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

United States National Committee
International Union of Radio Science

2011 NRSM

National Radio Science Meeting
4-7 January 2011

Sponsored by USNC/URSI

University of Colorado at Boulder
Boulder, Colorado
USA

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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)

Yahya Rahmat-Samii
USNC Chair
Northrop Grumman Professor of Electrical Engineering
University of California at Los Angeles
Email: rahmat@ee.ucla.edu

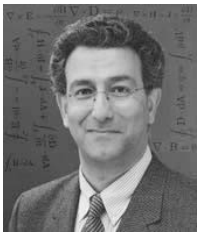
Steven C. Reising
USNC Secretary and Chair-Elect
Associate Professor of Electrical and Computer Engineering
Colorado State University
Email:
steven.reising@colostate.edu

Piergiorgio L.E. Uslenghi
USNC Past Chair
Professor of Electrical and Computer Engineering
University of Illinois at Chicago
Email: uslenghi@uic.edu

Gary S. Brown
USNC Accounts Manager
Bradley Distinguished Professor of Electromagnetics
Virginia Polytechnic Institute and State University
Email: randem@vt.edu

Kathie Bailey Mathae
Board Director
Board on International Scientific Organizations
The National Academies
Email: kbmathae@nas.edu

Ozlem Kilic
Chair, USNC Comm. A
Assistant Professor of Electrical Engineering and Computer Science
The Catholic University of America
Email: kilic@cua.edu



Nader Engheta
Chair, USNC Comm. B
H. Nedwill Ramsey Professor of Electrical and Systems Engineering, and Professor of Bioengineering
University of Pennsylvania
Email: engheta@ee.upenn.edu

Devereux Palmer
Chair, USNC Comm. C
Engineering Sciences Directorate
U.S. Army Research Laboratory
Email: dev.palmer@us.army.mil

John Papapolymerou
Chair, USNC Comm, D
Associate Professor of Electrical and Computer Engineering
Georgia Institute of Technology
Email:papapol@ece.gatech.edu

Danilo Erricolo
Chair, USNC Comm. E and USNC Student Coordinator
Associate Professor of Electrical and Computer Engineering
University of Illinois at Chicago
Email: erricolo@ece.uic.edu

Albin J. Gasiewski
Chair, USNC Comm. F
Director, Center for Environmental Technology
University of Colorado at Boulder
Email:
al.gasiewski@colorado.edu

Frank Lind
Chair, USNC Comm. G
Research Engineer
MIT Haystack Observatory
Email: flind@haystack.mit.edu

William E. Amatucci
Chair, USNC Comm. H
Plasma Physics Division
Naval Research Laboratory
Email:bill.amatucci@nrl.navy.mil

James M. Cordes
Chair, USNC Comm. J
Professor of Astronomy
Cornell University
Email:cordes@astro.cornell.edu

Susan C. Hagness
Chair, USNC Comm. K
Professor of Electrical and Computer Engineering
University of Wisconsin-Madison
Email: hagness@engr.wisc.edu

USNC-URSI National Radio Science Meeting
January 5-8, 2011
University of Colorado at Boulder

Scientific Program

Tuesday Evening **4 January 2011**

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

Wednesday Morning **5 January 2011**

Session B1: Metamaterials and Complex Structures
Room 1B40

Co-Chairs: Piergiorgio Uslenghi, *University of Illinois at Chicago*
Filippo Capolino, *University of California Irvine*

08:20 B1-1 DESIGN OF ACTIVE METAMATERIAL TRANSMISSION LINES
Li-Ming Si*[1,2], Kihun Chang[2], Tao Jiang[3], Xin Lv[1], Hao Xin[2]
[1]Department of Electronic Engineering, Beijing Institute of Technology, Beijing, China
[2]Electrical and Computer Engineering Department, University of Arizona, Tucson
[3]Department of Information Science and Electronic Engineering, Zhejiang University, Hangzhou, China

08:40 B1-2 FLUIDIC TUNING OF A FOUR-ARM SPIRAL FSS
Elizabeth C. Wells*, Gregory H. Huff
Electrical and Computer Engineering, Texas A&M University, College Station, TX

09:00 B1-3 MICROFLUIDICALLY-TUNABLE SUBWAVELENGTH PERIODIC STRUCTURES
Meng Li*, Nader Behdad
ECE, University of Wisconsin Madison, Madison, WI

09:20 B1-4 CHARACTERIZATION OF MODES IN ONE DIMENSIONAL ARRAYS OF PLASMONIC NANOSPHERES
Salvatore Campione*, Filippo Capolino
Electrical Engineering and Computer Science, University of California, Irvine, Irvine, CA

09:40 B1-5 TWO-DIMENSIONAL LENSING ON GRAPHENE
Ashkan Vakil*, Nader Engheta
Electrical & Systems Engineering, University of Pennsylvania, Philadelphia, Pennsylvania

10:00 Break

10:20 B1-6 A GENERAL FORMULATION FOR EXTRACTING THE PERMEABILITY AND PERMITTIVITY OF A MATERIAL LAYER USING FREE-SPACE, REFLECTION-ONLY MEASUREMENTS
Raenita A. Fenner*, Edward J. Rothwell
Electrical and Computer Engineering, Michigan State University, East Lansing, MI

10:40 B1-7 RADAR BACKSCATTER FROM CONDUCTING POLYHEDRAL SPHERES WITH POLYGON MESH SURFACES
Paul A. Bernhardt*
Plasma Physics Division, Naval Research Laboratory, Washington, DC

11:00 B1-8 SIZE-INDEPENDENT RESONATORS USING PHASE COMPENSATION
Piergiorgio L. E. Uslenghi*
University of Illinois at Chicago, Chicago, Illinois

11:20 B1-9 3-D EM SIMULATIONS FOR STUDY OF MODE SEPARATION AND FIELD MEASUREMENT IN RFQ STRUCTURES

Ki. R. Shin*[1], Yoon. W. Kang[2], Sang-Ho Kim[2], Aly E. Fathy[1]
[1]*Electrical Engineering and Computer Science, University of Tennessee, Knoxville, Tennessee*
[2]*Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, Tennessee*

Session BK1: Telemetry for Monitoring and Biosensing I
Room 155

Co-Chairs: Erdem Topsakal, *Mississippi State University*
Kubilay Sertel, *The Ohio State University*

08:20 BK1-1 ON USING METAMATERIALS TO INCREASE POWER TRANSFER EFFICIENCY IN TELEMETRY SYSTEMS

Ajit Rajagopalan*, Anil K. Ramrakhyani, Gianluca Lazzi
The University Of Utah, Salt Lake City, Utah

08:40 BK1-2 Telemetry for Non-Contact Capacitive Biopotential Recording Electrodes

Chun-ming Tang*, Christopher Dougherty, Ian McLemore, Rizwan Bashirullah
Electrical and Computer Engineering, University of Florida, Gainesville, FL

09:00 BK1-3 MAGNETOELASTIC RADIO-FREQUENCY IDENTIFICATION FOR BIOMEDICAL APPLICATIONS

Umut A. Gurkan*[1,2,3], Utkan Demirci[1,2,3], Ozan Akkus[4]
[1]*Demirci Bio-Acoustic-MEMS in Medicine (BAMM) Laboratory, Harvard Medical School, Boston, MA*
[2]*Center for Biomedical Engineering, Brigham and Women's Hospital, Boston, MA*
[3]*Massachusetts Institute of Technology, Harvard-MIT Division of Health Sciences & Technology, Cambridge, MA*
[4]*Weldon School of Biomedical Engineering, Purdue University, West Lafayette, IN*

09:20 BK1-4 PILL-CAPSULE RFID ANTENNAS FOR MEDICINE MONITORING

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

09:40 BK1-5 SELF-EXPANDABLE ANTENNA FOR BIOMEDICAL APPLICATIONS

Tse-Yu Lin*[1], Dohyuk Ha[1], Byung Guk Kim[1], Simon John[2], Pedro P. Irazoqui[1], William J. Chappell[1]
[1]*Electrical and Computer Engineering, Purdue University, West Lafayette, IN*
[2]*Howard Hughes Medical Institute at The Jackson Laboratory, Bar Harbor, ME*

10:00 Break

10:20 BK1-6 A BROADBAND THZ FOCAL PLANE ARRAY FOR EXCISED TISSUE IMAGING

Georgios C. Trichopoulos*, Kagan Topalli, Kubilay Sertel
ElectroScience Lab, The Ohio State University, Columbus, OH

10:40 BK1-7 AN IMPLANTABLE WIRELESS TELEMETRY SYSTEM FOR BLOOD PRESSURE MONITORING OF SMALL ANIMALS

Jesus E. Gaxiola-Sosa*, Kamran Entesari
Electrical Engineering, Texas A&M University, College Station, TX

11:00 BK1-8 TOWARDS A MINIATURE LONG TERM IMPLANTABLE BLOOD PRESSURE SENSOR: IN VIVO PORCINE STUDIES

Erdem Topsakal*, Tutku Karacolak
Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS

11:20 BK1-9 A NOVEL COIL FOR WIRELESS TELEMETRY SYSTEMS IN CHRONICALLY IMPLANTED DEVICES

Sundar Srinivas*[1], David Warren[2], Richard Normann[2], Ginaluca Lazzi[3]
[1]*physics, north carolina state university, raleigh*
[2]*bioengineering, university of utah, slat lake city, united states*
[3]*electrical engineering, university of utah, salt lake city, united states*

Session EC1: Waveform Diversity: Multidisciplinary Approaches to Different Sensing Modalities
Room 105

Co-Chairs: Shannon Blunt, *University of Kansas*
Eric Mokole, *Naval Research Laboratory*

08:20 EC1-1 BRIEF HISTORY OF WAVEFORM DIVERSITY

Eric L. Mokole*
Radar Division, Naval Research Laboratory, Washington DC

08:40 EC1-2 WAVEFORM DIVERSITY RESEARCH OF NRL RADAR DIVISION

Eric L. Mokole*
Radar Division, Naval Research Laboratory, Washington DC

09:00 EC1-3 DISTRIBUTED DETECTION ALGORITHMS FOR MIMO RADAR SENSORS

Raviraj S. Adve*[1], Byungwook Jung[2], Joohwan Chun[2]
[1]*Univ. of Toronto, Toronto, ON, Canada*
[2]*Korea Advanced Institute of Science and Technology, Daejon, Korea*

09:20 EC1-4 RADAR-EMBEDDED COMMUNICATIONS

Shannon D. Blunt*
Electrical Engineering & Computer Science, University of Kansas, Lawrence, KS

10:00 Break

10:20 EC1-5 BIOLOGICALLY INSPIRED WAVEFORM DIVERSITY AND DESIGN

Alessio Balleri[1], Hugh D. Griffiths*[1], Marc W. Holderied[2]
[1]*Electronic & Electrical Engineering, University College London, London, United Kingdom*
[2]*School of Biological Sciences, University of Bristol, Bristol, United Kingdom*

10:40 EC1-6 WAVEFORM AND SYNTHETIC APERTURE DESIGN FOR LOW FREQUENCY TOMOGRAPHY

Daniel J. Sego*[1], Griffiths Hugh[2], Michael C. Wicks[3]
[1]*Phantom Works, The Boeing Company/University College London, Seattle WA*
[2]*Electronic and Electrical Engineering, University College London, London, UNited Kingdom*
[3]*Sensors Directorate, Air Force Research Laboratory, Rome, NY*

11:00 EC1-7 THINNED SPECTRUM RADAR WAVEFORMS: PRELIMINARY EXPERIMENTAL RESULTS

Thomas Higgins*[1,2], Matthew R. Cook[2], Aaron K. Shackelford[1]
[1]*Radar Division, Naval Research Laboratory, Washington, DC*
[2]*EECS, University of Kansas, Lawrence, KS*

Session F1: Active Remote Sensing of the Earth's Environment
Room 150

Co-Chairs: Mahta Moghaddam, *The University of Michigan*
Andreas Muschinski, *Dept. of Electrical and Computer Engineering, University of Massachusetts Amherst*

08:20 F1-1 VERTICAL FLUXES OF LOCAL CLEAR-AIR RADAR AND SODAR REFLECTIVITY IN THE CONVECTIVE BOUNDARY LAYER

Andreas Muschinski*, Stephen J. Frasier
Dept. of Elec. and Comp. Eng., University of Massachusetts Amherst, Amherst, MA

08:40 F1-2 OPTICAL AND SONIC OBSERVATIONS OF FLUCTUATIONS OF THE VERTICAL TEMPERATURE GRADIENT IN THE INTERMITTENT NOCTURNAL ATMOSPHERIC SURFACE LAYER

Kekai Hu*, Lucas Root, Shiril Tichkule, Shanka Wijesundara, Andreas Muschinski
Dept. of Electrical and Computer Engineering, University of Massachusetts Amherst, Amherst, MA

09:00 F1-3 ESTIMATION OF BEAM TRANSVERSE WIND VELOCITY USING ANGLES OF ARRIVAL FROM SPATIALLY SEPARATED LIGHT SOURCES

Shiril Tichkule*, Kekai Hu, Lucas M. Root, Shanka N. Wijesundara, Andreas Muschinski
Department of Electrical and Computer Engineering, University of Massachusetts Amherst, Amherst, MA

09:20 F1-4 A STUDY OF SEA SURFACE HEIGHT RETRIEVALS USING DOPPLER MEASUREMENTS FROM NUMERICALLY SIMULATED BACKSCATTER DATA

Chun Sik Chae*, Joel T. Johnson
Electrical and Computuer Engineering, The Ohio State University, Columbus Ohio

09:40 F1-5 A RADAR SCATTERING LANDSCAPE SIMULATOR FOR INVESTIGATING MULTISCALE SPATIAL AGGREGATION STRATEGIES

Mariko S. Burgin*, Mahta Moghaddam
Dept. of Electrical Engineering and Computer Science, Radiation Laboratory, University of Michigan, Ann Arbor, MI

10:00 Break

10:20 F1-6 VALIDITY AND EFFECTIVENESS OF EM INVERSION ALGORITHMS FOR VLF SUBSURFACE IMAGING

David Strauss*[1], Ivan Linscott[1], Umran Inan[2]
[1]*Electrical Engineering, Stanford University, Stanford, CA*
[2]*Electrical Engineering, Koc University, Istanbul, Turkey*

10:40 F1-7 3D FDTD MODELING OF TIME-DOMAIN MARINE CSEM IN DETECTING SUBSEAFLOOR HYDROCARBON RESERVOIRS UNDER SHALLOW SEAWATER

Jiajun Niu*, Jamesina J. Simpson
Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM

11:00 F1-8 MILLIMETER-WAVE MEASUREMENTS OF KRAFT RECOVERY BOILER DEPOSITION

John M. Mower*[1], Yasuo Kuga[1], Peter Ariessohn[2]
[1]*Electrical Engineering, University of Washington, Seattle, Washington*
[2]*Enertechnix, Inc., Maple Valley, Washington*

Session G1: Ionospheric Data Assimilation and Modeling
Room 200

Co-Chairs: Attila Komjathy, *NASA JPL/Caltech*
G Bust, *ASTRA*

10:20 G1-1 COMPARISONS OF MODEL AND OBSERVED IONOSPHERIC SUB-PEAK PLASMA FREQUENCY PROFILES

Leo F. McNamara*
RVBXI, Air Force Research Laboratory, Albuquerque, New Mexico

10:40 G1-2 DATA ASSIMILATION OF FORMOSAT-3/COSMIC USING NCAR TIE-GCM

I-Te Lee*, Jann-Yenq Liu
National Central University, Institute of Space Science, Taoyuan, Taiwan

11:00 G1-3 ASSIMILATION IN IRI OF REAL TIME DATA FROM THE GLOBAL IONOSPHERIC RADIO OBSERVATORY

Ivan A. Galkin*[1], Xueqin Huang[1], Bodo W. Reinisch[1], Dieter Bilitza[2]
[1]University of Massachusetts Lowell, Center for Atmospheric Research, Lowell, MA
[2]Dept. Computational and Data Services, George Mason University, Fairfax, VI

11:20 G1-4 NEAR-REAL TIME ASSIMILATION OF COSMIC/FORMOSAT-3 AND GROUND-BASED TEC DATA USING A GLOBAL GPS NETWORK IN JPL/USC GAIM

Philip J. Stephens*, Attila Komjathy, Brian D. Wilson, Anthony J. Mannucci, Byron A. Iijima, Xiaoqing Pi, Olga Verkhoglyadova, Vardan Akopian
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

11:40 G1-5 A JPL/USC NESTED GRID GAIM UPDATE: NEW DATA PROCESSING AND VALIDATION RESULTS

Attila Komjathy*, Vardan Akopian, Miguel Dumett, Philip Stephens, Brian D. Wilson, Byron A. Iijima, Xiaoqing Pi, Anthony J. Mannucci
NASA JPL/Caltech, Pasadena, California

Session GHF1: Global Navigation Satellite Systems and Radio Beacon Remote Sensing I
Room 200

Co-Chairs: Valery Zavorotny, *NOAA/Earth System Research Laboratory*
Carl Siefring, *Naval Research Laboratory*
Sigrid Close, *Stanford University*

08:20 GHF1-1 ANALYSIS OF STORM-TIME DYNAMICS DEDUCED FROM GNSS-BASED IONOSPHERIC IMAGING

Seebany Datta-Barua*[1], Gary S. Bust[2], Geoffrey Crowley[2]
[1]Aviation and Technology, San Jose State University, San Jose, CA
[2]ASTRA, San Antonio, TX

