2015 IEEE Radio & Wireless Week

FINAL PROGRAM

Omni Hotel
San Diego, California, USA
25–28 January, 2015

RWW & RWS General Chair:
Karl Varian

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IEEE Microwave Theory and Techniques Society (MTT-S)
IEEE Antennas and Propagation Society (APS)
IEEE Engineering in Medicine & Biology Society (EMBS)

http://www.radiowirelessweek.org

General Chair's Invitation to the IEEE Radio and Wireless Week

I have the great honor and pleasure to invite you to the 2015 IEEE Radio Wireless Week (RWW). This will be the ninth RWW and our third time in San Diego.

RWW2015 will be held at the Omni San Diego Hotel, San Diego, California, 25 – 28 January, 2015. The venue is nestled in the heart of the historic Gaslamp Quarter, and is just moments away from the city´s top sites and attractions. With many wireless semiconductor companies, aerospace and defense industry, as well as world class universities in the area, San Diego will be a great location for all the attendees. RWW2015 consists of five related conferences that focus on the intersection between wireless communication theory, systems, circuits, and device technologies creating a unique forum for engineers to discuss various technologies for state-of-art wireless systems and their end-use applications. The conference targets to bridge the gap between digital, RF, hardware, and software that need to be seamlessly combined to keep wireless industry and mobile applications growing.

RWW's multidisciplinary events bring together innovations that are happening across the broad wireless spectrum. It is our hope that RWW is a place where you will not only find discussions or present problems, but you will also be inspired by the diverse technical content that might spark ideas for future research. The diversity of RWW is underlined by three diverse co-sponsor IEEE societies: Microwave Theory and Techniques Society (MTT-S), Antennas and Propagation Society (APS), and Engineering in Medicine and Biology Society (EMBS).

In addition to traditional podium presentations and poster sessions, there will be a track for IEEE Distinguished Lectures, Sunday and Monday half day workshops, panels, industry exhibits, WirelessApps industry presentations, and a demo session. A highlight on Tuesday will be the plenary talk on "Wearable Wireless Sensor Technologies for Truly Personalized Medicine and Wellness" by Dr. Chris Van Hoof, who is Director of Wearable Healthcare at imec in Leuven, Belgium and Eindhoven, the Netherlands. Also on Tuesday afternoon, in its third year, there will be a demo session where presenters can bring in a demonstration of their latest wireless experiments for a hands-on interactive forum. Demo sessions are particularly appropriate with the spirit of RWW because we get to see and feel how people are tackling real-world problems to address the next wireless innovation.

To support and encourage students pursuing a career in wireless area, each conference will have a student paper competition with awards that will be presented at the Tuesday banquet. On Monday afternoon, all student paper competition finalists will present their work in the poster session. I encourage you to check out what the next generation of wireless engineers are working on.

I would like to invite everyone to join us for 3 ½ days of great technical presentations, discussions, networking, and some fun in beautiful San Diego, California, 25-28 January 2015.

RWW2015 General Chair
Karl Varian

General Chair
Karl Varian

Technical Program Chair
Jeremy Muldavin

RWS 2015 Technical Program Committee

Passive Antennas
Chair: Jiang Zhu
James Schaffner, Marco Antoniades
Alessandro Cidronali, Goutam Chattopadhyay
Ahmed Kishk, Songnan Yang
Glauco Fontgalland, Arnaud Amadjikpe

Propagation Channel Modeling and Utilization
Chair: Daniel Benevides da Costa
Emery Chen, Michael Ong Lin Chuen
Changzhi Li

Transceivers and Front-end Technologies SOC and SiP
Chair: Shoichi Narahashi
Nathalie Deltimple, T.S. Jason Horng
Wasif Tanveer Khan, Telesphor Kamgaing
Hiroshi Okazaki, Xinwei Wang
Max Scardelletti

MIMO, Signal Processing and Smart Antennas
Chair: Ramya Bhagavatula
Yazhou Wang, Michael Chia
Eiji Okamoto, Dimitris Toumpakaris
Chau Yuen

High-speed and Broadband Wireless Technologies
Chair: Shilong Pan
Beatrice Cabon, Yik-Chung Wu
Idelfonso Tafur Monroy, Minoru Fujishima

Software Defined Radios and Cognitive Radios
Chair: Abbas Omar
Nuno Borges Carvalho, Yves Baeyens
Dimitrie C. Popescu, Lin Song
Ed Niehenke

Wireless Systems Architecture and Modeling
Chair: Markos Anastasopoulos
Ugo Dias, Hyun Kyu Chung
Vegas Olmos

Emerging Wireless Technologies and Applications
Chair: Sergio Pacheco
Debabani Choudhury, Chia-Chan Chang
Dimitrios Peroulis, Yoshihiro Kawahara
Zhen Ning Low

Digital Signal Processing as Applied to Wireless
Chair: Karl Molnar
Upkar Dhaliwal, Shin Hara
Swami Sankaran, Renato Negra
Xinwei Wang

Passive Components and Packaging
Chair: Rashaunda Henderson
Hualiang Zhang, Roberto Gomez-Garcia
Xun Gong, Dariush Mirshekar
Clemens Ruppel

Late News Papers
Chair: Sergio Pacheco
Takao Inoue, Karl Varian
Xun Gong, Charlie Jackson
Kevin Chuang, Telesphor Kamgaing

Invited Papers
Chair: Telesphor Kamgaing
Sergio Pacheco

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Topical Conference BioWireleSS Co-Chairs:
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Donald Lie, Texas Tech University
Jan-Erik Mueller, Intel

The 15TH Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems

Message from the SiRF General Chair:

Welcome to SiRF 2015!

The IEEE Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems (SiRF) continues moving forward to its 15th year. The establishment was inspired by the fast-growing capability of full system integration in silicon (Si) technology, combining high-speed digital and RF circuitry as a total solution. The early years of this conference were a time of pursuing for device and circuit performance in Si-based design. The advance of Si technology kept successfully demonstrating impressive progress, and steadily spreading the application spectrum into the millimeter-wave regime and higher.

It is now generally acknowledged that CMOS monolithic microwave integrated circuits (MMICs) is catching up with GaAs semiconductor technologies to deliver sufficient efficiency and fulfill the general requirement in a variety of commercial RF products that used to be a forbidden area to Si technology. The technical scope of this conference therefore has been greatly extended to a broad range of technology development and system applications. Device technologies include smart materials, nano-technologies, narrowwire and grapheme, Si photonics, and so on. Circuit and system applications cover designs of mixed-signal, microwave, millimeter-wave, and terahertz (THz) frequency bands, based on Si-related technology. System characterization takes into account heterogeneous System-in-Package (SiP), flexible electronics, and sensor systems. The critical development of SiGe BiCMOS and RF silicon-on-insulator (RFSOI) has been embedded in conversations in the conference venue. The conference offers an invaluable platform networking worldwide RF IC designers and researchers for experience sharing of amazing breakthroughs and dialogues of the future trends. SiRF2015 will continue as a part of Radio and Wireless Week (RWW) on Jan. 26-28 2015 in the harbor city of San Diego in Southern California, United States, where it participated RWW the first time. SiRF2015 is sponsored by IEEE Microwave Theory and Techniques Society (MTT-S).

To address the emerging technology and future direction of research and development, several reputed speakers are invited from the academia and industry to nourish conversations. The partial list of tentative speakers is as follows.

1. Prof. Erich Kasper, Stuttgart University, will present silicon monolithic millimeter-wave integrated circuit integration of millimeter-wave antenna with two terminal devices for medical applications.
2. Prof. Huei Wang, National Taiwan University, will discuss millimeter-wave IC design in CMOS technology.
3. Prof. Gabriel Rebeiz, University of California San Diego, will share research of tunable filter design.
4. Prof. Larry Larson, Brown University, will talk about the applications and challenges of Internet of Things.
5. Dr. Paul Colestock, Global Foundries, will show the roadmap of technology development.
6. Dr. Art Morris, Wispry, will present the company core technology of tunable/reconfigurable MEMS capacitors integrated into RFCMOS.

Furthermore, it is worth mentioning that in this year's conference a great focus session will be organized on topics related to RFSOI technology. Several talks from Qorvo, IBM, Tower Jazz and other companies will reveal current updates and future trends to the interested audience.

You are welcome to join us at SiRF2015 in January 2015. Authors please demonstrate your work summarized in a three-page manuscript in PDF format. Note that selected conference papers will be considered for publication in IEEE Transactions on Microwave Theory and Techniques with a significant extension through the regular review process.

Please visit us at http://www. silicon-rf.org to see further details. We will be meeting each other in San Diego!

Yours sincerely,

Chien-Nan Kuo, Ph. D.
National Chiao Tung University
cnkuo@mail.nctu.edu.tw
SiRF 2015 General Chair

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Julio Costa, Qorvo
Hasan Sharifi, HRL Laboratories

Technology, Devices and Modeling
Chair: Mehmet Kaynak, IHP GmbH
Julio Costa, Qorvo
Mingta Yang, Qualcomm
Katsuyoshi Washio, Hitachi
Guofu Niu, Auburn University
Harrie Tilmans, IMEC
Paul Hurwitz, Tower Jazz

Passives and MEMS
Chair: Jean-Pierre Raskin, UCL
Xun Gong, UCF
Pierre Blondy, University Limoges
Emmanuel Defay, LETI
Hasan Sharifi, HRL Laboratories

Circuits
Chair: Larry Larson, Brown University
Hermann Schumacher, Ulm University
Vince Fusco, Queens University of Belfast
Lance Kuo, Raytheon
Yunliang Zhu, Qualcomm
Austin Ying-Kuang Chen, Skyworks Solutions
Hsieh-Hung Hsieh, TSMC
Kenichi Okada, Tokyo Inst. of technology
Monte Miller, Freescale
Gang Liu, University of California San Diego

Applications and Wireless Architectures
Chair: Francesco Dantoni, TI
Donald Y. C. Lie, Texas Tech University
Chien-Nan Kuo, NCTU
Jürgen Hasch, Bosch
Yan Li, Qorvo
Himanshu Khatri, Qualcomm

Late News Papers
Chair: Sergio Pacheco, Freescale
Takao Inoue, National Instruments
Karl Varian, Raytheon
Xun Gong, University of Central Florida
Charlie Jackson, Northrop Grumman
Kevin Chuang, NanoSemi, Inc.
Telesphor Kamgaing, Intel

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Jae-Sung Rieh, Korea University
Clemens Ruppel, EPCOS AG
Hermann Schumacher, Ulm University
Vaclav Valenta, Ulm University
Katsuyoshi Washio, Tohoku University
Robert Weigel, University of Erlangen-Nuremberg

REGISTRATION HOURS

Registration is open during the following times at the Grand Ballroom Foyer:

Sunday, 25 January: 12:00-17:00
Monday, 26 January: 07:00-19:00
Tuesday, 27 January: 07:00-17:00
Wednesday, 28 January: 07:00-12:00

EXHIBIT HOURS

The exhibition area (Salons C,D,E) is open during the following times:

Monday, 26 January 2015 13:00 – 17:30
Tuesday, 27 January 2015 10:00 – 17:00

For the latest information and details on how to become a sponsor and exhibit at RWW please visit: http://www.radiowirelessweek.org/exhibits.

SOCIAL EVENTS

Complimentary Daily Breakfast (Mon.-Wed.)
Place: Palm Terrace
Time: 07:00-08:00

Complimentary Daily AM Coffee Breaks
Place: Salon CDE
Time: 9:40-10:10

Complimentary Daily PM Coffee Breaks
Place: Salon CDE
Time: 15:10-15:40

RWW Reception
Place: Palm Terrace
Monday 18:00-20:00

RWW/SiRF Awards Banquet
Place: Gallery 3B
Tuesday 18:30-21:00

RWW Topical Conferences

Power Amplifiers for Radio and Wireless Applications (PAWR)

Interest in power amplifier technology remains at an all time high because of the emergence of new device materials such as GaN that offer improved performance, and the need for ever greater linearity and efficiency by the world's expanding wireless communication infrastructure. This year, the Topical Conference on Power Amplifiers for Wireless and Radio Applications (PAWR) will feature a full day of power amplifier focused sessions, including the latest advances on power amplifier technology, efficiency enhancement techniques, system analysis, modeling and distortion reduction, an interactive workshop on Advances on Power Amplifiers for Modern Wireless Communications and a panel session on 5G Power Amplifier Technologies.

Technical Committee:

Distortion Reduction Techniques in RF Power Amplifiers

Chair: Allen Katz
Slim Boumaiza, Armando Cova
Kiki Ikossi, Jinsung Choi
Peter Kenington, Shabbir Moochalla
Timo Rahkonen, Joe Staudinger

High Efficiency RF Power Amplifiers

Chair: Arturo Mediano
James Komiak, Song Lin
Chao Lu, Mohammad Madihian
Frederick Raab, Dave Runton
Ali Tombak, John Walker

RF Power Amplifier Technology

Chair: Marc Franco
Nick Cheng, Nathalie Deltimple
Murat Eron, Gary Hau
Bumman Kim, Donald Lie
Zoya Popovic, Paolo Colantonio

Power Amplifier Modeling and System Analysis

Chair: Andrei Grebennikov
Francis Rotella, Robert Caverly
Almudena Suarez, Wolfgang Heinrich
Stephen Maas, Jose Carlos Pedro
Gene Tkachenko

Wireless Sensors and Sensor Networks (WiSNet)

WiSNet is dedicated to the advancement of wireless sensors for commercial and industrial applications and will be held to specifically focus on the latest developments in these areas of RF Sensors and Sensor Networks. Wireless sensors and sensor networks are critical system components for manufacturing, monitoring, safety, as well as positioning and tracking applications. This year, WiSNet2015 will be a full day topical conference focused on the latest developments in these areas. Different sessions will focus on sensors and smart sensor networks ranging from UHF, RFID applications to millimeter-wave radar systems.

Technical Committee:

Wireless Sensors for Communication, Radar, Positioning and Imaging Applications

Chair: Martin Vossiek
Changzhi Li, Aly Fathy
Mario Pauli, Kamal Samanta

Wireless Sensors for Localization, Tracking, and RFID Technologies

Chair: Manos M. Tentzeris
Xianming Qing, Apostolos Georgiadis
Hao Xin, Reinhard Feger

Wireless Integrated Sensors, Front-Ends, and Building Blocks

Chair: Linus Maurer
Huei Wang, Thomas Ussmueller
Nils Pohl, Andreas Baenisch
Daniela Dragomirescu, Holger Maune

Wireless Sensors for Harsh Environments, Home, Health and Communication

Chair: Alexander Koelpin
Georg Fischer, Arne Jacob
Maurizio Bozzi, Hendrik Rogier

Sensor Network Communication Architecture and Topologies

Chair: Rahul Khanna
Alexander Koelpin, Xun Gong
Huaping Liu

Multi-port Technology

Chair: Alexander Koelpin
Serioja Tatu, Iñigo Molina Fernández
Fadhel Ghannouchi, Tuami Lasri
Adriana Serban, Gabor Vinci

Wireless Sensors for Wearable Computing and Internet of Things

Chair: Rahul Khanna
Alexander Koelpin, Xun Gong
Huaping Liu

Invited Papers

Chair: Rahul Khanna
Alexander Koelpin

Biomedical Wireless Technologies, Networks, and Sensing Systems (BioWireleSS)

The IEEE Topical Conference on Biomedical Wireless Technologies, Networks, and Sensing Systems (BioWireleSS) will be a vital part of the IEEE Radio and Wireless Symposium, featuring the latest developments in wireless biomedical technologies, networks and sensing systems. The wireless revolution has begun to infiltrate the medical community with patient health monitoring, telesurgery, mobile wireless biosensor systems, and wireless tracking of patients and assets becoming a reality. The rapid evolution of wireless technologies coupled with powerful advances in adjacent fields such as biosensor design, low power battery operated systems, and diagnosing and reporting for intelligent information management has opened up a plethora of new applications for wireless systems in medicine.

