

**RAWCON**

**IEEE  
Radio &  
Wireless  
Conference**



**ATLANTA 2004**



*Featuring the*  
**Wireless Exhibition**

**F I N A L P R O G R A M**

**Omni Hotel at CNN Center**  
Atlanta, Georgia, USA  
19 – 22 September 2004

**<http://www.rawcon.org>**

*General Co-Chairs:*

J. Stevenson Kenney, *Georgia Institute of Technology*  
Ke Wu, *Ecole Polytechnique de Montreal*

*Technical Program Co-Chairs:*

Mohammad Madihian, *NEC Laboratories America, Inc.*  
Xiaodong Wang, *Columbia University*

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**IEEE**





## Keynote Address

Don't miss the opening session of the Conference, featuring our keynote speaker, Dr. Al Javed, Vice President of Wireless Networks Technology, Nortel Networks.

**"Perceptions of Future Wireless Networks"**

Third Generation Wireless Networks are finally beginning to be deployed commercially around the world this year. These networks are extending voice services to multimedia services. This presentation will address design challenges faced by systems beyond 3G, as well as, new and emerging wireless technologies which will enable us to meet those challenges, including the evolution towards fully broadband networks and techniques for making these broadband networks very flexible and offer context and content aware multimedia communications services.

## Poster/Exhibition Reception

Monday, September 20, 2004

On Monday evening, please join us from 5:00 to 7:00 PM for a Welcome Reception, held in conjunction with the Monday Poster Session and the opening of the expanded Wireless Exhibition of wireless products and services.

## Conference Banquet

On Monday evening at 7:00 PM, following the opening of the Poster Session, Exhibition and Reception, you are invited to the conference Banquet, followed at 8:15 PM by an address by Prof. David J. McLaughlin, Director of the NSF Center for Collaborative Adaptive Sensing of the Atmosphere, at the University of Massachusetts, Amherst. The title of Prof. McLaughlin's talk is **"Distributed Collaborative Adaptive Sensing for Hazardous Weather Detection, Tracking, and Predicting"**.

Monday, September 20, 2004

1:00 PM

## Opening Remarks

J. Stevenson Kenney, General CoChair

1:20 PM

## Keynote Address: "Perceptions of Future Wireless Networks."

Dr. Al Javed, Vice President of Wireless Networks Technology, Nortel Networks, USA

Session M1 3:00 PM – 5:00 PM  
Enabling Technologies for the Next Generation Radio and Wireless Communications

Chair: Mohammad Madhian, NEC Laboratories America, Inc.  
Co-Chair: Xiaodong Wang, Columbia University

M1.1 3:00 PM

## Radios for Next Generation Wireless Networks (invited)

A. Rofougaran, M. Rofougaran, A. Behzad, Broadcom Corporation, Irvine, CA, USA

M1.2 3:30 PM

## MIMO: A Disruptive Technology Enabling Very High Spectral Efficiency Beyond Conventional Limits (invited)

R. A. Valenzuela, D. Chizhik, J. Ling, Bell Laboratories - Lucent Technologies, Holmdel, NJ, USA

M1.3 4:00 PM

## Transmit Pre-Coding for MIMO Wireless (invited)

Arogyaswami Paulraj, Stanford University, Stanford, CA, USA

M1.4 4:30 PM

## A Protocol Suite for Wireless Sensor and Actor Networks (invited)

Ian F. Akyildiz, Ismail H. Kasimoglu, Georgia Institute of Technology, Atlanta, GA, USA

## Poster Session P1. 5:00 PM – 7:00 PM

Chair: Ke Wu, Ecole Polytechnique de Montreal

P1.2

## The Performance of A Multistage Quasi-Orthogonal Minimum Output Energy Multiuser Detector for Convolutionally Coded CDMA Systems in Multipath Environment

M. Aziz, S. El-Ramly\*, Information Technology Institute (ITI), Cairo, Egypt, \*Ain Shams University, Cairo, Egypt

P1.3

## Fast Constant Modulus Algorithm in the DFT Domain

Y. Yang<sup>1</sup>, C. Park<sup>2</sup>, J. Song<sup>3</sup>, <sup>1</sup>The Univ. of Suwon, Whasung, Korea, <sup>2</sup>TVlogic Inc. Whasung-city, Korea, <sup>3</sup>Analog Devices Korea Ltd, Seoul, Korea

P1.4

## High Speed Equalizer for GSM/GPRS

N. V. Gottimukkala, P. Garapati, P. Jinuga, V. Gadesina, Hellossoft (India) Pvt. Ltd, Hyderabad, India

P1.5

## Novel Optimum Reduced Search MLSE Decoding Algorithm Enabling System-aware Power Savings

A. Wellig, J. Zory, N. When\*, STMicroelectronics, Geneva, Switzerland, \*University of Kaiserslautern, Kaiserslautern, Germany

P1.7

## Error Vector Magnitude of OFDM Signals Caused by Sampling Clock Jitter

N. Ando, R. Hayashi, T. Takagi, Mitsubishi Electric Corporation, Kamakura, Japan

P1.8

## Adaptive Compensation of Nonlinear Distortion in Multicarrier Direct-Conversion Receivers

A. Shahed, M. Valkama, M. Renfors, Tampere University of Technology, Tampere, Finland

P1.9

## Cluster-Based Location Routing Algorithm for Vehicle to Vehicle Communication

R. Santos, R. Edwards, A. Edwards\*, University of Sheffield, Sheffield, United Kingdom, †University of Colima, Colima, Mexico

P1.10

## Implementation of the Integrated Network and Link Control Functions for Multi-hop Mesh Networks in Broadband Fixed Wireless Access Systems

Y. Kishi, K. Tabata, T. Kitahara, Y. Imagawa, A. Idoue, S. Nomoto, KDDI R&D Laboratories, Inc., Kamifukuoka, Saitama, Japan

P1.11

## Surface Acoustic Wave Sensors: Attributes and Advantages

P. J. Edmonson, W. D. Hunt\*, P.J. Edmonson Ltd., Hamilton, Canada, \*Georgia Institute of Technology, Atlanta, GA, USA

P1.12

## Minimum Traffic Inter-BS SHO Boundary Selection Algorithm for CDMA-Based Wireless Networks

M. H. Abu-Amara, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

P1.13

## Modeling Radiowave Scattering by An Elliptical Cylinder and Its Applications In Communications and Imaging

X. Huang, B. Chen, H. Cui, R. Pastore\*, M. Farwell\*, Stevens Institute of Technology, Hoboken, NJ, USA, \*U.S. Army CECOM-RDEC, Fort Monmouth, NJ, USA

P1.14

## Performance Evaluation of an Ultra Wideband Radiolocation System with Directional Beacon

W. Chung, D. S. Ha, D. Ni\*, Virginia Tech, Blacksburg, VA, USA, \*NASA Johnson Space Center, Houston, TX, USA

P1.17

## A 1-8 GHz MMIC Down-Conversion Mixer with Input/Output Active Baluns using SiGe HBT Process

S. Lee, J.-Y. Lee, S.-Y. Lee, C. Park, J.-Y. Kang, Electronics and Telecommunications Research Institute, Daejeon, South Korea

P1.18

## Effects of Microwave Switch Isolation on a Butler Matrix Beamforming Network in Smart Antenna Systems

K. U-yen, M. Ahn, J. S. Kenney, Georgia Institute of Technology, Atlanta, GA, USA

P1.19

## Multi-Slice Behavioral Model of RF Systems and Devices

A. L. Walker, M. B. Steer, K. Gard, K. Gharaibeh, North Carolina State University, Raleigh, NC, USA

P1.20

## A Fully Embedded LTCC Stripline Parallel Coupled BPF for 40 GHz BMWs Application

Y. H. Cho\*, Y. C. Lee, C. S. Park, J. W. Lee\*, M. S. Song\*, Information and Communications(ICU), Daejeon, Korea, \*Electronics and Telecommunications Research Institute(ETRI), Daejeon, Korea

