

**National Academies of Sciences and Engineering
National Research Council
of the
United States of America**

**United States National Committee
International Union of Radio Science**

2008 NRSM



***National Radio Science Meeting
3-6 January 2008***

Sponsored by USNC/URSI

***University of Colorado at Boulder
Boulder, Colorado
USA***

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Table of Contents – links to the sessions

Sessions – links to each paper in the session

Author List – links to the papers for each author

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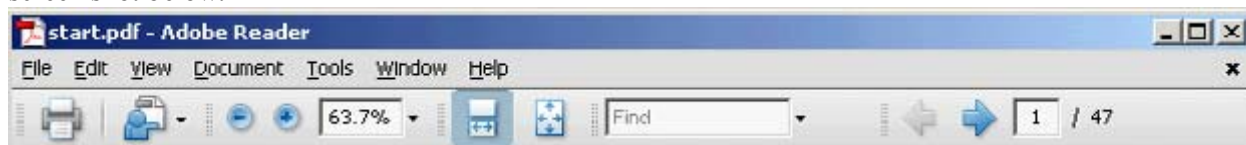
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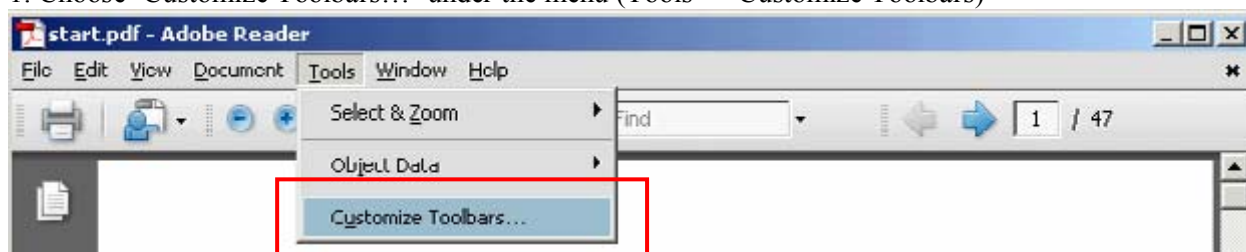
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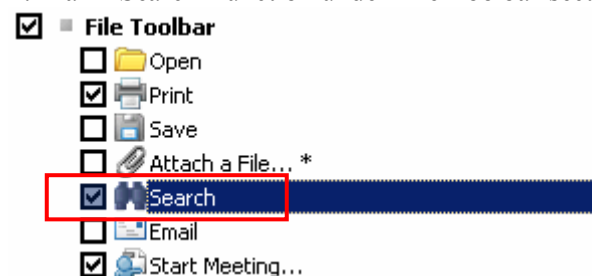


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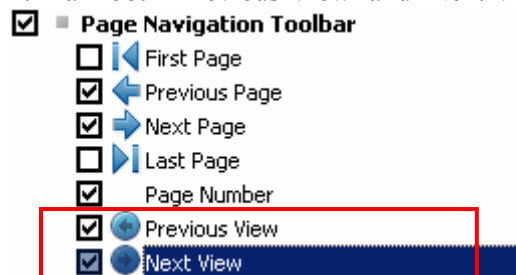


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NATIONAL RADIO SCIENCE MEETING

January 3-6, 2008 University of Colorado at Boulder

Membership

United States National Committee
INTERNATIONAL UNION OF RADIO SCIENCE

Executive Committee:

Chair: P. L. E. Uslenghi, University of Illinois, Chicago
Secretary: Y. Rahmat-Samii, University of California, Los Angeles
Immediate Past Chair: Umran S. Inan, Stanford University, Palo Alto
Accounts Manager: Gary S. Brown (Ex-officio), Virginia Tech

Society Representatives(2005-2007)

American Astronomical Society (AAS)	Donald Backer
American Geophysical Union (AGU)	David Hysell
American Meteorological Society (AMS)	Richard Doviak
IEEE Antennas and Propagation Society (AP-S)	Susan C. Hagness
IEEE Geoscience and Remote Sensing Society (GRS-S)	Edgeworth R. Westwater
IEEE Microwave Theory and Techniques (MTT-S)	Tatsuo Itoh

Members At Large (2005-2007)

Jacqueline N. Hewitt
Gary S. Brown
Steven C. Reising
Susan C. Hagness
Jennifer T. Bernhard
Paul A. Bernhardt
Nader Engheta
Robert L. Gardner

Commission Chairs (2006–2008)

Commission A: Electromagnetic Metrology	Vijay Nair
Commission B: Fields and Waves	David R. Jackson
Commission C: Signals and Systems	Devereux Palmer
Commission D: Electronics and Photonics	L. Wilson Pearson
Commission E: Electromagnetic Noise and Interference	Cynthia Ropiak
Commission F: Wave Propagation and Remote Sensing	Roger Lang
Commission G: Ionospheric Radio Propagation	John Mathews
Commission H: Waves in Plasma	Meers Oppenheim
Commission J: Radio Astronomy	David Woody
Commission K: Electromagnetics in Biology and Medicine	Gianluca Lazzi

U.S. URSI Officers (2006–2008)

URSI Vice-President Chalmers M. Butler
Assistant Secretary-General (Publications): W. Ross Stone

Ex-Officio Members – Non Voting

Chair, Student Paper Contest	Steven C. Reising
Chair, USNC-URSI Meetings Committee	William A. Davis
Chair, Joint IEEE AP-S/USNC-URSI Meetings Committee	Robert Nevels
Coordinator, USNC-URSI Web Page	William A. Davis
USNC-URSI Representative to USNC-CODATA	Kurt W. Weiler
Coordinator, USNC-URSI Boulder Meeting	Christina Patarino

Government Liaison Representatives

Wayne Van Citters, Director, Division of Astronomical Sciences, NSF
Thomas E. Gergely, Electromagnetic Spectrum Manager, Division of Astronomical Sciences, NSF
Joe Capp, Army Spectrum Manager, US Army
Bruce Swearingen, Director, NAVEMSCEN, Naval Electromagnetic Spectrum Center, US Navy
John C. H. Wang, Propagation Analysis Branch, FCC
Martin Ralph, Environmental Technology Laboratory, NOAA

CD & Program Preparation:

P. L. E. Uslenghi
USNC Commission Chairs
W. A. Davis (Web Master) and Taeyoung Yang

Schedule of Commission Business Meetings

Commission A: Thursday, January 3, 17:00	Commission F: Friday, January 4, 17:00
Commission B: Thursday, January 3, 18:00	Commission G: Friday, January 4, 18:00
Commission C: Saturday, January 5, 17:00	Commission H: Saturday, January 5, 17:00
Commission D: Friday, January 4, 17:00	Commission J: Thursday, January 3, 18:00
Commission E: Thursday, January 3, 17:00	Commission K: Friday, January 4, 18:00

Special Meetings

USNC/URSI Committee, Wednesday, January 2, 19:00-23:00, Marriott Hotel.
Plenary Session and Student Paper Competition, Friday, January 4, 08:30-11:45, Mathematics Auditorium.
USNC/URSI Executive Council, Sunday, January 6, 06:30-08:00, Marriott Hotel.

Reception

1830 → 2100, Friday, 4 January **Engineering Center Lobby**

URSI MISSION

The International Union of Radio Science (universally referred to as URSI) is one of the majority of Scientific Unions which adhere to the International Council of Scientific Unions (ICSU). It was created in 1919, during the Constitutive Assembly of the International Research Council (now ICSU) at the same time as the International Unions of Astronomy (IAU), of Geodesy and Geophysics (IUGG), and of Pure and Applied Chemistry (IUPAC). URSI's origins go back even further than 1919 because it was essentially a change in name of the earlier Commission Internationale de Telegraphie sans Fil, which had been active during the period 1913-1914 when the only existing type of radio communication system was radiotelegraphy.

The original objective of URSI in 1919 (to encourage "scientific studies of radiotelegraphy, especially those which require international cooperation") has, over the past 75 years, been broadened to include all radio science, from telecommunications to radio astronomy, and covering the frequency range from ELF to optical.

In the context of the present activities of URSI, the term "radioscience" includes not only the transmission of information from a transmitter to a distant receiver, but also the acquisition of information about distant passive objects by the use of radar techniques, studies of the radiation stimulated or spontaneously emitted by these objects, and active modification of objects by powerful radio waves. Radio remote sensing techniques have been widely applied in research in geographical, geophysical and other branches of science. In astronomy, celestial bodies and ionized regions are investigated through study of their radiofrequency emissions and effects (dispersion, polarization) on propagation. Much of space research involves passive and active experiments on or using radio waves from ELF to LF and much also depends on the applications of radio techniques in communication, sensing and control.

