USNC–URSI National Radio Science Meeting

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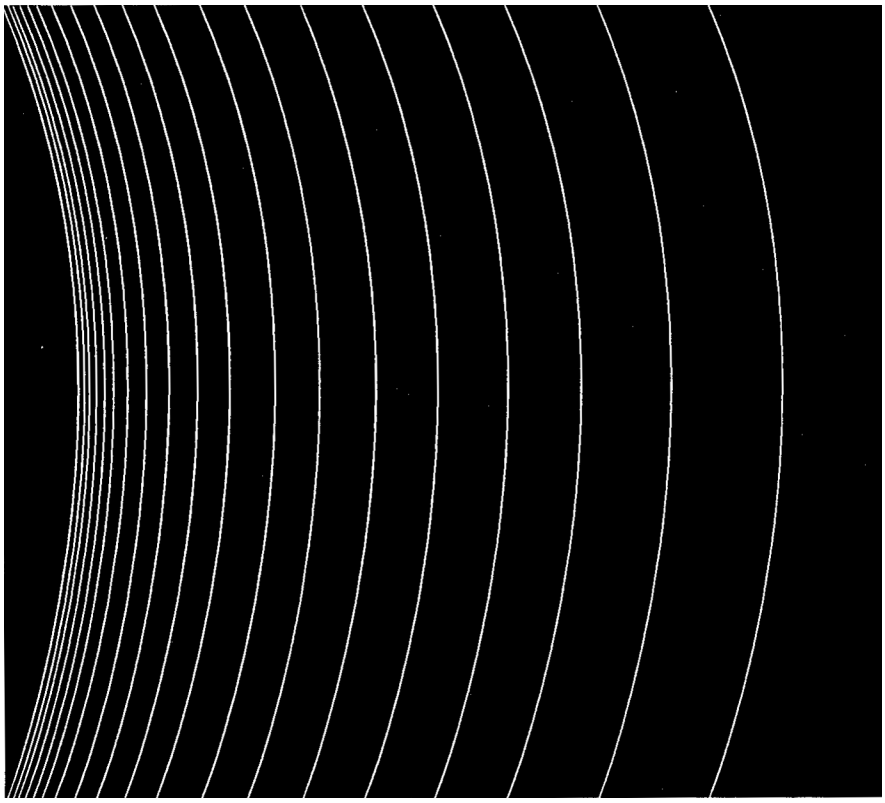

6–9 January 2010

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

Room	105	150	151	155	200	245	265	1B40
Wednesday 6 January 08:20-12:00	FS1 - Mesoscale Numerical Weather Prediction in Support of Wave Propagation Modeling I	F1 - Active Remote Sensing of the Oceans, Atmosphere and Land	KB1 - Advances in Computational Biophotonics	A1 - Measurement and Calibration Techniques for Remote Sensing Applications	G1 - Meteor Science	H1 - Space Plasma Laboratory Experiments	FS2 - Radar Remote Sensing of Precipitation	B1 - Session in Memory of Professor Robert S. Elliott
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	KB2 - 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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UNITED STATES NATIONAL COMMITTEE
INTERNATIONAL UNION OF RADIO SCIENCE
TECHNICAL PROGRAM
National Radio Science Meeting
6–9 January 2010
University of Colorado at Boulder
Sponsored by USNC–URSI

ROOM AND TIME SCHEDULE FOR SESSIONS

Tuesday, 5 January 2010

USNC–URSI Committee,
Millennium Hotel, 1900-2300

Wednesday, 6 January 2010

Morning Sessions:		**page**
A1	0820, Room 155	4
B1	0820, Room 1B40	4
F1	0820, Room 150	5
FS1	0820, Room 105	5
FS2	0820, Room 265	6
G1	0820, Room 200	6
H1	0820, Room 245	7
KB1	0820, Room 151	8
Afternoon Sessions:		**page**
BS1	1320, Room 1B40	8
D1	1320, Room 155	9
FS3	1320, Room 105	9
FS4	1320, Room 150	10
G2	1320, Room 245	11
GH1	1320, Room 200	11
GH2	1520, Room 245	12
J1	1320, Room 265	12
KB2	1320, Room 151	13
Business Meetings:		**page**
Commission D	1700, Room 155	13
Commission F	1700, Room 150	13
Commission G	1800, Room 200	13
Commission K	1800, Room 151	13
Reception:		
Engineering Center Lobby		13
(Beer and wine provided)		
1830–2100		