P1.21

## A Low Power Wide Band CMOS VCO for Multi-Standard Radios

A. Fard, T. Johnson, D. Aberg, Mälardalen University, Västerås, Sweden

P1.22

## The Impact of Nonlinear Amplifier Distortion on the Performance of CDMA Systems

K. M. Gharaibeh, K. G. Gard, M. B. Steer, North Carolina State University, Raleigh, NC, USA

P1.23

## Experimental Characterization of LINC Outphasing Combiners' Efficiency and Linearity

G. Poitau, A. Birafane, A. Kouki, Ecole de Technologie Supérieure, Montreal, Canada

P1.24

## A Voltage Controlled Oscillator Using Barium Strontium Titanate (BST) Thin Film Varactor

A. M. Victor, J. Nath, D. Ghosh, B. Boyette, J. P. Maria, A. I. Kingon, M. B. Steer, G. T. Stauff\*, North Carolina State Univ., Raleigh, NC, USA, \*ATMI Inc., Danbury, CT, USA

P1.25

## Equivalent Circuit Model of On-Wafer Interconnects for CMOS RFICs

X. Shi<sup>1</sup>, J. Ma<sup>1</sup>, B. Ong<sup>1</sup>, K. Yeo<sup>1</sup>, M. Do<sup>1</sup>, E. Li<sup>2</sup>, <sup>1</sup>Nanyang Technological University, Singapore, <sup>2</sup>Institute of High Performance Computing(IHPC), Singapore, Singapore

P1.26

## An Analysis of Small-Signal Source-Body Resistance Effect on RF Power MOSFETs for 5-GHz Band WLAN Applications

Y.-S. Lin, K.-H. Chen, H.-M. Hsu\*, S.-C. Chen, J.-N. Yeh, National Chi-Nan University, Puli, Nantou, Taiwan, R.O.C. \*National Chung-Hsing University Taichung Taiwan, R.O.C.

P1.27

## Temperature-Dependence of Noise Figure of Monolithic RF Transformers on a Thin (20 μm) Silicon Substrate

Y.-S. Lin, T. Wang\*, S.-S. Lu\*, National Chi-Nan University, Puli, Taiwan, R.O.C. \*National Taiwan University, Taipei, Taiwan, R.O.C.

Tuesday, September 21, 2004

Session T1A 8:00 AM - 9:50 AM  
Wireless Communications and Smart Antenna Techniques

Chair: Mary Ann Ingram, Georgia Institute of Technology  
Co-Chair: Geoffrey Li, Georgia Institute of Technology

T1A.1 8:00 AM

## Layered Matrix Modulation (invited)

J. Terry, Nokia Research Center, Irving, TX, USA

T1A.2 8:30 AM

## Performance of Coherent Receivers with Hybrid Selection/Equal-Gain Combining

C. D. Iskander, Florida Atlantic University, Boca Raton, FL, USA

T1A.3 8:50 AM  
**Real-time Interference Nulling Method for Mobile Communication Systems**  
L. Maraccioli, R. Vincenti Gatti, R. Sorrentino, *University of Perugia, Perugia, Italy*

T1A.4 9:10 AM  
**Five-Port Receiver for High Rates 16QAM Modulation in the Ka-band**  
S. Abou Chakra, B. Huyart, *ENST, Paris, France*

T1A.5 9:30 AM  
**Dipole-Array Assisted Doppler Spread Compensator for Mobile Digital Terrestrial Television Broadcasting Receiver**  
Y.-C. Yu, M. Okada, H. Yamamoto, *NAIST, Ikoma, Japan*

**Session T1B 8:00 AM - 9:50 AM**  
**Active Front-End Subsystems**

Chair: Afshin S. Daryoush, *Drexel University*  
Co-Chair: Edmar Camargo, *Fujitsu Compound Semiconductor*

T1B.1 8:00 AM  
**THz Semiconductor-Based Front-End Receiver Technology for Space Applications (invited)**  
I. Mehdi, P. Siegel, *Jet Propulsion Laboratory, Pasadena, CA, USA*

T1B.2 8:30 AM  
**Wideband Impedance Matching of Integrated Antennas and CMOS Low Noise Amplifiers for a Multi-Band UWB Receiver**  
S. Chung, S.-Y. Lee, K.-H. Park, *Korea Advanced Institute of Science and Technology, Daejeon, Korea*

T1B.3 8:50 AM  
**A 60 GHz Transceiver with Multi-Gigabit Data Rate Capability**  
B. Bosco, S. Franson, R. Emrick, S. Rockwell, J. Holmes, *Motorola Labs, Tempe, AZ, USA*

T1B.4 9:10 AM  
**Miniature Fully-integrated Wireless-LAN Front-end-Modules Based on LTCC Technology**  
A. Chernyakov, K. Markov, D. Orlenko, P. Heide, C. Ruppel, *EPCOS AG, Munich, Germany*

T1B.5 9:30 AM  
**4-bit Flash ADC in InP-HBT Technology Using Distributed Resistor Ladder**  
M. Mokhtari, J. Jensen, T. Kaplan, C. Fields, D. McLaughlin, W. Ng, *HLR Laboratories LLC, Malibu, CA, USA*

**Session T2A 10:00 AM – 11:50 AM**  
**MIMO Communication: RF and Calibration Issues**  
Chair: Robert W. Heath Jr., *The University of Texas at Austin*  
Co-Chair: Jeff Zhuang, *Motorola Labs*

T2A.1 10:00 AM  
**RF and Algorithmic Considerations for Practical MIMO Wireless Implementation (invited)**  
M. Jensen, J. Wallace, *Brigham Young University, Provo, UT, USA*

T2A.2 10:30 AM  
**OFDM-MIMO WLAN BS Front-end Gain and Phase Mismatch Calibration**  
J. Liu<sup>1,2</sup>, A. Bourdoux<sup>1</sup>, J. Craninckx<sup>1</sup>, P. Wambacq<sup>1</sup>, B. Côme<sup>1</sup>, S. Donnay<sup>1</sup>, A. Barel<sup>1</sup>, <sup>1</sup>IMEC, *Leuven, Belgium*, <sup>2</sup>Also Ph.D. student at VUB, *Brussels, Belgium*, VUB, *Belgium*

T2A.3 10:50 AM  
**Simulation of the Achievable Indoor MIMO Capacity by Using an Adaptive Phased-Array**  
M. S. Elnaggar, S. Safavi-Naeini, S. K. Chaudhuri, *University of Waterloo, Waterloo, Canada*

T2A.4 11:10 AM  
**Impact of Front-end Effects on the Downlink Performance of OFDM-MIMO Transceivers**  
J. Liu<sup>1,2</sup>, A. Bourdoux<sup>1</sup>, J. Craninckx<sup>1</sup>, B. Côme<sup>1</sup>, P. Wambacq<sup>1</sup>, S. Donnay<sup>1</sup>, A. Barel<sup>1</sup>, <sup>1</sup>IMEC, *Leuven, Belgium*, <sup>2</sup>VUB, *Brussels, Belgium*

T2A.5 11:30 PM  
**OFDM WLAN System Utilizing Smart Antenna DBF-IC for Mobile Terminal**  
K. Sato, K. Akita, T. Kogawa, K. Ito\*, *Toshiba Corporation, Kawasaki, Japan*, \**Toshiba Corporation Semiconductor Company, Kawasaki, Kanagawa, Japan*

**Session T2B 10:00 AM - 11:50 AM**  
**High-Efficiency, Multi-mode Transmitter Architectures**  
Chair: Jan-Erik Mueller, *Infineon Technology*  
Co-Chair: Chul Soon Park, *School of Engineering, Information and Communication University*