Technical Committee:

Wireless Technologies for Biosignals and Modeling in Medical Environments

Chair: Jung-Chih Chiao
Alper Bozkurt, Natalia Nikolova
Marc Notten, Mohammad-Reza Tofighi
Aydin Farajidavar, Nicole McFarlane
Jeremy Holleman

Wireless Position and Localization in Medicine

Chair: Changzi Li
Andreas Stelzer, David Ricketts
Michael Kuhn, Upkar Dhaliwal
Aydin Farajidavar, Mohamed Mahfouz
Aly Fathy

PAN, BAN, Energy Scavenging and Remote Patient Monitoring

Chair: Changzhi Li
Dietmar Kissinger, Dominique Schreurs
David Ricketts, Yong Xin Guo
Syed Islam, Aydin Farajidavar

Micro-Sensors and In-vivo Microsystems

Chair: David Dubuc
Jung-Chih Chiao, Marc Notten
Michael Kuhn, Arnaud Pothier
Claire Dalmay, Katia Grenier
Alper Bozkurt, Syed Islam
Melika Roknsharifi, Joachim Oberhammer
Pingshan Wang, Hung-Wei Wu
Rizwan Bashirullah

Microwaves in Biological Applications and Interaction with Biological Tissues

Chair: Mohammad-Reza Tofighi
Yong Xin Guo, Victor Lubecke
Dominique Schreurs, Indira Chatterjee
Usmah Kawoos, Andre Vander Vorst
Katia Grenier, Jung-Chih Chiao
Arye Rosen, David Dubuc
Joachim Oberhammer

Medical Imaging and Applications

Chair: Natalia Nikolova
Arye Rosen, Usmah Kawoos
Anand Gopinath, Victor Lubecke
Changzhi Li, Mohammad-Reza Tofighi
Bashir Morshed

Invited Papers

Chair: Katia Grenier
Syed Islam

Focused Sessions & Others

Chair: Syed Islam
Katia Grenier

Technical Program for 2015 Radio Wireless Week (RWW)

WORKSHOPS/INDUSTRY FORUM/PANEL

SUNDAY, 25 JANUARY 2015 (13:30-17:30)

Workshop
Millimeter Waves in 5G: State of the Art and Potential

Room: Gallery 1

Organizer:
Wilhelm Keusgen, Fraunhofer Heinrich-Hertz-Institute, Berlin, Germany

The millimeter-wave frequency band is seen as a good candidate for future 5G mobile radio networks. The availability of multiple Gigahertz of bandwidth promises to be an answer to the ever increasing data rates in access and backhaul links. At the same time new challenges arise. Mass production of RF communication circuits for this band is at its beginning. The knowledge on the outdoor channel is still very limited. New approaches for integrated steerable high gain antennas are necessary to counter the higher path loss at the high frequencies. The network architecture is expected to become more and more heterogeneous with a mixture of different cell radii and the wide deployment of small cells.

With views from industrial and scientific research this workshop will give an overview on the state of the art and the huge potentials of millimeter-waves in 5G.

Speakers:

Millimeter-Waves for Future Mobile Communications
Wilhelm Keusgen, Fraunhofer Heinrich-Hertz-Institute, Germany

Hybrid Precoding and Channel Estimation Algorithms for Millimeter-Wave Systems
Robert W. Heath Jr., The University of Texas at Austin, USA

Performance evaluation of 5G cellular networks with millimeter-wave small-cell base stations
Kei Sakaguchi, Tokyo Institute of Technology and Osaka University, Japan

Channel Measurement and Modeling for Millimeter-Wave Mobile Communication
Richard Weiler, Fraunhofer Heinrich-Hertz-Institute, Germany

Hardware Realizations to Millimeter-Wave 5G Systems
Tauno Vähä-Heikkilä,
VTT Technical Research Centre of Finland, Finland

mmWave Technology Evolution for Next Generation Wireless Systems
Ali Sadri, Intel Corporation, USA

Unleashing Millimeter-Wave Frequencies – Test and Measurement Aspects
Andreas Rößler , Rohde & Schwarz USA Inc., USA

Workshop
RFID Technologies

Room: Gaslamp 3

Organizers:
Thomas Ussmueller, University of Innsbruck, Austria
Apostolos Georgiadis, CTTC, Spain

Radio-frequency identification (RFID) is a technology for wireless communication and sensing. Most of today's RFID tags are passive tags without their own power supply. Thus they have to rely on the electro-magnetic energy of the incoming data signal or on other sources of energy for powering the the tag.

This workshop is a tutorial workshop discussing the basic principles of RFID systems. The first talk will give an overview on RFID technologies. It will discuss the various available frequency bands their physical properties and their typical usage scenarios. In addition the talk will cover the different available RFID standards. The second talk will focus on wireless powering and the performance of the rectifier stages responsible for powering the RFID tag chip and consequently determining to a large extent the operating range of passive RFID tags. Subsequent talks will describe the communication principles of RFID systems and provide a summary of existing as well as potential applications of the technology.

Speakers:

Overview of RFID standards
Thomas Ussmueller, University of Innsbruck, Austria

Wireless Power Transmission for RFID-tags
Apostolos Georgiadis, Centre Tecnologic de Telecomunicacions de Catalunya (CTTT), Spain

Wireless Data Transmission in RFID Systems
Thomas Ussmueller, University of Innsbruck, Austria

RFID Applications: present, future and futuristic ones
Luca Roselli[1] and Alessandra Costanzo[2], [1]University of Perugia, [2]University of Bologna, Italy

SAW RFID-Transponder-based wireless systems and applications
Amelie Hagelauer, University of Erlangen-Nuremberg, Germany

Workshop
3D Printing and its Impact on Wireless Systems

Room: Gaslamp 2

Organizer:
Manos M. Tentzeris, Georgia Institute of Technology, USA

This workshop will be focused on alternative solutions to implement 3D circuit design and inkjet printing for new and emerging wireless systems. The speakers will focus their talks on inkjet printed wireless sensor networks and smart 3D surfaces.

Speakers:

Additive Manufacturing Techniques for RF Modules and WSN's
Manos Tentzeris, Georgia Tech, USA

Inkjet pritned antennas and circuits for energy harvesting and wireless sensors
Apostolos Georgiadis, CTTC, Spain

A novel reconfigurable origami accordion antenna
Benjamin Cook, Georgia Tech, USA

System in Package on Paper (SiPoP) technology as a means to realize extremely low cost 3D millimeter-wave circuits and systems
Luca Roselli, Perugia University, Italy

Smart Surfaces using WPT
Nuno Borges Carvalho, DETI – Instituto de Telecomunicações, Universidade de Aveiro, Portugal

Workshop
Advances on Power Amplifiers for Modern Wireless Communications

Room: Gaslamp 4

Organizer:
Slim Boumaiza, University of Waterloo, Canada

This workshop will be devoted to the design of Power Amplifiers for Modern Wireless Communications, spanning from Next generation Doherty to outphasing and special techniques for wideband amplifier.

Speakers:

Title: Next Generation Doherty and Outphasing Amplifiers
Leo de Vreede, University of Delft, Netherlands

The Doherty Power Amplifier for Broadband or Multiband Communication Systems
Paolo Colantonio, University of Roma Tor Vergata, Italy

Broadband Doherty Amplifier and Envelop Tracking Power Amplifier for Carrier Aggregated Signals
Slim Boumaiza, University of Waterloo, Canada

Varactor Based Dynamic Load Modulation Amplifiers for Wideband and Multiband Applications
Christian Fager, Chalmers University, Sweden

REGISTRATION

Advance registration for RWW 2015 is open now until January 5, 2015. Register now to take advantage of the early registration pricing! Please note that workshop fees are additional.

Please visit http://www.radiowirelessweek.org/attendees/registration-information/ for more information.

MONDAY, 26 JANUARY 2015

Workshop
Microwave Biosensing Developments in Asia

Time: 13:30-17:30
Room: Gallery 3AB

Organizer:
Hung-Wei Wu, Kun Shan University, J.-C. Chiao, University of Texas - Arlington, USA

In recent years, the development of advanced RF/microwave/wireless sensing techniques for emerging biomedical applications have made significant progresses and shown great promises for commercial uses and improving human well-being. Innovative technologies and integration of electromagnetics and biology have opened new opportunities for scientific researches and healthcare applications globally. The aims of this workshop are to report recent research achievements by invited experts from Asia and motivate interactive discussions among international attendees in the promising areas of RF, microwave and wireless biosensing. The workshop focuses on aspects of wireless sensor devices, bio-signals, bio-materials, biochemical sensing, wireless power transfer and vital sign detection.

Attendees in this workshop will be able to:
1. Obtain a broad, state-of-the-art overview of materials, devices, systems and measurement techniques for microwave biosensing technologies in five different regions;
2. Comprehend in-depth knowledge and technical obstacles in industry standards compliance, innovative research, and practical scenarios with sharing of firsthand experience from these experts;
3. Discuss critical issues and technical challenges facing in laboratories and commercialization;
4. Inspire new research ideas and share synergistic concepts among the global RF, microwave and wireless communities.

Speakers:

Wireless Sensor Microsystems for Medical Devices
Prof. Minkyu Je, Daegu Gyeongbuk Institute of Science & Technology (DGIST), Korea

Wireless Sensing and Measurement of Doppler Bio-signals and Biomaterials
Prof. Lixin Ran, Zhejiang University, China

State-Of-The-Art of Wireless Technologies for Medical Bio and Biochemical Sensing in Asia and Critical Aspects of Such Technologies
Prof. Agnes Tixier-Mita, University of Tokyo, Japan

Wireless Power Transfer Technology for Medically Implantable Devices
Prof. Franklin Young-Jae Bien, Ulsan National Institute of Science and Technology (UNIST), Korea

A Review on Microwave/Millimeter-wave Sensor Systems for Vital Sign Detection
Prof. Huei Wang, National Taiwan University, Taiwan

Industry Forum
Tutorial Workshop on Advances in SiGe BiCMOS Technology with Chip Scale Phased Array Applications

Time: 09:00-12:00
Room: Gallery 3AB

Organizer and Speaker: Gabriel M. Rebeiz, Wireless Communications Industry Endowed Chair Professor, University of California-San Diego, USA

This course will present the latest work on microwave and mm-wave phased arrays at UCSD and selected companies. The course will show that one can build large phased arrays on a single chip covering distinct frequency bands, from 2 GHz to > 94 GHz, using commercial CMOS and SiGe processes. The course will start with some on-chip phased array architectures and the pros and cons of each architecture. Typical designs include an 8-element 8-16 GHz SiGe phased array receiver, a 16-element Tx/Rx phased array at 42-48 GHz with 5-bit amplitude and phase control, 8, 16 and 32-element 60 GHz phased array chips from industrial contributors, 16- element Rx phased array at 77-84 GHz which includes a built-in-self-test system Also, an 8-20 GHz digital beam-former chip capable of multiple beam operation and with high immunity to interferers will also be presented. In terms of wafers-scale designs, 94 GHz and 110 GHz wafer-scale phased arrays will also be presented including high efficiency antennas. The course will conclude with packaging techniques for highly dense phased arrays which are as critical as the chip itself since packaging can have a severe effect on the coupling between the channels. It will be shown that SiGe and CMOS has changed the way we think about phased arrays and has allowed the fabrication of highly complex systems at a cost reduction of 5-10x compared to an all-GaAs solution. Most importantly, it made phased arrays a possibility/reality for a large range of low/medium cost phased arrays, such as point-to-point communications, SATCOM, and low power radars.

Panel
5G Power Amplifier Technologies

Time: 19:00-20:30
Room: Grand Salon B

Organizer: Andrei Grebennikov, Microsemi Co., USA

Moving towards the forthcoming 5G cellular systems calls for wider modulation bandwidth, higher frequencies, and high density local-area networks with a merge of many technologies and techniques. This imposes the strong requirements to power amplifiers as key elements of the cellular transmitters, both in handsets and base stations, including their reconfigurability and varactor tuning capability, carrier aggregation and linearity, frequency bandwidths up to millimeter waves, efficiency and integration level for small-cell base stations, Doherty, envelope tracking, or outphasing configurations, CMOS vs. GaAs HBT and GaN HEMT vs. LDMOSFET technologies. There will be no formal presentation, with the main emphasis to provide expert answers to questions posed by attendees, who are strongly encouraged to participate in the discussion and express their vision. Any power amplifier architectures and techniques, technologies and frequencies are open for discussion.

Moderators:
Andrei Grebennikov, Microsemi Co., USA
Murat Eron, Wireless Telecom Group Inc., USA

Panelists:
Marc Franco, Qorvo, USA
Florinel Balteanu, Skyworks, USA
James Wong, Huawei, China
Peter Asbeck, University of California-San Diego, USA
Christian Fager, Chalmers University of Technology, Sweden
Rik Jos, NXP, The Netherlands

Attractions in San Diego, CA

The 2015 IEEE Radio and Wireless Week (RWW) will be held at the Omni Hotel in San Diego, California. San Diego is a premier tourist destination for individuals and families from around the world. In addition to the options of rental cars and taxis, local transportation includes trolley and bus services, surfrider trains, and tourist buses offering day tours. The following are some of the suggested activities, organized by their distance from the conference and how you might get there:

Less than 10 min by foot

Gaslamp District: This downtown business and commercial area boasts numerous restaurants, bars, shopping outlets, and nightclubs.
Petco Park: The baseball stadium is the home of the local team, the San Diego Padres.
Ship Museums of San Diego: The USS Midway Museum is housed on an aircraft carrier, and the Mari- time Museum of San Diego is housed in the Star of India, one of the world's oldest sailing ships. Both museums are located on North Harbor Drive, along the waterfront.
Seaport Village: Enjoy a stroll through this park on the ocean front, with shopping, restaurants, and picnic spots to enjoy along the way.
Embarcadero: A marina park, going south along the water, past the Coronado bridge, Embarcadero has views of the ocean and downtown as well as restaurants.
Diego Civic Theater: Home to San Diego opera and Broadway shows, is located on Third and B streets downtown.

Less than 15 minutes by bus or taxi

Balboa Park: It is the largest urban cultural park in the nation. It is located at the northwest corner of the downtown area. It is home to the world-famous San Diego Zoo and other beautiful gardens, such as the Japanese Friendship Garden, Botanical Garden, and Lily Pond. It also includes a collection of more than a dozen major museums, including the Natural History Museum, Air and Space Museum, Museum of Photographic Art, and San Diego Museum of Art. It also houses performing arts venues, including the Old Globe Theater.
Old Town San Diego State Historic Park: Celebrate the Mexican heritage in California at this park with its collection of exhibits, historic sites, and entertainment outlets along with many restaurants, snack shops, and specialty shops.
Mission San Diego de Alcala: This historic site is one of the seven original Jesuit missions, founded in 1769 and built before California became a U.S. state.

20-60 miniutes by car

Point Loma: Travel to this lookout point above San Diego Bay to take photos. It is the home of Cabrillo National Monument and Old Point Loma Light House. The Fort Rosecrans National Cemetery is on the way along Cabrillo Memorial Drive.
Sunset Cliffs Natural Park: A great place to watch the sun set over the Pacific Ocean.
Mission Bay Park: A 4,600-acre aquatic park dedicated to leisure and active sports with kayaking opportunities.
La Jolla Coves: A famous diving, swimming, and snorkeling spot. Closeby are Shell Beach Tide Pools and the Museum of Contemporary Arts.
Torrey Pines Gliderport: On top of a ocean-facing cliff, watch people paragliding around the cliffs or try hang gliding yourself.
Birch Aquarium at Scripps: Perched on a bluff overlooking the Pacific ocean, the aquarium is a public exploration center at Scripps Institution of Oceanography at the University of California, San Diego, with a large aquarium of cold-water fish.