USNC-URSI National Radio Science Meeting
Boulder, Colorado, January 3-6, 2008

SCIENTIFIC PROGRAM

Wednesday PM **January 2, 2008**

1900 - 2300 USNC/ URSI Committee, Marriott Hotel

Thursday AM **January 3, 2008**

Session A1 - Measurement Techniques and Models for EM Applications **Room 151**

Co-Chairs: O. Kilic, *Catholic University of America*

<kilic@cua.edu>

R. H. Lang, *George Washington University*

<lang@gwu.edu>

0920 **A1-1 Improved Resonant Cavity Techniques to Measure Dielectric Constant of Seawater at L-Band**

Y. Tarkocin*, R. H. Lang, C. Utku, D. M. LeVine

0940 **A1-2 Millimeter Wave Dielectric Measurement of Sand for Sand Cloud Attenuation Estimations**

P. H. Stack*, O. Kilic, D. Wikner, S. J. Weiss

1000 **Break**

1020 **A1-3 A Re-Evaluation of ASTM D 4935 → Standard Test Method for Measuring the Electromagnetic Shielding Effectiveness of Planar Materials**

D. Carosa, K. Maruta, J. J. Whalen*

1040 **A1-4 Developing a Low-Cost Automated Test Tool for Measuring Gain, Noise Figure, and Low-Level Power Spectral Density**

R. Parker*, A. Olson

1100 **A1-5 Subnanosecond Sample Holder**

C. E. Baum*

1120 **A1-6 Radio Frequency Emissions from Hypervelocity Impacts: Detecting Micrometeoroid Impacts to Spacecraft**

M. J. Starks*, D. L. Cooke, P. E. Holloday, J. T. Griffith, W. D. Reinhart,

T. F. Thornhill III

Session B1 - Antennas **Room 1B40**

Chair: W. A. Davis, *Virginia Tech*

<wadavis@vt.edu>

0800 **B1-1 Mathematical Analysis of the On-Boresight Energy Characteristics of the Radiation Field of the Impulse Radiating Antenna**

I. Chappell II*, I. Kohlberg

- 0820 **B1-2 Trade-offs Associated with Antennas for Software Defined Radios**
S. P. Bates*, W. A. Davis
- 0840 **B1-3 Dual-Polarized MAW Spirals**
W. N. Kefauver*, P. Cencich, D. S. Filipovic.
- 0900 **B1-4 Design of Omnidirectional Electrically Small Vee-Shaped Antenna Using Characteristic Modes**
K. A. Obeidat, B. D. Raines, R. G. Rojas
- 0920 **B1-5 Fully-Embedded Ultra-Wideband Antenna at the Base of Laptop Computers**
T. Yang*, S.-Y. Suh, W. A. Davis, V. K. Nair
- 0940 **B1-6 Bandwidth Improvement of Hemispherical Helical Antennas**
H. Alsawaha, A. Safaai-Jazi

Session B2 - Arrays

Room 1B40

- Chair: R. J. Pogorzelski, *Jet Propulsion Laboratory*
<pogo@jpl.nasa.gov>
- 1020 **B2-1 On the Application of the Continuum Model of Coupled Oscillator Arrays with Coupling Delay to Finite Arrays**
R. J. Pogorzelski*
- 1040 **B2-2 RF MEMS Actuated Reconfigurable Reflectarray: A Novel Patch-Slot Element Design**
H. Rajagopalan*, Y. Rahmat-Samii
- 1100 **B2-3 Degrees of Freedom in Linear Array Systems with Traveling Wave Polarized Antennas**
G. Gupta, A. Rajagopalan, B. L. Hughes, G. Lazzi
- 1120 **B2-4 Parasitic Modifications to the Finite, Foursquare Antenna Array**
T. R. Vogler*, W. A. Davis
- 1140 **B2-5 Steerable Yagi Array Antennas Using Dielectric Phase Shifters**
S. Dahlstet, J. Cha, M. Stoneback, Y. Kuga
- 1200 **B2-6 Frequency Reconfigurable Microstrip Circular Patch Array**
N. K. Saxena, P. K. S. Pourush

Session B3 - Numerical Methods

Room 105

- Co-Chairs: S. R. Rengarajan, *California State University, Northridge*
<srengarajan@csun.edu>
D. R. Wilton, *University of Houston*
<wilton@uh.edu>
- 0840 **B3-1 Analysis of Iris-Excited Centered Longitudinal Slots using Entire Domain Basis Functions with Edge Conditions**
S. R. Rengarajan*
- 0900 **B3-2 Unconditionally Stable Complex-Envelope FDTD Algorithm for the Analysis of Logging Tools for Borehole Prospection**
H. O. Lee*, F. L. Teixeira

- 0920 **B3-3 Investigation of Fourth Order FDTD Method Using Symmetric Boundary Extrapolation**
J. Wilson*, C. Wang, Y. Kang, A. E. Fathy
- 0940 **B3-4 A Symplectic Runge-Kutta Scheme for Spectral-Element Time-Domain Method in Electromagnetic Simulation**
J. Chen, J.-H. Lee, Q. H. Liu
- 1000 **Break**
- 1020 **B3-5 Interpolation of 2D Periodic Layered-Medium Green's Function**
F. T. Celepcikay*, D. R. Wilton, D. R. Jackson, F. Capolino
- 1040 **B3-6 A Novel Hybrid SIM-SEM Method for 3D Electromagnetic Scattering Problems**
Y. Lin, J. Liu, J. Lee, Q. H. Liu
- 1100 **B3-7 Residual Terms for the Wire Antenna Computation**
W. A. Davis*
- 1120 **B3-8 Antenna Array Fault Identification Using an \rightarrow Exact \rightarrow Discrete Inverse Method**
K. J. Kaczmariski*, S. R. Laxpati, W. R. Stone
- 1140 **B3-9 On the Convergence of Method of Moment and Mode Matching for 2-D Planar Phased Arrays**
M. H. Awida*, A. H. Kamel, A. Fathy

Special Session FS1 - Propagation and Scattering from Vegetation

Room 150

Organizers and Co-Chairs:

S. Saatchi, *Jet Propulsion Laboratory*

<sassan.saatchi@jpl.nasa.gov>

R. H. Lang, *George Washington University*

<lang@gwu.edu>

- 0820 **FS1-1 A Comparison of L-Band and P-band Interferometry at La Selva, Costa Rica for Tree Height Estimation**
S. Hensley*, P. Siqueira, B. Chapman, S. Saatchi
- 0840 **FS1-2 Transient Response from a Vegetation Canopy to Stepped-Frequency Radar**
M. Kurum*, R. H. Lang, P. O'Neill, A. Joseph, T. Jackson, M. Cosh
- 0900 **FS1-3 UHF Foliage Penetration and Scattering Model for SAR Applications**
S. S. Saatchi*
- 0920 **FS1-4 Explore Biophysical Information of Radar and Lidar Data using Theoretical Models**
K. J. Ranson*, G. Sun
- 0940 **FS1-5 Coherent and Incoherent Waves in a Trunk Dominated Forest**
R. Lang*, C. Utku, S. Seker

Special Session FS2 - Remote Sensing Education

Room 150

Organizers and Co-Chairs:

A. J. Gasiewski, *University of Colorado*

<al.gasiewski@colorado.edu>

P. B. Chilson, *University of Oklahoma*

<chilson@ou.edu>

- 1020 **FS2-1 A Curriculum for Modern Graduate Instruction in Electromagnetic Remote Sensing**
A. J. Gasiewski*
- 1040 **FS2-2 Remote Sensing Education in the ECE Department at GW**
R. H. Lang*
- 1100 **FS2-3 Recent Developments in Weather Radar Educational Opportunities at the University of Oklahoma**
P. B. Chilson*, R. D. Palmer, M. Yearly, M. Biggersta, T. Y. Yu, G. Zhang, Y. Zhang
- 1120 **Panel Discussion**

Session GH1 - Meteor Physics I

Room 200

- Co-Chairs: S. Briczinski, *Pennsylvania State University*
<sjb144@psu.edu>
S. Palo, *University of Colorado*
<scott.palo@colorado.edu>
- 0840 **GH1-1 Modeling Meteor Head Echo Observations Using the Arecibo Radar**
L. P. Dyrud*, D. Janches
- 0900 **GH1-2 A Modeling and Observational Comparison of the Diurnal, Seasonal, and Latitudinal Variability of the Meteor Input Function Detected by HPLA Radars in the Northern Hemisphere**
J. T. Fenzke*, J. Sparks, D. Janches
- 0920 **GH1-3 A Statistical Analysis of Automated-Search Meteor Results from Radar Observations at Arecibo, Non-Decelerating Events and their Implication in Meteor Mass Flux Estimates**
S. J. Briczinski*, J.D. Mathews, D. D. Meisel
- 0940 **GH1-4 Accretion of Matter by the Sun: Influence on the Solar Corona**
H. Lamy*, J.F. Lemaire
- 1000 **Break**
- 1020 **GH1-5 Observations of the Diurnal and Seasonal Meteoric Input Variability at High Latitudes Using the 450 MHz PFISR**
J. Sparks*, D. Janches, J. Fenzke, M. J. Nicolls, C. Heinselman
- 1040 **GH1-6 The Three Radars: Radio and Meteor Science Outcomes from Comparisons of Meteor Radar Observations at AMISR Poker Flat, Sondrestrom, and Arecibo**
J. D. Mathews*, S.J. Briczinski, D. D. Meisel, C. J. Heinselman
- 1100 **GH1-7 Very Small Meteors → A Comparison of Ablation, Deceleration and Detection Theory with Observations**
J. Zinn*, S. Close, P. Colestock, D. Janches
- 1120 **GH1-8 Frequency and Aspect Angle Dependence of Non-Specular Trails**
S. Close*, T. Hamlin, P. Colestock, M. Oppenheim
- 1140 **GH1-9 On the Formation and Evolution of Radar Meteor Trails**
A. Malhotra*, J. D. Mathews, J. Urbina

Special Session HS1 - Laboratory Experiments and Spacecraft/plasma Interactions **Room 245**

Organizers: E. A. Bering II, *University of Houston*
<eabering@uh.edu>

W. E. Amatucci, *Naval Research Laboratory*
<bill.amatucci@nrl.navy.mil>

Co-Chairs: E. A. Bering II, *University of Houston*
<eabering@uh.edu>
Dave Blackwell, *Naval Research Laboratory*
<dave.blackwell@nrl.navy.mil>

0820 **HS1-1 Nonlinear Interactions, Heating and Turbulence Associated with Large Amplitude Alfvén Waves in a Laboratory Plasma**

T. A. Carter*, D. W. Auerbach

0840 **HS1-2 Pulsed Alfvén Wave Experiments in a Helicon Plasma Source**

A. Hansen*, E. Scime, S. Houshmandyar

0900 **HS1-3 Experiments on Antenna Impedance and Whistler Propagation in the Space Physics Simulation Chamber at NRL**

D. D. Blackwell, D. N. Walker, G. R. Gatling, C. S. Compton, E. M. Tejero, W. E. Amatucci

0920 **HS1-4 Double Layer Formation in Expanding Helicon Plasmas: Recent Results**

