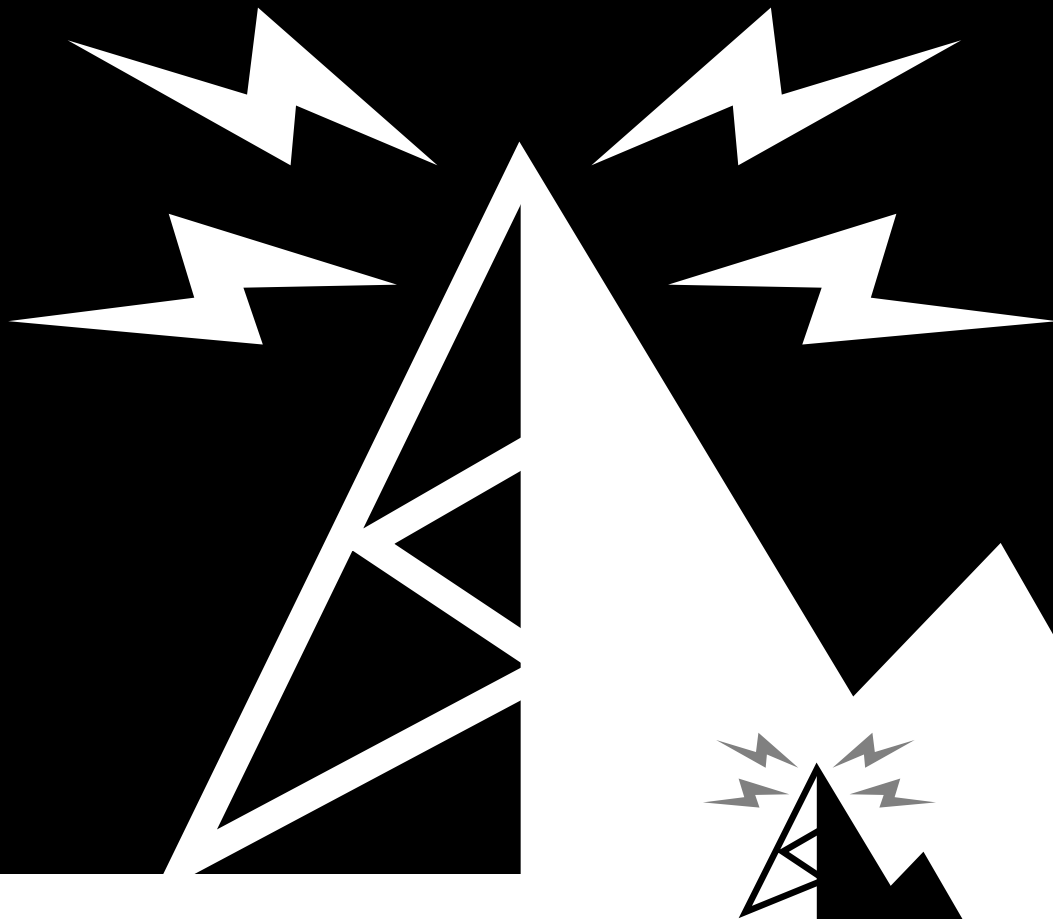


FINAL PROGRAM



# RAWCON 2000

2000 IEEE Radio and  
Wireless Conference

Denver Marriott Southeast  
Denver, Colorado, USA  
September 10-13, 2000

<http://rawcon.org>

*RAWCON2000 Co-Sponsors*  
IEEE Microwave Theory and  
Techniques Society (MTT-S)  
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*RAWCON2000 Technical Co-Sponsors*  
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Institute for  
Telecommunications Sciences

*RAWCON2000 Media Co-Sponsors*  
Applied Microwave & Wireless  
RCR Wireless

*General Chair:*

Dr. Michael S. Heutmaker, *Lucent Technologies, Princeton, NJ, USA*

*Technical Program Chair:*

Dr. Kari-Pekka Estola, *Nokia Research Laboratories, Helsinki, Finland*





## 2000 IEEE Radio and Wireless Conference

MONDAY, SEPTEMBER 11, 2000

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13:00-13:20

Opening Remarks

Michael S. Heutmaker, *Lucent Technologies, General Chair*

Kari-Pekka Estola, *Nokia Research Center, Technical Program Chair*

13:20-13:50

Keynote Address

Technologies and Systems for Fourth Generation Mobile Wireless Systems  
Al Javed, *Vice President and Chief Engineer, Wireless; Chief Technology Officer, Access Networks, Nortel Networks, Nepean, Ontario, Canada*