08:40 GHF1-2 GPS REFLECTOMETRIC MEASUREMENTS OF OCEAN SURFACE ROUGHNESS FROM HIGH-ALTITUDE AIRCRAFT

Valery U. Zavorotny*[1], Dennis M. Akos[2], Hanna Muntzing[3]
[1]Physical Sciences Division, NOAA/Earth System Research Laboratory, Boulder CO
[2]Department of Aerospace Engineering Sciences, University of Colorado, Boulder CO
[3]Lulea University of Technology, Lulea, Sweden, Sweden

09:00 GHF1-3 ADAPTIVE GPU-ACCELERATED SOFTWARE SATELLITE BEACON PROCESSING FOR GEOSPACE ENVIRONMENTAL SENSING

John T. Grasel*[1], Philip J. Erickson[2], William R. Rideout[2], Frank D. Lind[2]
[1]*Harvey Mudd College, Claremont, CA*
[2]*Atmospheric Sciences Group, MIT Haystack Observatory, Westford, MA*

09:20 GHF1-4 THE TANDEM INSTRUMENTED CUBESATS EXPERIMENT (TICE) IN LOW EARTH ORBIT FOR CONTINUOUS OCCULTATION OBSERVATIONS OF THE IONOSPHERE

Paul A. Bernhardt*[1], Carl L. Siefring[1], Joe D. Huba[1], John Abrams[2], Scott Miller[2], Nestor Voronka[3]
[1]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[2]*ARES Corporation, Torrence, CA*
[3]*Tethers Unlimited Inc, Bothell, WA*

Session H1: Waves in Space Plasmas I
Room 245

Co-Chairs: Mark Golkowski, *University of Colorado Denver*
G. Ganguli,

08:20 H1-1 ULTRA-LOW FREQUENCY WAVE INTERACTIONS WITH THE IONOSPHERE

Marc R. Lessard*[1], Hyomin Kim[1], Matthew Young[1], Mark J. Engebretson[2], Jesse Woodroffe[3], Kjellmar Oksavik[4]
[1]*Space Science Center, Univ of New Hampshire, Durham, NH*
[2]*Physics, Augsburg College, Minneapolis, MN*
[3]*Physics, Univ of Minnesota, Minneapolis, MN*
[4]*Arctic Geophysics, UNIS, Longyearbyen, NO-9171, Norway*

08:40 H1-2 ULTRA-LOW-FREQUENCY ELECTROMAGNETIC WAVES IN THE MULTI-COMPONENT PLASMA

Anatoly V. Streltsov*
Thayer School of Engineering, Dartmouth College, Hanover, NH

09:00 H1-3 EFFECT OF THE IONOSPHERIC DENSITY CAVITY ON DYNAMICS OF ULF WAVES IN THE MAGNETOSPHERE

Nan Jia, Anatoly Streltsov*
Thayer School of Engineering, Hanover,NH

09:20 H1-4 APPLICATIONS OF ELECTRON GYRO RESONANCE IN THE IONOSPHERIC INCOHERENT SCATTER SPECTRA

Asti N. Bhatt*
MIT Haystack Observatory, Westford, MA

09:40 H1-5 GROUND-LEVEL DETECTION OF AURORAL KILOMETRIC RADIATION

James W. LaBelle*[1], Roger R. Anderson[2]
[1]*Department of Physics and Astronomy, Dartmouth College, Hanover New Hampshire*
[2]*Department of Physics and Astronomy, University of Iowa, Iowa City, Iowa*

10:00 Break

10:20 H1-6 UNDERSTANDING OBSERVATIONS OF TERRESTRIAL VLF TRANSMITTERS BY THE DEMETER SPACECRAFT

Michael J. Starks*[1], Kevin L. Graf[2], Richard A. Quinn[3], Timothy Bell[2], Umran S. Inan[2], Parrot Michel[4]
[1]*Space Vehicles Directorate, Air Force Research Laboratory, Kirtland AFB, NM*
[2]*STAR Laboratory, Stanford University, Stanford, CA*
[3]*AER Corporation, Lexington, MA*
[4]*LPC2E/CNRS, Orleans, France*

10:40 H1-7 APPLICATION OF MINIMUM VARIANCE TECHNIQUES TO SPECTROGRAM ANALYSIS OF TRIGGERED EMISSIONS

Andrew R. Gibby*
Arion Systems, Inc., Chantilly, Virginia

11:00 H1-8 THEORETICAL ANALYSIS OF THE WHISTLER MODE INSTABILITY IN CHORUS WAVES AND TRIGGERED EMISSIONS

Mark Golkowski*[1], Andrew R. Gibby[2]
[1]*Electrical Engineering, University of Colorado Denver, Denver, CO*
[2]*Arion Systems Inc, Chantilly, VA*

11:20 H1-9 INDUCED NONLINEAR SCATTERING OF MAGNETOSPHERICALLY REFLECTING WHISTLERS

Chris E. Crabtree*[1], Leonid Roudakov[2], Manish Mithaiwala[1], Gurudas Ganguli[1], Vitaly Galinsky[3], Valentin Shevchenko[3]
[1]*Plasma Physics Division, NRL, Washington, DC*
[2]*Icarus Research Inc., Bethesda, MD*
[3]*Department of Electrical and Computer Engineering, University of California, San Diego, CA*

11:40 H1-10 STEREO OBSERVATIONS OF FORESHOCK ELECTRONS AND LANGMUIR WAVES

Marc P. Pulupa*[1], Stuart D. Bale[1,2], Robert P. Lin[1,2], Davin E. Larson[1]
[1]*UC Berkeley Space Sciences Laboratory, Berkeley, CA*
[2]*Department of Physics, UC Berkeley, Berkeley, CA*

Session J1: Large-N Radio Arrays: Issues and Algorithms
Room 265

Co-Chairs: Larry D'Addario, *JPL/Caltech*
James Cordes, *Cornell University*

08:20 J1-1 THE ALLEN TELESCOPE ARRAY

David R. DeBoer*, Geoff Bower, Jack Welch
Radio Astronomy Lab, University of California Berkeley, Berkeley, CA

08:40 J1-2 THE MURCHISON WIDEFIELD ARRAY AS A LARGE-N PATHFINDER

Colin Lonsdale*
MIT Haystack Observatory, Westford, MA

09:00 J1-3 DATA ANALYSIS METHODS AND CHALLENGES FOR THE LONG WAVELENGTH ARRAY

Jayce D. Dowell*[1], Jacob M. Hartman[2], Gregory B. Taylor[1]
[1]*University of New Mexico, Albuquerque, NM*
[2]*Naval Research Laboratory, Washington, DC*

09:20 J1-4 HYDROGEN EPOCH OF REIONIZATION ARRAY (HERA)

Judd D. Bowman*
School of Earth and Space Exploration, Arizona State University, Tempe, AZ

09:40 J1-5 SIGNAL PROCESSING FOR A LUNAR ARRAY: MINIMIZING POWER CONSUMPTION

Larry D'Addario[1], Sam Simmons*[2]
[1]*Tracking Systems and Applications, Jet Propulsion Laboratory, Pasadena, CA*
[2]*Dept. of Physics, Massachusetts Institute of Technology, Cambridge, MA*

10:00 Break

10:20 J1-6 A STRAWMAN CORRELATOR FOR THE SKA

Larry R. D'Addario*
JPL/Caltech, Pasadena, CA

10:40 J1-7 PRIMARY BEAM SHAPE CALIBRATION FROM MOSAICKED, INTERFEROMETRIC OBSERVATIONS

Charles L. H. Hull*, Geoffrey C. Bower, Steve Croft, Peter K. G. Williams, Casey Law, David Whysong
UC Berkeley, Berkeley, CA

11:00 J1-8 SUBTRACTION OF POINT SOURCES FROM INTERFEROMETRIC RADIO IMAGES THROUGH AN ALGEBRAIC FORWARD MODELING SCHEME

Gianni Bernardi*
Harvard-Smithsonian Center for Astrophysics, Cambridge MA

Session KB1: Computational Biophotonics and Nanophotonics
Room 151

Co-Chairs: Jamesina Simpson, *University of New Mexico*
Ilker Capoglu, *Northwestern University*

08:20 KB1-1 SEMICONDUCTOR NANOPILLAR CHARACTERIZATION FOR IMPROVED SOLAR ENERGY COLLECTION USING FULL-WAVE ELECTROMAGNETIC ANALYSIS

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

08:40 KB1-2 PILLAR NANOSURFACES FOR SERS

Kevin L. Shuford*[1], Alessia Polemi[1], Sabrina M. Wells[2], Michael J. Sepaniak[2], Nickolay V. Lavrik[3]
[1]*Chemistry, Drexel University, Philadelphia, PA*
[2]*Chemistry, University of Tennessee, Knoxville, TN*
[3]*Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, TN*

09:00 KB1-3 ENHANCED RAMAN SCATTERING FROM NANOPARTICLE-DECORATED NANOCONE SUBSTRATES: A PRACTICAL APPROACH TO HARNESS IN-PLANE EXCITATION

Ying S. Hu*[1], Jaeseok Jeon[2], Tae J. Seok[2], Seunghyun Lee[3], Jason H. Hafner[4], Rebekah A. Drezek[1,5], Hyuck Choo[2,6]
[1]*Bioengineering, Rice University, Houston, TX*
[2]*Electrical Engineering and Computer Science, University of California, Berkeley, Berkeley, CA*
[3]*Chemistry, Rice University, Houston, TX*
[4]*Physics and Astronomy, Rice University, Houston, TX*
[5]*Electrical and Computer Engineering, Rice University, Houston, TX*
[6]*The Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA*

09:20 KB1-4 LASER SPECKLE IMAGING IN THE SPATIAL FREQUENCY DOMAIN USING MONTE CARLO

Tyler B. Rice*, Amaan Mazhar, Soren Konecky, Bernard Choi, Anthony J. Durkin, Bruce J. Tromberg
Biomedical Optics, Beckman Laser Institute, Irvine, CA

09:40 KB1-5 METHODS AND MODELS FOR SIMULATING LIGHT PROPAGATION AND SCATTERING IN BIOLOGICAL MEDIA

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

10:00 Break

10:20 KB1-6 NUMERICAL ELECTROMAGNETIC SIMULATION OF SPECTROSCOPIC MICROSCOPY: APPLICATIONS IN EARLY-STAGE CANCER DETECTION

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

10:40 KB1-7 ANALYSIS OF BACKSCATTERED FIELDS FROM PHOTONIC NANOJET-ILLUMINATED INHOMOGENEOUS DIELECTRIC OBJECTS HAVING ROUGH SURFACES

Cesar Mendez Ruiz*, Jamesina J. Simpson
Electrical and Computer Engineering, University of New Mexico, Albuquerque, New Mexico

11:00 KB1-8 NUMERICAL STUDY OF HEMATOCRIT-DEPENDENT PACKING FUNCTION ON OPTICAL PROPERTIES OF BLOOD

Wendy W. Yip*, Alan V. Sahakian
Electrical Engineering and Computer Science, Northwestern University, Evanston IL

11:20 KB1-9 A PLATFORM FOR THE PRECISE QUANTIFICATION OF DNA ORIENTATION AND CONFORMATION

Selim M. Unlu*[1], Philipp S. Spuhler[2], Laura Sola[3], Margo Monroe[2], Xirui Zhang[2], Marcella Chiari[3]
[1]*Electrical Engineering, Boston University, Boston*
[2]*Biomedical Engineering, Boston University, Boston*
[3]*Istituto di Chimica del Riconoscimento Molecolare, Consiglio Nazionale delle Ricerche, Milano, Italy*

Session A1: Metamaterial Device Measurements
Room 1B40

Co-Chairs: Steven Weiss, *U.S. Army Research Laboratory*
Jeffrey Boksiner, *US Army RDECOM CERDEC S&TCD*

13:20 A1-1 MEASUREMENT OF METAMATERIAL LOADED WIDE BAND AND WIDE SCAN RADIATING ELEMENTS

Micheal J. Buckley*, Jeremiah D. Wolf, James B. West
Advanced Technology Center, Rockwell Collins, Cedar Rapids, Iowa

13:40 A1-2 EXPERIMENTAL VERIFICATION OF UNIDIRECTIONAL PROPAGATION IN PRINTED MAGNETIC PHOTONIC CRYSTALS

Nil Apaydin*, Lanlin Zhang, Kubilay Sertel, John L. Volakis
Dept. of Electrical and Computer Engineering, The Ohio State University, ElectroScience Laboratory, Columbus, OH

14:00 A1-3 EXPERIMENTAL VALIDATION OF NEAR-ISOTROPIC NEGATIVE-REFRACTION IN A METAMATERIAL SLAB

Amir I. Zaghloul*[1,2], Youn M. Lee[1], Steven J. Weiss[1]
[1]*SEDD, US Army Research Laboratory, Adelphi, MD*
[2]*Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Falls Church, VA*

14:20 A1-4 BROADBAND CHARACTERIZATION OF ISOTROPIC AND ANISOTROPIC MICROWAVE METAMATERIALS

Vasundara V. Varadan*
Electrical Engineering, University of Arkansas- Fayetteville, Fayetteville, AR

14:40 A1-5 INITIAL CHARACTERIZATION OF A CONFORMAL METAMATERIAL-BASED ANTENNA ARRAY

William F. Moulder*, Ioannis Tzanidis, Kubilay Sertel, John L. Volakis
The Ohio State University, Columbus, OH

Session A2: Permittivity Measurements
Room 1B40

Co-Chairs: William Davis, *Virginia Tech*
James BakerJarvis, *NIST*

15:20 A2-1 MICROWAVE CHARACTERIZATION OF NANO-STRUCTURED THIN FILM WITH GIANT DIELECTRIC RESPONSE

Te-Chuan Chen*[1], Lu Wang[1,2], Gordon Goodyear[3], Angelo Yiali[3], Hao Xin[1,2]
[1]Electrical and Computer Engineering Department, University of Arizona, Tucson, AZ
[2]Physics Department, University of Arizona, Tucson, AZ
[3]Sigma Technologies International, Tucson, AZ

15:40 A2-2 WIDEBAND IN FIELD PERMITTIVITY MEASUREMENT PROBE DESIGN

Nicholas Host*, Chi-Chih Chen
The ElectroScience Laboratory, Ohio State University, Columbus, OH

16:00 A2-3 MATERIAL PROPERTY CHARACTERIZATION OF SILICON CARBIDE (SIC) SUBSTRATE FOR HIGH-TEMPERATURE RF APPLICATIONS

Taeyoung Yang*[1], William A. Davis[1], John Coggin[2], Russell May[2]
[1]Electrical Engineering, Virginia Tech, Blacksburg, VA
[2]Prime Photonics, LC, Blacksburg, VA

16:20 A2-4 FREE-SPACE COMPLEX PERMITTIVITY MEASUREMENTS AT G-BAND

Charles R. Dietlein*, Abigail S. Hedden, David A. Wikner
US Army Research Laboratory, Adelphi, MD

16:40 A2-5 FLUCTUATION-DISSIPATION RELATIONS IN ELECTROMAGNETIC INTERACTION WITH MATERIALS

James Baker-Jarvis*
818, NIST, Boulder, CO

Session B2: Electromagnetic Interaction
Room 245

Co-Chairs: Jamesina Simpson, *University of New Mexico*
Majid Manteghi, *Virginia Tech*

15:20 B2-1 PROJECTILE AIRFRAME EFFECTS ON THE RF PROPAGATION CHARACTERISTICS OF GUIDED MUNITIONS

Gary L. Katulka*, Rex A. Hall, David J. Hepner
Guidance Technologies Branch, Army Research Laboratory, Aberdeen Proving Ground, MD

15:40 B2-2 WIDELY TUNABLE X-BAND BANDSTOP RESONATOR WITH TUNABLE EXTERNAL COUPLING

Eric J. Naglich*, Hjalti H. Sigmarsson, William J. Chappell
Electrical and Computer Engineering, Purdue University, West Lafayette, IN

16:00 B2-3 HIGH POWER NEAR FIELD MAGNETIC COUPLING USING A DYNAMICALLY PHASED ANTENNA ARRAY

Devin W. Williams*, Majid Manteghi
Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA

16:20 B2-4 GLOBAL FDTD MODELING OF THE EARTH-IONOSPHERE SYSTEM DURING THE 2003 OCTOBER HALLOWEEN STORMS

Joshua A. Kotobi[1], Antti Pulkkinen[2], Jamesina J. Simpson*[1]
[1]ECE, University of New Mexico, Albuquerque, NM
[2]Catholic University of America at NASA/GSFC, Greenbelt, MD

16:40 B2-5 EXPERIENCES WITH COMPUTER AND LABORATORY-BASED INSTRUCTION FOR UNDERGRADUATE MICROWAVE ENGINEERING FOR AVIATION

William C. Barott*, Jeanette B. Barott
Electrical Engineering, Embry-Riddle Aeronautical University, Daytona Beach, FL

Session D1: Microwave Devices, Components and Subsystems
Room 155

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

15:20 D1-1 A COMPACT TUNABLE FILTER USING BST THIN FILM VARACTORS

Jiang Hu*[1,2], Benjamin Lacroix[1], Negar Tavassolian[1], John Papapolymerou[1]
[1]*The School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta GA*
[2]*Department of Microwave Engineering, University of Electronic Science and Technology of China, Chengdu SC, China*

15:40 D1-2 CHARGING MECHANISMS IN CAPACITIVE RF MEMS SWITCHES WITH SILICON NITRIDE: THE EFFECT OF A LEAKY DIELECTRIC

Negar Tavassolian*[1], John Papapolymerou[1], Matroni Koutsoureli[2], George Papaioannou[2]
[1]*Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA*
[2]*Physics Department, University of Athens, Athens, Greece*