E. Scime, I. Biloiu, A. Hansen, R. Hardin, Z. Harvey, W. Przybysz

0940 **HS1-5 The VASIMR Ion Cyclotron Heating Experiment**

M. S. Brukardt*, E. A. Bering II, F. R. Chang-Diaz, J. P. Squire, T. W. Glover, V. T. Jacobson, G. E. McCaskill, L. D. Cassidy

Special Session HS2 - Waves in Plasma: New Missions **Room 245**

Organizers and Co-Chairs:

J. Labell, *Dartmouth College*

<james.w.labelle"@dartmouth.edu>

R. E. Ergun, *University of Colorado*

<ree@lasp.colorado.edu>

1020 **HS2-1 Structured Low-Frequency Whistler Mode Emissions Observed in Recent Auroral Rocket Experiments**

J. LaBelle, C. Colpitts

1040 **HS2-2 Wave Growth in an Inhomogeneous Medium**

R. E. Ergun, D. M. Malaspina

1100 **HS2-3 Discrete Upper-Hybrid Waves**

P. H. Yoon*

1120 **HS2-4 Ion Two-stream Instabilities in the Auroral Acceleration Zone**

L. Muschietti*

1140 **HS2-5 Radiation from CMI Emission in Auroral Cavities: New Results on the Shell-Driven Maser and Angular Beaming Patterns**

R. L. Mutel*, I. W. Christopher, W. M. Peterson

1200 **HS2-6 Interchange and Quasi-Interchange Motions in a Dipole Magnetic Field: Numerical Animations**

J. F. Lemaira, N. André

Chair: T. W. Thompson, *Jet Propulsion Laboratory*
<twthompson@jpl.nasa.gov>

- 0820 **J1-1 Future Trends in Atmospheric Radio Occultations: Crosslink and Uplink**
Sami Asmar*
- 0840 **J1-2 Goldstone/VLA 3.5-cm Mars Radar Observations in 2003**
B.J. Butler*, M.A. Slade, D.O. Muhleman, M.R. Chizek, K. Mogren
- 0900 **J1-3 Interannual observations of the Martian ionosphere**
K. Cahoy*
- 0920 **J1-4 Laboratory Measurements of W-band Continuum Opacity of Ammonia Using a Fully Confocal Fabry-Perot Resonator**
K. Devaraj*, P. G. Steffes
- 0940 **J1-5 New Laboratory Measurements of the Microwave Absorption Coefficient of Ammonia and Water Vapor under Jovian Conditions**
T. R. Hanley*
- 1000 **Break**
- 1020 **J1-6 From Modeling to Laboratory Measurements: Simulated**
B. M. Karpowicz*, P. G. Steffes
- 1040 **J1-7 Results from the SHARAD Sounding Radar on the Mars Reconnaissance Orbiter**
R. J. Phillips*
- 1100 **J1-8 Latest Results from Mars Advanced Radar For Subsurface and Ionospheric Sounding**
A. Safaeinili, J. Plaut, W. Kofman, J. Mougnot, G. Picardi
- 1120 **J1-9 Exploration of Planetary Surfaces Using Spacecraft Bistatic Radar**
R. A. Simpson*, G. L. Tyler, E. A. Marouf, S. W. Asmar, M. Pätzold, B. Häusler
- 1140 **J1-10 Probing Coronal Mass Ejections with Faraday Rotation Measurements**
S. R. Spangler*, C. A. Whiting

Session B4 - Scattering And Diffraction**Room 105**

Chair: D. Erricolo, *University of Illinois at Chicago*
<erricolo@ece.uic.edu>

- 1340 **B4-1 Exact 2D Scattering Analysis of a Slot Backed by Cavity and Covered by a Multilayer Diaphragm**
S. M. Canta*, D Erricolo
- 1400 **B4-2 Diffraction by a Material-loaded Tandem Slit**
S. Seran*, J. P. Donohoe, E. Topsakal
- 1420 **B4-3 Effects of Antenna Radiation Pattern on Validations of Alternative Scattering Theories for Distributed Scatterers**
W. Wasykiwskyj*, J. Alatishe
- 1440 **B4-4 Measurements of Ultra Wideband Radar Cross Sections of an Automobile Using Circular Polarizations**
H. Osaki*, T. Kobayashi

Session B5 - Wireless Communications**Room 105**

Chair: O. Kilic, *Catholic University of America*
<kilic@cua.edu>

- 1520 **B5-1 Improve Communications between Traffic Management Center and Traffic Measurement Sensor Elements in a Rural Environment**
Y. Liang, R. S. Wolff.
- 1540 **B5-2 Interference Analysis for Cellular Satellite Systems Using a Sub-Beam Approach**
A. Basiri*, O Kilic, A. I. Zaghoul
- 1600 **B5-3 Channel Estimation, MMSE-LE Equalization, and Multi-level Amplitude Modulation for the Dual-Wavelength Free Space Optical Communications System using Modified Vector Radiative Transfer Theory**
C. N. Reinhardt*, S. Jaruwatanadilok, Y. Kuga, J. A. Ritcey
- 1620 **B5-4 Intrinsically Safe Digital Enhanced Cordless Telephone (DECT) Based Communication System for Underground Coal Mines and Other Hazardous Area**
S. Gupta, S. K. Sinha*, S. Kumar

Session B6 - Metamaterial-Based Components and Novel Devices**Room 1B40**

Co-Chairs: N. Engheta, *University of Pennsylvania*
<engheta@ee.upenn.edu>
D. R. Jackson, *University of Houston*
<djackson@uh.edu>

- 1320 **B6-1 CRLH-TL Multi-Band Microstrip Patch Antenna**
Z. Qiu*, J. Venkataraman
- 1340 **B6-2 Techniques for Scanning through Broadside with Periodic Leaky-Wave Antennas**
S. Paulotto, P. Baccarelli, F. Frezza, D. R. Jackson

- 1400 **B6-3 Modified Log-Periodic Dipole Array Antenna for Wide Band Pulse Radiation**
P. Jin*, R. W. Ziolkowski
- 1420 **B6-4 Metamaterial-based Compact CPW-Fed Antenna for 44 GHz Applications**
H. Zhang, H. Xin*, R. W. Ziolkowski
- 1440 **B6-5 Finite-size Periodic Stacks of Anisotropic Layers: Field Enhancement Effects and Sensitivity Analysis**
K.-Y. Jung*, F. L. Teixeira
- 1500 **Break**
- 1520 **B6-6 Band Gap Characteristics of Media with Lattice Structure**
S. Mudaliar, M. M. Weiner
- 1540 **B6-7 Near-Field Focusing Plates**
A. Grbic, L. Jiang, R. Merlin
- 1600 **B6-8 Non-Focal Minimum-Phase-Error Planar Rotman Lens**
J. Dong*, A. I. Zaghoul, R. Rotman
- 1620 **B6-9 Dual Localized Defect Modes in One-Dimensional Photonic Lattices**
B. He*, W. C. Chew
- 1640 **B6-10 Planar Slotline Isolator Based on Semiconductor Magnetoplasma**
S. S. Alshannaq*, R. G. Rojas
- 1700 **B6-11 The Mueller Matrix, Optical Rotation and Circular Dichroism in Biological and Chemical Complex Chiral Materials → Engineering Applications**
E. Bahar*

Session E1 - Electromagnetic Noise and Interference

Room 151

Co-Chairs: R. L. Gardner, *Consultan*
<robert.l.gardner@verizon.net>
D. V. Giri, *Pro-Tech*
<dgiri@silcon.com>

- 1320 **E1-1 Sidewall Waveguide Slot Antenna for High Power**
C. E. Baum*
- 1340 **E1-2 Two Antennas for Differential Mesoband Operation**
C. E. Baum*
- 1400 **E1-3 Experimental Setups and Comparison of the Experimental, Analytical and Numerical Results for the Focal Waveform of Two- and Four-Fed Arms Prolate-Spheroidal Antenna (IRA)**
S. Altunc*, J. Buchenauer, C. E. Baum, C. G. Christodoulou, E. Schamiloglu
- 1420 **E1-4 Inclusion of “Carl’s Law” in Intentional Electromagnetic Interference Susceptibility Analysis**
R. L. Gardner*
- 1440 **E1-5 Documented Electromagnetic Effects**
D. V. Giri, F. M. Tesche

Organizers and Co-Chairs:

M. Newkirk, *Johns Hopkins Applied Physics Laboratory*

<michael.newkirk@jhuapl.edu>

K. Davidson, *Naval Postgraduate School*

<kldavids@nps.edu>

- 1320 **FS3-1 Multipath Radar Propagation Modeling: Assessment of the Miller-Brown Approximation for a Vertically Polarized Line Source**
D. E. Freund*, N. E. Woods, H.-C. Ku, R. S. Awadallah
- 1340 **FS3-2 A Fast Ray Optics Model for Propagation, Radar and Communications Performance Analysis**
R. P. Wasky*, J. Z. Gehman
- 1400 **FS3-3 Characterizing Surface Wave Propagation over Roadbeds using a Finite Difference Time Domain Method**
J. W. Schuster, S. A. Fast, J. F. Stack, Jr., R. S. Belmonte
- 1420 **FS3-4 Radar Performance for S, C and X Bands during the Onset of a Sea Breeze Event Off the California Baja**
J. Stapleton*, R. E. Marshall
- 1440 **FS3-5 Performance Surface Metoc Impacts on Radar in Naval Operations**
K. Davidson*, P. Guest, F. Price, T. Haack
- 1500 **Break**
- 1520 **FS3-6 Surface Layer Physics Based Technique for Blending Evaporation Duct Profiles to Mesoscale Numerical Weather Prediction Refractivity Profiles**
R. E. Marshall*, W. D. Thornton
- 1540 **FS3-7 Self-Weighting Clustering Analysis of Refractive Index Profiles**
R. S. Belmonte, S. A. Fast
- 1600 **FS3-8 Mapping the GPS Multipath Environment Using the Signal-to-Noise Ratio (SNR)**
A. Bilich*, K. Larson
- 1620 **FS3-9 Variation in Propagation Loss Predictions Due to Uncertainty in Topographic Data**
D. E. Davis*, G. S. Brown
- 1640 **FS3-10 Remote Sensing of Soil Moisture Content of Composite Rough Terrain with Large Slope Fluctuations Based on a Variational Approach**
E. Bahar*

