USNC–URSI National Radio Science Meeting

6-9 January 2016
Boulder, Colorado, USA

Sponsored by the US National Committee for the
International Union of Radio Science
and CU Conference Services,

University of Colorado Boulder

www.nrsmboulder.org
International Union of Radio Science / Union Radio Scientifique Internationale

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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 URSI and the U.S. National Committee (USNC) of URSI are organized into ten commissions:

- Electromagnetic Metrology (Commission A)
- Fields and Waves (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 and 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 of URSI (USNC-URSI) is appointed by the National Academies of Sciences, Engineering and Medicine, 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 (NRSM) each January in Boulder, Colorado. The IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (RSM), co-sponsored by USNC-URSI and the Antennas and Propagation Society of the Institute of Electrical and Electronics Engineers (IEEE/AP-S), is held each summer. Every five to eight years, a North American Radio Science Meeting (NARSM) is organized, co-sponsored by the U.S. and Canadian National Committees to URSI. The last NARSM was held in Vancouver, British Columbia, Canada on July 19-25, 2015.

The international URSI General Assembly and Scientific Symposium is held every three years in locations around the world. The 31st URSI General Assembly and Scientific Symposium was held in Beijing, China, on August 17-23, 2014. Over 1300 papers were presented by authors from over 50 countries in technical sessions covering the areas of all ten URSI Commissions. The 32nd URSI General Assembly and Scientific Symposium will be held in Montreal, Quebec, Canada, on August 19-26, 2017. The symposium website is www.gass2017.org.

For further information on USNC-URSI please visit www.usnc-ursi.org.


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

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Authors have the option to have summaries archived in IEEE Xplore (subject to standard IEEE processing) through the technical co-sponsorship of the meeting by the IEEE Antennas and Propagation Society (IEEE/AP-S).
TUESDAY, 5 January 2016  page
USNC-URSI Business Meeting  4
19:00–23:00, Millennium Hotel

WEDNESDAY, 6 January 2016  page
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Session B1 08:20, Room 1B40
Session B2 08:20, Room 200
Session B3 08:20, Room 105
Session B4 08:20, Room 155
Session B5 10:20, Room 200
Session C1 08:20, Room 1B51
Session F1 08:20, Room 150
Session H1 08:20, Room 245
Session J1 08:20, Room 265

AFTERNOON SESSIONS  10
Session B6 13:20, Room 1B40
Session B7 13:20, Room 200
Session B8 13:20, Room 105
Session B9 13:20, Room 155
Session B10 13:20, Room 1B51
Session B11 15:20, Room 1B40
Session B12 15:20, Room 200
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BUSINESS MEETINGS  16
Commission E 17:00, Room 155
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Commission A 18:00, Room 245
Commission C 18:00, Room 151

RECEPTION  16
18:30-21:00, Engineering Center Lobby
(Beer and wine provided. Must have government issued ID and conference badge.)

THURSDAY, 7 January 2016  page
MORNING PLENARY SESSION  17
Student Paper Competition  17
08:20, Mathematics Auditorium (Math 100)
Meeting Highlight  17
10:00, Mathematics Auditorium (Math 100)

AFTERNOON SESSIONS  17
Session B12 13:20, Room 1B40
Session B13 13:20, Room 200
Session B14 13:20, Room 105
Session C2 13:20, Room 1B51
Session F3 13:20, Room 150
Session H3 13:20, Math 100
Session H4 15:20, Math 100
Session HE1 13:20, Room 151
Session HG1 13:20, Room 245
Session J3 13:20, Room 265
Session J4 15:20, Room 265
Session K1 13:20, Room 155

BUSINESS MEETINGS  23
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Commission G 17:00, Room 200
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Commission J 18:00, Room 265
Commission K 18:00, Room 155

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Session B16 08:20, Room 200
Session C3 08:20, Room 1B51
Session F4 08:20, Room 150
Session F5 10:20, Room 1B51
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Session J5 08:20, Room 265
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AFTERNOON SESSIONS  29
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Session F6 13:20, Room 245
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Session G1 13:20, Room 105
Session J7 13:20, Room 265

SATURDAY, 9 January 2016  32
USNC-URSI Executive Council Meeting  32
08:00–11:00, Millennium Hotel

UNITED STATES NATIONAL COMMITTEE
INTERNATIONAL UNION OF RADIO SCIENCE
TECHNICAL PROGRAM
National Radio Science Meeting
6-9 January 2016
University of Colorado Boulder
Sponsored by USNC-URSI

ROOM AND TIME SCHEDULE FOR SESSIONS
National Radio Science Meeting
6-9 January 2016
University of Colorado Boulder
Sponsored by USNC-URSI

TUESDAY EVENING, 5 January 2016
19:00 – 23:00 USNC-URSI Business Meeting, Millennium Hotel

WEDNESDAY MORNING, 6 January 2016
Session A1: Novel Measurements of EM Materials and Systems
Room 151

Co-Chairs: Joshua Gordon, National Institute of Standards and Technology;
Jeanne Quimby, National Institute of Standards and Technology

08:20 A1-1
DYNAMIC EVALUATION OF SIX-AXIS ROBOTIC SPHERICAL AND EXTRAPOLATION MEASUREMENTS GUIDED BY A LASER TRACKER
Alexandra E. Curtin*, David R. Novotny, Joshua A. Gordon, Ronald Wittmann, Michael Francis, Jeffrey R. Guerrieri
National Institute of Standards and Technology, Boulder, CO

08:40 A1-2
ELECTROMAGNETIC SCATTERING FROM CARBON NANOTUBES IN THE TUMBLEWEED CONFIGURATION
Ahmed M. Hassan*1, Fernando Vargas-Lara2, Jack F. Douglas2, Edward J. Garbocti3
1Computer Science Electrical Engineering, University of Missouri-Kansas City, Kansas City, MO
2Materials Science and Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD
3Applied Chemicals and Materials Division, National Institute of Standards and Technology, Boulder, CO

09:00 A1-3
PORTABLE AND CONFORMAL RF SENSOR FOR HIGH-ACCURACY REAL-TIME IMAGING
Md Asiful Islam*, Asimina Kiourti, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

09:20 A1-4
DETERMINING ACCURATE ESR VALUES OF CERAMIC DECOUPLING CAPACITORS
Sai Ram Anand Vempati*1, Sunil S. Kollipara2, Aleksandr Guftarov2*, Melinda J. Pikit-May1, Eric Bogatin1
1Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO
2Mentor Graphics Corporation, Longmont, CO

10:00 Break

10:20 A1-6
NOVEL 5X-LINE TECHNIQUE TO EXTRACT COPPER CONDUCTIVITY
Chun-Ting Wang Lee*1, Bill Hargin2, Heidi Barnes3, Eric Bogatin1
1Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO
2University of Colorado Boulder, Boulder, CO
3Keysight Technologies, Santa Rosa, CA

11:00 A1-8
VARIABILITY OF SOUNDER MEASUREMENTS IN MANUFACTURING FACILITIES
Jeanne T. Quimby*, Alexandra E. Curtin1, David R. Novotny1, Kate A. Remley1, Rick Candell2
1CTL, National Institute of Standards and Technology, Boulder, CO
2National Institute of Standards and Technology, Gaithersburg, MD

11:20 A1-9
A COMPARISON OF BROADBAND REALIZED GAIN MEASUREMENTS BETWEEN A NEAR-FIELD RANGE AND A NEWLY RENOVATED SHORT TAPERED CHAMBER
Theodore K. Anthony*
Antennas and RF Integration Technologies Branch, U.S. Army Research Lab, Adelphi, MD

Session B1: Numerical Methods
Room 1B40

Co-Chairs: Branislav Notaros, Colorado State University;
Melinda Pikit-May, University of Colorado

08:20 B1-1
SEPARATION OF ELECTRIC AND MAGNETIC SURFACE CURRENTS IN EQUIVALENT EM PROBLEMS
Ravi C. Bollimuntha*1, Mohammed F. Hadi123, Melinda J. Pikit-May1, Atef Z. Elsherbeni3
1Electrical, Computer and Energy Engineering, University of Colorado at Boulder, Boulder, CO
2Electrical Engineering, Kuwait University, Kuwait City, KUWAIT
3Electrical Engineering and Computer Science, Colorado School of Mines, Golden, CO

08:40 B1-2
EXCITATION OF PLANE WAVES IN HIGHER ORDER FDTD GRIDS
Ravi C. Bollimuntha*1, Mohammed F. Hadi123, Melinda J. Pikit-May1, Atef Z. Elsherbeni3
1Electrical, Computer and Energy Engineering, University of Colorado at Boulder, Boulder, CO
2Electrical Engineering, Kuwait University, Kuwait City, KUWAIT
3Electrical Engineering and Computer Science, Colorado School of Mines, Golden, CO
09:00 B1-3
HIGH PERFORMANCE MULTI-CPU AND MULTI-GPU COMPUTING OF THE HIGH-ORDER FV24 ALGORITHM
Sanjay D'Mello, Alec Weiss, Melinda Piket-May, Mohammed Hadji, Atef Elsherbeni
1 Electrical, Computer, and Energy Engineering, University of Colorado Boulder, Boulder, CO
2 Electrical Engineering, Kuwait University, Kuwait City, KUWAIT
3 Electrical Engineering and Computer Science, Colorado School of Mines, Golden, CO

09:20 B1-4
COMPARATIVE ANALYSIS OF CUDA AND OPENCL FOR ELECTROMAGNETICS SIMULATIONS USING FDTD
Rohit P. Kandurwar, Vinit S. Vyas, Melinda J. Piket-May, Mohammed F. Hadji, Atef Z. Elsherbeni, Daniel A. Connors
1 Electrical, Computer and Energy Engineering, University of Colorado at Boulder, Boulder, CO
2 Electrical Engineering and Computer Science, Colorado School of Mines, Golden, CO
3 Electrical Engineering, Kuwait University, Kuwait City, KUWAIT
4 Electrical Engineering, University of Colorado Denver, Denver, CO

09:40 B1-5
A QUASI-MAGNETOSTATIC VOLUME INTEGRAL METHOD FOR SIMULATING NON-LINEAR HYS-TERETIC AND MAGNETOSTRICTIVE MATERIALS, Stephen D. Gedney, John C. Young, Robert J. Adams, Carl S. Scheider
1 Electrical Engineering, University of Colorado Denver, Denver, CO
2 Electrical and Computer Engineering, University of Kentucky, Lexington, KY