Thursday, 7 January 2010

Morning Plenary Session:		**page**
Mathematics Auditorium, 0820		14
Afternoon Sessions:		**page**
A2	1320, Room 155	14
B2	1320, Room 1B40	15
B3	1320, Room 151	15
E1	1320, Room 105	16
F2	1320, Room 150	16
GH3	1320, Room 200	17
H2	1320, Room 245	18
J2	1320, Room 265	18
Business Meetings:		**page**
Commission A	1700, Room 155	19
Commission E	1700, Room 105	19
Commission B	1800, Room 1B40	19
Commission J	1800, Room 265	19

Friday, 8 January 2010

Morning Sessions:		**page**
B4	0820, Room 151	19
BS2	0820, Room 1B40	20
C1	1020, Room 105	20
E2	0820, Room 105	21
FS5	0820, Room 150	21
GJ1	0820, Room 200	22
HG1	0820, Room 245	23
J3	0820, Room 265	23
K3	0820, Room 155	24
Afternoon Sessions:		**page**
A3	1320, Room 155	25
A4	1520, Room 155	25
B5	1320, Room 1B40	25
B6	1320, Room 151	26
C2	1320, Room 105	27
C3	1520, Room 105	27
FS6	1320, Room 150	27
G3	1320, Room 200	28
HG2	1320, Room 245	29
HG3	1520, Room 245	29
J4	1320, Room 265	29
Business Meetings:		**page**
Commission C	1700, Room 105	30
Commission H	1700, Room 245	30

Saturday, 9 January 2010

USNC–URSI Executive Council
Millennium Hotel, 0820-0950

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*

8:20 A1-1
US NAVY RADAR CROSS SECTION MEASUREMENT CAPABILITIES & CALIBRATION
Bruce Crock*, Thomas Miller
RF Technology Branch, Naval Surface Warfare Center, West Bethesda, MD

8:40 A1-2
OPTIMAL CALIBRATION OF RADIOMETER USING SYSTEM IDENTIFICATION TECHNIQUES
Miao Tian*, Albin J. Gasiewski
ECEE, University of Colorado at Boulder, Boulder, CO

9:00 A1-3
ANALYZING NON STATIONARY PROCESSES IN RADIOMETERS
Paul E. Racette*
NASA Goddard Space Flight Center, Greenbelt, MD

9:20 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*

8:20 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*

8:40 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

9:00 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

9:20 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

9:40 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, Japan*
[2]*Electrical Engineering Department, University of California, Los Angeles, Los Angeles, CA*

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 60 GHZ 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

*Presenting author

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, *The George Washington University*

8:20 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

8:40 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 at Boulder, CO*

9:00 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, OH

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 at 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*

8:20 FS1-1
REVIEW ON THE MODEL PREDICTION OF EM/EO IN THE COASTAL LITTORAL ZONE
Sue Chen*, Tracy Haack
NRL, Monterey, CA

8:40 FS1-2
REVIEW ON THE MODEL PREDICTION OF EM/EO IN THE COASTAL LITTORAL ZONE: PART 2
Sue Chen*, Tracy Haack
NRL, Monterey, CA

9:00 FS1-3
METEOROLOGICAL DATA REQUIREMENTS FOR SURFACE-BASED NAVAL RADARS
George D. Dockery*
Johns Hopkins University Applied Physics Laboratory, Laurel, MD

9:20 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, France*
[3]*SHOM, Brest, France*

9:40 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
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, New Zealand

WEDNESDAY MORNING, continued

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, CA

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 Haack[3], Robert Marshall[4]
[1]*JCMM, Met Office, Reading, United Kingdom*
[2]*Defence Outcomes,, Met Office, Exeter, United Kingdom*
[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
Stéphane Gaudreault*, Jocelyn Mailhot, Anna Glazer, Stéphane Belair
Environment Canada, Dorval, Québec, Canada

Session FS2: Radar Remote Sensing of Precipitation
Room 265
Co-Chairs: V Chandrasekar, *Colorado State University*; Guifu Zhang, *University of Oklahoma*