Co-Chairs: S. Briczinski, *Pennsylvania State University*

<sjb144@psu.edu>

S. E. Palo, *University of Colorado*

<scott.palo@colorado.edu>

- 1340 **GH2-1 The Effect of Charged Particles on Ambipolar Diffusion in the Polar Mesopause Region**
A. P. Ballinger, P. B. Chilson*, R. D. Palmer, S. Kirkwood, N. J. Mitchell

- 1400 **GH2-2 A Detailed Error Analysis for Meteor Radar Systems: Evaluation of COBRA Meteor Radar Observations during 2005 and 2006**
C. Kang*, S. E. Palo
- 1420 **GH2-3 A Numerical Model for VHF Meteor Radar Systems**
K. Johnson*, S. E. Palo, D. Janches, J. Fentzke
- 1440 **GH2-4 Correlation Analysis of the Westward-Propagating Semidiurnal Tide with Wave Number One at the South Pole and Planetary Waves with Wave Number One in the Opposite Hemisphere**
E. M. Lau*, X. Zhang, S. E. Palo

Session G3 - Ground and Space Based Radio Beacons

Room 200

Co-Chairs: P. A. Bernhardt, *Naval Research Laboratory*
<paul.bernhardt@nrl.navy.mil>
T. L. Gaussiran II, *University of Texas*
<gauss@arlut.utexas.edu>

- 1520 **G3-1 Ionospheric Measurements from Low Frequency Radio Telescopes**
T. L. Gaussiran II*, D. C. Munton, M. H. Montgomery, R. S. Calfas, A. Cohen
- 1540 **G3-2 Techniques for Improved Measurement of TEC with GPS**
L. P. Dyrud*, A. Jovancevic, A. Brown, B. Wilson
- 1600 **G3-3 Overview of a Software Radio Beacon Receiver Project**
F. D. Lind*, D. Ancukiewicz, H. Guturu, W. Harmon, A. J. Coster, P. J. Erickson, J. Marchese, W. J. Rideout
- 1620 **G3-4 Scintillation and TEC Receiver in Space (CITRIS) Instrument for Ionospheric Research**
C. L. Siefring*, P. A. Bernhardt
- 1640 **G3-5 Temporal and Spatial Variations in TEC Measured from the Indian GPS Network of Receivers during the Low Solar Activity Period of 2004-2005**
P.V.S. Rama Rao*, S. G. Krishna, K. Niranjana, D.S.V.V.D. Prasad
- 1700 **G3-6 Spatial and Temporal Characteristics of L-Band Scintillations over the Indian Low-Latitude Region and Their Possible Impact on GPS Navigation**
P.V.S. Rama Rao*, S. Gopi Krishna, K. Niranjana, D.S.V.V.D. Prasad

Special Session HS3 - Radiation Belts

Room 245

Organizers and Co-Chairs:

M. Spasojevic, *Stanford University*
<mariaspasojevic@stanford.edu>
A. V. Streltsov, *Dartmouth College*
<anatoly.v.streltsov@dartmouth.edu>

- 1400 **HS3-1 Magnetospheric ULF Activity as a Function of Solar Wind Conditions: Implications for Particle Energization in the Radiation Belts**
S. R. Elkington, S. G. Claudepierre, C.-L. Huang, A. A. Chan
- 1420 **HS3-2 MHD Test Particle Simulations of > 10 MeV Radiation Belt Formation During Storm Sudden Commencement**
B. T. Kress*, M. K. Hudson, M. D. Looper, J. M. Albert, J. G. Lyon, C. C. Goodrich

- 1440 **HS3-3 Losses and Sources of the Radiation Belts Electrons due to Wave-particle Interactions**
Y.Y. Shprits, D. A. Subbotin, R. M. Thorne
- 1500 **Break**
- 1520 **HS3-4 Substorm SAPS/SAID and the Plasmasphere's Fine Structure**
E. V. Mishin*, P.A. Puhl-Quinn, P.M. Décréau
- 1540 **HS3-5 Subionospheric VLF Observations of VLF Transmitter Induced Precipitation of Inner Radiation Belt Electrons**
K. Graf, U. S. Inan
- 1600 **HS3-6 Empirical Models of Saturation in VLF Triggered Emissions**
A. R. Gibby*, U. S. Inan, T. F. Bell
- 1620 **HS3-7 Post-noon Pc 1 Micropulsation Activity and Auroral Energetic Proton Precipitation on 27 January 2003**
E. Bering *, M. Engebretson, J. Posch, R. Holzworth, A. Kadokura, M. Kokorowski, B. Reddell, H. Yamagishi

Session J2 - Transient Astronomical Events

Room 265

Chair: T. J. W. Lazio, *Naval Research laboratory*
<joseph.lazio@nrl.navy.mil>

- 1400 **J2-1 Radio Transients: Exploring Axes of Discovery**
J. M. Cordes*
- 1420 **J2-2 Searching for Low-Frequency Radio Transients using ETA**
K. Deshpande*, S. Ellingson, J. Simonetti, S. Cutchin, C. Patterson, B. Martin
- 1440 **J2-3 All-Sky Imaging Search for Transients with the Long Wavelength Demonstrator Array**
T. E. Clarke*
- 1500 **Break**
- 1520 **J2-4 Automated Detection of Low Frequency Radio Transients with LOFAR**
M. Wise*, T. Coenen, R. Fender, C. Law, J. Masters, J. Miller-Jones, B. Scheers, H. Spreeuw, B. Stappers, J. Swinbank, R. Wijers
- 1540 **J2-5 A Search for Low-Frequency Radio Transients at 330 and 235 MHz**
S. D. Hyman*, S. Roy, S. Pal, T. J. W. Lazio, N. E. Kassim, P. S. Ray
- 1600 **J2-6 A Search for Cerenkov Burst Emission from UHE Neutrino Interactions in the Lunar Regolith**
T. R. Jaeger*, R. L. Mutel
- 1620 **J2-7 First Results from Astropulse: A Search for Microsecond Transient Radio Signals Using Distributed Computing**
J. Von Korff*, D. Werthimer, E. Korpela
- 1640 **J2-8 Detection of Radio Pulsars and Transients in the Arecibo Pulsar-ALFA Survey**
Z. Arzoumanian, D. C. Backer, R. Bhat, F. Camilo, D. J. Champion, S. Chatterjee, J. M. Cordes, F. Crawford, J. S. Deneva*, A. A. Deshpande, P. C. Freire, B. M. Gaensler, J. L. Han, J. W. Hessels

- 1700 **J2-9 Radio Transient Searches with the Allen Telescope Array**
G. C. Bower*
- 1720 **J2-10 Transient Detection with the GLAST/LAT Data Processing Pipeline**
J. Chiang*

Business Meetings

- 1700 **Commission A Room 151**
- 1700 **Commission E Room 105**
- 1800 **Commission B Room 1B40**
- 1800 **Commission J Room 265**

-
- 1900 **Town Hall Meeting for U.S. NRC Survey of the Scientific Uses of the Radio Spectrum** **Room 265**
- Moderators: A. J. Gasiewski, *University of Colorado*
<al.gasiewski@colorado.edu>
D. C. Backer, *University of California at Berkeley*
D. B. Lang, *U.S. National Research Council*

Student Paper Competition

Organizer and Chair: S. C. Reising, *Colorado State University*
<steven.reising@colostate.edu>

0850 **Announcements**

0900 **Presentations by the three finalists**

1000 **Break**

Electromagnetism in Nanotechnology

Organizers and Co-Chairs:

V. K. Nair (Comm. A), *Intel Corporation*
<v.nair@ieee.org>

L. W. Pearson (Comm. D), *Clemson University*
<pearson@ces.clemson.edu>

1030 **P1 - Electromagnetic Behavior of Metamaterials and Nanostructures at Optical Frequencies**
A. Bratkovski, *Hewlett-Packard Laboratories* <alex.bratkovski@hp.com>

1115 **P2 - The Pervasive Role of Electromagnetism in the Next Generation of Electronics and Photonics Devices for Communications Systems**
L. Lunardi, *North Carolina State University* <leda_lunardi@ncsu.edu>

Student Paper Competition

1200 **Awards Ceremony**
S. C. Reising

Session B7 - Theoretical Electromagnetics**Room 105**

Chair: E. Kuester, *University of Colorado*
<kuester@schof.colorado.edu>

- 1400 **B7-1 Path Integrals in Electromagnetics**
C. E. Baum*
- 1420 **B7-2 Maximum Recoverable Energy from a One Port Network and its Relationship to Bandwidth**
R. H. Dieren*, E. F. Kuester
- 1440 **B7-3 Electromagnetic Modeling of Carbon Nanotubes and Their Application as Microwave Interconnects**
K. Kim*, D. S. Filipovic
- 1500 **Break**
- 1520 **B7-4 Electromagnetic Wave Scattering by Elastic Objects**
M. S. Tong*, W. C. Chew
- 1540 **B7-5 Transformation of Surface Plasmon Polaritons at Surface Structures**
B. Baumeier, A. A. Maradudin, T. A. Leskova, W. Zierau.
- 1600 **B7-6 Investigation of Time Reversal Effects in Random Scattering Media on Super-Resolution by FDTD Monte Carlo Simulations**
T. Chan, S. Jaruwatanadilok, Y. Kuga, A. Ishimaru

Special Session BS8 - Metamaterials**Room 1B40**

Organizers and Co-Chairs:

N. Engheta, *University of Pennsylvania*
<engheta@ee.upenn.edu>
R. W. Ziolkowski, *University of Arizona*
<ziolkows@ece.arizona.edu>

