USNC–URSI National Radio Science Meeting

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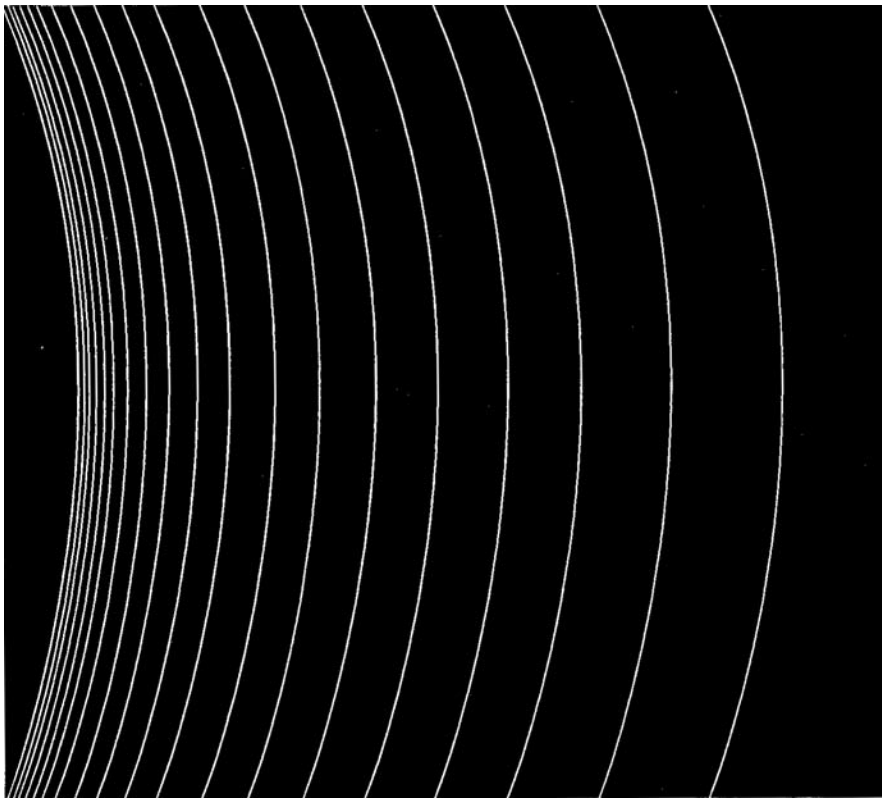

6–9 January 2010

Boulder, Colorado, USA

Sponsored by the US National Committee for

International Union of Radio Science

and CU Conference Services,

University of Colorado at Boulder

www.nrsmboulder.org

2010 NRSM

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2010 USNC-URSI National Radio Science Meeting
Meeting Overview: Technical Program and Commission Business Meetings

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Lunch								
Wednesday 6 January 13:20-17:00	FS3 - Mesoscale Numerical Weather Prediction in Support of Wave Propagation Modeling II	FS4 - Passive Remote Sensing of the Earth's Environment	K2 - Electromagnetic Sensing and Treatment Applications in Medicine	D1 - Microwave, mm-wave and submm-wave circuits and applications	GH1 - Ionospheric Modification I	G2 - Radar and Radio Techniques GH2 - Complex Dynamical Systems and Statistical Inversion	J1 - Designs and Subsystems for the Square Kilometer Array	BS1 - Special Session: Graphics Processing Units for Computational Electromagnetics
Evening		F Business - 17:00	K Business - 18:00	D Business - 17:00	G Business - 18:00			
Thursday 7 January 08:20-12:00	**Plenary Session and Student Paper Competition**							
Lunch	**Lunch Provided for Student Travel Awardees and Student Paper Finalists**							
Thursday 7 January 13:20-17:00	E1 -High-Power Electromagnetics: Environments and Sources	F2 - Propagation Modeling and Measurements	B3 - Printed Devices	A2 - Metrology Efforts at NIST	GH3 - Ionospheric Modification II	H2 - Waves in Space Plasmas	J2 - Digital Signal Processing for Radio Astronomy	B2 - Antenna Theory, Design, and Measurement
Evening	E Business - 17:00			A Business - 17:00			J Business - 18:00	B Business - 18:00
Friday 8 January 08:20-12:00	E2 - EM Interference: Effects and Cyber Threats C1 - Signals and Systems: Algorithms	FS5 - Waves in Random and Complex Media	B4 - Metamaterials	K3 - Human body interactions with electromagnetic devices	GJ1 - Ionospheric Measurements and Radiotelescope Effects	HG1 - Lightning-Ionospheric Interactions I	J3 - Pulsar Timing Precision for Probing Gravity	BS2 - Special Session: Ultra-Wideband Antennas
Lunch								
Friday 8 January 13:20-17:00	C2 - Signals and Systems: Applications C3 - Signals and Systems: Performance and Processing	FS6 - Waves in Random Media with Applications in Remote Sensing of Vegetation	B6 - Computational Methods in Electromagnetics	A3 - Antenna Measurements A4 - Specialized Measurement Techniques for Antennas & Materials	G3 - Ionospheric Data Assimilation and Modeling	HG2 - Lightning-Ionospheric Interactions II HG3 - Lunar Dust Dynamics	J4 - New Telescopes, Techniques and Observations	B5 - Trends in Theoretical Electromagnetics
Evening	C Business - 17:00					H Business - 17:00		

International Union of Radio Science/Union Radio Scientifique Internationale

Founded in 1919, the International Union of Radio Science (URSI) coordinates studies, research, applications, scientific exchange, and communication in all fields of radio science from telecommunications and radio astronomy to medicine (www.ursi.org).

Both the union and the U.S. national committee are organized into ten commissions:

Electromagnetic Metrology (Commission A)
Fields and Waves, Electromagnetic Theory and Applications (Commission B)
Radiocommunication Systems and Signal Processing (Commission C)
Electronics and Photonics (Commission D)
Electromagnetic Environment and Interference (Commission E)
Wave Propagation and Remote Sensing (Commission F)
Ionospheric Radio Propagation (Commission G)
Waves in Plasmas (Commission H)
Radio Astronomy (Commission J)
Electromagnetics in Biology and Medicine (Commission K)

About the USNC-URSI

The U.S. National Committee to URSI (USNC-URSI) is appointed by the National Research Council of the National Academies and represents U.S. radio scientists in URSI. It encourages studies in radio science, provides a forum for the dissemination of research findings, and provides an organizational infrastructure for the radio science community in the United States.

The USNC-URSI hosts the National Radio Science meeting each January in Boulder, Colorado. The National Radio Science symposium, co-sponsored by the USNC-URSI and the Antennas and Propagation Society of the Institute of Electrical and Electronics Engineers (IEEE/AP-S), is held each summer. Every few years, a North American Radio Science (NARS) meeting is organized, co-sponsored by the U.S. and Canadian National Committees to URSI. Ottawa, Canada, hosted the most recent NARS meeting in July 2007.

The international URSI General Assembly is held every three years in locations around the world. The USNC-URSI is proud to have hosted the 29th General Assembly in Chicago, Illinois, August 7-16, 2008. Over 1,200 U.S. and international scientists, including over 350 students and Young Scientists, participated in sessions covering all ten commissions. The USNC-URSI helped to support meeting expenses for approximately 200 U.S. and international students and Young Scientists. The 30th URSI General Assembly will be held in Istanbul, Turkey, August 13-20, 2011. For further information on the USNC-URSI please visit www.usnc-ursi.org.

U.S. National Committee Leadership and Commission Chairs (2009-2011)

(In addition to the individuals below, the USNC-URSI includes Members at Large, Society Representatives, and scientists serving in executive roles in international URSI.)

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USNC-URSI National Radio Science Meeting
January 6-9, 2010
University of Colorado at Boulder

Final Program

Tuesday Evening **5 January 2010**

19:00 – 23:00 USNC-URSI Committee, Millennium Hotel

Wednesday Morning **6 January 2010**

Session A1: Measurement and Calibration Techniques for Remote Sensing Applications
Room 155

Co-Chairs: Albin Gasiewski, *University of Colorado at Boulder*
Ozlem Kilic, *The Catholic University of America*

08:20 A1-1 US NAVY RADAR CROSS SECTION MEASUREMENT CAPABILITIES & CALIBRATION
Bruce Crock*, Thomas Miller
RF Technology Branch, Naval Surface Warfare Center, West Bethesda, MD

08:40 A1-2 OPTIMAL CALIBRATION OF RADIOMETER USING SYSTEM IDENTIFICATION TECHNIQUES
Miao Tian*, Albin J. Gasiewski
ECEE, University of Colorado, Boulder, Boulder, Colorado

09:00 A1-3 ANALYZING NON STATIONARY PROCESSES IN RADIOMETERS
Paul E. Racette*
NASA Goddard Space Flight Center, Greenbelt, MD

09:20 A1-4 A NEW ANALYTIC FORMULATION FOR IONOSPHERIC REMOVAL IN GPS RADIO OCCULTATION MEASUREMENTS
Christopher Jeffery*
LANL, Los Alamos, NM

Session B1: Session in Memory of Professor Robert S. Elliott
Room 1B40

Co-Chairs: Yahya Rahmat-Samii, *UCLA*
Sembiam Rengarajan, *California State University, Northridge*

08:20 B1-1 APPLICATION OF THE RECIPROCITY PRINCIPLE IN THE DESIGN AND ANALYSIS OF MICROSTRIP REFLECTARRAY ANTENNAS
Sembiam R. Rengarajan*[1,2]
[1]*Electrical and Computer Engineering, California State University, Northridge, CA*
[2]*Jet Propulsion Laboratory, Caltech, Pasadena, CA*

08:40 B1-2 COGNITIVE ARRAY - A NEW APPROACH
William G. Tidd*, Raymond J. Weber, Yikun Huang
Electrical and Computer Engineering, Montana State University Bozeman, Bozeman, MT

09:00 B1-3 MODELING PATTERN RECONFIGURABLE ANTENNAS FOR USE IN ADAPTIVE ARRAYS

Tyrone L. Roach*, Jennifer T. Bernhard
Electrical and Computer Eng., University of Illinois at Urbana-Champaign, Urbana, IL

09:20 B1-4 INTEGRATION AND PERFORMANCE OF A COSMIX-ENABLED PHASE RECONFIGURABLE REFLECT-ARRAY ELEMENT

Stephen A. Long*, Gregory H. Huff
Electrical and Computer Engineering, Texas A&M University, College Station, TX

09:40 B1-5 ROTMAN LENS VERSUS POWER DIVIDER FOR ARRAY APPLICATIONS

Junwei Dong*[1,2], Rudolf Cheung[2]
[1]The Bradley Department of Electrical & Computer Engineering, Virginia Polytechnic Institute and State University, Falls Church, VA
[2]Microwave Engineering Corporation (MEC), North Andover, MA

10:00 Break

10:20 B1-6 APPLICATION OF MATRIX METHOD WITH ORTHOGONAL MODES FOR SIMPLE DESIGN OF MULTIBAND/WIDEBAND SMALL ANTENNAS

Keisuke Noguchi*[1], Harish Rajagopalan[2], Yahya Rahmat-Samii[2]
[1]Department of Information and Communication Engineering, Kanazawa Institute of Technology, Nonoichi, Ishikawa
[2]Electrical Engineering Department, University of California, Los Angeles, Los Angeles, California

10:40 B1-7 APPLICATION OF RETRODIRECTIVE ARRAYS FOR NATIONAL SECURITY

Bao Jun Lei*, Larry K. Martin, Reece T. Iwami, Tyler C. Chun, Alexis Zamora, Monte K. Watanabe, Wayne A. Shiroma
Department of Electrical Engineering, University of Hawaii at Manoa, Honolulu, HI

11:00 B1-8 Development of SIW Cavity-Backed Dual Polarized Ku-Band Microstrip Patch Arrays

Mohamed H. Awida*[1], Shady H. Suleiman[2], Aly E. Fathy[1]
[1]University of Tennessee at Knoxville, Knoxville, TN
[2]Winegard Company, Burlington, IA

11:20 B1-9 A STEERABLE 60GHZ ARRAY ANTENNA USING RECONFIGURABLE DIELECTRIC SLAB MATERIALS

Matthew Stoneback*
University of Washington, Seattle, WA

11:40 B1-10 AN INEXPENSIVE, PHASED-ARRAY DESIGN USING IMPEDANCE MODULATION

Majid Manteghi*
ECE, Virginia Tech, Blacksburg, VA

12:00 B1-11 TERAHERTZ INTERFEROMETRIC IMAGING THROUGH A RANDOM MEDIUM

Andrew T. Smith*, Ozlem Kilic
The Catholic University of America, Washington, DC

Session F1: Active Remote Sensing of the Oceans, Atmosphere and Land
Room 150

Co-Chairs: Valery Zavorotny, *NOAA/Earth System Research Laboratory*
Roger Lang, *George Washington Uniiversity*

08:20 F1-1 MICROWAVE IMAGERY OF INTERNAL WAVES ON THE OCEAN

William J. Plant*, William C. Keller, Kenneth Hayes, Gene Chatham
Applied Physics Laboratory, University of Washington, Seattle WA

08:40 F1-2 OCEAN SCATTEROMETRY WITH GPS BISTATIC SOFTWARE RADAR

Valery U. Zavorotny*[1], Dennis M. Akos[2], Edward J. Walsh[1]
[1]*Physical Sciences Division, NOAA/Earth System Research Laboratory, Boulder CO*
[2]*Department of Aerospace Engineering Sciences, University of Colorado, Boulder CO*

09:00 F1-3 A STUDY OF INTERFEROMETRIC PHASE STATISTICS FOR SEA SURFACE HEIGHT RETRIEVAL USING NUMERICALLY SIMULATED BACKSCATTER DATA

Chun Sik Chae*, Joel T. Johnson
Electrical And Computer Engineering/ElectroScience Lab, The Ohio State University, Columbus Ohio

10:00 Break

10:20 F1-4 COMPARISON OF ALTERNATIVE MODELS FOR EM BACKSCATTERING FROM THE SEA SURFACE UNDER THE SMALL AMPLITUDE APPROXIMATION

Wasyl Wasylkiwskyj*[1], Jimmy Alatishe[2]
[1]*Electrical and Computer Eng., The George Washington University, Washington DC*
[2]*Radar Division, Naval Research Laboratory, Washington DC*

10:40 F1-5 HIGH POWER AMPLIFIER DESIGN FOR A NEW 449 MHZ WIND PROFILER RADAR

Brad Lindseth*[1,2], William O. J. Brown[1], Steve A. Cohn[1], James R. Jordan[3], Terry Hock[1], Nestor Lopez[4,2], John Hoversten[2], Zoya Popovic[2]
[1]*EOL, NCAR, Boulder, CO*
[2]*ECEE, University of Colorado, Boulder, CO*
[3]*NOAA, Boulder, CO*
[4]*MIT Lincoln Laboratory, Lexington, MA*

11:00 F1-6 MAPPING OF SAND LAYER THICKNESS IN DESERTS USING SAR INTERFEROMETRY

Adel Elsherbini*, Kamal Sarabandi
Radiation Laboratory, University of Michigan, Ann Arbor, MI

Session FS1: Mesoscale Numerical Weather Prediction in Support of Wave Propagation Modeling I
Room 105

Co-Chairs: Robert Marshall, *Naval Surface Warfare Center, Dahlgren*
Tracy Haack, *NRL*

08:20 FS1-1 REVIEW ON THE MODEL PREDICTION OF EM/EO IN THE COASTAL LITTORAL ZONE

Sue Chen*, Tracy Haack
NRL, Monterey CA

08:40 FS1-2 REVIEW ON THE MODEL PREDICTION OF EM/EO IN THE COASTAL LITTORAL ZONE: PART 2

Sue Chen*, Tracy Haack
NRL, Monterey CA

09:00 FS1-3 METEOROLOGICAL DATA REQUIREMENTS FOR SURFACE-BASED NAVAL RADARS

George D. Dockery*
Johns Hopkins University Applied Physics Laboratory, Laurel, MD

09:20 FS1-4 WRF-MODEL BASED CLIMATOGRAPHIES OF EVAPORATION DUCT HEIGHT

Francois Vandenberghe*[1], Eric Mandine[2], Michel Aidonidis[3]
[1]*NCAR, Boulder, CO*
[2]*C-S, Toulon*
[3]*SHOM, Brest*

09:40 FS1-5 ATMOSPHERIC REFRACTIVITY RESEARCH UTILIZING MESOSCALE MODELING STUDIES

Tracy Haack*
NRL, Monterey CA

10:00 Break

10:20 FS1-6 STUDIES OF ESTIMATING EM PROPAGATION WITH HIGH RESOLUTION MODEL DATA AND OBSERVED METOC DATA

Kenneth L. Davidson*, Paul A. Frederickson, Peter S. Guest
Department of Meteorology, Naval Postgraduate School, Monterey. CA

10:40 FS1-7 SEABREEZE 2009: A MULTIDISCIPLINARY EXPERIMENT INVESTIGATING RADAR PROPAGATION AND OCEAN AND ATMOSPHERIC PROCESSES, BAY OF PLENTY, NEW ZEALAND

Sally A. Garrett*
Environmental and Marine Science, Network Systems, Defence Technology Agency, Auckland

11:00 FS1-8 AN INVESTIGATION OF SEA SURFACE TEMPERATURE ON MICROWAVE REFRACTIVITY: THE WALLOPS-2000 EXPERIMENT

William T. Thompson*, Tracy Haack
NAVAL RESEARCH LABORATORY, MONTEREY, CALIFORNIA

11:20 FS1-9 MESOSCALE MODELLING FOR RADAR PROPAGATION PREDICTION - EVALUATION OF MODEL INITIAL CONDITIONS

Changgui Wang*[1], Peter A. Clark[1], Damian Wilson[2], Tracy Hacck[3], Robert Marshall[4]
[1]*JCMM, Met Office, Reading*
[2]*Defence Outcomes,, Met Office, Exeter*
[3]*The Naval Research Laboratory, Monterey, CA*
[4]*Radio and Atmospheric, Naval Surface Warfare Center, Dahlgren, Virginia*