8:20 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*

8:40 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

9:00 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, OK*
[2]*National Severe Storms Laboratory, NOAA, Norman, OK*
[3]*School of Electrical and Computer Engineering, University of Oklahoma, Norman, OK*

9:20 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*

9:40 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, OK

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, *Los Alamos National Labs*

8:20 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*

8:40 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 at Boulder, Boulder, CO*
[3]*SRI International, Menlo Park, CA*

9:00 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*

9:20 G1-4
ASPECT SENSITIVITY CONSIDERATIONS IN DETERMINING METEOR TRAIL DURATIONS
Akshay Malhotra1, John D. Mathews*[1], Kimberly Ray[2]
[1]*Penn State University, University Park, PA*
[2]*Electrical Engineering, Texas Lutheran University, Seguin, TX*

9:40 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 at 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*

8:20 H1-1
THERMAL PLASMA FACILITY FOR THE STUDY OF PERTURBED PLASMA SHEATHS
Lisa E. Gayetsky*, Kristina A. Lynch
Physics and Astronomy, Dartmouth College, Hanover, NH

8:40 H1-2
LABORATORY PLASMA WITH THE ELECTRON TEMPERATURE OF THE LOWER IONOSPHERE
Shannon B. Dickson*, Scott H. Robertson
Department of Physics, University of Colorado at Boulder, Boulder, CO

9:00 H1-3
INVESTIGATING MAGNETOSPHERIC WAVE AMPLIFICATION USING THE HAARP IONOSPHERIC HEATING FACILITY
Mark Golkowski*
Electrical Engineering, Stanford University, Stanford, CA

9:20 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

9:40 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

WEDNESDAY MORNING, continued

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, NH

Session KB1: Advances in Computational Biophotonics
Room 151
Co-Chairs: Jamesina Simpson, *University of New Mexico*; Susan Hagness, *University of Wisconsin-Madison*

8:20 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*

8:40 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*

9:00 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

9:40 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

WEDNESDAY AFTERNOON, 6 January 2010

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 Laboratories, Sony Corporation, Tokyo, Japan*
[2]*EE Dept EMC lab., Pennsylvania State University, State College, PA*

14:40 BS1-5
TRANSFORMING CUDA BASED TLM ALGORITHMS TO THE OPENCL PARADIGM
Poman So*
Electrical and Computer Engineering, University of Victoria, Victoria, British Columbia, Canada

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, Ontario, Canada

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, Canada

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, Canada

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, *Georgia Institute of Technology*; Jennifer Bernhard, *The University of Illinois*

13:20 D1-1
DIELECTRIC ROD ANTENNAS FOR 193 THZ 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, CO

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, NC*
[2]*University of Maryland, College Park, MD*
[3]*RF and Electronics Division, U.S. Army Research Laboratory, Adelphi, MD*

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, *Naval Research Laboratory*

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

WEDNESDAY AFTERNOON, continued

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, MA*
[2]*Andaman Environment and Natural Disaster Research Center, Faculty of Technology and Environment, Prince of Songkla University, Phuket Campus, Phuket, Thailand*

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, FL

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, Italy*
[6]*CETEMPS, University of LAquila, LAquila, Italy*

16:00 FS4-8
FAST JACOBIAN MIE LIBRARY FOR TERRESTRIAL HYDROMETEORS
Srikumar Sandeep*, Albin J. Gasiewski
Center For Environmental Technology, University of Colorado at Boulder, 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 at 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, Canada*

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

15:00 Break

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, Turkey*

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, Turkey*

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[1], Ken R. Bromund[1], Paul A. Bernhardt[2]
[1]*NASA/Goddard Space Flight Center, Greenbelt, MD*
[2]*Naval Research Laboratory, Washington, DC*

WEDNESDAY AFTERNOON, continued

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, Canada

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, Urbana-Champaign, IL*
[2]*University of Michigan, Ann Arbor, MI*

17:00 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, MA*
[4]*University of Oslo, Oslo, Norway*
[5]*Polish Acad. Sci., Warsaw, Poland*

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, British Columbia, Canada

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, South Africa*

Session KB2: Electromagnetic Sensing and Treatment Applications in Medicine
Room 151
Co-Chairs: Susan Hagness, *University of Wisconsin-Madison*; Mahta Moghaddam, *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, AR

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, WI*
[2]*Department of Neurological Surgery, University of Wisconsin-Madison, Madison, WI*

