FINAL PROGRAM

Austin, Texas, USA
Renaissance Austin Hotel
20–23 January, 2013

2013 Radio & Wireless Week Sponsors:
IEEE Microwave Theory and Techniques Society (MTT-S)
IEEE Communications Society (ComSoc)
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 honour and pleasure to invite you to the 2013 IEEE Radio and Wireless Week (RWW). This will be the seventh RWW and the first one in Texas.

RWW2013 will be held at the Renaissance Austin Hotel in Austin, TX, January 20-23, 2013. Austin is an appropriate site for RWW since it is a vibrant center for high-tech and businesses contributing to the whole food chain of the continuously expanding wireless and radio industry. This is supplemented by University of Texas at Austin and other well known Universities nearby preparing for the future together with startups. This kind of environment fits well with the focus of RWW. RWW2013 will consist of five related conferences that focus on the intersection between radio systems and wireless technology, creating a unique forum for engineers to discuss hardware design and system performance of state-of-the-art wireless systems and their end-use applications. The conference targets to bridge the gap between digital and RF and hardware and software which need to be seamlessly combined to keep wireless industry and mobile applications growing. This multidisciplinary IEEE event will offer the latest information on wireless communications and networking, associated enabling technologies, and emerging new services and applications. Four diverse IEEE Societies are cosponsors of the RWW events: Microwave Theory and Techniques Society (MTT-S), Antennas and Propagation Society (AP-S), Communications Society (ComSoc), and Engineering in Medicine and Biology Society (EMBS).

In addition to the traditional podium technical talks and poster sessions, there will be an IEEE Distinguished Lecture track, workshops, panels on hot wireless subjects and a relevant industry exhibition. It is especially worth mentioning that the podium sessions include very high quality Late News Papers due to the very rigorous review process applied. A highlight on Tuesday will be the plenary talk on “System Approach to RF and Microwave Design” by Dr. James Truchard, co-founder and current president and CEO of National Instruments (NI). On Sunday and Monday evenings there will be panel sessions free of charge for all wireless professionals. The demo track Tuesday afternoon will provide an interactive forum with hands-on demonstrations of the latest wireless experimental demonstrations. For the first time an attractive “Wireless OTA Technical Tour” is offered (pls see “Highlights” at www.radiowirelessweek.org for tour and registration info). We have added a RWW New Attendee Reception to welcome attendees new to RWW.

To support the future of wireless research, each conference will have a student paper competition with awards that will be presented at the Tuesday Joint RWW Banquet. On Monday afternoon, all the student finalists will present their work in the poster session.

I would like to invite everyone to join us for 3½ days of great technical presentations, career networking, informative commercial exhibition, and some fun at 20-23 January 2013 in Austin, TX.

RWW2013 General Chair
Jan-Erik Mueller

General Chair
Jan-Erik Mueller

Technical Program Chair
Karl Varian

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Lin Song Dimitrie C. Popescu

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Rahul Khanna Chiang-Cheng Tseng
Linghe Kong Jianhua He

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Barbara M. Masini Yoshihiro Kawahara
Zhen Ning Low

Digital Signal Processing as Applied to Wireless
Chair: Takao Inoue Shihara Kang
Co-Chair: Daivide Dardari Jia-Chin Lin

Passive Components and Packaging
Chair: Rashaunda Henderson Xun Gong
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The 13th Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems

Message from the SiRF General Chair:

Welcome to SiRF 2013!

The IEEE Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems heads into its 13th installment. During its lifetime, the art of monolithic microwave integrated circuits (MMICs) has seen a dramatic development, largely driven by Silicon technology progress. While in the 1990’s the lossy Si substrate was seen as a significant implementation hurdle, and the emerging Silicon-Germanium heterojunction bipolar transistor was just beginning to close the speed gap between Silicon and group III-V semiconductor technologies, Silicon MMICs are now common place, in consumer applications where it can harness the economy of scale of Silicon production processes, or in lower volume applications where Si ICs are not necessarily cheaper than their GaAs competitors, but offer an impressive on-chip complexity combining many high speed analog circuit functions with on-chip digital control. High density, or in DC-DC conversion for increased design flexibility.

With the introduction of radio frequency micro-electro-mechanical structures (RF MEMS) as a monolithic option into state-of-the-art Si/ SiGe BiCMOS foundry processes, the door is wide open for true single chip radio frequency microsystems. The same micromachining techniques needed for RF MEMS or through-Silicon via connections can produce highly efficient on-chip antennas, which in the millimeter-wave range no longer come with a hefty chip real estate penalty. The fully self-contained 122 GHz radar front-end which connects to the embedding system only for DC supply and a digital control bus is thus just around the corner.

The rapidly maturing Silicon RF technology is not necessarily good news for SiRF. Once comfortably in the realm of specialists’ workshops, where you met the same group of colleagues every year, SiRF now competes with GaAs competitors, but offer an impressive on-chip complexity combining many high speed analog circuit functions with on-chip digital control. High density, or in DC-DC conversion for increased design flexibility.

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Francesco Dantoni, TI
Jürgen Hasch, Bosch
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Chien-Nan Kuo, National Chiao Tung University

REGISTRATION HOURS
Registration is open during the following times at the Registration Desk located in the Renaissance Austin:
- Sunday, 20 January: 10:00-17:00
- Monday, 21 January: 07:00-17:00
- Tuesday, 22 January: 07:00-17:00
- Wednesday, 23 January: 07:00-10:00

SOCIAL EVENTS
Complimentary Daily Breakfast
Place: Plaza Registration Desk
Time: 07:00-08:00

Complimentary Daily Coffee Breaks
Place: Plaza Registration Desk or Rio Grande Exhibit Hall (During exhibit hours)
Time: 9:30-10:10, 14:00-15:40

Daily Lunch
A lunch buffet will be served Monday-Wednesday in the Atrium Lobby from 11:45-13:30

SiRF 2013 Late News Session
Technical Program Committee
Chair: Karl Varian, Raytheon
Jan-Erik Mueller, Intel Mobile Communications
Sergio Pacheco, Freescale
Robert Caverly, Villanova University
Alexander Koeplin, University of Erlangen-Nuremberg
Rahul Khanna, Intel
Dietmar Kissinger, University of Erlangen-Nuremberg
Mohamed Mahfouz, University of Tennessee
Hermann Schuchamcher, Ulm University
Slim Boumaiza, Texas Tech University
Mehmet Saykan, IHP GmbH

EXHIBIT HOURS
The exhibition area is open during the following times:
- Monday, 21 January 2013: 10:00 - 17:00
- Tuesday, 22 January 2013: 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/
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, distortion reduction, and for the second year, an interactive workshop answering questions on power amplifier linearization and efficiency enhancement.

Technical Committee:

- Distortion Reduction Techniques in RF Power Amplifiers
  Chair: Allen Katz
  Slim Boumaiza
  Armando Cova
  Kiki Iossi
  Peter Kenington
  Stephan Leuschner
  Shabbir Moochalla
  Timo Rahkonen
  Joe Staudinger

- High Efficiency RF Power Amplifiers
  Chair: Frederick Raab
  James Korniak
  Song Lin
  Chao Lu
  Mohammad Madhian
  Arturo Mediano
  Dave Runton
  Ali Tombak
  Jau-Horng Chen

- RF Power Amplifier Technology
  Chair: Marc Franco
  Nick Cheng
  Nathalie Dettimple
  Murat Eron
  Gary Hau
  Bunnan Kim
  Donald Lie
  Zoya Popovic

- Power Amplifier Modeling and System Analysis
  Chair: Almudena Suarez
  Mark van der Heijden
  Peter Aaen
  Robert Caverty
  Andrei Grebennikov
  Wolfgang Heinrich
  Stephen Maas
  Karl Martin Gjertsen

Platinum Sponsor:

RFMD

Diamond Sponsor:

SONNET

Following our experiments at RWW 2012 and IMS 2012, RWW 2013 in partnership with Hubvents.com will introduce a new online technical discussion forum and social network for symposium attendees. The objective of this initiative is to increase opportunities of technical discussion with authors and with other attendees beyond the limited time-slots of the regular technical sessions and also to enhance attendee networking at the symposium. Symposium attendees will also have access to conference schedule, publications in their mobile devices and they will also be able to share their presentations with other symposium attendees.

SOCIAL NETWORK ANNOUNCEMENT

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

The IEEE Topical Conference on Biomedical Wireless Technologies, Networks, and Sensing Systems (BioWireleSS) will premier in Austin, Texas. This two day topical conference 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. 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 Farajdavvar

- Wireless Position and Localization in Medicine
  Chair: Changzhi Li
  Dietmar Kissinger
  Dominique Schreurs
  Yong Xin Guo
  Syed Islam
  Aydin Farajdavvar

- PAN, BAN, Energy Scavenging and Remote Patient Monitoring
  Chair: Changzhi Li
  Jung-Chih Chiao
  Marc Notten
  Arnaud Poither
  Claire Dalmary
  Katia Grenier
  Alper Bozkurt

- Micro-Sensors and In-vivo Microsystems
  Chair: Rizwan Bashirullah
  Jung-Chih Chiao
  Dominique Schreurs
  Yong Xin Guo
  N Gotham
  Aydin Farajdavvar

- Microwaves in Biological Applications and Interaction with Biological Tissues
  Chair: Mohammad-Reza Tofighi
  Yong Xin Guo
  Victor Lubecke
  Dominique Schreurs
  Indira Chatterjee
  Usman Kawaos
  Katia Grenier
  Jung-Chih Chiao

- Medical Imaging and Applications
  Chair: Natalia Nikolova
  Arie Rosen
  Usman Kawaos
  Victor Lubecke
  Mohammad-Reza Tofighi
  Changzhi Li
Panel Session - Tunable and Reconfigurable Radio Frontends 19:00-20:30

Panel Moderator: Jan-Erik Mueller, Intel Mobile Communications, Germany
Room: Trinity A & B

Panelists: Andrea van Bazzoij, Epcos
Marc Facchini, Peregrine
Art Morris, WiSpry
Dimosthenis Peroulis, Purdue University
André van Bezooijen, Epcos
Paul Tornatta, Cavendish-Kinetics
Robert Vajna, Intel Corporation
Nuno Borges Carvalho, Intel Corporation
Dimitrios Peroulis, Purdue University
Art Morris, WiSpry
Marc Facchini, Peregrine
Andre van Bezooijen, Epcos
Paul Tornatta, Cavendish-Kinetics

Abstract:
The complexity, cost and size of the RF front-end in cellular phones develops more and more to a bottleneck which may impact future revenue of related industry as a whole unless disruptive solutions can be found. The vision to replace the many parallel fixed tuned receive and transmit RF signal paths of today by one tunable path for low-band and another one for high-band exists for long. Tunable device technologies based on BST, SCs or MEMS are maturing. Tunable and reconfigurable filters are a subject of intense research. Despite of this currently available solutions do not yet meet requirements for cellular phones. The panel will discuss cellular requirements, available solutions, their limitations and measures to overcome current barriers.