10:00 Break

10:20 B1-6
DOUBLE-HIGHER-ORDER FINITE ELEMENT MODELING OF A CONFORMAL PERFECTLY MATCHED LAYER FOR ELECTROMAGNETIC SCATTERING SIMULATION
Aaron P. Smull, Ana B. Manic, Sanja B. Manic, Branislav M. Notaros
Electrical and Computer Engineering, Colorado State University, Fort Collins, CO

10:40 B1-7
A COMPREHENSIVE COMPARISON OF FFT-ACCELERATED INTEGRAL EQUATION METHODS VS. FDTD FOR BIOELECTROMAGNETICS
Jackson W. Massey, Ali E. Yilmaz
Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX

11:00 B1-8
HUMAN MOTION DETECTION IN INDOOR ENVIRONMENT- A MODEL USING MULTILEVEL FAST MULTIPOLE ALGORITHM ON GRAPHICAL PROCESSING UNIT CLUSTER
Nghia H. Tran, Tuan Phan, Ozlem Kilic
Electrical Engineering and Computer Science, The Catholic University of America, Washington, DC

11:20 B1-9
ANALYSIS OF A PERTURBATIVE TRANSFORMATION OPTICS-BASED SPECTRAL-DOMAIN TECHNIQUE FOR FIELD COMPUTATION IN TILTED PLANAR-LAYERED MEDIA
Kamalesh K. Sainath, Fernando L. Teixeira
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

11:40 B1-10
ACCURATE AND VERSATILE HIGH-ORDER MODELING OF ELECTROMAGNETIC SCATTERING ON PLASMONIC NANOSTRUCTURES
Hamid T. Chorsi, Stephen D. Gedney
Electrical Engineering, University of Colorado Denver, Denver, CO

Session B2: Emerging Applications of Phased Arrays
Room 200

08:20 B2-1
BEAMFORMING FOR THE ASKAP RADIO TELESCOPE
1 Astronomy and Space Science, CSIRO, Sydney, NSW, AUSTRALIA
2 Centre for Astrophysics and Computing, Swinburne University of Technology, Melbourne, Victoria, AUSTRALIA
3 Physics and Electronics, Rhodes University, Grahamstown, SOUTH AFRICA
4 School of Physics, University of Melbourne, Melbourne, Victoria, AUSTRALIA

08:40 B2-2
PERFORMANCE ANALYSIS OF A MM-WAVE PHASED ARRAY FEED FOR THE GREEN BANK TELESCOPE
Junming Diao, Richard Black, Karl Warnick, Brian Jeffs, Neal Erickson
Electrical and Computer Engineering, Brigham Young University, Provo, UT

09:00 B2-3
PROGRESS TOWARDS DETECTION OF PULSARS AND FAST RADIO BURSTS WITH PHASED ARRAY FEEDS
Richard A. Black, Brian D. Jeffs, Gregory Hellbourg
1 Electrical and Computer Engineering, Brigham Young University, Provo, UT
2 CSIRO Astronomy and Space Science, Sydney, NSW, AUSTRALIA

09:20 B2-4
SPATIAL INTERFERENCE FILTERING: ADVANTAGES AND LIMITATIONS
Gregory Hellbourg
Astronomy and Space Science, CSIRO, Marsfield NSW, AUSTRALIA

09:40 B2-5
NON-LINEAR INTERFERENCE MITIGATION USING ARRAYS
Peter S. Wyckoff
PreDetection Solutions, Scottsdale, AZ
WEDNESDAY MORNING, continued

Session B3: Complex Media, Propagation and Metasurfaces
Room 105

Co-Chairs: Filippo Capolino, University of California Irvine; Robert Burkholder, The Ohio State University

08:20 B3-1
SCATTERING ANOMALIES FOR RADIALLY ANISOTROPIC SPHERES
Ari Sihvola¹,1, Henrik Wallen¹, Henrik Kettunen²
¹Radio Science and Engineering, Aalto University, Espoo, FINLAND
²Mathematics and Statistics, University of Helsinki, Helsinki, FINLAND

08:40 B3-2
SCALAR POTENTIAL FORMULATION AND DEPOLARIZING DYAD ARTIFACT REMOVAL FOR A GYROTROPIC MEDIUM
Michael J. Havrilla*
Air Force Institute of Technology, Wright-Patterson AFB, OH

09:00 B3-3
TUNABLE GUIDED SURFACE PLASMON-POLARITON USING TWO-DIMENSIONAL HYPERBOLIC GRAPHENE METASURFACE
S. A Hassani Gangaraj*, Andrei Nemilentsau, George Hanson
Electrical Engineering, University of Wisconsin Milwaukee, Milwaukee, WI

09:20 B3-4
FOCUSED AZIMUTHALLY POLARIZED VECTOR BEAM AND ITS APPLICATION ON ARTIFICIAL OPTICAL MAGNETISM
Mehdi Veysi*, Caner Guclu, Filippo Capolino
Electrical Engineering and Computer Science, University of California Irvine, Irvine, CA

09:40 B3-5
THEORY OF GAIN ENHANCEMENT IN PERIODIC STRUCTURES WITH DEGENERATE BAND EDGES
Mohamed Orhman*, Mehdi Veysi, Filippo Capolino
University of California, Irvine, Irvine, CA

10:00 Break

10:20 B3-6
THEORY OF PHOTO-INDUCED FORCES IN TIP-SAMPLE JUNCTIONS
Faeez Tork Ladani*,1, Junghoon Jahng2, Vartkess A. Apkarian3, Eric O. Potma1,3
¹Electrical Engineering and Computer Science, University of California Irvine, Irvine, CA
²Physics and Astronomy, University of California Irvine, Irvine, CA
³Chemistry, University of California Irvine, Irvine, CA

10:40 B3-7
ESTIMATION OF HIGH FREQUENCY WAVE FIELDS USING GAUSSIAN RAY BUNDLES AND DELAUNAY TESSELLATION
Stephen D. Lynch, Jay Alford-Lago*
Atmospheric Propagation 55280, SSC Pacific, San Diego, CA

11:00 B3-8
EFFICIENT SECOND-HARMONIC GENERATION FROM NANOSTRUCTURED HYPERBOLIC METAMATERIALS ON THE QUANTUM SCALE
Mehdi Hajizadegan*, Maryam Sakhdari, Pai-Yen Chen
Electrical Engineering, Wayne State University, Detroit, MI

Session B4: Guided Waves and Waveguiding Structures
Room 155

Co-Chairs: Christos Christodoulou, University of New Mexico; Edward Rothwell, Michigan State University

08:20 B4-1
GSTC APPLIED TO A COAXIAL TRANSMISSION LINE
Nick J. Krull*, Edward F. Kuester
Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO

08:40 B4-2
A NEW WAVEGUIDE VERIFICATION STANDARD FOR THE CHARACTERIZATION OF MAGNETIC MATERIALS
Jonathan L. Frasch*, Edward J. Rothwell
Electrical and Computer Engineering, Michigan State University, East Lansing, MI

09:00 B4-3
ELECTROMAGNETIC CHARACTERIZATION OF MATERIALS USING A DUAL CHAMBERED HIGH TEMPERATURE WAVEGUIDE
Jeffrey S. Sovern*, Michael J. Havrilla, Milo W. Hyde
Air Force Institute of Technology, Wright-Patterson AFB, OH

09:20 B4-4
UWB DOUBLE RIDGE WAVEGUIDE COUPLER WITH LOW LOSS
Amin Darvazehban, Omid Manoochehri*, Farhad Farzami, Danilo Erricolo
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

09:40 B4-5
COMPUTATION OF THE SCATTERING PARAMETERS OF A SYSTEM OF WAVEGUIDE SECTIONS USING A RECURSION TECHNIQUE
Edward J. Rothwell*, Jonathan L. Frasch, Sean Ellison, Prem Chahal
Electrical and Computer Engineering, Michigan State University, East Lansing, MI

10:00 Break

10:20 B4-6
A MECHANICALLY TUNABLE MULTI-SPLIT-RING-SLOT WAVEGUIDE DIRECTIONAL COUPLER FOR HIGH-POWER MICROWAVE APPLICATIONS
Xuyuan Pan*, Georgios Atmatzakis, Christos G. Christodoulou
Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM
10:40 B4-7
EXPERIMENTAL VALIDATION OF MODE DOMINANCE REVERSAL IN NOVEL SLOW WAVE STRUCTURE FOR HIGH POWER BACKWARD WAVE OSCILLATOR
Ushemadzoro Chipengo*, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

11:00 B4-8
INVESTIGATION OF SURFACE WAVE PROPAGATION ALONG A MULTIPLE-REPEATER WIRELESS POWER TRANSFER SYSTEM
Bin Xu*, Yang Li
Electrical and Computer Engineering, Baylor University, Waco, TX

11:20 B4-9
HIGH POWER MICROWAVE POLARIZATION ROTATOR
Hamide Seidfaraji*, Georgios Atmatzakis, Christos Christodoulou
Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM

11:40 B4-10
TRANSMISSION CHARACTERISTICS OF DIELECTRIC-COATED METAL ROD TRANSMISSION LINE FOR A FLEXIBLE TRANSMISSION MEDIUM AT MILLIMETER-WAVE FREQUENCIES
Futoshi Kuroki, Satoshi Kitabayashi*
National Institute of Technology, Kure College, Kure, JAPAN

Session B5: Reconfigurable Antennas and Circuits
Room 200

Co-Chairs: Xun Gong, University of Central Florida; Manos Tentzeris, Georgia Tech

10:20 B5-1
ULTRA-WIDEBAND RF FILTER FOR SELF-INTERFERENCE CANCELLATION IN STAR SYSTEMS
Stephen J. Watt*, Elias A. Alwan, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

10:40 B5-2
DESIGN OF A NOVEL ORIGAMI ULTRA-WIDEBAND MONOFLAR ANTENNA
Xueli Liu, Shun Yao, Stavros V. Georgakopoulos*
Florida International University, Miami, FL

11:00 B5-3
A RADIATION PATTERN RECONFIGURABLE ANTENNA FOR WLAN ACCESS
Joseph Costantine*1,2, Rouwaida Kanji1, Zahi Ghorayeb1, Tala Al Bahar1, Yara Itani1, Youssef Tawk3,2, Christos G. Christodoulou2
1Electrical and Computer Engineering, American University of Beirut, Beirut, LEBANON
2COSMIAC, University of New Mexico, Albuquerque, NM
3Electrical and Computer Engineering, Notre Dame University, Louaize, LEBANON