13:50-15:30

Session M1

Wireless Systems

Chair: Kari-Pekka Estola, *Nokia Research Center*

13:50

Evolving the Capabilities of IS-2000: An Overview of 1XTREME (invited)  
George Fry, Giridhar Mandyam, *Nokia, Dallas, TX, USA*

### Poster/Exhibition Reception and Banquet

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Monday, September 11, 2000

On Monday evening, please join us from 5:30 to 7:00 pm for a welcome reception, held in conjunction with the Monday Poster Session and the opening of the RAWCON2000 Exhibition of wireless products and services. At 7:00 pm we will proceed to the RAWCON2000 Banquet, followed by the Panel Session "Education, Research, and the Wireless Industry" at 8:30 pm.

14:20

Design Efficiencies for Indoor Wireless (invited)  
Theodore S. Rappaport, *Virginia Polytechnic University, Blacksburg, VA, USA*

14:50

Design and Implementation of a Completely Reconfigurable Soft Radio  
Srikathyayani Srikanteswara, Michael Hosemann, Jeffrey H. Reed, Peter M. Athanas, *Virginia Polytechnic University, Blacksburg, VA, USA*

15:10

A Study of Wireless Access Networks Architecture Using Multi-Level Modulation Methods  
Masahiro Nishi, Hitomi Teraoka, Teruaki Yoshida, *Hiroshima City University, Hiroshima, Japan*

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BREAK 15:30 - 16:00

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16:00 - 17:10

Session M2

Systems, Antennas, and Signal Processing  
Chair: Tim Brown, *University of Colorado*

16:00

Steerable Antennas for Base Stations (invited)  
Theodore Sizer, *Lucent Technologies, Crawford Hill, NJ, USA*

16:30

New Cellular Wireless System Concept for Very High Bit Rate Data Transmission With Smart Antennas at the Mobile and Base Station  
Adrian Boukalov, Seppo J. Halme, Ren Aifeng, *Helsinki University of Technology, Helsinki, Finland*

16:50

A Code Tracking Technique for Direct Sequence Spread Spectrum Using Adaptive Filtering  
Michael Hosemann, Srikathyayani Srikanteswara, Jeffrey H. Reed, *Virginia Polytechnic University, Blacksburg, VA, USA*

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BREAK 17:10 - 17:30

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17:30 - 19:00

M3 Monday Poster Session

Chair: Mark Wickert, *University of Colorado at Colorado Springs*

System Architecture Posters

M3.1

Introducing Novel FDD and FDM in MC-CDMA to Enhance Performance  
Balasubramaniam Natarajan, Carl R. Nassar, *Colorado State University, Fort Collins, CO, USA*

M3.2

A New Wireless Network for 5 GHz License Exempt Applications  
John Sydor, Alain Dugas, Jason Duggan, *Communications Research Centre, Ottawa, Ontario, Canada*

M3.3

New Transceiver Design Approaches for Digital Microwave Radios  
Mina Danesh, N. Hassaine, A. Rich, F. Concilio, *Harris Corporation, Dollard-des-Ormeaux, Quebec, Canada*

M3.4

Mesh Networks: A New Architecture for Broadband Wireless Access Systems  
Philip Whitehead, *Radiant Networks PLC, Essex, UK*

System Performance Posters

M3.5

IC-Friendly Line Codes for Direct-Conversion Receivers  
Dongling Pan, John T. Stonick, *Oregon State University, Corvallis, OR, USA*

M3.6

Performance of M-QAM with Nonlinear Transmit Amplifiers in Fading Channels  
George Chrisikos, Moe Z. Win, *AT&T Labs, Red Bank, NJ, USA*

M3.7

Analysis of Wideband Measurement Data to Assess and Predict System Performance for IMT2000 Systems  
Nikhil Adnani, R. J. C. Bultitude, *Communications Research Centre, Ottawa, Canada*

Antenna and Propagation Posters

M3.8

FEM-Based Hybrid Methods for the Analysis of Antennas on Electrically Large Structures  
Dong-Ho Han, Anastasis C. Polycarpou, Constantine A. Balanis, *Arizona State University, Tempe, AZ, USA*

M3.9

Planar Rectennas for 2.45 GHz Wireless Power Transfer  
Jouko Heikkinen, Pekka Salonen, Markku Kivikoski, *Tampere University of Technology, Tampere, Finland*

M3.10

A Broadband 64-Element 2-D Quasi-Yagi Antenna Array  
Kevin M. K. H. Leong, James Sor, William R. Deal, Yongxi Qian, Tatsuo Itoh, *University of California, Los Angeles, CA, USA*