Day-long activities

Sea World: Sea World is a one-of-a-kind theme park with sea-life and dolphin shows along with an aquarium, rides, and entertainment.
LEGOLAND: This theme park in Carlsbad, about 30 miles north of downtown, has exhibits and activities aimed at the young.
Tijuana, Mexico: Tijuana is San Diego's neighbor across the border in Mexico (but only a half hour from downtown). It is possible to drive up to the border, park, and take a bus across the border for a walk along Revolution Boulevard.
San Diego Zoo Safari Park (or Wild Animal Park): A 1,800-acre zoo near Escondido, it is located one-half-hour north of San Diego and features a train safari, shows, activities, and dining.

Petco Park, home to the Padres MLB franchise, is located next to the Omni Hotel
Courtesy: Omni Hotel, San Diego

MONDAY, 26 JANUARY 2015

RWW Session: MO1A

RWW Distinguished Lectures I

Chair: Hermann Schumacher, Ulm University

Room: Gallery 2

SiRF Session: MO1B

SiRF Circuits and Applications - 1

Chair: Larry Larson, Brown University
Co-Chair: Rahul Kodkani, Qual-Comm

Room: Grand Salon A

PAWR Session: MO1C

Distortion Reduction Techniques in RF Power Amplifiers

Chair: Allen Katz, Linearizer Technology, Inc.
Co-Chair: Kiki Ikossi

Room: Gallery 1

RWS Session: MO1D

High-speed and BroadBand Wireless Technologies

Chair: Mehmet Kaynak, IHP GmbH

Room: Grand Salon B

08:00

MO1A-1 An Introduction to Software Defined Radio for Engineers

Jeffrey Pawlan, Pawlan Communications

Co-Sponsored by IEEE MTT-S

Abstract: Software Defined Radio (SDR) is the culmination of advances on several fronts and probably the most significant area of development in radio systems today. The entire worldwide cellular system uses SDR. NASA and the US military communications are now almost exclusively using SDR. Soon new automobile radios will be SDR to accommodate multiple modulation formats. This lecture will begin with the definition, history and evolution of (SDR). RF/microwave engineers will find it clear and understandable because analogies will be made to conventional classic radio systems and components. A live demonstration of SDR will be presented.

MO1B-1 SIMMWIC Integration of Millmeter-Wave Antenna With Two Terminal Devices For Medical Applications (Invited)

E. Kasper, W. Zhang, University of Stuttgart, Institute of Semiconductor Engineering (IHT), Stuttgart, Germany

MO1C-1 Linearizers - Distortion Reduction in High Power Amplifiers (Invited)

A. Katz, The College of New Jersey/Linearizer Technology, Inc., Ewing Township, United States

MO1D-1 Novel Non-Square, Gray Coded, 64-QAM Constellations

D. H. Morais, Adroit Wireless Strategies, San Mateo, United States

08:20

MO1D-2 BCH and LDPC Coded Wideband Modem for 21-GHz Band Satellite Broadcasting System

Y. Suzuki, Y. Matsusaki, M. Kamei, A. Hashimoto, T. Kimura, S. Tanaka, T. Ikeda, NHK, Setagaya-ku, Japan

08:40

MO1A-2 RF Aspects of Magnetic Resonance Imaging

Robert Caverly, Villanova U.

Co-Sponsored by IEEE MTT-S

Abstract: Magnetic Resonance Imaging (MRI) scanners are an important diagnostic tool for the medical practitioner. MRI provides a non-invasive means of imaging soft tissues and to obtain real-time images of the cardiovascular system and other dynamic changes in the human body. MRI scanners rely heavily on a number of topical areas of interest to Electrical Engineers: image processing, high speed computing and RF (radio frequency) systems and components. This presentation will focus on some of the RF aspects of the MR process and MR scanners.

MO1B-2 A SiGe Differential 50ps Gaussian Pulse Generator for Sub-Sampling TDR Measurements

G. Hasenaecker[1], H. Rein[1], K. Aufinger[2], N. Pohl[3], T. Musch[1], [1]Ruhr-Universitaet Bochum, Bochum, Germany, [2]Infineon Technologies, Neubiberg, Germany, [3]Fraunhofer FHR, Wachtberg, Germany

MO1C-2 A Novel Input Matching Topology for Improved Digital Pre Distortion of RF Power Devices

R. J. Wilson[1,3], S. Goel[1], P. Singerl[2], [1]Infineon Technologies, Morgan Hill, United States, [2]Infineon Technologies, Villach, Austria, [3]Cardiff University, Cardiff, United States

MO1D-3 Compact Mono-Static/Bi-Static UWB System for Wall Parameters Extraction

S. Magoon[1], C. Thajudeen[2], A. Hoorfar[2], A. E. Fathy[1], [1]The University of Tennessee, Knoxville, Knoxville, United States, [2]Villanova University, Villanova, United States

09:00

MO1B-3 A 6.5 mW, Wide Band Dual-Path LC VCO Design With Mode Switching Technique in 130 nm CMOS

J. Li[1,2], N. Xu[1], Y. Sun[1,3], W. Rhee[1], Z. Wang[1], [1]Tsinghua University, Beijing, China, [2]University of California, San Diego, San Diego, United States, [3]Hua-Chuang Securities Brokerage CO LTD, Beijing, China

MO1C-3 A digital predistortion method based on nonuniform memory polynomial model using interpolated LUT

X. Feng[1], B. Feuvrie[1,2], A. S. Descamps[1,2], Y. Wang[1], [1]CNRS UMR6164, Polytech Nantes, Nantes, France, [2]IUT de Nantes, Carquefou, France

MO1D-4 Wideband Six-Port Receiver using Elliptical Microstrip-Slot Directional Couplers

M. Wei[1], Y. Chen[2], S. Qayyum[1], C. Tseng[2], R. Negra[1], [1]RWTH Aachen University, Aachen, Germany, [2]National Taiwan University of Science and Technology, Taipei, Taiwan

09:20

MO1B-4 Design of Fully Integrated Receiver Front-End for VSAT Applications

P. Wang[1], Y. Shen[1], M. Chou[1], Y. Chang[1,2], T. Wu[1], D. Chang[2], S. S. Hsu[1], [1]National Tsing Hua University, Hsinchu, Taiwan, [2]National Applied Research Laboratories, Hsinchu, Taiwan

MO1C-4 A New Form of Polynomial Model for Concurrent Dual-Band Digital Predistortion

C. Wang[1], W. Zhu[2], X. Zhu[1], [1]State Key Laboratory of Millimeter Waves, Nanjing, China, [2]School of Geography Science, Nanjing, China

RWW Session: MO2A

RWW Distinguished Lecturers II

Chair: Jeremy Muldavin, MIT Lincoln Laboratory

Room: Gallery 2

SiRF Session: MO2B

mmWave and Higher Frequency Applications

Chair: Herman Schumacher, Ulm University
Co-Chair: Austin Chen, Skyworks Solutions

Room: Grand Salon A

PAWR Session: MO2C

High Efficiency RF Power Amplifiers

Chair: Robert Caverly, Villanova University
Co-Chair: Art Morris , WiSpry

Room: Gallery 1

RWS Session: MO2D

Emerging Technologies I

Chair: Lawrence Larson, Brown University
Co-Chair: Medhi Shadaram, University of Texas at San Antonio

Room: Grand Salon B

10:10

MO2A-1 An Overview of M-Health Medical Video Communications

Constantinos Pattichis, University of Cyprus

Co-Sponsored by IEEE EMBS

Abstract: Significant technological advances over the past decade have led M-health systems and services to a remarkable growth. It is anticipated that such systems and services will soon be established in standard clinical practice. M-health medical video communication systems progression has been primarily driven by associated advances in video coding and wireless networks technologies. This lecture reviews medical video communication systems. It highlights past approaches and focuses on current design trends and future challenges. It provides an insight to the most prevailing diagnostically driven concepts and the challenges associated with each system component.

MO2B-1 Review of Silicon-based Millimeter-wave Radio Frequeny Integrated Circuits (Invited)

H. Wang, National Taiwan University, Taipei, Taiwan

MO2C-1 Simplified Analysis and Design of Outphasing Transmitters Using Class-E Power Amplifiers (Invited)

R. A. Beltran[1], F. H. Raab[2], [1]Skyworks Solutions, Inc., Newbury Park, United States, [2]Green Mountain Radio Research Co., San Diego, United States

MO2D-1 3GPP ACLR and EVM Measurements for Millimeter-Wave Wireless Backhaul Applications at 60GHz

S. Maier, H. Schlesinger, G. Luz, D. Ferling, W. Kuebart, A. Pascht, Alcatel-Lucent Bell Labs Germany, Stuttgart, Germany

10:50

MO2B-2 A 122-150 GHz LNA with 30 dB Gain and 6.2 dB Noise Figure in SiGe BiCMOS Technology

R. Ben Yishay, D. Elad, E. Shumaker, IBM Haifa Research Lab, Haifa, Israel

MO2C-2 A Pulsed Load Modulation (PLM) Power Amplifier with 3-Level Envelope Delta-Sigma Modulation (EDSM)

Y. Song, R. Zhu, Y. E. Wang, University of California Los Angeles, Los Angeles, United States

MO2D-2 Remote Phase Synchronization for Satellite Network Systems

J. Xu[1], J. Long[2], D. Ye[1], J. Huangfu[1], C. Li[3], L. Ran[1], [1]Zhejiang University, Hangzhou, China, [2]University of California at San Diego, La Jolla, United States, [3]Texas Tech University, Lubbock, United States

11:10

MO2B-3 120 GHz Low Power, High Gain, Wideband Active Balun For Chip-to-Chip Communication

C. Lee, H. Lee, D. Kang, I. Song, H. Kim, S. Cho, J. Lee, I. Oh, C. Park, KAIST, Yuesong-gu, Republic of Korea

MO2C-3 A Full X-Band High-efficiency 12-Watt GaAs MMIC Power Amplifier with Harmonic Tuning

Q. Wu, B. Song, Y. Shih, X. Huang, J. Wu, RML Technology Co., Ltd, Chengdu, China

MO2D-3 Non-Contact Hand Interaction with Smart Phones Using the Wireless Power Transfer Features

C. Liu[1], C. Gu[2], C. Li[1], [1]Texas Tech University, Lubbock, United States, [2]Marvell Semiconductor Inc., Santa Clara, United States

11:30

MO2B-4 Electronic THz Transmissive Imaging System

W. Chen[1], C. Lai[1], T. Yan[1], C. Li[2], T. Chao[1], C. Kuo[1], [1]National Chiao-Tung University, Hsinchu City, Taiwan, [2]National Central University, Jhongli City, Taiwan

MO2C-4 A 400 W 2-Way Asymmetrical Doherty PA with 50% Efficiency Based on Second-Generation Airfast™ LDMOS Technology

S. Embar, L. Wang, J. Kim, C. Dragon, G. Tucker, Freescale Semiconductor Inc., Tempe, United States

MONDAY, 26 JANUARY 2015

RWW

RWS Session: MO3A

MM-Wave and THz

Chair: Hasan Sharifi, HRL Labs
Co-Chair: Rashaunda Henderson, University of Texas at Dallas

Room: Gallery 2

RWS-SiRF Joint Session: MO3B

Analysis and Arrays

Chair: Jeremy Muldavin, MIT Lincoln Laboratory
Co Chair: Tommy Ellis

Room: Grand Salon A

PAWR Session: MO3C

CMOS RF Power Amplifier Technology

Chair: Marc Franco, Qorvo
Co-Chair: Murat Eron, Wireless Telecom Group

Room: Gallery 1

RWS Session: MO3D

Emerging Technologies II

Chair: Khanna Rahul, Intel

Room: Grand Salon B

13:30

MO3A-1 Microwave and Millimeter Wave Power Amplifiers: Technology, Applications, Benchmarks, and Future Trends (Invited)

J. J. Komiak, BAE Systems, Nashua, United States

MO3B-1 Front-End Non-Linear Distortion and Array Beamforming (Invited)

D. Rabinkin, W. Song, MIT Lincoln Laboratory, Lexington, United States

MO3C-1 CMOS High Bandwidth Envelope Tracking and Power Amplifiers for LTE Carrier Aggregation (Invited)

F. Balteanu, Skyworks Solutions, Inc., Irvine, United States

MO3D-1 Design of a Patch Antenna with Thermo-Electric Generator and Solar Cell for Hybrid Energy Harvesting

M. Virili[1,2], A. Georgiadis[2], A. Collado[2], P. Mezzanotte[1], L. Roselli[1], [1]University of Perugia, Perugia, Italy, [2]Centre Tecnològic de Telecomunicacions de Catalunya, Castelldefels, Spain

13:50

MO3D-2 Design of Efficient Rectifier for Low-Power Wireless Energy Harvesting at 2.45 GHz

T. Lee[1], P. Patil[1], C. Hu[1,2], M. Rajabi[1], S. Farsi[1], D. M. Schreurs[1], [1]KU Leuven, Heverlee, Belgium, [2]National Chiao Tung University, Hsinchu, Taiwan

14:10

MO3A-2 Power Synthesis at Low Frequencies in the THz Gap

J. Zhao[1], Z. Zhu[2], B. Zhang[1], D. Ye[1], C. Li[3], L. Ran[1], [1]Zhejiang Univercity, Hangzhou, China, [2]National Key Laboratory of Science and Technology on Space Microwave, Xian, China, [3]Texas Tech University, Lubbock, United States

MO3B-2 Continuous-Time Mode 2-D IIR Filter Enhanced Time-Delay Linear Aperture Arrays

A. Madanayake[1], C. Wijenayake[1], L. Belestotski[2], [1]The University of Akron, Akron, United States, [2]The University of Calgary, Calgary, Canada

MO3C-2 A 28 nm Standard CMOS Watt-Level Power Amplifier for LTE Applications

J. Fuhrmann[1,2], P. Oßmann[3], K. Dufrêne[1], H. Pretl[1], R. Weigel[2], [1]Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany, [2]DMCE GmbH & Co. KG, Linz, Austria, [3]Johannes Kepler University, Linz, Austria

MO3D-3 Stability of Non-Foster Circuits for Broadband Impedance Matching of Electrically Small Antennas

A. M. Elfrgani, R. G. Rojas, The Ohio State University, Columbus, United States

14:30

MO3A-3 Evolution of DIG Integrated Platform for Millimeter-Wave Applications

M. A. Basha[1,2], A. Samir[2,1], R. Zaghloul[1], [1]Zewail City of Science and Technology, 6th of October City, Egypt, [2]Mansoura University, Mansoura, Egypt

MO3B-3 Intermittently Operating RF Frontend with 5ns Startup Time for 10Gbps Proximity Wireless Communication

N. Kitazawa, K. Kohira, H. Ishikuro, Keio University, Yokohama, Japan

MO3C-3 A Compact, High-gain Q-Band Stacked Power Amplifier in 45nm SOI CMOS With 19.2 dBm Psat and 19% PAE

W. Tai[1], D. S. Ricketts[2], [1]Carnegie Mellon University, Pittsburgh, United States, [2]North Carolina State University, Raleigh, United States

14:50

MO3A-4 A 30 GHz Impulse Radiator with On-Chip Antennas for High-Resolution 3D Imaging

P. Chen, A. Babakhani, Rice University, Houston, United States

MO3B-4 A New Multiple-Antenna-Port and Multiple-User-Port Antenna Tuner

F. Broyde, E. Clavelier, Excem, Maule, France

MO3C-4 Millimeter-wave Packaging on Alumina Board for E-band CMOS Power Amplifiers

Y. Zhang, D. Zhao, P. Reynaert, KU Leuven, Leuven, Belgium

Time: 14:20 – 16:10 RWW STUDENT PAPER CONTEST Room: Grand Salon CDE

RWW 2015 Student Paper Chairs will select finalists among the student paper submissions, from each conference (RWS, PAWR, BioWireleSS, and WiSNet, SiRF). During the poster presentation, held January 26, Monday afternoon 14:20 -16:10, judges will visit the student posters and grade the papers in the following five areas: novelty of the research, quality of the poster, quantity of information presented, preparedness of the presenter, and interest to the RWW community. The committee of judges will then select the first- and the second-place winners from each conference for a total of 8 winners. The awards will be announced and presented during the RWW Banquet held Tuesday night from 18:00-21:00. Please visit the student paper competition and support outstanding work by future researchers in industry and academia.