11:20 B5-4
RECONFIGURABLE THZ ARRAY EMPLOYING VANADIUM DIOXIDE
Varirtha Sanphuang*, Nima Ghalichechian, Ninu K. Nahar, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

11:40 B5-5
RECONFIGURABLE SLOT-RING ANTENNAS FOR ARRAY APPLICATIONS
Xun Gong*, Mahmoud Shirazi, Tianjiao Li
Electrical Engineering and Computer Science, University of Central Florida, Orlando, FL

Session C1: Emerging Challenges in Reliability, Distributed Sensing, and Signal Processing
Room 1B51

Co-Chairs: Jean-Francois Chamberland, Texas A&M University; John Volakis, The Ohio State University

08:20 C1-1
AN EFFICIENT FINITE ELEMENT SCHEME FOR SIMULATING SUBSURFACE WIRELESS TELEMETRY IN WELL LOGGING APPLICATIONS
Jiefu Chen*
Electrical and Computer Engineering, University of Houston, Houston, TX

08:40 C1-2
HIGH DATA RATE MULTI-PATH TRANSMIT/RECEIVE SYSTEM WITH ON-SITE CODING
Dimitrios Siafarikas*, Elias A. Alwan, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

09:00 C1-3
NOTIONS OF PARALLEL COMPUTING AS A MEANS OF ENABLING SHORT DESIGN CYCLES IN RF-BASED INFERENCE SYSTEMS
Austin A. Taghavi*, Jean-Francois Chamberland, Gregory H. Huff
Electrical and Computer Engineering, Texas A&M University, College Station, TX

09:20 C1-4
DATA PROCESSING SOFTWARE FOR GEOPHYSICAL DATA FROM SATELLITE
Yuriy Shpadi1, Pavel Inchin1, Anatoly Streletsov*2
1Scientific Space Systems Laboratory, Institute of Space Technique and Technology, Almaty, Almatinskaya oblast, KAZAKSTAN
2Physical Sciences, Embry-Riddle Aeronautical University, Daytona Beach, FL

09:40 C1-5
SPACE RADIATION ENVIRONMENTAL ANALYSIS OF CUBESAT AVIONICS COMPONENTS
James M. Byrne*
Aeronautics and Astronautics - Space Systems Lab, Massachusetts Institute of Technology (MIT), Cambridge, MA

10:00 Break
WEDNESDAY MORNING, continued

10:20 C1-6
EXPERIMENTAL VALIDATION OF DIGITAL BEAM-FORMER PERFORMANCE WITH ULTRA-WIDEBAND ANTENNA ARRAYS USING ON-SITE CODING
Satheesh Bojja Venkatakrishnan*, Elias A. Alwan, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

10:40 C1-7
LEVERAGING RECONFIGURABLE ANTENNAS AND MACHINE LEARNING IN INFERENCE TASKS BASED ON WI-FI METADATA
Travis Taghavi*, Jean-Francois Chamberland, Gregory H. Huff
Electrical and Computer Engineering, Texas A&M University, College Station, TX

11:00 C1-8
CARDIAC RATE ESTIMATION USING CONTINUOUS WAVE RADAR AND ULTRA WIDEBAND RADAR AT DIFFERENT DISTANCES
Haofei Wang1, Lingyun Ren*2, Krishna Naishadham3, Aly E. Fathy2
1School of Information and Electronics, Beijing Institute of Technology, Beijing, CHINA
2Electrical Engineering and Computer Science, University of Tennessee, Knoxville, TN
3Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA

11:20 C1-9
SEARCH ALGORITHM COMPARISON FOR FAST OPTIMIZATION OF POWER AMPLIFIER LOAD IMPEDANCE AND INPUT POWER
Joseph Barkate1, Charles Baylis1, Alexander Tsatsoulas1, Zach Hayes1, Larry Cohen2, Robert Marks1
1Wireless and Microwave Circuits and Systems Program, Baylor University, Waco, TX
2Naval Research Laboratory, Washington, DC

11:40 C1-10
VERTICALLY INTEGRATED RESEARCH IN RECONFIGURABLE LIQUID-METAL RF DEVICES
Electrical Engineering, University of Hawaii at Manoa, Honolulu, HI

Session F1: RF Propagation Utilizing Numerical Weather Prediction I
Room 150

Co-Chairs: Tracy Haack, Naval Research Laboratory - Marine Meteorology Division;
Jonathan Gehman, The Johns Hopkins University - Applied Physics Laboratory

08:20 F1-1
MICROWAVE PWE PROPAGATION AND SCATTERING FROM ATMOSPHERIC TURBULENCE
Frank Ryan*
Applied Technology, Inc., San Diego, CA

08:40 F1-2
DIRECT RESOLUTION OF LOW-LEVEL RF REFRACTIVITY USING NWP
Nathaniel S. Winstead, Jonathan Z. Gehman*, Thomas R. Hanley
The Johns Hopkins University - Applied Physics Laboratory, Laurel, MD

09:00 F1-3
COMPARISON OF RF PREDICTIONS BASED ON TWO NUMERICAL WEATHER PREDICTION MODELS AND IN-SITU OBSERVATIONS IN THE NORTH SEA
Rick L. Navarro1, Amalia Barrios1, Fok Bolderheij2, Joris Derksen2, Katherine Horgan3, Vincent van Leijen4, Robert Marshall5, Ted Rogers6, Fred Schoonoverwoerd9, Tjarda Wilbrink4, Earl Williams5, Victor Wiss2
1Space and Naval Warfare Systems Center Pacific, San Diego, CA
2Netherlands Defense Academy (NLDA), Den Helder, NETHERLANDS
3Naval Surface Warfare Center Dahlgren Division, Dahlgren, VA
4Defense Materiel Organisation (DMO), Den Helder, NETHERLANDS
5Meteopérez, Mount Pleasant, Mount Pleasant, VA

09:20 F1-4
EVALUATION OF COAMPS USING MEASUREMENTS FROM THE CASPER PILOT EXPERIMENT
Marcela Ulate4, Qing Wang1, Tracy Haack7, Teddy Holl2, John Kaligis1, Ryan Yamaguchi1, Dick Lind1
1Naval Postgraduate School, Monterey, CA
2Naval Research Laboratory, Monterey, CA

09:40 F1-5
EVAPORATION AND MARINE LAYER DUCTING EFFECTS ON PROPAGATION DURING THE TAPS EXPERIMENT
Tracy Haack1, Andrew Kulesza2, Hedley Hansen3, Sally Garrett4, Martin Veasey1, Katherine Horgan6, V. Russel Wise1, Jacques Claverie1, Yvonick Hureau8, Jorg Hacker8
1Marine Meteorology Division, NRL, Monterey, CA
2School of the Environment, Flinders University, ARA, Adelaide, SA, AUSTRALIA
3RSTO, Edinburgh, SA, AUSTRALIA
4DSTO, Auckland, NEW ZEALAND
5UK Met Office, Exeter, UNITED KINGDOM
6Dahlgren Division, NSWC, Dahlgren, VA
7CREC St-Cyr & IETR, Guer, FRANCE
8Maîtrise de l’information, DGA, Rennes, FRANCE

10:00 Break

10:20 F1-6
EVALUATION OF VERTICAL REFRACTIVITY PROFILE BLENDING SCHEMES
Paul Frederickson*1, Tracy Haack2
1Meteorology, Naval Postgraduate School, Monterey, CA
2Marine Meteorology Division, Naval Research Laboratory, Monterey, CA