T2B.1 10:00 AM  
**Advanced Architectures for High-Efficiency Multi-mode, Multi-band Terminal Power Amplifiers (invited)**  
E. W. McCune, *Tropian, Cupertino, CA, USA*

T2B.2 10:30 AM  
**A Novel Wideband Digital Power Amplifier and Transmitter Architecture for Multimode Handsets**  
P. Nagle\*, R. M. Hussein<sup>1</sup>, A. Grebennikov, W. K. Ahmed\*, F. McGrath\*, *M/A-COM, Tyco Electronics, Somerset, U.S.A.*, \**M/A-COM, Tyco Electronics, Cork, Ireland*

T2B.3 10:50 AM  
**A New Envelope Predistortion Linearization Architecture for Handset Power Amplifiers**  
W. Woo, J. S. Kenney, *Georgia Institute of Technology, Atlanta, GA, U.S.A.*

T2B.4 11:10 AM  
**Correlation Techniques for Estimation of Amplifier Nonlinearity**  
M. Li, I. Galton, L. E. Larson, P. M. Asbeck, *University of California, San Diego, La Jolla, CA, USA*

T2B.5 11:30 AM  
**Fast and Accurate ACLR Estimation Method**  
L. Sundström, *Ericsson Mobile Platforms AB, Lund, Sweden*

Lunch 12:00 PM - 1:00 PM

**Session T3A 1:00 PM - 2:50 PM**  
**Wireless Sensing and Positioning**

Chair: Robert Weigel, *University of Erlangen-Nuremberg*  
Co-Chair: Mehdi Shadaram, *University of Texas at San Antonio*

T3A.1 1:00 PM  
**Passive Wireless Strain and Temperature Sensors Based on SAW Devices (invited)**  
V. A. Kalinin, *Transense Technologies plc, Bicester Oxon, UK*

T3A.2 1:30 PM  
**Remote Local Positioning Radar**  
L. Wiebking\*, M. Christmann\*, D. Mastela, M. Glaenger, M. Vossiek\*, <sup>\*</sup>Siemens AG, *Munich, Germany*, *Institute of Microsystems, Freiburg, Germany*

T3A.3 1:50 PM  
**Local Positioning for Wireless sensors Based on Bluetooth™**  
J. G. Castano, M. Svensson, M. Ekström, Y. Backlund, *University of Mälardalen, Västerås, Sweden*

T3A.4 2:10 PM  
**Low End Extension for Bluetooth**  
M. Honkanen, A. Lappeteläinen, K. Kivekäs, *Nokia Research Center, Tampere, Finland*

T3A.5 2:30 PM  
**Spiral Chip Implantable Radiator and Printed Loop External Receptor for RF Telemetry in Bio-Sensor Systems**  
R. N. Simons, D. G. Hall\*, F. A. Miranda, *NASA Glenn Research Center, Cleveland, OH, USA*, \**ZIN Technologies, Inc., Brook Park, OH, USA*

**Session T3B 1:00 PM - 2:50 PM**  
**RF Circuits for Next Generation Multi-Band/Broad-Band Communication Systems**  
Chair: Noriharu Suematsu, *Mitsubishi Electric Corporation, Cleveland, OH, USA*  
Co-Chair: Norman Chiang, *Teledyne Technologies*

T3B.1 1:00 PM  
**Implementation and Performance of a Multi-band Transceiver for Software Defined Radio (invited)**  
K. Araki, T. Nakagawa, M. Kawashimi, K. Kboayashi, K. Akabane, H. Shiba, H. Hayashi, *NTT Corporation, Kanagawa, Japan*

T3B.2 1:30 PM  
**0.8-5.2GHz Band SiGe-MMIC Q-MIX for a Multi-Band Multi-Mode Direct Conversion Receiver**  
C. Kageyama, K. Nakajima, K. Tsutsumi, E. Taniguchi, M. Shimozawa, N. Suematsu, *Mitsubishi Electric Corporation, Kanagawa, Japan*

T3B.3 1:50 PM  
**A SiGe BiCMOS Ultra Wide Band RFIC Transmitter Design for Wireless Sensor Networks**  
J. Zhao, A. Narayanan, C. Masey, S. Raman, *Virginia Tech, Blacksburg, VA, USA*

T3B.4 2:10 PM  
**1.2V CMOS 1-10GHz Traveling Wave Amplifiers Using Coplanar Waveguides as On-Chip Inductors**  
K. Bhattacharyya, T. Szymanski, *McMaster University, Hamilton, Canada*

T3B.5 2:30 PM  
**The Temperature Dependency of a GaAs pHEMT Wideband IQ Modulator IC**  
K. Ihara, *TRDA, Inc, San Diego, CA, USA*

**Session T4A 3:00 PM - 5:00 PM**  
**Passive Front-End Components**  
Chair: Aly Fathy, *The University of Tennessee*  
Co-Chair: Ahmad Khanifar, *Powerwave Technologies*

T4A.1 3:00 PM  
**A Compact 30 GHz Low Loss Balanced Hybrid Coupler Fabricated Using Micromachined Integrated Coax**  
R. T. Chen<sup>1</sup>, E. R. Brown<sup>2</sup>, R. S. Singh<sup>3</sup>, <sup>1</sup>Microfabrica Inc., *Burbank, USA*, <sup>2</sup>University of California at Santa Barbara, *Santa Barbara, CA, USA*, <sup>3</sup>University of California, *Los Angeles, CA, USA*

T4A.2 3:20 PM  
**New Type of Band-Pass Filter Using Higher Mode Strip Line for Millimeter Wave Integrated Circuits**  
F. Kuroki\*, K. Miyamoto, S. Nishida, <sup>\*</sup>Kure Nat'l Coll of Tech, *Kure, Japan*, <sup>\*</sup>Emeritus Prof. of Tohoku Univ, *Sendai, Japan*

T4A.3 3:40 PM  
**Novel CMOS Low-Loss Transmission Line Structure**  
J. Kim, B. Jung, P. Cheung\*, R. Harjani, *University of Minnesota, Minneapolis, MN, USA*

T4A.4 4:00 PM  
**Equivalent Circuit Design of Multilayer Parallel-Coupled Line Filter**  
G. Sung<sup>1</sup>, D. Yeo<sup>2</sup>, B. Kim<sup>3</sup>, <sup>1</sup>Hankyong National University, *Kyonggi-Do, Korea*, <sup>2</sup>Korea Institute of Ceramic Eng. & Tech, *Seoul, Korea*, <sup>3</sup>Arizona State University, *Tempe, AZ USA*

T4A.5 4:20 PM  
**A Novel Electromagnetic Bandgap (EBG) Structure for Mixed-Signal System Applications**  
J. Choi, V. Govind, M. Swaminathan, *Georgia Institute of Technology, Atlanta, GA, USA*

T4A.6 4:40 PM  
**Experimental Investigation of a Compact Aperture-coupled Multilayer Bandpass Filter for Wireless Systems**  
A. Djaiz, T. Denidni, *University Of Quebec, Montreal, Canada*

**Session T4B 3:00 PM - 4:50 PM**  
**UWB Technology**  
Chair: Haoping Liu, *Oregon State University*  
Co-Chair: Richard Yao, *Microsoft Research Asia*

T4B.1 3:00 PM  
**A Decision Feedback Autocorrelation Receiver for Pulsed Ultra-Wideband Systems (invited)**  
S. Zhao, H. Liu, Zhi Tain\*, *Oregon State University, Corvallis, OR, USA*  
<sup>\*</sup>Michigan Technological University, *Houghton, MI USA*