[MO3C-2] A 28 nm Standard CMOS Watt-Level Power Amplifier for LTE Applications
J. Fuhrmann[1,2], P. Oßmann[3], K. Dufrêne[1], H. Pretl[1], R. Weigel[2], [1]DMCE GmbH & Co. KG, Linz, Austria, [2]Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany, [3]Johannes Kepler University, Linz, Austria

[MO3C-4] Millimeter-wave Packaging on Alumina Board for E-band CMOS Power Amplifiers
Y. Zhang, D. Zhao, P. Reynaert, KU Leuven, Leuven, Belgium

[MO4C-2] Characterization and Modeling of Pulse Drivers for Switch Mode Power Amplifier Measurements
N. Leder, T. I. Faseth, H. A. Ruotsalainen, H. Arthaber, Technische Universität Wien, Vienna, Austria

[WE1A-4] Low-Weight Wireless Sensor Network for Encounter Detection of Bats
M. Hierold[1], S. Ripperger[2], D. Josic[2], F. Mayer[2], R. Weigel[1], A. Koelpin[1], [1]University of Erlangen-Nuremberg, Erlangen, Germany, [2]Museum of Natural History, Berlin, Germany

[WE3D-5] Diode Detector Design for 61 GHz Substrate Integrated Waveguide Six-Port Radar Systems
S. Mann, S. Erhardt, S. Lindner, F. Lurz, S. Linz, F. Barbon, R. Weigel, A. Koelpin, University of Erlangen-Nuremberg, Erlangen, Germany

[WE4A-4] Underwater Interferometric Radar Sensor for Distance and Vibration Measurement
M. Sporer[1], F. Lurz[1], E. Schluecker[2], R. Weigel[1], A. Koelpin[1], [1]University of Erlangen-Nuremberg (Inst. Elec. Eng.), Erlangen, Germany, [2]University of Erlangen-Nuremberg (Inst. Proc. Tech. and Mach.), Erlangen, Germany

[WE3A-2] 100 GHz Reflectometer for Sensitivity Analysis of MEMS Sensors Comprising an Intermediate Frequency Six-port Receiver
S. Linz, F. Oesterle, A. Talai, S. Lindner, S. Mann, F. Barbon, R. Weigel, A. Koelpin, Friedrich-Alexander University of Erlangen-Nuremberg, Erlangen, Germany

[TU1D-1] A Wearable System for Highly Selective L-glutamate Neurotransmitter Sensing
C. M. Nguyen[1], J. Mays[1], H. Cao[2], H. Allard[1], S. Rao[1], J. Chiao[1], [1]University of Texas at Arlington, Arlington, United States, [2]ETS Montreal, Montreal, Canada

[TU1D-3] A Low Power Wireless Sleep Apnea Detection System Based on Pyroelectric Sensor
I. Mahbub[1], M. Hasan[1], S. A. Pullano[2], F. Quaiyum[1], C. P. Stephens[3], S. K. Islam[1,3], A. S. Fiorillo[2], M. S. Gaylord[4], V. S. Lorch[4,3], N. Beitel[1,3], [1]University of Tennessee, Knoxville (ECE), Knoxville, United States, [2]University Magna Græcia, Catanzaro, Italy, [3]University of Tennessee, Knoxville (IBME), Knoxville, United States, [4]University of Tennessee, Knoxville (Mechanical,Aerosopace, BioMed), Knoxville, United States

[TU3D-1] Noncontact Heartbeat Detection using UWB Impulse Doppler Radar
L. Ren[1], Y. Koo[1], Y. Wang[2], A. E. Fathy[1], [1]University of Tennessee, Knoxville, Knoxville, United States, [2]Qorvo, Billerica, United States

[WE2D-2] A Permittivity Sensitive Phase-Locked Loop Based on a Silicon-Integrated Capacitive Sensor for Microwave Biosensing Applications
J. Nehring[1], M. Bartels[1], R. Weigel[1], D. Kissinger[1,2,3], [1]University of Erlangen-Nuremberg, Erlangen, Germany, [2]IHP GmbH, Frankfurt (Oder), Germany, [3]Technische Universität Berlin, Berlin, Germany

[MO3B-3] Intermittently Operating RF Frontend with 5ns Startup Time for 10Gbps Proximity Wireless Communication
N. Kitazawa, K. Kohira, H. Ishikuro, Keio University, Yokohama, Japan

[WE1C-2] An Integrated Reconfigurable Tuner in 45nm CMOS SOI Technology
A. Jou, C. Liu, S. Mohammadi, Purdue Univeristy, West Lafayette, United States

[WE2C-2] A 20GHz Class-C VCO Using Noise Sensitivity Mitigation Technique
K. Kimura, K. Okada, A. Matsuzawa, Tokyo Institute of Technology, OOkayama, Meguro-ku, Japan

[WE2C-4] Phase Noise Reduction in RF Oscillators utilizing Self-Injection Locked and Phase locked Loop
L. Zhang[1], A. K. Poddar[2], U. L. Rohde[2], A. S. Daryoush[1], [1]Drexel University, Philadelphia, United States, [2]Synergy Microwave, Paterson, United States

[MO2D-2] Remote Phase Synchronization for Satellite Network Systems
J. Xu[1], J. Long[2], D. Ye[1], J. Huangfu[1], C. Li[3], L. Ran[1], [1]Zhejiang University, Hangzhou, China, [2]University of California at San Diego, La Jolla, United States, [3]Texas Tech University, Lubbock, United States

[MO3A-4] A 30 GHz Impulse Radiator with On-Chip Antennas for High-Resolution 3D Imaging
P. Chen, A. Babakhani, Rice University, Houston, United States

[MO3D-3] Stability of Non-Foster Circuits for Broadband Impedance Matching of Electrically Small Antennas
A. M. Elfrgani, R. G. Rojas, The Ohio State University, Columbus, United States

[MO3D-1] Design of a Patch Antenna with Thermo-Electric Generator and Solar Cell for Hybrid Energy Harvesting
M. Virili[1,2], A. Georgiadis[2], A. Collado[2], P. Mezzanotte[1], L. Roselli[1], [1]University of Perugia, Perugia, Italy, [2]Centre Tecnològic de Telecomunicacions de Catalunya, Castelldefels, Spain

[MO4A-3] Curved Spiral Antennas for Freshwater Applications
R. A. Llamas[1,2], J. J. Niemeier[2], A. Kruger[1,2], [1]University of Iowa-ECE, Iowa City, United States, [2]University of Iowa-IIHR, Iowa City, United States

[MO4A-4] Fence Loaded Antenna Coupler for High-Band UWB with Steep Cutoff Characteristics
I. Saito, K. Kohira, H. Ishikuro, Keio University, Yokohama, Japan

[WE1B-5] A Class of Planar Multi-Band Wilkinson-Type Power Divider with Intrinsic Filtering Functionality
R. Loeches-Sanchez[1,2], D. Psychogiou[2], D. Peroulis[2], R. Gomez-Garcia[1], [1]University of Alcala, Alcala de Henares, Spain, [2]Purdue University , West Lafayette, United States

[WE4B-3] All-Analog Peak-to-Average Power Reduction using Constrained Clipping for OFDM Systems
M. Cho, J. S. Kenney, Georgia Institute of Technology, Atlanta, United States

[WE4B-4] An Experimental Evaluation on EVM Performance for 4-CSK(Color Shift Keying) using Visible Light with Multiple Full-color LEDs
H. Shimamoto, Y. Kozawa, Y. Umeda, Tokyo University of Science, Noda, Japan

Time: 14:00 – 16:20 RWW Wireless MicroApps Room: Grand Salon CDE

The Microwave/RF/Wireless Applications (Wireless MicroApps for short) Forum is a special session held within the exhibition area at RWW to enable vendors to conduct application-centric presentations that highlight their state-of-the-art products, technologies and services or solutions.

Company	Title
Kyocera	Microvias for Microwave Applications in Cofired Ceramics
MOSIS	Getting your IC Designs from Concept to Production Quickly and Cost Effectively
Sonnet Software	The Unified-FFT Method Accelerating Wireless Designs
National Instruments (formerly AWR)	Transceiver Module and Multi-element Phased Array Design with NI AWR Design Environment/Visual System Simulator (VSS) Software
Remcom	Time-Domain EM Simulation Enables Automotive Radar Sensor Design

More Wireless MicroApps announcements coming soon. Please stop by the exhibition area for more info.

MONDAY, 26 JANUARY 2015

RWS Session: MO4A

Advanced Antenna Technology

Chair: Nuno Borges Carvalho, Universidade de Aveiro

Room: Grand Salon A

SiRF Session: MO4B

RF SOI Technologies and Applications

Chair: Paul Hurwitz, Tower Jazz
Co-Chair: Mehmet Kaynak, IHP GmbH

Room: Grand Salon B

PAWR Session: MO4C

Power Amplifier Systems Concepts

Chair: Andrei Grebennikov, Microsemi Corporation
Co-Chair: Almudena Suarez, University of Cantabria

Room: Gallery 1

RWS Session: MO4D

Transceivers

Chair: Hiroshi Okazaki, NTT DoCoMo Inc.

Room: Gallery 2

15:40

MO4A-1 Design of Horizontally Polarized Ultra Wideband Slot Antennas for Wireless Applications

R. Kumar[1,2], R. Ram Krishna[2,1], [1]ARDE, Pune, India, [2]DIAT, Deemed University, Pune, India

MO4B-1 RFSOI Programmable Array of Capacitors (Invited)

M. Granger-Jones[1], J. Bendixen[3], J. Costa[2], M. Carroll[2], D. Kerr[2], C. Iversen[3], P. Mason[2], E. Spears[2], [1]Qorvo, San Jose, United States, [2]Qorvo, Greensboro, United States, [3]Qorvo, Aalborg, Denmark

MO4C-1 Challenges of Power Amplifier Design for Envelope Tracking Applications (Invited)

G. Collins[1], J. Wood[2], B. Woods[2], [1]MaxXentric Technologies, San Diego, United States, [2]Maxim Integrated, San Diego, United States

MO4D-1 SiGe BiCMOS Power Amplifier with a Switchable Output Matching Network for Efficiency Enhancement

Y. Lee, H. Li, J. Fu, National Central University, Jhongli City, Taiwan

16:00

MO4B-2 Improvements in SOI Technology for RF Switches (Invited)

M. Jaffe, A. Botula, J. Gambino, Z. He, A. Joseph, M. Abou-Khalil, R. Phelps, S. Shank, J. Slinkman, R. Wolf, J. Ellis-Monaghan, J. Gross, IBM Microelectronics Division, Essex Junction, United States

16:00

MO4D-2 A 9.99 mW Low-Noise Amplifier for 60 GHz WPAN System and 77 GHz Automobile Radar System in 90 nm CMOS

Y. Lin, C. Lee, C. Chen, National Chi Nan University, Puli, Taiwan

16:20

MO4A-3 Curved Spiral Antennas for Freshwater Applications

R. A. Llamas[1,2], J. J. Niemeier[2], A. Kruger[1,2], [1]University of Iowa-ECE, Iowa City, United States, [2]University of Iowa-IIHR, Iowa City, United States

MO4B-3 High Resistivity SOI Wafer Mapping for Mainstream RF System-on-Chip (Invited)

J. Raskin[1], E. Desbonnets[2], [1]Université Catholique de Louvain (UCL), Place du Levant[3], Belgium, [2]Soitec, Bernin, United States

MO4C-2 Characterization and Modeling of Pulse Drivers for Switch Mode Power Amplifier Measurements

N. Leder, T. I. Faseth, H. A. Ruotsalainen, H. Arthaber, Technische Universität Wien, Vienna, Austria

MO4D-3 30-GHz mHEMT Divide-by-Three Injection-Locked Frequency Divider With Marchand Balun

W. Chang[1], C. Meng[1], K. Tsung[1], G. Huang[2], [1]National Chiao Tung University, Hsinchu, Taiwan, [2]National Nano Device Laboratories, Hsinchu, Taiwan

16:40

MO4A-4 Fence Loaded Antenna Coupler for High-Band UWB with Steep Cutoff Characteristics

I. Saito, K. Kohira, H. Ishikuro, Keio University, Yokohama, Japan

MO4B-4 Comparison of Substrate Effects in Sapphire, Trap-Rich and High Resistivity Silicon Substrates for RF-SOI Applications

V. Sekar[1], C. Cheng[1], C. Zeng[1], A. Genc[2], T. Ranta[1], F. Rotella[1], R. Whatley[1], [1]Peregrine Semiconductor Corporation, San Diego, United States, [2]Entropic Communications, San Diego, United States

MO4C-3 The Impact of Channel Spacing on Memory Polynomial Models in Concurrent Dual-Band RF Power Amplification

K. N. Gebremicael[1], K. Morris[1], M. Beach[1], S. Wales[2], S. Ben Smida[1], M. Collett[1], [1]University of Bristol, Bristol, United Kingdom, [2]Chemring Technology Solutions, Hampshire, United Kingdom

MO4D-4 A GaN HEMT N-Path Filter with +17 dBm Jammer Tolerance

C. M. Thomas[1,2], L. E. Larson[3], [1]MaXentric Technologies, San Diego, United States, [2]University of California, San Diego, La Jolla, United States, [3]Brown University, Providence, United States

17:00

MO4A-5 FDTD Analysis of Platform Effect Reduction with Thin Film Ferrite

Z. Yao, Q. Xu, Y. E. Wang, University of California, Los Angeles, Los Angeles, United States

MO4B-5 Realisation of 40 GHz Conductor-backed Coplanar Waveguides and Meander Inductors on Surface-passivated High Resistivity Silicon

N. Hashim, A. Abuelgasim, K. de Groot, University of Southampton, Southampton, United Kingdom

MO4C-4 Bandwidth Reduction in Dynamic Load-modulated Power Amplifiers: Control and RF Signal Expansion, Efficiency and Linearity Trade-offs

K. Mimis, G. T. Watkins, Toshiba Research Europe Limited, Bristol, United Kingdom

TU2 Plenary Session

Dr. Chris Van Hoof

imec/KULeuven

Time: 10:10-12:10
Room: Grand Salon AB

Title:
Wearable Wireless Sensor Technologies for Truly Personalized Medicine and Wellness

Abstract:
The healthcare arena is on a clear path towards preventative and personalized medicine. Semiconductor nanotechnologies are a key enabler to reaching this goal. Wearable sensors that combine ultra-low-power analog, digital, and radio circuitry and novel sensors are emerging. These wearables can measure progressively more parameters with greater accuracy, have become smaller in size and are more energy efficient-such that their continuous use becomes a practical reality. Apart from managing chronic illness, a further disruption in our healthcare will happen through the management of health where prediction and prevention will be essential enablers. Particularly in this domain, wearable and even disposable sensors that monitor whether you live a healthy life, that assess your stress levels, your pain, your emotions and so on, are examples of new tools that are moving out of the realm of science fiction and into everyday reality. This talk will describe such systems that achieve medically relevant information in a consumer form factor: wristbands, patches, headsets, smart textiles, smart contact lenses are promising wearable platforms that have the potential to create a multitude of killer apps - and these killer apps will be saving lives.