10:40 F1-7
A NEW BLENDING ALGORITHM FOR EVAPORATIVE DUCT AND MESOSCALE MODEL PROFILES
Robin C. Cherrett*1, Qing Wang2, Hway-Jen Chen2, Paul Frederickson2
1Navy Fleet Weather Center, San Diego, CA
2Meteorology, Naval Postgraduate School, Monterey, CA
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<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Co-Chairs</th>
<th>Location</th>
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<tr>
<td>11:00</td>
<td>F1-8</td>
<td>THE IMPACT OF UAV DATA ASSIMILATION ON RADIO FREQUENCY PROPAGATION PREDICTIONS DURING THE 2009 NEW ZEALAND SEA BREEZE TRIAL</td>
<td>Katherine L. Horbun*1, Tracy Haack2, Sally A. Garrett3</td>
<td>Physics and Astronomy, Dartmouth College, Hanover, NH</td>
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<td>F1-9</td>
<td>RADIO REFRACTIVITY IN STRATIFORM AND CONVECTIVE RAIN REVEALED BY MESOSCALE NUMERICAL WEATHER PREDICTION DATA</td>
<td>Robert E. Marshall*</td>
<td>Mount Pleasant Meteorology, Woodford, VA</td>
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<td>08:20</td>
<td>H1-1</td>
<td>EVIDENCE FOR NONLINEAR VLF WAVE PHYSICS FROM EMFISIS INSTRUMENT SUITE ON BOARD VAN ALLEN PROBES</td>
<td>Chris Crabtree*1, Erik Tejero1, Gurudas Ganguli1, George Hospodarsky2, Craig Kletzing2</td>
<td>Division of Plasma Physics, Naval Research Laboratory, Washington, DC</td>
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<td>H1-2</td>
<td>IN SITU STATISTICAL OBSERVATION OF PC1 PEARL PULSIONS BY THE VAN ALLEN PROBES</td>
<td>Kristoff W. Paulson<em>1, Charles W. Smith1, Marc R. Lessard1, Roy B. Torbert</em>, Craig A. Kletzing1, John R. Wygant4</td>
<td>Space Science Center, University of New Hampshire, Durham, NH</td>
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<td>H1-3</td>
<td>OBSERVATIONS OF A GLOBAL COHERENCE SCALE MODULATING ELECTRON LOSS DUE TO PLASMASPERIC HISS</td>
<td>Aaron W. Breneman*1, Alexa J. Halford2, Robyn Millan2, Michael McCarthy3, Joseph F. Fennell4, John Sample3, Leslie A. Woodger4, George Hospodarsky6, John Wygant4, Cynthia Cattell1, Jerry Goldstein7, Craig Kletzing6</td>
<td>School of Physics and Astronomy, University of Minnesota, Minneapolis, MN</td>
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<td>H1-4</td>
<td>PLASMASPERIC HISS WAVE AMPLITUDES INFERRED FROM LOW-ALTITUDE MEASUREMENTS OF ENERGETIC ELECTRONS</td>
<td>Maria de Soria-Santacruz Pich*1, Wen Li2, Richard M. Thorne2</td>
<td>Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA</td>
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<td>H1-5</td>
<td>IMPROVED SPECTRAL ANALYSIS OF HISS AND CHORUS OBSERVATION IN GROUND-BASED DATA</td>
<td>Poorya Hosseini*, Mark Golkowski</td>
<td>Electrical Engineering, University of Colorado Denver, Denver, CO</td>
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<td>10:00</td>
<td>Break</td>
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<td>10:20</td>
<td>H1-6</td>
<td>EXCITATION OF DISCRETE AND BROADBAND WHISTLER WAVES IN A LABORATORY PLASMA</td>
<td>Xin An*1, Bart Van Compernolle2, Jacob Bryntnik1, Richard Thorne1, Patrick Pribyl2, Walter Gekelman2</td>
<td>Atmospheric and Oceanic Sciences, University of California, Los Angeles, Los Angeles, CA</td>
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<td>H1-7</td>
<td>LABORATORY INVESTIGATION OF NONLINEAR WHISTLER WAVE PROCESSES*</td>
<td>Bill Amatucci*, Erik Tejero, Chris Crabtree, Dave Blackwell, Guru Ganguli</td>
<td>Physics, University of California, Los Angeles, Los Angeles, CA</td>
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<td>11:00</td>
<td>H1-8</td>
<td>WHISTLER-MODE WAVE SIMULATIONS</td>
<td>Roxanna L. Stein*, Miles T. Bengtson, Sara A. Rosborough, Morgan M. Matheny, Anotoy V. Streltsov</td>
<td>Physical Sciences, Embry-Riddle Aeronautical University, Daytona Beach, FL</td>
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<td>11:20</td>
<td>H1-9</td>
<td>EFFECT OF FINITE ELECTRON AND ION TEMPERATURE ON MAGNETOSPERIC WHISTLER MODE RAY-TRACING</td>
<td>Ashanthi S. Maxworth*, Mark Golkowski</td>
<td>Electrical Engineering, University of Colorado Denver, Denver, CO</td>
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<td>08:20</td>
<td>J1-1</td>
<td>A GENERIC AND EFFICIENT “E-FIELD PARALLEL IMAGING CORRELATOR” SOFTWARE FOR NEXT-GENERATION RADIO TELESCOPES</td>
<td>Nithyanandan Thyagarajan*1, Adam P. Beardsley1, Judd D. Bowman1, Miguel F. Morales2</td>
<td>School of Earth and Space Exploration, Arizona State University, Tempe, AZ</td>
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<td>J1-2</td>
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<td>Physics, University of Washington, Seattle, WA</td>
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**Session J1: Emerging Instrumentation and Techniques**

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<td>09:00</td>
<td>J1-1</td>
<td>A GENERIC AND EFFICIENT “E-FIELD PARALLEL IMAGING CORRELATOR” SOFTWARE FOR NEXT-GENERATION RADIO TELESCOPES</td>
<td>Nithyanandan Thyagarajan*1, Adam P. Beardsley1, Judd D. Bowman1, Miguel F. Morales2</td>
<td>School of Earth and Space Exploration, Arizona State University, Tempe, AZ</td>
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<td>J1-2</td>
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<td></td>
<td>Physics, University of Washington, Seattle, WA</td>
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WEDNESDAY MORNING, continued

08:40  J1-2
THE EXTERNAL CALIBRATOR FOR HYDROGEN OBSERVATORIES
Daniel C. Jacobs*, Jacob Burba¹, Lauren Turner¹, Abraham Neben², Benjamin Stinnett¹, Marc Leatham¹, Michael Busch¹, Judd Bowman¹
¹School of Earth and Space Exploration, Arizona State University, Tempe, AZ
²Kavli Institute for Astrophysics and Space Research, Massachusetts Institute of Technology, Cambridge, MA

09:00  J1-3
CALIBRATING RADIO ARRAYS WITHOUT VISIBILITIES USING THE E-FIELD PARALLEL IMAGING CALIBRATION (EPICAL)
Adam P. Beardsley*, Nithyanandan Thyagarajan¹, Miguel F. Morales², Judd D. Bowman¹
¹School of Earth and Space Exploration, Arizona State University, Tempe, AZ
²Physics, University of Washington, Seattle, WA

09:20  J1-4
LOGNOMRAL INSTRUMENTAL ERROR ARISING IN MULTISTAGE RADIO FREQUENCY RADIOIMETERS
Bang D. Nhan¹*, Richard F. Bradley²,³,4, Abhirup Datta¹, Jack O. Burns¹
¹Center for Astrophysics and Space Astronomy, University of Colorado at Boulder, Boulder, CO
²Central Development Laboratory, National Radio Astronomy Observatory, Charlottesville, VA
³Astronomy, University of Virginia, Charlottesville, VA
⁴Electrical and Computer Engineering, University of Virginia, Charlottesville, VA

09:40  J1-5
CO INTENSITY MAPPING: FIRST CONSTRAINTS ON THE MOLEULAR GAS POWER SPECTRUM AT RED-SHIFT 3
Daniel P. Marrone*
Astronomy, University of Arizona, Tucson, AZ

10:00  Break

10:20  J1-6
IMPROVED POWER EFFICIENCY FOR CRYOGENIC AT THE VLA
Denis R. Urbain, Wes Grammer, Steven Durand*
Electronics, National Radio Astronomy Observatory, Socorro, NM

10:40  J1-7
A NEW VHF (“4-BAND”) FEED SYSTEM FOR THE VERY LARGE ARRAY
Steven W. Ellingston*
Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA

11:00  J1-8
MANUFACTURABLE CRYOGENIC SIE LNA FOR RADIO ASTRONOMY AND SPACE COMMUNICATIONS
Andrew W. Jantzen*, Sander Weirneb
Electrical Engineering, California Institute of Technology, Pasadena, CA

11:20  J1-9
NANOSATS FOR A LOW FREQUENCY SPACE-BASED RADIO INTERFEROMETER
Baptiste Ceccconi¹*, Stavros Katsanevas², Denis Puy³, Andre Laurens⁴, Albert-Jan Boonstra⁵, Marc Klein Wolt⁶, Mark Bentum⁶, Angelica Sicardi⁸, Jean-Louis Pincon⁹, Marco Agnan², Martin Giard¹⁰, Patrick Loumeau¹¹, Julien Girard¹², Cyril Tasse¹³
¹LESIA, Observatoire de Paris, Meudon, FRANCE
²APC, Universite Paris Diderot, Paris, FRANCE
³LUPM, Universite de Montpellier, Montpellier, FRANCE
⁴CNES, Toulouse, FRANCE
⁵ASTRON, Dwingeloo, NETHERLANDS
⁶Radboud University, Nijmegen, NETHERLANDS
⁷TU Twente, Twente, NETHERLANDS
⁸ONERA, Toulouse, FRANCE
⁹LPCE, Universite d’Orleans, Orleans, FRANCE
¹⁰IRAP, Universite de Toulouse, Toulouse, FRANCE
¹¹CS2, TelecomParisTech, Paris, FRANCE
¹²SAp/IRFU, CEA, Saclay, FRANCE
¹³GEPI, Observatoire de Paris, Meudon, FRANCE

WEDNESDAY AFTERNOON, 6 January 2016

Session B6: Finite Arrays and Antenna Measurements
Room 1B40

13:20  B6-1
FAR FIELD OF LARGE, WIDEBAND, SCANNING ARRAYS
Randy Haupt*, Payam Nayeri
Electrical Engineering and Computer Science, Colorado School of Mines, Golden, CO

13:40  B6-2
FOURIER ITERATION BETWEEN TWO MEASUREMENT PLANE FIELDS OF AN ANTENNA WITH LIMITED MEASURED DATA
Sembiam R. Rengarajan*, Ronald J. Pogorzelski
Electrical and Computer Engineering, California State University, Northridge, CA

14:00  B6-3
BEAMFORMING WITH RADIATION MODES OF FINITE GROUND PLANES EXCITED BY HETEROGENEOUS ARRAYS
Kurt R. Schab*, Jennifer T. Bernhard
Electromagnetics Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL
14:20 B6-4
SPACE-FED ANTENNA ARRAY DESIGN AND ANALYSIS SOFTWARE PACKAGE
Kyle Patel*, Payam Nayeri, Atef Z. Elsherbeni
Electrical Engineering and Computer Science, Colorado School of Mines, Golden, CO

Session B7: Printed Antennas and Arrays
Room 200

Co-Chairs: Edward Kuester, University of Colorado Boulder; Ozlem Kilic, The Catholic University of America

13:20 B7-1
STUDY OF REFLECTION AND BANDWIDTH LIMITS FOR EXPONENTIALLY TAPERED TRANSMISSION LINES
Raymond J. Sprungle¹,², Edward F. Kuester¹
¹Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO
²Ball Aerospace & Technologies Corporation, Boulder, CO

13:40 B7-2
MUTUAL COUPLING REDUCTION IN MICROSTRIP PATCH ANTENNA
Amin Darvazehyan¹, Ahmad Emadoddin², Omid Manoochehr³, Danilo Erricolo³
¹Electrical and Computer Engineering, Amirkabir University of Technology, Tehran, IRAN
²Electrical and Computer Engineering, Shahed University, Tehran, IRAN
³Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

14:00 B7-3
A CONFORMAL MICRO-STRIP ROTMAN LENS DESIGN USING PARTICLE SWARM OPTIMIZATION (PSO)
Toan K. Vo Dai*, Tuan Nguyen, Khai Cao, Thinh Le, Ozlem Kilic
Electrical Engineering and Computer Science, The Catholic University of America, Washington, DC

14:20 B7-4
A COMPACT DIRECTIVE MICROSTRIP SLOT ANTENNA FOR TETRA-BAND APPLICATIONS
Hamid T. Chorsi, Ryan Jacobs*, Mark Golkowski
Electrical Engineering, University of Colorado Denver, Denver, CO