T4B.2 3:30 PM  
**The Impact of Ultrawideband Emissions on cdma2000 Forward Link Performance**  
M. P. Green, P. Wang\*, *Nokia Research Center, Pomona, CA, USA*,  
<sup>\*</sup>Nokia Research Center, *Irving, PA, USA*

T4B.3 3:50 PM  
**A Reduced-Complexity ML Multi-User Detector for Dispersive UWB Signal Based on Combined Stack and Viterbi Trellis Search**  
W. Xu, Z. Chen, Z. Guo, R. Yao, *Microsoft Research Asia, Beijing, P.R. China*

T4B.4 4:10 PM  
**Cyclostationarity Based Air Interface Recognition for Software Radio Systems**  
M. Oner, F. Jondral, *University of Karlsruhe, Karlsruhe, Germany*

T4B.5 4:30 PM  
**UWB Communication using SAW Correlators**  
R. W. Brocato, E. J. Heller, J. R. Wendt, J. D. Blaich, G. A. Wouters, G. D. Omdahl, D. W. Palmer, *Sandia National Laboratories, Albuquerque, NM, USA*

**Poster Session P2, 5:00 PM – 7:00 PM**  
Chair: J. Stevenson Kenney, *Georgia Institute of Technology*

P2.1  
**Uplink Spectral Efficiency of Multiuser Distributed MIMO-CDMA Systems using Loosely Synchronised Spreading Codes**  
Z. Ni, D. Li, *Beijing University of Posts and Telecommunications, Beijing, P.R. China*

P2.2  
**On the Error Probability Performance of STBC under Correlated Rayleigh Fading**  
A. Maaref, S. Aissa, *INRS-EMT, Montreal, Canada*

P2.3  
**Cyclostationarity-Based Methods for the Extraction of the Channel Allocation Information in a Spectrum Pooling System**  
M. Oner, F. Jondral, *University of Karlsruhe, Karlsruhe, Germany*

P2.4  
**Monte Carlo Estimation of Time Mismatch Effect in an OFDM EER Architecture**  
J. Bercher, A. Diet, C. Berland, G. Baudoin, M. Villegas, *ESYCOM-ESIEE, Noisy le grand, France*

## Hotel

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## Poster/Exhibition Reception

Tuesday September 21, 2004  
5:00 - 7:00 PM

On Tuesday evening, please join us from 5:00 to 7:00PM for a reception, held in conjunction with the Tuesday Poster Session and the Wireless Exhibition of wireless products and services. Immediately following the Reception, we will proceed to the Panel Session and Buffet Dinner – **CAD Software for Wireless Technology – Where Are We?**, hosted by Wolfgang J. R. Hofer of the University of Victoria, BC, Canada.

## Exhibition

**Radio and Wireless 2004** includes an expanded Wireless Exhibition featuring wireless products and services. Exhibition hours are Monday 5PM - 7PM in conjunction with the Welcome Reception, Tuesday 7AM - 7PM, with a Reception (in conjunction with the Poster Session) 5:00PM - 7PM and Wednesday 9AM - 3PM. For more information on availability of booth and table-top spaces, please contact Kristen Dednah at [horizonhouse.com](mailto:horizonhouse.com) or +1-781-769-9750.

P2.5  
**Comparative Performance of Hierarchical Cell Architectures**  
J. B. de Marca, T. T. Vinhoza, *PUC/Rio, Rio de Janeiro, Brazil*

P2.6  
**A Simple OFDM Diversity Receiver based on Antenna Combining**  
N. Aoyama, Y.-C. Yu, M. Suzuki, M. Okada, H. Yamamoto, *NAIST, Ikomu, Nara, Japan*

P2.7  
**An Efficient Software-based Implementation of a Joint-Detection/Spatial Processing Receiver for TD-SCDMA**  
P. Aberl, A. Gatherer\*, *Texas Instruments, Freising, Germany*,  
\*Texas Instruments, Dallas, TX, USA

P2.8  
**EVM Degradation in Edge Two Point Modulation Scheme due to Quantization Effects**  
G. Avitabile, N. Lofu, *Politecnico di Bari, Bari, Italy*

P2.9  
**Passive (Zero DC Power) Sensors Using RF Backscatter**  
S. Mukherjee, *Wireless Dynamics Inc., Palo Alto, CA, USA*

P2.10  
**Protocol Support for Audio Streaming between Bluetooth Devices**  
S. Zeadally, A. Kumar, *Wayne State University, Detroit, MI, USA*

P2.11  
**A CDMA Scheduling Protocol Based on Ants Algorithm for Wireless Multimedia Networks**  
Z.-Z. Li, Y.-S. Zhu, *Dalian Maritime University, Dalian, P.R. China*

P2.12  
**TCP/IP Throughout over an Outdoor Multi-Hop Wireless LAN**  
F. M. Aziz, B. D. Woerner, *Virginia Polytechnic Institute and State University, Blacksburg, VA, USA*

P2.13  
**Three-Frequency Principle for Automotive Radar System**  
H. Zhang, K. Wu, *Poly-GRAMES Research Center, Montreal, Canada*

P2.14  
**Design and Implementation of a Bluetooth Signal Strength Based Location Sensing System**  
U. Bandara<sup>1,2</sup>, M. Hasegawa<sup>1</sup>, M. Inoue<sup>1</sup>, H. Morikawa<sup>1,2</sup>, T. Aoyama<sup>2</sup>,  
<sup>1</sup>National Institute of Information and Communications Technology, Hikarino-ku, Yokosuka, Japan, <sup>2</sup>The University of Tokyo, Bunkyo-ku, Tokyo, Japan

P2.15  
**An Energy Adaptive Demodulation for High Data Rates with Impulse Radio**  
S. Paquelet<sup>1</sup>, L. Aubert<sup>1,2</sup>, <sup>1</sup>Mitsubishi Electric ITE, Rennes, France,  
<sup>2</sup>ETR-NSA, Rennes, France

P2.17  
**Dielectric Waveguide Structures with Surface – Control Impedance**  
S. S. Gogyan, K. Wu\*, *Inst. of Radio Physics & Electronics, Asharak-2, Armenia*, \*Ecole Polytechnique de Montreal, QC, Canada

P2.18  
**An IC Based Self-Oscillating Mixer for Telecommunications**  
M. Tofighi, A. Daryoush\*, *Drexel University, Philadelphia, USA*,  
\*Daryoush GEMS Inc., Bryn Mawr, PA, USA

P2.19  
**Two-Layer Elliptic Filters With Enhanced Bandwidth**  
R. Wu, S. Amari, *Royal Military College of Canada, Kingston, Canada*

P2.20  
**IC Based Broadband Digital Receiver for 4G Wireless Communications**  
L. Zhou, S. Shetty, R. Spring, H. Ariak, W. Zheng, J. Hyun, M. Tofighi, A. Daryoush, *Drexel University, Philadelphia, PA, USA*

P2.21  
**Novel Control Architecture for IPHEMT Power Amplifiers achieving High Efficiency EDGE Application**  
L. Albasha, J. C. Clifton, I. Stubbs, A. Lawrenson, A. Eaton, *Sony Semiconductors and Electronic Solutions, Basingstoke, Hampshire UK*

P2.22  
**Truly Balanced Step Recovery Diode Pulse Generator with Single Power Supply**  
P. Rulikowski, J. Barrett, *Cork Institute of Technology, Cork, Ireland*

P2.23  
**A MMIC Smart Power Amplifier with On-Chip Dynamic Bias Controller for WCDMA Mobile Communication**  
Y. H. Choi, K. Y. Kim, J. H. Kim, Y. S. Noh, C. S. Park, *Information and Communications University, Yuseong, Daejeon, Korea*