16:00 D1-3 A LIGHTWEIGHT ORGANIC X-BAND ACTIVE RECEIVE PHASED ARRAY WITH INTEGRATED SIGE T/R MODULE AND SI-BASED MEMS T/R SWITCH

Chad E. Patterson*, Tushar K. Thrivikraman, Ana M. Yepes, Ted Heath, Swapan K. Bhattacharya, John D. Cressler, John Papapolymerou
Georgia Institute of Technology, Atlanta, GA

16:20 D1-4 RECTIFYING ANTENNA DESIGN METHOD FOR WIRELESS POWERING APPLICATIONS

Erez A. Falkensten*, Zoya Popovic
ECEE, CU Boulder, Boulder Colorado

Session EC2: Radar-Communication Spectrum Issues: Management, Allocation, and Compatibility
Room 105

Co-Chairs: LAWRENCE COHEN, *NAVAL RESEARCH LABORATORY*
Eric Mokole, *Naval Research Laboratory*

13:20 EC2-1 THE RADAR AND WIRELESS SPECTRUM ENVIRONMENT

Lawrence S. Cohen*[1], Randy Jost[2]
[1]*Naval Research Laboratory, Washington, DC*
[2]*SPACE DYNAMICS LABORATORY, UTAH STATE UNIVERSITY, LOGAN, UTAH*

13:40 EC2-2 ASSESSMENT OF APPROACHES TO ENSURING THE COMPATIBILITY OF RADAR AND WIRELESS COMMUNICATION SYSTEMS

Randy J. Jost*[1], Lawrence Cohen[2]
[1]*Space Dynamic Laboratory, Utah State University, North Logan, UT*
[2]*Radar Division, Naval Research Laboratory, Washington, DC*

14:00 EC2-3 INVESTIGATION AND ANALYSIS OF WIMAX ELECTROMAGNETIC COMPATIBILITY WITH ADJACENT-BAND (S-BAND) RADAR SYSTEMS

Frank H. Sanders*[1], John E. Carroll[1], Robert L. Sole[2]
[1]*ITS Laboratory, NTIA, U.S. Department of Commerce, Boulder, CO*
[2]*Office of Spectrum Management, NTIA, U.S. Department of Commerce, Washington, DC*

14:20 EC2-4 CASE STUDY: INVESTIGATION OF INTERFERENCE INTO 5 GHZ WEATHER RADARS FROM UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES

John E. Carroll*[1], Frank H. Sanders[1], Geoffrey A. Sanders[1], Robert L. Sole[2]
[1]ITS Laboratory, NTIA, U.S. Department of Commerce, Boulder, CO
[2]Office of Spectrum Management, NTIA, U.S. Department of Commerce, Washington, DC

14:40 EC2-5 CONTINUOUS PHASE MODULATION (CPM) FOR IMPLEMENTATION OF RADAR WAVEFORMS

Shannon D. Blunt*
Electrical Engineering & Computer Science, University of Kansas, Lawrence, KS

15:00 Break

15:20 EC2-6 WIRTINGER CALCULUS AS A MEANS TO ASSESS AND IMPROVE LINEARITY AND EFFICIENCY IN RADAR POWER AMPLIFIERS

Charles Baylis*, Robert J. Marks, Josh Martin, Loria Wang, Matthew Moldovan, Hunter Miller
Department of Electrical and Computer Engineering, Baylor University, Waco, Texas

15:40 EC2-7 EFFICIENT AND LINEAR TRANSMITTER CONCEPT FOR FUTURE HIGH POWER SOLID STATE RADAR SYSTEMS

Michael D. Roberg, Zoya Popovic*
University of Colorado, Boulder, CO

16:00 EC2-8 RECONFIGURABLE FILTER TECHNOLOGY FOR INTERFERENCE MITIGATION

Douglas R. Jachowski*, Andrew C. Guyette
Naval Research Laboratory, Washington, DC

16:20 EC2-9 RADAR AND COMMUNICATION SPECTRUM COMPATIBILITY REQUIRES SIMULTANEOUS MEASUREMENT OF BOTH FREQUENCY AND TIME ASPECTS

Thomas C. Hill*
RF Products, Tektronix. Inc., Beaverton, OR

16:40 EC2-10 IMPULSE SENSING THEORY: SUB WAVELENGTH RESOLUTION

Kim Scheff*, Pete Hansen, Eric L. Mokole
Radar Division, Naval Research Laboratory, Washington, DC

17:00 EC2-11 A CO-CHANNEL INTERFERENCE MODEL FOR SPREAD SPECTRUM TECHNOLOGIES

Timothy Riley*, Teresa Rusyn
ITS.E, US Dept. of Commerce NTIA/ITS, Boulder, CO

Session F2: 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 F2-1 SIMULTANEOUS RETRIEVAL OF OCEAN SURFACE SALINITY AND WIND USING COMBINED L-BAND PASSIVE-ACTIVE MICROWAVE DATA

Simon Yueh*, Julian Chaubell
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

13:40 F2-2 HYPERSPECTRAL MICROWAVE ATMOSPHERIC SOUNDING

William J. Blackwell*, R. V. Leslie, Michael L. Pieper, Jenna E. Samra
MIT Lincoln Laboratory, Lexington, MA

14:00 F2-3 TRADE-OFF BETWEEN VERTICAL RESOLUTION AND ACCURACY IN WATER VAPOR RETRIEVALS FROM GROUND-BASED MICROWAVE BRIGHTNESS TEMPERATURE MEASUREMENTS

Swaroop Sahoo*[1], Steven C. Reising[1], Jothiram Vivekanandan[2]
[1]*Electrical and Computer Eng., Colorado State University, Fort Collins CO*
[2]*Earth Observation Laboratory, National Center for Atmospheric Research, Boulder CO*

14:20 F2-4 ELECTROMAGNETIC ANALYSIS OF RADIOMETER CALIBRATION TARGETS USING FINITE DIFFERENCE TIME DOMAIN METHOD

Srikumar Sandeep*[1], Albin Gasiewski[1], David Walker[2]
[1]*Department of electrical engineering, University of Colorado, Boulder, CO*
[2]*Electromagnetics Division, National Institute of Standards and Technology, Boulder, CO*

14:40 F2-5 JASON MICROWAVE RADIOMETERS: AN OVERVIEW

Douglas Dawson, Amarit Kitiyakara, Shannon Brown, Sharmila Padmanabhan*, Oliver Montes
Microwave Remote Sensing Instruments, JPL, Pasadena, CA

15:00 Break

15:20 F2-6 DEVELOPMENT, AND FABRICATION OF A 92-GHZ RADIOMETER FOR IMPROVED COASTAL WET-TROPOSPHERIC CORRECTION ON SWOT

Darrin Albers*[1], Steven C. Reising[1], Alexander Lee[1], Shannon T. Brown[2], Pekka Kangaslahti[2], Douglas E. Dawson[2], Todd C. Gaier[2], Oliver Montes[2], Daniel J. Hoppe[2], Behrouz Khayatian[2]
[1]*Dept. of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO*
[2]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*

15:40 F2-7 DEVELOPMENT OF HIGH-FREQUENCY, INTERNALLY-CALIBRATED MILLIMETER-WAVE RADIOMETERS OPERATING AT 130 AND 166 GHZ

Alexander L. Lee*[1], Steven C. Reising[1], Darrin Albers[1], Shannon T. Brown[2], Pekka P. Kangaslahti[2], Douglas E. Dawson[2], Todd C. Gaier[2], Oliver Montes[2], Daniel J. Hoppe[2]
[1]*Electrical and Computer Engineering, Colorado State University, Fort Collins, CO*
[2]*Jet Propulsion Lab, California Institute of Technology, Pasadena, CA*

16:00 F2-8 OVERMODED WAVEGUIDE FOR BROADBAND MICROWAVE SPECTROSCOPY

Yu-Ting Huang*
Purdue University, West Lafayette, IN

16:20 F2-9 CHARACTERIZATION OF ELECTROMAGNETIC LOSSES IN THE TERAHERTZ REGIME DUE TO ATMOSPHERIC WATER CONTENT

Marcus J. Weber*, Benjamin B. Yang, Sarah L. Katz, John H. Booske
Department of Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, Wisconsin

Session GHF2: Global Navigation Satellite Systems and Radio Beacon Remote Sensing II
Room 200

Co-Chairs: Sigrid Close, *Stanford University*
Carl Siefring, *Naval Research Laboratory*
Valery Zavorotny, *NOAA/Earth System Research Laboratory*

13:20 GHF2-1 REMOTE SENSING OF LOW AND MID-LATITUDE IONOSPHERIC DISTURBANCES DURING SOLAR MINIMUM USING CITRIS AND CERTO MEASUREMENTS OF TEC AND RADIO SCINTILLATION

Carl L. Siefring*
Plasma Physics Division, Naval Research Laboratory, Washington, DC

13:40 GHF2-2 SATELLITE-BASED RADIO BEACONS AND THE SCINTILLATION NETWORK DECISION AID (SCINDA)

Ronald G. Caton*[1], Keith M. Groves[2], Santi Basu[3], Mike Verlinden[2]
[1]*Space Vehicles Directorate, Air Force Research Laboratory, Kirtland AFB, NM*
[2]*Space Vehicles Directorate, Air Force Research Laboratory, Hanscom AFB, NM*
[3]*Institute for Scientific Research, Boston College, Chestnut Hill, MA*

14:00 GHF2-3 TEMPORAL CHARACTERISTICS OF INTENSE GPS SCINTILLATIONS AT ASCENSION ISLAND

Charles S. Carrano*[1], Charles L. Rino[2]
[1]*Boston College, Chestnut Hill, MA*
[2]*Rino Consulting, Menlo Park, CA*

14:20 GHF2-4 SIMULATION OF GPS SCINTILLATION AND TEC USING ROCKET BORNE IONOSPHERIC DENSITY MEASUREMENTS

Lars P. Dyrud*[1], Joran Moen[2]
[1]*Johns Hopkins Applied Physics Laboratory, Laurel, MD*
[2]*University Of Oslo, Oslo, Norway*

14:40 GHF2-5 LONGITUDE-ALTITUDE TOMOGRAPHIC IMAGES OF LOW-LATITUDE PLASMA STRUCTURES

Matthew A. Hei*[1], Paul Bernhardt[1], Carl Siefring[1], Matthew Wilkens[1], Cesar Valladares[2], Trevor Garner[3], Roderick Heelis[4]
[1]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[2]*Institute for Scientific Research, Boston College, Boston, MA*
[3]*SGL/ARL, University of Texas at Austin, Austin, TX*
[4]*Hanson Center for Space Sciences, University of Texas at Dallas, Dallas, TX*

15:00 Break

15:20 GHF2-6 SEASONAL DEPENDENCE OF STORM ENHANCED DENSITY OBSERVED WITH GPS

Anthea Coster*[1], Shunrong Zhang[1], J. M. Ruohoniemi[2], Sebastien de Larquier[2]
[1]*MIT Haystack Observatory, Westford, MA*
[2]*Virginia Tech, Blacksburg,VA*

15:40 GHF2-7 OBSERVATIONS OF TEC STRUCTURES OVER THE ANATOLIAN PLATEAU

Trevor W. Garner[1], Thomas L. Gaussiran II*[1], Kanish Mehta[1], Amy Scholze[1], Ayman M. Mahrous[2]
[1]*Space and Geophysics Lab, Applied Research Labs., Univ. of Texas, Austin, Texas*
[2]*Helwan University, Helwan, Egypt*

16:00 GHF2-8 GPS INTERFEROMETRIC REFLECTOMETRY: FORWARD MODELING OF MULTIPATH CAUSED BY SURFACE UNDULATIONS, VIA GEOMETRICAL AND PHYSICAL OPTICS

Felipe G. Nievinski*[1], Valery U. Zavorotny[2], Kristine M. Larson[1]
[1]*Department of Aerospace Engineering Sciences, University of Colorado, Boulder, CO*
[2]*Earth Systems Research Laboratory, National Oceanic and Atmospheric Administration, Boulder, CO*

Session H2: Waves in Space Plasmas II and Nonlinear Effects & Plasma Turbulence
Room 245

Co-Chairs: Mark Golkowski, *University of Colorado Denver*
Peter Schuck, *NASA/GSFC*

13:20 H2-1 CONICAL ELECTRON DISTRIBUTIONS AT MARS: ARE WAVE-PARTICLE INTERACTIONS RESPONSIBLE FOR THE OBSERVATIONS?

Demet Ulusen*, David A. Brain
Space Sciences Laboratory, UCB, Berkeley, CA

13:40 H2-2 AURORAL MEDIUM FREQUENCY BURST EMISSIONS---A TERRESTRIAL ANALOG TO SOLAR TYPE III BURSTS?

James W. LaBelle*
Dartmouth College, Hanover New Hampshire

14:00 H2-3 HELICITY CONDENSATION AS THE ORIGIN OF CORONAL AND SOLAR WIND STRUCTURE

Spiro K. Antiochos*
Heliophysics Division, NASA/GSFC, Greenbelt, MD

14:20 H2-4 THE ROLE OF KINETIC PROCESSES IN MAGNETOSPHERIC DYNAMICS

Michael Hesse*, Seiji Zenitani, Masha Kuznetsova
NASA GSFC, Greenbelt, Maryland

Session J2: New Telescopes, Techniques and Observations I
Room 265

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

13:20 J2-1 PROGRESS ON THE AUSTRALIAN SKA PATHFINDER

Antony E. T. Schinckel*, David R. DeBoer
CSIRO ATNF, Epping, NSW, Australia

13:40 J2-2 LONG WAVELENGTH ARRAY UPDATE

Steven W. Ellingson*
Bradley Dept. of Electrical & Computer Engineering, Virginia Polytechnic Institute & State University, Blacksburg VA

14:00 J2-3 THE MEXICAN ARRAY RADIO TELESCOPE OF INTERPLANETARY SCINTILLATION, MEXART

Armando Carrillo-Vargas*[1], Ernesto Andrade-Mascote[1], Pablo Villanueva-Hernandez[1], Gilberto Casillas-Perez[2]
[1]*Unidad Michoacan, Universidad Nacional Autonoma de Mexico, Michoacan, Mexico, Mexico*
[2]*Ciencias Espaciales, Universidad Nacional Autonoma de Mexico, D. F., Mexico, Mexico*

14:20 J2-4 MEASURING COSMIC MICROWAVE BACKGROUND POLARIZATION WITH POLARBEAR

Nils W. Halverson*
University of Colorado at Boulder, Boulder, CO

14:40 J2-5 THE EVENT HORIZON TELESCOPE: NEW RESULTS AND FUTURE PLANS

Sheperd S. Doeleman*[1], The EHT Collaboration[2]
[1]*MIT Haystack Observatory, Westford, MA*
[2]*An International, Collaborative Group, Global*

15:00 Break

15:20 J2-6 COMPUTING CLUSTERS FOR SOFTWARE-BASED RADIO ASTRONOMY AND SETI AT THE ALLEN TELESCOPE ARRAY

William C. Barott*[1,2], Peter Backus[2], Samantha Blair[3], Gerald Harp[2], Jane Jordan[2], Colby Kraybill[3], Ken Smolek[2], Jon Richards[2], Jill Tarter[2]
[1]*Electrical Engineering, Embry-Riddle Aeronautical University, Daytona Beach, FL*
[2]*SETI Institute, Mountain View, CA*
[3]*Hat Creek Radio Observatory, Hat Creek, CA*

15:40 J2-7 A 3 GHZ BANDWIDTH SPECTROMETER FOR RADIO ASTRONOMY AND ATMOSPHERIC INSTRUMENTATION

Suraj Gowda*[1], Aaron Parsons[2], Robert Jarnot[3], Dan Werthimer[4]
[1]*EECS, University of California, Berkeley, Berkeley, CA*
[2]*Astronomy, University of California, Berkeley, Berkeley, CA*

[3]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*
[4]*Space Sciences Laboratory, University of California, Berkeley, Berkeley, CA*

16:00 J2-8 A NEW SPECTROMETER FOR THE GREEN BANK TELESCOPE

Anish Roshi*[1], John Ford[1], Andrew Siemion[2], Dan Werthimer[2]
[1]*National Radio Astronomy Observatory, Green Bank, WV*
[2]*University of California, Berkeley, Berkeley, CA*

16:20 J2-9 NEW WIDEBAND VLBI DATA ACQUISITION SYSTEMS

J. Romney*[1], C. Beaudoin[2], W. Brisken[1], S. Doeleman[2], S. Durand[1], A. Hinton[2], M. Luce[1], R. McWhirter[2], A. Niell[2], G. Peck[1], M. Revnell[1], C. Ruszczyk[2], M. Taveniku[2], C. Walker[1], A. Whitney[2]
[1]*National Radio Astronomy Observatory, Socorro, New Mexico*
[2]*MIT Haystack Observatory, Westford, MA*

16:40 J2-10 DERIVATIONS OF MAIN PARAMETERS OF THE MEXART USING STELLAR RADIO SOURCES

Pablo Villanueva*[1], Armando Carrillo-Vargas[1], Ernesto Andrade[1], Gilberto A. Casillas[2], Juan A. Gonzalez-Esparza[1]
[1]*Unidad Michoacan, Instituto de Geofisica, UNAM, Michoacan, Mexico, Mexico*
[2]*Ciencias Espaciales, Instituto de Geofisica, UNAM, DF, Mexico, Mexico*