- 1320 **BS8-1 Different Cloaks for Different Folks**
A. D. Yaghjian*, S. Maci
- 1340 **BS8-2 Exact Geometrical Optics Scattering by DNG Metamaterial Structures**
P. L. E. Uslenghi*
- 1400 **BS8-3 Metamaterial Property Determination Taking Boundary Effects into Account**
S. Kim*, E. F. Kuester, C. L. Holloway, J. Baker-Jarvis
- 1420 **BS8-4 Theory and Applications of Metafilms: The 2-D Equivalent of Metamaterials**
C. L. Holloway*
- 1440 **BS8-5 Active Coated Nano-Particles for Sensor Applications**
J. A. Gordon*, R. W. Ziolkowski
- 1500 **Break**
- 1520 **BS8-6 Design and Measurement of Frequency Tunable Metamaterials**
T. H. Hand, S. A. Cummer

- 1540 **BS8-7 Radiation Characteristics of Monopole Antenna Embedded in Low Effective Index of Refraction ($n < 1$) Wire Media**
R. Zhou*, H. Zhang, H. Xin
- 1600 **BS8-8 Experimental Demonstration of Epsilon-Near-Zero Behavior of a Waveguide at Cutoff and Its Tunneling and Energy Squeezing Properties**
B. E. Edwards*, A. Alu, M. Young, M. Silveirinha, N. Engheta
- 1620 **BS8-9 Optical Magnetism and Doubly Negative Metamaterials Based on Metallic Sphere Loops**
H. Liu*
- 1640 **BS8-10 Electric and Magnetic Dipole Modes Analysis of 3D Array of Two-Spheres Unit-Cell Configuration**
H. Mosallaei, S. Ghadarghadr

Special session FS4 – Passive Remote Sensing of the Earth’s Environment **Room 150**

Organizers and Co-Chairs:

E. Westwater, *University of Colorado*
<ed.r.westwater@noaa.gov>
S. Reising, *Colorado State University*
<steven.reising@colostate.edu>

- 1340 **FS4-1 Electrical Properties of Ocean Water at Mississippi Gulf Coast and Development of Electromagnetic Algorithms to Predict Sea Surface Salinity (SSS)**
K. B. Grantham*, T. Karacolak, R. J. Moorhead, E. Topsakal
- 1400 **FS4-2 An Anisotropic Ocean Surface Emissivity Model Based on WindSat Polarimetric Brightness Observations**
D. F. Smith*, R. L. Weber, A. J. Gasiewski
- 1420 **FS4-3 Calibration of an L-Band Soil Moisture Radiometer Using System Identification Techniques**
M. Tian*, A. J. Gasiewski
- 1440 **FS4-4 Results of Operational Near Real-Time Radiometric Soil Moisture Imaging in CLASIC 2007**
E. M. McIntyre*, A. J. Gasiewski
- 1500 **Break**
- 1520 **FS4-5 High-resolution Airborne Microwave Imaging of Snow Cover and Snow Water Equivalent (SWE) Retrieval**
B. B. Stankov*, A. J. Gasiewski, D. Cline, R. L. Weber, M. Tedesco
- 1540 **FS4-6 Wide Angle Infrared Imaging for Measuring Clouds for Earth-Space Optical Communications**
P. W. Nugent*, J. A. Shaw, S. Piazzolla
- 1600 **FS4-7 Fine-Scale Retrieval of Tropospheric Water Vapor using a Network of Compact Microwave Radiometers**
S. Padmanabhan*, J. Vivekanandan, S. C. Reising, F. Iturbide-Sanchez
- 1620 **FS4-8 Water Vapor and Liquid Water Path Retrievals from the Ground-based Scanning Radiometer during RHUBC**
E. R. Westwater*, D. Cimini, M. Klein, V. Leuski1, A. J. Gasiewski

- 1640 **FS4-9 Development of an Observational System Simulation Experiment (OSSE) for a Geostationary Microwave Imager**
A. J. Gasiewski*, R. L. Weber, A. Jash

Special session GS4 - Radar and Radio Techniques

Room 200

Organizer and Chair: F. D. Lind, *MIT Haystack Observatory*
<flind@haystack.mit.edu>

- 1400 **GS4-1 Differential Vector Velocity Effects on HF Radar Soundings in the Equatorial and in the Polar Ionosphere**
N. Zobotin*, J. W. Wright, G. Zhubankov
- 1420 **GS4-2 First Dynasonde Observations from Wallops Island**
T. W. Bullett, R. C. Livingston, R. N. Grubb, J. W. Wright, N. A. Zobotin, R. J. Redmon
- 1440 **GS4-3 A High-Accuracy HF Technique to Measure E Layer Heights**
B. Reinisch*, V. Paznukhov, D. Altadill
- 1500 **Break**
- 1520 **GS4-4 A Model of the MRR Distributed Passive Radar System**
L. E. Vertatschitsch*, J. D. Sahr
- 1540 **GS4-5 The Feasibility of Detecting and Characterizing Extensive Air Showers with Passive Radar**
G. A. Price*, M. G. Meyer
- 1600 **GS4-6 The Precision Expandable Radar Calibration Sphere (PERCS)**
P. A. Bernhardt*
- 1620 **GS4-7 Design of an FPGA-based Radar Controller**
R. Seal*, J. Urbina, M. P. Sulzer, S. Gonzalez
- 1640 **GS4-8 Voltage Level Data Management in Software Radar Systems**
F. D. Lind, P. J. Erickson, W. J. Rideout
- 1700 **Open Discussion on coordinated data standards for ionospheric measurements**
Moderator: F. D. Lind

Special session HGS4 - Ionospheric Modifications

Room 245

Organizers and Co-Chairs:

L. M. Kagan, *University of Western Ontario*
<lkagan@uwo.ca>
R. C. Moore, *University of Florida*
<moore@ece.ufl.edu>

- 1300 **HGS4-1 New Experiments in Ionospheric Heating with Low-Latitude HF Facilities**
P. A. Bernhardt*, J. D. Huba
- 1320 **HGS4-2 HF-Induced Irregularities and Scintillation Effects Investigated with the High Frequency Active Auroral Research Program (HAARP) Facility**
K. M. Groves*, S. Basu
- 1340 **HGS4-3 Studies of Langmuir Turbulence in HAARP Experiments**
J. P. Sheerin*, B. J. Watkins, W. A. Bristow, S. I. Oyama, C. J. Heinselman, K. M. Groves

- 1400 **HGS4-4 Low Altitude Artificial Auroras**
L. M. Kagan*
- 1420 **HGS4-5 CESAR: Compact Echelle Spectrograph for Aeronomic Research**
T. Slinger, E. Kendall*, A. L. Broadfoot
- 1440 **HGS4-6 Phenomena Initiated By The Hf Ionospheric Modification At Different Latitudes**
N. F. Blagoveshchenskaya, T. D. Borisova, V. A. Kornienko, T. R. Robinson, T. K. Yeoman, M. T. Rietveld
- 1500 **Break**
- 1520 **HGS4-7 F-region Magnetospheric ULF Generation by Modulated Ionospheric Heating**
D. K. Papadopoulos*, B. Tesfaye, H. Shroff, X. Shao, G. Milikh, C.-L. Chang, T. Wallace, U. Inan, D. Piddyachiy
- 1540 **HGS4-8 ELF/VLF Wave-injection Experiments and Magnetospheric Probing with the HAARP HF Heater**
U. S. Inan*
- 1600 **HGS4-9 Characterization of the D-Region Ionosphere Using ELF/VLF Wave Generation Experiments: An Interpretation and Review of Experimental Facts**
R. C. Moore*
- 1620 **HGS4-10 Variation of HF beam parameters in ELF/VLF generation via modulated heating of the auroral electrojet**
M. B. Cohen*, U. S. Inan, M. Golkowski
- 1640 **HGS4-11 Determination of Magnetospheric Propagation Paths of ELF/VLF Whistler-Mode Signals Excited by the HAARP HF Heater**
M. Golkowski*, U. S. Inan, M. B. Cohen
- 1700 **HGS4-12 Observations of ELF/VLF Waves Produced Using the HAARP HF Transmitter in Dual-Beam Configuration**
R. C. Moore*

Session J3 - Cosmic Microwave Background Instruments and Observations

Room 265

- Co-Chairs: D. Marrone, *University of Chicago*
<dmarrone@oddjob.uchicago.edu>
C. Reichardt, *California Institute of Technology*
<cr@its.caltech.edu>
- 1340 **J3-1 Results from ACBAR**
C. Reichardt*
- 1400 **J3-2 A Search for Arcminute Scale Anisotropy at 150 GHz**
S. R. Golwala*
- 1420 **J3-3 The Sunyaev-Zel'dovich Array Cluster Survey**
S. Muchovej*, J. Carlstrom, J. Cartwright, C. Greer, D. Hawkins, R. Hennessy, M. Joy, J. Lamb, E. Leitch, M. Loh, D. Marrone, A. Miller, T. Mroczkowski, C. Pryke, M. Runyan, M. Sharp, D. P. Woody
- 1440 **J3-4 South Pole Telescope**
Z. K. Staniszewski*
- 1500 **Break**

- 1520 **J3-5 The QUIET Polarimeter Array**
C. Bischoff*
- 1540 **J3-6 Status of the 1.4 Meter Telescope for the Q/U Imaging Experiment**
W. Imbriale*
- 1600 **J3-7 POLARBEAR : A Next-Generation Cosmic Microwave Background Polarization Experiment**
M. J. Myers*, P. Ade, K. Arnold, J. Borrill, M. Dobbs, G. Engargiola, G. Fuller, N. Halverson, W. Holzappel, A. Jaffe, B. Keating, Z. Kermish, A. T. Lee, E. Leitch, E. Linde, N. Miller
- 1620 **J3-8 EBEX: The E and B EXperiment**
A. Aboobaker*, P. Ade, F. Aubin
- 1640 **J3-9 Results from BICEP**
J. Kovac*