P2.24  
**Power Amplifier Linearization with Memory Effects Using Digital Pre-distortion and Genetic Algorithms**  
R. Sperlach, J. A. Sills\*, J. S. Kenney, *Georgia Institute of Technology, Atlanta, USA*, \*Khi Metrics Inc., Scottsdale, AZ, USA

P2.25  
**A Novel Bias Circuit and MMIC Power Amplifier Implementation for W-CDMA Mobile Handsets**  
Y. Noh<sup>1,2</sup>, J. Park<sup>2</sup>, C. Park<sup>2</sup>, *Information and Communications University (ICU), Daejeon, Korea*, <sup>2</sup>Electronics and Telecommunications Research Institute, Yusong, Daejeon, Korea

P2.26  
**Design and Analysis of a Low-power Constant Envelope Phase Shift Modulator**  
X. Yang, J. Lin, K. K. O, J. Brewer, *University of Florida, Gainesville, FL, USA*

P2.27  
**Performance Evaluation of 2D Rake Algorithms for WCDMA-DL Applications at the Handset**  
R. Mostafa, P. Khanna, W. Chung, J. Heo\*, J. H. Reed, D. S. Ha, *Virginia Polytechnic Inst. and State University, Blacksburg, USA*,  
\*Samsung Electronics, Suwon, Kyunggi, Korea

## Wednesday, September 22, 2004

**Session W1A 8:00 AM - 9:40 AM**  
**MIMO Communication: Handset Diversity and Implementation**  
Chair: Kapil Dandekar, *Drexel University*  
Co-Chair: Mary Ann Ingram, *Georgia Institute of Technology*

W1A.1 8:00 AM  
**Mobile Receive Diversity for cdma2000 (3G) Systems**  
S. Z. Asif, *Sprint, Overland Park, KS, USA*

W1A.2 8:20 AM  
**Non-Orthogonal Rate-2 Space Frequency Block Code on MIMO-OFDM Systems**  
J. Son, K. Kim, T. Reid, *Nokia Research Center, Irving, TX, USA*

W1A.3 8:40 AM  
**Direction-of-Transmission Estimation in Multiple-Input Single-Output Wireless Communication Systems**  
W. Lee, *University of Arkansas, Fayetteville, AR, USA*

W1A.4 9:00 AM  
**Design and Implementation of a Lattice Decoder for MIMO Systems**  
J. Ma, X. Huang, *University of New Orleans, New Orleans, LA, USA*

W1A.5 9:20 AM  
**A New Fast Sub-Optimum Search Method for Closed-Loop Transmit Diversity System with Limited Number of Feedback Bits**  
S. Ip, Z. Zhang, S. Cheung, T. Yuk, *The University of Hong Kong, Hong Kong, P.R. China*

**Session W1B 8:00 AM - 9:50 AM**  
**Wireless Channel and Signal Reception**  
Chair: Mehdi Shadaram, *University of Texas at San Antonio*  
Co-Chair: Mohammad Madhian, *NEC Laboratories America, Inc.*

W1B.1 8:00 AM  
**Antenna Selection with RF Pre-Processing: Robustness to RF and Selection Non-Idealities (invited)**  
P. Sudarshan, N. B. Mehta\*, A. F. Molisch\*, J. Zhang\*, *North Carolina State University (NCSU), Raleigh, NC, USA*, \*Mitsubishi Electric Research Labs, Cambridge, MA, USA

W1B.2 8:30 AM  
**Novel Mitigation Techniques for OFDM in a Doppler Spread Channel**  
P. Chayratsami, M. A. Wickert, *University of Colorado at Colorado Springs, Colorado Springs, CO, USA*

W1B.4 9:10 AM  
**Seasonal Variations in Path Loss in the 3.7 GHz Band**  
M. Batarie, T. K. Blankenship, J. Kepler, T. P. Krauss, *Motorola Labs, Schaumburg, IL, USA*

W1B.5 9:30 AM  
**Measurement-Based Modeling of a 5 GHz WLAN Transmitter**  
A. P. Webster, J. Liu\*, L. P. Dunleavy\*, H. Arslan\*, *Conexant Systems, Inc. Palm Bay, FL USA, University of South Florida, Tampa, FL, USA*

**Session W2A 10:00 AM – 12:00 PM**  
**Antennas for Wireless Communications**  
Chair: Wee Sang Park, *POSTECH*  
Co-Chair: Saieddin Safavi-Naeini, *University of Waterloo*

W2A.1 10:00 AM  
**Propagation Characteristics of International Space Station Wireless Local Area Network**  
S. U. Hwu, Y. Loh, C. C. Sham\*, *Lockheed Martin Space Operations, Houston, TX, USA*, \*NASA/JSC, Houston, TX, USA

W2A.2 10:20 AM  
**Throughput Improvement in Interference Limited Multipath Environments using a Ferroelectric Smart Antenna for IEEE 802.11b WLAN**  
M. Ahn, D. Kim, J. S. Kenney, *Georgia Institute of Technology, Atlanta, GA, USA*

W2A.3 10:40 AM  
Monopole Antenna Array Arrangement for Card-type Mobile Terminal  
Y. Okano, K. Cho, *University NTT DoCoMo, Inc., Yokosuka-shi, Japan*

W2A.4 11:00 AM  
Novel Very Small Dual-Band Chip-Size Antenna for Wireless Sensor Networks  
P. M. Mendes, M. Bartek\*, J. N. Burghartz\*, J. H. Correia, *University of Minho, Guimarães, Portugal*, \**Delft University of Technology, Delft, Netherlands*

W2A.5 11:20 AM  
A Compact Slot Antenna Array for Digital Beamforming and MIMO Applications  
S. Kim, Y. E. Wang, *University of California, Los Angeles, Los Angeles, CA, USA*

W2A.6 11:40 AM  
An Integrated Antenna for Pulse Modulation and Radiation  
W. Yao, Y. Wang, *University of California, Los Angeles, Los Angeles, CA, USA*

**Session W2B 10:00 AM – 11:50 AM**  
**Advanced RF Power Amplification and Signal Generation Techniques**

Chair: Earl McCune, *Tropian Inc.*  
Co-Chair: Jan-Erik Mueller, *Infineon Technology*

W2B.1 10:00 AM  
Status and Potential for CMOS Terminal PAs (invited)  
D. Leenaerts, G. Grillo, *Philips Research, Eindhoven, Netherlands*

W2B.2 10:30 AM  
A Linearized Doherty Amplifier Using Complex Baseband Digital Predistortion Driven by CDMA Signals  
O. Hammil, S. Bousnina, F. M. Gahnouchi, *Ecole Polytechnique Montreal, Montreal, QC, Canada*

W2B.3 10:50 AM  
Available Load Power in a RF Class D Amplifier with a Sigma-Delta Modulator Driver  
T. E. Johnson, S. Stapleton, *Simon Fraser University, Burnaby, BC, Canada*

W2B.4 11:10 AM  
Phase Noise Measurement of Free-Running VCO Using Spectrum Analyzer  
C. Yuen, K. Tsang, *City University of Hong Kong, Hong Kong, P.R. China*

W2B.5 11:30 AM  
Low-Cost RF and Microwave Source Design Using Substrate Integrated Waveguide Technique  
J. F. Mojica, C. Cassivi, K. Wu, *Poly-Grames Research Center École Polytechnique de Montréal, Montréal, QC, Canada*

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Lunch 12:00 PM - 1:00 PM

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**Session W3A 1:00 PM - 2:50 PM**  
**Broadband Sensor Network Applications**  
Chair: Linus Maurer, *DICE GmbH & CoKG, Austria*  
Co-Chair: Clemens Ruppel, *EPCOS*

W3A.1 1:00 PM  
Self Organization of Wireless Sensor Networks Using Ultra-Wideband Radios (invited)  
F. Nekoogar, F. Dowl, A. Spiridon, *Lawrence Livermore National Laboratory, Livermore, CA, USA*