Speakers:
- Introduction and Overview of Current SDR Receivers: Jeffrey Pawlan, Pawlan Communications, USA
- Correct Implementation of A/D Converters for SDR: Derek Redmayne, Linear Technology Corp., USA
- Multi-Gigabit Transmission Based on All- Silicon RF Front End Components for THz Sub-THz Communication Systems: Gabriel Rebeiz, University of California at San Diego
- Software Defined Radio: Recent Advancements in Hardware and Software: Jeffrey Pawlan, Pawlan Communications, USA
- Metamaterials Inspired Microwave Sensors: Martin Schüßler, Darmstadt Technical University, Germany
- Split ring resonator (SRR) and stepped impedance resonator (SIR) based metamaterial transmission lines: application to microwave components and novel sensing strategies: Ferran Martin, Universitat Autònoma de Barcelona, Spain
- Metamaterial Surface Antenna Technology: Ryan Stevenson, Kymeta Corp., USA
- Industrial Application of Advanced 1D Periodic Structures at SPINNER GmbH: Martin Lorenz, Spinner GmbH, Germany
- From Fundamental Research to Successful Commercialization: Steps, Risk, and Challenges: Maria Achatz, Polyconic Inc., USA
Travelling to Austin, TX

**FROM HOUSTON**

Take IH-35 North and exit onto Hwy. 183 North (Lampasas-Exit 239/240A). Go 4 miles on Hwy. 183 North and exit at Loop 360 (Capital of Texas Highway – Great Hills Trail). Turn left at first light (over freeway – keep in right lane) and then take the very first right turn, which is Arboretum Boulevard. Hotel is on the right.

**FROM SAN ANTONIO**

Take IH-35 North and exit onto Hwy. 183 North (Lampasas-Exit 239/240). Go 4 miles on Hwy. 183 North and exit at Loop 360 (Capital of Texas Highway – Great Hills Trail). Turn left at first light (over freeway – stay in right lane) and then take the very first right turn, which is Arboretum Boulevard. Hotel is on the right.

**FROM DALLAS**

Take Highway 183 North (Lampasas-Exit 239/240A). Go 4 miles on Hwy. 183 North and exit at Loop 360 (Capital of Texas Highway – Great Hills Trail). Turn left at first light (over freeway – keep in right lane) and then take the very first right turn, which is Arboretum Boulevard. Hotel is on the right.

**Hotel Information**

- **Check-in:** 3:00 PM
- **Check-out:** 12:00 PM
- **Express Check-In and Express Checkout**
- **Express Check-In and Express Checkout**
- **High-Speed Internet:** Complimentary wireless internet access in the guest rooms for those booked within the RWW room block
- **Meeting Rooms:** Wired, Wireless
- **Pet Policy:** Pets allowed, non-refundable sanitation fee: 75 USD; contact hotel for details
- **Accessibility:** Service animals allowed for persons with disabilities
- **This hotel has a smoke-free policy**
- **Renaissance Austin Hotel,**
  9721 Arboretum Boulevard, Austin, Texas 78759 USA
  1-512-343-2625 / 1-800-468-3571
  Visit [http://www.radiowirelessweek.org/attendees/to book rooms online](http://www.radiowirelessweek.org/attendees/to book rooms online)

**Austin Attractions**

- **Blanton Museum.** The Blanton Museum is part of the University of Texas at Austin and presents an impressive art collection that spans three continents and several centuries. Thursday is free to all.
- **Texas Capitol.** 309 feet tall, and modeled after the USA Capitol in Washington D.C., this is the nation’s tallest capitol in the country. It was designed by architect Elijah E. Myers and constructed of local red granite. It was completed in 1888 and it has been recently renovated to bring back the original typical color of the Texas stone. Free 30-45 minute daily tours describing the story of Austin and of Texas are offered every day.
- **Zilker Botanical Garden.** Zilker Botanical Garden features several themed garden areas, free and open to the public most of the year. The focus here is on exotic plants.
- **Barton Springs Pool.** Located in Zilker Park, Barton Springs Pool is a favorite Austin swimming hole for locals and visitors. It's a natural spring with three acres of water, lots of room for the numerous swimmers it attracts every moment of the year. It remains cool all year round, due to the natural water.
- **Lady Bird Johnson Wildflower Center.** Lady Bird Johnson, Texan first lady, was an advocate of preserving the natural beauty of regional gardens. She founded these gardens in 1982. Today, they're 279 acres of beautifully landscaped gardens, trails, and pretty buildings, including a cafe and a neat little gift shop. Native plants dominate the scene.
- **Harry Ransom Center.** Also part of the University of Texas at Austin, the Harry Ransom Center is an impressive art collection focused on multimedia artifacts. Rare books (including one of the early Gutenberg's Bibles), films, photographs and much more is available in this impressive center.
- **Salt Lick Barbeque.** A bit away from downtown Austin, it is one of the all-favorite Texan Barbeque, with its famed barbeque sauce and the brisket meat cooked for over 16 hours. It is worth the 20-mile drive just to see the massive outdoor barbeque pits. A tourist favorite.
- **The University of Texas at Austin Campus.** Located downtown, north of the Capitol, the campus is a pleasant area to visit and walk through. At its center, the famous Tower, symbol of the university, 27 stories high, it glows orange in celebration of UT sport victories.
- **Alamo Drafthouse.** Independent theater with interesting movies that you can watch while enjoying food and drink delivered to your seat.
- **Broken Spoke.** World-class country music in an authentic, typically Texan, dance hall. Sand-covered wood floors and train chandeliers complete the scene.
In recent several years, metamaterials research has moved toward practical engineering applications. In this talk, some new progresses of the metamaterial microstrip antennas and arrays are reported and new results are presented. Several different layouts and configurations are considered in the designs, and their corresponding radiation characteristics are presented and compared. Arrays and feeding networks are also designed and optimized. Some design experiences will be shared with, and their results of antenna impedance bandwidth, radiation patterns, and radiation efficiencies presented. Also, experimental data are present together with the design results to validate the designs and to gain more physical insights of the new layouts in the designs.
In this short lecture we shall highlight some of the challenges that are being faced in the field of digital pre-distortion (DPD), resulting from the demands of wider bandwidth and multi-protocol signals, more rapid convergence in adaptive DPD - 'real-time' DPD – and greater linearization accuracy, accommodating memory effects. We shall also describe some techniques for meeting these challenges, and present some ideas for new directions for DPD.
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<td>MO3C-2</td>
<td>A Novel, Fast and Precise Method to Perform Time Alignment Estimation and Compensation</td>
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<td>MO3C-3</td>
<td>Linearization of Efficient Harmonically-Injected PAs</td>
<td>A. R.</td>
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<td>MO3C-4</td>
<td>Predistortion Linearization to 100GHz</td>
<td>A. Katz</td>
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<td>13:45</td>
<td>MO3D-1</td>
<td>Optical Nanoantennas and their Applications (Invited)</td>
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<td>MO3D-2</td>
<td>Antenna Design Strategies to Reduce Coupling and Interference in Wireless Communications Systems (Invited)</td>
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<td>MO3D-3</td>
<td>Real-Time and Near-Real-Time Acquisition Systems for Measuring Aliasing in Small Arrays based on Crystal Microstructures</td>
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<td>MO3D-4</td>
<td>Staggered Pattern Charge Collector Design and Optimization</td>
<td>B. R.</td>
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<td>14:10</td>
<td>MO3A-1</td>
<td>Wireless Power</td>
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<td>MO3A-2</td>
<td>Low-Power Density Wireless Powering for Battery-less Sensors (Invited)</td>
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<td>MO3A-3</td>
<td>Far-Field RF Energy Transport</td>
<td>H. J.</td>
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<td>MO3A-4</td>
<td>Virtualizing Power Cords by Wireless Power Transmission and Energy Harvesting</td>
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<td>MO3A-5</td>
<td>Solar Powered Class-E Active Antenna Oscillator for Wireless Power Transmission</td>
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<td>14:10</td>
<td>MO3B-1</td>
<td>Schottky Diodes in CMOS for Terahertz Circuits and Systems (Invited)</td>
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<td>MO3B-2</td>
<td>A 294GHz 0.47mW Caterpillar Amplifier Based Transmitter in 65mm CMOS For THz Data-Links</td>
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<td>MO3B-3</td>
<td>Broadband InP MMICs for 120GHz Wireless Data Communications (Invited)</td>
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<td>MO3B-5</td>
<td>THz Beamforming Using Graphene-Based Devices</td>
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<td>14:10</td>
<td>MO3C-1</td>
<td>Concurrent Dual Band Digital Predistortion using Look Up Tables with Variable Depths (Invited)</td>
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**MONDAY, 21 JANUARY 2013**
RWW STUDENT PAPER CONTEST

RWW 2013 Student Paper Chairs will select finalists among the student paper submissions, from each conference (RWS, PAWR, BioWireless, and WSNNet). During the poster presentation, 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 second-place winners from each conference for a total of 8 winners. The awards will be announced and presented during the RWW Banquet. Please visit the student paper competition and support outstanding work by future researchers in industry and academia.

SIRF STUDENT PAPER CONTEST

Continuing the tremendous success from previous years, the SIRF 2013 is proud to present its Student Paper Competition. The papers in the competition represent the accomplishments of individual students and undergo an arduous review process to identify and acknowledge the best and brightest students in our research community. The high standards of reviewers and judges ensure that the best papers of the Student Paper Competition also rank among the best papers of the SIRF 2013. The student finalists will present their papers at their appropriate regular sessions, and also make special presentations at the Poster Session on Monday, January 21, from 2:20 PM to 4:10 PM. All SIRF 2013 participants are welcome and encouraged to visit the student papers during the Poster Session, at which time they will also be evaluated by a group of judges. The awards will be announced and presented during the RWiW Banquet.