M3.11

Automatic Phase Alignment for High Bandwidth Cartesian Feedback Power Amplifiers  
Joel L. Dawson, Thomas H. Lee, *Stanford University, Stanford, CA, USA*

## TUESDAY, SEPTEMBER 12, 2000

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8:00 - 9:20

Session T1  
System Performance: Applications  
Chair: Robert Achatz, *Institute for Telecommunications Sciences*

8:00

Busy Tone Access Control Using Low Power Non-License Radio for Wireless Infrared CATV System  
Shinya Masumura, Yuichi Tanaka, Masao Nakagawa, *Keio University, Kanagawa, Japan*

8:20

Orthogonal Frequency Division Multiplexing in Wireless Communication Systems with Multimode Fibre Feeds  
Bryn J. Dixon, Roger D. Pollard, Stavros Iezekiel, *The University of Leeds, Leeds, UK*

8:40

Optimizing Frequency Re-use in Point-to-Multipoint Deployments  
Dieter Scherer, Lucent Technologies, *Milpitas, CA, USA*

9:00

*Withdrawn*

9:20

Protocol Module of Wireless Data System Dedicated to Medical Care  
Gen Fujita, Kenji Matsumura, Makoto Furuie, Isao Shirakawa, Hiroshi Inada, *Osaka University, Osaka, Japan*

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BREAK 9:40 - 10:10

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10:10 - 12:00 Noon

Session T2  
System Performance and Optimization  
Chair: Peter Staecker

10:10

System Implication of Heat in Wireless High-Speed Data Networks (invited)  
Earl McCune, Tropian, Inc., *Cupertino, CA, USA*

10:40

Impact of Front-End Non-Idealities on Bit Error Rate Performances of WLAN-OFDM Transceivers  
B. Come, R. Ness, S. Donnay, L. Van der Perre, W. Eberle, P. Wambacq, M. Engels and I. Bolsens, *IMEC-DESICS, Heverlee, Belgium*

11:00

System Performance Evaluation of Packet Data Transfer in UTRA-FDD Standard  
Paolo Gorla, Davide Sorbara, *CSELT, Turin, Italy*

11:20

Effect of Various Threshold Settings on Soft Handoff Algorithm Performance  
Sung Jin Hong, I-Tai Lu, *Polytechnic University, Brooklyn, NY, USA*

11:40

MMSE Frequency Combining for CI/DS-CDMA  
Zhiqiang Wu, Carl R. Nassar, *Colorado State University, Fort Collins, CO, USA*

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LUNCH 12:00 Noon - 13:20

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13:20 - 14:40

Session T3  
Propagation  
Chair: Donn Harvey, *Metawave Communications Corp.*

13:20

A More Accurate Method to Define Exclusion Zones  
Christof Olivier, Luc Martens, *Ghent University, Ghent, Belgium*

13:40

A Random-Phase-Assisted Ray-Tracing Model and Its Verification with a Spatio-Temporal Channel Measurement in a Suburban Micro-Cellular Environment  
Houtao Zhu, Jiye Fu, Jun-ichi Takada, Kiyomichi Araki, *Tokyo Institute of Technology, Tokyo, Japan*; Hironari Masui, Masanori Ishii, Kozo Sakawa, Hiroyuki Shimizu, Takehiko Kobayashi, *YRP Key Technology Research Laboratories, Yokosuka, Japan*

14:00

Modeling and Analysis of Time Varying Radio Propagation Channel for LMDS  
P. Soma, Y. W. M. Chia, L. C. Ong, *National University of Singapore, Republic of Singapore*

14:20

Propagation Models at 5.8 GHz - Path Loss & Building Penetration  
Thomas Schwengler, Mike Gilbert, *U S WEST Advanced Technologies, Boulder, CO, USA*

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BREAK 14:40 - 15:10

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15:10 - 16:30

Session T4  
Antennas  
Chair: Jerry Grimm, *Nokia*

15:10

Kalman Filter Applied to GSC in Adaptive Antennas Array  
Fabio A. L. Gomes, Adriaio Duarte D. Neto, Aldayr D. de Araujo, *Universidade Federal do Rio Grande do Norte, Logoa Nova, Brasil*

15:30

Analysis of Reflector Antennas Including Higher-Order Interactions  
Dong-Ho Han, Anastasis C. Polycarpou, Constantine A. Balanis, *Arizona State University, Tempe, AZ, USA*