W3A.2 1:30 PM  
A Method for Distributed Medium Access in Ultra Wideband Ad Hoc and Sensor Networks  
N. J. August, H. Lee, D. S. Ha, *Virginia Tech, Blacksburg, VA, USA*

W3A.3 1:50 PM  
UWB Positioning for Wireless Embedded Networks  
K. Yu, I. Oppermann, *University of Oulu, Oulu, Finland*

W3A.4 2:10 PM  
An Adaptive Load Balancing in Multi-hop Mesh Networks for Broadband Fixed Wireless Access Systems  
T. Kitahara, Y. Kishi, Y. Imagawa, K. Tabata, S. Nomoto, A. Idoue, *KDDI R&D Laboratories, Inc., Kamifukuoka, Japan*

W3A.5 2:30 PM  
Average Synchronization Time in DSSS Sensor Array Networks  
R. E. Ziemer, M. A. Wickert, *University of Colorado at Colorado Springs, Colorado Springs, CO, USA*

**Session W3B 1:00 PM - 2:50 PM**  
**RF Building Blocks for Wireless Communication Terminals**  
Chair: Herbert Zirath, *Chalmers University of Technology*  
Co-Chair: Kenjiro Nishikawa, *NTT*

W3B.1 1:00 PM  
Overview of the Evolution in PLL Synthesizers Used in Mobile Terminals (invited)  
K. Itoh, M. Uesugi, S. Murakami, H. Joba, *Mitsubishi Electric, Amagasaki, Hyogo, Japan*

W3B.2 1:30 PM  
A 2.4GHz Fully CMOS RF Transceiver for 802.11b Wireless LAN Application  
W. Kong, C. Ye\*, H. Lin, *University of Maryland at College Park, College Park, MD, USA*, \**Maryland Semiconductor Inc., Clarksburg, MD, USA*

W3B.3 1:50 PM  
Linearity Analysis of SiGe HBT Amplifiers Using a Power-Dependent Coefficient Volterra Technique  
J. Deng, P. Gudem, L. E. Larson, *University UC, San Diego, La Jolla, CA, USA*

W3B.4 2:10 PM  
A 3.3V Operation Single HBT MMIC Power Amplifier For 2.4GHz/5GHz Dual-Band WLAN Applications  
Y. Noh<sup>1,2</sup>, J. Kim<sup>1</sup>, J. Park<sup>2</sup>, C. Park<sup>1</sup>, *Information and Communications University (ICU), Daejeon, Korea*, <sup>2</sup>*Electronics and Telecommunications Research Institute, Yusong, Daejeon, Korea*

W3B.5 2:30 PM  
High Dynamic Range Transient Simulation of Microwave Circuits  
S. Luniya, M. B. Steer, C. Christoffersen\*, *North Carolina State University, Raleigh, NC, USA*, \**Lakehead University, Thunder Bay, ON, Canada*

**Session W4A 3:00 PM - 4:40 PM**  
**CDMA for Wireless Systems**  
Chair: George Heiter, *Heiter Microwave Consulting*  
Co-Chair: Xiaodong Wang, *Columbia University*

W4A.1 3:00 PM  
Performance of Multicode DS/CDMA with Noncoherent M-ary Orthogonal Modulation subject to Power Amplifier Nonlinear Distortion  
C. D. Iskander, *Florida Atlantic University, Boca Raton, FL, USA*

W4A.2 3:20 PM  
Simulation Results for the Impact of Users' Locations and Distribution Characteristics on the Performance of Downlink WCDMA/TDD in Fading Channels  
M. H. Ismail, M. M. Matalgah, *The University of Mississippi, University, MS, USA*

W4A.3 3:40 PM  
A Split Band Duplexer for PCS CDMA Mobile Phones  
C. Block, T. Keiler, *EPCOS OHG, Deutschlandsberg, Austria*

W4A.4 4:00 PM  
Reduction of Cochannel Interference on the Forward Link CDMA Systems  
M. A. Salam, M. M. Al-Khatib, *University of South Alabama, Mobile, AL, USA*

W4A.5 4:20 PM  
An Alternative Multi-tone Representation of Complex Signals for Feedforward Systems  
A. H. Coskun, A. Mutlu, S. Demir\*, *ASELSAN Electronics Ind., Ankara, Turkey*, \**Middle East Tech Univ, Ankara, Turkey*

**Session W4B 3:00 PM - 4:50 PM**  
**UWB and Soft Radio Technologies**  
Chair: Zhi Ning Chen, *Institute for Infocomm Research (IIR)*  
Co-Chair: Hauping Liu, *Oregon State University*

W4B.1 3:00 PM  
An Efficient Multipath Channel Model for UWB Home Networking (invited)  
Z. Chen, R. Yao, Z. Guo, *Microsoft Research Asia, Beijing, P. R. China*

W4B.2 3:30 PM  
An Empirical Study of Electromagnetic Interference Caused by Ultrawideband Transmissions in an IEEE 802.11a Wireless Local Area Network  
J. Lopez, R. A. Raines, M. A. Temple, R. O. Baldwin, J. P. Stephens\*, *Air Force Institute of Technology, Wright Patterson AFB, USA*, \**Air Force Research Laboratory, Wright Patterson AFB, OH, USA*

W4B.3 3:50 PM  
Multimode Detector and IQ Imbalance Compensator in a Software Defined Radio  
P. Rykaczewski, I. Martoyo, Z. Liu, F. K. Jondral, *University of Karlsruhe, Karlsruhe, Germany*

W4B.4 4:10 PM  
HW accelerated Ultra Wide Band MAC protocol using SDL and SystemC  
M. Haroud, L. Blazevic, A. Biere\*, *STMicroelectronics, Plan-les-ouates, Switzerland*, \**Swiss Federal Institute of Technology, Zurich, Switzerland*

W4B.5 4:30 PM  
Design and Implementation of a Multirate Sub-sampling Front-end in Software Radio Systems  
M. R. Yuce, W. Liu\*, *NC State University, Raleigh, USA*, \**University of California at Santa Cruz, Santa Cruz, CA, USA*



## at a Glance

**Sunday, 19 September 2004**

*Sunday registration ends at 6 PM*

9 AM - 6 PM	Registration
9 AM - 10 AM	Coffee Break
10 AM - 5:30 PM	Workshops: <b>WS1:</b> UWB Technology: Components, Systems and Architectures <b>WS2:</b> MIMO Implementation Aspects <b>WS3:</b> Frequency Agile and Software Defined Radio

**Monday, 20 September 2004**

*Monday registration ends at 6 PM*

7 AM - 6 PM	Registration
7 AM - 8 AM	Workshop Breakfast
8 AM - 12 PM	Workshops <b>WM1:</b> Front End Opto-Electronics for Future Radio Communications <b>WM2:</b> Wireless Systems – Devices, Systems, and Applications <b>WM3:</b> Advances in RF and High-Speed System Integration

12 PM - 1 PM	Workshop Lunch
1 PM - 5 PM	Technical Sessions
5 PM - 7 PM	Exhibition
5 PM - 7 PM	Poster Session and Reception
7 PM - 9 PM	Banquet
8:15 PM	Banquet Address: <i>Distributed Collaborative Adaptive Sensing for Hazardous Weather Detection, Tracking, and Predicting</i>

**Tuesday, 21 September 2004**

*Tuesday registration ends at 6 PM*

7 AM - 6 PM	Registration
7 AM - 7 PM	Exhibition
7 AM - 8 AM	Breakfast
8 AM - Noon	Technical Sessions
12 PM - 1 PM	Lunch
1 PM - 5 PM	Technical Sessions
5 PM - 7 PM	Poster Session, Reception
7 PM - 9 PM	Buffet Dinner and Panel Session: <i>CAD Software for Wireless Technology – Where Are We?</i>