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, MI

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

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

THURSDAY MORNING, 7 January 2010

Plenary Session
Mathematics Auditorium
Student Paper Competition
Chair: Danilo Erricolo
University of Illinois at Chicago

8:20 Announcements

8:30 Rules and Guidelines of the Competition

8:40 Student Paper Presentations

9:40 Break

Anthropogenic and Natural Electromagnetic Environments: Effects on Electronic Systems
Mathematics Auditorium
Co-Chairs: William D. Palmer (Comm. C), *US Army Research Laboratory*; Danilo Erricolo (Comm. E), *University of Illinois at Chicago*

10:00 P-1
OUR OWN WORST ENEMY – CHALLENGES IN REDUCING ELECTRONIC FRATRICIDE
John A. Kosinski*
Intelligence and Information Warfare Directorate, US Army, Fort Monmouth, NJ

10:50 P-2
COMPUTER MODELING TOOLS FOR EMC ENGINEERS
Todd Hubing*
The Holcombe Department of Electrical and Computer Engineering, Clemson 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

THURSDAY AFTERNOON, 7 January 2010

Session A2: Metrology Efforts at NIST
Room 155
Co-Chairs: Christopher Holloway, *NIST*; James Baker-Jarvis, *NIST*

13:20 A2-1
METROLOGY FOR ELECTROMAGNETIC PROPERTIES DETERMINATION
James Baker-Jarvis*, 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
NIST, Boulder, CO

14:00 A2-3
MICROWAVE SCANNING PROBE METROLOGY FOR NANOMETER SCALE ELECTRONICS
Pavel Kabos*, T. M. Wallis, Atif Imtiaz, Chin-Jen Chiang
NIST, 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]*NIST, Boulder, CO*
[2]*NIST, Boulder, CO*
[3]*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
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, Catalunya, Spain*

16:40 A2-10
QUIET-ZONE FIELD EVALUATIONS USING NEAR-FIELD SPHERICAL SCANNING TECHNIQUES
Randal H. Direen*, Michael H. Francis, Ronald C. Wittmann
NIST, Boulder, CO

Session B2: Antenna Theory, Design, and Measurement
Room 1B40
Co-Chairs: Jennifer Bernhard, *University of Illinois at Urbana-Champaign*; Zoya Popovic, *University of Colorado at Boulder*

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, IL

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 at 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 OH

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, AR*
[2]*Electrical Engineering, University of Arkansas, Fayetteville, AR*
[3]*Mechanical Engineering, University of Arkansas, Fayetteville, AR*

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, India*
[2]*Satellite Communication and Antenna Division, Indian Space Research Organisation, Ahmedabad, Gujarat, India*
[3]*Satellite Communication and Antenna Division, Indian Space Research Organisation, Ahmedaba,Gujarat, India*
[4]*Avionics, Sreenidhi-Vaughn College, Hyderabad, Andhra Pradesh, India*

13:40 B3-2
REFLECTION PHASE ANOMALY FOR REFLECTARRAY ELEMENT WITH HIGH LOSS SUBSTRATES
Harish Rajagopalan*, Yahya Rahmat-Samii
Electrical Engineering, UCLA, Los Angeles, CA

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, CA

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, UT

Session E1: High-Power Electromagnetics: Environments and Sources
Room 105
Co-Chairs: Carl Baum, *University of New Mexico*; Danilo Erricolo, *University of Illinois at Chicago*

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 and G. Daniel 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
Johns Hopkins University, Applied Physics Laboratory, Laurel, MD

15:40 F2-7
RADAR POINTING ERRORS IN RANGE-INDEPENDENT AND RANGE-VARYING TROPOSPHERIC DUCTS
Raymond P. Wasky*
Johns Hopkins University, Applied Physics Laboratory, Laurel, MD

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 Warfare, 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, Norway*
[4]*Lancaster University, Lancaster, United Kingdom*
[5]*Arecibo observatory, Arecibo, PR*
[6]*University of Puerto Rico-Mayaguez, Mayagüez, 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, Norway*

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

THURSDAY AFTERNOON, continued

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, DC*
[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, CA

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, FL

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, MD

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, Russia*
[2]*Ruhr University, Bochum, Germany*

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, MD*
[2]*NASA Goddard Space Flight Center, Greenbelt, MD*