15:50

Implementation of a Real-Time, Frequency Selective, RF Channel Simulator Using a Hybrid DSP-FPGA Architecture  
Jeff R. Papenfuss, Omnipoint Technologies Inc., *Colorado Springs, CO, USA*; Mark A. Wickert, *University of Colorado at Colorado Springs, Colorado Springs, CO, USA*

16:10

Recent Results from Smart Antenna Experiments - Base Station and Handheld Terminals  
W. L. Stutzman, J. H. Reed, C. B. Dietrich, B-K Kim, D. G. Sweeney, *Virginia Tech, Blacksburg, VA, USA*

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BREAK 16:30 - 17:30

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17:30 - 19:00

T5 Tuesday Poster Session  
Chair: Bernard Geller, *Sarnoff Corp.*

T5.1

Large-Signal Scattering Parameter Measurements for RF Power Transistors  
John B. Call, William A. Davis, *Motorola, Tempe, AZ, USA*

T5.2

RF Frequency Properties of a Reverse Biased Thick Switching PIN-Diode  
Lioudmila Drozdovskaia, *Villanova University, Villanova, PA, USA*

T5.3

High Power Effects on Gallium Nitride-Based Microwave and RF Control Devices  
Robert H. Caverly, Nikolai Drozdovski, Michael Quinn, *Villanova University, Villanova, PA, USA*

T5.4

Design of Tuning Bandwidth and Linearity for VCO by Mathematical Solution and Computer Method  
Tseng-Chuan Wang, *Industrial Technology Research Institute (ITRI), Hsinchu, Taiwan*

T5.5

A New Pinched-Off Cold-FET Method to Extract Parasitic Capacitances of MESFETs and HEMTs  
Yeong-Lin Lai, Kuo-Hua Hsu, *Feng Chia University, Taichung, Taiwan, R.O.C.*

T5.6

0.24-um CMOS Technology for Bluetooth Power Application  
Yi-Jan Emery Chen, D. Heo, M. Hamai, J. Laskar, *Georgia Institute of Technology, Atlanta, GA, USA*; D. Bien, *National Semiconductor Corporation, Tucson, AZ, USA*

T5.7

Design and Characterization of CPW Feedthroughs in Multi-Layer Thin-Film MCM-D  
G. Carchon, B. Nauwelaers, *KU Leuven, Heverlee, Belgium*; O. DiMonaco, K. Vaesen, S. Brebels, W. DeRaedt, *IMEC, Heverlee, Belgium*

T5.8

A Method for Creating Multiple Attenuation Poles by a Microwave Filter Based on Tapped-Resonators  
Kouji Wada, Osamu Hashimoto, *Aoyama Gakuin University, Tokyo, Japan*

T5.9

A Bandpass Filter with Two Ring DRs Analysis Using the FDTD Method in an MIC Environment  
Sang-Ho Lim, Soon-Soo Oh, Young-Sik Kim, *Korea University, Seoul, Korea*

T5.10

Aperture-Coupled Stacked Microstrip Antenna With Dual Polarisation and Low Back-Radiation for X-Band SAR Applications  
F. Klefenz, A. Dreher, *German Aerospace Center (DLR), Wessling, Germany*

T5.11

Miniature Broadband Packaged Microstrip Antenna Using Wire-Bonding Technique  
Wei Ping Dou, M. Y. W. Chia, *Centre for Wireless Communications, Singapore Science Park II, Singapore*

T5.12

Small Broadband Microstrip Patch Antenna for IMT-2000 Handsets  
Yajun Wang, Lee Ching Kwang, *Nanyang Technological University, Singapore*

## WEDNESDAY, SEPTEMBER 13, 2000

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8:00 - 9:20

Session W1  
Active Device Characterization and Modeling  
Chair: Joseph Staudinger, *Motorola SPS*

8:00

Prediction of Output Carrier-to-Interference Ratios from Nonlinear Microwave Components Driven by Arbitrary Signals Using Intrinsic Kernel Functions  
H. Ku, J. S. Kenney, *Georgia Institute of Technology, Atlanta, GA, USA*; A. Leke, *Stanford University, Stanford, CA, USA*

8:20

Measurement Technique for Characterizing Memory Effects in RF Power Amplifiers  
Joel Vuolevi, Timo Rahkonen, Jani Manninen, *University of Oulu, Oulu, Finland*

8:40

Analysis of the Effects of Supply Noise Coupling on Phase Noise in Integrated LC CMOS Oscillators  
Radu Fetche, Cristina Fetche, *Washington State University, Pullman, WA, USA*; Terri Fiez, Kartikeya Mayaram, *Oregon State University, Corvallis, OR, USA*