11:40 FS1-10 MODELLING OF ATMOSPHERIC REFRACTIVITY IN THE LITTORAL ZONES USING GEM-LAM

Stphane Gaudreault*, Jocelyn Mailhot, Anna Glazer, Stphane Belair
Environment Canada, Dorval, QuÃ©bec

Session FS2: Radar Remote Sensing of Precipitation
Room 265

Co-Chairs: V Chandrasekar, *Colorado State University*
Guifu Zhang, *University of Oklahoma*

08:20 FS2-1 PERFORMANCE OF A MULTI-LAG CORRELATION ESTIMATOR FOR POLARIMETRIC RADAR MEASUREMENTS

Lei Lei*[1,2], Guifu Zhang[2,3], Robert Palmer[2,3], Boon Leng Cheong[2], Ming Xue[3,4]
[1]*School of Electrical and Computer Engineering, University of oklahoma, Norman, OK*
[2]*Atmospheric Radar Research Center (ARRC), University of oklahoma, Norman, OK*
[3]*School of Meteorology, University of oklahoma, Norman, OK*
[4]*Center for Analysis and Prediction of Storms (CAPS), University of oklahoma, Norman, OK*

08:40 FS2-2 DECOMPOSITION OF MULTIPLE ECHOES WITHIN A RADAR PULSE VOLUME

Cuong M. Nguyen*, Chandrasekar V. Chandra
Electrical & Computer Engineering, Colorado State University, Fort Collins, CO 80523

09:00 FS2-3 RETRIEVAL AND APPLICATION OF RAINDROP SIZE DISTRIBUTIONS FROM POLARIMETRIC RADAR DATA

Petar Bukovcic*[1], Dusan Zrnic[2], Guifu Zhang[1], Qing Cao[3]
[1]*School of Meteorology, University of Oklahoma, Norman, Okalhoma*
[2]*National Severe Storms Laboratory, NOAA, Norman, Okalhoma*
[3]*School of Electrical and Computer Engineering, University of Oklahoma, Norman, Okalhoma*

09:20 FS2-4 CROSS VALIDATION OF SPACE-BORNE RADAR AND GROUND DUAL-POLARIZATION RADAR

Berry Y. Wen*[1,2], Terry Schuur[3], Guifu Zhang[2], J.j. Gourley[3], Yang Hong[1,2]
[1]*School of Civil Engineering and Environmental Sciences, University of Oklahoma, Norman, OK*
[2]*ARRC, University of Oklahoma, National Weather Center, Norman, OK*
[3]*National Severe Storms Laboratory, National Weather Center (NWC), Norman, OK*

09:40 FS2-5 DUAL FREQUENCY AND DUAL POLARIZATION RADAR OBSERVATIONS OF PRECIPITATION AND RETRIEVALS FOR GPM GROUND VALIDATION

Minda Le*, V. Chandrasekar
Electrical and Computer Engineering, Colorado state university, fort collins,CO

10:00 Break

10:20 FS2-6 ISSUES IN VARIATIONAL RETRIEVAL OF RAINDROP SIZE DISTRIBUTION FROM POLARIMETRIC RADAR DATA

Qing Cao*, Guifu Zhang
University of Oklahoma, Norman, Oklahoma

10:40 FS2-7 A SPACED-ANTENNA SIMULATOR BASED ON THE CONFIGURATION OF THE NATIONAL WEATHER RADAR TESTBED (NWRT)

Yinguang Li*[1], Guifu Zhang[2], Richard J. Doviak[3]
[1]*Electrical and Computer Engineering, The University of Oklahoma, Norman, OK*
[2]*School of Meteorology, The University of Oklahoma, Norman, OK*
[3]*National Severe Storm Laboratory, Norman, OK*

Session G1: Meteor Science
Room 200

Co-Chairs: Julio Urbina, *The Pennsylvania State University*
Sigrid Close, *LANL*

08:20 G1-1 METEOR OBSERVATIONS FROM THE RESOLUTE BAY INCOHERENT SCATTER RADAR: FIRST RESULTS AND COMPARISON TO POKER FLAT

Stanley J. Briczinski*[1], John D. Mathews[2], Craig J. Heinselman[3]
[1]*Physics, The University of Wisconsin-Madison, Madison, WI*
[2]*Electrical Engineering, The Pennsylvania State University, University Park, PA*
[3]*SRI International, Menlo Park, CA*

08:40 G1-2 METEOR HEAD-ECHO OBSERVATIONS WITH PFISR OPERATED IN INTERFEROMETER MODE

Jonathan J. Sparks*[1,2], Diego Janches[1], Craig J. Heinselman[3], Michael J. Nicolls[3]
[1]*CoRA Division, NorthWest Research Associates, Boulder, CO*
[2]*Department of Physics, University of Colorado, Boulder, CO*
[3]*SRI International, Menlo Park, CA*

09:00 G1-3 THE RADIO SCIENCE IMPLICATIONS OF VHF & UHF METEOR TRAILS AT ARECIBO

John D. Mathews*[1], Stan J. Briczinski[2], Akshay Malhotra[1], Jennifer Cross[3]
[1]*Penn State University, University Park, PA*
[2]*Physics, University of Wisconsin-Madison, Madison, WI*
[3]*Electrical Engineering, Franklin W. Olin College of Engineering, Needham MA*

09:20 G1-4 ASPECT SENSITIVITY CONSIDERATIONS IN DETERMINING METEOR TRAIL DURATIONS

Akshay Malhotra[1], John D. Mathews*[1], Kimberly Ray[2]
[1]*Penn State University, University Park, PA*
[2]*Electrical Engineering, Texas Lutheran University, Seguin, TX*

09:40 G1-5 SIMULTANEOUS VHF/UHF DETECTION AND ANALYSIS OF POLARIZATION PROPERTIES OF HEAD ECHOES

Laura E. Vertatschitsch*[1], Sigrid Close[2], Patrick Colestock[2], John D. Sahr[1]
[1]Electrical Engineering, University of Washington, Seattle, WA
[2]ISR-2, Los Alamos National Labs, Los Alamos, NM

10:00 Break

10:20 G1-6 INITIAL DATA ANALYSIS FROM AN FPGA BASED METEOR RADAR DIGITAL RECEIVER

Cody Vaudrin*, Scott Palo
Aerospace Engineering, University of Colorado, Boulder CO

10:40 G1-7 GLOBAL VARIATION AND IMPLICATIONS OF METEOR TRAIL PLASMA TURBULENCE

Lars P. Dyrud*[1], Julio Urbina[2], Diego Janches[3]
[1]Space, Johns Hopkins Applied Physics Laboratory, Laurel, MD
[2]Communications and Space, Sciences Laboratory, Pennsylvania State University, State College, PA
[3]NWRA/ CoRA, Boulder, CO

11:00 G1-8 MODELING SPECULAR METEOR TRAILS AS PLASMA INSTABILITIES

Elijah B. Hibit*[1], Lars P. Dyrud[2], Julio V. Urbina[1]
[1]Penn State University, University Park, PA
[2]Center For Remote Sensing, Fairfax, VA

11:20 G1-9 Design, Implementation, and First Observations of Penn State Meteor Radar

Julio V. Urbina*[1], Ryan Seal[1], Lars Dyrud[2]
[1]Electrical Engineering, The Pennsylvania State University, University Park, PA
[2]Applied Physics Laboratory, John Hopkins University, Columbia, MD

Session H1: Space Plasma Laboratory Experiments
Room 245

Co-Chairs: Bill Amatucci, *Naval Research Laboratory*
Edward Thomas, *Auburn University*

08:20 H1-1 THERMAL PLASMA FACILITY FOR THE STUDY OF PERTURBED PLASMA SHEATHS

Lisa E. Gayetsky*, Kristina A. Lynch
Physics and Astronomy, Dartmouth College, Hanover, New Hampshire

08:40 H1-2 LABORATORY PLASMA WITH THE ELECTRON TEMPERATURE OF THE LOWER IONOSPHERE

Shannon B. Dickson*, Scott H. Robertson
Department of Physics, Univ. of Colorado - Boulder, Boulder, CO

09:00 H1-3 INVESTIGATING MAGNETOSPHERIC WAVE AMPLIFICATION USING THE HAARP IONOSPHERIC HEATING FACILITY

Mark Golkowski*
Electrical Engineering, Stanford University, Stanford, CA

09:20 H1-4 GENERATION OF ALFVEN WAVES BY HIGH POWER PULSE AT THE ELECTRON PLASMA FREQUENCY

Bart Van Compernolle*, Walter Gekelman, George Morales, Patrick Pribyl
BaPSF, UCLA, Los Angeles, CA

09:40 H1-5 EFFECTS OF ELECTRON COLLISIONS ON SHEAR ALFV\'EN WAVE DISPERSION AND DAMPING

Derek J. Thuecks*[1], Craig A. Kletzing[2], Fred Skiff[2], Scott R. Bounds[2], Stephen Vincena[3]
[1]Dept. of Physics, University of Wisconsin-Madison, Madison, WI
[2]Dept. of Physics and Astronomy, University of Iowa, Iowa City, IA
[3]Dept. of Physics and Astronomy, University of California at Los Angeles, Los Angeles, CA

10:00 Break

10:20 H1-6 WHISTLER WAVE PROPAGATION IN THE NRL SPACE PHYSICS SIMULATION CHAMBER

David D. Blackwell*[1], William E. Amatucci[1], Erik Tejero[2]
[1]*Plasma Physics, US Naval Research Laboratory, Washington DC*
[2]*Global Strategies Group North America, Inc., Crofton MD*

10:40 H1-7 MODIFYING LOW FREQUENCY INSTABILITIES IN A LINEAR MAGNETIZED PLASMA DEVICE

Ashley Eadon*, Ami DuBois, Edward Thomas
Physics Dept., Auburn University, Auburn, AL

11:00 H1-8 MEASUREMENTS OF ELECTRIC FIELD INDUCED FLUCTUATIONS IN THE COMPACT TOROIDAL HYBRID STELLARATOR

Mark Cianciosa*, Greg Hartwell, Stephen Knowlton, Edward Thomas
Physics, Auburn University, Auburn, AL

11:20 H1-9 LABORATORY STUDIES OF ELECTROMAGNETIC VELOCITY SHEAR-DRIVEN INSTABILITIES

Erik M. Tejero*[1], William E. Amatucci[2], Gurudas I. Ganguli[2], Edward Thomas, Jr.[3]
[1]*Auburn University/Global Strategies Group (NA), Inc., Auburn, AL/Crofton, MD*
[2]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[3]*Physics Department, Auburn University, Auburn, AL*

11:40 H1-10 IONOSPHERIC HF WAVE OBSERVATIONS RELEVANT TO LABORATORY MEASUREMENTS

James W. LaBelle*
Dartmouth College, Hanover New Hampshire

Session KB1: Advances in Computational Biophotonics
Room 151

Co-Chairs: Jamesina Simpson, *University of New Mexico*
Susan Hagness, *University of Wisconsin-Madison*

08:20 KB1-1 TOWARDS UNDERSTANDING THE PLASMONIC TUNABILITY OF GOLD-SILICA-GOLD MULTILAYER NANOSHELLS WITH CONCENTRIC AND OFFSET GEOMETRIES

Ying Hu*[1], Sterling Noelck[1], Rebekah Drezek[1,2]
[1]*Department of Bioengineering, Rice University, Houston, TX*
[2]*Department of Electrical & Computer Engineering, Rice University, Houston, TX*

08:40 KB1-2 ELECTRIC FIELD MONTE CARLO FOR SIMULATING COHERENT IMAGING MICROSCOPIES

Carole K. Hayakawa*[1], Vishnu V. Krishnamachari[2], Vasan Venugopalan[1], Eric O. Potma[2]
[1]*Dept. of Chemical Engineering and Materials Science, University of California, Irvine, Irvine, CA*
[2]*Dept. of Chemistry, University of California, Irvine, Irvine, CA*

09:00 KB1-3 ENHANCED BACKSCATTERING SIMULATION USING MONTE CARLO TO MODEL SHORT-RANGE LIGHT TRANSPORT IN WEAKLY SCATTERING MEDIA

Jeremy D. Rogers*, Vladimir Turzhitsky, Hariharan Subramanian, Ilker R. Capoglu, Vadim Backman
Biomedical Engineering, Northwestern University, Evanston, IL

09:40 KB1-4 OPTICAL-RESOLUTION PHOTOACOUSTIC MICROSCOPY FOR BIOMEDICAL APPLICATIONS

Song Hu*[1], Konstantin Maslov[1], Sunday Oladipupo[2], Ping Yan[3], Jeffrey M. Arbeit[2], Jin-Moo Lee[3], Lihong V. Wang[1]
[1]*Department of Biomedical Engineering, Washington University in St. Louis, St. Louis, MO*
[2]*Department of Surgery and Siteman Cancer Center, Washington University School of Medicine, St. Louis, MO*
[3]*Department of Neurology and the Hope Center for Neurological Disorders, Washington University School of Medicine, St. Louis, MO*

10:00 Break

10:20 KB1-5 MICROSCOPE IN A COMPUTER: NUMERICAL IMAGING USING THE FINITE-DIFFERENCE TIME-DOMAIN METHOD

Ilker R. Capoglu*[1], Allen Taflove[2], Vadim Backman[1]
[1]*Biomedical Engineering Department, Northwestern University, Evanston,IL*
[2]*Electrical Engineering and Computer Science Department, Northwestern University, Evanston,IL*

11:00 KB1-6 EXTENDED PHOTONIC NANOJETS FOR OBTAINING THE INTERNAL COMPOSITION OF A DIELECTRIC SLAB

Jamesina J. Simpson*
ECE, University of New Mexico, Albuquerque, NM

Session BS1: Special Session: Graphics Processing Units for Computational Electromagnetics Room 1B40

Co-Chairs: Atef Elsherbeni, *The University of Mississippi*
Kubilay Sertel, *The Ohio State University*

13:20 BS1-1 ON THE IMPLEMENTATION OF FAST-ITERATIVE SOLVERS ON GRAPHICAL PROCESSOR UNITS

Josh Mahaffey*, Kubilay Sertel, John Volakis
Electrical Engineering, The Ohio State University, Columbus, Oh

13:40 BS1-2 DEVELOPMENT OF COMPLEX DOUBLE-PRECISION LU DECOMPOSITION SOLVERS USING CUDA

Matthew J. Inman*[1], Atef Z. Elsherbeni[1], C. J. Reddy[2]
[1]*Department of Electrical Engineering, The University of Mississippi, Oxford, MS*
[2]*Applied EM, Hampton, VA*

14:00 BS1-3 ACCURATE AND EFFICIENT IMPLEMENTATION OF ELECTROMAGNETIC FIELDS IN DISPERSIVE MEDIA USING CUDA

Mohammad R. Zunoubi*[1], Jason Payne[2], Atef Elsherbeni[3]
[1]*Electrical and Computer Engineering, SUNY New Paltz, New Paltz, NY*
[2]*(AFRL/HE), US Air Force Research Laboratory, Brooks City-Base, TX*
[3]*Electrical Engineering, The University of Mississippi, University, MS*

14:20 BS1-4 IMPLEMENTATION OF GENERAL-PURPOSE ACCELERATION TECHNIQUES ON CELL PROCESSORS FOR GEMS − A CONFORMAL FDTD CODE.

Akira Muto*[1], Wenhua Yu[2], Raj Mittra[2]
[1]*Advanced Materials laobratories, Sony Corporation, Tokyo*
[2]*EE Dept EMC lab., Pennsylvania State University, State College*

14:40 BS1-5 TRANSFORMING CUDA BASED TLM ALGORITHMS TO THE OPENCL PARADIGM

Poman So*
Electrical and Computer Engineering, University of Victoria, Victoria, BC

15:00 Break

15:20 BS1-6 TOWARDS FAST FULL-WAVE WIRELESS CHANNEL MODELING USING GRAPHICS PROCESSOR ACCELERATED HIGH-ORDER FDTD

Costas Sarris, Neeraj Sood*, Gerard S. Baron
Department of Electrical and Computer Engineering, University of Toronto, Toronto

15:40 BS1-7 PERFORMANCE ANALYSIS OF CUDA IMPLEMENTATION OF FDTD ON TESLA GPU USING DOUBLE PRECISION ARITHMETICS

Veysel Demir*
Department of Electrical Engineering, Northern Illinois University, DeKalb, IL

16:00 BS1-8 AN INVESTIGATION INTO THE IMPLEMENTATION OF INTEGRAL EQUATION METHODS ON GPU

Sanjay Velamparambil*, James Perry, Michal Okoniewski
Acceleware Corporation, Calgary, Alberta

16:20 BS1-9 GPU ACCELERATED KRYLOV SUBSPACE METHODS AND PRECONDITIONERS FOR COMPUTATIONAL ELECTROMAGNETICS

Sanjay Velamparambil*, James Perry, Steve Thomas, Michal Okoniewski, Chris Mason, Dan Cyca, Geraud Krawezik
Acceleware Corporation, Calgary, Alberta

16:40 BS1-10 HIERARCHICAL FIELD COMPUTATION ON GRAPHICS PROCESSING UNITS (GPUS) FOR ELECTROMAGNETICS

Shaojing Li*, Boris Livshitz, Vitaliy Lomakin
Department of ECE, University of California San Diego, La Jolla, CA

Session D1: Microwave, mm-wave and submm-wave Circuits and Applications
Room 155

Co-Chairs: John Papapolymerou, *George Institute of Technology*
Jennifer Bernhard, *The University of Illinois*

13:20 D1-1 DIELECTRIC ROD ANTENNAS FOR 193THZ ON-WAFER COMMUNICATIONS

Hongyu Zhou*, Dejan S. Filipovic
Department of Electrical, Computer, and Energy Engineering, University of Colorado at Boulder, Boulder, CO

13:40 D1-2 HYBRID INTEGRATION OF LUMPED ELEMENTS WITH MICRO-RECTANGULAR COAXIAL TRANSMISSION LINES

Evan D. Cullens*, Negar Ehsan, Zoya Popovic
Electrical Engineering, University of Colorado at Boulder, Boulder, Colorado