MONDAY, 21 JANUARY 2013

Student Paper Contest Finalists - Poster Presentation

Time: 14:20 – 16:10

Room: Rio Grande

MO2C-1 A SiGe Bipolar-MOSFET Cascade Power Amplifier with Improved Linearity for Low-Power Broadband Wireless Applications
R. Wu, J. Lopez, Y. Li, D. Lie, Texas Tech University, Lubbock, United States

MO2D-2 Real Time Front-end for Cognitive Radio Inspired by the Human Cochlea
D. F. Malafaya, J. P. Magalhães, J. M. Vieira, N. M. de Carvalho, Universidade de Aveiro, Aveiro, Portugal

MO3C-2 A Novel, Fast and Precise Method to Perform Time Alignment Estimation and Compensation
A. Fansegul, B. Sofi, J.-E. Mueller, R. Weigel, Intel Mobile Communications GmbH, Neuburg, Germany

MO3D-4 Staggered Pattern Charge Collector Design and Optimization
B. R. Marshall, G. D. Durgin, Georgia Tech, Atlanta, United States

MO4B-1 A CMOS Class-E Power Amplifier of 40% PAE at 5GHz for Constant Envelope Modulation System
Y. Yamashita, D. Kanemato, H. Kanaya, K. Pöhär, K. Yoshida, Kyushu University, Fukuoka-shi, Japan

MO4B-4 A Fully-integrated Ka-band Stacked Power Amplifier in 45nm CMOS SOI Technology
J. Chen, S. R. Helmi, S. Mohammadi, Purdue University, West Lafayette, United States

TUSC-3 Measurement and Analysis of Intra-Vehicle UWB Channels
Q. Liang, A. Audu, H. Khair, H. Nie, W. Xiang, Z. Chen, University of Northern Iowa, Cedar Falls, United States

TUSC-4 Direct Downconversion Architecture Performance in Compact Pulse-Doppler Phased Array Radar Receivers
G. J. Vaillant, M. Allen, S. Singh, M. Esp, S. Chartier, M. Vakama, CASSidian, Ulm, Germany

TU1D-3 Distortion Analysis of Continuous-Wave Radar Sensor for Complete Respiration Pattern Monitoring
C. Gu, C. Li, Texas Tech University, Lubbock, United States

TU1D-5 Towards a Smart Bandage with Functional Near Infrared Spectroscopy Capability
J. Diefenderfer, M. C. Bair, A. Bozkurt, North Carolina State University, Raleigh, United States

TU3C-2 Multi-Gigabit 60 GHz OOK Front-End in 90 nm CMOS
A. Hamidian, A. Malignaggi, R. Shu, A. Kamal, G. Boeck, Berlin Institute of Technology, Berlin, Germany

TU3D-2 On-Body Characterization of Textile Antennas for Biomedical Health Monitoring Systems
P. Soh, G. A. Vanderbosch, M. D. Schreurs, Katholieke Universiteit Leuven, Leuven, Belgium

TU5C-1 Impedance Matching Method for Any-Hop Straight Wireless Power Transmission Using Magnetic Resonance
Y. Narusue, Y. Kawahara, T. Asami, RWC Minato, Japan

WE1A-1 Hybrid Analog-Digital Backscatter Platform for High Data Rate, Battery-Free Sensing
V. Tallis, M. Buettner, D. Wetherall, J. R. Smith, University of Washington, Seattle, United States

WE1C-2 A K-band SiGe Bipolar VCO with Transformer-Coupled Varactor for Backhaul Links
F. Padovana, M. Liebout, K. Mertens, A. Bevilacqua, A. Neviani, University of Pavia, Pavia, Italy

WE1D-1 A Microwave VNA for Biomedical In-line Concentration Measurements
M. Hofmann, A. Oborovski, G. Fischer, R. Weigel, D. Kessler, University of Erlangen-Nuremberg, Erlangen, Germany

WE2A-3 The Investigation of Milliwave Optical Harmonic Transponders and Radar for Monitoring Small Insects
N. Tahr, G. M. Brooker, University of Sydney, Sydney, Australia

WE2B-1 A 0.8V 1.1pJ/bit Inductive-Coupling Receiver with Pulse Extracting Clock Recovery Circuit and Intermittently Operating LNA
T. Jyo, T. Kuroda, H. Ishikawa, Keio University, Yokohama, Japan

WE2C-2 A High Q On-Chip Bondwire Transformer and Its Application to Low Power Receiver Front-End Design
C. Li, C. Kuo, National Chiao Tung University, Hsinchu, Taiwan

WE2D-1 A 4GHz-Bandwidth Op-Amp Free Track-and-Hold and 6-bit Flash ADC in 45nm SOI CMOS
M. W. Chen, D. Tian, S. Phatak, L. R. Carley, D. S. Ricketts, Carnegie Mellon University, Pittsburgh, United States

WE3P-2 Reconstruction Filter suitable for Lowpass Delta-Sigma RF Transmitters
D. Wang, R. Nagra, RWTH Aachen University, Aachen, Germany

WE4C-3 13-35GHz Concurrent Tri-band LNA with Feedback Notches
J. Lee, C. Nguyen, Texas A&M University, College Station, United States
Joint RWW Interactive Poster Session 1: 14:20-16:10  Room: Rio Grande

MONDAY, 21 JANUARY 2013

Lunch Panel Session - Wireless Personal Area Networks

Panel Moderator: Mehdi Shadaram, University of Texas at San Antonio, USA
Time: 12:00-13:10
Room: Trinity A
Panelists: Robert Heath, University of Texas at Austin, USA
Shuzo Kato, Tohoku University, Japan
Aria Nosratinia, University of Texas at Dallas, USA
Sriram Vishwanath, University of Texas at Austin, USA
Matt Maupin, Freescale, USA

Abstract:
With advances in wireless connectivity between such devices as PC's, PDA's, printers, etc., the realization of a wireless personal area network (WPAN) for interconnecting such devices in an individual's workspace has improved since 1994. The demand for high speed connectivity at home or office has pushed the WPAN technology to new milestones and created new challenges. In this panel, we have attempted to create a stage to foster new ideas and technical insights in the design, analysis and development WPAN. Panelists who are experts from academia and industry will discuss theoretical and practical aspects of WPAN. They will discuss the latest breakthroughs, antenna systems, power limitations, standardization, and specific WPAN routing requirements.

Lunch Panel Session - Should Design Engineers Really Care About Software Piracy?

Panel Moderator: Charlie Jackson, Northrop Grumman, USA
Time: 12:00-13:10
Room: Trinity B
Panelists: Chris Lujan, CEO of ITCA, USA
Ted Miracco, AWR, USA

Abstract:
According to the Business Software Alliance (BSA), 42% of the world’s software is pirated with a commercial value of over $638 per year. How do these figures scale down within the Wireless and microwave design communities and what is the cost impact to those that use legal software? Are there variations by geographic region or company size and how might these variations impact job growth and/or outsourcing of engineering work? What can be done to better protect software and intellectual property? Who uses pirated software, and what are the risks for employees and employers? Come hear interesting stories from the front lines in the battle to prevent software piracy.

Panel Session - Base Station Design Breakthrough Opportunities 19:00-20:30

Panel Moderators: Nuno Borges Carvalho, Universidad de Aveiro, Portugal
Jeffrey Pawlan, Pawlan Communications, USA
Room: San Marcos
Panelists: Nuno Borges Carvalho, Universidad de Aveiro Don Kimball, UCSD, USA
Ali Khyrollah, Ericsson, USA
Jeffrey Pawlan, Pawlan Communications
Rob Soni, CTO Alcatel-Lucent

Abstract:
While many take base station designs for granted, there are some aspects of the current technology that give opportunities for dramatic change and impact on the wireless industries. These are in the areas of compatibility with suburban infrastructure and in evening out power flux density field strength in the service areas. Zoning, permitting, and neighbor opposition have been a key factor in preventing the rollout of wireless infrastructure and hence limiting spectrum efficiency. Too often suburban infrastructure is bulky and looks like it was “designed by engineers”. Custom designed installations reduce this problem but are very expensive. Some speakers will address technical and visual design options for lowering the visual impact of suburban base stations.
While regulations have classically limited eirp of base stations to control interference, there is a real impact from high flux in near base stations that either limits spectrum efficiency or causes interference to adjacent band systems. When mobile radio used VHF and low UHF the wavelengths involved limited viable antenna design options. However, the growing use of 1-5 GHz for mobile wireless gives new design options to decrease “power on the ground” variation throughout the intended service area.
Moreover new challenges start to appear with new proposals of Radio over Fiber, and Femtocells, that will create an even more crowded spectrum and impact on the wireless industries. These are in the areas of compatibility with suburban infrastructure and in evening out power flux density field strength in the service areas. Zoning, permitting, and neighbor opposition have been a key factor in preventing the rollout of wireless infrastructure and hence limiting spectrum efficiency. Too often suburban infrastructure is bulky and looks like it was “designed by engineers”. Custom designed installations reduce this problem but are very expensive. Some speakers will address technical and visual design options for lowering the visual impact of suburban base stations.

SIRF Session: MO3P

Chair: Gabriel Montoro, Technical University of Catalonia

MO3P-1 30dBm P1dB and 4dB Insertion Losses Optimized 4G Antenna Tuner Fully Integrated in a 130 nm CMOS SOI Technology
F. Sonnerath1, R. Pilard1, F. Giansello1, S. Jan1, F. Le Pennec1, C. Persson2, C. Durand1, D. Gloria1, T. Microlaeronics, Crolles, France, Telecom Bretagne - Lab STICC, Brest, France

MO3P-2 A GaN Supply Modulator Compatib le with Feed Forward Loop for Wideband Envelope Tracking Power Amplifier
Z. Yang, L. Wang, R. Ma, S. Lanfranco, Nokia Siemens Networks, Beijing, China

MO3P-3 A PHFET Power Amplifier with an On-off Modulator
H. Yang, L. Lin, Y. E. Chen, National Taiwan University, Taipei, Taiwan

MO3P-4 Low-Power CMOS Inductorless Bandwidth-Enhanced Trans-impedance Amplifier for Short-Headroom Applications
M. H. Taghavi, P. Ahmadi, L. Belostotski, J. Haslett, University of Calgary, Canada

MO3P-5 NARMA-Based Linearization of RF Power Amplifiers with Non-Monotonic Response under Dynamic Hardware Reconfiguration
A. Thibodeau, A. Kouki, N. G. Constantin, Ecole De Technologie Superieure, Montreal, Canada

MO3P-6 Performance Analysis for Scalar Digital Predistortion
Z. Shi, J. Zhou, H. Li, J. Wu, Fujitsu R&D Center Ltd., Beijing, China

MO3P-7 Fluorine Improvement of MOSFET Interface as Revealed by RTS Measurements and HRTEM
J. Kim, J. Lee, S. Kim, K. Yoo, H. Park, Center for process development, Bucheon, Republic of Korea

MO3P-8 Low Frequency Dithering Technique for Linearization of Voltage Mode Class-D Amplifiers
F. Aftae Malekzadeh, A. van Roermund, R. Mahmoudi, University of Waterlow, Waterlow, Canada, Eindhoven University of Technology, Eindhoven, Netherlands

MO3P-9 IF Signal Filtering Techniques in Low IF Receiver for Narrowband Communications
S. Narieda, Akashi National College of Technology, Akashi, Japan