9:00

An RF MOSFET SPICE Model with a New Substrate Network  
Seonghearn Lee, *Hankuk University of Foreign Studies, Yongin, Korea*; Cheon Soo Kim, Hyun Kyu Yu, *Electronics and Telecommunications Research Institute, Taejon, Korea*

BREAK 9:20 - 9:50

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9:50 - 12:00 Noon

Session W2  
Wireless Receiver Circuits  
Chair: Masami Akaike, *Science University of Tokyo*

9:50

Optimization of Tunable Oscillators with AM to FM Conversion for Near-Carrier Phase Noise  
Gleb V. Klimovitch, *Watkins-Johnson Company, Palo Alto, CA, USA*

10:10

High Performance RF Front-End Circuits for CDMA Receivers Utilizing BiCMOS and Copper Technologies  
Tom Schiltz, Carl Denig, Charles Dozier, Hua Fu, Henry Lau, Glenn Watanabe, *Motorola Inc. SPS, Tempe, AZ, USA*

10:30

Adaptive Dual-Loop Algorithm for Cancellation of Time-Varying Offsets in Direct Conversion Mixers  
Christian Holenstein, John T. Stonick, *Oregon State University, Corvallis, OR, USA*

10:50

A 900 MHz CMOS Balanced Harmonic Mixer for Direct Conversion Receivers  
Zhaofeng Zhang, Zhiheng Chen, Jack Lau, *Hong Kong University of Science & Technology, Hong Kong, China*

11:10

Novel Indirect-Conversion Transceiver Architectures Using Phantom Oscillators  
Leonard MacEachern, Tajinder Manku, *University of Waterloo, Waterloo, Ontario, Canada*

LUNCH 12:00 Noon - 13:00

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13:00 - 14:20

Session W3  
RF Power Amplification  
Chair: Lutfi Albasha, *Filtronix*

13:00

Measurement Technique for Increasing the Linearity by Optimising the Source Impedance of RF Power Amplifiers  
Joel Vuolevi, Timo Rahkonen, Jani Manninen, *University of Oulu, Oulu, Finland*

13:20

ACPR Comparison of Low Pass and Band Pass Type Power Amplifier for 22 Mbps Wireless LAN Application  
K. H. Koo, L. Larson, *University of California, San Diego, La Jolla, CA, USA*; M. S. Jung, J. S. Park, *University of Incheon, Incheon, Korea*

## Poster/Exhibition Reception

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Tuesday, September 12, 2000  
5:30 - 7:00 pm

On Tuesday evening, please join us from 5:30 to 7:00 pm for a reception, held in conjunction with the Tuesday Poster Session and the finale of the RAWCON2000 Exhibition of wireless products and services. At 7:00 pm we will proceed to the Panel Session "Accessing the Wireless Internet: Cellular, LAN, or Other?".

13:40

Integrated Power Measurement Circuit  
for RF Power Amplifiers  
Ossi Pollanen, Esko Jarvinen, *Nokia Mobile  
Phones, Finland*

14:00

A European ISM Band Power Amplifier  
Module  
Ming-ta Hsieh, Jonghae Kim, Ramesh Harjani,  
*University of Minnesota, Minneapolis, MN, USA*

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BREAK 14:20 - 14:50

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14:50 - 16:30

Session W4  
Passive Devices  
Chair: Elizabeth Logan, *Intarsia Corp.*

14:50

Improved Techniques for the  
Measurement and Modeling of Plastic  
Surface Mount Packages to 20 GHz  
Darryl Jessie, Lawrence E. Larson,  
*University of California, San Diego, CA, USA*

15:10

Design of a Direct Ku-band Linear  
Subharmonically Pumped I/Q Vector  
Modulator in Multi-Layer Thin-Film  
MCM-D  
G. Carchon, D. Schreurs, B. Nauwelaers,  
*KU Leuven, Heverlee, Belgium; W. De Raedt,  
IMEC, Heverlee, Belgium*

15:30

High-Q Integrated Spiral Inductors for High  
Performance Wireless Front-End Systems  
P. Pieters, K. Vaesen, W. Diels, G. Carchon,  
S. Brebels, W. De Raedt, E. Beyne, R. P.  
Mertens, *IMEC, Leuven, Belgium*

15:50

Simplifying Passive Integration and  
Simulation  
Steve Whelan, *Intarsia Corporation, Fremont,  
CA, USA*

16:10

Low-Cost Realization of ISM Band Pass  
Filters Using Integrated Compline Structures  
Mi-Hyun Son, Sung-Soo Lee, Yong-Jun Kim,  
*Samsung Electronics Co., Suwon City, Korea*