14:00 D1-3 A COMPRESSIVE IMAGING DEMONSTRATION USING MILLIMETER-WAVE DIGITAL HOLOGRAPHY

Christy Fernandez-Cull[1], Michael Mattheiss[2], David A. Wikner*[3]
[1]*Dept. of Electrical and Computer Engineering, Duke University, Durham, North Carolina*
[2]*University of Maryland, College Park, Maryland*
[3]*RF and Electronics Division, U.S. Army Research Laboratory, Adelphi, Maryland*

14:20 D1-4 3D AND 2D MM-WAVE TRANSITIONS ON FLEXIBLE LCP SUBSTRATE

Amin H. Rida*, Manos M. Tentzeris
ECE, Georgia Institute of Technology, Atlanta, Ga

14:40 D1-5 GAS SENSING CNT-BASED PASSIVE RFID TAG

Vasileios Lakafosis*[1], Li Yang[2], Amin Rida[1], Manos M. Tentzeris[1]
[1]*Georgia Institute of Technology, Atlanta, GA*
[2]*Texas Instruments, Dallas, TX*

Session FS3: Mesoscale Numerical Weather Prediction in Support of Wave Propagation Modeling II
Room 105

Co-Chairs: Robert Marshall, *Naval Surface Warfare Center, Dahlgren*
Tracy Haack, *NRL*

13:20 FS3-1 APPLICATION OF MESOSCALE NWP TO PREDICTION OF RADAR CLUTTER

George LeFurjah*, Timothy S. Casey
Dahlgren Division, Naval Surface Warfare Center, Dahlgren, VA

13:40 FS3-2 AN OPERATIONAL SCHEME FOR MERGING VERTICAL REFRACTIVITY PROFILES FROM A MESOSCALE NUMERICAL WEATHER PREDICTION MODEL AND A BULK EVAPORATION DUCT MODEL

Paul Frederickson*[1], Peter Guest[1], Kenneth Davidson[1], Tracy Haack[2]
[1]*Department of Meteorology, Naval Postgraduate School, Monterey, CA*
[2]*Naval Research Laboratory, Monterey, CA*

14:00 FS3-3 A VALIDATION STUDY OF A NUMERICAL WEATHER PREDICTION / SURFACE LAYER REFRACTIVITY BLENDING TECHNIQUE BASED ON MONIN-OBUKHOV SIMILARITY THEORY

Katherine Horgan*, William Thornton, Victor Wiss, Janet Stapleton, Robert Marshall
Naval Surface Warfare Center Dahlgren Division, Dahlgren, VA

14:20 FS3-4 NUMERICAL WEATHER PREDICTION: A COMPARISON OF MEASURED AND MODELED DUCTING IN THE PERSIAN GULF

Nathaniel S. Winstead, Raymond E. Sterner, II, Jonathan Z. Gehman*
Johns Hopkins University Applied Physics Lab, Laurel, MD

14:40 FS3-5 EXTREME EXTENDED RADIO FREQUENCY PROPAGATION DUE TO SURFACE DUCTS FORMED BY STABLE INTERNAL BOUNDARY LAYERS IN OFFSHORE FLOW

Robert E. Marshall*, Katherine L. Horgan, Victor R. Wiss, William D. Thornton, Janet K. Stapleton
Naval Surface Warfare Center, Dahlgren, Dahlgren, VA

Session FS4: Passive Remote Sensing of the Earth's Environment
Room 150

Co-Chairs: Albin Gasiewski, *University of Colorado at Boulder*
Steven Reising, *Colorado State University*

13:20 FS4-1 FIRST WIDE-AREA OBSERVATIONS OF NORTH POLE PRECIPITATION: POTENTIAL FOR MILLIMETER-WAVE CLIMATE STUDIES

David H. Staelin*[1], Chinnawat Surussavadee[1,2]
[1]*Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, Massachusetts*
[2]*Andaman Environment and Natural Disaster Research Center, Faculty of Technology and Environment, Prince of Songkla University, Phuket Campus, Phuket*

13:40 FS4-2 HYPERSPECTRAL MICROWAVE ATMOSPHERIC SOUNDING FROM GEOSTATIONARY ORBIT: THE GEOMAS CONCEPT

William J. Blackwell*[1], Laura J. Bickmeier[1], R. V. Leslie[1], Carolyn A. Upham[1], Chinnawat Surussavadee[2]
[1]*MIT Lincoln Laboratory, Lexington, MA*
[2]*Research Laboratory of Electronics, MIT, Cambridge, MA*

14:00 FS4-3 A MICROWAVE IMAGER SOUNDER (MIS) FOR THE NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM (NPOESS) FLIGHT 2

David B. Kunkee*
NPOESS Space Systems, The Aerospace Corporation, Silver Spring, MD

14:20 FS4-4 PASSIVE L-BAND MICROWAVE OBSERVATIONS AND MODELING OF OCEAN SURFACE WINDS

Simon Yueh*, Steve Dinardo, Alexander Fore, Fuk Li
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

14:40 FS4-5 A WIDE-SWATH HURRICANE IMAGING RADIOMETER FOR IMAGING OF WIND SPEED AND RAIN RATE IN HURRICANES

Ruba A. Amarin*, Linwood Jones, Salem F. El-Nimri, James W. Johnson
Electrical Engineering and Computer Science, University of Central Florida, Orlando, Florida

15:00 Break

15:20 FS4-6 DETECTION OF IN-FLIGHT ICING HAZARDS WITH NASA'S NEW NARROWBEAM, MULTI-FREQUENCY SCANNING RADIOMETER

David J. Serke*[1], Fred Solheim[2], Randolph Ware[2], Andrew L. Reehorst[3], Marcia K. Politovich[1], Patrick Kennedy[4], Paul Beaty[2], David Brunkow[4], Robert Bowie[4]
[1]*RAL, NCAR, Boulder, CO*
[2]*Atmospheric Science, Colorado State University, Ft. Collins, CO*
[3]*Icing Branch, NASA Glenn Research Center, Cleveland, OH*
[4]*Radiometrics Corp., Boulder, CO*

15:40 FS4-7 3-D HUMIDITY RETRIEVAL USING A NETWORK OF COMPACT MICROWAVE RADIOMETERS TO CORRECT FOR WET TROPOSPHERIC PATH DELAY VARIATIONS IN SPACEBORNE INTERFEROMETRIC SAR IMAGERY

Swaroop Sahoo*[1], Steven C. Reising[1], Sharmila Padmanabhan[2], Jothiram Vivekanandan[3], Flavio Iturbide-Sanchez[4], Nazzareno Pierdicca[5], Emanuela Pichelli[6], Domenico Cimini[6]
[1]*Electrical and Computer Engineering, Colorado State University, Fort Collins, CO*
[2]*Microwave Remote Sensing Instruments, CalTech/NASA Jet Propulsion Laboratory, Pasadena, CA*
[3]*Earth Observation Laboratory, National Center for Atmospheric Research, Boulder, CO*
[4]*I.M. Systems Group, Inc., NOAA/NESDIS Center for Satellite Applications and Research, Camp Springs, MD*
[5]*Dept. Electronic Engineering, Sapienza University of Rome, Rome*
[6]*CETEMPS, University of LAquila, LAquila*

16:00 FS4-8 FAST JACOBIAN MIE LIBRARY FOR TERRESTRIAL HYDROMETEORS

Srikumar Sandeep*, Albin J. Gasiewski
Center For Environmental Technology, University of Colorado, Boulder, CO

16:20 FS4-9 ADVANCED COMPONENT DEVELOPMENT TO ENABLE LOW-MASS, LOW-POWER HIGH-FREQUENCY MICROWAVE RADIOMETERS FOR COASTAL WET-TROPOSPHERIC CORRECTION ON SWOT

Steven C. Reising*[1], Shannon T. Brown[2], Todd C. Gaier[2], Daniel J. Hoppe[2], Douglas E. Dawson[2], Alexander Lee[1], Darrin Albers[1]
[1]*Colorado State University, Fort Collins, CO*
[2]*Jet Propulsion Laboratory/CALTECH, Pasadena, CA*

16:40 FS4-10 AN ANISOTROPIC OCEAN SURFACE EMISSIVITY MODEL BASED ON WINDSAT POLARIMETRIC BRIGHTNESS OBSERVATIONS - JOEM

Dean F. Smith*, Bob L. Weber, Srikumar Sandeep, Albin J. Gasiewski
Electrical and Computer Engineering, Center for Environmental Technology, University of Colorado, Boulder, Boulder, CO

Session G2: Radar and Radio Techniques
Room 245

Co-Chairs: Frank Lind, *MIT Haystack Observatory*
Thomas Gaussiran, *Applied Research Laboratories, The University of Texas at Austin*

13:20 G2-1 DEVELOPMENT OF NONLINEAR IONOSPHERIC REMOVAL ALGORITHM (NIRA) FOR IONOSPHERIC ELECTRON DENSITY DETERMINATION USING BROADBAND RF DATA

Erin H. Lay*[1], Sigrid Close[1], Patrick Colestock[1], Gary Bust[2], Abram Jacobson[3]
[1]*ISR-2, Los Alamos National Lab, Los Alamos, NM*
[2]*ASTRA, San Antonio, Tx*
[3]*Earth and Space Sciences, University of Washington, Seattle, WA*

13:40 G2-2 MEASURING BOTTOM AND TOPSIDE ELECTRON DENSITY PROFILES WITH IONOSONDES FOR ASSIMILATION IN DENSITY MODELS

B Reinisch*[1], P Nsumei[1], I Galkin[1], X Huang[1], D Bilitza[2]
[1]*Center for Atmospheric Research, U. Massachusetts Lowell, Lowell MA*
[2]*College of Science, George Mason University, Fairfax, VA*

14:00 G2-3 ASSESSMENT OF MEAN AND TIDALLY-MODULATED GRAVITY WAVE MOMENTUM FLUXES WITH THE SOUTHERN ARGENTINA AGILE METER RADAR (SAAMER)

David C. Fritts*[1], Diego Janches[1], Wayne Hocking[2]
[1]*CoRA Division, NorthWest Research Associates, Boulder, CO*
[2]*Physics and Astronomy, University of Western Ontario, London, ON*

14:20 G2-4 ADAPTING THE NEW ARECIBO ON-DISH HF TRANSMITTER SYSTEM TO RADAR MODE

John D. Mathews*, Julio Urbina, Akshay Malhotra
Penn State University, University Park, PA

14:40 G2-5 THE RESOLUTE BAY INCOHERENT SCATTER RADAR (RISR)

Craig Heinselman*, Michael Nicolls, Todd Valentic, John Kelly
SRI International, Menlo Park, CA

Session GH1: Ionospheric Modification I
Room 200

Co-Chairs: Paul Bernhardt, *Naval Research Laboratory*
Mark Golkowski, *Stanford University*

13:20 GH1-1 TIME-FREQUENCY ANALYSIS APPLIED TO ELF/VLF WAVE GENERATION EXPERIMENTS AT HAARP

Robert C. Moore*, Shuji Fujimaru
University of Florida, Gainesville, FL

13:40 GH1-2 VLF SIGNATURES OF D-REGION DISTURBANCES

Nikolai G. Lehtinen*[1], Morris B. Cohen[1], Kevin Graf[1], Umran S. Inan[1,2]
[1]*Electrical Engineering, Stanford University, Stanford, CA*
[2]*Koc University, Istanbul*

14:00 GH1-3 ON THE GENERATION OF ELF/VLF WAVES INTO THE EARTH-IONOSPHERE WAVEGUIDE WITH STEERABLE HF HEATING OF THE LOWER IONOSPHERE

Morris B. Cohen*, Umran S. Inan, Nikolai G. Lehtinen, Marek Golkowski
Electrical Engineering, Stanford University, Stanford, CA

14:20 GH1-4 REEVALUATING SUBIONOSPHERIC DETECTION OF TRANSMITTER-INDUCED PRECIPITATION OF INNER RADIATION BELT ELECTRONS

Kevin L. Graf*[1], Umran S. Inan[2], Nikolai G. Lehtinen[1]
[1]*Stanford University, Stanford, CA*
[2]*Koc University, Istanbul*

14:40 GH1-5 RECENT EXPERIMENTS WITH ROCKET EXHAUST IN THE IONOSPHERE

Paul A. Bernhardt*
Naval Research Laboratory, Washington, DC

15:00 Break

15:20 GH1-6 ACTIVE EXPERIMENTS IN THE IONOSPHERE USING CHEMICAL RELEASES FROM THE SPACE SHUTTLE AND ROCKETS

Pete W. Schuck*[1], Robert F. Pfaff[l], Ken R. Bromund[1], Paul A. Bernhardt[2]
[1]*NASA/Goddard Space Flight Center, Greenbelt, MD*
[2]*Naval Research Laboratory, Washington, DC*

15:40 GH1-7 IONOSPHERIC IRREGULARITIES CAUSED BY SPACE SHUTTLE OMS ENGINE BURNS OBSERVED BY THE WALLOPS SUPERDARN HF RADAR

Elsayed R. Talaat*[1], Paul A. Bernhardt[2], Robin J. Barnes[1]
[1]*The Johns Hopkins University Applied Physics Laboratory, Laurel, MD*
[2]*Naval Research Laboratory, Washington, DC*

16:00 GH1-8 UHF Radar Observations of the Space Shuttle OMS Engine Burns in the Ionosphere

Asti N. Bhatt*[1], Paul A. Bernhardt[2], Phil J. Erickson[1], Frank Lind[1]
[1]*MIT Haystack Observatory, Westford, MA*
[2]*Naval Research Laboratory, Washington, DC*

16:20 GH1-9 UHF RADAR DIAGNOSTICS OF HIGH SPEED ROCKET EXHAUST INTERACTIONS WITH THE MID-LATITUDE IONOSPHERE

Philip J. Erickson*[1], Paul A. Bernhardt[2], Asti N. Bhatt[1], Frank D. Lind[1]
[1]*Atmospheric Sciences Group, MIT Haystack Observatory, Westford, MA*
[2]*Naval Research Laboratory, Washington, DC*

16:40 GH1-10 INCOHERENT SCATTER FROM DUSTY PLASMAS CREATED BY THE CHARGED AEROSOL RELEASE EXPERIMENT

Roger H. Varney*[1], Michael C. Kelley[1], Phillip J. Erickson[2], Asti Bhatt[2], Frank D. Lind[2], Paul A. Bernhardt[3]
[1]*School of Electrical and Computer Engineering, Cornell University, Ithaca, NY*
[2]*Atmospheric Sciences Division, MIT Haystack Observatory, Westford, MA*
[3]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*

Session GH2: Complex Dynamical Systems and Statistical Inversion
Room 245

Co-Chairs: G Bust, *ASTRA*
Lars Dyrud, *Johns Hopkins Applied Physics Laboratory*

15:20 GH2-1 A DYNAMICAL SYSTEMS APPROACH TO SOLAR TERRESTRIAL PHYSICS

G S. Bust*
ASTRA, San Antonio, Tx

15:40 GH2-2 WHAT SUPPORTS THE PARALLEL ELECTRIC FIELD IN THE TURBULENT FIELD-ALIGNED CURRENT REGIONS OF THE EARTH'S MAGNETOSPHERE? A NEW PARADIGM

John R. Jasperse*
Air Force Research Laboratory, Bedford, MA

16:00 GH2-3 INTERCHANGE INSTABILITIES AND CHAOTIC FLUID BEHAVIOR

Joseph D. Huba*, Ira B. Schwartz
Naval Research Laboratory, Washington, DC

16:20 GH2-4 PROGRESS IN THE NONLINEAR DESCRIPTION OF THE EVOLUTION OF E REGION IRREGULARITIES

Jean-Pierre St-Maurice*
Institute of Space and Atmospheric Sciences, U of Saskatchewan, Saskatoon, Saskatchewan

16:40 GH2-5 AN EFFICIENT STATE SPACE APPROACH TO SPATIOTEMPORAL IMAGE RECONSTRUCTION

Farzad Kamalabadi*[1], Mark D. Butala[1], Yuguo Chen[1], Richard A. Frazin[2]
[1]*University of Illinois, IL*
[2]*University of Michigan, MI*

17:20 GH2-6 STRUCTURE FUNCTIONS AND INTERMITTENCY IN IONOSPHERIC PLASMA TURBULENCE

Lars P. Dyrud*[1], B Krane[2], Meers Oppenheim[3], Hans Pecseli[4], Jan Trulsen[4], A Wernik[5]
[1]*Johns Hopkins Applied Physics Laboratory, Laurel, MD*
[2]*NDRE, Kjeller*
[3]*Boston University, Boston*
[4]*University of Oslo, Oslo*
[5]*Polish Acad. Sci., Warsaw*

Session J1: Designs and Subsystems for the Square Kilometer Array
Room 265

Co-Chairs: Sander Weinreb, *California Institute of Technology*
Lynn Baker, *Cornell University*

13:20 J1-1 ALLEN TELESCOPE ARRAY PROGRESS REPORT

Geoffrey C. Bower*
Department of Astronomy, UC Berkeley, Berkeley, CA

13:40 J1-2 PROGRESS REPORT ON THE LONG WAVELENGTH ARRAY (LWA)

Lee J. Rickard*
University of New Mexico, Albuquerque NM

14:00 J1-3 PROGRESS REPORT ON THE MURCHISON WIDEFIELD ARRAY

Colin Lonsdale*
MIT Haystack Observatory, Westford, MA

14:20 J1-4 THE RATIONALE FOR CHOOSING OFFSET GREGORIAN OPTICS FOR THE SKA/TDP DISH VERIFICATION PROGRAM

Lynn A. Baker*
Cornell University, Ithaca NY

14:40 J1-5 CONSIDERATIONS FOR THE SKA OFFSET OPTICS DESIGN

William A. Imbriale*[1], German Cortes-Medellin[2], Lynn Baker[2]
[1]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*
[2]*Cornell University, Ithaca, NY*