Special session KBS1 - Human Body Interaction with RF Systems

Room 151

Organizers and Co-Chairs:

Y. Rahmat-Samii, *University of California at Los Angeles*

<rahmat@ee.ucla.edu>

E. Topsakal, *Mississippi State University*

<topsakal@ece.msstate.edu>

- 1320 **KBS1-1 Antenna Design for Biomedical Applications: Small Antennas for Ingestible Capsules**
P. Izdebski*, Y. Rahmat-Samii
- 1340 **KBS1-2 On the Design of a Inductively Coupled Telemetry Coils for a Retinal Prosthesis**
A. Qusba*, A. Vinit Singh, G. Lazzi
- 1400 **KBS1-3 The Impact of Glucose Concentration in Blood Plasma on Relative Dielectric Constant and Conductivity**
E. Topsakal*, E.C. Moreland, T. Karacolak, M. Acar
- 1420 **KBS1-4 Antenna Solution for Mitigation of Near-Field Interactions with Devices and Human Operators**
T. Yang*, W.A. Davis, W.L. Stutzman
- 1440 **KBS1-5 Characterization of Skin-Mimicking Gels for Implantable Antennas Operating at ISM Band (2.4 GHz - 2.48 GHz)**
T. Yilmaz*, T. Karacolak, E. Topsakal

Special session KS2 - Wireless Medical Systems for Telemetry and Detection

Room 151

Organizers and Co-Chairs:

E. Topsakal, *Mississippi State University*

<topsakal@ece.msstate.edu>

J. Venkataraman, *Rochester Institute of Technology*

<jnveee@rit.edu>

- 1520 **KS2-1 Implantable LC Sensors for Tissue Characterization**
M. Yvanoff*, J. Venkataraman
- 1540 **KS2-2 Micromagnetic Stimulation of Retina: Numerical Solutions and Preliminary Results**
S. Srivinas*, J.S. George, G. Lazzi

- 1600 **KS2-3 An Experimental Study of Microbubbles as a Contrast Agent for Microwave-Induced Thermoacoustic Imaging of Breast Cancer**
A. Marshal*, J.H. Booske, S. C. Hagness
- 1620 **KS2-4 Exact Analytic 2D Solution to Obtain Optimal B_1 Excitation Field in Ultra-High Field MRI Applications**
G. Carluccio*, D. Erricolo
- 1640 **KS2-5 Electrical Properties of Nude Rat Skin and *In Vitro* Verification of Implantable Antennas**
T. Karacolak*, E. Topsakal
- 1700 **KS2-6 Heart Rate Extraction from Respiration Rate in Multiple Targets Measurements Using Ultra Wideband Sensors**
C. Li*, R. M. Buehrer, C. R. C. M. Da Silva

Business Meetings

1700	Commission D	Room 105
1700	Commission F	Room 150
1800	Commission G	Room 200
1800	Commission K	Room 151

Reception

1830 → 2100 **Engineering Center Lobby**

Special session AS2 - Antennas for Wireless Communications**Room 151**

Organizers and Co-Chairs:

V. K. Nair, *Intel Corporation*

<v.nair@ieee.org>

A. E. Fathy, *University of Tennessee*

<fathy@ece.utk.edu>

- 0900 **AS2-1 Overview of Factors Affecting Wireless Antenna Integration in the Mobile Platform**
A. Konanur*, K.-H. Lee, S.-Y. Suh, U. Karacaoglu, G. Chinn
- 0920 **AS2-2 Hybrid Real-Binary Particle Swam Optimization (HPSO) for Dual-Band Handset Antenna Design**
N. Jin*, Y. Rahmat-Samii
- 0940 **AS2-3 Reconfigurable Multi-Band Antenna for Multi-Radio Handsets and Laptops**
S. Yang, A. E. Fathy*, V. K. Nair
- 1000 **Break**
- 1020 **AS2-4 Balanced Antenna Research for Multi-Comm Antenna System in Wireless Mobile Devices**
S.-Y. Suh*, V. K. Nair, A. Konanur, K.-H. Lee
- 1040 **AS2-5 On-Chip Miniaturized Slot Antennas in 0.13 μ m CMOS Process**
N. Behdad*, D. Shi, M. P. Flynn
- 1100 **AS2-6 Security Issues of Retrodirective arrays**
J. Sun*, Darren Goshi, Tatsuo Itoh

Special Session BS9 - Thru-wall Modeling and Imaging**Room 1B40**

Organizers and Co-Chairs:

R. Burkholder, *Ohio State University*

<rjb@esl.eng.ohio-state.edu>

A. Hoorfar, *Villanova University*

<ahmad.hoorfar@villanova.edu>

- 0840 **BS9-1 The DARPA VisiBuilding Program**
E. J. Baranoski*
- 0900 **BS9-2 Propagation Modeling and Validation in the DARPA VisiBuilding Program**
R. S. Awadallah, D. E. Freund, C. R. Sprouse, R. J. Burkholder, R. J. Marhefka, C.-L. Chang, J. L. Volakis, E. J. Baranoski
- 0920 **BS9-3 Efficient Physics-Based, High Bandwidth Electromagnetic modeling of Building and Multi-Wall Structures**
P. B. Weichman*
- 0940 **BS9-4 Experimental Results of UWB See-Through-Wall Radar Development**
Y. Yang, A. E. Fathy
- 1000 **Break**

- 1020 **BS9-5 Advances in Through-Wall Imaging Using Impulse SAR**
G. Franceschetti*, J. Tatoian, D. Clark, J. McVay, G Gibbs
- 1040 **BS9-6 Building Structure Modeling and Reconstruction from Through-Wall**
E. R. Keydel1, N. S. Subotic, J. W. Burns, A. M. Morgan, W. D. Williams, D. Setterdahl, P. Shargo
- 1100 **BS9-7 Model-Based CLEAN Algorithm for Through-Wall Radar Image Enhancement**
P. C. Chang, R. J. Burkholder*, J. L. Volakis, R. J. Marhefka
- 1120 **BS9-8 The Building Tomography Inverse Problem**
E. M. Lavelly, Y. Zhang, E. H. Hill III, P. Weichman, Y.-S. Lai
- 1140 **BS9-9 Characterizing In-Building Scattering Primitives for Through-Wall Imaging**
J. Kim, J Grimm*, R Samaniego, J. Tomich

Special session FBS5 - Rough Surface Scattering and Effects

Room 150

Organizers and Co-Chairs:

G. S. Brown, *Virginia Tech*

<randem@vt.edu>

A. Ishimaru, *University of Washington*

<ishimaru@ee.washington.edu>

- 0820 **FBS5-1 Geometric Optics and Diffraction Effects in Forward and Backscattering From Steep and Breaking Waves**
A. G. Voronovich*, V. U. Zavorotny
- 0840 **FBS5-2 Diffraction Corrections to the GO Currents Induced at the Perfectly Conducting Smoothly Corrugated Surface**
I. Fuks*, V. U. Zavorotny
- 0900 **FBS5-3 Analysis of Numerically Simulated Wide-Band Low-Grazing HF Backscatter from Time-Varying Ocean-Like Surfaces**
J. V. Toporkov*, M. A. Sletten
- 0920 **FBS5-4 A Universal Model for Near-Nadir Ka-band Radar Backscatter from the Sea**
E. J. Walsh1*, M. L. Banner, C. W. Wright, D. C. Vandemark, B. Chapron, J. Jensen, S. Lee
- 0940 **FBS5-5 Scattering of Partially Coherent Waves Incident upon Rough Surfaces**
A. Ishimaru, S. Jaruwatanadilok, Y. Kuga
- 1000 **Break**
- 1020 **FBS5-6 Generation of Partially Coherent Light in Rough Surface Scattering and Suppression of the Speckle it Produces**
A. A. Maradudin*, T. A. Leskova, E. R. Mendez
- 1040 **FBS5-7 Near-field Scattering from a Class of Rough Surfaces**
T. H. Black*, G. S. Brown
- 1100 **FBS5-8 Simulation of Near-Ground Radiowave Propagation over Terrain Using FMM-Accelerated Nyström Method with Phase Extraction Technique**
D. Liao*, K. Sarabandi
- 1120 **FBS5-9 Ray Propagation in Inhomogeneous Atmospheres Over High Resolution 3D Terrains**
C. Rino*, D. Hancock

- 1140 **FBS5-10 The Propagation and Leakage of Waveguide Modes in a Waveguide with Randomly Rough Surfaces**
N. P. Puente*, E. I. Chaikina, E. R. Mendez, A. A. Maradudin, T. A. Leskova

Session GH5 - Ionospheric Effects of Lightning I

Room 200

Co-Chairs: N. Liu, *Pennsylvania State University*
<nul105@psu.edu>
R. A. Marshall, *Stanford University*
<ram80@stanford.edu>

- 0820 **GH5-1 The Characteristics of TLE-Producing Thunderstorms**
W. A. Lyons*
- 0840 **GH5-2 Sprite Spectral and Spatial Observations at 100 μ s resolution**
M. G. McHarg, H. Stenbaek-Nielsen, T. Kanmae
- 0900 **GH5-3 Lightning and Sprite Dynamics**
S. A. Cummer*
- 0920 **GH5-4 PIPER Sprite Observations During 2007 Summer Observation Campaign**
R. T. Newsome*, R. A. Marshall, U. S. Inan
- 0940 **GH5-5 Formation and Propagation of Negative Streamers in Sprites**
N. Liu*, V. Pasko
- 1000 **Break**
- 1020 **GH5-6 Sprites and Halos Produced by Positive and Negative Cloud-to-Ground Lightning over Argentina and Brazil: Overview of Video Images, ELF/VLF Data, and Meteorology**
J. N. Thomas*, M. J. Taylor, M. Bailey, S. A. Cummer, N. N. Solorzano, F. Sao Sabbas, D. Pautet, R. H. Holzworth, N. Jaugey, J. Li, M. P. McCarthy, M. Kokorowski, O. Pinto, Jr., N. J. Schuch
- 1040 **GH5-7 Sprite Altitudes Determined from Simultaneous Measurements**
R. Haaland*, G. McHarg, H. Nielsen, T. Kanmae
- 1100 **GH5-8 Mechanism of Infrasound Radiation from Sprites**
V. P. Pasko*, J. B. Snively
- 1120 **GH5-9 Possible Persistent Ionization Caused by Giant Blue Jets**
N. G. Lehtinen*, U. S. Inan
- 1140 **GH5-10 Dissociative Attachment as a Possible Cause of Early VLF Perturbations**
R. A. Marshall*, U. S. Inan