14:40 B7-5
HIGHER ORDER ANALYTICAL MODELS OF PLANAR MESH GRIDS
Omid Manoochehr*, Farhad Farzami, Danilo Erricolo
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

Session B8: Scattering
Room 105

Co-Chairs: Piergiorgio Uslenghi, University of Illinois at Chicago; Danilo Erricolo, University of Illinois at Chicago

13:20 B8-1
THEORY OF CHARACTERISTIC MODES FOR ELECTROMAGNETIC SCATTERING OF SINGLE-WALLED CARBON NANOTUBES WITH REALISTIC SHAPES
Ahmed M. Hassan¹,², Fernando Vargas-Lara², Jack F. Douglas², Edward J. Garboczi³
¹Computer Science Electrical Engineering, University of Missouri-Kansas City, Kansas City, MO
²Materials Science and Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD
³Applied Chemicals and Materials Division, National Institute of Standards and Technology, Boulder, CO

13:40 B8-2
ELECTROMAGNETIC SCATTERING FROM SINGLE-WALLED CARBON NANOTUBE DIMERS
Ahmed M. Hassan¹, Fernando Vargas-Lara², Jack F. Douglas², Edward J. Garboczi³
¹Computer Science Electrical Engineering, University of Missouri-Kansas City, Kansas City, MO
²Materials Science and Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD
³Applied Chemicals and Materials Division, National Institute of Standards and Technology, Boulder, CO

14:00 B8-3
OBSERVATIONS OF THE RADAR CROSS SECTION (RCS) PHENOMENA OF ANTENNAS THROUGH THE EYES OF CHARACTERISTIC MODES THEORY
Ezedeen A. Elghannai*, Roberto G. Rojas
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

14:20 B8-4
CALCULATION OF THE ULTIMATE INTRINSIC SIGNAL TO NOISE RATIO FOR A LOSSY ELLIPTIC CYLINDER
Switt Kittivittayakul¹,², Benedetto Grivo², Riccardo Lattanzi², Giuseppe Carluccio², Danilo Erricolo¹
¹Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL
²Radiology/Center of Advanced Imaging Innovation and Research, New York University, New York, NY

14:40 B8-5
SCATTERING BY TWO PARALLEL METALLIC HALF-PLANES PERPENDICULARLY TRUNCATED BY A METAL PLANE
Marco Poort*, Piergiorgio L. E. Uslenghi
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

15:00 Break

15:20 B8-6
ELECTROMAGNETIC SCATTERING BY A METALLIC QUARTER-CYLINDER LOCATED INSIDE A TRIHEDRAL METAL REFLECTOR
Piergiorgio L. E. Uslenghi*, Baker Al-Bahri
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL
WEDNESDAY AFTERNOON, continued

15:40 B8-7
EXACT SCATTERING FOR AN ELLIPTIC METAL CYLINDER AT THE INTERFACE BETWEEN ANTI-ISOREFRACTIVE HALF-SPACES
Seiran Khaledein*, Tadahiro Negishi, Danilo Erricolo
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

16:00 B8-8
EXACT SCATTERING FOR A METALLIC SPHEROID AT THE INTERFACE BETWEEN ANTI-ISOREFRACTIVE HALF-SPACES
Gargi S. Ghurye*, Tadahiro Negishi, Danilo Erricolo
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

16:20 B8-9
SUBROUTINES FOR THE COMPUTATION OF RADIAL MATHIEU FUNCTIONS FOR LARGE VALUES OF THE PARAMETER
Unnati C. Wadkar*, Danilo Erricolo
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

16:40 B8-10
NUMERICAL RESULTS FOR THE RADIATION BY A LINE SOURCE IN THE PRESENCE OF A SLOTTED METALLIC PLANE COVERED BY DPS AND DNG ELLIPtical LENSES
Brook Feyissa*, Danilo Erricolo, Tadahiro Negishi
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

17:00 B8-11
EXACT ELECTROMAGNETIC SCATTERING FROM A DIPOLE ANTENNA LOCATED INSIDE A MULTILAYER METAMATERIAL OBLATE SPHEROIDAL CAVITY
Yangqing Liu*, Tadahiro Negishi, Danilo Erricolo
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

17:20 B8-12
NUMERICAL RESULTS FOR THE RADIATION BY A DIPOLE ANTENNA ON THE AXIS OF A CIRCULAR HOLE IN A METALLIC PLANE COVERED BY DPS AND DNG OBLATE SPHEROIDAL LENSES
Farhad Farzami*, Tadahiro Negishi, Danilo Erricolo
Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

Session B9: 3D Printed Antennas
Room 155

Co-Chairs: Jacob Adams, North Carolina State University;
Hao Xin, University of Arizona

13:20 B9-1
ADDITIONALLY MANUFACTURED FLEXIBLE & ORIGAMI-RECONFIGURABLE ANTENNAS AND RF SENSORS
Manos M. Tentzeris*, Ryan Bahr, Jimmy Hester, John Kimionis
Electrical and Computer Engineering, Georgia Tech, Atlanta, GA

13:40 B9-2
MATERIALS CHARACTERIZATION AND CONFORMAL ANTENNAS FOR 3D PRINTED ANTENNA APPLICATIONS
Corey Shemelya1, Mike Zenha2, Min Liang3, Xiaojun Yu4, Junqi Wu5, David Espalin1, David Roberson1, Ryan Wicker1, Hao Xin3, Eric MacDonald6
1The University of Texas at El Paso, El Paso, TX
2NASA Glenn Research Center, Cleveland, OH
3University of Arizona, Tucson, AZ

14:00 B9-3
NOVEL ELECTROMAGNETIC STRUCTURES ENABLED BY 3D PRINTING TECHNOLOGY
Xiaojun Yu*, Junqi Wu, Min Liang, Ahmed H. Abdelrahman, Hao Xin
Electrical and Computer Engineering, University of Arizona, Tucson, AZ

14:20 B9-4
DESIGN AND DEVELOPMENT OF TRIPLE MODE WAVEGUIDE HORN ANTENNA USING 3D PRINTING TECHNOLOGY
Alejandro T. Castro*, Satish K. Sharma, Behrouz Babakhani
Electrical and Computer Engineering, San Diego State University, San Diego, CA

14:40 B9-5
DIRECT DIGITAL MANUFACTURING OF A 2.45 GHZ PHASED ARRAY
Thomas Ketter1, Casey Perkowski2, Paul Deffenbaugh2, John Statton1, Joshua Stephenson1, Kenneth Church2, Thomas Weller1
1University of South Florida, Tampa, FL
2Sciperio, Inc., Orlando, FL

15:00 Break

15:20 B9-6
USE OF LOW COST 3D PRINTERS IN ANTENNA RESEARCH.
Anders J. Johansson*
EIT, Lund University, Lund, SWEDEN

15:40 B9-7
THE ELECTRICAL PROPERTIES OF CARBON NANOTUBE AND GRAPHENE BASED FILAMENT FOR 3D PRINTED ANTENNAS
Patricia K. Mosgh1, Chenyu Wang1, Kenneth J. Wynne1, Erdem Topsakal2
1Chemical and Life Science Engineering, Virginia Commonwealth University, Richmond, VA
2Electrical and Computer Engineering, Virginia Commonwealth University, Richmond, VA

16:00 B9-8
3D PRINTED LIQUID METAL MOLDS FOR ANTENNA AND FEED PACKAGING
Collin Ladd1, Dishit Parekh1, Vivek Bharambe2, Michael D. Dickey1, Jacob J. Adams8
1Chemical and Biomolecular Engineering, North Carolina State University, Raleigh, NC
2Electrical and Computer Engineering, North Carolina State University, Raleigh, NC
Session B10: Uncertainty Quantification in CEM and Electronic Design Automation
Room 1B51

Co-Chairs: Jamesina Simpson, University of Utah; Sourajeet Roy, Colorado State University

13:20 B10-1
A CLASSIFICATION FRAMEWORK FOR METHODS OF UNCERTAINTY QUANTIFICATION IN COMPUTATIONAL ELECTROMAGNETICS
Sathya S. Ganta*, Barry D. Van Veen, Susan C. Hagness
Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, WI

13:40 B10-2
TOWARDS HIGH-DIMENSIONAL UNCERTAINTY QUANTIFICATION: A TENSOR PERSPECTIVE
Zheng Zhang1, Luca Daniel2
1Argonne National Laboratory, Lemont, IL
2Massachusetts Institute of Technology, Cambridge, MA

14:00 B10-3
STOCHASTIC COLLOCATION METHOD FOR FINITE ELEMENT WAVEGUIDE ANALYSIS AND STOCHASTIC GALERKIN METHOD FOR FINITE DIFFERENCE CIRCUIT ANALYSIS
Xu Chen*, Jose E. Schutt-Aine, Andreas C. Cangellaris
Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL

Session B11: Wearable Antennas and Electronics
Room 1B40

Co-Chairs: Christos Christodoulou, University of New Mexico; Asimina Kiourti, The Ohio State University

15:20 B11-1
ANALYSIS OF MILIMETER-SIZE IMPLANTED LOOP ANTENNAS FOR BRAIN-MACHINE INTERFACE SYSTEMS
Lingnan Song*, Yahya Rahmat-Samii
Electrical Engineering, University of California, Los Angeles, Los Angeles, CA

15:40 B11-2
DUAL COIL FOR REMOTE PROBING OF SIGNALS USING RESISTIVE WIRELESS ANALOG PASSIVE SENSORS (RWAPS)
Bashir I. Morshed*
Electrical and Computer Engineering, The University of Memphis, Memphis, TN

16:00 B11-3
CONFORMAL STRONGLY COUPLED MAGNETIC RESONANT ANTENNAS FOR WEARABLE APPLICATIONS
Karina A. Quintana, Pablo J. Gonzalez*, Kun Bao, Stavros V. Georgakopoulos
Electrical and Computer Engineering, Florida International University, Miami, FL

16:20 B11-4
A NEW CLASS OF COLORFUL TEXTILE ANTENNAS FOR WEARABLE ELECTRONICS
Asimina Kiourti*, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

16:40 B11-5
NOVEL STRETCHABLE AND WEARABLE HAND GESTURE SENSORS & ANTENNAS
Manos M. Tentzeris*, Taoran Le, Ryan Bahr
Electrical and Computer Engineering, Georgia Tech, Atlanta, GA