Session J2: Digital Signal Processing for Radio Astronomy
Room 265
Co-Chairs: Dan Werthimer, *University of California, 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, MD*
[2]*National Radio Astronomy Observatory, Green Bank, WV*
[3]*Department of Astronomy, University of Maryland, College Park, College Park, MD*

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, CA*
[2]*Department of Astronomy, University of California, Berkeley, Berkeley, CA*
[3]*Space Sciences Laboratory, University of California, Berkeley, Berkeley, CA*
[4]*Department of Electrical Engineering, University of California, Los Angeles, Los Angeles, CA*
[5]*Department of Electrical Engineering and Computer Science, University of California, Berkeley, Berkeley, CA*
[6]*California Institute of Technology, Pasadena, CA*
[7]*Digital Signal Processing Group, Karoo Array Telescope, Cape Town, South Africa*
[8]*Department of Computer Science, Stanford University, Stanford, CA*

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, NM*
[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, South Africa*

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*
[2]*SAO Submillimeter Array, Hilo, HI*
[3]*MIT Haystack Observatory, Westford, MA*

Businees 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

FRIDAY MORNING, 8 January 2010

Session B4: Metamaterials
Room 151
Co-Chairs: Piergiorgio Uslenghi, *University of Illinois at Chicago*; Christopher Holloway, *NIST, Boulder*

8:20 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

8:40 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*

FRIDAY MORNING, continued

9:00 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]*NIST, Boulder, CO*

9:20 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

9:40 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, OH

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*

8:20 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 OH

8:40 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

9:00 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, MT*
[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, OH

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, AR*
[2]*Electrical Engineering, University of Mississippi, University, MS*

Session E2: EM Interference: Effects and Cyber Threats
Room 105
Co-Chairs: Danilo Erricolo, *UIC*;
Ira Kohlberg, *Kohlberg Associates, Inc.*

8:20 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

8:40 E2-2
INTERFERENCE EFFECTS AND INTERFERENCE-LIMIT CRITERIA FOR RADAR RECEIVERS
Frank H. Sanders*, Robert L. Sole
Telecommunications Theory Div., US Department of Commerce NTIA/ITS, Boulder, CO

9:00 E2-3
FUNDAMENTALS OF HPRF EFFECTS MEASUREMENT AND STATISTICAL PREDICTION OF FUNCTIONAL IMPAIRMENT
David A. Schafer*
AFRL/RDHE, Albuquerque, NM

9:20 E2-4
SURVIVABILITY OF ATTACKED MUTUALLY DEPENDENT NETWORKS
Ira Kohlberg*
Kohlberg Associates, Alexandria, VA

9:40 E2-5
INSIGHTS FROM THE EMERGING DISCIPLINE OF NETWORK SCIENCE
Robin Burk*, Calvin Shipbaugh
RD-BAA, Defense Threat Reduction Agency, Fort Belvoir, VA

10:00 Break

Session FS5: Waves in Random and Complex Media
Room 150
Co-Chairs: Akira Ishimaru, *University of Washington, Seattle*;
Saba Mudaliar, *Air Force Research Laboratory*

8:20 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

8:40 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*

9:00 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*

9:20 FS5-4
SCATTERING FROM ROUGH SURFACES HAVING VARIABLE PROPERTIES
Gary S. Brown*
Bradley Department of Electrical & Computer Engineering, Virginia Tech, Blacksburg, VA

9:40 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

10:40 FS5-7
RETRIEVAL OF MULTILAYERED STRUCTURE PARAMETERS FROM RADAR DATA
Yuriy Goykhman*, Mahta Moghaddam
University of Michigan, Ann Arbor, Ann Arbor, MI

FRIDAY MORNING, continued

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*

8:20 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

8:40 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, NY*
[2]*Atmospheric Sciences, MIT Haystack Observatory, Westford, MA*
[3]*Curtin University of Technology, Perth, Western Australia, Australia*
[4]*Institute for Scientific Research, Boston College, Chestnut Hill, MA*
[5]*USAF AFMC AFRL/RVBXI, Hansom AFB, MA*

9:00 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, Germany*

9:20 GJ1-4
IMPACT OF MAGNETOIONIC EFFECTS ON RF PROPAGATION THROUGH VERTICALLY STRATIFIED AND ISOTROPIC IONOSPHERES
Christopher Jeffery*
LANL, Los Alamos, NM