Session GH6 - Ionospheric Irregularities and Instabilities

Room 105

Co-Chairs: J. Sahr, *University of Washington*
<jdsahr@u.washington.edu>
Meers Oppenheim, *Boston University*
<meerso@bu.edu>

- 0800 **GH6-1 High-Resolution VHF Radar Studies of Equatorial 150 km Irregularities at Jicamarca**
E. Kudeki*, O. Royrvik, P. Reyes, M. Milla
- 0820 **GH6-2 Analysis of VHF Coherent Scatter Observations of E-Region Irregularities in Puerto Rico and North Carolina**
J. Urbina*, E. Kudeki, S. Franke, R. Pfaff

- 0840 **GH6-3 A Statistical Comparison of Auroral Electrojet- and SAPS-Induced Irregularity Scatter**
S. E. Otterbacher, M. G. Meyer
- 0900 **GH6-4 Echo Imaging Results from Stanford California**
R. Cosgrove*
- 0920 **GH6-5 Observations of Waves in Morning Period at Arecibo**
A. Bhatt*, M. Kelley, M. Sulzer
- 0940 **GH6-6 A Non-Perturbative Approach to Ionospheric Turbulence**
A. M. Hamza*
- 1000 **Break**
- 1020 **GH6-7 A Comparison of Rocket Observations and Numerical Simulations of Farley-Buneman Turbulence in the E-Region**
L. P. Dyrud*, B. Krane, M. Oppenheim, H. L. P'ecseli, J. Trulsen, A. W. Wernik
- 1040 **GH6-8 The First Large-Scale Simulations of Farley-Buneman Turbulence in 3D**
M. Oppenheim, Y. Dimant, L. Dyrud
- 1100 **GH6-9 Ionospheric Density Irregularities and Electromagnetic Magnetosphere-Ionosphere Interactions at High Latitudes**
A. V. Streltsov
- 1120 **GH6-10 Omnipresent Waves in the Thermosphere?**
D. J. Livneh, J. D. Mathews, F. T. Djuth
- 1140 **GH6-11 Longitudinal Variability of the Low Latitude Ionosphere and Scintillation Activity**
D. Anderson*, M. Fedrizzi, C. Coker, K. Dymond, S. Budzien, D. Chua, S. Basu, R. Caton
- 1200 **GH6-12 Model Simulation of the Equatorial Electrojet and Vertical Drift**
T. W. Fang, A. D. Richmond, J. Y. Liu, A. Maute

Special session HGS5 - Dusty Plasmas and AIM Results I

Room 245

Organizers and Co-Chairs:

W. Scales, *Virginia Tech*

<wscales@vt.edu>

E. Thomas, Jr., *Auburn University*

<etjr@physics.auburn.edu>

AIM Satellite Results

- 0840 **HGS5-1 Initial Results of Global Imaging of PMCs from the CIPS Experiment on the AIM Satellite**
D. Rusch*
- 0900 **HGS5-2 Polar Mesospheric Cloud Measurements from the Solar Occultation For Ice Experiment (SOFIE)**
M. Hervig*
- 0920 **HGS5-3 The Cosmic Dust Experiment (CDE) Onboard the Aeronomy of Ice in the Mesosphere Mission**
M. Horanyi*, A. Poppe, D. James
- 0940 **HGS5-4 Laboratory experiments for AIM CDE Noise Analysis**
D. James*, A. Poppe, M. Horanyi

1000 **Break**

Dusty Plasma Laboratory Experiments

1020 **HGS5-5 Laboratory Studies of the Lunar Surface Potential and Plasma Probes for In Situ Measurements**

X. Wang*, M. Horanyi, Z. Sternovsky, S. Roberston, G.E. Morfill

1040 **HGS5-6 Density and Velocity Fluctuations and Finite Temperature Effects in Driven, Vertically Propagating Dust Acoustic Waves**

E. Thomas, Jr.* , R. L. Merlino

Session J4 - Designing Large N Arrays

Room 265

Chair: J. M. Cordes, *Cornell University*
<cordes@astro.cornell.edu>

0900 **J4-1 Antenna Cost Modeling For Large Arrays**

L. R. D'Addario*

0920 **J4-2 Calibration and Imaging Considerations in the Design of Large-N Arrays**

A. J. Kembal*

0940 **J4-3 The Dark Ages Lunar Interferometer**

J. Lazio*, S. Neff, D. Jones, J. Burns, S. Ellingson, S. Furlanetto, J. Kasper, R. MacDowall, G. Taylor, H. Thronson, K. Weiler, S. Bale, L. DeMaio, L. Greenhill, M. Kaiser, J. Ulvestad

1000 **Break**

1020 **J4-4 Scaling Correlator Architectures to Large Arrays of Antennas**

R. Navarro*

1040 **J4-5 Site Selection, Data Communications and Array Design for the Long Wavelength Array**

G. B. Taylor*, J. Dickel, F. Schinzel, S. Tremblay, Y. Pihlstrom, P. Crane, A. Cohen

1100 **J4-6 The Frequency Agile Solar Radiotelescope**

T. Bastian*

1120 **J4-7 Radio Interferometer Array Point Spread Functions**

D. P. Woody*

Special Session BS10 - RFID and Small Antennas**Room 1B40**

Organizers and Co-Chairs:

J. Volakis, *Ohio State University*

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W. A. Davis, *Virginia Tech*

<wadavis@vt.edu>

- 1320 **BS10-1 Novel Antenna Designs for Inkjet-Printed RFID Tags and Universal RFID Readers**
M. M. Tentzeris, A. Traille, L. Yang, A. Rida, R. Vyas, T. Wu
- 1340 **BS10-2 Miniaturized Active RFID Sensor Tags for use in a Robust Container Monitoring System**
K. E. Browne*, J. L. Volakis, C.-C. Chen
- 1400 **BS10-3 The Hidden Benefits of Backscatter Radio and RFID at 5.8 GHz**
G. D. Durgin*
- 1420 **BS10-4 End-fed RFID Tag Antenna Design**
J. F. Kim, W. A. Davis*
- 1440 **BS10-5 MicroChip Based High Throughput Small Footprint Wireless Vibration Sensors**
J. Kunthong, S. Welch, X. Cai, S. Bukkapatnam, V. Sarangan
- 1500 **Break**
- 1520 **BS10-6 Low-Frequency Bandwidth Extension of UWB Monocone Antennas**
J. L. McDonald*, F. Lalezari, D. S. Filipovic
- 1540 **BS10-7 Ferrite loaded Volumetric Spiral Antenna**
I. Tzanidis*, C.-C. Chen, J. L. Volakis
- 1600 **BS10-8 Miniature Antenna Using Printed Coupled Lines Emulating Degenerate Band Edge Crystals**
G. Mumcu*, K. Sertel, J. L. Volakis
- 1620 **BS10-9 Passive and Active Circuit Matching for VHF Antennas**
S. Koulouridis*, J. L. Volakis
- 1640 **BS10-10 Phase-Compensated Loaded-Loop Antenna for Near Field UHF RFID**
R. A. Oliver*

Session BS11 - Wireless Propagation and MIMO**Room 105**

Organizers and Co-Chairs:

M. Jensen, *Brigham Young University*

<jensen@ee.byu.edu>

S. Ellingson, *Virginia Tech*

<ellingson@vt.edu>

- 1320 **BS11-1 Lateral Position Dependence of MIMO Capacity in a Hallway at 2.4 GHz**
S. W. Ellingson, M. Harun

- 1340 **BS11-2 Investigation of the Effects of Antenna Spacing and Orientation in MIMO System for Wireless Laptop Reception**
S.-W. Lee*, A. E. Fathy, S. M. El-Ghazaly, V. K. Nair
- 1400 **BS11-3 Optimal Antenna Characteristics for MIMO Systems**
B. T. Quist, M. A. Jensen*
- 1420 **BS11-4 Parameterized Channel Feedback using Correlation-Based Channel Models for Multi-user MIMO Systems**
A. L. Anderson*, J. R. Zeidler, M. A. Jensen
- 1440 **BS11-5 Noise Penalty Due to Mutual Coupling for Receive Arrays**
K. F. Warnick*, D. Jones, B. D. Jeffs , M. A. Jensen
- 1500 **Break**
- 1520 **BS11-6 Polarization and Spatial Diversity for Wearable Antennas**
D. Psychoudakis, C.-C. Chen, J. L. Volakis*
- 1540 **BS11-7 A New MIMO Channel Model Including Diversity, Orientation and Depolarization Effects**
R. Bhagavatula1, C. Oestges, R. W. Heath, Jr.*
- 1600 **BS11-8 Three Dimensional Propagation Prediction Using Online Geo-Spatial Data**
Z. Yun, S. Y. Lim, M. F. Iskander
- 1620 **BS11-9 Novel Multi-Band MIMO Antenna Designs for Laptop Applications**
Y. Rahmat-Samii*
- 1640 **BS11-10 Frequency Reconfiguration of a Microstrip Patch Antenna Enabled by Colloidal Dispersions**
S. Goldberger*, G. H. Huff