Session BD1: Energy Harvesting Rectennas and Back-Ends
Room 200

Co-Chairs: Zoya Popovic, University of Colorado Boulder; John Volakis, The Ohio State University

15:20 BD1-1
AMBIENT ENERGY HARVESTING FLEXIBLE ADDITIVELY-MANUFACTURED TOPOLOGIES
Manos M. Tentzeris*, Jo Bito, Jimmy Hester
Electrical and Computer Engineering, Georgia Tech, Atlanta, GA

15:40 BD1-2
SINGLE-DIODE RECTENNAS WITH HIGH CONVERSION EFFICIENCIES AT VERY LOW INCIDENT POWER DENSITIES
Parisa Momenroodaki*, Ignacio Ramos, Zoya Popovic
Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO

16:00 BD1-3
WIRELESS POWER TO SENSORS EMBEDDED IN CONCRETE STRUCTURES
Rashed Bhuiyan, Xiaohua Jin, Md. R. Islam, Juan M. Caicedo, Mohammad Ali*
University of South Carolina, Columbia, SC

16:20 BD1-4
HIGH EFFICIENCY WIRELESS POWER HARVESTING AT LOW POWERS
Brock DeLong1, Qiaowei Yuan2, John Volakis1
1ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH
2National Institute of Technology, Sendai College, Sendai, JAPAN

16:40 BD1-5
MID-INFRARED ENERGY HARVESTING AND CONVERSION USING RECTIFYING HYPERBOLIC METAMATERIALS
Maryam Sakhdari*, Mehdi Hajizadegan, Pai-Yen Chen
Electrical and Computer Engineering, Wayne State University, Detroit, MI

17:00 BD1-6
ENHANCING WIRELESS POWER TRANSFER THROUGH FIELD DISTRIBUTION DESIGN
Erik S. Gamez Rodriguez*, David A. Schurig, Gianluca Lazzi
Electrical and Computer Engineering, University of Utah, Salt Lake City, UT
WEDNESDAY AFTERNOON, continued

Session CDE1: Spectrum Issues, Developments, and Solutions
Room 151

Co-Chairs: Charles Baylis, Baylor University; Gregory Huff, Texas A&M University

13:20 CDE1-1
CAN RADAR AND COMMUNICATION SYSTEMS HARMONIously CO-EXIST?
Shannon D. Blunt1, Eric L. Mokole*2
1University of Kansas, Lawrence, KS
2Independent Consultant, Burke, VA

13:40 CDE1-2
A SURVEY OF RESEARCH AND DEVELOPMENT TO ENHANCE THE USE OF SPECTRUM
Lawrence S. Cohen*
Consultant, Gaithersburg, MD

14:00 CDE1-3
RECENT DEVELOPMENTS ON SPECTRAL CONTAINMENT OF RADAR SIGNALS
John Jakabosky*1, Shannon D. Blunt1, Eric L. Mokole2, Chris Allen1
1Electrical Engineering and Computer Science, University of Kansas, Lawrence, KS
2Independent Consultant, Burke, VA

14:20 CDE1-4
JOINT OPTIMIZATION OF LOAD IMPEDANCE AND BIAS VOLTAGE FOR POWER-ADDED EFFICIENCY AND ADJACENT-CHANNEL POWER RATIO USING THE BIAS SMITH TUBE
Matthew Fellows1, Sarvin Rezayat1, Lucilja Lamers1, Joseph Barkate1, Charles Baylis*, Lawrence Cohen2, Robert J. Marks III1
1Electrical and Computer Engineering, Baylor University, Waco, TX
2Naval Research Laboratory, Washington, DC

14:40 CDE1-5
A SIMULTANEOUS CIRCUIT AND WAVEFORM OPTIMIZATION FOR RADAR SYSTEMS
Dylan Eustice1, Charles Baylis*, Larry Cohen2, Matthew Fellows1, Joseph Barkate1, Robert Marks II1
1Electrical and Computer Engineering, Baylor University, Waco, TX
2Naval Research Laboratory, Washington, DC

15:00 Break

15:20 CDE1-6
MODELING AGGREGATE INTERFERENCE FROM LTE SYSTEMS
Joel Dumke*, Nicholas Kent, Dylan Hicks
Institute for Telecommunication Sciences, Boulder, CO

15:40 CDE1-7
A GENERALIZED METHOD FOR EVALUATING INTERFERENCE IN SPECTRUM SHARING AND MANAGEMENT APPLICATIONS
Nicholas N. DeMinco*
Institute for Telecommunication Sciences, Boulder, CO

16:00 CDE1-8
A SIMULATION STUDY OF THE LTE INTERFERENCE ON WIFI SIGNAL DETECTION
Yao Ma*, Daniel G. Kuester, Jason Coder, William F. Young
Communication Technology Laboratory, RF Technology Division, National Institute of Standards and Technology, Boulder, CO

16:20 CDE1-9
TESTING SPECTRUM SENSING NETWORKS BY UAV
Daniel G. Kuester*, Ryan T. Jacobs, Yao Ma, Jason Coder
Communication Technology Lab, RF Technology Division, National Institute of Standards and Technology, Boulder, CO

16:40 CDE1-10
WAVEFORMS FOR INTERFERENCE TESTING OF EMERGENCY RESPONDER SAFETY DEVICES
Luis A. Gonzalez1, Audrey K. Pul*1, William F. Young2
1Electrical, Computer, and Energy Engineering, University of Colorado, Boulder, Boulder, CO
2Communications Technology Laboratory, National Institute of Standards and Technology, Boulder, CO

Session F2: RF Propagation Utilizing Numerical Weather Prediction II
Room 150

Co-Chairs: Katherine Horgan, Naval Surface Warfare Center Dahlgren Division; Qing Wang, Naval Postgraduate School

13:20 F2-1
VARIATIONAL ASSIMILATION OF GPS RADIO-OCCULTATION OBSERVATIONS IN RAINY CONDITIONS
Francois C. Vandenberghhe1, Michel Aidonidis2
1National Center for Atmospheric Research, Boulder, CO
2Meteo France, Brest, FRANCE

13:40 F2-2
EVAPORATION AND ELEVATED DUCT PROPERTIES OVER THE SUBTROPICAL EASTERN PACIFIC OCEAN REGION USING MAGIC DATA
Denny P. Alappattu*, Qing Wang
Meteorology, Naval Postgraduate School, Monterey, CA

14:00 F2-3
CASPER PILOT EXPERIMENT RESULTS: ESTIMATION OF ATMOSPHERIC REFRACTIVITY USING PROPAGATION LOSS
Caglar Yardim1, Jon Pozderac1, Robert Burkholder1, Qing Wang2
1ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH
2Meteorology, Naval Postgraduate School, Monterey, CA

14:20 F2-4
THE DESIGN OF CASPER FIELD PROGRAM FOR EM DUCTING RESEARCH
Qing Wang1, Robert Burkholder2, Tony DePaolo3, Haringra J. Ferando4, Tracy Haack3, Thomas Hanley5, Teddy Holi6, Katherine Horgan7, Haflidi Jonsson8, Djamal Khelif8, Wendell Nuss9, Ted Rogers9, Ivan Saveliev10, Kipp Shearmar11, Liai Sheng12, Caglar Yardim1
1Naval Postgraduate School, Monterey, CA
2The Ohio State University, Columbus, OH
3 Scripps Institution of Oceanography, University of California, San Diego, San Diego, CA
Session H2: Physics of Radiation Belts II
Room 245

Co-Chairs: Mark Golkowski, University of Colorado Denver; Craig Kletzing, University of Iowa

13:20 H2-1
OBSERVATIONS OF WHISTLER-MODE WAVES WITHIN DENSITY DUCTS BY THE VAN ALLEN PROBES
Sara A. Rosborough*, Miles T. Bengtson, Roxanne L. Stein, Morgan M. Matheny, Anatoly V. Streltsov
Physical Sciences, Embry-Riddle Aeronautical University, Daytona Beach, FL

13:40 H2-2
DISTRIBUTIONS OF WAVE POWER IN THE INNER MAGNETOSHERE AS ORGANIZED BY PLASMA PAUSE LOCATION
David M. Malaspina*, Allison N. Jaynes, Cory Boule, Craig Kletzing, Robert E. Ergun, John R. Wygant
1 Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, CO
2 Keene State College, Keene, NH
3 Physics and Astronomy, University of Iowa, Iowa City, IA
4 Physics and Astronomy, University of Minnesota, Minneapolis, MN

14:00 H2-3
THE ROLE OF SUBSTORMS AND WHISTLER-MODE CHORUS WAVES IN THE REBUILDING OF EARTH'S RADIATION BELT
1 LASP, University of Colorado Boulder, Boulder, CO
2 Space Weather Prediction Center, NOAA, Boulder, CO
3 CIERES, University of Colorado Boulder, Boulder, CO
4 NASA Goddard Space Flight Center, Greenbelt, MD
5 Aerospace Corporation, Los Angeles, CA
6 University of California Los Angeles, Los Angeles, CA
7 University of Iowa, Iowa City, IA
8 University of New Hampshire, Durham, NH
9 Los Alamos National Laboratory, Los Alamos, NM

14:20 H2-4
ULF WAVES IN THE PROTON RADIATION BELT
Anatoly V. Streltsov*, Joseph D. Huba
1 Physical Sciences, Embry-Riddle Aeronautical University, Daytona Beach, FL
2 Plasma Physics Division, Naval Research Laboratory, Washington, DC

14:40 H2-5
ANALYSIS OF WHISTLER WAVES DETECTED BY THE VAN ALLEN PROBES IN EARTHS RADIATION BELTS
Morgan M. Matheny*, Miles T. Bengtson, Sara A. Rosborough, Roxanna L. Stein, Anatoly Streltsov
Physical Sciences, Embry-Riddle Aeronautical University, Daytona Beach, FL
WEDNESDAY AFTERNOON, continued

Session J2: SKA Technical Development
Room 265

Co-Chairs: Eloy de Lera Acedo, University of Cambridge; Antony Schinckel, CSIRO Astronomy and Space Science

13:20 J2-1
THE MURCHISON WIDEFIELD ARRAY
Miguel F. Morales*
Physics, University of Washington, Seattle, WA

13:40 J2-2
HOLOGRAPHIC APERTURE ARRAY STATION CALIBRATION AT LOFAR
Michiel A. Brentjens*¹, David Bordenave²
¹Radio Observatory, ASTRON Netherlands Institute for Radio Astronomy, Dwingeloo, NETHERLANDS
²Physics and Astronomy, University of Washington, Seattle, WA