MO3P-10 Fluorine Improvement of MOSFET Interface as Revealed by RTS Measurements and HRTEM
J. Kim, J. Kim, C. Lee, J. Lee, D. Kim, N. Kim, K. Yoo, H. Park, Center for process development, Bucheon, Republic of Korea

Panelists: Nuno Borges Carvalho, Universidad de Aveiro, Portugal
Jeffrey Pawlan, Pawlan Communications, USA
Don Kimball, UCSD, USA
Ali Khyrollah, Ericsson, USA
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## RWS Focused Session: MO4A
### Wireless Enabled Automotive and Vehicular Applications

**Chair:** Martin Vossiek, University Erlangen-Nürnberg  
**Co-Chair:** Debabani Choudhury, Intel

- **Room:** Trinity A

### MO4A-1 77GHz Automotive Radar Sensors: Antenna Concept for Angular Measurements in Azimuth and Elevation

K. Baur, M. Mayer, S. Lutz, T. Walter, University of Applied Sciences Ulm, Ulm, Germany

### MO4A-2 Antenna Concept for an Automotive Radar Sensor at 150GHz

M. Koehler, J. Schuer, L. Schmidt, University of Ulm, Ulm, Germany

### MO4A-3 A Planar, Scalable Active Transceiver Array for Mobile Satcom Applications

T. Chaloun\(^1\), E. Meniconi\(^2\), T. Purtova\(^1\), V. Ziegler\(^1\),  
\(^1\)University of Ulm, Ulm, Germany, \(^2\)EADS Innovation Works, Munich, Germany

### MO4A-4 Wireless Power Transmission Progress for Electric Vehicle in Japan

N. Shinohara, Kyoto University, Kyoto, Japan

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## SiRF Session: MO4B
### Power Amplifiers and Transmitter Circuits

**Chair:** Hermann Schumacher, University of Ulm  
**Co-Chair:** Jae-Sung Rieh, School of Electrical Engineering, Korea University, Seoul, Korea

- **Room:** Trinity B

### MO4B-1 A CMOS Class-E Power Amplifier of 40% PAE at 5GHz for Constant Envelope Modulation System

Y. Yamashita, D. Kanemoto, H. Kanaya, R. K. Pokharel, K. Yoshida, Kyushu University, Fukuoka-shi, Japan

### MO4B-2 A An Impulse Radio UWB Transmitter for Communication and Precise Localization

D. Martynenko, G. Fischer, O. Klymenko, IHP, Frankfurt (Oder), Germany

### MO4B-3 Holistic Design of 8-Way Combining Transformers in SiGe Technology for Use in Millimetre-Wave Power Amplifiers

M. Thian\(^1\), M. Tiebout\(^2\), V. Fusco\(^2\),  
\(^1\)Infineon Technologies AG, Villach, Austria, \(^2\)Queen’s University Belfast, Belfast, United Kingdom

### MO4B-4 A Fully-integrated Ka-band Stacked Power Amplifier in 45nm CMOS SOI Technology

J. Chen, S. R. Helmi, S. Mohammadi, Purdue University, West Lafayette, United States

### MO4B-5 A 10-67GHz CMOS Step Attenuator with Improved Flatness and Large Attenuation Range

J. Bae, J. Lee, C. Nguyen, Texas A&M University, College Station, United States

### MO4C-1 Behavioural Modeling of RF Power Amplifiers (Invited)

J. Wood, Maxim Integrated, San Diego, United States

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## PAWR Session: MO4C
### RF Power Amplifier Modeling and System Analysis

**Chair:** Robert Caverly, Villanova University  
**Co-Chair:** Mark P. van der Heijden, NXP Semiconductors

- **Room:** Sabine

### MO4C-2 An Extension of Power Amplifier Behavioral Models for Optimizing Battery Current at System Level

S. Glock\(^1\), B. Soeg\(^2\), P. P. Vizarreta\(^3\), T. Usmanfar\(^1\), J.-E. Mueller\(^2\), G. Fischer\(^1\), R. Weigel\(^1\),  
\(^1\)Friedrich-Alexander-University of Erlangen-Nuremberg, Erlangen, Germany, \(^2\)Intel Mobile Communications, Neubiberg, Germany, \(^3\)Universitat Politècnica de Catalunya, Castelldefels, Barcelona, Spain

### MO4C-3 A Simple Output Impedance Model for Doherty Peaking Sub-Amplifiers Biased in Class C

D. G. Holmes, Freescale Semiconductor Inc., Tempe, United States

### MO4C-4 Behavioral Modeling Approach for Array of Amplifiers in Active Antenna Array System

S. Farsi\(^1\), J. Dooley\(^2\), K. Finnerty\(^2\), D. Schreurs\(^1\), B. Nauwelaers\(^1\), R. Farrell\(^2\),  
\(^1\)KU Leuven, Heverlee, Belgium, \(^2\)National University of Ireland Maynooth, Co. Kildare, Ireland

### MO4C-5 Liquid Crystal Based Patch Antenna Array for 60GHz Applications

P. Deo\(^1\), M. Mishekar-Syahkal\(^2\), L. Seddon\(^2\), S. Day\(^2\), A. Fernández\(^2\),  
\(^1\)University of Essex, Colchester, United Kingdom, \(^2\)University College London, London, United Kingdom

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## RWS Session: MO4D
### New Radiating Structures and Modern Antenna Arrays

**Chair:** Rashaunda Henderson , University of Texas at Dallas  
**Co-Chair:** Glauco Fontgalland, Federal University of Campina Grande

- **Room:** San Marcos

### MO4D-1 Dual-Polarized Low-Profile 16x4 SIW Cavity-Backed Patch Array for Direct Broadcast Satellite Applications

M. H. Awida\(^1\), S. F. Sulieman\(^2\), A. E. Fathy\(^2\),  
\(^1\)University of Tennessee, Knoxville, United States, \(^2\)Winegard Company, Burlington, United States

### MO4D-2 Dependency of Ka-band Reflectarray Unit Cell Reflection Properties on the Spacing between Antenna Elements

K. K. Karnati, S. Ebadi, X. Gong, University of Central Florida, Orlando, United States

### MO4D-3 A Novel Microstrip Rotating Cell for CP-Reflectarray Applications

S. A. Ibrahim, H. F. Hammad, German University in Cairo, Cairo, Egypt

### MO4D-4 A Novel UWB Hybrid Dipole Antenna with Quasi-Isotropic Radiation Pattern

J. Singh, A. Modiri, K. Kiasaleh, University of Texas at Dallas, Richardson, United States

### MO4D-5 A Simple Output Impedance Model for Doherty Peaking Sub-Amplifiers Biased in Class C

D. G. Holmes, Freescale Semiconductor Inc., Tempe, United States

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## RWW New Attendee Reception
**Time:** 17:20 - 18:00  
**Room:** Wedgewood

## RWW Reception
**Time:** 18:00 - 19:30  
**Room:** Trinity A
As we enter the era of “internet of things” the number of wireless devices sky rocket. To support this growth, the paradigm for designing, prototyping, and manufacturing a wireless communication device must also evolve. I will discuss our perspectives on the history of design, prototyping, test, and measurement, onto future of system level design for RF and microwave systems with a tightly integrated software and hardware tools.

Dr. James Truchard is the co-founder and CEO of National Instruments along with Jeff Kodosky and Sue Priebe. In 1976, working in the garage at Dr. Truchard’s home, he co-founded National Instruments. In 1986, in conjunction with the Swedish Academy of Engineering Sciences, he founded the National Academy of Engineering and the Royal Swedish Academy of Engineering Sciences.

Dr. Truchard received a B.S. in physics, and a Ph.D. in Electrical Engineering from the University of Texas at Austin. He is a member of the National Academy of Sciences, the Swiss Academy of Engineering Sciences, the Royal Society of Canada, and the National Academy of Engineering of the United States. He is a fellow of the Society of Wireless Rogers and a fellow of the Society of Information and Communication Systems of the Institute of Electrical and Electronic Engineers (IEEE). He received an IEEE Centennial Medal in 2000, the ? 물 우한 Technology Medal in 2002, and was elected an IEEE Fellow in 2003.

Dr. Truchard is a frequent lecturer on the history of design, prototyping, test, and measurement, onto future of system level design for RF and microwave systems with a tightly integrated software and hardware tools.

Abstract:
As we enter the era of “internet of things” the number of wireless devices sky rocket. To support this growth, the paradigm for designing, prototyping, and manufactur- ing a wireless communication device must also evolve. I will discuss our perspectives on the history of design, prototyping, test, and measurement, onto future of system level design for RF and microwave systems with a tightly integrated software and hardware tools.
Radio Wireless Week 2013 Demo Track

Tuesday, 22 January 2013 from 14:55-16:30

The technical program for the 2013 IEEE Radio and Wireless Week (RWW) will continue to have an exciting demo track on Tuesday afternoon. Relevant and interesting new developments from a variety of wireless innovations will be presented by industry experts. The demo track will provide an interactive forum with hands-on demonstrations of the latest wireless experiments:

1. **Wireless Physical Layer Test and Measurement**
2. **DC-Coupled CW Radar Sensor for Human Healthcare and Structural Health Monitoring Applications**
3. **Demonstration of a System for Simultaneous Transmit and Receive (STAR) Using a Single Antenna**
4. **Backscatter Modulation for Battery-Free Sensing**
5. **Investigation into the Next Generation Waveform Engineering System Based on Wide-band Vector Signal Generators**

Demo Track Chair: Jeffrey Pawlan, Pawlan Communications
**TUESDAY, 22 JANUARY 2013**

### RWS Session: T1US

**Passive Components**

Chair: Roberto Gomez-Garcia, University of Alcala
Co-Chair: Xun Gong, University of Central Florida

Room: Trinity B

**TU5A-1 Two-Octave All-Pass Phase Shifters for Phased Array Applications**

H. Fang1,2, X. Tang1, K. Mouthaan1, R. Guinvarch1,1, 1National University of Singapore, Singapore, Singapore, 2SONDRA/Supelec, Gif Sur Yvette, France