9:40 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*

8:20 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, PA

8:40 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, Turkey*

9:00 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

9:20 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*

9:40 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, PA

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 Institute of Technology, Melbourne, FL*
[2]*Physics Department and Santa Cruz Institute for Particle Physics, University of California, Santa Cruz, Santa Cruz, CA*

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, Istanbul, Turkey*

Session J3: Pulsar Timing Precision for Probing Gravity
Room 265
Co-Chairs: Joseph Lazio, *Naval Research Laboratory*;
James Cordes, *Cornell University*

8:20 J3-1
PULSAR TIMING AND GRAVITATIONAL PHYSICS
Ingrid H. Stairs*
Physics and Astronomy, University of British Columbia, Vancouver, British Columbia, Canada

8:40 J3-2
PULSAR TIMING AND GRAVITATIONAL PHYSICS: PART 2
Ingrid H. Stairs*
Dept. of Physics and Astronomy, University of British Columbia, Vancouver, British Columbia, Canada

FRIDAY MORNING, continued

9:00 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, Australia*
[5]*Center for Gravitational Wave Astronomy, UT Brownsville, Brownsville, TX*

9:20 J3-4
LONG-TERM, HIGH-PRECISION MILLISECOND PULSAR TIMING AT ARECIBO AND GREEN BANK
David J. Nice*
Bryn Mawr College, Bryn Mawr, PA

9:40 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, Western Australia, Australia*

Session K3: Human Body Interactions with Electromagnetic Devices
Room 155
Co-Chairs: Erdem Topsakal, *Mississippi State University*; Susan Hagness, *University of Wisconsin-Madison*

8:20 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

8:40 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*

9:00 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

9:20 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

9:40 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, MS

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

FRIDAY AFTERNOON, 8 January 2010

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 Communication Engineering, Wireless System Laboratry, Tokyo Denki University, Kanda-nishikicho, Chiyoda-ku, Tokyo, Japan

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, *US Army Research Laboratory*

15:20 A4-1
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, Raleigh, NC*

15:40 A4-2
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 at Boulder, Boulder, CO*
[2]*Electromagnetics Division, NIST, Boulder, CO*
[3]*Dept. of Mechanical Engineering, University of Colorado at Boulder, Boulder, CO*
[4]*National Changhua University of Education, Changhua, Taiwan*

16:00 A4-3
REMOVAL OF CHAMBER ARTIFACTS IN SPHERICAL NEAR-FIELD MEASUREMENTS
Ronald J. Pogorzelski*
Jet Propulsion Laboratory - Caltech, Pasadena, CA

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, NIST, Boulder, CO

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, OH

15:00 Break

FRIDAY AFTERNOON, continued

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*
3Department 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, OH

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, VA

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, OH

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, Italy*

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, CO

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, NM

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, TX

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, AR

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

15:00 Break

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, MT

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, GA

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, France*

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, United Kingdom*

FRIDAY AFTERNOON, continued

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 at Boulder, Boulder, CO*
[2]*Physical Sciences Division, NOAA/Earth System Research Laboratory, Boulder, CO*
[3]*Department of Geological Sciences, University of Colorado at Boulder, 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, CA

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, PA

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, France*

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, CO*
[2]*Institute for Atmospheric Physics, Kuehlungsborn, Germany*

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, University of Colorado at Boulder, Boulder, CO

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, CO*
[2]*Dept. of Physics, University of Colorado at Boulder, Boulder, CO*

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 at Boulder, Boulder, CO*
[2]*Colorado Center for Lunar Dust and Atmospheric Studies (CCLDAS), Boulder, CO*
[3]*LASP, University of Colorado at Boulder, 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 at Boulder, Boulder, CO*
[2]*CCLDAS, University of Colorado at Boulder, Boulder, CO*
[3]*Aerospae Engineering Sciences, University of Colorado at Boulder, Boulder, CO*
[4]*Max-Planck Institute for Nuclear Physics, Heidelberg, Germany*

17:00 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 Physics, University of Colorado at Boulder, Boulder, CO*
[2]*A&M Associates, Basye, VA*
[3]*LASP, Boulder, CO*
[4]*Max-Planck-Institut für Kernphysik, Heidelberg, Germany*