15:00 Break

15:20 J1-6 ANTENNA NOISE PERFORMANCE AND SIDELOBE LEVELS OF SKA OPTICS DESIGN

German Cortes-Medellin*[1], William A. Imbriale[2], Lynn Baker[1]
[1]*NAIC/Cornell University, Ithaca, NY*
[2]*Jet Propulsion Laboratory California Institute of Technology, Pasadena, CA*

15:40 J1-7 HIGH-PERFORMANCE LOW-COST COMPOSITE ANTENNA REFLECTORS FOR THE SKA

Gordon Lacy*, Gary J. Hovey
National Research Council, Penticton, BC

16:00 J1-8 1 TO 10 GHZ ANTENNA FEED TEST RESULTS

Sander Weinreb, Zan Zhang*
Electrical Engineering Dept, California Institute of Technology, Pasadena, CA

16:20 J1-9 WIDEBAND LOW NOISE AMPLIFIERS

Sander Weinreb*, Hamdi Mani
Electrical Engineering, California Institute of Technology, Pasadena, CA

16:40 J1-10 SENSITIVITY OPTIMIZATION AND SIGNAL PROCESSING FOR THE BYU/NRAO L-BAND PHASED ARRAY FEED

Karl F. Warnick*[1], David Carter[1], Taylor Webb[1], Brian D. Jeffs[1], Jonathan Landon[1], Michael Elmer[1], Rick Fisher[2], Roger Norrod[3]
[1]*Electrical and Computer Enginering, Brigham Young University, Provo, UT*
[2]*NRAO, Charlottesville, VA*
[3]*NRAO, Green Bank, WV*

17:00 J1-11 PACKETIZED CORRELATORS AND BEAMFORMERS FOR THE SQUARE KILOMETER ARRAY

Dan Werthimer*[1], Don Backer[1], Terry Filiba[1], Griffin Foster[1], Alan Langman[2], William Mallard[1], Jason Manley[2], Aaron Parsons[1], Andrew Siemion[1], Melvyn Wright[1]
[1]*University of California, Berkeley, CA*
[2]*Karoo Array Radio Telescope, Cape Town*

Session KB2: Electromagnetic Sensing and Treatment Applications in Medicine
Room 151

Co-Chairs: Susan Hagness, *University of Wisconsin-Madison*
Mahta Moghaddam, *The University of Michigan*

13:20 KB2-1 ANTENNA DESIGN FOR SMART CAPSULES FOR BIOMEDICAL APPLICATIONS: CHARACTERIZATION, CONSTRUCTION AND LINK BUDGET EVALUATION

Harish Rajagopalan, David Bennett, Yahya Rahmat-Samii*
Electrical Engineering Dept., University of California Los Angeles (UCLA), Los Angeles, CA

13:40 KB2-2 MODELING ELECTROMAGNETIC SIGNALS OF MULTIPLE BREAST CANCEROUS CELLS

Ahmed M. Hassan*, Magda El-Shenawee
Electrical Engineering, University of Arkansas, Fayetteville, Arkansas

14:00 KB2-3 A NUMERICAL STUDY OF NON-INVASIVE THERAPEUTIC BRAIN HYPERTHERMIA VIA MICROWAVE SPACE-TIME TRANSMIT BEAMFORMING

Matthew J. Burfeindt*[1], Earl Zastrow[1], Susan C. Hagness[1], Barry D. Van Veen[1], Joshua E. Medow[2]
[1]*Department of Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, Wisconsin*
[2]*Department of Neurological Surgery, University of Wisconsin-Madison, Madison,Wisconsin*

15:00 Break

15:20 KB2-4 MODIFYING CELL FUNCTIONS WITH ULTRASHORT PULSES

Shu Xiao*, Karl H. Schoenbach
Frank Reidy Research Center for Bioelectrics, Norfolk, VA

15:40 KB2-5 ELECTROMAGNETIC INVERSE SCATTERING WITH BORN ITERATIONS FOR SOFT TISSUE IMAGING

Mark Haynes*, Mahta Moghaddam
University of Michigan, Ann Arbor, Michigan

16:00 KB2-6 ON THE NUMERICAL DETERMINATION OF NEURAL ACTIVATION IN RETINAL SURFACE DUE TO STIMULATION WITH CORNEAL ELECTRODES

Carlos J. Cela, Gianluca Lazzi*
Electrical and Computer Engineering, North Carolina State University, Raleigh, NC

Business Meetings

17:00	Commission D	Room 155
17:00	Commission F	Room 150
18:00	Commission G	Room 200
18:00	Commission K	Room 151

Reception

Engineering Center Lobby 18:30-21:00
(Beer and Wine provided)

Thursday Morning **7 January 2010**

Session P1: PLENARY SESSION: Student Paper Competition
Mathematics Auditorium

Chair: Danilo Erricolo, *UIC*

08:20 Announcements

08:30 Rules and Guidelines of the Competition

08:40 Student Paper Presentations

09:40 Break

Session P2: PLENARY SESSION: Anthropogenic and Natural Electromagnetic Environments: Effects on Electronic Systems
Mathematics Auditorium

Co-Chairs: William Palmer, *US Army Research Office*
Danilo Erricolo, *UIC*

10:00 P2-1 OUR OWN WORST ENEMY CHALLENGES IN REDUCING ELECTRONIC FRATRICIDE

John Kosinski*
US Army RDECOM CERDEC I2WD, Fort Monmonth, NJ

10:50 P2-2 COMPUTER MODELING TOOLS FOR EMC ENGINEERS

Todd H. Hubing*
Clemnson University, Clemson, SC

11:40 Awards Ceremony – Student Paper Competition

12:00 Lunch for Student Travel Awardees, USNC Officers and Commission Chairs (Leeds Business School Atrium)

Session A2: Metrology Efforts at NIST
Room 155

Co-Chairs: Christopher Holloway, *NIST*
James BakerJarvis, *NIST*

13:20 A2-1 METROLOGY FOR ELECTROMAGNETIC PROPERTIES DETERMINATION

James BakerJarvis*, Chriss Grosvenor, Michael D. Janezic
NIST, Boulder, CO

13:40 A2-2 BROADBAND MICROWAVE CHARACTERIZATION OF SEMICONDUCTING NANOWIRE DEVICES

T. M. Wallis*, Atif Imtiaz, Chin-Jen Chiang, Dazhen Gu, Pavel Kabos
N.I.S.T., Boulder, CO

14:00 A2-3 MICROWAVE SCANNING PROBE METROLOGY FOR NANOMETER SCALE ELECTRONICS

Pavel Kabos*, T. M. Wallis, Atif Imtiaz, Chin-Jen Chiang
N.I.S.T., Boulder, CO

14:20 A2-4 RADIO FREQUENCY AND MICROWAVE POWER STANDARDS AT NIST

Thomas P. Crowley*
Electromagnetics Division, NIST, Boulder, CO

14:40 A2-5 QUANTUM-BASED SI TRACEABLE ELECTRIC-FIELD PROBE

Joshua A. Gordon*, Christopher L. Holloway
Electromagnetics Division, NIST, Boulder, CO

15:00 Break

15:20 A2-6 NIST PROGRAMS TO SUPPORT QUANTITATIVE MRI

Stephen E. Russek*
Electromagnetics, NIST, Boulder, CO

15:40 A2-7 FREE-FIELD, TIME-DOMAIN METROLOGY AT NIST

Chriss Grosvenor*[1], Dennis Camell[2], Galen Koepke[2], James Baker-Jarvis[1], Robert Johnk[3]
[1]818.01, National Institute of Standards and Technology, Boulder, CO
[2]818.02, National Institute of Standards and Technology, Boulder, CO
[3]ITS.T, Institute for Telecommunication Sciences, Boulder, CO

16:00 A2-8 DEVELOPMENT OF MICROWAVE BRIGHTNESS TEMPERATURE STANDARDS AT NIST

David K. Walker*, Amanda E. Cox, James Randa, Chriss A. Grosvenor, Dazhen Gu, Katherine MacReynolds
818, NIST, Boulder, CO

16:20 A2-9 BROADBAND MICROWAVE MEASUREMENTS OF NANOLITER LIQUID VOLUMES IN MICROFLUIDIC STRUCTURES

James C. Booth*[1], Nathan D. Orloff[1,2], Xiao Li Lu[1], Joshua P. King[1], Carlos Collado[1,3]
[1]Electromagnetics Division, NIST, Boulder, CO
[2]Department of Physics, University of Maryland, College Park, MD
[3]Universitat Polytechnica de Catalunya, Barcelona

16:40 A2-10 QUIET-ZONE FIELD EVALUATIONS USING NEAR-FIELD SPHERICAL SCANNING TECHNIQUES

Randal H. Direen*, Michael H. Francis, Ronald C. Wittmann
National Institute of Standards and Technology, Boulder, Colorado

Session B2: Antenna Theory, Design, and Measurement
Room 1B40

Co-Chairs: Jennifer Bernhard, *The University of Illinois*
Zoya Popovic, *The University of Colorado*

13:20 B2-1 DESIGN OF A MIMO DIELECTRIC RESONATOR ANTENNA FOR 700 MHZ WIRELESS APPLICATIONS

Jie-Bang Yan*, Jennifer T. Bernhard
Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL

13:40 B2-2 INVESTIGATION OF EDGE SERRATIONS TO ELIMINATE CAVITY EFFECT IN PARALLEL PLATE CONFIGURATIONS

Jessica E. Ruyle*, Jennifer T. Bernhard
Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana

14:00 B2-3 CONTINUOUS BIPOLAR SPIRAL SCANNING FOR BIPOLAR PLANAR NEAR-FIELD ANTENNA MEASUREMENTS

Timothy J. Brockett*, Yahya Rahmat-Samii
Electrical Engineering, University of California, Los Angeles, Los Angeles, CA

14:20 B2-4 PARTICLE SWARM OPTIMIZATION OF OPTIMAL THREE-PARAMETER APERTURE DISTRIBUTION FOR ANTENNA APPLICATIONS

Art Densmore*, Yahya Rahmat-Samii
Electrical Engineering, UCLA, Los Angeles, CA

14:40 B2-5 ESTIMATING CIRCULARLY POLARIZED SQUINT IN AN OFFSET REFLECTOR: A SIMPLIFIED APPROACH WITH AN INTUITIVE UNDERSTANDING

Art Densmore*, Yahya Rahmat-Samii
Electrical Engineering, UCLA, Los Angeles, CA

15:00 Break

15:20 B2-6 SLOT RECTIFIER ANTENNAS FOR LOW-POWER APPLICATIONS

Katrina Bossert*, Erez Falkenstein, Zoya Popovic
University of Colorado Boulder, Boulder, CO

15:40 B2-7 VOLUME INTEGRATED CONFORMAL UAV ANTENNAS

Brandan T. Strojny*, Roberto G. Rojas
Electrical and Computer Engineering, The Ohio State University, Columbus Ohio

16:00 B2-8 DESIGN AND FABRICATION OF A MEMS STEERABLE BROADBAND ANTENNA CAPABLE OF DUAL POLARIZATION

Douglas A. Hutchings*[1], Magda El-Shenawee[2], Steve Tung[3]
[1]*Microelectronics-Photonics, University of Arkansas, Fayetteville, Arkansas*
[2]*Electrical Engineering, University of Arkansas, Fayetteville, Arkansas*
[3]*Mechanical Engineering, University of Arkansas, Fayetteville, Arkansas*

16:20 B2-9 FULLY INTEGRATED SOLAR PANEL SLOT ANTENNA WITH PATTERN RECONFIGURABILITY

Mahmoud Mahmoud*, Reyhan Baktur
Utah State Univ., Logan, UT

16:40 B2-10 NUMERICAL STUDY OF ANTENNA COUPLING IN RECTANGULAR CAVITY WITH EXTERNAL LOADING

Jinjin Shen*
Aeroflex, Inc, Wichita, KS

Session B3: Printed Devices
Room 151

Co-Chairs: Reyhan Baktur, *Utah State University*
Steven Weiss, *U.S. Army Research Laboratory*

13:20 B3-1 SIMPLIFIED AND EFFICIENT DESIGN OF WIDEBAND PATCH ANTENNA

Makineni Pramod Kumar*[1], Sagi Sravan kumar[2], Rajeev J. Sharma[3], Vsk Reddy[4]
[1]Avionics, Sreenidhi-vaughn college, Hyderabad, Andhra pradesh
[2]Satellite communication and antenna division, Indian Space Research Organisation, Ahmedabad, Gujarat
[3]Satellite Communication and Antenna Division, Indian Space Research Organisation, Ahmedaba,Gujarat
[4]Avionics, Sreenidhi - Vaughn college, Hyderabad, Andhra pradesh

13:40 B3-2 REFLECTION PHASE ANOMALY FOR REFLECTARRAY ELEMENT WITH HIGH LOSS SUBSTRATES

Harish Rajagopalan*, Yahya Rahmat-Samii
Electrical Engineering, UCLA, Los Angeles

14:00 B3-3 60 GHZ VOLUMETRIC SWITCHED BEAM ARRAY

William F. Moulder*, Waleed Khalil, John L. Volakis
ElectroScience Lab, The Ohio State University, Columbus, OH

14:20 B3-4 INVESTIGATION OF THE E-SHAPED MICROSTRIP PATCH AS A POLARIZATION RECONFIGURABLE ANTENNA ELEMENT

Siwen Yong*, Jennifer T. Bernhard
University of Illinois at Urbana Champaign, IL

14:40 B3-5 VERTICAL TRANSITION OF MICROSTRIP LINE VIA CAPACITIVE COUPLING

Vincent J. Caruso*[1], Ozlem Kilic[1], Steven J. Weiss[2], William O. Coburn[2]
[1]EECS, The Catholic University of America, Washington, DC
[2]SEDD, The Army Research Lab, Adelphi, MD

15:00 Break

15:20 B3-6 RF MEMS RECONFIGURABLE SLOT-LOADED PATCH ANTENNA WITH INTEGRATED BIAS NETWORK

Ilkyu Kim*, Yahya Rahmat-Samii
Electrical Engineering, UCLA, Los Angeles and California

15:40 B3-7 INKJET-PRINTED MESHED CIRCULAR PATCH ANTENNAS ON TRANSPARENT SUBSTRATES

Tursunjan Yasin*, Reyhan Baktur
Electrical and Computer Engineering Dept, Utah State University, Logan, Utah

Session E1: High-Power Electromagnetics: Environments and Sources
Room 105

Co-Chairs: Carl Baum, *University of New Mexico*
Danilo Erricolo, *UIC*

13:20 E1-1 DETECTION OF SURFACE-BURST EMP IN THE PRESENCE OF CLOUD-TO-GROUND LIGHTNING

Carl E. Baum*
Dept. Electrical & Computer Engineering, University of New Mexico, Albuquerque, NM

13:40 E1-2 LOG-PERIODIC FOCUSING LENS FOR MELANOMA TREATMENT

Serhat Altunc, Prashanth Kumar*, Carl E. Baum, Christos G. Christodoulou, Edl Schamiloglu
Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM

14:00 E1-3 DESIGN OF A SWITCH SYSTEM AND LAUNCHING LENS FOR A PROLATE SPHEROIDAL IMPULSE RADIATING ANTENNA

Prashanth Kumar*, Serhat Altunc, Carl E. Baum, Christos G. Christodoulou, Edl Schamiloglu
Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM

14:20 E1-4 MICROWAVE PULSE COMPRESSION EXPERIMENTS

Everett G. Farr*[1], Leland H. Bowen[1], Carl E. Baum[2], William D. Prather[3]
[1]Farr Research, Inc., Albuquerque, NM
[2]University of New Mexico, Albuquerque, NM
[3]Directed Energy Directorate, Air Force Research Laboratory, Kirtland AFB, NM

14:40 E1-5 LIGHTNING RETURN-STROKE INITIATION CONDITIONS

Robert L. Gardner*
Consultant, Alexandria, VA

15:00 Break

15:20 E1-6 INTEGRATED SWITCHED OSCILLATOR AND ZIG-ZAG ANTENNA WITH PHOTOCONDUCTIVE SEMICONDUCTOR SWITCH AS A TERAHERTZ (THZ) PULSE TRANSMITTER

Mohammad Ershad Shaik*[1], Carl E. Baum[2], Christos G. Christodoulou[2], Edl Schamiloglu[2]
[1]Electrical & Computer Engineering, The University of Texas at Austin, Austin, TX
[2]Electrical & Computer Engineering, The University of New Mexico, Albuquerque, NM

15:40 E1-7 DESIGN OF ELECTROMAGNETIC TEST SITES

Carl E. Baum*
Dept. Electrical & Computer Engineering, University of New Mexico, Albuquerque, NM

16:00 E1-8 CONFORMAL IMPULSE RECEIVE ANTENNA ARRAYS

Dave V. Giri*[1], Michael D. Abdalla[2], Michael C. Skipper[2], Yahya Rahmat-Samii[3]
[1]Pro-Tech, Alamo, CA
[2]ASR Corporation, Albuquerque, NM
[3]Electrical Engineering, UCLA, Los Angeles, CA

Session F2: Propagation Modeling and Measurements
Room 150

Co-Chairs: Michael Newkirk, *JHU/APL*
George Dockery, *Johns Hopkins University Applied Physics Laboratory*

13:20 F2-1 A WIDEBAND CHANNEL MODEL USING THE PARABOLIC EQUATION WITH AN EXPERIMENTAL VALIDATION METHOD

Veena M. Gadwal*
SPAWAR Systems Center Pacific, San Diego, CA

13:40 F2-2 FIELD COUPLING OF HIGH-FIDELITY RADAR CROSS SECTION AND PROPAGATION MODELS

Frank Ryan*[1], Douglas Taylor[2], Dale Zolnick[2]
[1]Maritime Surveillance Div., SPAWAR Systems Center Pacific, San Diego, CA
[2]Radar Div., US Naval Research Laboratory, Washington, DC

14:00 F2-3 NEAR EARTH PROPAGATION WITH ARBITRARY ANTENNA PATTERNS

Kyle L. Labowski*, Christopher W. Penney, Richard R. Ohs, Ruth S. Belmonte
Remcom Inc, State College, PA