**TU5A-2 Design of Cross-Coupled Dispersive Delay Structures (DDs) for Analog Signal Processing**

Q. Zhang, C. Caloz, Ecole Polytechnique de Montreal, Montreal, Canada

**TU5A-3 Signal-Interference Microstrip Duplexers**

R. Gomez-Garcia, M. Sanchez-Renedo, R. Loeches-Sanchez, University of Alcala, Alcala de Henares, Spain

**TU5A-4 Reduced-Size GaN-based 10GHz 90° Hybrid for X-band Wireless Communications Systems**

I. Haroun, C. Plett, Carleton University, Ottawa, Canada

### RWS Session: T1UB

**Applications of Signal Processing in Wireless Communications**

Chair: Takao Inoue, National Instruments

Room: Trinity B

**TU5B-1 1.2G/s Hadamard Transform Front-End For Compressive Sensing in 65nm CMOS**

O. U. Khan, D. D. Wentzloff, University of Michigan, Ann Arbor, United States

**TU5B-2 10Gbps Millimeter-Wave OFDM Experimental System with Iterative Phase Noise Compensation**

D. Shin, S. Suyama, H. Suzuki, K. Fukawa, Tokyo Institute of Technology, Tokyo, Japan

**TU5B-3 RF Imperfections in Antenna Arrays: Response Analysis and Widely-Linear Digital Beamforming**

A. Hakkarainen, J. Werner, M. E. Valka-ma, Tampere University of Technology, Tampere, Finland

**TU5B-4 CRAVE: Cognitive Radio Enabled Vehicular Communications in Heterogeneous Networks**

D. B. Rawat1, Y. Zhao2, G. Yan3, M. Song4, 1Eastern Kentucky University, Richmond, United States, 2South Dakota School of Mines & Technology, Rapid City, United States, 3Indiana University, Kokomo, United States, 4The University of Toledo, Toledo, United States

### RWS Session: T1UC

**Wireless Energy Transport and Harvesting**

Chair: Zhizhang David Chen, Dalhousie University
Co-Chair: Shigeo Kawasaki, Japan Aerospace Exploration Agency (JAXA)

Room: Sabine

**TU5C-1 Impedance Matching Method for Any-hop Straight Wireless Power Transmission Using Magnetic Resonance**

Y. Naruse, Y. Kawahara, T. Asami, The University of Tokyo, Bunkyo-ku, Japan

**TU5C-2 Thermal Energy Harvesting for Power Amplifiers**

K. Niotaki, A. Georgiadis, A. Collado, Centre Tecnologic de Telecomunicacions de Catalunya, Castelldefels, Spain

**TU5C-3 Development of MMIC Rectenna at 24GHz**

K. Hasano1, N. Shinohara1, T. Seki2, M. Kawashima3, 1Kyoto University, Kyoto, Japan, 2NTT Corporation, Tokohama, Japan

**TU5C-4 Chip-to-package Wireless Power Transfer and its Application to mm-Wave Antennas and Monolithic Radiometric Receivers**

L. Aluigi1, 2, T. T. Thai2, M. M. Tentzeris1, L. Rosei1, F. Alimenti1, 1University of Perugia, Perugia, Italy, 2Georgia Institute of Technology, Atlanta, United States

### BioWireless Session: T1UD

**Micro-Sensors and In-vivo Microsystems**

Chair: Rizwan Bashirullah, University of Florida
Co-Chair: Mohamed Mahfouz, University of Tennessee

Room: San Marcos

**TU5D-1 Measuring the Microwave Permittivity of Single Particles**

Y. Yang1,2, Y. He1, H. Zhang1, K. Huang2, G. Yu1, P. Wang1, 1Clemson University, Clemson, United States, 2Sichuan University, Chengdu, China, 3The University of Findlay, Findlay, United States

**TU5D-2 Wireless Strain Sensor based on Amorphous Carbon for Human-Motion Detection**

U. Tata, H. Cao, V. Landge, C. M. Nguyen, Y. S. Seo, J. C. Chiao, University of Texas at Arlington, Arlington, United States

**TU5D-3 A Wireless Bladder Volume Monitoring System Using a Flexible Capacitive-based Sensor**

H. Cao1, U. Tata1, V. Landge1, A. Li2, Y. Peng1, J. Chiao1, 1University of Texas at Arlington (EEE Dept.), Arlington, United States, 2University of Texas at Arlington (Psychology Dept.), Arlington, United States

**TU5D-4 A 13pJ/bit 105Mbps IR-UWB transmitter using Pulse Position Modulation and with On-chip LDO Regulator in 0.13µm CMOS for Biomedical Implants**

M. N. Elzeftawi, L. Theogarajan, University of California Santa Barbara, Santa Barbara, United States

### Joint RWW Banquet

Tuesday Evening, 22 January 2013 from 18:00-21:00

Room: Ballroom A

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.

Photo by Andy Schrader
WE1A-1 Hybrid Analog-Digital Backscatter Platform for High Data Rate, Battery-Free Sensing
V. Talia, M. Buetnner, D. Wetherall, J. R. Smith, University of Washington, Seattle, United States
National Aeronautics and Space Administration, Kennedy Space Center, United States
Aberdeen Proving Grounds, United States

WE1A-2 Coherence Multiplexed Passive Wireless SAW RFID Tag System
N. V. Saldanha1, D. C. Malocha1, R. C. Youngquist1
1University of Central Florida, Orlando, United States
2University of Tennessee (EECS Dept), Knoxville, United States
3Georgia Institute of Technology, Atlanta, United States

WE1A-3 A UWB Transmit-Only Based Scheme for Multi-tag Support in a Millimeter Accuracy Localization System
N. C. Rowe1, A. E. Fathy1, M. J. Kuhn2, M. R. Mahfouz2
1University of Tennessee (ECECS Dept), Knoxville, United States
2University of Tennessee (MABE Dept), Knoxville, United States

WE1A-4 High-Q Adaptive Matching Network for Remote Powering of UHF RFID and Wireless Sensor Systems
Late News
O. Kazanc1, F. Maloberti2, C. Dehollain1
1Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland
2University of Pavia, Pavia, Italy

WE1A-5 High Speed, High Analog Bandwidth Buck Converter Using GaN HEMTs for Envelope Tracking Power Amplifier Applications
Late News
S. Shinjo1, Y. Hong1, H. Gheidi1, D. P. Kimball1, P. M. Asbeck1
1University of California San Diego, La Jolla, United States
2Mitsubishi Electric Corporation, Kanagawa, Japan

WE1B-1 Interference Alignment – Recent Results and Future Directions (Invited)
O. El Ayach, R. W. Heath, The University of Texas at Austin, Austin, United States

WE1B-2 Simulation of Time Jitter Effects on the Detection Performance of M-Sequence Based MIMO Radar Systems
I. Pasya, T. Kobayashi, Tokyo Denki University, Adachi-ku, Japan

WE1B-3 A Fast Direction of Arrival Estimation Procedure for Adaptive Array Antennas Covered by a Shaped Dielectric Lens
R. Sankaranarayanan, D. S. B, R V College of Engineering, Bangalore - 560059, India

WE1B-4 A Compact Phased Array Antenna System Based on Dual-Band Butler Matrices
H. Ren1, J. Shao1, R. Zhou1, B. Arigong1, H. Kim1, C. Li1, H. Zhang1
1University of North Texas, Denton, United States
2Texas Tech University, Lubbock, United States

WE1B-5 An Iterative Approach for Robust Beamforming with Channel Uncertainty (Invited)
A. Aziz1, M. Gui1, C. Thron2, S. Cui1, C. Georgiades1, X. Ma1
1National Instruments , Austin, United States
2Texas A&M University, College Station, United States
3Georgia Institute of Technology, Atlanta, United States

WE1C-1 Industrialization of mm-Wave SiGe Technologies: Status, Future Requirements and Challenges (Invited)
R. Lachner, Infineon Technologies AG, Munichen, Germany

WE1C-2 A K-band SiGe Bipolar VCO with Transformer-Coupled Varactor for Backhaul Links
F. Padovan1,2, M. Tiegout1, K. Mertens1
1University of Padova, Padova, Italy
2University of Pavia, Pavia, Italy

WE1C-3 A 76GHz Oscillator by High-Q Differential Transmission Line Loaded with Split Ring Resonator in 65nm CMOS
D. Cai1, Y. Shang2, H. Yu2, J. Ren1, K. Ye2
1Fudan University, Shanghai, China
2Nanyang Technological University, Singapore, Singapore

WE1C-4 A 36-49GHz Injection-locked Frequency Divider with Transformer-based Dual-path Injection
R. Shu1, V. Subramanian1, A. Hamidan1, A. Malignaggi1, K. Alli1, G. Boeck1,2
1Berlin Institute of Technology, Berlin, Germany
2Leibniz-Institut fuer Hochtiefrequenztechnik, Berlin, Germany

WE1D-1 Microwave Dielectric Spectroscopy: An Emerging Analyzing Technique for Biological Investigations at the Cellular Level (Invited)
K. Grenier1,2, D. Dubuc1,2, T. Chen1,2, F. Artis1,2, M. Poupot1, J. Fournie1,2,3,4
1Laas-CNRS, Toulouse, France
2Univ de Toulouse, LAAS, France
3NSEFM, Toulouse, France

WE1D-2 Dielectric Characterization of Biological Liquids and Tissues up to 110GHz using an LTCC CPW sensor
I. Ockel1,2, S. Liu1, D. Grillot1, B. Embrechts2, D. Schreurs2, W. De Raedt1, B. Nauwelaers1
1IMEC, Leuven (Heverlee), Belgium
2KU Leuven, Leuven (Heverlee), Belgium

WE1D-3 A Microwave VNA for Bio-medical In-Line Concentration Measurements
M. Hofmann, A. Oborovski, G. Fischer, R. Weigel, D. Kissinger, University of Erlangen Nuremberg, Erlangen, Germany

WE1D-4 A Microwave System for Blood Perfusion Measurements of Tissue: A Preliminary Study
M. Tofghi, C. Huynh, Penn State University, Harrisburg, Middletown, United States

WE1D-5 Conformal Multilayer Hyperthermia Applicators for Superficial Cancer Treatment in Veterinary Patients
Y. Koo1, R. Kazemi1, A. E. Fathy1, J. Phillips2
1University of Tennessee, Knoxville, United States
2Lincoln Memorial University, Harrogate, United States

WE1E-1 A 36-49GHz Injection-locked Frequency Divider with Transformer-based Dual-path Injection
R. Shu1, V. Subramanian1, A. Hamidan1, A. Malignaggi1, K. Alli1, G. Boeck1,2
1Berlin Institute of Technology, Berlin, Germany
2Leibniz-Institut fuer Hochtiefrequenztechnik, Berlin, Germany

WE1E-2 A Compact Phased Array Antenna System Based on Dual-Band Butler Matrices
H. Ren1, J. Shao1, R. Zhou1, B. Arigong1, H. Kim1, C. Li1, H. Zhang1
1University of North Texas, Denton, United States
2Texas Tech University, Lubbock, United States

WE1E-3 A 76GHz Oscillator by High-Q Differential Transmission Line Loaded with Split Ring Resonator in 65nm CMOS
D. Cai1, Y. Shang2, H. Yu2, J. Ren1, K. Ye2
1Fudan University, Shanghai, China
2Nanyang Technological University, Singapore, Singapore