14:00 J2-3
THE AUSTRALIAN SKA PATHFINDER - AN UPDATE
Antony E. T. Schinckel*, For The ASKAP Team
CSIRO Astronomy and Space Science, Epping, NSW, AUSTRALIA

14:20 J2-4
ASKAP’S PHASED ARRAY FEEDS FOR RADIO ASTRONOMY
Aaron P. Chippendale*, Aidan W. Hotan, For The ASKAP Team
Astronomy and Space Science, CSIRO, Sydney, NSW, AUSTRALIA

14:40 J2-5
MERKAT AS AN SKA-MID PRECURSOR
Justin L. Jonas*
Centre for Radio Astronomy Techniques & Technologies, Rhodes University, Grahamstown, SOUTH AFRICA

15:00 Break

15:20 J2-6
THE SKA LOW FREQUENCY APERTURE ARRAY
Eloy de Lera Acedo*¹, Andrew J. Faulkner¹, Jan Geralt bij de Vaate²
¹University of Cambridge, Cambridge, UNITED KINGDOM
²ASTRON, Dwingeloo, NETHERLANDS

15:40 J2-7
SKA1 LOW CORRELATOR
John D. Bunton*
CASS, CSIRO, Epping, AUSTRALIA

16:00 J2-8
DATA TRANSPORT FOR THE SKA
Keith J. Grainge*
Physics and Astronomy, University of Manchester, Manchester, UNITED KINGDOM

16:20 J2-9
LATEST PERFORMANCE PREDICTION OF THE SINGLE PIXEL FEEDS FOR THE SKA1-MID ARRAY
Isak P. Theron*, Robert Lehmensiek
EMSS Antennas, Stellenbosch, SOUTH AFRICA

16:40 J2-10
WIDEBAND FEED SYSTEM DEVELOPMENT FOR SKA
Bhushan Billade*¹, Magnus Dahlgren¹, Jonas Flygare¹, Jian Yang², Bo Westberg¹, Miroslav Pantaleev¹
¹Earth and Space Science, Chalmers University of Technology, Gothenburg, SWEDEN
²Signals and Systems, Chalmers University of Technology, Gothenburg, SWEDEN

17:00 J2-11
MID-FREQUENCY APERTURE ARRAY FOR THE SQUARE KILOMÈTRE ARRAY
Andrew J. Faulkner*¹, Eloy de Lera Acedo¹, Kris Zarb-Adami²
¹Cavendish Laboratory, University of Cambridge, Cambridge, UNITED KINGDOM
²University of Oxford, Oxford, UNITED KINGDOM

17:20 J2-12
LOW NOISE PHASED-ARRAY FEED WITH CMOS LNAs
Leonid Belostotski*¹, Aaron J. Beaulieu¹, Tom Burgess², Bruce Veidt², James W. Haslett¹
¹Electrical and Computer Engineering, University of Calgary, Calgary, Alberta, CANADA
²Herzberg, NRC, Penticton, BC, CANADA

Business Meetings

17:00 Commission E Room 155
17:00 Commission F Room 150
18:00 Commission A Room 245
18:00 Commission C Room 151

RECEPTION

18:30-21:00
Engineering Center Lobby
(Beer and wine provided. Must have government issued ID and conference badge.)
THURSDAY MORNING, 7 January 2016
Plenary Session
Mathematics Auditorium (Math 100)

Ernest K. Smith USNC-URSI Student Paper Competition
Chair: Erdem Topsakal, Virginia Commonwealth University

8:20 Announcements
8:30 Rules and Guidelines of the Competition
8:40 Student Paper Presentations
9:40 Break

Meeting Highlight: Electromagnetics in Medicine
Co-Chairs: John Volakis, The Ohio State University
Mahta Moghaddam, University of Southern California

10:00 P1-1
WEAK MAGNETIC FIELDS EFFECTS ON BIOLOGICAL SYSTEMS
Frank S. Barnes*
Electrical, Computer, and Energy Engineering, University of Colorado at Boulder, Boulder, CO

10:50 P1-2
MINIATURE WIRELESS IMPLANTS FOR DIAGNOSIS AND THERAPY
Jung-Chih Chiao*
Electrical Engineering, University of Texas at Arlington, Arlington, TX

11:40 Awards Ceremony for Student Paper Competition

12:00 Lunch for Student Travel Awardees, USNC Officers and Commission Chairs (Colorado Room in the Center for Community)

THURSDAY AFTERNOON, 7 January 2016

Session B12: Advances in Computational EM and Emerging Applications
Room 1B40

Co-Chairs: Branislav Notaros, Colorado State University;
Yahya Rahmat-Samii, University of California, Los Angeles

13:20 B12-1
GENERALIZED GAUGE A-PHI FORMULATION TO SOLVE ELECTROMAGNETICS PROBLEMS
Weng Cho Chew*
Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL

13:40 B12-2
USE OF LIS IMPROVED LEVIN METHOD FOR HIGHLY OSCILLATORY REFLECTOR ANTENNA DIFFRACTION KERNEL
Arthur Densmore, Yahya Rahmat-Samii*
Electrical Engineering, University of California Los Angeles, Los Angeles, CA

14:00 B12-3
AN FFT-ACCELERATED MULTIREGION INTEGRAL-EQUATION METHOD FOR ANALYZING ANTENNAS IMPLANTED IN ANATOMICAL HUMAN MODELS
Jackson W. Massey*, Ali E. Yilmaz
Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX

14:20 B12-4
DISPERSION RELATION FOR CYLINDRICAL FDTD GRIDS
Mohammad F. Hadji1,2,3, Atef Z. Elsherbeni2, Melinda J. Piket-May2, Samir F. Mahmoud1
1Electrical Engineering, Kuwait University, Kuwait, KUWAIT
2Electrical Engineering and Computer Science, Colorado School of Mines, Golden, CO
3Electrical, Computer and Energy Engineering, University of Colorado at Boulder, Boulder, CO

14:40 B12-5
ACCELERATING GREEN'S FUNCTIONS FOR UNIAXIAL ANISOTROPIC LAYERED MEDIA USING SOMMERFELD AND RELATED IDENTITIES
Dawei Li*, Donald R. Wilton, David R. Jackson, Ji Chen
Electrical and Computer Engineering, University of Houston, Houston, TX

15:00 Break

15:20 B12-6
RECENT ADVANCES IN DISCONTINUOUS GALERKIN BOUNDARY ELEMENT METHODS FOR MAXWELL EQUATIONS
Zhen Peng*
Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM

15:40 B12-7
HARDWARE ACCELERATION OF AN FMM-FFT SOLVER USING CONSUMER-GRADE GPUs
Malcolm J. Miranda1, Tayfun Ozdemir1, Robert J. Burkholder2
1Virtual EM Inc., Ann Arbor, MI
2ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

16:00 B12-8
GLOBAL 3-D FDTD EARTH-IONOSPHERE MODELS ON EXISTING PETASCAL AND FUTURE EXASCALE SUPERCOMPUTERS
Ali Reza Samimi1, Jamesina J. Simpson2
1Nanometrics, Milpitas, CA
2Electrical and Computer Engineering, University of Utah, Salt Lake City, UT

16:20 B12-9
APPLYING COMPUTATIONAL EM TO REMOTE SENSING AND CHARACTERIZATION OF ATMOSPHERIC PRECIPITATION IN SNOW AND RAIN OBSERVATION CAMPAIGNS
Branislav M. Notaros*, V. N. Brini, Cameron Kleinkorn, Gwo-Jong Huang, Methala Thurai, Patrick Kennedy, Sanja B. Manic, Ana B. Manic, Elene Chobanyan, Nada J. Sekeljic, Milan M. Ilic
Electrical & Computer Engineering, Colorado State University, Fort Collins, CO
THURSDAY AFTERNOON, continued

16:40 B12-10
R.O.S.E. BY ANY OTHER NAME
Jin-fa Lee*, Yongpin Chen, Xuehe Tien, Ming Jiang
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

Session B13: Antennas for Small Satellites
Room 200

Co-Chairs: Reyhan Baktur, Utah State University; David Jackson, University of Houston

13:20 B13-1
CHARACTERIZATION OF KA-BAND MESH SURFACES FOR CUBESAT REFLECTOR ANTENNAS: FROM SIMPLE WIRE GRID MODEL TO COMPLEX KNITS
Vignesh Manohar*, Yahya Rahmat-Samii
Electrical Engineering, University of California Los Angeles, Los Angeles, CA

13:40 B13-2
STUDY OF INTEGRATING REFLECTARRAY WITH SOLAR CELL FOR SMALL SATELLITE APPLICATIONS
Taha Shahvirdi dizaj yekan*, Reyhan Baktur
Electrical and Computer Engineering, Utah State University, Logan, UT

14:00 B13-3
MICROSTRIP ANTENNAS FOR CUBESATS
Xinyu Liu*, Jingshen Liu 1, David R. Jackson 1, Ji Chen 1, Patrick W. Fink 2, Gregory Y. Lin 2
1Electrical and Computer Engineering, University of Houston, Houston, TX
2Electrical Engineering, University of California Los Angeles, Los Angeles, CA

14:20 B13-4
A MULTI-FUNCTION MILLIMETER-WAVE PHASED ARRAY FOR SMALL SATELLITES
Markus H. Novak* 1, Félix A. Miranda 2, John L. Volakis 1
1ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH
2NASA Glenn Research Center, Cleveland, OH

14:40 B13-5
POLARIZATION RECONFIGURABLE ANTENNA FOR SMALL SATELLITE APPLICATION
Taha Shahvirdi dizaj yekan*, Reyhan Baktur
Electrical and Computer Engineering, Utah State University, Logan, UT

15:00 Break

15:40 B14-2
MEASUREMENT OF A LOW-PROFILE TACSAT ANTENNA
Steven Weiss*
U.S. Army Research Laboratory, Adelphi, MD

14:00 B14-3
HF RESONANT STRUCTURE DESIGN USING CHARACTERISTIC MODES
Kristopher R. Buchanan, Carlos Flores*, Diana Acer, John Rockway
Electromagnetics Technology Branch, SSC-Pacific, San Diego, CA