14:20 F2-4 PROPAGATION PREDICTIONS WITH REAL TIME MODELS

Ronald Eichenlaub*, Greg Skidmore
Remcom, Inc., State College, PA

14:40 F2-5 NEARING EARTH MODELING USING A GPU

Jamie K. Infantolino, Ruth S. Belmonte*, James F. Stack, Stephen A. Fast
Remcom, Inc., State College, PA

15:00 Break

15:20 F2-6 TESTING THE POINTING ERROR ACCURACY OF THE STANDARD ATMOSPHERE EXPONENTIAL REFRACTIVITY MODEL AT VARIOUS GLOBAL LOCATIONS

Julius Goldhirsh*, Raymond P. Wasky, Jonathan Z. Gehman
Applied Physics Laboratory, Johns Hopkins University, Laurel, Maryland

15:40 F2-7 RADAR POINTING ERRORS IN RANGE-INDEPENDENT AND RANGE-VARYING TROPOSPHERIC DUCTS

Raymond P. Wasky*
The Johns Hopkins University, Applied Physics Laboratory, Laurel, Maryland

16:00 F2-8 GENERATING AN ACCURATE VERTICAL AEROSOL PROFILE

Brooke A. Bachmann*, Stephen Hammel
Atmospheric Propagation Branch, Space and Naval Warfare Systems Center Pacific, San Diego, CA

16:20 F2-9 THE JHU/APL CW LINKS SYSTEM FOR PROPAGATION ASSESSMENT: VALIDATION OF MODELING APPROACH USING IN SITU ENVIRONMENTAL MEASUREMENTS

Thomas R. Hanley*, J. R. Rottier
Johns Hopkins University - Applied Physics Laboratory, Laurel, MD

16:40 F2-10 NEAR-EARTH PROPAGATION MEASUREMENTS AND MODELING FOR SHORT RANGE COMMUNICATIONS LINKS

Robert M. Barts*[1], Robert Karl[1], Robert Johnk[2], Nicholas DeMinco[2], Paul McKenna[2], Robert Wert[3], Brian Sjoberg[3], Kris Matson[1]
[1]*Applied Research Associates, Raleigh, NC*
[2]*Institute for Telecommunications Sciences, Boulder, CO*
[3]*Tactical Electronic Warefare, Naval Research Laboratories, Washington, DC*

17:00 F2-11 INVESTIGATION OF WAVE PROPAGATION IN A DIELECTRIC ROD ARRAY

Yang Li*, Hao Ling
Electrical and Computer Engineering, The University of Texas at Austin, Austin, Tx

Session GH3: Ionospheric Modification II
Room 200

Co-Chairs: Paul Bernhardt, *Naval Research Laboratory*
Mark Golkowski, *Stanford University*

13:20 GH3-1 CONSTRUCTING THE ARECIBO HF FACILITY AND PREPARING FOR TESTING AND EXPERIMENTS

Michael P. Sulzer*
Arecibo observatory, Arecibo, PR

13:40 GH3-2 THE OSIRIS MISSION: AN ORBITAL SYSTEM FOR INVESTIGATING THE RESPONSE OF THE IONOSPHERE TO STIMULATION AND SPACE WEATHER

Sven G. Bilen*[1], Pavol Pribula[1], Allen T. Kummer[1], Adam C. Escobar[1], Julio V. Urbina[1], Paul A. Bernhardt[2], Michael T. Rietveld[3], Michael J. Kosch[4], Sixto A. Gonzalez[5], Jose Roman-Rasado[6]
[1]*The Pennsylvania State University, University Park, PA*
[2]*Naval Research Laboratory, Washington, DC*
[3]*EISCAT Scientific Association, Ramfjordbotn*
[4]*Lancaster University, Lancaster*
[5]*Arecibo observatory, Arecibo, PR*
[6]*University of Puerto Rico-Mayaguez, Mayagez, PR*

14:00 GH3-3 DECAMETER STRUCTURE IN HEATER-INDUCED AIRGLOW AT THE HAARP FACILITY

Elizabeth Kendall*[1], Robert Marshall[2], Todd Parris[3], Asti Bhatt[4], Anthea Coster[4], Paul Bernhardt[5], Craig Selcher[5]
[1]*SRI International, Menlo Park CA*
[2]*Stanford University, Stanford CA*
[3]*University of Alaska, Fairbanks AK*
[4]*MIT Haystack Observatory, Westford MA*
[5]*Naval Research Laboratory, Washington DC*

14:20 GH3-4 PLASMA RESONANCES IN ARTIFICIAL IONOSPHERIC LAYERS GENERATED BY HIGH-POWER HF HEATING

Todd Pedersen*[1], Evgeny Mishin[1], Lee Snyder[2], Bjorn Gustavsson[3]
[1]*Space Vehicles Directorate, Air Force Research Laboratory, Hanscom AFB, Massachusetts*
[2]*Northwest Research Associates, Stockton Springs, ME*
[3]*University of Tromso, Tromso*

14:40 GH3-5 LOW FREQUENCY ELECTROSTATIC EMISSIONS EXCITED BY HAARP

Craig A. Selcher, Paul A. Bernhardt*
Naval Research Laboratory, Washington, DC

15:00 Break

15:20 GH3-6 HF-INDUCED IONIZATION ENHANCEMENTS WITH HAARP

Keith Groves*[1], Todd Pedersen[1], Randy Cicale[1], Mike Verlinden[1], Michael McCarrick[2], James Secan[3]
[1]*Space Wx Center of Excellence, Air Force Research Laboratory, Hanscom AFB, MA*
[2]*BAE, Inc., Washington D.C.*
[3]*Northwest Research Associates, Inc., Tucson, AZ*

15:40 GH3-7 ELECTRON ACCELERATION AND IONIZATION PRODUCTION IN HIGH-POWER HEATING EXPERIMENTS AT HAARP

Evgeny Mishin*, Todd Pedersen
Space Vehicles Directorate, Air Force Research Laboratory, Hanscom AFB, MA

Session H2: Waves in Space Plasmas
Room 245

Co-Chairs: Anatoly Streltsov, *Dartmouth College*
Nikolai Lehtinen, *Stanford University*

13:20 H2-1 RESONANT-PARTICLE TRANSPORT AND RESONANCE-BROADENING EFFECTS

Michael Schulz*
(self-employed), Redwood City, California

13:40 H2-2 ELECTROMAGNETIC ION CYCLOTRON WAVE REDISTRIBUTION IN THE EARTH'S MAGNETOSPHERE DUE TO RING CURRENT H+ IN THE WAVE DISPERSION RELATION

Konstantin Gamayunov*
Department of Physics and Space Sciences, Florida Institute of Technology, Melbourne, Florida

14:00 H2-3 SAID-RELATED NONLINEAR WAVE EFFECTS IN THE PLASMASPHERE

Evgeny Mishin*[1], Pamela Puhl-Quinn[2]
[1]*Space Vehicles Directorate, Air Force Research Laboratory, Hanscom AFB, MA*
[2]*Space Science Center, Univ. of New Hampshire, Durham, NH*

14:20 H2-4 SOUNDING ROCKET AND SATELLITE OBSERVATIONS OF LOWER HYBRID , ION-BERNSTEIN AND ELECTROSTATIC HYDROGEN CYCLOTRON MODE WAVES GENERATED BY DOWNFLOWING IONS IN THE CUSP

Erik T. Lundberg*[1], Paul M. Kintner[1], Kristina Lynch[2], Meghan Mella[2], Marc Lessard[3]
[1]*Electrical and Computer Engineering, Cornell University, Ithaca, NY*
[2]*Physics, Dartmouth College, Hanover, NH*
[3]*Institute for the study of Earth, Oceans and Space, University of New Hampshire, Durham, NH*

14:40 H2-5 EFFECT OF FREQUENCY MODULATION ON A PROPAGATION OF WHISTLER-MODE WAVES IN THE MAGNETOSPHERE.

Anatoly V. Streltsov*[1], Mark Golkowski[2], Umran S. Inan[2], K D. Papadopoulos[3]
[1]*Thayer School of Engineering, Dartmouth College, Hanover, NH*
[2]*STAR Laboratory, Stanford University, Stanford, CA*
[3]*Physics Department, University of Maryland, College Park, MD*

15:00 Break

15:20 H2-6 VLF AND HF PLASMA WAVES ASSOCIATED WITH SPREAD-F PLASMA DEPLETIONS OBSERVED ON THE C/NOFS SATELLITE

Robert F. Pfaff*, Peter W. Schuck, Jeff H. Klenzing
NASA/Goddard Space Flight Center, Greenbelt

15:40 H2-7 WEAKLY-DISSIPATIVE HYBRID DUST ION-ACOUSTIC SOLITARY WAVES

Tatiana V. Losseva*[1], Sergey I. Popel[1], Anatoly P. Golub'[1], Padma K. Shukla[2]
[1]*Institute of Geospheres Dynamics RAS, Moscow*
[2]*Ruhr University, Bochum*

16:00 H2-8 RBSP MISSION: UNDERSTANDING DYNAMIC VARIABILITY OF RADIATION BELTS

Aleksandr Ukhorskiy*[1], Barry Mauk[1], Nicola Fox[1], David Sibeck[2], Joseph Grebowsky[2]
[1]*Space, Johns Hopkins University Applied Physics Laboratory, Laurel*
[2]*NASA Goddard Space Flight Center, Greebelt*

Session J2: Digital Signal Processing for Radio Astronomy
Room 265

Co-Chairs: Dan Werthimer, *UC Berkeley*
James Cordes, *Cornell University*

13:20 J2-1 DISCOVERY OF LIGHTNING ON MARS USING A DIGITAL KURTOSIS DETECTOR

Christopher S. Ruf*, Nilton O. Renno
Atmospheric, Oceanic & Space Sciences, University of Michigan, Ann Arbor, MI

13:40 J2-2 WIDE BANDWIDTH INSTRUMENTATION FOR GIANT PULSE AND TRANSIENT OBSERVATIONS

Glenn Jones*
Electrical Engineering, Caltech, Pasadena, CA

14:00 J2-3 PROTOTYPING SCALABLE DIGITAL SIGNAL PROCESSING SYSTEMS FOR RADIO ASTRONOMY USING DATAFLOW MODELING

Nimish Sane*[1], John Ford[2], Andrew Harris[3], Shuvra S. Bhattacharyya[1]
[1]*Department of Electrical and Computer Engineering, and Institute for Advanced Computer Studies, University of Maryland, College Park, College Park, Maryland*
[2]*National Radio Astronomy Observatory, Green Bank, West Virginia*
[3]*Department of Astronomy, University of Maryland, College Park, College Park, Maryland*

14:20 J2-4 CASPER: RAPID DEVELOPMENT OF RADIO ASTRONOMY INSTRUMENTATION

Andrew P. V. Siemion*[1,2], Dan Werthimer[1,3], Don Backer[1,2], Henry Chen[1,4], Matt Dexter[1,2], Terry Filiba[1,5], Griffin Foster[1,2], Suraj Gowda[1,5], Glenn Jones[6], David MacMahon[1,2], William Mallard[1], Jason Manley[1,7], Peter L. McMahon[1,8], Aaron R. Parsons[1,2], Mark Wagner[1], Melvyn Wright[1,2]
[1]*Center for Astronomy Signal Processing and Electronics Research, University of California, Berkeley, Berkeley, California*
[2]*Department of Astronomy, University of California, Berkeley, Berkeley, California*
[3]*Space Sciences Laboratory, University of California, Berkeley, Berkeley, California*
[4]*Department of Electrical Engineering, University of California, Los Angeles, Los Angeles, California*
[5]*Department of Electrical Engineering and Computer Science, University of California, Berkeley, Berkeley, California*
[6]*California Institute of Technology, Pasadena, California*

[7]*Digital Signal Processing Group, Karoo Array Telescope, Cape Town*
[8]*Department of Computer Science, Stanford University, Stanford, California*

14:40 J2-5 FLEXIBLE HETEROGENEOUS SPECTROMETERS AND PULSAR PROCESSORS

Terry E. Filiba*[1], Henry Chen[2], Peter McMahon[3], Dan Werthimer[1]
[1]*University of California, Berkeley, Berkeley CA*
[2]*University of California, Los Angeles, Los Angeles CA*
[3]*Stanford University, Palo Alto CA*

15:00 Break

15:20 J2-6 RADIO FREQUENCY INTERFERENCE FROM DIGITAL SIGNAL PROCESSING HARDWARE AT THE ALLEN TELESCOPE ARRAY

William C. Barott*[1], Vicente J. Gonzaga[2], Peter Backus[3], Jill Tarter[3], Alex Rudolph[2], Yvette Cendes[3]
[1]*Embry-Riddle Aeronautical University, Daytona Beach, FL*
[2]*Cal Poly Pomona, Pomona, CA*
[3]*SETI Institute, Mountain View, CA*

15:40 J2-7 IMPLEMENTATION OF A DIGITAL PROCESSING SUBSYSTEM FOR A LONG WAVELENGTH ARRAY STATION

Robert Navarro*[1], Elliot H. Sigman[1], Duo Wang[1], Melissa A. Soriano[1], Larry R. D'Addario[1], Joe Craig[2], Steve Ellingson[3]
[1]*Communications, Tracking and Radar Division, Jet Propulsion Laboratory, Pasadena, CA*
[2]*University of New Mexico, Albuquerque*
[3]*Bradley Dept. of Electrical & Computer Engineering, Virginia Polytechnic Institute & State University, Blacksburg, VA*

16:00 J2-8 "SOFTWARE" CORRELATORS IN RADIO INTERFEROMETRY: CURRENT USAGE AND ADVANTAGES

Adam T. Deller*, Walter F. Brisken
NRAO, Socorro NM

16:20 J2-9 THE CARMA CORRELATOR SYSTEM

David W. Hawkins*
PMA/OVRO, California Institute of Technology, Big Pine, CA

16:40 J2-10 A 4GB/S DIGITAL VLBI BACKEND

Alan Hinton[1], Alan Whitney[1], Sheperd Doeleman*[1], Arthur Niell[1], Mikael Taveniku[1], Chester Ruszczyk[1], Russ Mcwhirter[1], Steven Durand[2], Jon Romney[2], Mike Revnell[2], George Peck[2], Miguel Guerra[2], Dan Werthimer[3], Alan Langman[4], Walter Brisken[2], Craig Walker[2]
[1]*MIT Haystack Observatory, Westford, MA*
[2]*National Radio Astronomy Observatory, Socorro, NM*
[3]*Berkeley Space Sciences Lab, Berkeley, CA*
[4]*Karoo Array Telescope, Pinelands*

17:00 J2-11 A VLBI PHASED ARRAY PROCESSOR FOR THE SUBMILLIMETER ARRAY

Jonathan Weintroub*[1], Rurik Primiani[1], James Moran[1], Christopher Schaab[2], Sheperd Doeleman[3], Alan Rogers[3]
[1]*Harvard-Smithsonian Center for Astrophysics, Cambridge, MA 02130*
[2]*SAO Submillimeter Array, Hilo, HI 96720*
[3]*MIT Haystack Observatory, Westford, MA 01886*

Business Meetings

17:00	Commission A	Room 155
17:00	Commission E	Room 105
18:00	Commission B	Room 1B40
18:00	Commission J	Room 265

Session B4: Metamaterials
Room 151

Co-Chairs: Piergiorgio Uslenghi, *University of Illinois at Chicago*
Christopher Holloway, *NIST, Boulder*

08:20 B4-1 RADIATION FROM A PARALLEL-PLATE WAVEGUIDE CAPPED BY A PARABOLIC DNG METAMATERIAL LENS

Oguzhan Akgol, Danilo Erricolo, Piergiorgio L. E. Uslenghi*
Department of ECE, University of Illinois at Chicago, Chicago, IL

08:40 B4-2 A PHYSICAL EXPLANATION OF ANGLE-INDEPENDENT BEHAVIOR OF METAFILMS/METASURFACES

Joshua A. Gordon*[1], Christopher L. Holloway[1], Andrew Dienstfrey[2]
[1]*EEEL, NIST, Boulder, CO*
[2]*ITL, NIST, Boulder, CO*

09:00 B4-3 EFFECTIVE PROPERTY DETERMINATION OF A METAMATERIAL FROM OBLIQUE INCIDENCE REFLECTION AND TRANSMISSION TAKING BOUNDARY EFFECTS INTO ACCOUNT

Sung Kim*[1], Edward F. Kuester[1], Christopher L. Holloway[2], James Baker-Jarvis[2]
[1]*University of Colorado at Boulder, Boulder, CO*
[2]*National Institute of Standards and Technology, Boulder, CO*

09:20 B4-4 ROOM-TEMPERATURE FARADAY-ROTATION ISOLATOR BASED ON MAGNETIZED SEMICONDUCTORS

Shadi S. Alshannaq*, Roberto G. Rojas
Electrical and Computer Engineering, THE OHIO STATE UNIVERSITY, COLUMBUS, OH

09:40 B4-5 MAGNETIC SEMICONDUCTORS FOR MILLIMETER-WAVE NON-RECIPROCAL DEVICE APPLICATIONS

Idahosa A. Osaretin*, Roberto G. Rojas
Electrical and Computer Engineering, The Ohio State University, Columbus Ohio

10:00 Break

10:20 B4-6 PLANAR MICRO- LENS: A REFLECTARRAY IN THE OPTICAL DOMAIN

Jingjing Li*, David Fattal, Raymond G. Beausoleil
IQSL, Hewlett-Packard Research Lab, Palo Alto, CA

10:40 B4-7 DESIGN OF A POLARIZATION RECONFIGURABLE CROSSED-DIPOLE ANTENNA USING SURFACE INTEGRATED FLUIDIC LOADING MECHANISMS

Sean A. Goldberger*[1], Frank Drummond[2], Joel Barrera[1], Stephen Davis[2], Jamie Edelen[1], Michelle Geppert[1], YaShavaun Judie[1], Quinn Manley[1], Cameron Peters[2], Samantha Smith[3], Gregory H. Huff[1]
[1]*Electrical and Computer Engineering, Texas A&M University, College Station, TX*
[2]*Aerospace Engineering, Texas A&M University, College Station, TX*
[3]*Mechanical Engineering, Texas A&M University, College Station, TX*