WE1E-4 A Microwave System for Blood Perfusion Measurements of Tissue: A Preliminary Study
M. Tofghi, C. Huynh, Penn State University, Harrisburg, Middletown, United States

WE1E-5 Conformal Multilayer Hyperthermia Applicators for Superficial Cancer Treatment in Veterinary Patients
Y. Koo1, R. Kazemi1, A. E. Fathy1, J. Phillips2
1University of Tennessee, Knoxville, United States
2Lincoln Memorial University, Harrogate, United States

WE1E-6 A Microwave VNA for Bio-medical In-Line Concentration Measurements
M. Hofmann, A. Oborovski, G. Fischer, R. Weigel, D. Kissinger, University of Erlangen Nuremberg, Erlangen, Germany

WE1E-7 A Microwave System for Blood Perfusion Measurements of Tissue: A Preliminary Study
M. Tofghi, C. Huynh, Penn State University, Harrisburg, Middletown, United States

WE1E-8 Conformal Multilayer Hyperthermia Applicators for Superficial Cancer Treatment in Veterinary Patients
Y. Koo1, R. Kazemi1, A. E. Fathy1, J. Phillips2
1University of Tennessee, Knoxville, United States
2Lincoln Memorial University, Harrogate, United States

WE1F-1 Microwave Dielectric Spectroscopy: An Emerging Analyzing Technique for Biological Investigations at the Cellular Level (Invited)
K. Grenier1,2, D. Dubuc1,2, T. Chen1,2, F. Artis1,2, M. Poupot1, J. Fournie1,2,3,4
1Laas-CNRS, Toulouse, France
2Univ de Toulouse, LAAS, France
3NSEFM, Toulouse, France

WE1F-2 Dielectric Characterization of Biological Liquids and Tissues up to 110GHz using an LTCC CPW sensor
I. Ockel1,2, S. Liu1, D. Grillot1, B. Embrechts2, D. Schreurs2, W. De Raedt1, B. Nauwelaers1
1IMEC, Leuven (Heverlee), Belgium
2KU Leuven, Leuven (Heverlee), Belgium

WE1F-3 A Microwave VNA for Bio-medical In-Line Concentration Measurements
M. Hofmann, A. Oborovski, G. Fischer, R. Weigel, D. Kissinger, University of Erlangen Nuremberg, Erlangen, Germany

WE1F-4 A Microwave System for Blood Perfusion Measurements of Tissue: A Preliminary Study
M. Tofghi, C. Huynh, Penn State University, Harrisburg, Middletown, United States

WE1F-5 Conformal Multilayer Hyperthermia Applicators for Superficial Cancer Treatment in Veterinary Patients
Y. Koo1, R. Kazemi1, A. E. Fathy1, J. Phillips2
1University of Tennessee, Knoxville, United States
2Lincoln Memorial University, Harrogate, United States

WE1F-6 A Microwave System for Blood Perfusion Measurements of Tissue: A Preliminary Study
M. Tofghi, C. Huynh, Penn State University, Harrisburg, Middletown, United States

WE1F-7 Conformal Multilayer Hyperthermia Applicators for Superficial Cancer Treatment in Veterinary Patients
Y. Koo1, R. Kazemi1, A. E. Fathy1, J. Phillips2
1University of Tennessee, Knoxville, United States
2Lincoln Memorial University, Harrogate, United States
**WEDNESDAY, 23 JANUARY 2013**

**WisNet Session: WE2A**

**Wireless Sensors for Communication, Radar, Positioning and Imaging Applications**

Chair: Martin Vossiek, Technical University of Clausthal

Co-Chair: Nils Pohl, Ruhr University Bochum

Room: Trinity A

**WE2A-1 Through-Wall Wearable Doppler Radar System: Active Textile Antenna Design, Prototyping and Experiment (Invited)**

S. Agneessens, P. Van Torre, F. Declercq, B. Spinnewyn, G. Stockman, H. Rogier, D. Vande Ginste, Ghent University, Gent, Belgium

**WE2A-2 Highly Accurate Noncontact Water Level Monitoring using Continuous-Wave Doppler Radar**

G. Wang1, C. Gu1, J. Rice2, T. Inoue2, C. Li3
1Texas Tech University, Lubbock, United States, 2University of Florida, Gainesville, United States, 3National Instruments, Austin, United States

**WE2A-3 The Investigation of Millimetre Wave Optical Harmonic Transponders and Radar for Monitoring Small Insects**

N. Tahir, G. M. Brooker, University of Sydney, Sydney, Australia

**WE2A-4 High Range Resolution Frequency-Hopping Sensor System**

N. Keya, R. Nakamura, A. Kajiwara, Keio University, Yokohama, Japan

**WE2A-5 A Stepped-Frequency Continuous Wave Ranger for Aiding Pedestrian Navigation**

J. M. Downey1, J. Parmesh1, D. D. Stanci2, T. Mukherjee3, 1Carnegie Mellon University, Pittsburgh, United States, 2Industrial Technology Research Institute (ITRI), Hsinchu, Taiwan, 3Sabanci University, Istanbul, Turkey

**RWW Session: WE2B**

**Advances in Low Noise Low Power Receivers**

Chair: Hiroshi Okazaki, NTT DoCoMo Inc.

Co-Chair: Telesphor Kamgaing, Intel Corporation

Room: Trinity B

**WE2B-1 A 0.8V 1.1pJ/bit Inductive-Coupling Receiver with Pulse Extracting Clock Recovery Circuit and Intermittently Operating LNA**

T. Jyo, T. Kuroda, H. Ishikuro, Keio University, Yokohama, Japan

**WE2B-2 An 84dB-Gain-Range and 1GHz-Bandwidth Variable Gain Amplifier Using Gain Flattening Capacitors for Multi-Gigabit Radio**

R. Kitamura, T. Tsukizawa, N. Saito, Panasonic Corporation, Yokohama City, Japan

**WE2B-3 2.4GHz 7.4mW 300kHz Flicker-Noise-Corner Direct Conversion Receiver Using 0.18µm CMOS and Deep-N-Well NPN BJT**

W. Chang1, C. Meng1, J. Syu1, C. Wang1, G. Huang2
1National Chiao Tung University, Hsinchu, Taiwan, 2National Nano Device Laboratories, Hsinchu, Taiwan

**WE2B-4 Dynamic Range Extension for HF Receiver Frontend**

G. Ulbricht, Fraunhofer-Institute for Integrated Circuits, Erlangen, Germany

**WE2B-5 A Low Profile Efficient Leaky-Wave Antenna Composed of High Aspect Ratio EBG Unit Cells**

M. Hosseini, D. M. Klymyshyn, University of Saskatchewan, Saskatoon, Canada

**WE2B-6 49GHz 6-Bit Programmable Divider in SiGe BiCMOS**

A. Ergintav1, Y. Sun1, C. Scheytt2, Y. Gurbuz3
1IHP, Frankfurt (Oder), Germany, 2University Paderborn, Paderborn, Germany, 3Sabanci University, Istanbul, Turkey

**WE2B-7 A 0.8V 1.1pJ/bit Inductive-Coupling Receiver with Pulse Extracting Clock Recovery Circuit and Intermittently Operating LNA**

T. Jyo, T. Kuroda, H. Ishikuro, Keio University, Yokohama, Japan

**WE2B-8 4GHz-Bandwidth Op-Amp Free Track-and-Hold and 6-bit Flash ADC in 45nm SOI CMOS**

M. W. Chen, D. Tian, S. Phatak, L. R. Carley, D. S. Ricketts, Carnegie Mellon University, Pittsburgh, United States

**WE2B-9 A Fully Integrated 120GHz Six-Port Receiver Front-End in a 130nm SiGe BiCMOS Technology**

B. Laemmlie1, K. Schmalz2, J. Borngraber3, J. C. Scheytt1, R. Weigel1, A. Koelpin1, D. Kissinger1
1University of Erlangen-Nuremberg, Erlangen, Germany, 2University of Erlangen-Nuremberg, Erlangen, Germany, 3Fraunhofer-Institute for Integrated Circuits, Erlangen, Germany

**SITR Session: WE2C**

**RF and Millimeter-Wave Systems**

Chair: Larry Larson, Brown University

Co-Chair: Hermann Schumacher, University of Ulm

Room: Sabine

**WE2C-1 Waveguide-Capillary Tube Integration Schemes for the Characterization of Nano-liter Liquids at Millimeter Wave Frequencies with Record Sensitivities**

J. Stiens1,2, V. Matvejev1, C. De Tande1, W. Ranson1, D. Mangelings1, R. Willaert1, W. De Raedt1, 1Wise Universiteit Brussel, Brussels, Belgium, 2IMEC, Leuven, Belgium

**WE2C-2 Waveguide-Capillary Tube Integration Schemes for the Characterization of Nano-liter Liquids at Millimeter Wave Frequencies with Record Sensitivities**

J. Stiens1,2, V. Matvejev1, C. De Tande1, W. Ranson1, D. Mangelings1, R. Willaert1, W. De Raedt1, 1Wise Universiteit Brussel, Brussels, Belgium, 2IMEC, Leuven, Belgium

**WE2C-3 A CMOS Fully Integrated Antenna System Transceiver with Beam-formability for Millimeter-Wave Active Imaging**

N. Mai-Khanh, K. Asada, The University of Tokyo, Bunkyo-ku, Japan

**WE2C-4 A High Q On-Chip Bondwire Transformer and Its Application to Low Power Receiver Front-End Design**

C. Li1, C. Kuo1, M. Kuo2
1National Chiao Tung University, Hsinchu, Taiwan, 2Industrial Technology Research Institute (ITRI), Hsinchu, Taiwan

**WE2C-5 A Fully Integrated 120GHz Six-Port Receiver Front-End in a 130nm SiGe BiCMOS Technology**

B. Laemmlie1, K. Schmalz2, J. Borngraber3, J. C. Scheytt1, R. Weigel1, A. Koelpin1, D. Kissinger1
1University of Erlangen-Nuremberg, Erlangen, Germany, 2University of Erlangen-Nuremberg, Erlangen, Germany, 3Fraunhofer-Institute for Integrated Circuits, Erlangen, Germany

**BioWireleSS Session: WE2D**

**Advances in Micro and Millimeter-Wave Biosensing and Interaction**

Chair: Katia Grenier, LAAS-CNRS, France

Co-Chair: J. C. Chiao, University of Texas at Arlington

Room: San Marcos

**WE2D-1 Aqueous Protein Solution Differentiation with High Frequency Microwave Debye Relaxation Analysis**

T. H. Basey-Fisher1,2, S. M. Hanham1, S. B. Merelli3, S. A. Maier4, N. Klein5, 1Imperial College London, London, United Kingdom, 2Imperial College London, London, United Kingdom