## RAWCON 2000 AT A GLANCE

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### 2000 IEEE Radio and Wireless Conference

Sunday 9/10

10 am - 4 pm	Registration
Noon - 1 pm	Workshop Lunch
1 pm - 5 pm	Workshop: Ultra Wideband (UWB) Communications Technology

Monday 9/11

7 am - 6 pm	Registration
7 am - 8 am	Workshop Breakfast
8 am - noon	Workshop: Tutorial on Wireless Networking
Noon - 1 pm	Workshop Lunch
1 pm - 5 pm	Technical Sessions
5:30 pm - 7 pm	Exhibition, Poster Session, and Reception
7 pm - 8:30 pm	Banquet
8:30 pm - 10 pm	Panel Session: Education, Research, and the Wireless Industry

Tuesday 9/12

7 am - 6 pm	Registration
7 am - 7 pm	Exhibition
7am - 8 am	Breakfast
8 am - noon	Technical Sessions
noon - 1:20 pm	Lunch
1:20 pm - 5 pm	Technical Sessions
5:30 pm - 7 pm	Exhibition, Poster Session, and Reception
7 - 9 pm	Panel Session: Accessing the Wireless Internet: Cellular, LAN, or Other?

Wednesday 9/13

7 am - noon	Registration
7 am - 8 am	Breakfast
8 am - 4:30 pm	Technical Sessions
Noon - 1 pm	Lunch
1 pm - 5 pm	Technical Sessions

Watch //rawcon.org for the latest information on  
**RAWCON2000**

# SPECIAL TECHNICAL PROGRAMS

## SUNDAY AFTERNOON WORKSHOP

### ULTRA WIDEBAND (UWB) COMMUNICATIONS TECHNOLOGY

Sunday, September 10, 2000, 1:00 PM–5:00 PM

Organizer:

Michael Heutmaker, *Lucent Technologies*

Speakers:

Rex Morey, *Lawrence Livermore National Lab*

Moe Win, *AT&T Research Laboratories*

Paul Withington, *Time Domain Corporation*

Ultra Wideband (UWB) technology represents a radical departure from present-day architectures for communications systems and may be on the verge of initial commercialization. UWB systems manipulate picosecond RF pulses to transmit and receive data. The speakers will combine a technical tutorial with a snapshot of the state of this innovative technology.

## MONDAY MORNING WORKSHOP

### WIRELESS NETWORKING TUTORIAL

Monday, September 11, 2000

8:00 AM–12:00 Noon

Organizers:

Michael Heutmaker, *Lucent Technologies*

Tim Brown, *University of Colorado*

Speakers:

Kumar Balachandran, *Ericsson*

Tim Brown, *University of Colorado*

Gerry Christensen, *SignalSoft*

Barry Dropping, *Symmetricom*

This workshop addresses one of the fundamental interdisciplinary aspects of wireless communications: how to configure communications networks to let a number of mobile users share a number of wireless channels. The presenters will cover the following topics:

- Cellular Architecture and Networking (45 min, G. Christensen)
- Network-Level Impact of the Wireless Channel (30 min, T. Brown)
- Intelligent Mobile Networking and Applications (45 min, G. Christensen)
- Synchronization Issues in Wireless Networking (30 min, B. Dropping)
- Third Generation (3G) Wireless Networking (30 min, K. Balachandran)
- Wireless Application Protocol (WAP) (30 min, K. Balachandran)

## RAWCON2000 KEYNOTE ADDRESS

### TECHNOLOGIES AND SYSTEMS FOR FOURTH GENERATION MOBILE WIRELESS SYSTEMS

Monday, September 11, 2000, 1:20 PM–1:50 PM

Al Javed, *Vice President and Chief Engineer,*

*Wireless; Chief Technology Officer, Access*

*Networks, Nortel Networks, Nepean, Ontario, Canada*

Third generation (3G) Mobile Wireless Systems are currently under development. Their field deployment will commence in early 2001. These systems are being designed to be data-centric with peak bit rates of 384kb/s in fully mobile environments. This talk will address the evolution of technologies and systems that will result in fourth generation systems with 10 times higher peak bit rates and capacities than the 3rd generation systems and fully compatible with Internet Protocol (IP) based networking.