Session K1: Emerging Diagnostic and Therapeutic Applications of Electromagnetics
Room 151

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

13:20 K1-1 IMAGE BASED TIME-REVERSAL FOCUSING FOR TRANSCUTANEOUS MICROWAVE THERMAL THERAPY

John P. Stang*, Mahta Moghaddam, Oliver D. Kripfgans, J. Brian Fowlkes, Paul L. Carson
University of Michigan, Ann Arbor, MI

13:40 K1-2 TIME-MULTIPLEXED BEAMFORMING FOR NON-INVASIVE MICROWAVE HYPERTHERMIA TREATMENT

Earl Zastrow, Barry D. Van Veen, Susan C. Hagness*
University of Wisconsin-Madison, Madison, WI

14:00 K1-3 TOWARD A MORE COMPLETE TISSUE MODEL DEVELOPMENT FOR MICROWAVE THERMAL ABLATION

Zhen Ji*, Christopher L. Brace
University of Wisconsin-Madison, Madison, WI

14:20 K1-4 MICROWAVE-INDUCED THERMOACOUSTIC IMAGING FOR RADIO-FREQUENCY TUMOR ABLATION: A HYBRID FDTD MODELING AND EXPERIMENTAL STUDY

Yiming J. Deng, Mark Golkowski*
Departments of Electrical Engineering and Bioengineering, University of Colorado Denver, Denver, CO

15:00 Break

15:20 K1-5 A FAST ALGORITHM TO OPTIMIZE TRANSMIT EFFICIENCY FOR LOCAL EXCITATION WITH A TRANSMIT ARRAY

Giuseppe Carluccio*[1], Christopher M. Collins[2], Danilo Erricolo[1]
[1]*University of Illinois at Chicago, Chicago, IL*
[2]*Pennsylvania State University, Hershey, PA*

15:40 K1-6 ACTIVATION OF SENSORY AND MOTOR PERIPHERAL NERVES DUE TO CUTANEOUS ELECTRICAL STIMULATION

Kyle M. Loizos*, Carlos J. Cela, Gianluca Lazzi
Electrical and Computer Engineering, University of Utah, Salt Lake City, UT

16:00 K1-7 REGRESSION BASED DESIGN FOR DEVELOPMENT OF A BREAST PHANTOM

Camerin C. Hahn*[1], Sima Noghanian[1], Edward R. Sauter[2]
[1]*Electrical Engineering, University of North Dakota, Grand Forks, ND*
[2]*School of Medicine and Health Sciences, University of North Dakota, Grand Forks, ND*

Business Meetings

17:00	Commission E	Room 105
17:00	Commission F	Room 150
17:00	Commission K	Room 151
18:00	Commission D	Room 155

Reception

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

Thursday Morning **6 January 2011**

Plenary Session Dedicated to the Memory of William E. Gordon
Mathematics Auditorium

Ernest K. Smith USNC-URSI 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

Meeting Highlight: From the Inner World of Subatomic Particles to the Cosmology of the Universe

Co-Chairs: Yahya Rahmat-Samii, *University of California Los Angeles (UCLA)*
Steven Reising, *Colorado State University*

10:00 P2-1 THE STATUS OF PARTICLE PHYSICS AND THE COSMOLOGICAL CONNECTIONS

Daniel Green*
Fermi National Accelerator Laboratory (Fermilab), Batavia, IL

10:20 P2-2 THE COSMIC MICROWAVE BACKGROUND AS A PROBE OF THE EVOLVING UNIVERSE

William L. Holzapfel*
Physics, University of California, Berkeley, CA

Session A3: Enhanced Measurement Techniques, Design and Calibration
Room 155

Co-Chairs: Paul Racette, *NASA Goddard Space Flight Center*
Aly Fathy, *U. Tennessee*

13:20 A3-1 ON THE USE OF EQUIANGULAR AND ARCHIMEDEAN SPIRAL ANTENNAS IN UWB TRANSMIT-RECEIVE ANTENNA SYSTEM

Mohamed A. Elmansouri*, Dejan S. Filipovic
Department of Electrical, Computer, and Energy Engineering, University of Colorado, Boulder, Colorado

13:40 A3-2 A NEW COMPACT WIDE BAND EIGHT WAY SIW POWER DIVIDER AT X-BAND

Robab Kazemi*[1,2], Ramezan A. Sadeghzadeh[2]
[1]*Electrical Engineering and Computer Science, University of Tennessee, Knoxville- TN*
[2]*Faculty of Electrical and Computer Engineering, K. N. Toosi University of Technology, Tehran, Iran*

14:00 A3-3 APPLICATION OF SINGULARITY EXPANSION METHOD IN MEASURING SIZE OF A STENT IMPLANTED IN THE ARTERY

Nastaran Hendijani*, Daniel B. Cooper, Pavlos P. Vlachos, Majid Manteghi
Virginia Polytechnic Institute and State University, Blacksburg, Virginia

14:20 A3-4 MULTI-PHYSICS MODELING OF COUPLED ELECTRICAL AND THERMAL PROBLEMS IN 3D SYSTEM INTEGRATION

Ahmadreza Ghahremani*[1], Essam Elkhouly[1], Aly Fathy[1], Yunqiang Yang[2], Mosaab Abughalib[2]
[1]*EECS, University Of Tennessee, Knoxville*
[2]*Agilent Technologies Inc, Colorado*

14:40 A3-5 CALIBRATED NOISE MEASUREMENTS WITH INDUCED RECEIVER GAIN FLUCTUATIONS

Paul E. Racette*[1], David Walker[2], Dazhen Gu[2], Marco Rajola[3], Ashly Spevacek[4]
[1]*NASA Goddard Space Flight Center, Greenbelt, MD*
[2]*NIST, Boulder, CO*
[3]*University of Pisa, Pisa, Italy*
[4]*University of Minnesota, MN*

Session A4: Microwave to THz Device Measurements
Room 155

Co-Chairs: William Coburn, *US Army Research Laboratory*
Christopher Holloway, *NIST*

15:20 A4-1 Experimental Characterization of Doped Silicon Conductivity in the Terahertz Regime with a High-Q Quasioptical Resonator

Benjamin B. Yang*, Sarah L. Katz, Keely J. Willis, Susan C. Hagness, Irena Knezevic, John H. Booske
Department of Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, Wisconsin

15:40 A4-2 INTEGRATED THZ HORN ANTENNA USING EBG STRUCTURES

Li-Ming Si*[1,2], Yong Liu[1], Si-Heng Zhu[1], Hao Xin[2]
[1]*Department of Electronic Engineering, Beijing Institute of Technology, Beijing, China*
[2]*Electrical and Computer Engineering Department, University of Arizona, Tucson*

16:00 A4-3 SIMULATION OF A TAPERED V-ANTENNA IMMERSED IN A SILICON DIELECTRIC

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

16:20 A4-4 ON THE LIMITS OF RADAR WAVEFORM GENERATION FOR CONTROLLING OUT-OF-BAND SPECTRAL CONTENT

Jean W. de Graaf*, Lawrence S. Cohen
Radar, Naval Research Laboratory, Washington DC

Session B3: Session Dedicated to the Memory of Dr. Carl E. Baum: Theoretical Methods in Fields and Waves
Room 1B40

Co-Chairs: Dave Giri, *Pro-Tech*
Piergiorgio Uslenghi, *University of Illinois at Chicago*

13:20 B3-1 DR. CARL BAUM -- OUR FRIEND, PHILOSOPHER AND GUIDE

D. V. Giri*[1], Piergiorgio L. E. Uslenghi[2]
[1]*Dept. ECE, University of New Mexico, Albuquerque, NM*
[2]*University of Illinois at Chicago, Chicago, Illinois*

13:40 B3-2 INTENSITY REDUCTION OF ELECTROMAGNETIC RADIATION BY AN OPTIMIZED OCCULTER

Wasyl Wasylkiwskyj*[1], Shahram R. Shiri[2]
[1]*Electrical and Computer Engineering, The George Washington University, Washington DC*
[2]*Optics Branch, NASA/Goddard Space Flight Center, Greenbelt*

14:00 B3-3 UTILIZING NONLINEAR INDUCTORS FOR BANDWIDTH IMPROVEMENT

Mohsen Salehi*, Majid Manteghi
Electrical & Computer Engineering, Virginia Tech, Blacksburg, VA

14:20 B3-4 A DUAL-POLARIZED NEAR-FIELD FOCUSING PLATE, WITH FOCUSING IN TWO DIRECTIONS

S. Ali Hosseini*, Filippo Capolino
Electrical Engineering and Computer Science, University of California,Irvine, Irvine, CA

14:40 B3-5 ATTENUATION VS. FREQUENCY OF AN ELEMENTARY VERTICAL DIPOLE SITUATED ABOVE A FLAT LOSSY EARTH

Kristopher R. Buchanan*
U.S. Army Research Laboratory, Adelphi, MD

15:00 Break

15:20 B3-6 AN EFFICIENT METHOD FOR SCATTERING FROM A POLYGONAL CYLINDER

Santosh Seran*, Patrick J. Donohoe, Erdem Topsakal
Mississippi State University, Starkville,MS

15:40 B3-7 GPGPU ACCELERATED INTERFEROMETRIC IMAGING THROUGH RANDOM MEDIA

Andrew Smith*, Ozlem Kilic, Vinh Dang, Esam El-Araby
EECS, The Catholic University of America, Washington, DC

16:00 B3-8 COMPARATIVE ANALYSIS OF RECTENNA ARRAY CONFIGURATIONS FOR RFID SENSORS

Ugur Olgun*, Chi-Chih Chen, John L. Volakis
ElectroScience Lab., The Ohio State University, Columbus, Ohio

16:20 B3-9 COMBINED USE OF VARIOUS PASSIVE RADAR CROSS-CORRELATION RANGE-DOPPLER TECHNIQUES AND ANGLE OF ARRIVAL USING MUSIC FOR THE DETECTION OF GROUND MOVING OBJECTS

Thomas Chan*, Yasuo Kuga, Sumit Roy
Electrical Engineering, University of Washington, Seattle, WA

Session B4: Numerical Methods I
Room 151

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

13:20 B4-1 A NUMERICAL STUDY IN COMPLEX ANALYSIS: APPLICATIONS OF THE WEYL REPRESENTATION OF THE GREEN'S FUNCTION

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

13:40 B4-2 EFFICIENT STRATEGIES FOR THE MPIE SOLUTION OF PERIODIC STRUCTURES IN LAYERED MEDIA

Donald R. Wilton*[1], David R. Jackson[1], Simone Paulotto[1], Guido Valerio[2], William A. Johnson[3], Lorena I. Basilio[3], William L. Langston[3], Ferhat T. Celepcikay[1], Alessandro Francavilla[1]
[1]*Electrical and Computer Engineering, University of Houston, Houston, TX*
[2]*Electronic Engineering, La Sapienza University of Rome, Rome, Italy*
[3]*Sandia National Laboratories, Albuquerque, NM*

14:00 B4-3 AN MPI/GPU PARALLELIZATION OF AN INTERIOR PENALTY DISCONTINUOUS GALERKIN TIME-DOMAIN METHOD FOR MAXWELL'S EQUATIONS

Stylianos Dosopoulos*, Jin-Fa Lee
The Ohio State University, Columbus, Ohio

14:20 B4-4 ANALYSIS OF CORRUGATED HORNS USING A NOVEL AUGMENTATION OF THE APERTURE MODE WITH QUADRATIC PHASE

Arthur C. Densmore*, Yahya Rahmat-Samii
EE, UCLA, Los Angeles, CA

14:40 B4-5 HIGHER ORDER DIAKOPTIC FEM-MOM ANALYSIS OF ELECTRICALLY LARGE AND COMPLEX PERIODIC ELECTROMAGNETIC SCATTERERS

Dragan I. Olcan[1], Milan M. Ilic[1,2], Branislav M. Notaros*[2], Branko M. Kolundzija[1], Antonije R. Djordjevic[1]
[1]*School of Electrical Engineering, University of Belgrade, Belgrade, Serbia, Serbia*
[2]*Electrical & Computer Engineering Department, Colorado State University, Fort Collins, Colorado*

Session B5: Numerical Methods II and RF Materials
Room 151

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

15:20 B5-1 INVESTIGATIONS OF OPTIMAL GEOMETRICAL AND FIELD/CURRENT MODELING PARAMETERS FOR HIGHER ORDER FEM, MOM, AND HYBRID CEM TECHNIQUES

Eve M. Klopf*[1], Nada J. Sekeljic[1], Milan M. Ilic[1,2], Branislav M. Notaros[1]
[1]*Electrical & Computer Engineering Department, Colorado State University, Fort Collins, Colorado*
[2]*School of Electrical Engineering, University of Belgrade, Belgrade, Serbia, Serbia*

15:40 B5-2 2-D FDTD CALCULATIONS OF THE DIFFRACTION COEFFICIENT OF VIBRATING WEDGES

Monica R. Madrid*, Jamesina J. Simpson
Electrical and Computer Engineering, The University of New Mexico, Albuquerque, NM

16:00 B5-3 RF MATERIAL CHARACTERIZATION OF CONDUCTOR-BACKED MEDIA USING A NDE MICROSTRIP PROBE

Michael J. Havrilla[1], Andrew E. Bogle*[2], Milo W. Hyde[1], Edward J. Rothwell[3]
[1]*Electrical and Computer Engineering, Air Force Institute of Technology, Wright Patterson AFB, Ohio*
[2]*Sensor Systems Division, University of Dayton Research Institute, Dayton, Ohio*
[3]*Electrical and Computer Engineering, Michigan State University, East Lansing, Michigan*

16:20 B5-4 USING ANGLE AND THICKNESS REFINEMENT IN THE TWO-POLARIZATION METHOD FOR FREE-SPACE MATERIAL CHARACTERIZATION

Edward J. Rothwell*[1], Raenita A. Fenner[1], Lydell L. Frasch[2]
[1]*Electrical and Computer Engineering, Michigan State University, East Lansing, MI*
[2]*The Boeing Company, Saint Louis, MO*

16:40 B5-5 CHARACTERIZATION OF ELECTROMAGNETIC WAVE PROPERTIES FOR COMPLEX MATERIALS AND THEIR INTERPRETATION AS MATERIAL PARAMETERS

Daniel Sjoberg*[1], Christer Larsson[1,2]
[1]*Electrical and Information Technology, Lund University, Lund, Sweden*
[2]*Saab Dynamics, Linkping, Sweden*

Session BC1: Ground-Penetrating Radar
Room 105

Co-Chairs: Amir Zaghloul, *Virginia Polytechnic Institute and State University*
William Palmer, *US Army Research Office*

13:20 BC1-1 GROUND PENETRATING RADAR TECHNOLOGY DEVELOPMENT AT THE ARMY RESEARCH LABORATORY

Anders Sullivan*, Kelly Sherbondy, Lam Nguyen, Karl Kappra
US Army Research Laboratory, Adelphi, MD

13:40 BC1-2 CONSIDERING THE BREWSTER ANGLE IN LOSSY DIELECTRIC MEDIA FOR GPR LANDMINE DETECTION SYSTEMS

Ian McMichael*
S&T Countermine Branch, U.S. Army NVESD, Ft Belvoir, VA

14:00 BC1-3 UWB SWEPT-FREQUENCY RADAR MEASUREMENTS FOR DETECTION OF BURIED OBJECTS AT GRAZING INCIDENCE

Junfei Li[1], Obadiah O. Kegege[2], Heinrich D. Foltz*[1], Edward J. Banatoski[1]
[1]*University of Texas - Pan American, Edinburg, TX*
[2]*NASA Glenn Research Center, Cleveland, OH*

14:20 BC1-4 MICROWAVE MICROSCOPE FOR SHALLOWLY BURIED MINES

Kim Scheff*, Eric L. Mokole
Radar Division, Naval Research Laboratory, Washington DC

14:40 BC1-5 A SUBSURFACE IMAGING APPROACH BASED ON NEAR-GROUND SENSOR NETWORKS UTILIZING ULTRA-WIDEBAND NEAR-FIELD FOCUSING

Fikadu T. Dagefu*, Kamal Sarabandi
Electrical Engineering and Computer Science, University of Michigan, Ann Arbor

15:00 Break

15:20 BC1-6 TIME-FREQUENCY ANALYSIS OF SOIL AND TARGETS FOR GPR LANDMINE DETECTION

Naomi R. Schwartz*[1], Amir I. Zaghloul[1,2]
[1]*Electrical and Computer Engineering Department, Virginia Polytechnic Institute and State University, Falls Church, Virginia*
[2]*SEDD, US Army Research Laboratory, Adelphi, MD*

15:40 BC1-7 THROUGH WALL IMAGING AND GAIT RECOGNITION OF HUMAN OBJECTS USING AN IR-UWB RADAR

Yazhou Wang*[1], Depeng Yang[1], Aly E. Fathy[1], Moeness G. Amin[2]
[1]*EECS, University of Tennessee, Knoxville, TN*
[2]*Center for Advanced Communications, Villonova University, Villonova, PA*

16:00 BC1-8 PORTABLE RING-RESONATOR PERMITTIVITY MEASUREMENT SYSTEM

Gregory Mazzaro*, Kelly Sherbondy, Jie Hu
RF Signal Processing & Modeling Branch, U.S. Army Research Laboratory, Adelphi, MD

Session BK2: Telemetry for Monitoring and Biosensing II
Room 1B51

Co-Chairs: Kubilay Sertel, *The Ohio State University*
Erdem Topsakal, *Mississippi State University*