**WE2D-2 Waveguide-Capillary Tube Integration Schemes for the Characterization of Nano-liter Liquids at Millimeter Wave Frequencies with Record Sensitivities**

J. Stiens1,2, V. Matvejev1, C. De Tande1, W. Ranson1, D. Mangelings1, R. Willaert1, W. De Raedt1, 1Wise Universiteit Brussel, Brussels, Belgium, 2IMEC, Leuven, Belgium

**WE2D-3 Millimeter-Wave Integrated Reflectometer Architectures for Biomedical Applications (Invited)**

D. Kaisinger, B. Laemmle, I. Nasr, R. Weigel, University of Erlangen-Nuremberg, Erlangen, Germany

**WE2D-4 Broadband Discrimination of Living and Dead Lymphomas Cells with a Microwave Interdigitated Capacitor**

T. Chen1, D. Dubuc1, M. Poupou1, J. Fournié1, K. Grenier1, 1LAAS CNRS, Toulouse, France, 2INSERM, Toulouse, France

**WE2D-5 Millimeter Wave Bioeffects at 94GHz on Skeletal Muscle Contractile Function**

I. Chatterjee1, J. Yoon1, R. Wiese2, S. Luongo3, P. Mastin3, L. Sadovnik3, G. L. Craviso1, 1University of Nevada, Reno, United States, 2University of Nevada School of Medicine, Reno, United States, 3Sierra Nevada Corporation, Sparks, United States
**WEDNESDAY, 23 JANUARY 2013**

**WiSNET Session: WE3A**

Wireless Integrated Sensor Front-Ends and Building Blocks

Chair: Thomas Ussmueller, University of Erlangen-Nuremberg
Co-Chair: Alexander Koelpin, University of Erlangen-Nuremberg
Room: Trinity A

**Joint RWS/SIRF Session: WE3B**

Power Amplifiers and Transmitter Modules

Chair: Yaoming Sun, Innovations for High Performance Microelectronics Leibniz-Institut
Co-Chair: Luciano Boglione, Solid State Scientific Corp.
Room: Trinity B

**Late News Session: WE3C**

Wireless Sensors for Harsh Environments, Home, Health and Communication

Chair: Alexander Koelpin, University of Erlangen-Nuremberg
Co-Chair: Rahul Khanna, Intel
Room: San Marcos

**WE3A-1 Radar Measurements with Micrometer Accuracy and Nanometer Stability Using an Ultra-Wideband 90 GHz Radar System (Invited)**

N. Pohl1, T. Jaschke1, S. Scherri2, S. Ayyan2, M. Pauli2, T. Zwick2, T. Muschi,1 Ruhr-University Bochum, Bochum, Germany, 1Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

**WE3A-2 Range-Time-Frequency Representation of Pulse Doppler Imaging Radar for Indoor Localization and Classification (Invited)**

Y. Wang, A. E. Fathy, University of Tennessee, Knoxville, United States

**WE3A-3 Ultra-Low Power Transmitter Trade-offs for Super-Resolution Tracking of Rodents**

V. Goverdovsky, D. Yates, C. Papavassiliou, Imperial College London, London, United Kingdom

**WE3A-4 An Energy Harvesting System using 3-Stage Voltage Multiplier and MPVD Charge Pump for Wireless Sensor Networks**

R. D. Shrivastava, D. Deshpande, C. Li, R. Gale, ECE, TTU, Lubbock, Lubbock, United States

**WE3A-5 Reconfigurable L & S Band Thin Film Miniature Band-Pass Filter**

Late News

S. Kunasani, S. Mazumder, Raytheon IDS, Sudbury, United States

**WE3B-1 A 26dBm Output Power SiGe Power Amplifier for Mobile 16 QAM LTE Applications**

G. Lee, J. Jung, J. Song, GIST, Gwangju, Republic of Korea

**WE3B-2 14.4mW 10Gbps CMOS Limiting Amplifier with Local DC Offset Cancellers**

K. Takano1, R. Fujimoto2, M. Motoyoshi1, K. Katayama1, M. Fujishima1,1 Hiroshima University, Higashi-Hiroshima, Japan, 2Toshiba Corporation, Kawasaki, Japan

**WE3B-3 A SiGe HBT Power Amplifier with Integrated Mode Control Switches for LTE Applications**

J. Jung, G. Lee, J. Song, GIST, Gwangju, Republic of Korea

**WE3B-4 A Hybrid GaN/Organic X-Band Transmitter Module**

S. Pavlidis1, C. A. Donado Morcillo1, P. Song1, W. T. Khan1, R. Fitch1, J. Gillespie2, R. Febo2, T. Quach2, J. A. Jayamon, A. Agah, B. Hanafi, H. T. Dabag, J. F. Buckwalter, P. M. Asbeck, University of California San Diego, La Jolla, United States, 1Air Force Research Laboratory, Dayton, United States

**WE3B-5 A SPST Cellular Antenna Switch in 2.5V CMOS Thin-Film SOI**

Late News

V. Blaschke, A. Unikovski, P. Hurwitz, S. Chaudhry, TowerJazz, Newport Beach, United States

**WE3C-1 Contactless Characterization of Yeast Cell Cultivation at 7GHz and 240GHz**

Late News

J. Wessel1, K. Schmalz1, B. Cahilli2, G. Gastrock2, C. Meliani1,1 HPI, Frankfurt (Oder), Germany, 2IBA, Heilbad Heiligenstadt, Germany

**WE3C-2 Submillimeter-Wave InP HEMT Amplifiers with Current-Reuse Topology**

Late News

M. Sato, S. Shiba, H. Matsumura, T. Takahashi, T. Suzuki, Y. Nakasha, N. Hara, Fujitsu Ltd., Atsugi, Japan

**WE3C-3 Reconfigurable Multiband SAW Filters for LTE Applications**

Late News

X. Lu1, J. Galipeau2, K. Mouthaan1, E. H. Brecht, B. Abbott, 1National University of Singapore, Singapore, Singapore, 2TriQuint Semiconductor, Aopoka, United States

**WE3C-4 A W-band Stacked FET Power Amplifier with 17dBm Psat in 45nm SOI CMOS**

Late News

J. A. Jayamon, A. Agah, B. Hanafi, H. T. Dabag, J. F. Buckwalter, P. M. Asbeck, University of California San Diego, La Jolla, United States

**WE3C-5 Class-E Power Amplifier Design at 2.5GHz using a Packaged Transistor**

Late News

G. F. Collins1, J. Wood2,1 MaxXentric Technologies, La Jolla, United States, 2Maxim Integrated Products, San Jose, United States

**WE3D-1 An IPv6-enabled Wireless Shoe-Mounted Platform for Health-monitoring (Invited)**

C. Mariotti1,2, V. Lakafosis1, M. M. Tentzeris1, L. Roselli2,1 Georgia Institute of Technology, Atlanta, United States, 2University of Perugia, Perugia, Italy

**WE3D-2 Radiofrequency Sensors for Snow Conditions Monitoring and Real Time Avalanche Alerts**

A. Carta, A. Ghaghazanian, R. Stefanelli, D. Trinchero, iXem Labs, Politecnico di Torino, Torino, Italy

**WE3D-3 Heat, Vibration, Dust, Salt Spray, Weather - Taking Wireless Positioning to the Extreme (Invited)**

H. Millner1, P. Gudsen1, S. Roehr1, M. Christmann1, M. Vossiek1,1 Symeo GmbH, Neubiberg/Munich, Germany, 2Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen, Germany

**WE3D-4 Dynamic Wireless Sensor Networks for Real Time Safeguard of Workers Exposed to Physical Agents in Constructions Sites**

E. Pieveanni, A. Plesca, R. Stefanelli, D. Trinchero, iXem Labs Politecnico di Torino, Torino, Italy
RWW Session: WE3P
Chair: Gabriel Montoro, Technical University of Catalonia

WE3P-1 An Electrically-Small, 3-D Cube Antenna Fabricated with Additive Manufacturing
I. T. Nassar, T. M. Weller, University of South Florida, Tampa, United States

WE3P-2 Characterizing a Proposed Sixteen-Element Array Antenna Designed for Microwave Imaging of Breast Cancer
A. Modiri, K. Kiasaleh, S. Chandrasah, University of Texas at Dallas, Richardson, United States

WE3P-3 3GHz band HTS Multichannel Receiving Unit with 8 modules
H. Kayano, N. Shikokawa, T. Kagawuchi, K. Nakayama, M. Yamazaki, Toshiba Corporation, Kawasaki, Japan

WE3P-4 Multiple-Band Rejection Notches in Miniaturized UWB Fifth-Order Filter Using E-Shape Microstrip Structures
R. T. Hammond, D. Mirshekar-Syahkal, University of Essex, Colchester, United Kingdom

WE3P-6 A Compact Charge-Based Physical Model for AlGaN/GaN HEMTs
F. M. Yigletu1,2,1, B. Illigeue1,2,1, S. Khandelwal2,1, T. A. Fjeldly2,1, Lesenechal2,1, P. Descamps2,1, J. Lefebvre1, D. Pasquet3, F. Voiron3, University of Kitakyushu, Kitakyushu, Japan

WE3P-7 Tunable Frequency Ferromagnetic Resonance of Co Nanowire Arrays
M. Pasquale, C. P. Sasso, E. S. Olivetti, M. Coisson, Istituto Nazionale di Ricerca Metrologica, Torino, Italy

WE3P-8 A New UWB Link Set-Up for Breast Tumor Detection
S. Razzavazadeh, Islamic Republic of Iran Broadcasting University, Tehran, Iran

WE3P-9 Time-Reversal UWB-IR Considering Channel Estimation Error
H. Ishikawa, A. Matsumoto, R. Nakamura, A. Kajiwara, The University of Kitakyushu, Kitakyushu, Japan

WE3P-10ICI of Time-Reversal UWB-IR Communication
Z. He, H. Ishikawa, R. Nakamura, A. Kajiwara, The University of Kitakyushu, Kitakyushu, Japan

WE3P-11 Millimeter-Wave Phase-Locked Loops for Terahertz Transceiver Using Sub-harmonic Injection Locking
S. Bhagavatheeewaran, B. Banerjee, The University of Texas at Dallas, Richardson, United States

WE3P-12 Joint Transmitter Adaptation and Power Control in Multi-User Wireless Systems with Fading Channels
S. Abraham1, D. C. Popescu2,1, Tuskegee University, Tuskegee, United States

WE3P-13 A K-Band Low-Power CMOS Transformer-Feedback VCO
J. Tsi, J. Chou, National Taiwan Normal University, Taipei, Taiwan

WE3P-14 Magnetostimulation by Inductive Power Transfer Systems
J. S. McLean, A. Medina, R. Sutton, TDK R&D Corp., Cedar Park, United States