Plenary Speaker:
Dr. Chris Van Hoof, imec/KULeuven

Chris Van Hoof is Director of Wearable Healthcare at imec in Leuven, Belgium and Eindhoven, the Netherlands and imec Fellow. In the Wearable Healthcare program, imec and its industrial partners from across the value chain create and validate solutions at technology, component and application level. Chris Van Hoof has a track record of 20 years of initiating, executing and leading national and international contract R&D at imec. His work resulted in 3 startups (2 in the healthcare domain) and he delivered space qualified flight hardware to two cornerstone European Space Agency missions. After a PhD in Electrical Engineering (University of Leuven, 1992), Chris Van Hoof has held positions at imec at manager and director level in diverse technical fields (sensors and imagers, MEMS and autonomous microsystems, wireless sensors, body-area networks). He has published over 500 papers in journals and conference proceedings and given over 50 invited talks. Chris Van Hoof is also full professor at the University of Leuven (KULeuven).

RWS Session: TU1B

Software Defined Radios and Cognitive Radios

Chair: Abbas Omar, University of Magdeburg

Room: Gallery 1

08:00

TU1B-1 Receiver Cancellation of Radar in Radio

K. L. Tokuda[1], J. H. Kim[2], R. J. Baxley[1,2], J. S. Kenney[1], L. S. Cohen[3], [1]Georgia Institute of Technology, Atlanta, United States, [2]Georgia Tech Research Institute, Atlanta, United States, [3]Naval Research Laboratory, Washington, United States

8:20

TU1B-2 Double Quadrature Mixer for Adaptive Spur Cancellation in Ultra-Wideband Radios

S. Z. Mack[1,2], J. Wight[1,2], [1]Carleton University, Ottawa, Canada, [2]D-TA Systems, Ottawa, Canada

08:40

TU1B-3 On the Double Threshold Energy Detection-Based Spectrum Sensing over kappa-mu Fading Channels

A. O. Ribas, U. S. Dias, University of Brasilia, Brasília, Brazil

SiRF Session: TU1C

Topics in RF Modeling and Characterization Techniques

Chair: Hasan Sharifi, HRL Laboratories
Co-Chair: Monte Miller, Frescale

Room: Grand Salon B

08:00

TU1C-1 Tunable Filters and Antennas for 4G LTE Systems (Invited)

G. M. Rebeiz, C. H. Ko, Y. Cho, B. Avser, A. Alazemi, O. Gurbuz, University of California, San Diego, United States

08:40

TU1C-2 Multitone-FM Analysis of MEMS Varactor Phase Noise Contribution in VCOs

G. Kahmen[1], H. Schumacher[2], [1]Rohde & Schwarz GmbH, Munich, Germany, [2]Ulm University, Ulm, Germany

09:00

TU1C-3 L-2L De-embedding Method with Double-T-type PAD Model for Millimeter-wave Amplifier Design

S. Kawai, K. K. Tokgoz, K. Okada, A. Matsuzawa, Tokyo Institute of Technology, Meguro-ku, Japan

09:20

TU1C-4 Cross-Line Characterization for Capacitive Cross Coupling in Differential Millimeter-Wave CMOS Amplifiers

K. K. Tokgoz, K. Lim, Y. Seo, S. Kawai, K. Okada, A. Matsuzawa, Tokyo Institute of Technology, Tokyo, Japan

BioWireleSS Session: TU1D

Wireless Remote Sensing of Biosignals

Chair: Mohamed Tofighi, Pennsylvania State University
Co-Chair: Aly Fathy, University of Tennessee

Room: Gallery 2

TU1D-1 A Wearable System for Highly Selective L-glutamate Neurotransmitter Sensing

C. M. Nguyen[1], J. Mays[1], H. Cao[2], H. Allard[1], S. Rao[1], J. Chiao[1], [1]University of Texas at Arlington, Arlington, United States, [2]ETS Montreal, Montreal, Canada

8:20

TU1D-2 Body-worn Fully-Passive Wireless Analog Sensors for Biopotential Measurement Through Load Modulation

S. Consul-Pacareu, D. Arellano, B. I. Morshed, The University of Memphis, Memphis, United States

TU1D-3 A Low Power Wireless Sleep Apnea Detection System Based on Pyroelectric Sensor

I. Mahbub[1], M. Hasan[1], S. A. Pullano[2], F. Quaiyum[1], C. P. Stephens[3], S. K. Islam[1,3], A. S. Fiorillo[2], M. S. Gaylord[4], V. S. Lorch[4,3], N. Beitel[1,3], [1]University of Tennessee, Knoxville (ECE), Knoxville, United States, [2]University Magna Græcia, Catanzaro, Italy, [3]University of Tennessee, Knoxville (IBME), Knoxville, United States, [4]University of Tennessee, Knoxville (Mechanical,Aerospace, BioMed), Knoxville, United States

TU1D-4 Feasibility of Patterned Vertical CNT for Dry Electrode Sensing of Physiological Parameters

M. Abu-Saude, S. Consul-Pacareu, B. I. Morshed, University of Memphis, Memphis, United States

TU1D-5 A Wireless Device to Monitor Pressure in Compression Bandages

N. Mehmood[1], A. Hariz[1], S. Templeton[2], N. H. Voelcker[3], [1]University of South Australia, Adelaide, Australia, [2]Royal District Nursing Service, Adelaide, Australia, [3]University of South Australia, Adelaide, Australia

TUESDAY, 27 JANUARY 2015

RWS Session: TU3A	RWS Session: TU3B	SiRF Session: TU3C	BioWireleSS Session: TU3D
Passive Antennas Chair: Jiang Zhu, Google[x] Room: Grand Salon A	**Propagation and Channel Modelling** Chair: Chenming Zhou, National Institute for Occupational Safety and Health Room: Gallery 1	**Power Amplifier Applications** Chair: Julio Costa, Qorvo Co-Chair: Paul Hurwitz, Tower Jazz Room: Grand Salon B	**Remote Patient Monitoring and Energy Scavenging** Chair: Syed Kamrul Islam, University of Tennessee Co-Chair: Victor Lubecke, University of Hawaii Room: Gallery 2
13:30			
TU3A-1 A CPW-Fed Meandered-Shaped Monopole Antenna with Asymmetrical Ground Planes *D. Hsieh, J. Wu, Y. Cheng, C. Wang, National University of Tainan, Tainan, Taiwan*	**TU3B-1 Physics-based Ultra-Wideband Channel Modeling for Tunnel/Mining Environments** *C. Zhou, National Institute for Occupational Safety and Health, Pittsburgh, United States*	**TU3C-1 A +18 dBm Broadband CMOS Power Amplifier RFIC with Distortion Cancellation** *A. M. El-Gabaly[1,2], C. E. Saavedra[1], [1]Queen's University, Kingston, Canada, [2]Peraso Technologies Inc., Toronto, Canada*	**TU3D-1 Noncontact Heartbeat Detection Using UWB Impulse Doppler Radar** *L. Ren[1], Y. Koo[1], Y. Wang[2], A. E. Fathy[1], [1]University of Tennessee, Knoxville, Knoxville, United States, [2]Qorvo, Billerica, United States*
13:50			
TU3A-2 WLAN Antenna Integrated in Indoor Ceiling Mounted Light System *L. Loizou, J. Buckley, B. O'Flynn, J. Barton, Tyndall National Institute, Cork, Ireland*	**TU3B-2 Millimeter-Wave Channel Sounding of Outdoor Ground Reflections** *R. J. Weiler[1], M. Peter[1], W. Keusgen[1], A. Kortke[2], M. Wisotzki[1], [1]Fraunhofer Heinrich Hertz Institute, Berlin, Germany, [2]TU Berlin, Berlin, Germany*	**TU3C-2 A 1.8 to 2.4 GHz Stacked Power Amplifier Implemented in 0.25 µm CMOS SOS Technology** *S. R. Helmi, H. Shan, S. Mohammadi, Purdue University, West Lafayette, United States*	**TU3D-2 Signal Processing Techniques for Vital Sign Monitoring Using Mobile Short Range Doppler Radar** *A. Rahman, E. Yavari, X. Gao, V. M. Lubecke, O. Boric-Lubecke, University of Hawaii at Manoa, Honolulu, United States*
14:10			
TU3A-3 Dual-Band Pattern-Reconfigurable Yagi-Uda Antenna *N. Gagnon, Communications Research Centre Canada, Ottawa, Canada*	**TU3B-3 Spectrum Sensing over Nakagami-m/Gamma Composite Fading Channel with Noise Uncertainty** *W. A. Silva, K. M. Mota, U. S. Dias, University of Brasilia, Brasilia, Brazil*	**TU3C-3 Channelized Active Noise Elimination (CANE) With Envelope Delta Sigma Modulation** *R. Zhu, Y. Song, Y. E. Wang, University of California, Los Angeles, Los Angeles, United States*	
14:30			
TU3A-4 Broadband RCS Reduction and Gain Enhancement Microstrip Antenna Using Ground Plane Slotted AMC Superstrate *J. Gao, J. Y. Zheng, Y. X. Cao, H. H. Yang, Q. W. Li, D. Zhang, Air Force Engineering University, Xi'an, China*	**TU3B-4 A Radiation Pattern Diversity Antenna Operating at the 2.4 GHz ISM Band** *S. Dumanli, Toshiba Research Europe Limited, Bristol, United Kingdom*	**TU3C-4 A 60 GHz Highly Reliable Power Amplifier with 13 dBm Psat 15% Peak PAE in 65 nm CMOS Technology** *B. Moret[1,2], N. Deltimple[1], E. Kerherve[1], A. Larie[1], B. Martineau[2], D. Belot[2], [1]University of Bordeaux, Talence, France, [2]STMicroelectronics, Crolles, France*	**TU3D-4 A Low-Input-Voltage Wireless Power Transfer for Biomedical Implants** *H. Jiang[1], K. Bai[1], W. Zhu[1], D. Lan[1,2], J. Zhang[1], J. Wang[2], M. Shen[3], R. J. Fechter[4], M. Harrison[4], S. Roy[5], [1]San Francisco State University, San Francisco, United States, [2]University of South Florida, Tampa, United States, [3]Aalborg University, Aalborg, Denmark, [4]UC San Francisco-Surgery, San Francisco, United States, [5]UC San Francisco-Bioengineering and Therapeutic Sciences, San Francisco, United States*

JOINT RWW BANQUET

Tuesday Evening, 27 January 2015 from 18:30-21:00
Room: Gallery 3B

Join your friends, co-workers and fellow researchers in an informal setting of lively discussion, dinner and wine. In addition, see the student paper award winners from the RWS, PAWR, WiSNet, BioWireless and SiRF receive their awards.

Exhibits/Wireless MicroApps/Demo

Industry Exhibits: Monday 26 January 13:00 - 17:30 and Tuesday 27 January 10:00 - 17:00
Room: Grand Salons CDE
Wireless MicroApps: Tuesday 27 January 14:00 - 16:20
Room: Grand Salons CDE
Demo Session: Tuesday 27 January 15:00 - 17:00
Room: Grand Salons CDE Foyer

Interactive Poster Session: Power Amplifiers 14:55-16:55

TU3P Advances in RF Power Amplifiers

Chair: Yupeng Jia, National Instruments
Room: Grand Salon CDE

TU3P-1 On the use of Frequency Transformations in the Design of Broad-band and Concurrent Multi-band Power Amplifiers
N. Nallam[1], S. Chatterjee[2], [1]IIT Guwahati, Guwahati, India, [2]IIT Delhi, New Delhi, India

TU3P-2 Envelope Tracking RF Power Amplifier with Lead-Lag Modulator
G. T. Watkins, K. Mimis, Toshiba Research Europe Limited, Bristol, United Kingdom

TU3P-3 A 3.6 GHz Linear High Efficiency Doherty Amplifier with 40 dBm Saturated Output Power using GaN on SiC HEMT Devices
B. Baker[1,2], R. L. Campbell[2], [1]Qorvo, Hillsboro, United States, [2]Portland State University, Portland, United States

TU3P-4 On the Estimation of Power Amplifier Efficiency for Modulated Signals
M. Vejdaniamiri, M. Helaoui, F. Ghannouchi, University of Calgary, Calgary, Canada

TU3P-5 Bi-level Quadrature-modulation Low-pass EPWM transmitter Using Half Side of Tri-level ΔΣ Modulator
T. Noda, W. Someya, Y. Iikura, Y. Umeda, Y. Kozawa, Tokyo University of Science, Noda, Japan

TU3P-6 RF Power Amplifier Behavioral Modeling Using Wavelet Multiresolution
C. Mateo-Pérez, P. L. Carro, P. García-Dúcar, J. de Mingo, University of Zaragoza, Zaragoza, Spain

TU3P-7 Designing Power Amplifiers for Spectral Compliance Using Spectral Mask Load-Pull Measurements
M. Fellows, J. Barlow, C. Baylis, J. Barkate, R. J. Marks II, Baylor University, Waco, United States

TU3P-8 Over 65% PAE GaN Voltage-Mode Class D Power Amplifier for 465 MHz Operation Using Bootstrap Drive
H. Nakamizo[1,2], K. Mukai[1], S. Shinjo[1], H. Gheidi[2], P. Asbeck[2], [1]Mitsubishi Electric Corporation, Kamakura, Japan, [2]University of California, San Diego, La Jolla, United States

TU3P-9 GaN-on-Si Transformer-Coupled Class D Power Amplifier
M. R. Hasin[1], J. N. Kitchen[1], B. Ardouin[2], [1]Arizona State University, Tempe, United States, [2]XMOD Technologies, Bordeaux, France

TU3P-10 Study of the Impedance Transformation Ratio of Microwave Rectifier for Outphasing Power Recycling Application
D. Wang, J. Guan, R. Negra, RWTH Aachen University, Aachen, Germany

Exterior View of the Omni San Diego Hotel
Courtesy: Omni Hotel, San Diego

Demo Track Presentations — Room: Grand Salon CDE
Tuesday, 15:00- 17:00

In its fourth year of RWW, there will be a demo session where presenters bring in demonstrations of their latest wireless experiments for a hands-on interactive forum. Come, see and feel how people are tackling real-world problems to address the next wireless innovation!

1. Noninvasive Continuous Mobile Blood Pressure Monitoring using Novel PPG Optical Sensor
Vahram Mouradian, Armen Poghosyan, and Levon Hovhannisyan, Sensogram Technologies Inc., USA
We are presenting a novel PPG optical sensor and methodology which have been integrated into a prototype standalone device ensuring for the first time the noninvasive, continuous, wearable, remote and mobile monitoring of blood pressure and other human vital signs, such as heart rate, oxygen saturation, respiration rate, etc. This small device allows the user to read, store, process and transmit all the measurements to a remote location.

2. Non-contact Hand Interaction with Smart Phones using the Wireless Power Transfer Features
Chenhui Liu, Changzhan Gu, and Changzhi Li, Department of Electrical and Computer Engineering, Texas Tech University & Marvell Semiconductor Inc., USA
We will demonstrate the non-contact interaction with the wireless power transfer coil inside the smart phone. The interaction between human and smart phones gradually changed from button pressing to screen touching in the past decade. Lately, as a trend of wireless application, wireless charging is growing up as a competitive feature for smart phones. The basic idea of the wireless charging is the wireless electromagnetic coupling between inductive coils, which means that we can also perform mutual coupling between our hand and the coil, so as to control smart phones without contact. This technique illustrates a system that configures an oscillator using the wireless charging coil as part of the resonant tank, and the resonant frequency of the oscillator will change as the impedance of the coil will change due to the mutual coupling between hand and the coil. This enables us to perform non-contact interaction with smart phones with little extra hardware expense.