13:20 BK2-1 CELL PHONE DETECTS CANCER FROM URINE

Shuqi Wang*[1], Xiaohu Zhao[1], Imran Khimji[1], Dale Edwards[2], Weiliang Qiu[2], Daniel W. Cramer[2], Bin Ye[2], Utkan Demirci[1,3]
[1]*Renal department, Harvard Medical School, Cambridge, MA*
[2]*Obstetrics and Gynecology and Reproductive Biology, Harvard Medical School, Boston, MA*
[3]*Harvard-MIT Health Sciences and Technology, Cambridge, MA*

13:40 BK2-2 SMALL FORM FACTOR (SFF) PACKAGING ON LIQUID CRYSTAL POLYMER (LCP) FOR IMPLANTABLE WIRELESS INTRAOCULAR PRESSURE (IOP) SENSOR INSIDE MICE EYE

Dohyuk Ha*[1], Tse-Yu Lin[1], Byung Guk Kim[1], Simon John[2], Pedro P. Irazoqui[1], William J. Chappell[1]
[1]*ECE, Purdue University, West Lafayette*
[2]*Howard Hughes Medical Institute, Bar Harbor*

14:00 BK2-3 DIELECTRIC PROPERTIES OF PORCINE SKIN TISSUE IN THE MICROWAVE FREQUENCY RANGE

Erdem Topsakal*, Tutku Karacolak, Travis A. Nylin, Ercan S. Unlu
Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS

14:20 BK2-4 WIRELESS POWER TRANSFER EFFICIENCY IMPROVEMENT USING MULTIPLE COILS

Anil K. RamRakhyani*[1], Sundar Srinivas[2], Gianluca Lazzi[1]
[1]*ECE, University of Utah, Salt lake City, Utah*
[2]*Physics, North Carolina State, raleigh, NC*

14:40 BK2-5 RF POWERING FOR MINIATURE IMPLANTABLE INTRAOCULAR PRESSURE (IOP) SENSOR

Byung Guk Kim*[1], Rajkumar C. Kubendran[1], Tse-Yu Lin[1], Dohyuk Ha[1], Simon John[2], Pedro P. Irazoqui[1], William J. Chappell[1]
[1]*ECE, PURDUE UNIVERSITY, WEST LAFAYETTE, IN*
[2]*Howard Hughes Medical Institute at Jackson Laboratory, Bar Harbor*

Session F3: Radar Remote Sensing of Precipitation
Room 150

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

13:20 F3-1 POLARIMETRIC RADAR SIGNATURES IN SUPERCELL STORMS

Matthew R. Kumjian*, Alexander V. Ryzhkov
Cooperative Institute for Mesoscale Meteorological Studies, University of Oklahoma, Norman, OK

13:40 F3-2 CONVECTIVE VERSUS STRATIFORM RAIN MICROPHYSICS CHARACTERIZED BY VIDEO DISDROMETER AND POLARIMETRIC RADAR OBSERVATIONS

Petar Bukovcic*[1], Dusan Zrnic[2], Guifu Zhang[1]
[1]*School of Meteorology, University of Oklahoma, Norman, Okalhoma*
[2]*NSSL, NOAA, Norman, Oklahoma*

14:00 F3-3 INCORPORATING NASA SPACE-BORNE PRECIPITATION RESEARCH PRODUCTS INTO NATIONAL MOSAIC QPE OPERATIONAL SYSTEM FOR IMPROVED PRECIPITATION MEASURES

Yixin B. Wen*[1,2], Yang Hong[1,2], Jian Zhang, Guifu Zhang[2], Jonathan J. Gourley, Sheng Chen[1,2]
[1]*Department of Civil Engineering and Environmental Science, University of Oklahoma, Norman, OK*
[2]*Atmospheric Radar Research Center, University of Oklahoma, Norman, OK*

14:20 F3-4 RETRIEVING PRECIPITATION MICROPHYSICAL STATE OF A CONVECTIVE SYSTEM USING RADAR DATA AND THE ENSEMBLE KALMAN FILTER

Bryan J. Putnam*[1,2], Ming Xue[1,2], Guifu Zhang[1], Youngsun Jung[2], Nate Snook[1,2]
[1]*School of Meteorology, Univeristy of Oklahoma, Norman, OK*
[2]*Center for Analysis and Prediction of Storms, University of Oklahoma, Norman, OK*

15:00 Break

15:20 F3-5 SPACE-TIME CHARACTERIZATION MODEL FOR PRECIPITATION SYSTEM AND APPLICATION IN ADAPTIVE SCAN FOR PHASED ARRAY WEATHER RADARS

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

15:40 F3-6 A CYLINDRICAL POLARIMETRIC PHASED ARRAY RADAR FOR PRECIPITATION MEASUREMENTS: CONCEPTUAL DESIGN AND SIMULATIONS

Lei Lei*[1,2], Guifu Zhang[3,2]
[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*

16:00 F3-7 A NEW APPROACH TO DETECT THE GROUND CLUTTER IN WEATHER RADAR MEASUREMENTS

Yinguang Li*[1], Guifu Zhang[2], Richard J. Doviak[3]
[1]*School of 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 G2: Radar and Radio Techniques for Ionospheric Diagnostics
Room 200

Co-Chairs: Thomas Gaussiran, *Applied Research Laboratories, The University of Texas at Austin*
Terence Bullett, *CIRES*

13:20 G2-1 ENABLING LOW COST DISTRIBUTED SOFTWARE RADIO ARRAYS

Frank D. Lind*[1], Philip J. Erickson[1], Jim Marchese[1], Peter Anderson[2], Ross Daly[3]
[1]*MIT Haystack Observatory, Westford, MA*
[2]*SUNY Oneonta, Oneonta, NY*
[3]*Carnegie Mellon University, Pittsburgh, PA*

13:40 G2-2 OBLIQUE SOUNDING OF SUBAURORAL IONOSPHERE OVER YAKUTSK: DIGISONDE OBSERVATIONS AND MODELING RESULTS

Alexander E. Stepanov[1], Lengvard D. Filippov[1], Ivan A. Galkin*[2], Bodo W. Reinisch[2,3]
[1]*Schafer Institute of Space Physics and Aeronomy, Yakutsk, Russia*
[2]*Center for Atmospheric Reseach, University of Massachusetts Lowell, Lowell, MA*
[3]*Lowell Digisonde International, LLC, Lowell, MA*

14:00 G2-3 NEW IONOSONDE OBSERVATIONS FROM PUERTO RICO

Terence W. Bullett*
CIRES, University of Colorado, Boulder Colorado

14:20 G2-4 SPATIAL EFFECTS OF HF MULTIPLE SCATTERING IN THE IONOSPHERE: EXPERIMENTAL OBSERVATIONS

Nikolay A. Zabotin*[1,2], Terence W. Bullett[1,3]
[1]*CIRES, University of Colorado at Boulder, Boulder, CO*
[2]*ECEE, University of Colorado at Boulder, Boulder, CO*
[3]*NGDC, NOAA, Boulder, CO*

14:40 G2-5 COMPARISON OF STATISTICAL ANALYSIS OF MIDLATITUDE SPREAD F FOR VARIOUS SITES INCLUDING WALLOPS ISLAND (VIRGINIA), BOULDER (COLORADO), VANDENBERG (AFB, CALIFORNIA), AND DYESS (AFB, TEXAS)

Preeti Bhaneja*, Terrence W. Bullett
CIRES/NGDC, Boulder, CO

15:00 Break

15:20 G2-6 OBSERVATIONS OF EVENING ENHANCEMENT IN GROUND BACKSCATTER FROM MID-LATITUDE SUPERDARN RADARS

Sebastien de Larquier*[1], Michael J. Ruohoniemi[1], Joseph B. Baker[1], Anthea J. Coster[2], Shun-Rong Zhang[2]
[1]*ECE, Virginia Tech, Blacksburg, VA*
[2]*MIT Haystack Observatory, Westford, MA*

15:40 G2-7 SUPERDARN OBSERVATIONS OF SUBAURORAL IONOSPHERIC CONVECTION ASSOCIATED WITH LEAKY SHIELDING DURING AN AURORAL SUBSTORM

Lasse B. N. Clausen, Joseph B. H. Baker*, J. Michael Ruohoniemi
Virginia Tech, Blacksburg, VA

16:00 G2-8 LONG-TERM VLF-LF MEASUREMENTS AT MIKHNEVO RADIO MONITORING OBSERVATORY

Andrey N. Lyakhov*, Andrey A. Egoshin, Vladimir M. Ermak, Yuri V. Poklad, Yuli I. Zetzer, Ekaterina N. Yakimenko
Institute of Geospheres Dynamics, Moscow, Russian Federation

Session H3: Dusty Plasmas
Room 245

Co-Chairs: Edward Thomas, *Auburn University*
Scott Robertson, *Dept. of Physics, Univ. of Colorado - Boulder*

13:20 H3-1 STRUCTURIZATION IN DC DISCHARGE DUSTY PLASMAS

Jonathon R. Heinrich*, Su-Hyun Kim, Robert L. Merlino
Department of Physics and Astronomy, The University of Iowa, Iowa City, Iowa

13:40 H3-2 SPATIALLY RESOLVED VELOCITY DISTRIBUTION MEASUREMENTS IN DUSTY PLASMA SYSTEMS

Ross Fisher*, Edward Thomas, Jr
Physics, Auburn University, Auburn, Alabama

14:00 H3-3 DEVELOPMENT AND RESULTS OF THE 2D DUST SIMULATION CODE DEMON

Mark R. Cianciosa*, Robert A. Jefferson, Edward E. Thomas
Physics, Auburn University, Auburn, AL

14:20 H3-4 DUST ACOUSTICAL WAVES UNDER MICROGRAVITY AND MICROGRAVITY-LIKE CONDITIONS

Stephanie A. Wissel*
Princeton Plasma Physics Laboratory, Princeton NJ

14:40 H3-5 DUSTY SPACE PLASMA DIAGNOSIS USING TEMPORAL BEHAVIOR OF POLAR MESOSPHERIC SUMMER ECHOES DURING ACTIVE MODIFICATION

Alireza Mahmoudian*[1], Wayne A. Scales[1], Mike Kosch[2], Andrew Sinior[2], Graham Routledge[2], Michael Rietveld[3]
[1]*Electrical and Computer Engineering, Virginia Tech, Blacksburg,VA*
[2]*Electrical Engineering, Lancaster University, Lancaster, United Kingdom*
[3]*EISCAT facilities, Tromso, Norway*

15:00 Break

15:20 H3-6 MODELING OF PLASMA INSTABILITIES ASSOCIATED WITH ARTIFICIALLY CREATED DUSTY PLASMAS IN THE NEAR-EARTH SPACE ENVIRONMENT

Haiyang Fu*, Wayne Scales
Bradley Department of Electrical and Computer Engineering, Virginia Tech, Blacksburg

15:40 H3-7 DUST TRANSPORT AND ELECTRIC FIELD DISTRIBUTIONS IN PLANETARY CRATERS

Xu Wang*[1], Mihaly Horanyi[1], Scott Robertson[1], Andrew Poppe[1], Alex Likhanskii[2]
[1]*Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder,CO*
[2]*Tech-X Corporation, Boulder,CO*

16:00 H3-8 SIMULATIONS OF THE NEAR-SURFACE LUNAR PLASMA ENVIRONMENT

Andrew R. Poppe*[1], Jasper S. Halekas[2], Mihaly Horanyi[1]
[1]*Lab. for Atmospheric and Space Physics, Univ. of Colorado, Boulder, Colorado*
[2]*Space Sciences Lab., Univ. of California at Berkeley, Berkeley, California*

16:20 H3-9 LABORATORY INVESTIGATIONS OF THE UV-GENERATED LUNAR PHOTOELECTRON SHEATH

Adrienne Dove*[1,2], Zoltan Sternovsky[2], Xu Wang[2], Scott Robertson[3], Mihaly Horanyi[2,3]
[1]*Department of Astrophysical and Planetary Sciences, University of Colorado, Boulder, CO*
[2]*Laboratory for Atmospheric and Space Physics, Boulder, CO*
[3]*Department of Physics, University of Colorado, Boulder, CO*

16:40 H3-10 MEASURING THE LUNAR DUST CLOUD VIA IN SITU DUST DETECTION

Jamey Szalay*[1,2], Keith Drake[1,2], Zoltan Sternovsky[1,2], Mihaly Horanyi[1,2]
[1]*University of Colorado at Boulder, Boulder, CO*
[2]*Laboratory for Atmospheric and Space Physics, Boulder, CO*

17:00 H3-11 TIME-RESOLVED MEASUREMENTS OF TWO-DIMENSIONAL VELOCITY PROFILES IN COMPLEX (DUSTY) PLASMAS

Edward Thomas*, Joseph Shaw
Physics Department, Auburn University, Auburn, AL

Session J3: Transient Radio Sources, Surveys and Algorithms
Room 265

Co-Chairs: Joseph Lazio, *JPL*
James Cordes, *Cornell University*

13:20 J3-1 SEARCHING FOR MILLISECOND RADIO TRANSIENTS WITH THE ALLEN TELESCOPE ARRAY

Casey J. Law*[1], Glenn E. Jones[2]
[1]*Radio Astronomy Lab, UC Berkeley, Berkeley, CA*
[2]*Department of Astronomy, California Institute of Technology, Pasadena, CA*

13:40 J3-2 RESULTS FROM THE FLY'S EYE FAST RADIO TRANSIENT SEARCH AT THE ALLEN TELESCOPE ARRAY

Andrew P. V. Siemion*[1], Geoff Bower[1], Matt Dexter[1], Griffin Foster[1], William Mallard[2], Peter L. McMahon[3], Mark Wagner[2], Dan Werthimer[2]
[1]*Department of Astronomy, University of California, Berkeley, Berkeley, California*
[2]*Center for Astronomy Signal Processing and Electronics Research, University of California, Berkeley, Berkeley,*

California
[3]Department of Electrical Engineering, Stanford University, Stanford, California

14:00 J3-3 V-FASTR: COMMENSAL TRANSIENT DETECTION WITH THE VERY LONG BASELINE ARRAY

Walter F. Brisken*[1], Adam T. Deller[1], Walid Majid[2], David R. Thompson[2], Steven Tingay[3], Kiri Wagstaff[2], Randall Wayth[3]
[1]National Radio Astronomy Observatory, Socorro, NM
[2]Jet Propulsion Laboratory, Pasadena, CA
[3]ICRAR/Curtin University, Perth, WA, Australia

14:20 J3-4 GIANT PULSE OBSERVATIONS WITH GAVRT

Glenn Jones*[1,2], Ryan Shannon[3]
[1]Jansky Fellow, National Radio Astronomy Observatory, Charlottesville, VA
[2]California Institute of Technology, Pasadena, CA
[3]Astronomy Department, Cornell University, Ithaca, NY

14:40 J3-5 SEARCH FOR ELECTROSTATIC DISCHARGES ON MARS

Marin M. Anderson*[1], Andrew Siemion[1], Dan Werthimer[1], Imke de Pater[1], Geoff C. Bower[1], William C. Barott[2]
[1]University of California, Berkeley, Berkeley, CA
[2]Embry-Riddle, Daytona Beach, FL

15:00 Break

15:20 J3-6 SCALABLE HETEROGENEOUS SETI AND PULSAR SPECTROMETERS

Terry E. Filiba*[1,2], Dan Werthimer[1,3], Andrew Siemion[1,4], Mark Wagner[1]
[1]Center for Astronomy Signal Processing and Electronics Research, University of California, Berkeley, Berkeley, CA
[2]Electrical Engineering and Computer Science, University of California, Berkeley, Berkeley, CA
[3]Space Sciences Laboratory, University of California, Berkeley, Berkeley, CA
[4]Astronomy, University of California, Berkeley, Berkeley, CA

15:40 J3-7 A FPGA BASED FAST TRANSIENT SEARCH PLATFORM FOR THE AUSTRALIAN SQUARE KILOMETRE ARRAY PATHFINDER

Robert Navarro*[1], Nathan Clarke[2], Larry D'Addario[1], Joseph Trinh[1], Tsan-Huei Cheng[1]
[1]Jet Propulsion Laboratory, Pasadena, CA
[2]International Centre for Radio Astronomy Research, Perth, Western Australia, Australia

16:00 J3-8 VAST: AN ASKAP SURVEY FOR VARIABLES AND SLOW TRANSIENTS

Shami Chatterjee*[1], Tara Murphy[2]
[1]Department of Astronomy, Cornell University, Ithaca, New York
[2]School of Physics, The University of Sydney, Sydney, NSW, Australia

16:20 J3-9 THE VAST SURVEY: SOFTWARE PIPELINE, SOURCE FINDING AND TRANSIENT DETECTION

Paul J. Hancock*, Tara Murphy
University of Sydney, Sydney, NSW, Australia

Business Meetings

17:00	Commission A	Room 155
17:00	Commission G	Room 200
18:00	Commission B	Room 1B40
18:00	Commission J	Room 265

Session B6: Session Dedicated to the Memory of Prof. Robert E. Collin: Antennas I
Room 1B40

Co-Chairs: John Volakis, *Ohio State University*
Yahya Rahmat-Samii, *University of California Los Angeles (UCLA)*

08:20 B6-1 ANTENNA RADIATION AND ENERGY STORAGE MECHANISM: A POYNTING VECTOR VIEWPOINT

Taeyoung Yang*, William A. Davis
Electrical Engineering, Virginia Tech, Blacksburg, VA