Session BS2: Special Session: Ultra-Wideband Antennas
Room 1B40

Co-Chairs: John Volakis, *Ohio State University*
C. Chen, *Ohio State University*

08:20 BS2-1 INTERWEAVED SPIRAL ARRAY (ISPA) PROVIDING A 10:1 BANDWIDTH IN CONFORMAL INSTALLATIONS

Ioannis Tzanidis*, Kubilay Sertel, John L. Volakis
Electrical and Computer Engineering, The Ohio State University, Electroscience Lab., Columbus Ohio

08:40 BS2-2 DUAL POLARIZED UWB ANTENNAS BASED ON THE COUPLED SECTORIAL LOOPS ANTENNA CONCEPT

Adel Elsherbini*, Kamal Sarabandi
Radiation Laboratory, University of Michigan, Ann Arbor, MI

09:00 BS2-3 MICROWAVE LENS PENCIL-BEAM FORMER FOR UWB APPLICATIONS

Junwei Dong*[1,2], Amir I. Zaghloul[1,3]
[1]The Bradley Department of Electrical & Computer Engineering, Virginia Polytechnic Institute and State University, Falls Church, VA
[2]Microwave Engineering Corporation (MEC), North Andover, MA
[3]U.S. Army Research Laboratory, Adelphi, MD

10:00 Break

10:20 BS2-4 Wideband Conformal Array with Integrated Feed and Matching Network for Wide-Angle Scanning

Justin A. Kasemodel*, Chi-Chih Chen, John L. Volakis
Electrical and Computer Engineering, ElectroScience Lab, The Ohio State Univesity, Columbus, OH

10:40 BS2-5 A DUAL-POLARIZED WIDEBAND ANTENNA WITH SHIELDED DIELECTRIC LOADING

Hyuk-Jun Seo*, Ahmed A. Kishk
Electrical Engineering, University of Mississippi, University, MS

11:00 BS2-6 LOW PROFILE TOP-LOADED CONE ANTENNA FOR VHF TO UHF OPERATION

Shenario E. Amaldoss*, Dimitrios Psychoudakis, Chi-Chih Chen, John L. Volakis
Electroscience Lab, Ohio State University, Columbus, OH

Session C1: Signals and Systems: Algorithms
Room 105

Chair: William Palmer, *US Army Research Office*

10:20 C1-1 COMBINED USE OF VARIOUS PASSIVE RADAR RANGE-DOPPLER TECHNIQUES AND ANGLE OF ARRIVAL USING MUSIC FOR THE DETECTION OF GROUND MOVING OBJECTS

Thomas Chan*, Sermsak Jaruwatanadilok, Yasuo Kuga
Eletrical Engineering, University of Washington, Seattle, WA

10:40 C1-2 A FREQUENCY AND 2D DIRECTION ESTIMATION ALGORITHM

Raymond J. Weber*[1], Yikun Huang[1], Grant B. Brandal[2]
[1]Department of Electrical and Computer Engineering, Montana State University, Bozeman, Montana
[2]Department of Physics, Whitman College, Walla Walla, WA

11:00 C1-3 PREDICTIONS OF THE SPATIALLY CORRELATED STATISTICAL MIMO RADAR TARGET MODEL

Mark T. Frankford*, Joel T. Johnson
Dept. of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio

11:20 C1-4 CRACK DETECTION IN BURIED PIPES USING COMPLEX RESONANT FREQUENCIES

Fadi Deek*, Magda El-Shennawee
Electrical Engineering, University of Arkansas, Fayetteville,AR

11:40 C1-5 SPATIAL LOW PASS FILTER FOR TE EXPERIMENTAL MEASUREMENTS FOR MICROWAVE IMAGE ENHANCEMENT

Ahmed M. Hassan*[1], Mohammad Reza Hajihashemi[1], Magda El-Shenawee[1], Asem Al-Zoubi[2], Ahmed A. Kishk[2]
[1]*Electrical Engineering, University of Arkansas, Fayetteville, Arkansas*
[2]*Electrical Engineering, University of Mississipi, University, Mississipi*

Session E2: EM Interference: Effects and Cyber Threats
Room 105

Co-Chairs: Danilo Erricolo, *UIC*
Ira Kohlberg, *Kohlberg Assoicates, Inc.*

08:20 E2-1 SUSCEPTIBILITY MODELS IN INTENTIONAL EMI

David C. Stoudt*, Robert L. Gardner
Office of the Distinguished Engineer for Directed Energy, Naval Surface Warfare Center, Dahlgren, VA

08:40 E2-2 INTERFERENCE EFFECTS AND INTERFERENCE-LIMIT CRITERIA FOR RADAR RECEIVERS

Frank H. Sanders*, Robert L. Sole
Telecommunications Theory Div., U.S. Department of Commerce NTIA/ITS, Boulder, CO

09:00 E2-3 FUNDAMENTALS OF HPRF EFFECTS MEASUREMENT AND STATISTICAL PREDICTION OF FUNCTIONAL IMPAIRMENT

David A. Schafer*
AFRL/RDHE, albuquerque, nm

09:20 E2-4 SURVIVABILITY OF ATTACKED MUTUALLY DEPENDENT NETWORKS

Ira Kohlberg*
Kohlberg Associates, Alexandria, VA

09:40 E2-5 INSIGHTS FROM THE EMERGING DISCIPLINE OF NETWORK SCIENCE

Robin Burk*, Calvin Shipbaugh
RD-BAA, Defense Threat Reduction Agency, FORT BELVOIR VA

Session FS5: Waves in Random and Complex Media
Room 150

Co-Chairs: Akira Ishimaru, *University of Washington, Seattle*
Saba Mudaliar, *Air Force Research Laboratory*

08:20 FS5-1 A COMMUNICATION CHANNEL IN RANDOM MEDIA APPLIED TO PROPAGATION IN THE OCEAN, ATMOSPHERIC TURBULENCE, AND RAIN

Akira Ishimaru*, Sermsak Jaruwatanadilok, Yasuo Kuga
University of Washington, Seattle, WA

08:40 FS5-2 CALCULATION OF EM SCATTERING FROM MONTE-CARLO SIMULATED RANDOM OCEAN SURFACE

Valerian I. Tatarskii*[1], Viatcheslav V. Tatarskii[2]
[1]*Radio Hydro Physics, LLC, Boulder, CO*
[2]*EAS, Georgia Institute of Technology, Atlanta, GA*

09:00 FS5-3 MONTE-CARLO SIMULATION OF THE OCEAN SURFACE WITH GIVEN STATISTICAL PROPERTIES

Viatcheslav V. Tatarskii*[1], Valerian I. Tatarskii[2]
[1]*EAS, Georgia Institute of Technology, Atlanta, GA*
[2]*Radio Hydro Physics, LLC, Boulder, CO*

09:20 FS5-4 SCATTERING FROM ROUGH SURFACES HAVING VARIABLE PROPERTIES

Gary S. Brown*
Bradley Department of Electrical & Computer Engineering, Virginia Tech, Blacksburg, VA

09:40 FS5-5 SCATTER CROSS SECTIONS FOR TWO DIMENSIONAL, MULTI-SCALE ROUGH SURFACES: A UNIFIED FULL WAVE VARIATIONAL TECHNIQUE

Ezekiel Bahar*
Electrical Engineering Department, University of Nebraska-Lincoln, Lincoln, NE

10:00 Break

10:20 FS5-6 IMAGING THROUGH CLOUDS WITH CHIRPED TRAINS OF INFRA-RED PULSES

Elizabeth H. Bleszynski*, Marek C. Bleszynski, Thomas Jaroszewicz
monopole research, Thousand Oaks, CA 91360

10:40 FS5-7 RETRIEVAL OF MULTILAYERED STRUCTURE PARAMETERS FROM RADAR DATA

Yuriy Goykhman*, Mahta Moghaddam
University of Michigan, Ann Arbor, Ann Arbor, MI

11:00 FS5-8 DIFFERENTIAL CIRCULAR REFLECTION AT A FREE SPACE-CHIRAL INTERFACE, ASSUMING CONSTITUTIVE RELATIONS FOR GYROTROPIC MEDIA AND THE DRUDE-BORN-FEDEROV CONSTITUTIVE RELATIONS

Ezekiel Bahar*
Electrical Engineering Department, University of Nebraska-Lincoln, Lincoln, NE

11:20 FS5-9 UTILITY OF THE BRILLOUIN PRECURSOR IN DEBYE-TYPE DIELECTRICS

Kurt E. Oughstun*
College of Engineering & Math, University of Vermont, Burlington, VT

11:40 FS5-10 WAVES IN A MEDIUM WITH TWO-TEMPERATURE ELECTRON POPULATION

Saba Mudaliar*
Sensors Directorate, Air Force Research Laboratory, Hanscom AFB, MA

Session GJ1: Ionospheric Measurements and Radiotelescope Effects
Room 200

Co-Chairs: Anthea Coster, *MIT Haystack Observatory*
Richard Perley, *National Radio Astronomy Observatory*
Lee Rickard, *University of New Mexico*

08:20 GJ1-1 SCIENCE APPLICATIONS OF LOW-FREQUENCY ARRAYS FROM AN IONOSPHERIC PERSPECTIVE

Anthea Coster*, Divya Oberoi, Phil Erickson
Atmospheric Science, MIT Haystack Observatory, Westford, MA

08:40 GJ1-2 OBSERVATIONS OF TRAVELING IONOSPHERIC DISTURBANCES WITH GPS RECEIVERS AT THE MURCHISON WIDEFIELD ARRAY (MWA)

Jennifer Williams*[1], Anthea Coster[2], David Herne[3], Charles Carrano[4], Divya Oberoi[2], Keith Groves[5]
[1]*Siena College, Loudonville, New York*
[2]*Atmospheric Sciences, MIT Haystack Observatory, Westford, MA*
[3]*Curtin University of Technology, Perth Western Australia*
[4]*Institute for Scientific Research, Boston College, Chestnut Hill, MA*
[5]*USAF AFMC AFRL/RVBXI, Hansom AFB, MA*

09:00 GJ1-3 IONOSPHERIC STUDIES FOR THE LONG WAVELENGTH ARRAY

Christopher Watts*[1], Ken Dymond[2], Jeff Karle[1], Masaya Kuniyoshi[3], Aaron Cohen[2], Namir Kassim[2], Clayton Coker[2]
[1]*University of New Mexico, Albuquerque, NM*
[2]*Naval Research Laboratory, Washington, DC*
[3]*Max-Planck-Institut fuer Radioastronomie, Bonn*

09:20 GJ1-4 IMPACT OF MAGNETOIONIC EFFECTS ON RF PROPAGATION THROUGH VERTICALLY STRATIFIED AND ISOTROPIC IONOSPHERES

Christopher Jeffery*
LANL, Los Alamos, NM

09:40 GJ1-5 HIGH-SENSITIVITY DUAL POLARIZATION SATELLITE BEACON STUDIES OF IONOSPHERIC VARIATIONS

Philip J. Erickson*[1], Anthea J. Coster[1], Frank D. Lind[1], James P. Anderson[2], Eric B. Phelps[2], Glen I. Langston[3]
[1]*Atmospheric Sciences Group, MIT Haystack Observatory, Westford, MA*
[2]*MIT Lincoln Laboratory, Lexington, MA*
[3]*National Radio Astronomy Observatory, Green Bank, WV*

10:00 Break

10:20 GJ1-6 OCCURRENCE STATISTICS OF IONOSPHERIC IRREGULARITIES OBSERVED IN THE VICINITY OF THE PLASMAPAUSE FOOTPOINT BY MID-LATITUDE SUPERDARN RADARS

Joseph B. H. Baker*[1], Alvaro J. Ribeiro[1], J. Michael Ruohoniemi[1], Raymond A. Greenwald[1], Patrick T. Newell[2]
[1]*Bradley Department of Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA*
[2]*Johns Hopkins University Applied Physics Laboratory, Laurel, MD*

10:40 GJ1-7 THEORY OF RF PROPAGATION THROUGH VERTICALLY STRATIFIED AND ISOTROPIC IONOSPHERES

Christopher Jeffery*[1], Robert Roussel-Dupre[2], Patrick Colestock[1]
[1]*ISR-2, LANL, Los Alamos, NM*
[2]*SciTech Solutions, LLC, Santa Fe, NM*

11:00 GJ1-8 OBSERVATIONS OF REGIONAL IONOSPHERIC PHENOMENA BY THE VERY LARGE ARRAY (VLA) AND SUPPORTING SENSORS

K F. Dymond*[1], C Watts[2], C Coker[1], N Kassim[1], T J. Lazio[1], K Weiler[1], P Crane[1], L J. Rickard[2], G B. Taylor[2]
[1]*Naval Research Laboratory, Washington, DC*
[2]*University of New Mexico, Albuquerque, NM*

11:20 GJ1-9 APPLICATIONS OF THE LONG WAVELENGTH ARRAY (LWA) TO IONOSPHERIC MEASUREMENTS

Lee J. Rickard*[1], Dayton Jones[2], Christopher Watts[1], Robert Navarro[2], Gregory B. Taylor[1], Joseph Lazio[3]
[1]*University of New Mexico, Albuquerque NM*
[2]*California Institute of Technology, Jet Propulsion Laboratory, Pasadena CA*
[3]*Remote Sensing Division, Naval Research Laboratory, Washington DC*

Session HG1: Lightning-Ionosphere Interactions I
Room 245

Co-Chairs: Robert Moore, *University of Florida*
Ningyu Liu, *Florida Institute of Technology*

08:20 HG1-1 ON THE VALIDITY OF LOCAL FIELD APPROXIMATION IN MODELING OF LIGHTNING ELECTRIC FIELDS IN THE LOWER IONOSPHERE

Victor P. Pasko*
Penn State University, University Park, Pennsylvania

08:40 HG1-2 RECOVERING ELVE TIME-RADIUS EMISSION PROFILES FROM HIGH-SPEED CAMERA AND/OR MULTI-ANODE PHOTOMETER DATA

Robert T. Newsome*[1], Umran S. Inan[1,2]
[1]*Space, Telecommunication, and Radioscience Laboratory, Stanford University, Stanford, CA*
[2]*Koc University, Istanbul*

09:00 HG1-3 A NEW DEVICE PERFORMING MEASUREMENTS OF OPTICAL RETURN STROKE SPEEDS IN LIGHTNING

Robert C. Moore*, Ryan Nuzzaci
Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL

09:20 HG1-4 REVIEW OF THE SPRITES 2009 MISSION ABOARD THE HIGH-PERFORMANCE INSTRUMENTED AIRBORNE PLATFORM (HIAPER) AIRCRAFT

Matthew G. McHarg*[1], Hans C. Stenbaek-nielsen[2], Takeshi Kanmae[2], Ryan K. Haaland[3]
[1]*Physics, United States Air Force Academy, US Air Force Academy, CO*
[2]*Geophysical Institute, Fairbanks, AK*
[3]*Physics and Engineering, Fort Lewis College, Durango, CO*

09:40 HG1-5 SPRITE STREAMER LUMINOUS TRAIL CAUSED BY INCREASING CURRENT FLOWING ALONG THE STREAMER

Ningyu Liu*
Physics and Space Sciences, Florida Institute of Technology, Melbourne, FL

10:00 Break

10:20 HG1-6 EFFECTS OF SPATIAL NON-UNIFORMITY OF STREAMER DISCHARGES ON SPECTROSCOPIC DIAGNOSTICS OF PEAK ELECTRIC FIELDS IN TRANSIENT LUMINOUS EVENTS

Sebastien J. Celestin*, Victor P. Pasko
Pennsylvania State University, University Park, Pennsylvania

10:40 HG1-7 VARIATION OF THE SPRITE STREAMER EXPONENTIAL GROWTH RATE WITH AMBIENT ELECTRIC FIELD AND ALTITUDE

Burcu Kosar*, Ningyu Liu
Physics and Space Sciences, Florida Institute of Technology, Melbourne,FL

11:00 HG1-8 FIRST RESULTS FROM THE AIRBORNE DETECTOR FOR ENERGETIC LIGHTNING EMISSIONS (ADELE)

David M. Smith*[1], Joseph R. Dwyer[2], Brian W. Grefenstette[1], Bryna J. Hazelton[1], Forest Martinez-McKinney[1], Ziyan Zhang[1], Alexander Lowell[1], Nicole A. Kelley[1], Michael E. Splitt[3], Steven M. Lazarus[3], William Ulrich[3], Hamid Rassoul[2], Meagan Schaal[2], Ziad H. Saleh[2], Eric Cramer[2], Xuan-Min Shao[4], Cheng Ho[4], Steven A. Cummer[5], Gaopeng Lu[5], Richard Blakeslee[6]
[1]*Physics Department and Santa Cruz Institute for Particle Physics, University of California, Santa Cruz, Santa Cruz, CA*
[2]*Department of Physics and Space Science, Florida Institute of Technology, Melbourne, FL*
[3]*Department of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL*
[4]*Los Alamos National Laboratory, Los Alamos, NM*
[5]*Electrical and Computer Engineering Department, Duke University, Durham, NC*
[6]*Marshall Space Flight Center, NASA, Huntsville, AL*

11:20 HG1-9 MONTE CARLO CALCULATIONS OF THE POSITRONS GENERATED BY RELATIVISTIC FEEDBACK

Joseph R. Dwyer*[1], David M. Smith[2]
[1]*Department of Physics and Space Sciences, Florida Intitute of technology, Melbourne, FL*
[2]*Physics Department and Santa Cruz Institute for Particle Physics, University of California, Santa Cruz, Santa Cruz*

11:40 HG1-10 TERRESTRIAL GAMMA-RAY FLASH PRODUCTION BY LIGHTNING LEADERS

Brant E. Carlson*[1], Nikolai G. Lehtinen[1], Umran S. Inan[2]
[1]*Stanford University, Stanford, CA*
[2]*Koc University, Sariyer-Istambul*

Session J3: Pulsar Timing Precision for Probing Gravity
Room 265

Co-Chairs: Joseph Lazio, *Naval Research Laboratory*
James Cordes, *Cornell University*

08:20 J3-1 PULSAR TIMING AND GRAVITATIONAL PHYSICS

Ingrid H. Stairs*
Physics and Astronomy, University of British Columbia, Vancouver, B.C.