**Wednesday, 22 September 2004**

*Wednesday registration ends at 3 PM*

7 AM - 3 PM	Registration
7 AM - 8 AM	Breakfast
9 AM - 3 PM	Exhibition
8 AM - Noon	Technical Sessions
12 PM - 1 PM	Lunch
1 PM - 5 PM	Technical Sessions

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## Sunday Workshops

### WORKSHOP WS1: UWB TECHNOLOGY: COMPONENTS, SYSTEMS AND ARCHITECTURES

Sunday, September 19, 2004  
10:00 AM – 5:30 PM

Organizer: Zhi Ning Chen, *Institute for Infocomm Research, Singapore*

**Speakers:**

Robert J. Fontana, *Multispectral Solutions, Inc.*  
Ahmed H. Tewfik, *University of Minnesota*  
Robert A. Scholtz, *University of Southern California*  
Naiel K. Askar, *General Atomics*  
Huseyin Arslan, *University of South Florida*  
Ian Oppermann, *University of Oulu, Finland*  
Won Namgoong, *University of Southern California*  
Thomas Kaiser, *University of Duisburg-Essen, Germany*  
M. Y. W. Chia, *Institute for Infocomm Research, Singapore*  
Zhi Ning Chen, *Institute for Infocomm Research, Singapore*

The new allocation of extremely wide frequency ranges has greatly promoted the applications of Ultra Wideband (UWB) technology in wireless/wired communications. The transmission of digital data at very high rates and with very low power over a very wide frequency band will raise many issues in UWB systems. The workshop at RAWCON 2003 discussed more issues pertaining to standards, which was successfully attractive to many participants from both industry and academia. This workshop will highlight the advances in the research and development related to UWB components, systems and architectures. The distinguished speakers in the area will share their in-depth understanding of emerging UWB technology with you.

### WORKSHOP WS2: MIMO IMPLEMENTATION ASPECTS

Sunday, September 19, 2004  
10:00 AM – 5:30 PM

Organizer: Thomas Kaiser, *University of Duisburg-Essen, Germany*

**Speakers:**

Tom Kraus and Frederick W. Vook, *Motorola Labs*  
S. Haene, *ETH Zürich, Switzerland*  
Mary Ann Ingram, *Georgia Tech*  
Matthias Stege, *Signalion, Germany*  
Daniel Borkowski, *RWTH Aachen, Germany*  
Steve Ellingson, *Virginia Tech*  
Andreas Wilzeck, *Uni Duisburg-Essen, Germany*  
Jürgen Rinas, *University of Bremen, Germany*  
Steffen Paul, *Infineon Technologies, Germany*  
Ernst Aschbacher, *Vienna University of Technology, Austria*  
Nam-kyu Ryu, *Hanyang University, Korea*  
Ramón Martínez Rodríguez-Osorio, *Universidad Politécnica de Madrid, Spain*  
Ludwig Schwörer, *Nokia, Germany*

MIMO techniques have emerged as a key technology for third and higher generations of wireless communication systems because they add a new spatial dimension to the currently used time, frequency, and code multiple access technologies. MIMO techniques offer an elegant and relatively inexpensive opportunity of increasing system capacity, number of users served, and quality of service. Today developments and progress in this strategic area are away from cost efficient practical implementation. Distinguished speakers will cover a multitude of typical applications, from smart antennas and MIMO techniques for CDMA based cellular networks to multi-antenna techniques for wireless local area networks.

### WORKSHOP WS3: FREQUENCY AGILE AND SOFTWARE DEFINED RADIO

Sunday, September 19, 2004  
10:00 AM – 5:30 PM

Organizers: Robert Weigel, *University Erlangen, Germany*  
Clemens Ruppel, *EPCOS AG, Germany*  
Linus Maurer, *DICE GmbH & CoKG, Austria*  
Georg Fischer, *Lucent Bell Labs Europe, Germany*

**Speakers:**

Thomas Müller, *DaimlerChrysler, Germany*  
Patrick Scheele, *Technische Universität Darmstadt, Germany*  
Jörg Brakensiek, *Nokia, Germany*  
Linus Maurer, *DICE, Linz, Austria*  
Clemens Ruppel, *EPCOS, Germany*  
Patrick Morgan, *Silicon Laboratories*  
Kenneth O, *University of Florida*  
Geoff Dawe, *BitWave Semiconductor*

Interest in reconfigurability with terminals and also whole networks is significantly rising. Various research projects look at reconfigurability from an end to end perspective of a communication link, with baseband signal processing part as well as the RF part of a communication device. The workshop therefore addresses aspect of reconfigurability with RF through offering frequency agility with the radio and with baseband processing through reconfigurable digital signal processing. Frequency agility is therefore understood as one aspect of a general view on software radio to realize Multimode devices that are Multistandard and Multiband capable. A great challenge with reconfigurable devices is the optimization for the right balance between analog and digital signal processing and how imperfections of the hardware are compensated. The level of reconfigurability further depends on the tuneability of the used materials, the components and the architectural choices made. For cost efficient implementations of reconfigurable devices, integration techniques play a key role.

## Monday Morning Workshops

### WORKSHOP WM1: FRONT END OPTO-ELECTRONICS FOR FUTURE RADIO COMMUNICATIONS

Monday, September 20, 2004  
8:00 AM – 12:00 PM

Organizer: Afshin S. Daryoush, *Drexel University*

**Speakers:**

A. Nirmalathas, *University of Melbourne, Australia*  
K. Kitayama, *Osaka University, Japan*  
T. Nagatsuma, *NTT, Japan*  
Tibor Berceci, *Budapest University of Technology and Economics, Hungary*  
Hiroyo Ogawa, *Communication Research Laboratory, Japan*  
M. Ali Khatibzadeh, *Anadigics, Inc.*

Future wireless communications are being pushed to broadband communications with rates well above Gb/s. Millimeter wave access systems require innovation in optical and electronic hardware as part of the front end subsystems. This workshop addresses system architectures and performance of the front end optoelectronics that could meet information throughput of well above Gb/s. Topics include: fiber-wireless networks, millimeter-wave radio-on-fiber systems, over 100 GHz mm-wave technologies for 10 Gbit/s wireless links, 24 GHz UWB radar, and front-end RF module integration trends in wireless mobile terminals.

### WORKSHOP WM2: WIRELESS SENSORS – DEVICES, SYSTEMS, AND APPLICATIONS

Monday, September 20, 2004  
8:00 AM – 12:00 PM

Organizers: Olga Boric-Lubecke and Victor Lubecke, *University of Hawaii at Manoa*

**Speakers:**

Amy Droitcour, *Stanford University*  
Sokwoo Rhee, *Millennial Net, Inc.*  
Carsten Mundt, *Stanford University*  
Robert Weikle, *University of Virginia*

Wireless sensors offer the advantage of minimizing physical constraints on the monitored environment and thus enable various embedded applications where conventional monitoring is not possible or desirable. On the other hand, wireless sensors must meet the challenges of compact size, low power consumption, and limited bandwidth. This workshop will address the issues of using wireless devices in physiological monitoring, including design constraints on single-chip Doppler radars, minimizing power consumption in wireless sensor networks, Bluetooth enabled wearable sensors, and development of millimeter wave components that will enable use of that part of the spectrum for future wireless networks.