08:40 B6-2 AN ANALYTICAL ASYMPTOTIC CORRECTION TERM FOR POWER TRANSMISSIONS IN THE FRESNEL REGION

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

09:00 B6-3 NEAR-FIELD DETUNING CHARACTERIZATION FOR PORTABLE SMALL-ANTENNA DEVICES

Christian W. Hearn*
Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA

09:20 B6-4 MINIATURIZED 1" DUAL-BAND GPS ANTENNA ELEMENT

Liang Yue*, Chi-Chih Chen, Dimitris Psychoudakis, John L. Volakis
Electrical & Computer Engineering, The Ohio State University, Columbus Ohio

09:40 B6-5 EVALUATION OF THE ANTENNA NOISE TEMPERATURE FOR ARBITRARY ANTENNA POINTING ANGLES AND ENVIRONMENTAL TEMPERATURE PROFILES

Shenheng Xu, Yahya Rahmat-Samii*
Electrical Engineering Dept., University of California, Los Angeles, Los Angeles, CA

10:00 Break

10:20 B6-6 LOW PROFILE SPIRAL WITH PARTIALLY COATED FERRITE GROUND PLANE AND REACTIVE LOADING

Ming Chen*, Chi-Chih Chen, Dimitrios Psychoudakis, John Volakis
Dept. of Electrical and Computer Engineering, Ohio State University, Columbus, Ohio

10:40 B6-7 WIRE REALIZATION OF VIVALDI AND INVERTED VIVALDI ANTENNAS

William O. Coburn*[1], Amir I. Zaghloul[1,2]
[1]*RDRL-SER-M, US Army Research Laboratory, Adelphi MD*
[2]*VA Polytechnic and SU, Blacksburg, VA*

11:00 B6-8 A COMPARATIVE STUDY ON TRANSPARENT ANTENNAS DESIGNED FROM MESHED CONDUCTOR, INDIUM TIN OXIDE, AND CARBON NANOTUBE BASED CONDUCTOR

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

11:20 B6-9 FREQUENCY INDEPENDENT PERFORMANCE OF AN N-ARM MODULATED ARM WIDTH SPIRAL ANTENNA

William N. Kefauver*[1,2], Dejan S. Filipovic[1]
[1]*ECEE, University of Colorado, Boulder, Boulder, Colorado 80309*
[2]*EML, Lockheed Martin Space Systems Co., Denver, CO*

11:40 B6-10 WIDEBAND PATTERN NULLING USING MULTI-ARMED SPIRAL ANTENNAS

Matthew J. Radway*, Dejan S. Filipovic
University of Colorado, Boulder, CO

12:00 B6-11 PUSHING THE LIMITS-- SOLUTIONS FOR HIGH GAIN CIRCULARLY POLARIZED UHF SLOT ANTENNAS INTEGRATED ON SOLAR PANELS OF A CUBESAT

Maryam Jamali*, Reyhan Baktur
Dept. of Electrical and Computer Engineering, Utah State University, Logan, Utah

Session F4: Waves in Random and Complex Media I
Room 150

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

08:20 F4-1 3D ELECTROMAGNETIC SCATTERING FROM DISCRETE RANDOM MEDIA USING RECURSIVE T-MATRIX AND PLANE WAVE EXPANSION OF SPHERICAL HARMONICS

Xueyang Duan*, Mahta Moghaddam
Department of Electrical and Computer Engineering, University of Michigan, Ann Arbor

08:40 F4-2 PATH LOSS CALCULATION IN A VEGETATED ENVIRONMENT: 3D-RADIATIVE TRANSPORT THEORY

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

09:00 F4-3 DEVELOPMENT OF A PRECISE AND FAST MULTISTREAM SCATTERING-BASED DMRT MODEL WITH JACOBIAN

Miao Tian*, Albin J. Gasiewski
ECEE Dept., University of Colorado, Boulder, Boulder, Colorado

09:20 F4-4 PROPAGATION OF THZ-MODULATED TRAINS OF INFRARED PULSES

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

10:00 Break

10:20 F4-5 NUMERICAL ANALYSIS OF SCATTERING FROM A CLUSTER OF BRANCHES USING THE SECOND ORDER MULTIPLE SCATTERING APPROXIMATION

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

10:40 F4-6 RADIATION CHARACTERISTICS OF ANTENNAS EMBEDDED IN A MEDIUM WITH A TWO-TEMPERATURE ELECTRON POPULATION

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

11:00 F4-7 COMMUNICATION THROUGH HYPERSONIC OR RE-ENTRY PLASMAS

Christopher N. Davis[1], Sven G. Bilen[2], Dean Massey*[1]
[1]*ElectroDynamic Applications, Inc., Ann Arbor, MI*
[2]*The Pennsylvania State University, University Park,PA*

11:20 F4-8 TOTAL TRANSMISSION THROUGH A FREE-SPACE-CHIRAL INTERFACE

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

Session F5: Mesoscale Numerical Weather Prediction in Support of Wave Propagation Modeling
Room 151

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

08:20 F5-1 RADIO-FREQUENCY PROPAGATION IN THE TROPOSPHERE: STATE OF THE ART, AND DEPENDENCE ON METEOROLOGICAL DATA (PART 1)

Jonathan Z. Gehman*[1], Amalia E. Barrios[2]
[1]*Johns Hopkins University Applied Physics Laboratory, Laurel, ,MD*
[2]*SPAWAR Systems Center, San Diego, CA*

08:40 F5-2 RADIO-FREQUENCY PROPAGATION IN THE TROPOSPHERE: STATE OF THE ART, AND DEPENDENCE ON METEOROLOGICAL DATA (PART 2)

Jonathan Z. Gehman*[1], Amalia E. Barrios[2]
[1]*Johns Hopkins University Applied Physics Laboratory, Laurel, ,MD*
[2]*SPAWAR Systems Center, San Diego, CA*

09:00 F5-3 SIGNIFICANT DIURNAL CHANGES IN MULTI-WAVELENGTH RADIO FREQUENCY CLEAR AIR PROPAGATION OVER TERRAIN

Peter Bresnahan*, Robert Marshall, Katherine Horgan, Isha Renta
Q32, NSCWDD, Dahlgren, VA

09:20 F5-4 MULTI-WAVELENGTH RADAR PERFORMANCE DURING A STRONG DUCTING EVENT OFF WALLOPS ISLAND, VA PREDICTED BY THE COUPLED OCEAN / ATMOSPHERE MESOSCALE PREDICTION SYSTEM

Katherine Horgan*, Isha Renta, Robert Marshall
Naval Surface Warfare Center Dahlgren Division, Dahlgren, VA

09:40 F5-5 CLIMATOLOGIES OF POD WITH THE COUPLED SYSTEM WRF-APM

Francois Vandenberghe*[1], Eric Mandine[2], Michel Aidonidis[3]
[1]*National Center for Atmospheric Research, CO*
[2]*C-S Systemes d'information, Toulon, France*
[3]*Service Hydrographique et Oceanographique de la Marine, Brest, France*

10:00 Break

10:20 F5-6 VARIATIONS IN REFRACTIVE CONDITIONS AND ONE-WAY X-BAND RADAR PROPAGATION AT SEABREEZE 2009

Sally A. Garrett*
Defence Technology Agency, Auckland, New Zealand

10:40 F5-7 AIR-SEA COUPLED MODELING OF COASTAL REFRACTIVITY

Tracy Haack*, Xiadong Hong, Holt Teddy
NRL, Monterey CA

11:00 F5-8 CONFIGURATION OF NWP MODELLING FOR PREDICTING ANOMALOUS ATMOSPHERIC PROPAGATION CONDITIONSEVALUATION OF THE MODEL VERTICAL RESOLUTION

Changgui Wang*
JCMM, Met Office, United Kingdom, Reading, United Kingdom

11:20 F5-9 EVALUATION OF THE IMPACT OF VERTICAL RESOLUTION CHANGES ON MESOSCALE COAMPS* FORECASTS OVER THE ARABIAN GULF BASED ON OBSERVED AND MODELED SURFACE DUCTING EVENTS.

Roger A. Stocker*[1], Jonathan Z. Gehman[2], Jason E. Nachamkin[3], Tracy Haack[3]
[1]*Fleet Numerical Meteorology and Oceanography Center (FNMOC), Monterey CA*
[2]*Applied Physics Laboratory, The Johns Hopkins University, Laurel MD*
[3]*Monterey Division, Naval Research Laboratory, Monterey CA*

11:40 F5-10 EXAMINING THE SOURCES OF ERROR IN NUMERICAL WEATHER PREDICTIONS OF SURFACE DUCTS

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

12:00 F5-11 AN EVALUATION OF THE USE OF NUMERICAL WEATHER PREDICTION DATA WITH ELECTROMAGNETIC PROPAGATION TACTICAL DECISION AIDS

Paul A. Frederickson*
Department of Meteorology, Naval Postgraduate School, Monterey, CA

Session FJE1: Radio Frequency Interference Mitigation and Spectrum Usage
Room 155

Co-Chairs: David Kunkee, *The Aerospace Corporation*
Steven Ellingson, *Virginia Polytechnic Institute & State University*

08:20 FJE1-1 MINING THE GBT METADATA ARCHIVE: STATISTICS ON RADIO FREQUENCY USE, 2002 - 2010

Andrew W. Clegg*[1], Michael Blatnik[2], Carla Beaudet[3], Ronald J. Maddalena[3]
[1]*National Science Foundation, Arlington, Virginia*
[2]*Lynchburg College, Lynchburg, Virginia*
[3]*National Radio Astronomy Observatory, Green Bank, West Virginia*

08:40 FJE1-2 RFI OUTLOOK AND OBSERVATIONS OF SPECTRUM UTILIZATION AT LWA-1

Joe Craig*
Long Wavelength Array, University of New Mexico, Albuquerque, Nm

09:00 FJE1-3 STATISTICAL ANALYSES OF SMOS RADIO FREQUENCY INTERFERENCE

Mustafa Aksoy*, James Park, Joel T. Johnson
Dept. of Electrical and Computer Engineering and ElectroScience Lab, The Ohio State University, Columbus, OH

09:20 FJE1-4 DETECTION AND MITIGATION OF RADIO FREQUENCY INTERFERENCE FOR THE SMAP L-BAND RADIOMETER

Joel T. Johnson*[1], Priscilla N. Mohammed[2], Christopher S. Ruf[3], Jeffrey R. Piepmeier[2]
[1]*Electrical and Computer Engineering, The Ohio State University, Columbus, OH*
[2]*NASA Goddard Space Flight Center, Greenbelt, MD*
[3]*Atmospheric, Oceanic, and Space Sciences, University of Michigan, Ann Arbor, MI*

10:00 Break

10:20 FJE1-5 INTERFERENCE CANCELLING PHASED ARRAY FEED FOR THE GREEN BANK TELESCOPE

Jonathan Landon[1], Brian D. Jeffs[1], Karl F. Warnick*[1], Rick Fisher[2], Roger Norrod[3]
[1]*Brigham Young University, Provo, UT*
[2]*NRAO, Charlottesville, VA*
[3]*NRAO, Green Bank, WV*

10:40 FJE1-6 GENERALIZED SPECTRAL KURTOSIS

Dale E. Gary*, Gelu M. Nita
Physics Department, New Jersey Institute of Technology, Newark, NJ

11:00 FJE1-7 THE NATIONAL SCIENCE FOUNDATION'S ENABLING ACCESS TO THE RADIO SPECTRUM WORKSHOP: VISION AND RESEARCH DIRECTIONS

Jennifer T. Bernhard*[1], Jeffrey H. Reed[2], Jung-min Park[2], Andrew W. Clegg[3]
[1]*ECE Department, University of Illinois at Urbana-Champaign, Urbana, IL*
[2]*ECE Department, Virginia Tech, Blacksburg, VA*
[3]*MPS Division, National Science Foundation, Arlington, VA*

Session G3: Meteors I
Room 200

Co-Chairs: Julio Urbina, *The Pennsylvania State University*
Lars Dyrud, *Johns Hopkins Applied Physics Laboratory*

08:20 G3-1 IONOSPHERIC EFFECT CAUSED BY 1908 TUNGUSKA EVENT

Tatiana V. Losseva*, Marina Y. Kuzmicheva
Institute of Geospheres Dynamics of the Russian Academy of Sciences, Moscow,MO, Russian Federation

08:40 G3-2 SCATTERING AND POLARIZATION OF A LONG-DURATION METEOR TRAIL

Sigrid Close*[1], Michael Kelley[2], Laura Vertatschitsch[3], Meers Oppenheim[4], Alex Fletcher[1], Jonathan Yee[1]
[1]*Dept. of Aeronautics and Astronautics, Stanford University, CA*
[2]*Dept. of Electrical Engineering, Cornell University, NY*
[3]*Dept. of Electrical Engineering, University of Washington, WA*
[4]*Dept. of Astronomy, Boston University, MA*

09:00 G3-3 FIRST RESULTS FROM ARECIBO METEOR OBSERVATIONS USING CHIRPED PULSES WITH BOTH THE 430 MHZ AND 46.8 MHZ RADARS

Michael P. Sulzer*[1], Sigrid Close[2], Brandon Fetroe[2]
[1]*Arecibo observatory, Arecibo, PR*
[2]*Stanford University, Palo Alto, CA*

09:20 G3-4 STATISTICAL IMPLICATIONS OF UHF DIURNAL METEOR OBSERVATIONS

Stanley J. Briczinski*[1], John D. Mathews[2]
[1]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[2]*Penn State, University Park, PA*

09:40 G3-5 PREDICTING MICROMETEOR RADIANT DISTRIBUTIONS AND PROPERTIES OBSERVED BY HPLA RADAR USING A METEOR INPUT FUNCTION MODEL

Jonathan T. Fentzke*[1], Diego Janches[2]
[1]*CoRA Division/SAS Dept., NWRA | Arecibo Observatory, Boulder, CO*
[2]*Space Weather Laboratory, NASA/GSFC, Greenbelt, MD*

10:00 Break

10:20 G3-6 A NUMERICAL MODEL OF THE EFFECTS OF PLASMA ELONGATION ON HEAD ECHO POLARIZATION FEATURES OF MICROMETEOROIDS

Laura E. Vertatschitsch*, John D. Sahr
Electrical Engineering, University of Washington, Seattle, WA

10:40 G3-7 ON THE POSSIBLE EFFECT OF SIGNAL PROCESSING ON METEOR-HEAD DATA FROM JICAMARCA

Freddy Galindo*[1], Julio Urbina[1], Jorge Chau[2], Lars Dyrud[3]
[1]*Pennsylvania State University, University Park, Pennsylvania*
[2]*Radio Observatorio Jicamarca, Lima, Peru*
[3]*John Hopkins University,, Columbia, MD*

11:00 G3-8 THE METEOROID MASS DISTRIBUTION OBSERVED AT THE JICAMARCA RADIO OBSERVATORY AND THE CONNECTION TO SPORADIC METEOR SOURCES

Elizabeth N. Bass*[1], Meers M. Oppenheim[1], Jorge L. Chau[2]
[1]*Astronomy Department, Boston University, Boston, MA*
[2]*Radio Observatorio de Jicamarca, Lima, Peru*

11:20 G3-9 ON THE ROLE OF BRAGG SCATTERING IN RADAR METEOR HEAD-ECHOES

John D. Mathews*
Radar Space Sciences Lab, Penn State University, University Park, PA

11:40 G3-10 RADAR METEOR EVIDENCE THAT METEOROID FLARES GENERATE INTENSE PLASMA WAVES

John D. Mathews*[1], Frank T. Djuth[2]
[1]*Radar Space Sciences Lab, Penn State University, University Park, PA*
[2]*Geospace Research, Inc. , El Segundo, CA*

Session GH1: Ionospheric Modification
Room 105

Co-Chairs: Michael Sulzer, *Arecibo observatory*
Paul Bernhardt, *Naval Research Laboratory*

08:20 GH1-1 PLASMA WAVES EXCITED SPACE SHUTTLE OMS BURNS IN THE IONOSPHERE

Paul A. Bernhardt*[1], Carl L. Seifring[1], Rob F. Pfaff[2], Pete W. Schuck[2], Robert A. Haaser[3]
[1]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[2]*Goddard Space Flight Center, Greenbelt, MD*
[3]*WB Hanson Center for Space Sciences, Univeristy of Texas at Dallas, Dallas, TX*

08:40 GH1-2 VLF RADIO OBSERVATIONS OF IONOSPHERIC PERTURBATIONS PRODUCED BY SOFT GAMMA-RAY REPEATER 1550-5418

Brant E. Carlson*[1], Nikolai G. Lehtinen[2], Morris B. Cohen[2], Gerald J. Fishman[3], Chryssa Kouveliotou[3], Alexander van der Horst[3], Vandiver Chaplan[4], Umran S. Inan[5]
[1]*Physics, University of Bergen, Bergen, Norway*
[2]*Electrical Engineering, Stanford University, Stanford, CA*
[3]*NASA Marshall Space Flight Center, Huntsville, AL*
[4]*University of Alabama Huntsville, Huntsville, AL*
[5]*Electrical Engineering, Koc University, Istanbul, Turkey*

09:00 GH1-3 EFFECTS OF ARTIFICIAL D-REGION DISTURBANCES ON THE TRANSIONOSPHERIC PROPAGATION OF VLF WAVES

Nikolai G. Lehtinen*[1], Timothy F. Bell[1], Umran S. Inan[1,2]
[1]*Electrical Engineering, Stanford University, Stanford, CA*
[2]*Koc University, Istanbul, Turkey*