## BANQUET

Monday, September 11, 2000, 7:00 PM–8:30 PM

Banquet Address

COLORADO INSTITUTE OF TECHNOLOGY

8:15 PM– 8:30 PM

Marc Holtzman, *Secretary of Technology, Governor's Office of Innovation and Technology, State of Colorado; Chairman of the Board, Colorado Institute of Technology*

The Colorado Institute of Technology (CIT) was founded in March 2000 to significantly increase the number of students graduating in information technology (IT) disciplines in Colorado by:

- Delivering world class courses and technology programs;
- Attracting and retaining outstanding science and technology faculty;
- Partnering with business to develop and deliver courses which meet specific business needs;
- Increasing the number of high school students interested in IT disciplines through special programs and summer classes;
- Partnering with universities to enhance curricula in IT disciplines.

## MONDAY EVENING PANEL SESSION

EDUCATION, RESEARCH, AND THE WIRELESS INDUSTRY

Monday, September 11, 2000, 8:30 PM–10:00 PM

Moderator:

Peter Staecker

Panelists:

Misty Baker, *Executive Director, Global*

*Wireless Education Consortium (GWEC)*

Lawrence Dunleavy, *Wireless and Microwave*

*Program (WAMI), University of South Florida*

David Falconer, *Carleton University*

Theodore S. Rappaport, *Founding Director,*

*Mobile and Portable Radio Research Group*

*(MPRG), Virginia Tech*

In response to worldwide growth in wireless communications, relationships between universities and industry in RF/wireless technology are evolving. The panelists are leaders in finding ways for university researchers to identify needs of the commercial wireless industry and advance the state of the art; leveraging the advantages of industry sponsorship of leading-edge academic laboratory facilities; enabling university-industry collaboration to develop curriculum formats for wireless technology; contributing to emerging wireless standards, and more. The session will take place as the after-dinner program of the RAWCON2000 Banquet.

## TUESDAY EVENING PANEL SESSION

ACCESSING THE WIRELESS INTERNET:

CELLULAR, LAN, OR OTHER?

Tuesday, September 12, 2000, 7:00 PM–9:00 PM

Organizers:

Michael Heutmaker, *Lucent Technologies*

Modest Oprysko, *IBM*

Moderator:

Brad Smith, *Data/IP Networking Editor,*

*Wireless Week*

Panelists:

Kumar Balachandran, *Senior Consulting Engineer, Ericsson, Inc.*

Phil Belanger, *Vice President, Wireless Business Development, Wayport, Inc.; Chair, Wireless Ethernet Compatibility Alliance (WECA)*

Gary Hand, *Mobile Software Strategy Manager, Pervasive Computing Division, IBM Corp.*

Bruce Rowland, *Senior Manager, Internet Wireless Systems, Lucent Technologies*

Durga Satapathy, *Principal Member of Technical Staff, Sprint; Chair, IEEE 802.16's Wireless High-Speed Unlicensed Metropolitan Area Networks Study Group*

Technology, business, and performance aspects of wireless access to the Internet are reshaping the landscape of the wireless industry. How many people will use their mobile phone to access the Internet, and for what purposes? Will third-generation cellular technology be economically feasible on a mass scale? Will ubiquitous and economical high-speed wireless LAN connections be a significant player for portable users? Will fixed wireless access significantly enhance the availability of broadband access? Will all of these modes complement each other or all exist independently? The panelists bring the perspectives of service providers, mobile phone developers, infrastructure developers, and computer companies to the discussion of what is happening now and what might happen next.



# ON-SITE REGISTRATION FORM

2000 IEEE Radio and  
Wireless Conference  
September 10-13, 2000  
Denver, CO, USA  
<http://rawcon.org>

Please fill out all the fields

Dr.  Mr.  Ms. IEEE Member # \_\_\_\_\_ Job Title \_\_\_\_\_

First Name \_\_\_\_\_ Middle Initial \_\_\_\_\_ Last Name \_\_\_\_\_

Affiliation \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip/Postal Code \_\_\_\_\_ Country \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

E-Mail \_\_\_\_\_ Nickname to print on badge \_\_\_\_\_

## REGISTRATION FEES

### Technical Sessions

- |  |       |
|--|-------|
| <input type="checkbox"/> IEEE Member         | \$300 |
| <input type="checkbox"/> Non-member          | \$375 |
| <input type="checkbox"/> IEEE Student Member | \$225 |
| <input type="checkbox"/> Retired IEEE Member | \$225 |
| <input type="checkbox"/> Presenter           | \$225 |

### Optional Workshops (including lunch and notes)

- |   |      |
|---|------|
| <input type="checkbox"/> Workshop, Sunday afternoon | \$95 |
| <input type="checkbox"/> Workshop, Monday morning   | \$95 |