08:40 J3-2 PULSAR TIMING AND GRAVITATIONAL PHYSICS: PART 2

Ingrid H. Stairs*
Dept. of Physics and Astronomy, University of British Columbia, Vancouver, B.C.

09:00 J3-3 DETECTION OF BURST GRAVITATIONAL WAVE SOURCES IN A PULSAR TIMING ARRAY

Andrea N. Lommen*[1], L S. Finn[2], William Coles[3], George B. Hobbs[4], Fredrick A. Jenet[5], Richard N. Manchester[4], Russel T. Edwards[4]
[1]*Physics and Astronomy, Franklin and Marshall College, Lancaster, PA*
[2]*Center for Gravitational Wave Physics, Penn State University, State College, PA*
[3]*Electrical Engineering and Computing, UC San Diego, La Jolla, CA*
[4]*Australia Telescope National Facility, CSIRO, Epping, NSW*
[5]*Center for Gravitational Wave Astronomy, UT Brownsville, Brownsville, TX*

09:20 J3-4 LONG-TERM, HIGH-PRECISION MILLISECOND PULSAR TIMING AT ARECIBO AND GREEN BANK

David J. Nice*
Bryn Mawr College, Bryn Mawr, PA

09:40 J3-5 A STUDY OF NUMERICAL EFFECTS IN DIGITAL SIGNAL PROCESSING FOR PULSAR APPLICATIONS

Erica Whitfield*[1], John Ford[2]
[1]*Southwest Baptist University, Bolivar, MO*
[2]*National Radio Astronomy Observatory, Green Bank,WV*

10:00 Break

10:20 J3-6 CURRENT AND FUTURE INSTRUMENTATION FOR HIGH-PRECISION PULSAR TIMING

Paul Demorest*[1], Patrick Brandt[2], Ron DuPlain[1], John Ford[2], Randy McCullough[2], Scott Ransom[1], Jason Ray[2]
[1]*National Radio Astronomy Observatory, Charlottesville, VA*
[2]*National Radio Astronomy Observatory, Green Bank, WV*

10:40 J3-7 A NEW METHOD FOR DETECTING GRAVITATIONAL WAVES USING PULSARS

Ryan M. Shannon*, James M. Cordes
Astronomy, Cornell University, Ithaca, NY

11:00 J3-8 DETECTION OF GRAVITATIONAL WAVE BURSTS USING PULSAR TIMING DATA

P. P. Yu*, X. Siemens, L. Price, J. Creighton
Physics, University of Wisconsin, Milwaukee, WI

11:20 J3-9 100 MICRO-ARCSECOND IMAGING OF A PULSAR SCATTERING DISK

Walter F. Brisken*[1], William A. Coles[2], Adam T. Deller[1], Jian-Jian Gao[2], Jean-Pierre Macquart[3], Barney J. Rickett[2], Steven J. Tingay[3]
[1]*National Radio Astronomy Observatory, Socorro, NM*
[2]*Electrical Engineering and Computer Science, University of California, San Diego, La Jolla, CA*
[3]*Applied Physics, Curtin University of Technology, Perth, WA*

Session K3: Human Body Interactions with Electromagnetic Devices
Room 155

Co-Chairs: Erdem Topsakal, *Mississippi State University*
Susan Hagness, *University of Wisconsin-Madison*

08:20 K3-1 A MINIATURIZED DUAL BAND IMPLANTABLE ANTENNA FOR LONG TERM MEDICAL WIRELESS TELEMETRY

Xin Li*, Tutku Karacolak, Erdem Topsakal
Electrical Enigineering, Mississippi State University, Starkville, MS

08:40 K3-2 IN VIVO VERIFICATION OF IMPLANTABLE ANTENNAS USING RATS AS MODEL ANIMALS

Erdem Topsakal*[1], Tutku Karacolak[1], Peter Ryan[2], Robert Cooper[2]
[1]Department of Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS
[2]College of Veterinary Medicine, Mississippi State University, Mississippi State, MS

09:00 K3-3 UNCONDITIONALLY STABLE TIME-DOMAIN COMPUTATION OF CONTACT IMPEDANCE AND RECRUITMENT VOLUMES IN THE HUMAN BODY DUE TO CONTACT CURRENTS

Nitin Kwatra, Stefan Schmidt, Gianluca Lazzi*
Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC

09:20 K3-4 ELECTRODE DESIGN FOR CONCENTRATION OF ELECTRIC FIELD AT SKIN CANCER

Carl E. Baum*
Dept. Electrical & Computer Engineering, University of New Mexico, Albuquerque, NM

09:40 K3-5 BODY CENTRIC/IMPLANTABLE ANTENNAS FOR EARLY DETECTION OF BREAST CANCER

Mary V. Dancsisin*, Travis A. Nylin, Tutku Karacolak, Erdem Topsakal
Electrical and Computer Engineering, Mississippi State University, Starkville, MS

10:00 Break

10:20 K3-6 CHARACTERIZATION OF TISSUE MIMICKING GELS FOR BREAST PHANTOM CONSTRUCTION FOR USE IN THE EARLY DETECTION OF BREAST CANCER

Travis A. Nylin*, Mary V. Dancsisin, Erdem Topsakal
Electrical and Computer Engineering, Mississippi State University, Starkville, Mississippi

10:40 K3-7 CONTROLLING THE RADIATION PATTERN AND POLARIZATION OF A RADIATING MOLECULE BY MULTI-OPTICAL-ANTENNA SYSTEMS

Jingjing Li*, Wei Wu, Zhiyong Li
IQSL, Hewlett-Packard Research Lab, Palo Alto, CA

Session A3: Antenna Measurements
Room 155

Co-Chairs: William Davis, *Virginia Tech*
Steven Keller, *US Army Research Laboratory*

13:20 A3-1 DESIGN AND MEASUREMENT OF WIDEBAND VHF DIRECTION FINDING ANTENNA MOUNTED ON AERIAL VEHICLE WING

Steven D. Keller*
US Army Research Laboratory, Adelphi, MD

13:40 A3-2 DEVELOPMENT OF A UWB SHORT RANGE IMPULSE RADAR SUPPRESSING CARRIER LEAKAGE

Takehiko Nishide*, Hironori Enkoji, Natsuki Hashimoto, Takehiko Kobayashi
Information and communivation engineering, Wireless System Laboratry, Tokyo Denki University, Kanda-nishikicho, Chiyoda-ku, Tokyo

14:00 A3-3 A LOW-PROFILE, C-BAND, ELECTRICALLY-SCANNED ARRAY USING A FLEXIBLE ROTMAN LENS FOR ARMY PLATFORMS

Theodore K. Anthony*, Steven J. Weiss
RDRL-SER-M, Army Research Lab, Adelphi, MD

14:20 A3-4 REMOTE RADIATION-PATTERN MEASUREMENTS

Taeyoung Yang*, William A. Davis
Virginia Tech Antenna Group, Blacksburg, VA

Session A4: Specialized Measurement Techniques for Antennas and Materials
Room 155

Co-Chairs: Michael Janezic, *NIST*
Steven Weiss, *U.S. Army Research Laboratory*

15:20 A4-1 REMOVAL OF CHAMBER ARTIFACTS IN SPHERICAL NEAR-FIELD MEASUREMENTS

Ronald J. Pogorzelski*
Jet Propulsion Laboratory - Caltech, Pasadena, CA

15:40 A4-2 CHARACTERIZATION OF LIQUID METAL ALLOY (EGAIN) LOSSES IN COIL AND PATCH ANTENNA CONFIGURATIONS

Gerard J. Hayes*[1], Amit Qusba[1], Gianluca Lazzi[1], Ju-Hee So[2], Michael D. Dickey[2]
[1]Electrical and Computer Engineering, North Carolina State University, Raleigh, NC
[2]Chemical Engineering, North Carolina State University, Raleight, NC

16:00 A4-3 FULL-WAVE MODELING AND MEASUREMENTS OF PT NANOWIRES

Kichul Kim*[1], T. Mitch Wallis[2], Paul Rice[3], Chin-Jen Chiang[4], Atif Imtiaz[2], Pavel Kabos[2], Dejan S. Filipovic[1]
[1]Dept. of Electrical, Computer, and Energy Engineering, UNIVERSITY OF COLORADO, BOULDER, CO
[2]Electromagnetics Division, National Institute of Standard and Technology, BOULDER, CO
[3]Dept. of Mechanical Engineering, UNIVERSITY OF COLORADO, BOULDER, CO
[4]National Changhua University of Education, Changhua

16:20 A4-4 ANTENNA RADIATION PATTERN ESTIMATION FROM PARTIALLY-SCANNED NEAR-FIELD DATA

Taeyoung Yang*, William A. Davis
Virginia Tech Antenna Group, Blacksburg, VA

16:40 A4-5 NEAR-FIELD MEASUREMENT TECHNIQUES AND IMAGING

Randal H. Direen*, David Novotny, Katherine MacReynolds, Rondal C. Witttmann
Antenna measurements, National Institute of Standards and Technology, Boulder, Colorado

Session B5: Trends in Theoretical Electromagnetics
Room 1B40

Co-Chairs: David Jackson, *University of Houston*
William Davis, *Virginia Tech*

13:20 B5-1 LAGRANGIAN FORMULATION OF THE COMBINED-FIELD FORM OF THE MAXWELL EQUATIONS

Carl E. Baum*
Dept. Electrical & Computer Engineering, University of New Mexico, Albuquerque, NM

13:40 B5-2 MINIMUM RADIATION-Q OF ANTENNAS BOUNDED BY A PROLATE SPHEROID

Taeyoung Yang*, William A. Davis, Warren L. Stutzman
Virginia Tech Antenna Group, Blacksburg, VA

14:00 B5-3 SCATTERING FROM DIELECTRIC LOADED PEC SEMICIRCULAR CYLINDER AND STRIP

Santosh Seran*, John P. Donohoe, Erdem Topsakal
Department of Electrical and Computer Engineering, Mississippi State University, Mississippi State,MS

14:20 B5-4 RADAR BACKSCATTER FROM CONDUCTING POLYHEDRAL SPHERES

Paul A. Bernhardt*
Naval Research Laboratory, Washington, DC

14:40 B5-5 ANALYTICAL MODEL OF THE ELECTROMAGNETIC BIAS USING THE PHYSICAL OPTICS SCATTERING THEORY

Praphun Naenna*, Joel T. Johnson
THE OHIO STATE UNIVERSITY, Columbus, Ohio

15:00 Break

15:20 B5-6 TARGET DETECTION WITH FOCUSING IMPULSE RADIATING ANTENNAS

Chandra Bajracharya*, Shu Xiao, Karl H. Schoenbach
Frank Reidy Research Center for Bioelectrics, Old Dominion University, Norfolk, VA

15:40 B5-7 A NUMERICAL STUDY OF TM WAVES ON AN ISOLATED WIRE

William O. Coburn, Steven Weiss*
RDRL-SER-M, US Army Research Laboratory, Adelphi MD

16:00 B5-8 PRODUCING ENFIRE OMNIDIRECTIONAL RADIATION PATTERNS FROM LEAKY-WAVE ANTENNAS

Ellen M. O'Connor*, Minh Tran, David R. Jackson, Stuart A. Long
Department of Electrical and Computer Engineering, Applied Electromagnetics Lab, University of Houston, Houston, TX

16:20 B5-9 FABRY-PEROT RESONANCES OF TOTAL TRANSMISSION IN MULTILAYER SUB-WAVELENGTH PARTIALLY-REFLECTING SURFACES

Chandra Sekhar Reddy Kaipa*
Electrical Engineering, University of Mississippi, University, MS

16:40 B5-10 THE COUPLING CALCULATIONS BETWEEN TWO ARBITRARILY ORIENTED ANTENNAS IN NEAR- AND FAR-FIELD REGIONS

Ahmed H. Akgiray*, Yahya Rahmat-Samii
Electrical Engineering, University of California, Los Angeles, CA

Session B6: Computational Methods in Electromagnetics
Room 151

Co-Chairs: Fernando Teixeira, *Ohio State University*
Ozlem Kilic, *The Catholic University of America*

13:20 B6-1 ANALYSIS OF SKEWED GRID PERIODIC STRUCTURES USING FDTD

Khaled ElMahgoub*[1], Fan Yang[1], Atef Elsherbeni[1], Veysel Demir[2], Ji Chen[3]
[1]*Electrical Engineering, University of Mississippi, University MS*
[2]*Electrical Engineering, Northern Illinois University, DeKalb IL*
[3]*Department of Electrical & Computer Engineering, University of Houston, Houston TX*

13:40 B6-2 ELECTROMAGNETIC RESPONSE OF LOGGING-WHILE-DRILLING SENSORS IN ECCENTRIC BOREHOLES AND ANISOTROPIC EARTH FORMATIONS

Hwa Ok Lee*, Fernando L. Teixeira
ECE, The Ohio State University, Columbus, OHIO

14:00 B6-3 TWO IMPLEMENTATIONS OF THE METHOD OF ORDERED MULTIPLE INTERACTIONS TO PREDICT SCATTERING FROM LOSSY DIELECTRIC SURFACES

Benjamin A. Westin*, Daniel E. Davis, Gary S. Brown
Electrical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA

14:20 B6-4 AN ACCURATE AND COMPUTATIONALLY FAST APPROXIMATION FOR COMBINED FIELD INTEGRAL EQUATION GREEN'S FUNCTIONS

Daniel E. Davis*, Benjamin A. Westin, Gary S. Brown
Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Blacksburg

14:40 B6-5 INTERCONNECT AND LUMPED ELEMENTS MODELING IN INTERIOR PENALTY DISCONTINUOUS GALERKIN TIME-DOMAIN METHODS

Stylianos Dosopoulos*, Jin-fa Lee
THE OHIO STATE UNIVERSITY, Columbus, Ohio

15:00 Break

15:20 B6-6 APPLICATIONS OF CLONAL SELECTION PRINCIPLES IN ELECTROMAGNETICS PROBLEMS

Quang M. Nguyen*, Ozlem Kilic
EE, Catholic University of America, Washington DC

15:40 B6-7 INCREMENTAL DOUBLE DIFFRACTION COEFFICIENTS FOR COMPLEX SOURCE POINTS

Stefano M. Canta*[1], Danilo Erricolo[1], Alberto Toccafondi[2]
[1]*ECE Department, University of Illinois at Chicago, Chicago, IL*
[2]*Information Eng. Department, University of Siena, Siena*

16:00 B6-8 INVESTIGATION OF SECURITY BENEFITS OF DIRECTIONAL MODULATION IN VARIOUS SCATTERING ENVIRONMENTS

Michael P. Daly*, Jennifer T. Bernhard
Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL

16:20 B6-9 A COMPARATIVE ANALYSIS OF FAST MULTIPLE KNIFE-EDGE DIFFRACTION METHODS WITH MEASURED DATA

Nicholas DeMinco*, Paul M. McKenna, Robert T. Johnk, Christopher J. Behm, Christopher Redding, Timothy J. Riley, Steven Carroll, George Engelbrecht, James W. Leslie, Mark A. McFarland, Patricia J. Raush
Institute for Telecommunication Sciences, Boulder, Colorado

16:40 B6-10 ULTRA HIGH-RESOLUTION FDTD MODELING OF A HIGH-PERFORMANCE VLSI PACKAGE FOR IDENTIFYING EMC ISSUES

Cesar Mendez Ruiz*, Jamesina J. Simpson
ECE, University of New Mexico, Albuquerque, New Mexico

Session C2: Signals and Systems: Applications
Room 105

Chair: William Palmer, *US Army Research Office*

13:20 C2-1 WIDEBAND MICROWAVE SENSING OF PASSIVE RADAR TARGETS FOR APPLICATIONS IN GRANULAR MATERIALS RESEARCH

Earl Zastrow*[1], Carlo Van Niekerk[2], Jennifer T. Bernhard[2], Susan C. Hagness[1]
[1]*Electrical and Computer Engineering, University of Wisconsin - Madison, Madison, WI*
[2]*Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL*

13:40 C2-2 ESTIMATION OF LINK BUDGET, CAPACITY, AND LIFETIME OF A MULTIFUNCTIONAL ANTENNA RECONNAISSANCE SPHERE (MARS)

Gregory H. Huff*, Sunil Khatri, Jean-Francois Chamberland
Texas A&M University, College Station

14:00 C2-3 INVERSE SCATTERING OF MULTIPLE 3D DIELECTRIC TARGETS USING THE LEVEL SET ALGORITHM

Mohammad Reza Hajihashemi*, Magda El-Shenawee
Electrical Engineering, University of Arkansas, Fayetteville, Arkansas

14:20 C2-4 UWB RADAR THROUGH-WALL DETECTION BASED ON THREE-DIMENSIONAL IMAGING – EXPERIMENTAL RESULTS

Yazhou Wang*, Aly E. Fathy
EECS, University of Tennessee, Knoxville, TN

14:40 C2-5 THROUGH-THE-WALL RADAR IMAGING SYSTEMS SIMULATIONS AND MEASUREMENTS

Traian Dogaru*, Calvin Le, Lam Nguyen
U.S. Army Research Laboratory, Adelphi, MD

Session C3: Signals and Systems: Performance and Processing
Room 105

Chair: William Palmer, *US Army Research Office*

15:20 C3-1 INTERFEROMETRIC MODIFICATION OF LOCKHEED MARTIN PSTAR SYSTEM TO FACILITATE THREE DIMENSIONAL AIRSPACE SURVEILLANCE

Scott E. Otterbacher*, Denise Thorsen
University of Alaska Fairbanks, Fairbanks, AK

15:40 C3-2 LINEAR AND EFFICIENT ENVELOPE TRACKING PA FOR HIGH-PAR WAVEFORMS

John Hoversten*, Michael Roberg, Zoya Popovic
Dept. of Electrical, Computer, and Energy Engineering, University of Colorado at Boulder, Boulder, CO