3. Real-time Jammer Suppression Using Evanescent-mode Cavity Filters
Mohammad Abu Khater, Dimitra Psychogiou, and Dimitrios Peroulis, Adaptive Radio Electronics and Sensors (ARES) Group, Dpt. of Electrical and Computer Engineering, Purdue University, USA
With the ever increasing usage of the frequency radio spectrum, the performance of RF transceivers is severely degraded by radio frequency interference that is often created by adjacent electronic devices or coexisting communication carriers. In this demo, a real-time monitoring system that is able to: (a) identify and (b) suppress jamming signals is demonstrated for the first time. The jammer identification concept is based on a closed□loop system that consists of a tunable evanescent-mode band-stop filter (BSF) followed by a power detector.

4. Perfect Wireless Power Receiving Surface
Zheda Chen, Rong Wang, Jiaqi Zhao, Dexin Ye, and Lixin Ran, Zhejiang University, China
The surface is an artificially synthesized perfectly matched layer (PML) embedded with Schottky rectifying diodes to harvest wireless energy existing in natural environment. The surface is well designed to allow maximum receiving and recycling of ubiquitous radio power from ambient-radiation sources and provide DC power for low-power electronics. Compared with conventional rectenna system, the surface can achieve a nearly perfect absorption of the ambient wireless energy with a large receiving area. With its simple structure, such artificial surface can be specially designed and tailored to maximize wireless energy absorption under different environment. It can also be economically produced in the forms of soft substrates and/or textures which can then be used in clothes, tents or other daily items for energy harvesting. The surface can also be used in other renewable energy fields such as Solar Power Satellite System (SPSS).

5. Real-time PreDistortion and Envelope Tracking for High Efficiency Power Amplifiers
Jonmei J. Yan, Paul Theilmann, Donald F. Kimball, and Toshifumi Nakatanii, MaXentric Technologies, LLC., USA
We will present a live demonstration of envelope tracking with real-time digital pre-distortion (DPD) for high efficiency and high linearity power amplifiers for micro-basestation applications. This work is motivated by today's need for high spectral efficiency in the crowded frequency spectrum allocations, leading to signals with high peak to average ratios (PAPRs). Unlike conventional power amplifiers, with the use of real-time pre-distortion, envelope tracking power amplifiers can achieve high efficiency and high linearity simultaneously. In envelope tracking, the power supplied to the RF power amplifier (RFPA) varies as a function of the envelope of the RF signal, minimizing the power consumption and increasing its efficiency by keeping the RFPA close to saturation most of the time.

6. Low Power 24 GHz Radar System for Occupancy Monitoring
Fabian Lurz, Sebastian Mann, Sarah Linz, Stefan Lindner, Robert Weigel, and Alexander Koelpin, Institute for Electronics Engineering, University of Erlangen-Nuremberg, Germany
We will demonstrate a low-power 24 GHz continuous wave (CW) prototype system for occupancy monitoring and presence detection. It is based on a minimalistic hardware approach and is able to wirelessly sense human respiratory signals so that even non-moving persons can be detected. By intermittently measuring, the average power consumption can be significantly reduced down to e.g. 0.2mW for 20 measurements per second. Experiments verify that, due to the short wavelength, the single channel receiver limitations can be neglected when only a detection of human presence but no evaluation of the breathing frequency is necessary. For the demo track session we propose a functional system demonstrator with a live MATLAB graphical user interface (GUI). Additional insight will be given into the internal processes of the low-power system concept by showing the baseband voltage and duty cycles of the single components on a digital storage oscilloscope (DSO) while simultaneously monitoring the power consumption on a precision DC analyzer.

7. Sub-THz Low-power and High-speed OOK Transmitter and Receiver for uncompressed HD video streaming
Hea Jin Lee, Chong Hyun Yoon, Joong Geun Lee, Chae Jun Lee, Dong Min Kang, In Sang Song, Sung Jun Cho, Hong Yi Kim, Inn Yeol Oh, and Chul Soon Park, Department of Electrical engineering, Korea Advanced Institute of Science and Technology (KAIST), Korea
Through researches, we designed low-power high-speed OOK transmitter and receiver using sub-THz carrier frequency and will demonstrate wireless streaming of large amount of data having a data rate of 3Gbps at this demo track. High speed characteristic of sub-THz enables the system to use the uncompressed data for transmitting and receiving so that the system architecture and its cost is reduced.

8. Compact High Resolution Radar at 80 GHz and 140 GHz
Nils Pohl, Sven Thomas, Simon Kueppers, and Timo Jaeschke, Institute of Integrated Systems, Ruhr-University Bochum, Germany
We will demonstrate an FMCW radar sensor with two different front-ends, operating at 80GHz and 140GHz. They achieve an ultra-wide bandwidth of 25GHz and 48GHz, respectively. The mmWave front-ends of the sensor are realized as a custom SiGe MMIC and embedded in a compact sensor board. For control and raw data transmission a USB interface is used. The signal processing and visualization can be done using a standard computer, e.g. with MATLAB. The sensor will be demonstrated with both front-ends as a live demo during the RWW demo session.

TUESDAY, 27 JANUARY 2015

RWS-SiRF Joint Session: TU5A	RWS Session: TU5B	RWS Session: TU5C	BioWireleSS Session: TU5D
RF & Internet of Things	**Late News**	**High Speed II**	**Wireless BAN and Medical Imaging**
Chair: Jeremy Muldavin, MIT Lincoln Laboratory Co-Chair: Karen Gettings, MIT Lincoln Laboratory	Chair: Sergio Pacheco, Freescale	Chair: Debabani Choudhury, Intel	Chair: Changzhi Li , Texas Tech University Co-Chair: Arnaud Pothier, XLIM
Room: Grand Salon A	Room: Gallery 1	Room: Grand Salon B	Room: Gallery 2
	16:00		
TU5A-1 Redefining the Leading Edge: A Silicon RF Perspective (Invited) *P. Colestock, Global Foundries, San Diego, United States*	**TU5B-1 A Pseudorandom Clocking Scheme for a CMOS N-path Band-pass Filter with 10-to-15 dB Spurious Leakage Improvement** *C. Thomas[1], W. Leung[2], L. E. Larson[3], [1]University of California, San Diego, La Jolla, United States, [2]Qualcomm Inc., San Diego, United States, [3]Brown University, Providence, United States*	**TU5C-1 Iterative Receiver for Millimeter-Wave OFDM Systems: Evaluation of High Doppler Shift by Dynamic Channel Model** *Y. Chang, M. Furukawa, H. Suzuki, K. Fukawa, Tokyo Institute of Technology, Tokyo, Japan*	**TU5D-1 Fiber Antenna for Wireless Body Area Networks** *T. Nikoubin[1], M. Garipally[1], T. Nguyen[2], Z. Wang[2], M. Saed[1], C. Li[1], [1]Texas Tech University, Lubbock, United States, [2]University of Texas, Austin, United States*
	16:20		
	TU5B-2 Performance of Non-Coherent FSK Virtual MISO Systems in Correlated Rayleigh Fading *M. Hussain, S. Hassan, National University of Sciences & Technology, Islamabad, Pakistan*	**TU5C-2 Development of a very Low-cost Down Converter for the IEEE802.11ad Wireless Network Appliance Test** *K. Fujiwara[1], N. Shibagaki[2], T. Kobayashi[1], H. Hanyu[2], [1]Tokyo Metropolitan Industrial Technology Research Institute, Koto-ku, Japan, [2]Hitachi, Ltd., Information & Telecommunication Systems Company, Kawasaki, Japan*	**TU5D-2 Radiation Pattern Steering for On-body Gateways at the 2.4 GHz ISM Band** *S. Dumanli, Toshiba Research Europe Limited, Bristol, United Kingdom*
	16:40		
TU5A-2 RF and Microwave Technology Challenges for Internet-of-Things Applications (Invited) *L. E. Larson, Brown University, Providence, United States*	**TU5B-3 A Low Power 24 GHz Radar System for Occupancy Monitoring** *F. Lurz, S. Mann, S. Linz, S. Lindner, F. Barbon, R. Weigel, A. Koelpin, University of Erlangen-Nuremberg, Erlangen, Germany*	**TU5C-3 Performance Evaluation of LTE-Advanced Downlink Adopting Higher Order Modulation in Small Cells** *T. Ohseki, T. Yamamoto, Y. Suegara, KDDI R&D Laboratories, Inc., Fujiminoshi, Japan*	**TU5D-3 Dual Thermal Time Constant Electrothermal Modeling of PIN Diode Protection Circuits** *R. H. Caverly, Villanova University, Villanova, United States*
		17:00	
		TU5C-4 Evaluation of Information Leak by Robustness Evaluation of Countermeasure to Disguised CSI in PLNC Considering Physical Layer Security *K. Matsumoto[1], O. Takyu[1], T. Fujii[2], T. Ohtsuki[3], F. Sasamori[1], S. Handa[1], [1]Shinshu University, Nagano, Japan, [2]The University of Electro-Communications, Chofu, Japan, [3]Keio University, Yokohama, Japan*	**TU5D-4 Reconfigurable Analog-to-Digital Converter for Implantable Bioimpedance Monitoring** *T. C. Randall, I. Mahbub, S. K. Islam, University of Tennessee, Knoxville, United States*

WEDNESDAY, 28 JANUARY 2015

RWW

WiSNet Session: WE1A

Insight in Sensor Networks and System Design

Chair: Rahul Khanna, Intel
Co-Chair: Andreas Stelzer, Johannes Kepler University, Linz

Room: Gallery 1

RWW Session: WE1B

Passive Components and Packaging I

Chair: Hualiang Zhang, University of North Texas
Co-Chair: Roberto Gomez-Garcia, University of Alcala

Room: Grand Salon A

SiRF Session: WE1C

Tunable and Reconfigurable Technologies

Chair: J.P. Raskin, Université catholique de Louvain (UCL)
Co-Chair:Monte Miller, Freescale

Room: Grand Salon B

BioWireleSS Session: WE1D

Micro Biosensing

Chair: Dietmar Kissinger , IHP GmbH
Co-Chair: JC Chiao, University of Texas Arlington

Room: Gallery 2

08:00

WE1A-1 Review of the Present Technologies Concurrently Contributing to the Implementation of the Internet of Things (IoT) Paradigm: RFID, Green Electronics, WPT and Energy Harvesting (Invited)

L. Roselli[1], C. Mariotti[1], P. Mezzanotte[1], F. Alimenti[1], G. Orecchini[1], M. Virili[1], N. B. Carvalho[2], [1]University of Perugia, Perugia, Italy, [2]University of Aveiro, Aveiro, United States

WE1B-1 Miniaturized Via-less Ultra-Wideband Bandpass Filter Based on CRLH-TL Unit Cell

A. O. Alburaikan, M. Aqeeli, X. Huang, Z. Hu, The University of Manchester, Manchester, United Kingdom

WE1C-1 Reconfigurable Solutions for Mobile Device RF Front-ends (Invited)

A. Morris, wiSpry, San Diego, United States

WE1D-1 Why using High Frequency Dielectric Spectroscopy for Biological Analytics? (Invited)

M. Poupot[1,2], D. Dubuc[2,3], F. Artis[1,3], K. Grenier[2,3], J. Fournie[1,2], [1]CRCT , Av. Hubert Curien, France, [2]Univ. Toulouse [3], Toulouse, France, [3]CNRS, Toulouse, France

08:20

WE1A-2 Combined Localization and Data Transmissionin Energy-Constrained Wireless Sensor Networks

T. Nowak[1], A. Koelpin[2], F. Dressler[3], M. Hartmann[1], L. Patino[1], J. Thielecke[1], [1]University of Erlangen-Nürnberg-Inst. Info. Tech., Erlangen, Germany, [2]University of Erlangen-Nürnberg-Inst. Elec. Eng., Erlangen, Germany, [3] University of Paderborn, Paderborn, Germany

WE1B-2 Dual-Band Negative Group Delay Circuit Using Defected Microstrip Structure

G. Chaudhary[1], P. Kim[1], J. Jeong[1], Y. Jeong[1], J. Lim[2], [1]Chonbuk National University, Jeonju-si, Republic of Korea, [2]Soonchunhyang University, Asan, Republic of Korea

08:40

WE1A-3 Wireless Integrated Sensor Nodes for Indoor Monitoring and Localization (Invited)

D. Kissinger[1,2], A. Schwarzmeier[3], F. Grimminger[4], J. Mena-Carrillo[4], W. Weber[4], G. Hofer[5], G. Fischer[3], R. Weigel[3], [1]IHP, Frankfurt (Oder), Germany, [2]Technische Universität Berlin, Berlin, Germany, [3]FAU Erlangen-Nuremberg, Erlangen, Germany, [4]Infineon Technologies, Neubiberg, Germany, [5]Infineon Technologies Austria, Graz, Austria

WE1B-3 A high power Ka-band SPST switch MMIC using 0.25 um GaN on SiC

S. Kaleem[1], J. Kuhn[2], R. Quay[2], M. Hein[1], [1]Ilmenau University of Technology, Ilmenau, Germany, [2]Fraunhofer Society for the Advancement of Applied Research, Freiburg, Germany

WE1C-2 An Integrated Reconfigurable Tuner in 45nm CMOS SOI Technology

A. Jou, C. Liu, S. Mohammadi, Purdue Univeristy, West Lafayette, United States

WE1D-2 Broadband Dielectric Characterization of CHO-K1 Cells Using Miniaturized Transmission-Line Sensor

N. Meyne[1], G. Fuge[2], S. Hemanth[3], H. K. Trieu[3], A. Zeng[2], A. F. Jacob[1], [1]Technische Universität Hamburg-Harburg-Inst. Hochfreq., Hamburg, Germany, [2]Technische Universität Hamburg-Harburg-Inst. Bioproz. und Biosys., Hamburg, Germany, [3]Technische Universität Hamburg-Harburg-Inst. Mikrosystem., Hamburg, Germany

09:00

WE1A-4 Low-Weight Wireless Sensor Network for Encounter Detection of Bats

M. Hierold[1], S. Ripperger[2], D. Josic[2], F. Mayer[2], R. Weigel[1], A. Koelpin[1], [1]University of Erlangen-Nuremberg, Erlangen, Germany, [2]Museum of Natural History, Berlin, Germany

WE1B-4 High Frequency-Selectivity Impedance Transformer

P. Kim[1], G. Chaudhary[1], J. Park[1], Y. Jeong[1], J. Lim[2], [1]Chonbuk National University, Jeonju, Republic of Korea, [2]Soonchunhyang University, Asan, Republic of Korea

WE1C-3 Ferroelectric MIM Capacitors for Compact High Tunable Filters

R. De Paolis[1], S. Payan[2], M. Maglione[2], G. Guegan[3], F. Coccetti[1], [1]CNRS, Toulouse, France, [2]CNRS, Bordeaux, France, [3]ST-Microelectronics, Tours, France

WE1D-3 A Microwave Sensor Dedicated to Dielectric Spectroscopy of Nanoliter Volumes of Liquid Medium and Flowing Particles

A. Landoulsi, C. Dalmay, A. Bessaudou, P. Blondy, A. Pothier, XLIM, Limoges, France

09:20

WE1A-5 Ad-Hoc Multilevel Wireless Sensor Networks for Distributed Microclimatic Diffused Monitoring in Precision Agriculture