### Additional Options

- |   |       |
|---|-------|
| <input type="checkbox"/> Monday Reception, Banquet,<br>Panel, and Exhibition Only | \$60  |
| <input type="checkbox"/> Tuesday Reception, Panel,<br>and Exhibition Only         | \$25  |
| <input type="checkbox"/> Additional copy of Proceedings<br>(on-site pickup only)  | \$40  |
| <input type="checkbox"/> Guest Registration (meals only)                          | \$135 |

Guest name for badge: \_\_\_\_\_

## PAYMENT

Total Payment Due: \$ \_\_\_\_\_

- Enclosed is a check payable in US funds to  
IEEE - RAWCON2000
- Charge my fees to:
- VISA  MasterCard  AmEx  Disc  Diners Club

Card # \_\_\_\_\_ Exp. \_\_\_\_\_

Signature \_\_\_\_\_

DON'T FORGET TO SIGN!

### INCLUDED WITH TECHNICAL SESSIONS

- Admission to two and a half days of oral technical sessions
- Admission to exhibition, poster sessions, and two evening panel sessions
- Proceedings book with about 75 four-page papers
- Meals (banquet on Monday evening; breakfast and lunch on Tuesday and Wednesday)
- Monday and Tuesday evening receptions
- Five refreshment breaks

Privacy Policy: Your registration data may be made available to RAWCON2000 exhibitors.

## MESSAGE FROM THE GENERAL CHAIR

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RAWCON has become a leading interdisciplinary forum for advances in wireless communications by highlighting the intersections between RF technology and communications system design. This interdisciplinary focus may change its look from year to year, but the RAWCON Technical Program Committee works to nurture it in the selection of papers as well as in the construction of panels and workshops.

RAWCON is also known for its informal and interactive atmosphere. This ambience, together with the single-track structure of the program, enables specialists from various technical fields to learn from one another during workshops, panel discussions, receptions, and meals, as well as during presentations. RAWCON attracts attendees from industry and universities around the world, and this mixture adds further interest to the conference.

The wireless Internet is a theme at RAWCON2000, including these three program elements:

- Wireless Networking Tutorial workshop explains how networks share a number of wireless channels among a number of mobile users, from Cellular to Third-Generation (3G) and the Wireless Application Protocol (WAP).
- Keynote Address "Systems and Technologies for Fourth Generation Mobile Wireless Systems" by Al Javed, who is Vice President and Chief Engineer, Wireless, at Nortel Networks.
- "Accessing the Wireless Internet: Cellular, LAN, or Other?" panel session features discussion of which methods of accessing the wireless Internet will succeed, and why. The issues include technology, economics, the needs of various users, and how the outcome affects the future course of the industry.

In addition to the 68 presentations in the Technical Program, don't miss these highlights of RAWCON2000:

- Ultra Wideband (UWB) Communications Technology workshop combines tutorial elements with a snapshot of the status of this innovative technology.
- "Education, Research, and the Wireless Industry" panel session features speakers who describe some successful models for collaboration between universities and industry.
- Vendor Exhibit including booth and tabletop displays from leading wireless industry suppliers.

As always, we look for feedback from our attendees and presenters to help us chart the future of RAWCON. Please give your comments and suggestions to any Committee member or myself. I'm looking forward to seeing you in September.

—Mike

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Dr. Mark Wickert, *University of Colorado*

### Exhibition

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RAWCON2000 includes an exhibition of wireless products and services on Monday (5 - 7 pm) and Tuesday (7 am - 7 pm). Booth and tabletop spaces may still be available. For information please check rawcon.org or contact the Exhibition Chair, Roger Marks of NIST (r.b.marks@ieee.org or +1-303-497-3037).

### Registration Hours

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Sunday, September 10  
10 am - 4 pm  
Monday, September 11  
7 am - 6 pm  
Tuesday, September 12  
7 am - 6 pm  
Wednesday, September 13  
7 am - noon

### Hotel and Travel

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Denver Marriott Southeast  
6363 E. Hampden Ave.  
Denver, CO 80222  
+1-800-228-9290 (tel)  
+1-303-691-3418 (fax)

Please make your own reservations with the hotel. The conference rate is \$95 (single or double occupancy) plus tax (currently 13.55%). Rooms are reserved through August 18, 2000, but the conference rate is offered afterward if space is available.

The hotel is 26 miles from Denver International Airport and offers free parking. Driving time is 30-45 minutes. SuperShuttle serves this route from 5 am through midnight and offers a discounted \$27 round trip if you mention "RAWCON." See rawcon.org for full details and directions.