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

FRIDAY AFTERNOON, continued

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

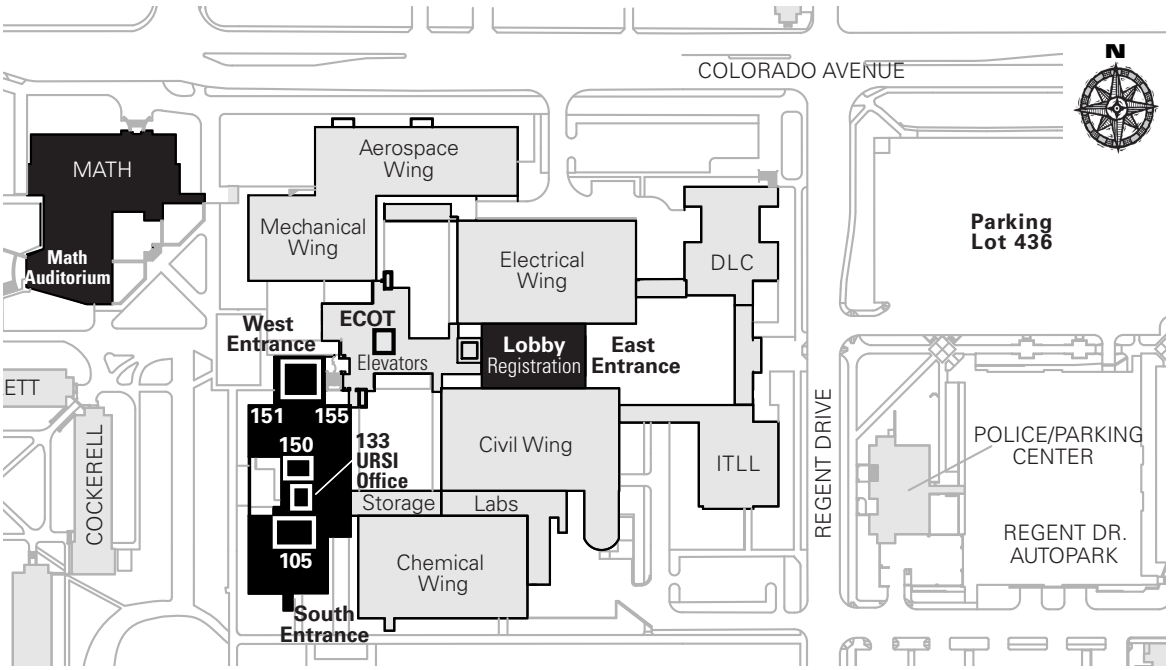
SATURDAY MORNING, 9 January 2010

8:20 – 9:50 USNC–URSI Executive Council, Millennium Hotel

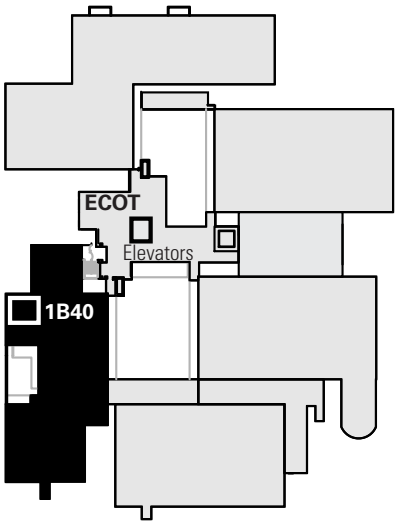
NOTES

NOTES

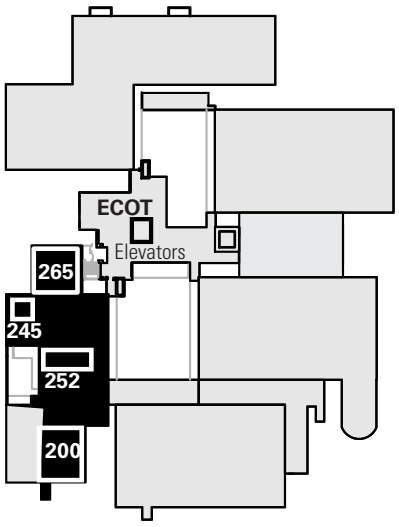
CU-Boulder Engineering Center (EC)



Main / First Floor



Ground / B Level



Second Floor

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