A. Rodriguez de la Concepcion, R. Stefanelli, D. Trinchero, iXem Labs - Politecnico di Torino, Torino, Italy

WE1B-5 A Class of Planar Multi-Band Wilkinson-Type Power Divider with Intrinsic Filtering Functionality

R. Loeches-Sanchez[1,2], D. Psychogiou[2], D. Peroulis[2], R. Gomez-Garcia[1], [1]University of Alcala, Alcala de Henares, Spain, [2]Purdue University , West Lafayette, United States

WE1C-4 10.6 THz Figure-of-Merit Phase-change RF Switches with Embedded Micro-heater

J. Moon, H. Seo, D. Le, H. Fung, A. Schmitz, T. Oh, S. Kim, K. Son, B. Yang, HRL Laboratories, Malibu, United States

WE1D-4 Sub-microliter Microwave Dielectric Spectroscopy for Identification and Quantification of Carbohydrates in Aqueous Solution

F. Artis[1,2], D. Dubuc[1], J. Fournie[2], M. Poupot[2], K. Grenier[1], [1]LAAS-CNRS and Toulouse Univ., Toulouse, France, [2]CRCT, Toulouse, France

WEDNESDAY, 28 JANUARY 2015

RWW

WisNet Session: WE2A

Advanced Localization and Sensing Technologies

Chair: Luca Roselli, University of Perugia
Co-Chair: Holger Maune, University of Darmstadt
Room: Gallery 1

RWW Session: WE2B

Passive Components and Packaging II

Chair: Dariush Mirshekar-Syahkal, University of Essex
Co-Chair: Rashaunda Henderson, University of Texas Dallas

Room: Grand Salon A

SiRF Session: WE2C

SiRF Circuits and Applications - 2

Chair: Chiennan Kuo, National Chiao Tung University
Co-Chair: Austin Chen, Skyworks Solutions

Room: Grand Salon B

BioWireleSS Session: WE2D

Microwaves Interaction with Biological Materials

Chair: JC Chiao , University of Texas Arlington
Co-Chair: Pinshan Wang, Clemson University

Room: Gallery 2

10:10

WE2A-1 Robust Localization of Passive UHF RFID Tag Arrays Based on Phase-Difference-of-Arrival Evaluation

M. Scherhäufl[1], M. Pichler[1], A. Stelzer[2], [1]Linz Center of Mechatronics GmbH, Linz, Austria, [2]Johannes Kepler University, Linz, Austria

WE2B-1 Varactor Tuned Ring Resonator Filter With Wide Tunable Bandwidth

C. Kim[1], K. Chang[2], X. Liu[1], [1]University of California Davis, Davis, United States, [2]College Station, United States

WE2C-1 Low Power and High Speed OOK Modulator for Wireless Inter-Chip Communications

H. Lee, C. Yoon, J. Lee, C. Lee, D. Kang, I. Song, S. Cho, H. Kim, I. Oh, C. Park, KAIST, 291 Daehak-ro, Yuseong-gu, Daejeon, Republic of Korea

WE2D-1 When Dielectric Spectroscopy Meets THz Spectroscopy; The Tale of Two Estranged Brothers (Invited)

Y. Feldman[1], P. Ben Ishai[1,2], [1]The Hebrew University of Jerusalem, Jerusalem, Israel, [2]Neteera, Jerusalem, Israel

10:30

WE2A-2 Experimental Evaluation of A Pairwise Broadcast Synchronization in A Low-Power Cyber-Physical System

U. Ghoshdastider, R. Viga, M. Kraft, University of Duisburg-Essen, Duisburg, Germany

WE2B-2 Small Low-Pass Filter Using Slotted-Ground-Plane Resonator

J. Wu, D. Hsieh, Y. Cheng, W. Wang, C. Wang, National University of Tainan, Tainan, Taiwan

WE2C-2 A 20GHz Class-C VCO Using Noise Sensitivity Mitigation Technique

K. Kimura, K. Okada, A. Matsuzawa, Tokyo Institute of Technology, Okayama, Meguro-ku, Japan

10:50

WE2A-3 DMA-driven Control Method for Low Power Sensor Node

T. Enami, K. Kawakami, H. Yamazaki, Fujitsu Laboratories Ltd., Kawasaki, Japan

WE2C-3 Radio-Frequency Flexible Transistors on Cellulose Nanofibrillated Fiber (CNF) Substrates

J. Seo[1], T. Chang[1], R. Sabo[2], Z. Cai[2], S. Gong[3], Z. Ma[1], [1]University of Wisconsin-Madison, Madison, United States, [2]U.S. Department of Agriculture (USDA), Madison, United States, [3]University of Wisconsin-Madison, Madison, United States

WE2D-2 A Permittivity Sensitive Phase-Locked Loop Based on a Silicon-Integrated Capacitive Sensor for Microwave Biosensing Applications

J. Nehring[1], M. Bartels[1], R. Weigel[1], D. Kissinger[1,2,3], [1]University of Erlangen-Nuremberg, Erlangen, Germany, [2]IHP GmbH, Frankfurt (Oder), Germany, [3]Technische Universität Berlin, Berlin, Germany

11:10

WE2A-4 Wireless Sensors for Stratified Soil Microwave Scanning Applied to Precision Quality Agriculture

E. Pievanelli, D. Trinchero, A. Rodriguez de la Concepcion, R. Stefanelli, iXem Labs - Politecnico di Torino, Torino, Italy

WE2B-4 Sharp-Rejection Highpass and Dual-Band Bandpass Planar Filters with Multi-Transmission-Zero-Generation Transversal Cell

R. Loeches-Sanchez[1,2], D. Psychogiou[2], D. Peroulis[2], R. Gomez-Garcia[1], [1]University of Alcala, Alcala de Henares, Spain, [2]Purdue University, West Lafayette, United States

WE2C-4 Phase Noise Reduction in RF Oscillators utilizing Self-Injection Locked and Phase locked Loop

L. Zhang[1], A. K. Poddar[2], U. L. Rohde[2], A. S. Daryoush[1], [1]Drexel University, Philadelphia, United States, [2]Synergy Microwave, Paterson, United States

WE2D-3 Non-contact Measurement of Complex Permittivity Based on Coupled Magnetic and Electric Resonances

J. Dong[1], F. Shen[1], J. Huangfu[1], S. Qiao[2], C. Li[3], L. Ran1, [1]Zhejiang University, Hangzhou, China, [2]Zhejiang University City College, Hangzhou, China, [3]Texas Tech University, Lubbock, United States

11:30

WE2A-5 Sensor Network with Energy Efficient and Low-cost Gas Sensor Nodes for the Detection of Hazardous Substances in the Event of a Disaster

S. Rademacher, K. Schmitt, M. Mengers, J. Wöllenstein, Fraunhofer Institute for Physical Measurement Techniques IPM, Freiburg, Germany

WE2B-5 A Fourth Order Tunable Capacitor Coupled Microstrip Resonator Band Pass Filter

S. Hao, Q. J. Gu, University of California, Davis, Davis, United States

WE2D-4 Design and Evaluation of Electrode for Dielectrophoretic Characterization of Blood Cells

M. Eguchi[1], F. Kuroki[2], H. Imasato[1], T. Yamakawa[1], [1]Fuzzy Logic Systems Institute, Kitakyushu, Japan, [2]Kure National College of Technology, Kure, Japan

Joint RWW Interactive Poster Session
12:55-14:30

WE3P: Transceivers and Front-end Technologies SOC and SiP

Chair: Yupeng Jia, National Instruments
Room: Grand Salon CDE

WE3P-1 A Low Power and High Conversion Gain 77~81 GHz Double-Balanced Up-Conversion Mixer with Excellent LO-RF Isolation in 90 nm CMOS
Y. Lin, R. Liu, C. Wang, C. Chen, National Chi Nan University, Puli, Taiwan, National Chi Nan University, Puli, Taiwan

WE3P-2 Accelerating Software Radio on ARM: Adding NEON Support to VOLK
N. E. West[2,1], D. J. Geiger[1], G. M. Scheets[2], [1]U.S. Naval Research Laboratory, Washington, United States, [2]Oklahoma State University, Stillwater, United States

WE3P-3 Series-Cascaded Absorptive Notch-Filters for 4G-LTE Radios
D. Psychogiou, R. Mao, D. Peroulis, Purdue University, West Lafayette, United States

WE3P-4 Two Half-Lambda Dipole Array Coplanar Feed Wideband PCB Antenna
Q. W. Pan, Manukau Institute of Technology, Manukau, New Zealand

WE3P-5 On Coupled-Resonator Filters with Tunable Bandwidth
M. K. Wohler, A. Jaschke, M. Schühler, Fraunhofer Institute for Integrated Circuits, Erlangen, Germany

WE3P-6 Performance Comparison of Raised Cosine Shaped and Rectangular Pulsed Signals in E-Band Communication Systems
F. Boes[1], J. Antes[1], D. Meier[1], T. Messinger[1], D. Müller[1,2], R. Henneberger[3], A. Tessmann[4], I. Kallfass[1], 1University of Stuttgart, Stuttgart, Germany, [2]Karlsruher Institute of Technology, Karlsruhe, Germany, [3]RPG Radiometer Physics GmbH, Meckenheim, Germany, [4]Frauenhofer IAF, Freiburg, United States

WE3P-7 Resonant Characteristics of Metal Rod Resonator Supported by PEEK Material at 60 GHz
M. Teramoto, F. Kuroki, National Institute of Technology, Kure College, Kure, Japan

WE3P-8 A Capacitively-loaded Loop Antenna for UHF Near-field RFID Reader Applications
M. Dhaouadi[1], M. Mabrouk[1], A. Ghazel[1], T. Phu Vuong[2], A. Coelho[2], [1]Grescom SUPCOM, Ariana, Tunisia, [2]Grenoble INP - Minatec , Grenoble, France

WE3P-10 Gold Nanorod Array Structured Silicon Nitride Films for Reliable RF MEMS Capacitive Switches
L. Michalas[1], S. Xavier[2], M. Koutsoureli[1], O. El Jouaidi[2], S. Bansropun[1], G. Papaioannou[2], A. Ziaei[2], [1]University of Athens, Athens, Greece, [2]Thales, Paris, France

WE3P-11 Noninvasive Continuous Mobile Blood Pressure Monitoring using Novel PPG Optical Sensor
V. Mouradian, A. Poghosyan, L. Hovhannisyan, Sensogram Technologies Inc., Plano, United States

WE3P-12 Miniaturized 60 GHz Triangular CMOS Antenna-on-Chip using Asymmetric Artificial Magnetic Conductor
A. Barakat[1], A. Allam[1], H. Elsadek[2], A. Abdel-Rahman[1], S. Hanif[3], R. K. Pokharel[3], [1]Egypt-Japan University of Science and Technology, New Borg-Alarab, Egypt, [2]Electronics Research Institute, Dokki, Egypt, [3]Kyushu University, Fukuoka, Japan

San Diego Trolley
Courtesy: Omni Hotel, San Diego

WEDNESDAY, 28 JANUARY 2015

WiSNET Session: WE3A

Six-Port and Multi-Port Technology

Chair: Fadhel Ghannouci, University of Calgary
Co-Chair: Alexander Koelpin, University of Erlangen

Room: Gallery 1

RWS Session: WE3B

3D and Printed Technologies for RF

Chair: Shamsur Mazumder

Room: Grand Salon A

RWS Session: WE3C

Late News II

Chair: Sergio Pacheco, Freescale
Co-Chair: Karen Gettings, MIT Lincoln Laboratory

Room: Grand Salon B

WiSNET Session: WE3D

Novel Sensors and Sensor Components

Chair: Nils Pohl, Fraunhofer Institute for High Frequency Physics and Radar Techniques
Co-Chair: Changzhi Li, Texas Tech University
Room: Gallery 2

13:30

WE3A-1 Six-Port Technology for MIMO and Cognitive Radio Receiver Applications (Invited)

A. Hasan[1], M. Helaoui[1], N. Boulejfen[2,1], F. Ghannouchi[1], [1]University of Calgary, Calgary, Canada, [2]University of Hail, Hail, Saudi Arabia

WE3B-1 RCS Reduction of Ridged Waveguide Slot Antenna Array with Metamaterial Absorber

X. Cao, W. Li, J. Gao, Q. Yang, Air Force Engineering University, Xi'an, China

WE3C-1 High-Performance W-band LNA and SPDT Switch in 0.13 um SiGe HBT Technology

C. A. Ulusoy[1], R. Schmid[1], M. Kaynak[2], B. Tillack[2,3], J. D. Cressler[1], [1]Georgia Institute of Technology, Atlanta, United States, [2]IHP Microelectronics GmbH, Frankfurt (Oder), Germany, [3]Technische Universitaet Berlin, Berlin, Germany

WE3D-1 Millimeter-Wave Radar Systems On-Chip and in Package: Current Status and Future Challenges (Invited)

R. Feger, A. Stelzer, Johannes Kepler University Linz, Linz, Austria

13:50

WE3A-2 100 GHz Reflectometer for Sensitivity Analysis of MEMS Sensors Comprising an Intermediate Frequency Six-port Receiver

S. Linz, F. Oesterle, A. Talai, S. Lindner, S. Mann, F. Barbon, R. Weigel, A. Koelpin, Friedrich-Alexander University of Erlangen-Nuremberg, Erlangen, Germany

WE3B-2 2.4 GHz Inkjet-Printed RF Energy Harvester on Bulk Cardboard Substrate (Invited)

Z. Khonsari[1], T. Björninen[1], M. M. Tentzeris [2], L. Sydänheimo[1], L. Ukkonen[1], [1]Tampere University of Technology, Tampere, Finland, [2]Georgia Institute of Technology, Atlanta, United States

WE3C-2 A Broadband Rx Band Noise Reduction Circuit with CMOS Switch for Multi-Band Power Amplifier

Y. Kawamura, S. Shinjo, K. Iyomasa, M. Hirobe, K. Kato, Y. Takahashi, S. Yamabe, K. Horiguchi, M. Hieda, K. Yamanaka, Mitsubishi Electric Corporation, Kamakura, Japan

WE3D-2 A 7-µW 2.4-GHz Wake-Up Receiver with 80 dBm Sensitivity and High Co-Channel Interferer Tolerance

H. Milosiu, F. Oehler, M. Eppel, D. Fruehsorger, T. Thoenes, Fraunhofer IIS, Erlangen, Germany

14:10

WE3A-3 Forward V-band Vector Network Analyzer Based on a Modified Six-port Technique

K. Haddadi, T. Lasri, IEMN, Villeneuve d'Ascq, France

WE3B-3 Ultra-Wideband Microwave Components Fabricated Using Low-Cost Aerosol-jet Printing Technology

X. Lan[1], X. Lu[2], T. Blumenthal[3], V. Fratello[3], W. Chan[1], M. Truong[1], K. Kiyono[1], Y. Zhang[2], G. Gu[2], M. Tan[1], [1]Northrop Grumman, Redondo Beach, United States, [2]University of Massachusetts Lowell, Lowell, United States, [3]QI2, Kent, United States

WE3C-3 Transmit-Receive (T/R) Isolation Enhancement with an Indented Antenna Array

Q. Xu, S. Qin, Y. E. Wang, UCLA, Los Angeles, United States

WE3D-3 A Time to Digital Converter for use in Ultra Wide Band Radar Sensor Nodes

D. Genschow, IHP, Frankfurt (Oder), Germany

14:30

WE3A-4 A New Compact V-band Six-Port Down-Converter Receiver for High Data Rate Wireless Applications

C. Hannachi, S. Tatu, Institut National de la Recherche Scientifique-EMT, Montréal, Canada

WE3B-4 Planar Monopole Antennas on Substrates Fabricated Through an Additive Manufacturing Process