09:20 GH1-4 OPTIMAL GEOPHYSICAL CONDITIONS FOR ELF/VLF GENERATION IN MODULATED HEATING EXPERIMENTS

George Jin*[1], Maria Spasojevic[1], Morris B. Cohen[1], Nikolai G. Lehtinen[1], Umran S. Inan[1,2]
[1]*Electrical Engineering, Stanford University, Stanford, CA*
[2]*Koc University, Istanbul, Turkey*

09:40 GH1-5 ANALYSIS OF TIME-OF-ARRIVAL OBSERVATIONS PERFORMED DURING ELF/VLF WAVE GENERATION EXPERIMENTS AT HAARP

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

10:00 Break

10:20 GH1-6 DIGISONDE HF IMAGING OF ARTIFICIAL IONOSPHERIC LAYERS

Vadym V. Paznukhov, Bodo W. Reinisch*, Ryan Hamel
University of Massachusetts Lowell Center for Atmospheric Research, Lowell, MA

10:40 GH1-7 OVERVIEW OF PLASMA WAVES GENERATED DURING HIGH POWER RADIO WAVES EXPERIMENTS AT HAARP

Paul A. Bernhardt*
Plasma Physics Division, Naval Research Laboratory, Washington, DC

11:00 GH1-8 STATUS OF THE NEW ARECIBO HF FACILITY

Michael P. Sulzer*
Arecibo observatory, Arecibo, PR

11:20 GH1-9 THE HF IONOSPHERIC MODIFICATION PROCESS AT ARECIBO - NEW RESULTS IN PREPARATION FOR THE 2011 EXPERIMENTS

Frank T. Djuth*, L D. Zhang
Atmospheric Sciences, Geospace Research, Inc., El Segundo, CA

11:40 GH1-10 MODELING CONJUGATE EFFECTS FROM ARECIBO HEATER EXPERIMENTS

Joseph D. Huba*[1], Glenn Joyce[2], Paul Bernhardt[1]
[1]*Naval Research Laboratory, Washington, DC*
[2]*Icarus Research, Inc., Bethesda, MD*

Session HG1: Lightning and its Interaction with the Ionosphere I
Room 245

Co-Chairs: Morris Cohen, *Stanford University*
Steve Cummer, *Duke University*

08:20 HG1-1 WAVEFORMS OF NIGHTTIME ATMOSPHERICS AS A MEASURE OF THE LOWER IONOSPHERIC ELECTRON DENSITY PROFILES OVER UK AND FRANCE ON AUGUST 31, 2008

Victor P. Pasko*[1], Martin Fullekrug[2]
[1]*Penn State University, University Park, Pennsylvania*
[2]*University of Bath, Bath, BA2 7AY, United Kingdom*

08:40 HG1-2 TRANSIENT LUMINOUS EVENTS AND THE STORMS WHICH PRODUCE THEM

Walter A. Lyons*[1], Steven A. Cummer[2], Tim Samaras[3], Timothy J. Lang[4], Paul R. Krehbiel[5], William L. Beasley[6], Victor Pasko[7], Eugene W. McCaul[8]
[1]*FMA Research, Inc., Fort Collins, CO*
[2]*Electrical and Computer Engineering, Duke University, Durham, NC*
[3]*National Technical Services, Littleton, CO*
[4]*Atmospheric Sciences, Colorado State University, Fort Collins, CO*
[5]*New Mexico Tech, Socorro, NM*
[6]*Meteorology, University of Oklahoma, Norman, OK*
[7]*Pennsylvania State University, State College, PA*
[8]*USRA, Huntsville, AL*

09:00 HG1-3 ION CHEMISTRY AND LOCAL CONDUCTIVITY CHANGE INDUCED BY SPRITE STREAMERS IN THE LOWER IONOSPHERE

Ningyu Liu*[1], Davis D. Sentman[2]
[1]*Department of Physics and Space Sciences, Florida Institute of Technology, Melbourne, FL*
[2]*University of Alaska, Geophysical Institute, Fairbanks, AK*

09:20 HG1-4 LIGHTNING EFFECTS ON THE IONOSPHERE DURING LOW DENSITY CONDITIONS seen by C/NOFS

Robert H. Holzworth*[1], Michael P. McCarthy[1], Robert F. Pfaff[2], Abram R. Jacobson[1], Douglas E. Rowland[2]
[1]*Earth and Space Sciences, University of Washington, Seattle,WA*
[2]*Goddard Space Flight Center, NASA, Greenbelt, VA*

09:40 HG1-5 WORLD COVERAGE FOR SINGLE STATION LIGHTNING DETECTION

Cecile Mackay*, Antony C. Fraser-Smith
Stanford University, Stanford, CA

10:00 Break

10:20 HG1-6 OPTICAL REMOTE SENSING OF ELECTRIC FIELDS ABOVE THUNDERSTORMS

Brant E. Carlson*[1], Brennan M. Burns[2], Morris B. Cohen[2], David S. Lauben[2], Daniel S. Smith[2], Umran S. Inan[3]
[1]*Physics, University of Bergen, Bergen, Norway*
[2]*Electrical Engineering, Stanford University, Stanford, CA*
[3]*Electrical Engineering, Koc University, Istanbul, Turkey*

10:40 HG1-7 TOWARD A TIME-DOMAIN FRACTAL LIGHTNING SIMULATION

Can Liang*[1], Brant Carlson[2,1], Nikolai G. Lehtinen[1], Morris B. Cohen[1], David S. Lauben[1], Umran S. Inan[3,1]
[1]*electrical engineering, stanford university, stanford CA*
[2]*University of Bergen, Bergen, Norway*
[3]*Ko University, Istanbul, Turkey*

11:00 HG1-8 A NEW METHOD FOR VLF REMOTE SENSING OF LIGHTNING-INDUCED IONOSPHERIC DISTURBANCES

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

11:20 HG1-9 METHODOLOGY AND PERFORMANCE ESTIMATES OF THE GLD360 LIGHTNING DETECTION NETWORK

Ryan K. Said*[1], Martin J. Murphy[2], Nicholas W. S. Demetriades[2], Umran S. Inan[1], Kenneth L. Cummins[3]
[1]*Electrical Engineering, Stanford University, Stanford, CA*
[2]*Tucson Operations, Vaisala, Tucson, AZ*
[3]*Atmospheric Sciences, University of Arizona, Tucson, AZ*

Session J4: New Telescopes, Techniques and Observations II
Room 265

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

08:20 J4-1 COMPARISON OF OCTAVE BAND CORRUGATED HORNS WITH WIDE BAND FEEDS FOR USE AS SINGLE PIXEL FEEDS IN A WIDEBAND RADIO TELESCOPE

William A. Imbriale*
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

08:40 J4-2 NEW DEVELOPMENTS IN THE ULTRA WIDEBAND, LOW NOISE, ACTIVE SINUOUS ANTENNA

Rohit S. Gawande*[1], Richard F. Bradley[2]
[1]*Electrical and Computer Engineering, University of Virginia, Charlottesville, VA*
[2]*NRAO Technology Center, National radio Astronomy Observatory, Charlottesville, VA*

09:00 J4-3 WIDEBAND NEAR-CONSTANT BEAMWIDTH FLARED QUAD-RIDGE HORN FEED FOR REFLECTOR ANTENNAS IN RADIO ASTRONOMY

Ahmed H. Akgiray*, Sander Weinreb
Electrical Engineering, California Institute of Technology, Pasadena, CA

09:20 J4-4 DESIGN AND ANALYSIS OF LOW FREQUENCY STRUT-STRADDLING FEED ARRAYS FOR EVLA REFLECTOR ANTENNAS

Mahmud Harun*, Steven W. Ellingson
Bradley Dept. of Electrical & Computer Engineering, virginia polytechnic institute and state university, blacksburg, VA

09:40 J4-5 EVLA X-BAND RECEIVER PERFORMANCE

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

10:00 Break

10:20 J4-6 ADAPTING A CRYOGENIC SAPPHIRE OSCILLATOR FOR VERY LONG BASELINE INTERFEROMETRY

Tao Mai*[1], Sheperd Doeleman[1], Alan E. E. Rogers[1], John G. Hartnett[2], Michael E. Tobar[2], Nitin Nand[2]
[1]*Haystack Observatory, MIT Haystack Observatory, Westford, MA*
[2]*School of Physics, University of Western Australia, Crawley, WA, Australia*

10:40 J4-7 A TEMPERATURE BASED GAIN AND NOISE COMPENSATION TECHNIQUE FOR PRECISION RADIOMETRY

Chaitali R. Parashare*[1], Richard F. Bradley[2]
[1]*Department of Electrical and Computer Engineering, University of Virginia/ National Radio Astronomy Observatory, Charlottesville VA*
[2]*National Radio Astronomy Observatory, Charlottesville VA*

11:00 J4-8 THE POTENTIAL FOR THE ALLEN TELESCOPE ARRAY TO SUPPORT DEEP SPACE RADIO SCIENCE INVESTIGATIONS

Sami Asmar*[1], Sue Finley[1], Dayton Jones[1], Danny Kahan[1], Robert Navarro[1], Kamal Oudrhiri[1], Les White[1], Goeff Bower[2], Billy Barott[3]
[1]*Jet Propulsion Laboratory, Pasadena, CA*
[2]*UC Berkeley, Berkeley, CA*
[3]*Embry-Riddle Aeronautical University, Daytona Beach, FL*

Session B7: Antennas II
Room 1B40

Co-Chairs: Dejan Filipovic, *University of Colorado at Boulder*
Sembiam Rengarajan, *California State University*

13:20 B7-1 TECHNIQUES FOR ENHANCED DISTINCTION OF PLANAR RETRO-REFLECTIVE ARRAYS

Jacquelyn A. Vitaz*, Kamal Sarabandi
Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI

13:40 B7-2 A LINEARLY AND CIRCULARLY POLARIZED ACTIVE INTEGRATED ANTENNA

Ali Khoshniat*, Reyhan Baktur
Department of Electrical and Computer Engineering, Utah State University, Logan, UT

14:00 B7-3 AN EXTREMELY LOW-PROFILE, COMPACT AND BROADBAND TIGHTLY COUPLED PATCH ARRAY

Erdinc Irci*, Kubilay Sertel, John L. Volakis
Department of Electrical & Computer Engineering, The Ohio State University ElectroScience Laboratory, Columbus, OH

14:20 B7-4 DIAGNOSIS OF UNDESIRABLE GRATING LOBES IN LARGE ARRAY ANTENNAS COMPRISED OF SUB-ARRAY ELEMENTS

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

14:40 B7-5 RECTANGULAR PATCH ELEMENTS FOR DUAL POLARIZED DUAL BEAM MICROSTRIP REFLECTARRAYS

Sembiam R. Rengarajan*
Electrical and Computer Engineering, California State University, Northridge, CA

15:00 Break

15:20 B7-6 DUAL-BAND CIRCULARLY-POLARIZED ANTENNAS USING UNEQUAL ARM U-SLOTS

Payam Nayeri*, Kai-Fong Lee, Atef Z. Elsherbeni, Fan Yang
The University of Mississippi, University, MS

15:40 B7-7 PARTICLE SWARM OPTIMIZATION IN DESIGNING RECONFIGURABLE PIXELLED PATCH ANTENNAS

Joshua M. Kovitz*, Yahya Rahmat-Samii
Electrical Engineering, University of California Los Angeles, Los Angeles, California

16:00 B7-8 INVESTIGATIONS OF THE FREQUENCY AGILITY OF AN ELECTRICALLY SMALL ANTENNA

Steven M. Dawson*, Siwen Yong, Jennifer T. Bernhard
ECE Department, University of Illinois at Urbana-Champaign, Urbana, IL

16:20 B7-9 A GEOMETRICALLY-APPROPRIATE CAVITY MODEL FOR A SPHERICAL INVERTED-F ANTENNA

David L. Rolando*, Gregory H. Huff
Electrical and Computer Engineering, Texas A&M University, College Station, TX

16:40 B7-10 INVESTIGATION OF DIRECTIVE ANTENNA RADIATION IN A METAL CUT-WIRE ARRAY

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

17:00 B7-11 MODIFIED EQUIVALENT CIRCUIT FOR FAT-TYPE FOLDED STRIP DIPOLE STRUCTURES

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

Session C1: Signals and Systems
Room 105

Co-Chairs: William Palmer, *US Army Research Office*
Gregory Huff, *Texas A&M University*

13:20 C1-1 IMPROVED SPECTRUM ESTIMATION AND CLUTTER MITIGATION FOR PASSIVE COHERENT RADAR

Zac Berkowitz*, John D. Sahr
Electrical Engineering, University of Washington, Seattle, Washington

13:40 C1-2 IMAGING AND TRACKING OF TARGETS IN CLUTTER USING DIFFERENTIAL TIME-REVERSAL

Ahmed E. Fouda*, Fernando L. Teixeira
ElectroScience Laboratory, the Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH

14:00 C1-3 COMPRESSIVE SENSING UWB POSITIONING SYSTEM

Depeng Yang*, Aly Fathy, Gregory Peterson, Husheng Li
EECS, University of Tennessee, Knoxville, TN

14:20 C1-4 INVESTIGATION OF CHALLENGES TOWARDS ACHIEVING SUB-MM ACCURACY FOR AN ULTRA WIDE BAND LOCALIZATION SYSTEM

Essam A. Elkhouly*[1], Michael Kuhn[2], Jonathan Turnmir[1], Aly Fathy[1], M. Mahfouz[2]
[1]*EECS, University of Tennessee, Knoxville, TN*
[2]*MABE, University of Tennessee, Knoxville, TN*

14:40 C1-5 COUPLING EFFECTS IN ELECTRICALLY SMALL DIRECTION FINDING

Matthew J. Slater*, Jennifer T. Bernhard
Electrical and Computer Engineering, University of Illinois, Urbana, IL

15:00 Break

15:20 C1-6 DEVELOPMENT OF AN RFID SYSTEM FOR INDOOR TARGET LOCALIZATION

Yilin Mao*[1], Jianxia Xue[2], Fan Yang[1], Atef Z. Elsherbeni[1]
[1]*Department of Electrical Engineering, The University of Mississippi, Oxford, MS*
[2]*Department of Computer and Information Science, The University of Mississippi, Oxford, MS*

15:40 C1-7 ESTIMATING THE NUMBER OF POLES IN CHIPLESS RFID TAG SIGNAL

Chowdhury M. R. Shahriar*, Majid Manteghi
Bradley Department of Electrical & Computer Engineering, Virginia Tech, Blacksburg, VA

16:00 C1-8 A STREAMING, 3 GHZ BANDWIDTH SPECTROMETER UTILIZING AN AUTODESIGNED AND AUTOPLACED FFT CORE

Suraj Gowda*[1], Aaron Parsons[2], Robert Jarnot[3], Dan Werthimer[4]
[1]*EECS, University of California, Berkeley, Berkeley, CA*
[2]*Astronomy, University of California, Berkeley, Berkeley, CA*
[3]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*
[4]*Space Sciences Laboratory, University of California, Berkeley, Berkeley, CA*

16:20 C1-9 A HYBRID DSP AND FPGA SYSTEM FOR SOFTWARE DEFINED RADIO APPLICATIONS

Vladimir S. Podosinov*, Majid Manteghi
Virginia Tech Antenna Group, Department of Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA

16:40 C1-10 NOISE MODELING AND DESIGN FOR BJT OSCILLATORS

William A. Davis*[1], Scott Brock[2]
[1]*ECE, Virginia Tech, Blacksburg, VA*
[2]*Thales Communications, Inc, Clarksburg, MD*

Session E1: High-Power Electromagnetics: Sources and Effects
Room 155

Chair: Dave Giri, *Pro-Tech*

15:20 E1-1 COMBINED NUMERICAL AND ANALYTICAL TECHNIQUES FOR DETECTING COMPLEX STRUCTURES IN THE PRESENCE OF A CONDUCTING SURFACE

Scott von Laven[1], Ira Kohlberg*[2], Robert McMillan[3]
[1]*Amtec Corporation, Huntsville, AL*
[2]*Kohlberg Associates, Reston, Va*
[3]*U.S. Army Space and Missile Defense Command, Huntsville, AL*

15:40 E1-2 A COMPARISON OF THE EFFECT OF TRANSIENT EM FIELDS FROM A NARROWBAND AND A HYPERBAND SOURCE ON A BURIED COMMUNICATION CABLE

K. Sunitha*[1], M. Joy Thomas[1], D. V. Giri[2]
[1]*Department of Electrical Engineering, Indian Institute of Science, Bangaluru, India*
[2]*Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM.*

16:00 E1-3 A COMPREHENSIVE ASSESSMENT APPROACH FOR PROTECTING COMMERCIAL FACILITIES FROM INTENTIONAL ELECTROMAGNETIC INTERFERENCE (IEMI)

William A. Radasky*, Edward B. Savage
Metatech Corporation, Goleta, California

16:20 E1-4 FUNDAMENTALS OF HPRF EFFECTS MEASUREMENT AND STATISTICAL PREDICTION OF FUNCTIONAL IMPAIRMENT

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

Session F6: Waves in Random and Complex Media II
Room 155

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

13:20 F6-1 ROUGH SURFACE MCF (MUTUAL COHERENCE FUNCTION) FOR NEAR SURFACE OBJECT IMAGING

Akira Ishimaru*[1], Sermsak Jaruwatanadilok[2], Yasuo Kuga[1]
[1]*Electrical Engineering, University of Washington, Seattle, Seattle, WA*
[2]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*

