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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Navigation in Adobe Reader ( )

There are several techniques to navigate through the conference PDF. These include the navigation buttons, links in the file, bookmarks, the find (search in the local file), or the search function of Reader.

Navigation buttons (ACROBAT TOOLBAR – They may appear on the main menu toolbar or on the lower status bar of Reader)

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Go to the start of the current document 

NAVIGATION – historical:

Go forward one page in the history of all pages viewed 

Go back one page in the history of all pages viewed 

Links in the file: There are links for the abstracts and in the author list at the end of the document. Just select the link when the hand changes to a pointed hand.

Table of Contents – links to the sessions
Sessions – links to each paper in the session
Author List – links to the papers for each author
Note: Use the history button to return to the Program from an Abstract

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Search (all of the abstracts)

If you select the Search button (

), you may search the index of the abstracts for specific words. Use the radio button for the 2008 NRSM index.

**Page View (

)**

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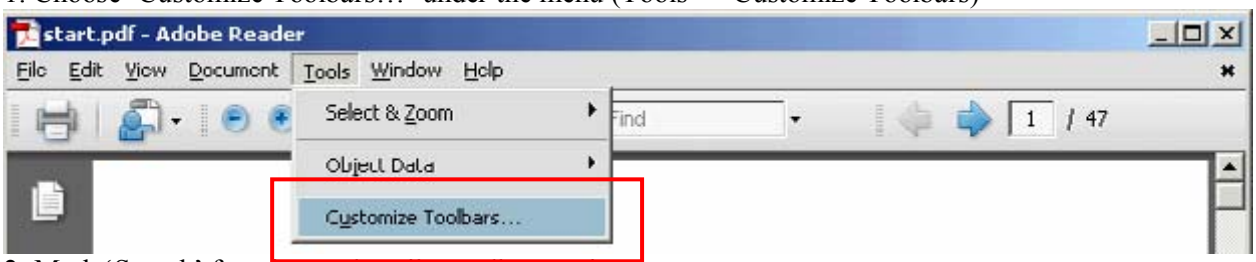
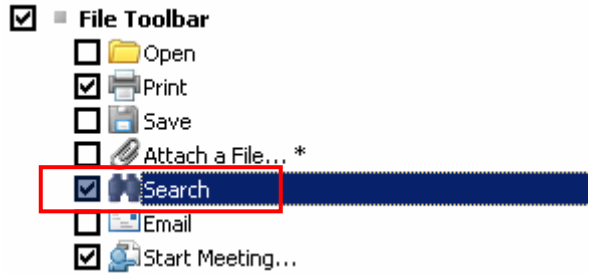
The search (Search), previous (Previous View), and next (Next View) view functions provide a convenient way to explore individual abstract files linked in this document (Start.pdf). However, in Adobe Reader version 8, these functions are disabled on the toolbar as a default setting, as shown in the screen shot below.

Steps to enable search function (Search)

1. Choose 'Customize Toolbars…' under the menu (Tools → Customize Toolbars)



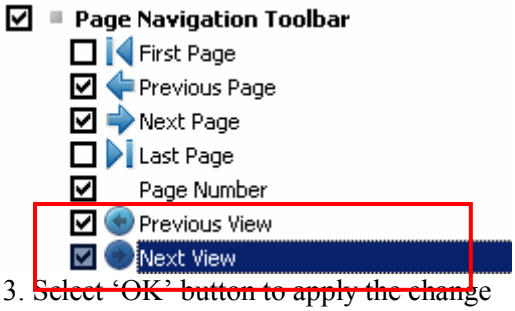
2. Mark 'Search' function under File Toolbar section



3. Select 'OK' button to apply the change

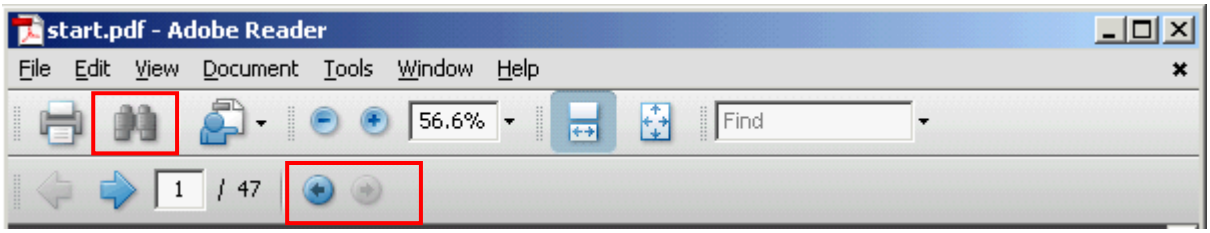
Steps to enable previous (Previous View), and next (Next View) view functions

1. Choose 'Customize Toolbars…' under the menu (Tools → Customize Toolbars)
2. Mark both 'Previous View' and 'Next View' functions under Page Navigation Toolbar section



3. Select 'OK' button to apply the change

After enabling the functions, the toolbar section should have search and previous & next view icons as the below:



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
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American Astronomical Society (AAS)	Donald Backer
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Commission C: Signals and Systems	Devereux Palmer
Commission D: Electronics and Photonics	L. Wilson Pearson
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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

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Chair, USNC-URSI Meetings Committee	William A. Davis
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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 B: Thursday, January 3, 18:00
Commission C: Saturday, January 5, 17:00
Commission D: Friday, January 4, 17:00
Commission E: Thursday, January 3, 17:00
Commission F: Friday, January 4, 17:00
Commission G: Friday, January 4, 18:00
Commission H: Saturday, January 5, 17:00
Commission J: Thursday, January 3, 18:00
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 → Exact→ Discrete Inverse Method**
K. J. Kaczmarski*, 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. Yeary, 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. Fentzke, 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

Session J1 - Recent Solar System Radio and Radar Results **Room 265**

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. Mouginot, 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. Wasylkiwskyj*, 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. Zaghloul

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. Zaghloul, 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-Feed 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

Special Session FS3 - Propagation Modeling and Measurements **Room 150**

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*

Session GH2 - Meteor Physics II **Room 200**

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. Niranjan, 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. Niranjan, D.S.V.V.D. Prasad

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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

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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*

Plenary session **Math Auditorium**

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. Direen*, 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. Zabotin*, J. W. Wright, G. Zhbankov

1420 **GS4-2 First Dynasonde Observations from Wallops Island**
T. W. Bullett, R. C. Livingston, R. N. Grubb, J. W. Wright, N. A. Zabotin, 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. Slanger, E. Kendall*, A. L. Broadfoot

1440 **HGS4-6 Phenomena Initiated By The Hf Ionosperic 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. Holzapfel, 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 0.13µm 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. Lavely, 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 μs 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. Kemball*

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*
<volakis.1@osu.edu>
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*
<attila.komjathy@jpl.nasa.gov>
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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