16:00 C3-3 IMPLEMENTATION AND USE OF GIGASAMPLE PER SECOND SAMPLING AND GPU-ACCELERATED PROCESSING OF ULTRA-WIDEBAND SYSTEMS

Jonathan L. Turnmire*[1], Aly Fathy[1], Gregory Peterson[1], Mohamed Mahfouz[2]
[1]EECS, The University of Tennessee, Knoxville, Knoxville, TN
[2]MABE, The University of Tennessee, Knoxville, Knoxville, TN

16:20 C3-4 A LOCAL POSITIONING SYSTEM FOR WIRELESS NETWORKS

Raymond J. Weber*, Yikun Huang
Department of Electrical and Computer Engineering, Montana State University, Bozeman, Montana

16:40 C3-5 ISOLATING INDIVIDUAL RADIO WAVE PROPAGATION MECHANISMS USING SPACE-TIME FILTERS

Ryan J. Pirkl*, Gregory D. Durgin
Georgia Institute of Technology, Atlanta

Session FS6: Waves in Random Media with Applications in Remote Sensing of Vegetation
Room 150

Co-Chairs: Akira Ishimaru, *University of Washington, Seattle*
Saba Mudaliar, *Air Force Research Laboratory*

13:20 FS6-1 ESTIMATION OF TROPICAL FOREST STRUCTURE FROM FUSION OF SAR AND LIDAR MEASUREMENTS

Sassan S. Saatchi*
Jet Propulsion Laboratory/CALTECH, Pasadena, CA

13:40 FS6-2 ON POSSIBILITIES AND LIMITATIONS OF POLARIMETRIC SAR INTERFEROMETRY FOR FOREST REMOTE SENSING

Maxim Neumann*[1], Laurent Ferro-Famil[2], Sassan S. Saatchi[1]
[1]*Jet Propulsion Laboratory, Pasadena, CA*
[2]*University of Rennes 1, Rennes*

14:00 FS6-3 RADAR BACKSCATTERING MODEL FOR MULTI-SPECIES FORESTS BASED ON WAVE THEORY

Mariko S. Burgin*[1], Mahta Moghaddam[1], Richard M. Lucas[2]
[1]*Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI*
[2]*Institute of Geography and Earth Sciences, University of Wales, Aberystwyth*

14:20 FS6-4 EFFECTS OF TREES ON PATH LOSS IN A VEGETATED RESIDENTIAL ENVIRONMENT RADIATIVE TRANSPORT THEORY

Saul A. Torrico*[1], Roger H. Lang[2]
[1]*Comsearch, Ashburn, VA*
[2]*Electrical and Computer Engineering,, The George Washington University, Washington, DC*

14:40 FS6-5 GPS MULTIPATH IN THE PRESENCE OF VEGETATION

Kristine M. Larson*[1], Valery U. Zavorotny[2], Eric E. Small[3], John J. Braun[4], Ethan D. Gutmann[5], Scott Haeffelin[1]
[1]*Department of Aerospace Engineering Sciences, University of Colorado, Boulder CO*
[2]*Physical Sciences Division, NOAA/Earth System Research Laboratory, Boulder CO*
[3]*Department of Geological Sciences, University of Colorado, Boulder CO*
[4]*COSMIC, University Corporation for Atmospheric Research, Boulder CO*
[5]*National Center for Atmospheric Research, Boulder CO*

15:00 Break

15:20 FS6-6 NUMERICAL ANALYSIS OF SCATTERING FROM A CLUSTER OF LEAVES USING THE DISCRETE DIPOLE APPROXIMATION METHOD

Qianyi Zhao*, Roger Lang
Department of Electrical and Computer Engineering, The George Washington University, Washington DC

15:40 FS6-7 MODELING POL-INSAR MEASUREMENTS OF FOREST STRUCTURE

Shadi Oveisgharan*, Sassan S. Saatchi
Jet Propulsion Lab, Pasadena, CA

Session G3: Ionospheric Data Assimilation and Modeling
Room 200

Co-Chairs: Attila Komjathy, *NASA JPL/Caltech*
Joseph Huba, *Naval Research Laboratory*

13:20 G3-1 NCAR/TIEGCM: A COMMUNITY MODEL FOR THE COUPLED THERMOSPHERE/IONOSPHERE SYSTEM

Liying Qian*[1], Stanley C. Solomon[1], Alan G. Burns[1], Philip C. Chmbarlin[2]
[1]*High Altitude Observatory, National Center for Atmospheric Research, Boulder, CO*
[2]*National Aeronautics and Space Administration, Washington, DC*

13:40 G3-2 MODELING DAWN DENSITY DEPLETIONS WITH SAMI3

Joseph D. Huba*[1], Glenn Joyce[2], Jonathan Krall[1], Carl Siefring[1], Paul Bernhardt[1]
[1]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[2]*Icarus Research Inc, Bethesda, MD*

14:00 G3-3 THREE-DIMENSIONAL SIMULATION OF EQUATORIAL SPREAD-F

Jonathan Krall*
Plasma Physics Division, Naval Research Laboratory, Washington, DC

14:20 G3-4 NESTED GRID JPL/USC GAIM

Miguel A. Dumett*, Vardan Akopian, Brian D. Wilson, Attila Komjathy, Xiaoqing Pi, Byron A. Iijima, Anthony J. Mannucci
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California

14:40 G3-5 THE USU GAIM DATA ASSIMILATION MODELS: SPECIFICATION OF THE LOW- AND MID-LATITUDE IONOSPHERE

Ludger Scherliess*, Donald C. Thompson, Robert W. Schunk
Center for Atmospheric and Space Sciences, Utah State University, Logan, UT

15:00 Break

15:20 G3-6 COMBINING DATA ASSIMILATION WITH MODELING: UNDERSTANDING THE PHYSICS

G S. Bust*
ASTRA, San Antonio, Tx

15:40 G3-7 EXTRACTION OF EMPIRICAL ORTHOGONAL FUNCTIONS FROM LARGE DATA SETS FOR MODELING IONOSPHERIC ELECTRON DENSITY PROFILES

Linda Habash Krause*, Anthony L. Franz, James D. Musick
Department of Physics, U. S. Air Force Academy, USAF Academy, CO

16:00 G3-8 ENSEMBLE KALMAN FILTERING FOR ASSIMILATION OF GPS-BASED IONOSPHERIC OBSERVATIONS

Tomoko Matsuo*[1], Jeffrey L. Anderson[2], Eduardo A. Araujo-Pradere[1]
[1]*CIRES, University of Colorado at Boulder, Boulder, CO*
[2]*IMAGe, National Center for Atmospheric Research, Boulder, CO*

16:20 G3-9 FDTD CALCULATION OF THE FARADAY ROTATION OF EM WAVES PROPAGATING WITHIN THE IONOSPHERE

Yaxin Yu*, Jamesina J. Simpson
ECE Department, University of New Mexico, Albuquerque, NM

Session HG2: Lightning-Ionosphere Interactions II
Room 245

Co-Chairs: Ningyu Liu, *Florida Institute of Technology*
Robert Moore, *University of Florida*

13:20 HG2-1 DEVELOPMENT OF EFFICIENT MONTE CARLO MODELS FOR STUDIES OF ELECTRON RUNAWAY PHENOMENA IN AIR

Sebastien J. Celestin*, Victor P. Pasko
Pennsylvania State University, University Park, Pennsylvania

13:40 HG2-2 OBSERVATION AND MODELING OF THE ELECTROMAGNETIC TRANSVERSE RESONANCE OF THE EARTH-IONOSPHERE CAVITY AND VARIATION OF THE D-REGION ELECTRON DENSITY NEAR SUNSET

Fernando Simoes*[1,2], Jean-Jacques Berthelier[2]
[1]*NASA-GSFC, Greenbelt, MD*
[2]*LATMOS-IPSL, Saint Maur*

Session HG3: Lunar Dust Dynamics
Room 245

Co-Chairs: Zoltan Sternovsky, *LASP, University of Colorado*
Mihaly Horanyi, *LASP, University of Colorado*

15:20 HG3-1 STUDYING THE CHARGE STATE OF NOCTILUCENT CLOUDS USING A MASS SPECTROMETER

Scott R. Knappmiller*[1], Scott Robertson[1], Zoltan Sternovsky[1], Mihaly Horanyi[1], Markus Rapp[2]
[1]*Physics, University of Colorado at Boulder, Boulder Colorado*
[2]*Institute for Atmospheric Physics, Kuehlungsborn*

15:40 HG3-2 IMPACT GENERATED PLASMAS ON THE LUNAR SURFACE

Mihaly Horanyi*, Tobin Munsat, Scott Robertson, Zoltan Sternovsky, Xu Wang
Dept. of Physics / LASP, U. of Colorado, Boulder

16:00 HG3-3 PARTICLE-IN-CELL SIMULATIONS OF DUST-LADEN PHOTOELECTRON SHEATHS ON THE LUNAR SURFACE

Andrew R. Poppe*[1,2], Mihaly Horanyi[1,2]
[1]*Laboratory for Atmospheric and Space Physics, Boulder, Colorado*
[2]*Dept. of Physics, University of Colorado, Boulder, Colorado*

16:20 HG3-4 LABORATORY INVESTIGATIONS OF LUNAR DUST TRANSPORT

Xu Wang*[1,2], Mihaly Horanyi[1,3,2], Scott Robertson[1,2]
[1]*Physics, University of Colorado, Boulder,CO*
[2]*Colorado Center for Lunar Dust and Atmospheric Studies (CCLDAS), Boulder,CO*
[3]*LASP, University of Colorado, Boulder,CO*

16:40 HG3-5 THE LUNAR DUST EXPERIMENT (LDEX) FOR THE LUNAR ATMOSPHERE AND DUST ENVIRONMENT EXPLORER (LADEE) MISSION

Zoltan Sternovsky*[1,2,3], Mihaly Horanyi[1,2], Eberhard Gruen[1,4], Ralf Srama[4], George Lawrence[1]
[1]*LASP, University of Colorado, Boulder CO*
[2]*CCLDAS, University of Colorado, Boulder CO*
[3]*Aerospae Engineering Sciences, University of Colorado, Boulder CO*
[4]*Max-Planck Institute for Nuclear Phyisics, Hedelberg*

17:20 HG3-6 COMPUTER MODEL OF THE DUST TRAJECTORY SENSOR (DTS)

Jianfeng Xie*[1], Siegfried Auer[2], Eberhard Grn[3,4], Zoltan Sternovsky[3], Mihaly Horanyi[3]
[1]*Dept. of Phyiscs, University of Colorado at Boulder, Boulder,CO*
[2]*A&M Associates, Basye, VA*
[3]*LASP, Boulder,CO*
[4]*Max-Planck-Institut fr Kernphysik, Heidelberg*

Session J4: New Telescopes, Techniques and Observations
Room 265

Co-Chairs: Richard Bradley, *National Radio Astronomy Observatory*
James Cordes, *Cornell University*

13:20 J4-1 PAPER 2010: AN UPDATE

Richard F. Bradley*[1], Don Backer[2], Chris Carilli[3]
[1]*Central Development Laboratory, National Radio Astronomy Observatory, Charlottesville, VA*
[2]*Astronomy Department, University of California, Berkeley, CA*
[3]*Array Operations Center, National Radio Astronomy Observatory, Socorro, NM*

13:40 J4-2 CHARACTERIZING ENVIRONMENTAL RADIO FREQUENCY INTERFERENCE AT THE ATA

Vicente C. Gonzaga*[1], William C. Barott[2], Peter Backus[3], Jill Tarter[3], Rick Forster[4], Alex Rudolph[1]
[1]*Cal Poly Pomona, Pomona, CA*
[2]*Embry-Riddle Aeronautical University, Daytona Beach, FL*
[3]*SETI Institute, Mountain View, CA*
[4]*University of California, Berkeley, CA*

14:00 J4-3 CORRECTION OF DIRECTION DEPENDENT EFFECTS IN INTERFEROMETRIC IMAGING

Sanjay Bhatnagar*
NRAO, Socorro, NM

14:20 J4-4 MOSAICING IN THE VISIBILITY DOMAIN (UV) FOR HETEROGENOUS RADIO INTERFEROMETERS

Kumar Golap*
National Radio Astronomy Observatory, Socorro, NM

14:40 J4-5 SIGNIFICANT IMPROVEMENTS TO THE GBT SURFACE ACCURACY VIA CONVENTIONAL HIGH-RESOLUTION RADIO HOLOGRAPHY

Todd R. Hunter*[1], Frederic R. Schwab[1], Steve D. White[2], John M. Ford[2], Frank D. Ghigo[2], Ron J. Maddalena[2], Brian S. Mason[1], Jack D. Nelson[2], Jason Ray[2], Bob Simon[2]
[1]*NRAO, Charlottesville, VA*
[2]*NRAO, Green Bank, WV*

15:00 Break

15:20 J4-6 DESIGN AND PERFORMANCE OF THE K-BAND HETERODYNE FOCAL PLANE ARRAY FOR THE ROBERT C. BYRD GREEN BANK RADIO TELESCOPE

Steven D. White*, Matt Morgan, Felix J. Lockman, Eric Bryerton, Glen Langston, Roger Norrod, Bob Simon, Galen Watts, Sivasankaran Srikanth, Gary Anderson
National Radio Astronomy Observatory, Green Bank, WV

15:40 J4-7 A NOVEL X-BAND ORTHOMODE TRANSDUCER

Gordon M. Coutts*
National Radio Astronomy Observatory, Socorro,NM

16:00 J4-8 DESIGN CONCEPTS FOR LARGE SUB-MILLIMETER TELESCOPES

David P. Woody*
Owens Valley Radio Observatory, Caltech, Big Pine, CA

16:20 J4-9 WIDE-FIELD SUBMILLIMETER CAMERA OPTICS

Stephen Padin*
Caltech, Pasadena CA

16:40 J4-10 THE EVENT HORIZON TELESCOPE: A (SUB)MM-VLBI NETWORK FOR IMAGING SUPER MASSIVE BLACK HOLES

Sheperd S. Doeleman*
MIT Haystack Observatory, Westford, MA

Business Meetings

17:00	Commission C	Room 105
17:00	Commission H	Room 245

Saturday Morning **9 January 2010**

08:20 – 09:50 USNC-URSI Executive Council, Millennium Hotel

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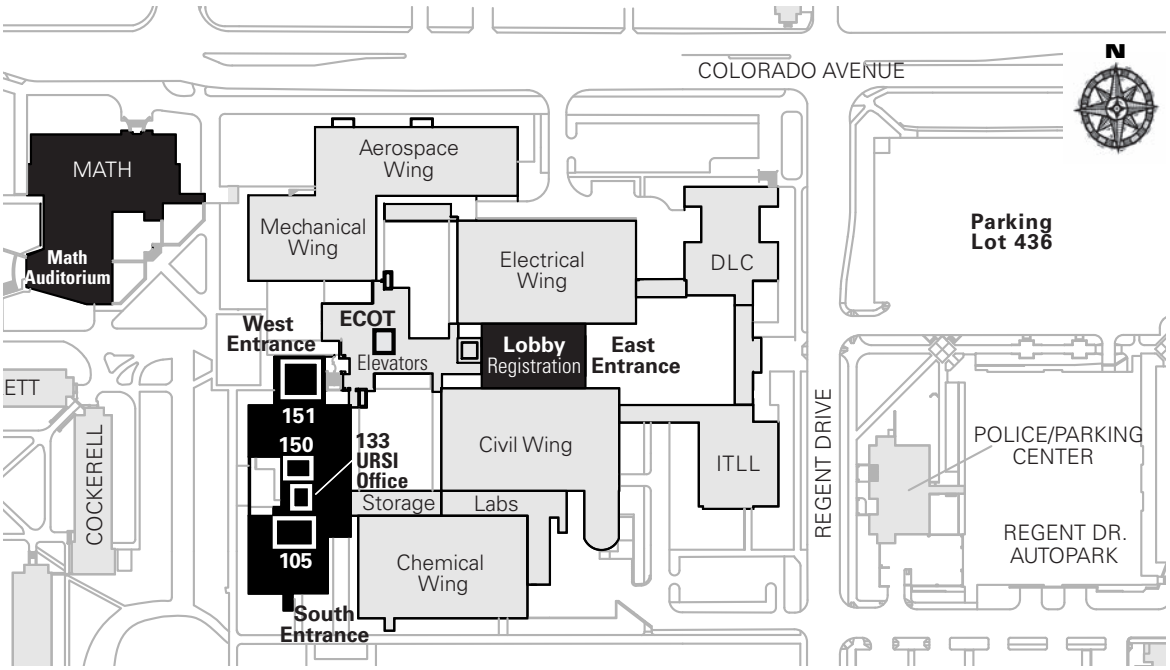
CU-Boulder Engineering Center (EC)



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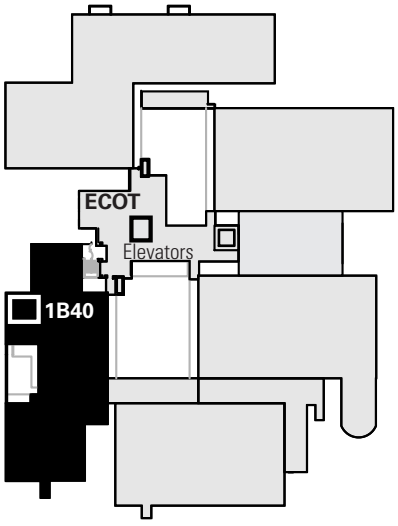

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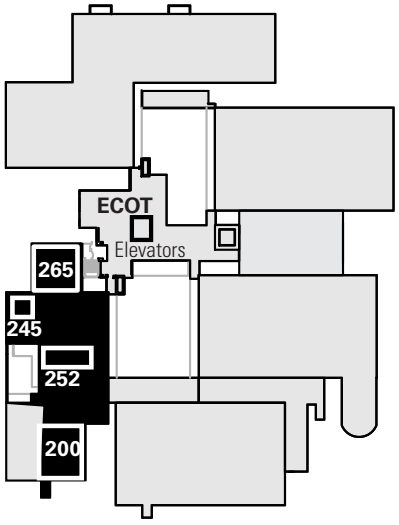

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