C. D. Saintsing[1], K. Yu[2], H. J. Qi[2], M. M. Tentzeris[1], [1]Georgia Institute of Technology(ECE), Atlanta, United States, [2]Georgia Institute of Technology(Mechanical), Atlanta, United States

WE3D-4 Generation of UWB pulses utilizing directly modulated tunable MEMS-VCSEL (Invited)

C. Gierl, Q. T. Le, C. Damm, F. Küppers, TU Darmstadt, Darmstadt, Germany

14:50

WE3A-5 ADC Depending Limitations for Six-Port Based Distance Measurement Systems

S. Lindner, F. Barbon, S. Linz, F. Lurz, S. Mann, R. Weigel, A. Koelpin, University of Erlangen-Nuremberg, Erlangen, Germany

WE3D-5 Diode Detector Design for 61 GHz Substrate Integrated Waveguide Six-Port Radar Systems

S. Mann, S. Erhardt, S. Lindner, F. Lurz, S. Linz, F. Barbon, R. Weigel, A. Koelpin, University of Erlangen-Nuremberg, Erlangen, Germany

WiSNet Session: WE4A	RWW Session: WE4B	RWW Session: WE4D
Sensor Networks for Modern Applications	**Wireless System Modelling**	**Digital Signal Processing**
Chair: Christian Damm, University of Darmstadt Co-Chair: Dietmar Kissinger, IHP GmbH	Chair: Syed Islam, University of Tennessee at Knoxville	Chair: Jeremy Muldavin, MIT Lincoln Laboratory
Room: Gallery 1	Room: Grand Salon A	Room: Grand Salon B
15:40		
WE4A-1 An Ultra-High Resolution Radar-System Operating at 300 GHz (Invited) *N. Pohl[1], S. Stanko[1], M. Caris[1], A. Tessmann[2], M. Schlechtweg[2], [1]Fraunhofer FHR, Wachtberg, Germany, [2]Fraunhofer IAF, Freiburg, Germany*	**WE4B-1 Phase Noise Cancellation Performance in Self-Heterodyning Transceivers for Wireless Backhaul Applications** *S. Maier, X. Yu, H. Schlesinger, G. Luz, P. Jueschke, U. Seyfried, A. Pascht, Alcatel-Lucent Bell Labs Germany, Stuttgart, Germany*	**WE4D-1 High-Resolution Indoor Positioning System using SDR Modules** *A. N. Gaber, S. Prcanovic, A. Omar, The University of Magdeburg , Magdeburg, Germany*
16:00		
WE4A-2 Millimeter-wave Radar Distance Measurements in Micro Machining *S. Ayhan[1], S. Thomas[2], N. Kong[3], S. Scherr[1], M. Pauli[1], T. Jaeschke[4], J. Wulfsberg[3], N. Pohl[2], T. Zwick[1], [1]Karlsruhe Institute of Technology , Karlsruhe, Germany, [2]Fraunhofer Institute for High Frequency Physics and Radar Techniques, Wachtberg, Germany, [3]Helmut Schmidt University - Hamburg, Hamburg, Germany, [4]Ruhr University Bochum, Bochum, Germany*	**WE4B-2 Enhancing Connectivity for Communication and Control in Unmanned Aerial Vehicle Networks** *D. B. Rawat, R. Grodi , C. Bajracharya, Georgia Southern University , Statesboro, United States*	**WE4D-2 Outphasing Multi-Level RF-PWM Signals for Inter-Band Carrier Aggregation in Digital Transmitters** *S. Chung[1,2], R. Ma[1], K. Teo[1], K. Parsons[1], [1]Mitsubishi Electric Research Laboratories, Cambridge, United States, [2]MIT, Cambridge, United States*
16:20		
WE4A-3 Structural Health Monitoring of Wind Turbines using Low-Cost Portable K-band Radar: an ab-initio Field Investigation (Invited) *T. Nikoubin[1], J. Muñoz-Ferreras[3], R. Gómez-García[3], D. Liang[2], C. Li[1], [1]Texas Tech University, Lubbock, United States, [2]Texas Tech University, Lubbock, United States, [3]University of Alcalá, Alcalá de Henares, Spain*	**WE4B-3 All-Analog Peak-to-Average Power Reduction using Constrained Clipping for OFDM Systems** *M. Cho, J. S. Kenney, Georgia Institute of Technology, Atlanta, United States*	**WE4D-3 Frequency Quadrupling Transmitter Architecture with Digital Predistortion for High-Order Modulation Signal Transmission** *Y. Liu, G. Liu, P. M. Asbeck, University of California at San Diego, La Jolla, United States*
16:40		
WE4A-4 Underwater Interferometric Radar Sensor for Distance and Vibration Measurement *M. Sporer[1], F. Lurz[1], E. Schluecker[2], R. Weigel[1], A. Koelpin[1], [1]University of Erlangen-Nuremberg (Inst. Elec. Eng.), Erlangen, Germany, [2]University of Erlangen-Nuremberg (Inst. Proc. Tech. and Mach.), Erlangen, Germany*	**WE4B-4 An Experimental Evaluation on EVM Performance for 4-CSK (Color Shift Keying) using Visible Light with Multiple Full-color LEDs** *H. Shimamoto, Y. Kozawa, Y. Umeda, Tokyo University of Science, Noda, Japan*	**WE4D-4 Real Time Digital Signal Strength Tracking for RF Source Location** *J. D. Popp[1], J. Lopez[2], [1]University of Washington, Seattle, United States, [2]NoiseFigure Research, Inc., Lubbock, United States*
17:00		
WE4A-5 Urban Highway Bridge Structure Health Assessments using Wireless Sensor Network *F. X. Li[1], A. Islam[2], A. S. Jaroo[2], H. Hamid[2], J. Jalali[1], M. Sammartino[1], [1]Youngstown State University, Youngstown, United States, [2]Youngstown State University, Youngstown, United States*		**WE4D-5 Digital Cancellation Technique to Mitigate Receiver Desensitization in Cellular Handsets Operating in Carrier Aggregation Mode With Multiple Uplinks and Multiple Downlinks** *H. Gheidi[1], H. T. Dabag[2], Y. Liu[1], P. M. Asbeck[1], P. Gudem[2,1], [1]University of California San Diego, La Jolla, United States, [2]Qualcomm Inc, San Diego, United States*

Industry Exhibits

Room:
Grand Salon CDE

Monday, 26 January 2015
13:00 – 17:30

Tuesday, 27 January 2015
10:00 – 17:00

Exhibitor	Booth
Sonnet Software, Inc (Diamond Sponsor)	3
Keysight Technologies (Sponsor)	8
Virginia Diodes, Inc. (Sponsor)	13
Berkeley Nucleonics	10
CST of America, Inc	11
EMSCAN	15
Focus Microwaves Inc	14
Kyocera America, Inc	7
Maury Microwave	6
Microwave Product Digest	5
MOSIS	2
National Instruments	12
Remcom, Inc	9
RF Micropower	4
West Bond Inc	1

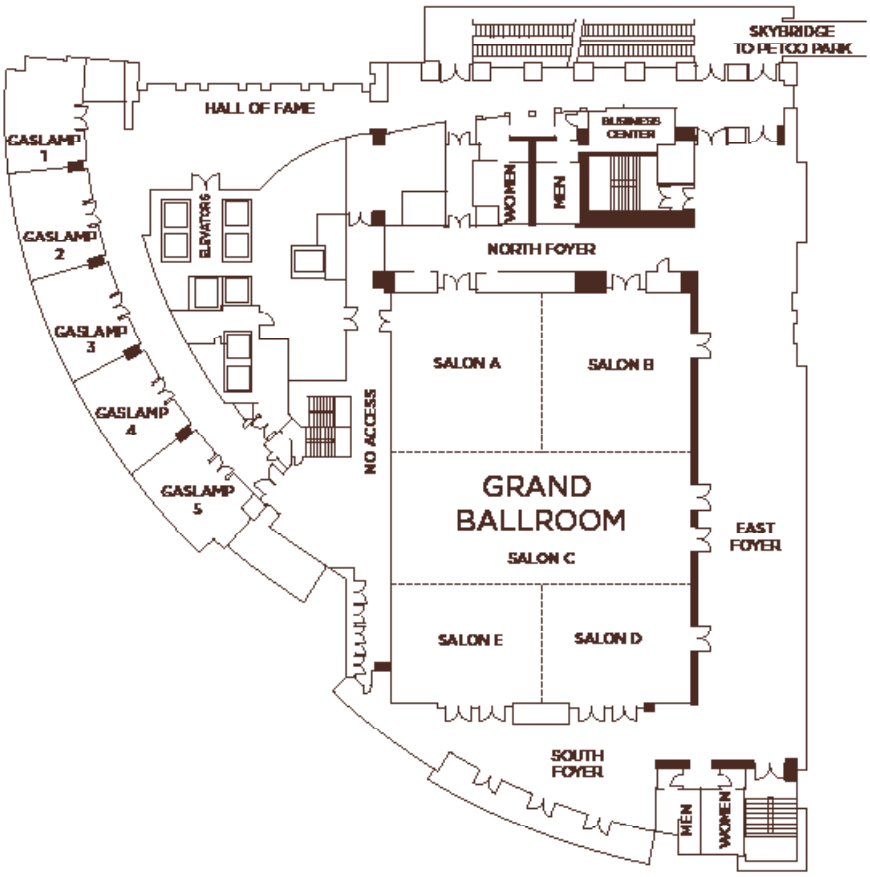
Diamond Sponsor: SONNET®

Sponsors: KEYSIGHT TECHNOLOGIES, Virginia Diodes, Inc.

Omin Hotel, Mccormick Schmics Sea Food Restaurant
Courtesy: Omni Hotel, San Diego

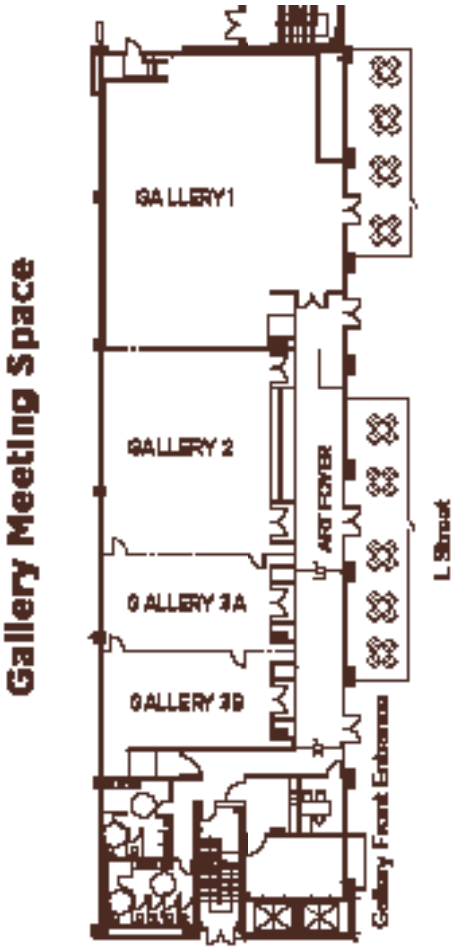
Hotel Maps

4th Floor



5th Floor

Gallery Meeting Space



Driving Directions to the OMNI San Diego, CA

Address: 675 L Street, San Diego, CA 92101
Telephone: +1 (619) 231-6664 or
1-800-THE-OMNI (843-6664)

FROM SAN DIEGO INTERNATIONAL AIRPORT – 14 Min./4 Mi.
Follow the airport exit signs toward Harbor Drive/Downtown San Diego. Merge onto Harbor Drive going south along the San Diego Bay. Follow Harbor Drive as it turns to the left at Seaport Village. Turn left onto 5th Avenue. Make an immediate right onto L Street. Proceed 1 block on L Street. The hotel is located on the right on the corner of 6th Avenue and L Street.

DIRECTIONS FROM THE NORTH — VIA HIGHWAY 5 SOUTH
Take Highway 5 South to the 10th Avenue exit. Follow 10th Avenue to Market Street. Turn right onto Market Street and proceed to 6th Avenue. Turn left onto 6th Avenue and proceed to L Street. The hotel is on the left on the corner of 6th Avenue and L Street.

DIRECTIONS FROM THE NORTH — VIA HIGHWAY 163 SOUTH
Take Highway 163 until it turns into 10th Avenue. Follow 10th Avenue to Market Street. Turn right onto Market Street and proceed to 6th Avenue. Turn left onto 6th Avenue and proceed to L Street. The hotel is on the left on the corner of 6th Avenue and L Street.

DIRECTIONS FROM THE EAST — VIA HIGHWAY 8 WEST.
Take Highway 8 West to Highway 163 South toward downtown. Take Highway 163 until it turns into 10th Avenue. Follow 10th Avenue to Market Street. Turn right onto Market Street and proceed to 6th Avenue. Turn left onto 6th Avenue and proceed to L Street. The hotel is on the left on the corner of 6th Avenue and L Street.

DIRECTIONS FROM LOS ANGELES OR ORANGE COUNTY
Take Interstate 405 South until it merges with Interstate 5 South. Take Highway 5 South to the 10th Street exit. Follow 10th Street to Market Street. Turn right onto Market Street and proceed to 6th Avenue. Turn left onto 6th Avenue and proceed to L Street. The hotel is on the left on the corner of 6th Avenue and L Street.

RWW 2015 at a Glance

Activity	Location	Sunday (Jan. 25, 2015)		Monday (Jan. 26, 2015)			Tuesday (Jan. 27, 2015)			Wednesday (Jan. 28, 2015)		
		Afternoon	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening
RWW Workshops	Gaslamp 1	13:30-17:30			13:30-17:30							
	Gaslamp 2											
	Gaslamp 3											
	Gallery 1											
Panel	Grand Salon B					19:00-20:30						
Industry Forum	Gallery 3A			9:00-12:00								
RWW Plenary	Grand Salon AB						10:10-12:10					
RWS Sessions	Grand Salon A, Grand Salon B, Gallery 1, Gallery 2			8:00-9:20, 10:10-11:30	13:30-15:10, 15:40-17:20		8:00-9:00	13:30-14:50, 16:00-17:20		8:00-9:40, 10:10-11:50	13:30-14:50, 15:40-17:00	
PAWR Sessions	Gallery 1			8:00-9:40, 10:10-11:50	13:30-15:10, 15:40-17:20							
WiSNet Sessions	Gallery 1, Gallery 2									8:00-9:40, 10:10-11:50	13:30-15:10, 15:40-17:20	
BioWireleSS Sessions	Gallery 2						8:00-9:40	13:30-14:50, 16:00-17:20		8:00-9:40, 10:10-11:50		
SiRF Sessions	Grand Salon A, Grand Salon B, Gallery 2			8:00-9:40, 10:10-11:50	13:30-15:10, 15:40-17:20		8:00-9:40	13:30-14:50		8:00-9:40, 10:10-11:30		
Distinguished Lectures I & II	Gallery 2			8:00-9:20, 10:10-10:50								
Student Paper Contest	Grand Salon CDE				14:20-16:10							
Interactive Poster Sessions								14:55-16:55			12:55-14:30	
Exhibits	Grand Salon CDE				13:00- 17:30			10:00-17:00				
RWW MicroApps								14:00-16:20				
Breakfast	Palm Terrace			7:00-8:00			7:00-8:00			7:00-8:00		
AM Coffee Break	Salon CDE			9:40-10:10			9:40-10:10			9:40-10:10		
PM Coffee Break	Salon CDE				15:10-15:40			15:10-15:40			15:10-15:40	
RWW Reception	Palm Terrace					18:00-20:00						
RWW Awards Banquet	Gallery 3B								18:30-21:00