Session BD12 - Devices, Guided Waves, and Propagation

Room 150

Chair: D. S. Filipovic, *University of Colorado*
<dejan@colorado.edu>

- 1320 **BD12-1 Reflection Type of Injection Locked Gunn Oscillator and Its Applications at 60 GHz**
F. Kuroki, K.-I. Ohue
- 1340 **BD12-2 Design, Fabrication and Characterization of Switched Oscillators at 200 and 500 MHz**
D. V. Giri, M. Nyffeler, M. C. Skipper
- 1400 **BD12-3 Transmission Characteristics of Bilaterally Metal-Loaded Tri-Plate Strip Transmission Line at Millimeter-wavelengths**
F. Kuroki, Y.-S. Omote, R.-T. Mazumoto
- 1420 **BD12-4 Crosstalk Analysis of Micromachined Rectangular Coaxial Lines**
Y. Saito*, D. S. Filipovic
- 1440 **BD12-5 The Effect of Conductivity on the Brillouin Precursor**
N. A. Cartwright*, K. E. Oughstun
- 1500 **Break**

- 1520 **BD12-6 Range Dependent Marine Atmospheric Boundary Layer Refractivity Profiles Developed by Blending Evaporation Duct Model and Numerical Weather Prediction Model Profiles**
W. D. Thornton, R. E. Marshall
- 1540 **BD12-7 Propagation Model Development Considerations for Close-in Distances and Low-Antenna Height Applications**
N. DeMinco
- 1600 **BD12-8 Observation of Controllable Non-Bragg Gap in Periodically Corrugated Waveguide**
V. A. Pogrebnyak, J. Whalen*

Session C1 - Radio Circuits and Systems

Room 151

Co-Chairs: F. L. Teixeira, *Ohio State University*
<teixeira@ece.osu.edu>
L. W. Pearson, *Clemson University*
<pearson@ces.clemson.edu>

- 1400 **C1-1 Design of a Smart Antenna Test-Bed for WiMAX Radio Technologies**
M. Panique, A. Khallaayoun, Y. Huang
- 1420 **C1-2 Dual-Frequency Amplitude and Phase Measurements by Blind Demodulation of MSK-Modulated VLF Signals**
R. C. Moore*
- 1440 **C1-3 Reconfigurable Distributed Networking for Terrestrial and Space Applications**
A. Zamora*, T. Lim, T. N. Tamashiro, R. T. Iwami, W. G. Tonaki, J. M. Akagi, W. A. Shiroma
- 1500 **Break**
- 1520 **C1-4 Ultrawideband Time-Reversal Imaging Using Space-Frequency Multistatic Data Matrices**
M. E. Yavuz*, F. L. Teixeira
- 1540 **C1-5 RF Processing for Cancellation of Close-In Interferer**
J. B. Simoneau, L. W. Pearson*, C. W. Baum
- 1600 **C1-6 Detection of Multilayer Targets Using NRD Guide Pulse Radar at 60 GHz**
F. Kuroki, K. Takayama

Session GH7 - Ionospheric Effects of Lightning II

Room 200

Co-Chairs: N. Liu, *Pennsylvania State University*
<nul105@psu.edu>
R. A. Marshall, *Stanford University*
<ram80@stanford.edu>

- 1320 **GH7-1 High-Energy Secondary Electron Beams Produced by Terrestrial Gamma-Ray Flashes**
J. R. Dwyer*, D. M. Smith, B. W. Grefenstette
- 1340 **GH7-2 Meteorological Context of RHESSI Terrestrial Gamma-Ray Flashes**
B. J. Hazelton*, D. M. Smith, S. M. Lazarus, M. E. Splitt, J. R. Dwyer, H. K. Rassoul, E. H. Lay, R. H. Holzworth
- 1400 **GH7-3 A Reanalysis of the Time Evolution and Spectroscopy of the BATSE TGFs**
B. W. Grefenstette*, D. M. Smith, J. R. Dwyer, G. J. Fishman

- 1420 **GH7-4 The Production Altitude and Time Delays of the Terrestrial Gamma Flashes → Revisiting the BATSE Spectra**
N. Ostgaard*, T. Gjesteland, J. Stadsnes , P. H. Connell , B. Carlson
- 1440 **GH7-5 Energetic Electrons Accompanying Terrestrial Gamma-Ray Flashes**
B. E. Carlson*, N. G. Lehtinen, U. S. Inan

Special session GS8 - Ionospheric Models and Data Assimilation

Room 200

Organizers and Co-Chairs: A. Komjathy, *Jet Propulsion Laboratory*

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G. Bust, *Atmospheric & Space Technology Research Associates*

<gbust@astraspace.net>

- 1500 **GS8-1 Relating the Interplanetary-Induced Electric Fields (IEFs) with the Low-Latitude Zonal Electric Fields (LLZEFs) under Geomagnetically Disturbed Conditions**
A. Anghel*, D. Anderson, T. Fuller-Rowell, J. Chau, K. Yumoto, A. Bhattacharyya
- 1520 **GS8-2 Electron Density Profile Inversions Obtained from FORTE Broadband Data**
S. Close*, G. Bust, A. R. Jacobson
- 1540 **GS8-3 Including Airglow Measurements in Ionospheric Data Assimilations**
R. DeMajistre*, R.K. Schaefer, L.J. Paxton
- 1600 **GS8-4 Investigation of the Impact of New Data Sources on IDA4D Analyzed Electron Densities**
G. Bust*
- 1620 **GS8-5 The Challenges of Validating GAIM Models of the Ionosphere**
C.R. Baker*, G.J Bishop, D.T. Decker, L.F. McNamara, J.A. Welsh
- 1640 **GS8-6 Assimilating COSMIC And Ground-Based GPS Measurements To Estimate Ionospheric Parameters Using JPL/USC GAIM**
A. Komjathy*, B. Wilson, X. Pi, M. Dumett, B. Iijima, A. Mannucci
- 1700 **GS8-7 Global Assimilative Ionospheric Modeling and the Tiny Ionospheric Photometer on the COSMIC Constellation**
C. Coker, P. B. Dandenault, K. F. Dymond, S. A. Budzien, D. Chua, X. Pi, A. Komjathy, G. S. Bust
- 1720 **GS8-8 Imaging of Sporadic E Layers with the Poker Flat Incoherent Scatter Radar**
C. J. Heinselman, M. J. Nicolls
- 1740 **GS8-9 Imaging Coherent Backscatter Radar Observations of Equatorial F-Region Irregularities in Brazil**
F. S. Rodrigues, D. L. Hysell, E. R. de Paula

Special session HGS6 - Dusty Plasmas and AIM Results II

Room 245

Organizers and Co-Chairs:

W. Scales, *Virginia Tech*

<wscales@vt.edu>

E. Thomas, Jr., *Auburn University*,

<etjr@physics.auburn.edu>

Dusty Space Plasma Experiments

- 1340 **HGS6-1 The Charged Aerosol Release Experiment (CARE)**
P. A. Bernhardt*, W. Scales, C. Chen
- 1400 **HGS6-2 Detection and Mass-analysis of Charged Aerosol Particles in a PMSE/NLC Layer by a Rocket-Borne Spectrometer**
S. Roberston*, M. Horanyi, S. Knappmiller, Z. Sternovsky, R. Holzworth, M. Shimogawa, J. Gumbel, M. Khaplanov, L. Megner, M. Friedrich, G. Baumgarten, R. Latteck, M. Rapp
- 1420 **HGS6-3 Mesospheric Aerosol Sampling Spectrometer**
S. Knappmiller*, S. Roberston, M. Horanyi, R. Kohnert, Z. Sternovsky
- 1440 **HGS6-4 Simple Rocket-Borne Spectrometer to Measure the Ion Composition of the Mesosphere**
S.J. Smith*, S. Robertson, Z. Sternovsky
- 1500 **Break**
- Ground-Based Dusty Space Plasma Measurements*
- 1520 **HGS6-5 Recent Measurements of PMSE with the 450-MHz Poker Flat Incoherent Scatter Radar**
M. J. Nicholls*, C. J. Heinselman, M. C. Kelley, R. H. Varney, M. J. Taylor, R. L. Collins, K. Mizutani
- 1540 **HGS6-6 D-Region and PMSE Studies with PFISR**
D. Janches*, M. J. Nicolls, D. C. Fritts, C. Heinselman
- 1600 **HGS6-7 Diagnostic Possibilities Utilizing Radio Wave Heating of Mesospheric Dust Clouds**
W. A. Scales*, C. Chen

Session J5 - New Telescopes, Techniques and Observations **Room 265**

Chair: D. P. Woody, *California Institute of Technology*
<dwoody@caltech.edu>

- 1320 **J5-1 GAVRT: A Radio Astronomy Based Science Curriculum for K-12 Students**
G. Jones*
- 1340 **J5-2 The Supercam IF Processor: Back-End Technology for Large-Format Focal Plane Arrays**
G. Jones*
- 1400 **J5-3 SuperCam: A 64 Pixel Superheterodyne Camera**
C. Groppi*
- 1420 **J5-4 Mapping the Beam of a Low Frequency Antenna Using Satellite Signals**
R. F. Bradley*
- 1440 **J5-5 Interference Cancellation and Sensitivity Optimization using an L-Band Focal Plane Array on the Green Bank 20m Telescope**
J. Landon*, D. Jones, B. D. Jeffs, K. F. Warnick, R. Fisher, R. Norrod
- 1500 **Break**
- 1520 **J5-6 Instrument Development for the Precision Array to Probe the Epoch of Reionization (PAPER)**
R. Bradley*

1540 **J5-7 The GAVRT Back-End Sub-System: an FPGA Based Instrument Capable of Processing Radio Astronomy Signals with Extremely Large Instantaneous Bandwidth**
G. Jones*

1600 **J5-8 A Time-Domain Beam-Former with Integrated Correlator for Rapid Calibration of Antenna Arrays**
W. C. Barott*, O. Milgrome, M. Wright, V. Nagpal, D. MacMahon

Business Meetings

1700 **Commission C Room 151**

1700 **Commission H Room 245**

Sunday AM

January 6, 2008

0630 → 0800 **USNC/URSI Executive Council, Marriott Hotel**

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