinear Vector Network Measurements for broadband RF Power Amplifiers Design and Linearization	
	WMK: Affordable Phased-Arrays for SATCOM and Point-to-Point Systems Using Silicon Technologies	
	SMB: Fundamentals of Magnetic-Resonance Imaging	
	WMI: Automotive Radar and Vehicular Network Security	
Friday, 15 June 2018	SFA: Multi-Beam Antennas and Beam-Forming Networks	
	WFD: Advanced Synthesis techniques for reduced size filtering networks	
	WFA: Ultra-Low-Power Nanowatt to Microwatt Receivers for the Internet of Things	
	WFB: RF Front-Ends for Enhanced Mobile Communications towards 5G	
	WFF: Tunable Passive Devices for Multi-band Systems	
	WFG: Advances in Linearization Techniques for 5G and Beyond	
	WFH: Module Integration and Packaging/IC Co-Integration for Millimeter-wave Communications and 5G	
	WFI: Innovative Technologies for RF and millimeter-wave Tuning and Switching	
	WFJ: Design of Matching Networks for Optimal Performance of Power Amplifiers and Transmitters	
	WFK: The New GaN: Advancements in novel-materials based GaN Microwave and mm-Wave Technologies	
	WFE: Recent advances in non-linear and non-reciprocal RF microwave devices	
	SFB: Using active fiber optic for distributed antenna system (DAS) system in 5G MIMO system and automobile radar system	

For the latest on IMS and Microwave Week visit www.ims2018.org

5G Summit, Panel Sessions, RF Boot Camp

5G Summit, Tuesday, 12 June 2018; Room 103

The 5G Summit, at the Pennsylvania Convention Center in Philadelphia, is an IEEE event that is organized by two of IEEE's largest societies – MTT-S and ComSoc. This special collaboration, for the second year running, complements MTT-S' "hardware and systems" focus with ComSoc's "networking and services" focus. The one-day Summit features talks from experts from government, academia, and industry experts on various aspects of 5G services and applications. It's further complemented by the 5G Pavilion at the IMS2018 exhibition where table top demonstrations and "fire-side" chats are presented at the 5G theater.

5G Summit Speakers:



"Bringing the World Closer Together"

Jin Bains
Head of Connectivity, SCL, Facebook



"AT&T Perspectives on 5G Services"

David Lu
Vice President, AT&T

Other featured presentations from Huawei, GM, Keysight, NI, Global Foundries, MACOM as well as academia will include following topics:

- Spectrum/Regulatory
- Infrastructure/Trials, Applications
- Technologies, Circuits, Systems
- Design, Test & Measurement Challenges
- Test-bed Services for 5G

Lunchtime Panel session: "mmWave Radios in Smartphones: What they will look like in 2, 5, and 10 years"

For complete agenda visit: www.ims2018.org/5g-summit

Panel Sessions

Can a residential wireless Gbps internet connection compete with wired alternatives?

Tuesday, 12 June 2018, 12:00-13:00,
Room 201A

5G PA/FEM: Si or III-V - who will win the race?

Thursday, 14 June 2018, 12:00-13:00,
Room 201A

Body Wearable Technology: is it still relevant and what is its future?

Wednesday, 13 June 2018, 12:00-13:00,
Room 201A

Physicians Panel: Utilization of RF/Microwaves in Medicine

Thursday, 14 June 2018, 12:00-14:00,
Room 204B

RF Boot Camp, Monday, 11 June 2018; Room 109B

This one-day course is ideal for newcomers to the microwave world, such as technicians, new engineers, college students, engineers changing their career path, as well as marketing and sales professionals looking to become more comfortable in customer interactions involving RF & Microwave circuit, and system concepts and terminology. The format of the RF Boot Camp is like that of a workshop or short course, with multiple presenters from industry and academia presenting on a variety of topics including:

- The RF/Microwave Signal Chain
- Network Characteristics, Analysis and Measurement
- Fundamentals of RF Simulation
- Impedance Matching & Device Modeling Basics
- Introduction to RF and Microwave Filters
- Spectral Analysis and Receiver Technology
- Signal Generation
- Modulation and Vector Signal Analysis
- Microwave Antenna Basics
- Introduction to Radar and Radar Measurements

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Exhibition, Mobile App, Key Deadlines

Exhibition Overview:

The Exhibition consists of over 600 exhibiting companies who represent the state of the art when it comes to materials, devices, components, and subsystems, as well as design and simulation software and test/measurement equipment. Whatever you are looking to acquire, you will find the industry leaders ready and willing to answer your purchasing and technical questions.

Exhibition Dates and Hours

Tuesday, 12 June 2018	09:30 to 17:00
Wednesday, 13 June 2018	09:30 to 17:00
Exhibit-Only Time:	13:30 to 15:10
Industry Hosted Reception:	17:00 to 18:00
Thursday, 14 June	09:30 to 15:00

MicroApps

The Microwave Application seminars (MicroApps) offered Tuesday, 12 June through Thursday, 14 June, 2018, provide a unique forum for the exchange of ideas and practical knowledge related to the design, development, production, and test of products and services. MicroApps seminars are presented by technical experts from IMS2018 exhibitors with a focus on providing practical information, design, and test techniques that practicing engineers and technicians can apply to solve the current issues in their projects and products.

Industry Workshops

The Industry Workshops are 2-hour industry-led presentations featuring hands-on, practical solutions often including live demonstrations and attendee participation. These Workshops are open to all registered Microwave Week attendees at a nominal charge.

Visit <https://ims2018.org/exhibition> for more information.

IMS Microwave Week Mobile App:

The IMS Microwave Week app is now available in the Apple App store and Google Play store. Install the app on your Android or iOS device to view the full schedule of Workshops, Short Courses, IMS and RFIC Technical Sessions, IMBioC, ARFTG, Panel Sessions, Social Events and Exhibition information. On-site during Microwave Week you will be able to download IMS and RFIC papers, locate exhibitors, upload photos and explore all that Philadelphia, PA has to offer! Download today!



Apple App Store



Google Play Store

Key Deadlines:

Early Bird Registration Deadline: 14 May 2018
Advance Registration Deadline: 8 June 2018
Housing Bureau Deadline: 18 May 2018

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