13:40 F6-2 PROPAGATION OF A NORTON SURFACE WAVE OVER A GENTLY UNDULATING ROUGH SURFACE: INCLUDING THE TRANSITION REGION

Gary S. Brown*
ECE, Virginia Tech, Blacksburg, VA

14:00 F6-3 MONTE-CARLO MODELING OF RADAR SCATTERING FROM THE OCEAN SURFACE: COMPARISON WITH EXPERIMENT

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

14:20 F6-4 INVESTIGATION OF EM BACKSCATTERING FROM THE SEA SURFACE UNDER THE SMALL SLOPE APPROXIMATION

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

Session F7: Propagation Modeling and Measurements
Room 151

Co-Chairs: Gary Brown, *Virginia Tech*
Michael Newkirk, *JHU/APL*

13:20 F7-1 ATMOSPHERIC CHANNEL TRANSFER FUNCTION MODELING AND EXTRACTION FOR FREE-SPACE OPTICAL COMMUNICATIONS

Colin N. Reinhardt*[1], Yasuo Kuga[1], James Ritcey[1], Akira Ishimaru[1], Dimitris Tsintikidis[2], Stephen Hammel[2]
[1]*Electrical Engineering, University of Washington, Seattle, WA*
[2]*Atmospheric Propagation, SPAWAR SSC Pacific, US Navy, San Diego, CA*

13:40 F7-2 GENERATING AN ACCURATE VERTICAL AEROSOL PROFILE: AN UPDATE

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

14:00 F7-3 EMPIRICAL STUDIES OF FADING CHANNEL CHARACTERISTICS AT VHF AND UHF FREQUENCIES

Christopher Redding*, Christopher Behm, Tim Riley, Robert Stafford
Institute for Telecommunication Sciences, Boulder, CO

14:20 F7-4 CHARACTERIZING ATMOSPHERIC CONDITIONS FROM SPS-48 RADAR DATA

Nathan Fuhrer*
SSC Pacific, San Diego, CA

15:00 Break

15:20 F7-5 SIMPLIFICATION OF THE COMBINED FIELD INTEGRAL EQUATIONS FOR PROPAGATION PREDICTION

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

15:40 F7-6 MULTIPLE GRAZING ANGLE CLUTTER ESTIMATION IN NON-STANDARD ATMOSPHERE

Ali Karimian*, Caglar Yardim, Peter Gerstoft, William S. Hodgkiss
University of California, San Diego, San Diego, CA

Session G4: Meteors II
Room 200

Co-Chairs: Lars Dyrud, *Johns Hopkins Applied Physics Laboratory*
Julio Urbina, *The Pennsylvania State University*

13:20 G4-1 PLASMA TURBULENCE EFFECTS ON SPECULAR TRAIL OBSERVATIONS

Lars P. Dyrud*[1], Julio Urbina[2], Freddy Galindo[2]
[1]*Johns Hopkins Applied Physics Laboratory, Laurel, MD*
[2]*Communications and Space, Sciences Laboratory, Pennsylvania State University, University Park, PA*

13:40 G4-2 UPGRADES TO THE SAAMER SYSTEM AND THE RESULTING CAPABILITIES OF THE METEOR RADAR

Steven Pifko*[1], Diego Janches[2,3], Jose Luis Hormaechea[4], Adrian Murphy[5], Sigrid Close[1]
[1]*Aeronautics and Astronautics, Stanford University, Stanford, CA*
[2]*NASA Goddard Space Flight Center, Greenbelt, MD*
[3]*NWRA Colorado Research Associates, Boulder, CO*
[4]*Estacion Astronomica Rio Grande, Rio Grande, TDF, Argentina*
[5]*Genesis Software, North Adelaide, SA, Australia*

14:00 G4-3 OBSERVATIONS, VALIDATION AND CALIBRATION OF THE PENN STATE METEOR RADAR

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

14:20 G4-4 UNIVERSITY OF COLORADO SOFTWARE DEFINED METEOR RADAR: SYSTEM DEVELOPMENT UPDATE AND RECENT RESULTS

Cody V. Vaudrin*, Scott E. Palo
Aerospace Engineering Sciences, University of Colorado, Boulder, CO

Session GJ1: Low Frequency Arrays and the Ionosphere
Room 200

Co-Chairs: Anthea Coster, *MIT Haystack Observatory*
Richard Bradley, *National Radio Astronomy Observatory*

15:20 GJ1-1 RECENT PROGRESS IN IONOSPHERIC MODELING FOR CALIBRATING RADIO INTERFEROMETERS.

Huib T. Intema*
National Radio Astronomy Observatory, Charlottesville, VA

15:40 GJ1-2 TEMPERATURE EFFECTS ON GPS BIAS DETERMINATION

Jennifer Williams*[1], Anthea J. Coster[2], David Herne[3], Allan Weatherwax[1], Divya Oberoi[2], Keith Groves[4], Charles Carrano[5]
[1]*Dept of Physics and Astronomy, Siena College, Loudonville, NY*
[2]*MIT Haystack Observatory, Westford, MA*
[3]*Curtin University of Technology, Perth, Western Australia, Australia*
[4]*AFRL, Hansom AFB, MA*
[5]*Boston College, Chesnut Hil, MA*

16:00 GJ1-3 VHF OBSERVATIONS OF SMALL-SCALE IONOSPHERE TEC FLUCTUATIONS WITH AN ASTRONOMICAL INTERFEROMETER

Joe Helmboldt*[1], Joseph Lazio[2,1], Huib Intema[3], Ken Dymond[1]
[1]*US Naval Research Laboratory, Washington, DC*
[2]*Jet Propulsion Laboratory, Pasadena, CA*
[3]*National Radio Astronomy Oservaroty, Charlottesville, VA*

16:20 GJ1-4 PROBING THE IONOSPHERE WITH PAPER

Nicole Gugliucci*[1,2], Richard Bradley[2]
[1]*Department of Astronomy, University of Virginia, Charlottesville, VA*
[2]*National Radio Astronomy Observatory, Charlottesville, VA*

16:40 GJ1-5 SPECTROSCOPIC IMAGING OF THE DYNAMIC QUIET SUN USING THE MURCHISON WIDEFIELD ARRAY PROTOTYPE SYSTEM

Lynn D. Matthews*[1], Divya Oberoi[1], M W A Team[2]
[1]*MIT Haystack Observatory, Westford, MA*
[2]*Murchison Widefield Array, International, Collaboration*

Session H4: Waves in Laboratory Plasmas
Room 150

Co-Chairs: Bill Amatucci, *Naval Research Laboratory*
David Blackwell, *US Naval Research Laboratory*

13:20 H4-1 CONTROL OF GRADIENT-DRIVEN INSTABILITIES THROUGH NONLINEAR INTERACTION WITH SHEAR ALFVEN WAVES

Troy Carter*
Physics and Astronomy, UCLA, Los Angeles, CA

13:40 H4-2 ION-ION HYBRID ALFVEN WAVE RESONATOR

Stephen T. Vincena*, George J. Morales, James E. Maggs, William A. Farmer
University of California at Los Angeles, Los Angeles, CA

14:00 H4-3 ALFVN WAVE HEATING OF ARGON IONS IN THE HOT HELICON EXPERIMENT (HELIX)

Stephanie H. Sears*, Matthew E. Galante, Dustin W. McCarren, Saeid Houshmandyar, Robert W. VanDervort, Earl E. Scime
Physics, West Virginia University, Morgantown, West Virginia

14:20 H4-4 THE PLASMA SHEATH AND ANTENNA COUPLING IN SPACE PLASMAS

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

14:40 H4-5 MULTIPLE POINT MEASUREMENT OF DC ELECTRIC FIELDS IN THE TOPSIDE AURORAL IONOSPHERE

Erik T. Lundberg*[1], Paul Kintner[1], Kristina Lynch[2], Meghan Mella[2]
[1]*Electrical and Computer Engineering, Cornell University, Ithaca, NY*
[2]*Physics and Astronomy, Dartmouth College, Hanover, NH*

15:00 Break

15:20 H4-6 LABORATORY INVESTIGATION OF ELECTROMAGNETIC VELOCITY SHEAR-DRIVEN INSTABILITIES

Erik M. Tejero*[1], William E. Amatucci[2], Christopher E. Crabtree[2], Gurudas Ganguli[2], Christopher D. Cothran[3], Edward Thomas, Jr.[1]
[1]*Physics Department, Auburn University, Auburn, AL*
[2]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[3]*Global Defense Technology and Systems, Inc., Crofton, MD*

15:40 H4-7 FLOW MODIFICATION AND MEASUREMENT IN A LINEAR MAGNETIZED PLASMA DEVICE

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

16:00 H4-8 WEAKLY MAGNETIZED PLASMA DEVICE WITH 370K ELECTRON TEMPERATURE

Devin A. Konecny*, Shannon B. Dickson, Scott H. Robertson
Physics, University of Colorado, Boulder, CO

16:20 H4-9 A LARGE-VOLUME PLASMA DEVICE WITH 200K ELECTRON TEMPERATURE

Shannon Dickson*, Devin Konecny, Scott Robertson
Dept. of Physics, University of Colorado, Boulder, CO

16:40 H4-10 COMPACT ROCKET-BORNE LANGMUIR PROBES FOR IONOSPHERIC DUSTY PLASMA MEASUREMENTS

Robert D. Niederriter*, Scott H. Robertson
Dept. of Physics, University of Colorado, Boulder, Colorado

Session HG2: Lightning and its Interaction with the Ionosphere II
Room 245

Co-Chairs: Steve Cummer, *Duke University*
Morris Cohen, *Stanford University*

13:20 HG2-1 GBM OBSERVATIONS OF TERRESTRIAL GAMMA-RAY FLASHES

Valerie Connaughton*, Michael S. Briggs
CSPAR, University of Alabama in Huntsville, Huntsville, AL

13:40 HG2-2 GAMMA RAYS AND ELECTRON BEAMS FROM LIGHTNING DISCHARGES

Morris B. Cohen*[1], Brant E. Carlson[2,1], Ryan K. Said[1], Umran S. Inan[1,3], Nikolai G. Lehtinen[1], Michael S. Briggs[4], Valerie Connaughton[4], Gerald Fishman[5], Steve Cummer[6]
[1]*Stanford University, Stanford, CA*
[2]*University of Bergen, Bergen, Norway*
[3]*Koc University, Istanbul, Turkey*
[4]*University of Alabama Huntsville, Huntsville, AL*
[5]*NASA Marshall Space Flight Center, Huntsville, AL*
[6]*Duke University, Durham, NC*

14:00 HG2-3 OBSERVATION OF A TGF WITH ADELE AND LIMITS ON ASSOCIATIONS WITH LIGHTNING

Nicole Kelley*[1], David M. Smith[1], Alexander Lowell[1], Joseph Dwyer[2], Steven Cummer[3], Gaopeng Lu[3], Richard Blakeslee[4], Xuan-Min Shao[5], Cheng Ho[5]
[1]*Physics Department, University of California, Santa Cruz, Santa Cruz, CA*
[2]*Department of Physics and Space Sciences, Florida Institute of Technology, Melbourne, FL*
[3]*Department of Electrical and Computer Engineering, Duke University, Durham, NC*
[4]*NASA's Marshall Space Flight Center, Huntsville, AL*
[5]*Los Alamos National Laboratory, Los Alamos, NM*

14:20 HG2-4 BEYOND TGFS: STEPPED LEADERS AND CONTINUOUS RELATIVISTIC BREAKDOWN IN THUNDERCLOUDS OBSERVED WITH ADELE

David M. Smith*[1], Nicole Kelley[1], Alexander Lowell[1], Forest Martinez-McKinney[1], Joseph R. Dwyer[2], Michael Splitt[3], Steven Lazarus[3], Eric Cramer[2], Steven Levine[3], Steven Cummer[4], Gaopeng Lu[4], Xuan-Min Shao[5], Cheng Ho[5], Hamid Rassoul[2]
[1]*Physics Department and Santa Cruz Institute for Particle Physics, University of California, Santa Cruz, Santa Cruz, CA*
[2]*Department of Physics and Space Sciences, Florida Institute of Technology, Melbourne, FL*
[3]*Department of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL*
[4]*Department of Electrical and Computer Engineering, Duke University, Durham, NC*
[5]*Los Alamos National Laboratory, Los Alamos, NM*

14:40 HG2-5 PROGRESS IN UNDERSTANDING THE X-RAY EMISSIONS FROM LIGHTNING

Joseph R. Dwyer*
Department of Physics and Space Sciences, Florida Intitute of technology, Melbourne, FL

15:00 Break

15:20 HG2-6 RADIO FREQUENCY PULSES PRODUCED BY COSMIC-RAY EXTENSIVE AIR SHOWERS TRAVERSING THUNDERCLOUDS

Shahab Arabshahi*, Joseph R. Dwyer, Hamid K. Rassoul
FLORIDA INSTITUTE OF TECHNOLOGY, MELBOURNE, FL

15:40 HG2-7 MODELING RUNAWAY ELECTRON AVALANCHES AND ITS APPLICATIONS TO TERRESTRIAL GAMMA-RAY FLASHES

Eric S. Cramer*, Joseph R. Dwyer, Hamid K. Rassoul
Physics and Space Sciences, Florida Institute of Technology, Melbourne, FL

Session J5: Millimeter-Wave Technology: Science and Status
Room 265

Co-Chairs: David woody, *Caltech*
James Cordes, *Cornell University*

13:20 J5-1 SUPERCONDUCTING MICRORESONATOR DETECTORS FOR MM/SUBMM ASTRONOMY

Jonas Zmuidzinas*
Caltech, Pasadena, CA

13:40 J5-2 THE MUSIC INSTRUMENT FOR SUB/MILLIMETER ASTROPHYSICS

Thomas P. Downes*[1], Nicole G. Czakon[1], Peter K. Day[2], Jiansong Gao[3], Jason Glenn[4], Sunil R. Golwala[1], Matt I. Hollister[1], Henry G. LeDuc[2], Philip R. Maloney[4], Benjamin A. Mazin[5], Omid Noroozian[1], Hien T. Nguyen[2], Jack Sayers[2], James A. Schlaerth[4], Seth Siegel[1], Anastasios Vayonakis[1], Philip R. Wilson[2], Jonas Zmuidzinas[1]
[1]*California Institute of Technology, Pasadena, CA*
[2]*Jet Propulsion Laboratory, Pasadena, CA*
[3]*National Institute of Standards and Technology, Boulder, CO*
[4]*University of Colorado, Boulder, CO*
[5]*University of California, Santa Barbara, CA*

14:00 J5-3 FIRST LIGHT INSTRUMENTATION FOR CERRO CHAJNANTOR ATACAMA TELESCOPE

Gordon J. Stacey*[1], Thomas Nikola[1], Jason Glenn[2], Phil Maloney[2], Jonas Zmuidzinas[3], Steve Padin[3], Sunil Golwala[3], Matt Bradford[4]
[1]*Astronomy, Cornell University, Ithaca, NY*
[2]*CASA, University of Colorado, Boulder, CA*
[3]*Physics, Caltech, Pasadena, CA*
[4]*JPL, Pasadena, CA*

14:20 J5-4 PROBING THE CMB POLARIZATION WITH FEEDHORN-COUPLED SUPERCONDUCTING POLARIMETER ARRAYS

Michael D. Niemack*
Quantum Sensors, NIST, Boulder, CO

14:40 J5-5 90 GHZ INSTRUMENTATION FOR, AND SCIENCE WITH, THE GREEN BANK TELESCOPE

Brian S. Mason*[1], David T. Frayer[2], Todd R. Hunter[1], Roger R. Norrod[2], Frederick R. Schwab[1], Michael J. Stennes[2], Simon R. Dicker[3], Phillip M. Korngut[3], Mark J. Devlin[3]
[1]*National Radio Astronomy Observatory, Charlottesville, VA*
[2]*National Radio Astronomy Observatory, Green Bank, WV*
[3]*Physics, University of Pennsylvania, Philadelphia, PA*

15:00 Break

15:20 J5-6 CRYOGENIC MMIC LOW NOISE AMPLIFIERS: PROGRESS AND RECENT RESULTS

Lorene A. Samoska*[1], Pekka Kangaslahti[1], Todd C. Gaier[1], Kieran Cleary[2], Rodrigo Reeves[2], Patricia Voll[3], Judy M. Lau[3], Matthew Sieth[3], Sarah E. Church[3]
[1]*Jet Propulsion Laboratory, Pasadena, CA*
[2]*California Institute of Technology, Pasadena, CA*
[3]*Stanford University, Stanford, CA*

15:40 J5-7 DEVELOPMENT OF A SCALABLE 4-ELEMENT W-BAND ARRAY BASED ON MMIC HEMT AMPLIFIERS

Sarah E. Church*[1], Kieran Cleary[2], Todd C. Gaier[3], Andrew Harris[4], Pekka Kangaslahti[3], Judy Lau[1], Anthony C. Readhead[2], Rodrigo Reeves[2], Lorene Samoska[3], Matthew Sieth[1], Sami Tantawi[5], Dan Van Winkle[5], Patricia Voll[1]
[1]*Physics, Stanford University, Stanford, CA*
[2]*Physics, Mathematics and Astronomy, California Institute of Technology, Pasadena, CA*
[3]*Jet Propulsion Laboratory, Pasadena, CA*
[4]*Astronomy, University of Maryland, College Park, MD*
[5]*Slac National Accelerator Laboratory, Menlo Park, CA*

16:00 J5-8 DUAL CIRCULAR POLARIZATION 1MM RECEIVERS FOR CARMA

Richard L. Plambeck*, Gregory A. Engargiola, Charles L. H. Hull
Radio Astronomy Lab, University of California, Berkeley, CA

Business Meetings

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

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