WE3P-15 Building Blocks for an X-Band SiGe BiCMOS T/R Module
T. Dinc1, I. Kalyoncu1, M. Kaynak2, Y. Gurbuz2, Sabanci University, Istanbul, Turkey

WE3P-16 Reducing Substrate Noise Coupling in a 3D-PICS Integrated Passive Device by Localized P+ Guard Rings
M. Ben Salah1, D. Pasquet1, F. Voiron1, P. Descamps2, J. Lefevre1, D. Lesenechal1, IHP Microelectronics, Frankfurt (Oder), Germany

WE3P-17 Compact Wideband Rat-Race Hybrid Utilizing Composite Right/Left-Handed Transmission Lines
Y. Sumimoto1, T. Kawai1, A. Enokihara1, I. Ohta1, K. Satoh1, Y. Suzuki1, H. Okazaki1, S. Narahashi1, University of Hyogo, Himeji, Japan

WE3P-18 A 4-bit SiGe Passive Phase Shifter for X-Band Phased Arrays
I. Kalyoncu1, E. Ozeren1, M. Kaynak2, Y. Gurbuz1, Sabanci University, Istanbul, Turkey

WE3P-19 A K-Band Low-Power CMOS Switch
I. Kalyoncu1, E. Ozeren1, M. Kaynak2, Y. Gurbuz2, Sabanci University, Istanbul, Turkey

WE3P-20 A fully integrated bulk-CMOS switch based tunable transformer for RF and antenna matching
W. Bakalaki1, A. Thomas1, R. Weigel1, Infineon Technologies AG, Neubiberg, Germany

WE3P-21 Doppler Radar Sensor for Occupancy Monitoring
E. Yavari, H. Jou, L. Duke, O. Boric-Lubecke, University of Hawaii at Manoa, Honolulu, United States

WE3P-22 Transmission of 3-Gb/s Uncompressed HD Video in a Optoelectronic-Oscillator-Based Radio over Fiber Link
Z. Tang, S. Pan, Nanjing University of Aeronautics and Astronautics, Nanjing, China

WE3P-23 Reconstruction Filter suitable for Lowpass Delta-Sigma RF Transmitters
D. Wang, R. Negra, RWTH Aachen University, Aachen, Germany

WE3P-24 Dual Band Electrically Small Non-Uniform Pitch Ellipsoidal Helix Antenna for Cardiac Pacing Applications
H. Huang1,2, P. Chen2, M. Ferrari1, Y. Hu3, D. Akinwande1, The Methodist Hospital Research Institute, Houston, United States

WE3P-25 Design Considerations for Asymmetric Magnetically Coupled Resonators used in Wireless Power Transfer Applications
G. Lee2, B. H. Waters2, C. Shi2, W. Park1, J. R. Smith2, Pohang University of Science and Technology, Pohang, Republic of Korea

WE3P-26 A Wireless Sensing Platform Utilizing Ambient RF Energy
A. N. Parks1, A. P. Sample1, Y. Zhao1, J. R. Smith2, University of Washington (EE Dept), Seattle, United States

WE3P-27 BER Performance Analysis of Interference-Limited BPSK Cooperative Communication Systems with Cochannel Interference in Nakagami-m Fading Channels
M. S. Akhoirshida, M. M. Matalgah, The University of Mississippi, United States

WE3P-28 Evaluation of EM Absorption Loss for Continuous Monitoring of Breast Cancer
M. M. Elsewe, D. Chatterjee, University of Missouri - Kansas City, Kansas City, United States

WE3P-29 RF Multicarrier Signaling and Antenna Systems for Low SNR Broadband Underwater Communications
K. Naishadham1, B. Kelley2, Georgia Institute of Technology, Atlanta, United States

WE3P-30 The University of Texas at Austin, Austin, United States

Downtown Skyline
Photo courtesy of Austin CVB
**Wednesday, 23 January 2013**

**WiSNet Session: WE4A**

**Sensor Network Communication Architecture and Topologies**
Chair: Rahul Khanna, Intel
Co-Chair: Alexander Koelpin, University of Erlangen-Nuremberg
Room: Trinity A

**RWW Session: WE4B**

**Millimeter-Wave System-in-Packages, Emerging Microwave Circuits and Techniques**
Chair: Bhaskar Banerjee, University of Texas Dallas
Room: Trinity B

**SIRF Session: WE4C**

**Millimeter-Wave Circuits**
Chair: Larry Larson, Brown University
Co-Chair: Hermann Schumacher, University of Ulm
Room: Sabine

**RWW Session: WE4D**

**Wireless Systems Architecture and Modeling’2**
Chair: Debabani Choudhury, Intel
Room: San Marcos

### 15:40

**WE4A-1 Scalable Map-Based Tasking for Urban Scale Multi-purpose Sensor Networks (Invited)**
H. Tran¹, N. Bulusu¹, T. Dang², W. Feng³,
¹Portland State University, Portland, United States,
²Washington State University Vancouver, Vancouver, United States

**WE4B-1 In-depth Bifurcation Analysis of Nonlinear Microwave Circuits (Invited)**
A. Suarez, F. Ramirez,
University of Cantabria, Santander, Spain

**WE4C-1 Towards mm-Wave System-On-Chip with Integrated Antennas for Low-cost 122 and 245GHz Radar Sensors (Invited)**
J. C. Scheytt¹,¹, Y. Sun¹, K. Schmalzl¹, Y. Mao¹, R. Wang¹, W. Debiski², W. Winkler²
¹IFH, Frankfurt (Oder), Germany,
²Siemens Radar GmbH, Frankfurt (Oder), Germany,
³[3]University of Paderborn, Paderborn, Germany

**WE4D-1 Verification of Interference Avoidance Effect with Adaptive Channel Diversity Method based on ISA100.11a Standard**
Y. Serizawa, T. Yano, Miyazaki, K. Mizugaki, R. Fujisawa, M. Kokubo, Hitachi Ltd., Kokubunji, Japan

### 16:00

**WE4A-2 Energy-Efficient Monitoring of Distributed System Resources for Self-Organizing Sensor Networks (Invited)**
F. Dresler, D. Neuner,
University of Innsbruck, Innsbruck, Austria

**WE4B-2 A Low-Cost, Wide-Band 60GHz Down-Converter Module for Multi-Gigabit per Second Wireless Communication**
G. Liu, A. C. Ulusoy, A. Trasser, H. Schumacher,
Ulm University, Ulm, Germany

**WE4C-2 A K-Band CMOS Monolithic Phase-Invertible Variable Attenuator with Feedback Notch Comparator Incorporating the Pulse Comparator**
H. Wu¹, C. Wang², J. Ma¹, C. Tsang¹,
¹Tianjin University, Tianjin, China,
²MStar Semiconductors Inc., Zhubei City, Taiwan

**WE4D-2 Range Extension Using Optimal Node Deployment in Linear Multi-hop Cooperative Networks**
S. A. Hassan,
National University of Sciences and Technology, Islamabad, Pakistan

### 16:20

**WE4A-3 A Distributed Self-Relocating Algorithm for Randomly Deployed Mobile Wireless Sensors (Invited)**
Y. Qu, S. Georgakopoulos,
Florida International University, Miami, United States

**WE4B-3 Non-Reciprocal Faraday Rotation in Graphene: Just a Unique Phenomenon or Even More? (Invited)**
D. Sounas, C. Caloz,
École Polytechnique de Montréal, Montreal, Canada

**WE4C-3 A 13/24/35-GHz Concurrent Tri-band LNA with Feedback Notches**
J. Lee, C. Nguyen,
Texas A&M University, College Station, United States

**WE4D-3 Simulator for Capacity Analysis of Base Stations for Mobile Networks using Google Maps**
J. A. Figueiras¹, P. Sebastiá³, F. Cerca², N. David³,
¹Lisbon University Institute, Lisboa, Portugal,
²Instituto de Telecomunicações, Lisboa, Portugal

### 16:40

**WE4A-4 Synchronization and Synchronization of Wireless Sensor Networks**
J. Reis, N. B. Carvalho,
IT Aveiro, Aveiro, Portugal

**WE4B-4 A Packaged 60GHz Low-Power Transceiver with Integrated Antennas for Short-Range Communications**
J. A. Zevallos Luna¹, A. Siligaris¹, C. Pujol², L. Dussopt¹,
¹CEA, Grenoble, France,
²Agilent Technologies, Massy, France

**WE4C-4 A 13/24/35-GHz Concurrent Tri-band LNA with Feedback Notches**
J. Lee, C. Nguyen,
Texas A&M University, College Station, United States

**WE4D-4 Physical Layer Security of Hybrid Spread Spectrum Systems**
A. Martin, Y. Hasan, R. M. Buehrer,
Virginia Tech, Blacksburg, United States

### 17:00

**WE4A-5 Performance Evaluation of Hybrid Spread Spectrum Based Advanced Smart Metering Infrastructure Network with Multi-User Detection Techniques in Jamming Channel**
Late News
S. Garlapati, R. M. Vaghefi, M. R. Buehrer, J. H. Reed,
Virginia Tech, Blacksburg, United States

**WE4B-5 Ultra Low Noise Cryogenic Amplifiers for Radio Astronomy (Invited)**
E. W. Bryerton, M. Morgan, M. W. Pospieszalski,
National Radio Astronomy Observatory, Charlottesville, United States

**WE4C-4 Key components of a 130GHz Dicke-radiometer SiGe FIC**
E. Shumaikhe, J. Elkind, D. Elad,
IBM, Haifa, Israel

**WE4D-5 Experimental Evaluation of Adaptive Impedance Control for MIMO Antennas in an FDD-LTE Terminal**
Late News
I. Kanjo, Y. Amano, A. Yamaguchi,
KDDI R&D Laboratories Inc., Fujisawa City, Japan

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**Wireless OTA Technical Tour and BBQ**
Bus loads at Renaissance at 5:45 pm, bus returns to hotel at 8:45 pm
See “Highlights” on RWW2013 website for tour and registration info
Exhibit Space Layout

Exhibitor Booth
- Anritsu 10
- AWR Corporation 7
- Copper Mountain Technologies 8
- CST of America, Inc. Lanyard Sponsor 2
- ETS-Lindgren 1
- Maury Microwave 11
- Mesuro Limited 13
- National Instruments Corporation 8
- Presto Engineering 14
- RFMD Platinum Sponsor 3
- Rogers Corporation 12
- Sonnet Software Inc. Diamond Sponsor 15
- Think RF 6
## 2013 IEEE Radio & Wireless Week at a Glance

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**Activity Location**
- **A**: Morning
- **E**: Evening
- **N**: Noon
- **M**: Afternoon