### WORKSHOP WM3: ADVANCES IN RF AND HIGH-SPEED SYSTEM INTEGRATION

Monday, September 20, 2004  
8:00 AM – 12:00 PM

Organizers: Joy Laskar, Kyutae Lim, and Sudipto Chakraborty, *Georgia Institute of Technology*

**Speakers:**

Modest M. Oprysko, *IBM*  
Udy A. Srivastava, *Intel*  
Chang-Ho Lee, *Georgia Institute of Technology*  
Manos Tantzaris, *Georgia Institute of Technology*

This workshop focuses on advanced circuits and packaging technologies for high data rate mixed signal communication front-ends. The subtopics include development of millimeterwave integrated circuits in silicon, packaging technologies for densely integrated mixed signal products, circuits/systems codesign for front-end communication modules, vertical integration aspects of the integrated module for small form factor implementation, along with the development of power amplifier module. This workshop covers all aspects of advanced developments on circuits and systems for mixed signal systems.

## Tuesday Panel Session

### Panel Session 7:00 PM - 9:00 PM CAD Software for Wireless Technology – Where Are We?

Tuesday, September 21, 2004

Mediator: Wolfgang J. R. Hoefler, *University of Victoria, BC, Canada*

#### Panel Speakers

James Rautio, *Sonnet Software*

Steve Maas, *Applied Wave Research*

Zoltan Cendes, *Ansoft*

Jian-X. Zheng, *Zeland Software and AC Microwave*

Todd Cutler, *Eagleware*

Chris Mueth, *Agilent EEsof*

With ever-increasing speed and bandwidth of RF and microwave circuits and systems, wireless research and development heavily rely on advanced CAD and modeling. Today, the widespread popularity and applications of commercial software packages in support of circuit and system designs have fundamentally changed the landscape of our RF and microwave wireless industry in connection with both analog and digital worlds.

This panel consists of distinguished software experts and developers who will present a wide array of viewpoints regarding the use of existing software packages in the market. Various design issues will be discussed ranging from analog RF front-ends to digital base-band circuits. State-of-the-art components and system design tools will be highlighted with regards to simulation accuracy and speed, optimization, and application range. Emerging CAD platforms and future trends will also be shown.

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Chair: Prof. Robert Heath, *The University of Texas at Austin*

Dr. Anand Dabak, *Texas Instruments Inc.*

Prof. Kapil Dandekar, *Drexel University*

Prof. Mary Ann Ingram, *Georgia Institute of Technology*

Prof. Youjian Liu, *University of Colorado at Boulder*

Dr. David Love, *The University of Texas at Austin*

Dr. Jeff Zhuang, *Motorola Labs Inc.*

### Area 2) Wireless Communication Systems

Chair: Prof. Geoffrey Li, *Georgia Institute of Technology*

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Prof. Thomas Kaiser, *Universitaet Duisburg-Essen*

Dr. Ben Lu, *NEC Laboratories America, Inc.*

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### Area 3) Wireless Sensors / Ad Hoc Networks

Chair: Prof. Robert Weigel, *University of Erlangen-Nuremberg*

Dr. Norbert Geng, *Siemens*

Dr. Victor Kalinin, *Transense Technologies*

Prof. Joy Laskar, *Georgia Institute of Technology*

Prof. Sanjay Raman, *Virginia Tech*

Dr. Clemens Ruppel, *EPCOS*

Dr. Aimin Sang, *NEC Laboratories America, Inc.*

Prof. Mehdi Shadaram, *University of Texas at San Antonio*

### Area 4) Emerging Technologies

Chair: Dr. Richard Yao, *Microsoft Research*

Dr. Michael Buehrer, *Virginia Tech*

Dr. Zhi Ning Chen, *Institute for Infocomm Research*

Dr. Zihua Guo, *Microsoft Research Asia*

Dr. Jin-Meng Ho, *Texas Instruments Inc.*

Dr. Joe Huang, *Flarion Technology*

Prof. Erik G. Larsson, *The George Washington University*

Prof. Huaping Liu, *Oregon State University*

### Area 5) Front-End Electronics & Antennas

Chair: Prof. Afshin Daryoush, *Drexel University*

Dr. John Bojarski, *US Army, CECOM*

Dr. Edmar Camargo, *Fujitsu*

Prof. Aly Fathy, *The University of Tennessee*

Dr. Ahmad Khanifar, *Powerwave Technologies*

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Dr. Harris Moyer, *HRL*

Dr. Takashi Ohira, *ATR Adaptive Communications*

Prof. Weesang Park, *Pohang University of Science and Technology*

Prof. Safieddin Safavi-Naeini, *University of Waterloo*

Dr. Ralf Tempel, *ATMEL*

Dr. Xiangdong Zhang, *Communicant Semiconductor Technologies*

### Area 6) Signal Generation/Power Amplification

Chair: Dr. Jan-Erik Mueller, *Infineon Technologies*

Dr. Genevieve Baudoin, *ESYCOM - ESIEE*

Dr. Andre van Bezooijen, *Philips*

Prof. Giorgio Leuzzi, *University of L'Aquila*

Dr. Earl McCune, *Tropian*

Prof. Chul Soon Park, *Information and Communications University*

Dr. Joel Vuolevi, *RFIC*

### Area 7) RF/Analog IC's for Wireless Comm.

Chair: Dr. Noriharu Suematsu, *Mitsubishi Electric Corporation*

Prof. Masami Akaike, *Science University of Tokyo*

Dr. Norman Chiang, *Teledyne Technologies*

Prof. Lawrence Larson, *University of California, San Diego*

Dr. Kenjiro Nishikawa, *NTT*

Dr. Satoshi Tanaka, *Hitachi, Ltd.*

Prof. Herbert Zirath, *Chalmers University of Technology*

## MESSAGE FROM THE GENERAL CHAIRS

**R**The IEEE Radio and Wireless Conference (RAWCON) has always focused on the intersection between radio systems and wireless technology, which creates a unique forum for engineers to discuss the state-of-the-art in the field and to explore connections between hardware design and system performance. This year, we continue this tradition with an expanded program offering the latest information on our traditional subjects of cellular communications, wireless LAN, and their associated enabling technologies. In addition, we have added several subjects to our technical program: MIMO antenna systems and technologies, wireless sensor networks, ultra-wideband (UWB) systems and technologies, and software-defined radio systems. Over 130 papers presented in 17 technical sessions and 2 interactive sessions were selected from a record number of 250 submissions this year. Of course none of this would be possible without the volunteer effort of our Technical Program Committee Co-Chairs, Mohammad Madhian and Xiaodong Wang and the TPC members who supported them.

To accommodate the expanded technical program, the dual-track format that began in 2003 will be expanded to occur on both Tuesday and Wednesday. For the first year, we will be supplying the Proceedings on CD-ROM, as well as our traditional printed copy. The dedication of our Publications Chair, George Heiter, and the electronic manuscript submission system, developed and administered by Jeff Pond, added greatly to our success in putting together these publications.

In addition to our technical program, we have expanded the workshop offerings to six, coordinated by Jenshan Lin. The topics are reflective of those in the technical sessions, but will be presented in an informal format, offering increased opportunities for exchange between the speakers and audience. The Keynote Address, by Al Javad of Nortel Networks will discuss the impact of 3rd generation wireless networks and their evolution toward wireless broadband networks. The Monday night Banquet will feature an address by Prof. David McLaughlin, Director of the NSF Center for Collaborative Adaptive Sensing of the Atmosphere at the University of Massachusetts at Amherst. Finally, our Panel Session, chaired by Prof. Wolfgang Hoefer, promises a lively exchange between panelists from the CAD industry as they discuss integration of these tools as it applies to wireless system design.

Another conscious change for 2004 is the expansion of the Wireless Exhibition. This year, the exhibits are being managed by Horizon House (<http://www.horizonhouse.com>), the same company that runs the exhibition for the International Microwave Symposium (IMS) and the European Microwave Conference (EuMC).

As always, your feedback is greatly appreciated that will help us chart the future of RAWCON. In closing, the General Co-Chairs wish to thank you for your support and attendance of RAWCON 2004 here in Atlanta!

J. Stevenson Kenney and Ke Wu, General Co-Chairs