14:20 B14-4
A DEPLOYABLE VIVALDI-FED CONICAL HORN ANTENNA FOR CUBESATS
Arjun Gupta* 1, Joseph Constantinou 1, Youssef Tawk 1, Christos Christodoulou 1, Sergio Pellegrino 2, Maria Sakovsky 2
1Electrical Engineering and Computer Science, Washington State University, Vancouver, WA
2Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM

14:40 B14-5
COMPACT ANTENNAS WITH REDUCED SELF INTERFERENCE FOR IN-BAND FULL-DUPLEX SYSTEMS
Gregory Makar* 1, Santosh Saran*, Nghi Tran 3, Tutku Karacolak 1
1Engineering and Computer Science, Washington State University, Vancouver, WA
3Electrical and Computer Engineering, Mississippi State University, Starkville, MS

15:00 Break

15:20 B14-6
IMPACT OF RADIATION QUALITY FACTOR ON THE TRANSIENT RADIATION FROM A DIRECTLY MODULATED ANTENNA
Shruti Srivastava*, Jacob J. Adams
Electrical and Computer Engineering, North Carolina State University, Raleigh, NC

Session C2: Compressive Sensing
Room 1B51

Co-Chairs: Ozelem Kilic, The Catholic University of America; Aly Fathy, University of Tennessee

13:20 C2-1
STEPPED-FREQUENCY CONTINUOUS WAVE RADAR BASED ON COMPRESSION SENSING
Lingyun Ren* 1, Haofei Wang 2, Vinh Dang 3, Ozelem Kilic 3, Aly E. Fathy 1
1Electrical Engineering and Computer Science, University of Tennessee, Knoxville, TN
2School of Information and Electronics, Beijing Institute of Technology, Beijing, CHINA
3Electrical Engineering and Computer Science, The Catholic University of America, Washington, DC

13:40 C2-2
COMPRESSION SENSING BASED APPROACH FOR THROUGH-WALL DETECTION OF HUMAN RESPIRATORY RATE: PERFORMANCE ANALYSIS
Vinh Dang*, Nghi Tran, Ozelem Kilic
Electrical Engineering and Computer Science, The Catholic University of America, Washington, DC
14:00 C2-3
RECONFIGURABLE ARRAY BASED COMPRESSIVE SENSING MILLIMETER WAVE SYSTEM
Min Liang*1, Ying Li2, Mark A. Neifeld1, Hao Xin1
1 Electrical and Computer Engineering, University of Arizona, Tucson, AZ
2 Electrical and Computer Engineering, University of Science and Technology of China, Hefei, CHINA

14:20 C2-4
COMPRESSIVE SENSING IN RADAR IMAGING OF SUBSURFACE AND THROUGH-THE-WALL TARGETS
Ahmad Hoofar*1, Wenhui Zhang2
1 Electrical and Computer Engineering, Villanova University, Villanova, PA
2 Checkpoint Systems Inc., NJ

14:40 C2-5
PHASE-SENSITIVE THZ IMAGING USING INTENSITY-ONLY MEASUREMENTS
Syed An Nazmus Saquib*, Kubilay Sertel
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

15:00 Break

15:20 C2-6
SPARSE EEG SOURCE LOCALIZATION VIA RANGE SPACE ROTATION
Ahmed Ali Hilli*
Electrical and Computer Engineering, Rutgers University, New Brunswick, NJ

Session F3: Methods and Models for Precipitation Sensing
Room 150
Co-Chairs: Chandrasekar V. Chandra, Colorado State University; Albin Gasiewski, University of Colorado at Boulder

13:20 F3-1
INTEGRATED REMOTE AND IN-SITU SENSING
Eric Frew*, Brian Argrow
Aerospace Engineering Systems, University of Colorado Boulder, Boulder, CO

13:40 F3-2
HIGH-FREQUENCY AIRBORNE MICROWAVE AND MILLIMETER-WAVE RADIOMETER (HAMMR) WEST COAST FLIGHT CAMPAIGN: INTEGRATED WATER VAPOR AND LIQUID WATER RETRIEVALS
Xavier Bosch-Lluis*1, Steven C. Reising1, Pekka Kangaslahti2, Alan B. Tanner2, Shannon T. Brown2, Sharmila Padmanabhan2, Oliver Monte2, Thaddeus P. Johnson1, Victoria D. Hadel1, Karen Ng1
1 Microwave Systems Laboratory, Colorado State University, Fort Collins, CO
2 Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

14:00 F3-3
FEASIBILITY STUDY OF A MICROWAVE RADIOMETER FOR AVIATION SAFETY - MRA'S
Marian Klein*1, Vladimir G. Irisov1, Albin J. Gasiewski2
1 Center for Environmental Sciences and Technology, Boulder, CO
2 Boeing Environmental Sciences and Technology, Boulder, CO

14:20 F3-4
CROSS VALIDATION OF GPM-DPR DUAL-FREQUENCY MEASUREMENTS WITH GROUND RADAR DUAL POLARIZATION MEASUREMENTS
Sounak K. Biswas*, V. Chandrasekar, Karthik Ganesan
Electrical and Computer Engineering, Colorado State University, Fort Collins CO

14:40 F3-5
ONGOING STUDIES OF WINTER PRECIPITATION WITHIN THE MASCRAED PROJECT AND ADVANCES TO THE OBSERVATION AND ANALYSIS PROCESS
Cameron Kleinkort*, Gwo-Jong Huang, Sanja B. Manić, Ana B. Manić, Patrick Kennedy, V. N. Bringi, Branislav M. Notaros
Electrical and Computer Engineering, Colorado State University, Fort Collins CO

15:00 Break

15:20 F3-6
ANALYSIS OF SCATTERING CHARACTERISTICS OF ICE AND WATER RAIN PARTICLES USING SURFACE INTEGRAL EQUATION METHOD AND RADAR OBSERVATIONS
Sanja B. Manić*, Merhala Thurai, V. N. Bringi, Branislav M. Notaros
Electrical and Computer Engineering, Colorado State University, Fort Collins CO

15:40 F3-7
SEPARATION OF CLOUD AND DRIZZLE USING SPECTRAL ANALYSIS FOR ARM CLOUD RADAR
V. Chandrasekar*, Shashank S. Joshi, Pratik Ramdasi
Electrical and Computer Engineering, Colorado State University, Fort Collins CO

16:00 F3-8
HIGH-RESOLUTION WIND RETRIEVAL IN THE LOWER TROPOSHERE WITH CASA DFW URBAN RADAR NETWORK
Haonan Chen*, V. Chandrasekar, Shashank Joshi
Electrical and Computer Engineering, Colorado State University, Fort Collins CO

16:20 F3-9
ESTIMATION OF LINEAR DEPOLARIZATION RATIO AT ATTENUATING FREQUENCIES
Robert M. Beauchamp*, V. Chandrasekar
Electrical and Computer Engineering, Colorado State University, Fort Collins CO

16:40 F3-10
ATTENUATION CORRECTION FOR POLARIMETRIC RADAR OBSERVATIONS AT X-, KU-, AND KA-BAND FREQUENCIES
Haonan Chen*, V. Chandrasekar
Electrical and Computer Engineering, Colorado State University, Fort Collins CO

Session H3: Waves in Outer Solar System Plasmas
Math 100
Co-Chairs: William Kurth, University of Iowa; Robert Ergun, University of Colorado Boulder

13:20 H3-1
MODELING THE RADIO EMISSIONS OF JUPITER AND SATURN
Sebastien L. Hess*
DESP, ONERA - The French Aerospace Lab, Toulouse, FRANCE
THURSDAY AFTERNOON, continued

13:40 H3-2
PLASMA WAVES IN SATURN’S MAGNETOSPHERE
George B. Hospodarsky1, Douglas Menietti1, David Pisa1,2, William S. Kurth3, Donald A. Gurnett1, Ann M. Persoon1, Ondrej Santolík2, Jared S. Leisner1,3, Terrance F. Averkamp1
1Physics and Astronomy, University of Iowa, Iowa City, IA
2Institute of Atmospheric Physics CAS, Prague, CZECH REPUBLIC
3SDSE, LLC., Silver Spring, MD

14:00 H3-3
PLASMA WAVES ASSOCIATED WITH DIONE’S MAGNETOSPHERIC INTERACTION
William S. Kurth4, George B. Hospodarsky1, Patricia Schippers2, Michel Moncuquet4, Alain Lecacheux2, Frank J. Crany3, Krishan Khurana4, Donald G. Mitchell3
1Physics & Astronomy, University of Iowa, Iowa City, IA
2Observatoire de Paris, Meudon, FRANCE
3Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, CO
4Institute of Geophysics and Planetary Physics, University of California, Los Angeles, CA

14:20 H3-4
RADIO EMISSIONS AND ELECTRON PLASMA OSCILLATIONS DETECTED IN THE LOCAL INTERSTELLAR MEDIUM BY VOYAGER 1
Donald A. Gurnett*, William S. Kurth
Physics and Astronomy, University of Iowa, Iowa City, IA

14:40 H3-5
RADIATION FROM ELECTRON PHASE SPACE HOLES AS A POSSIBLE SOURCE OF JOVIAN S-BURSTS
Katherine A. Goodrich*, Robert E. Ergun
Astrophysical and Planetary Sciences, University of Colorado Boulder, Boulder, CO

Session H4: Waves and Instabilities in Laboratory and Space Plasmas
Math 100

Co-Chairs: Robert Pfaff, NASA Goddard Space Flight Center; James LaBelle, Dartmouth College; Erik Tejero, Naval Research Laboratory

15:20 H4-1
GPS AND RADAR DATA ANALYSIS OF MIDLATITUDE IONOSPHERIC PLASMA WAVE IRREGULARITIES
Wayne Scales1,2, Ahmed Eltass2, John Ruohoniemi1, Joseph Baker1, Philip Erickson1
1Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA
2Electrical Engineering, Alexandria University, Alexandria, EGYPT

15:40 H4-2
EXPERIMENTAL VALIDATION OF ELECTROMAGNETIC ELECTRON-ION HYBRID INSTABILITY THEORY
Carl L. Enloe*, Erik M. Tejero, William E. Amatucci, Christopher E. Crabtree, Gurudas I. Ganguli
Plasma Physics Division, Naval Research laboratory, Washington, DC

16:00 H4-3
ANALYSIS OF SIDEBANDS FROM MAGNETOSPHERIC EMISSIONS TRIGGERED BY THE SIPLE STATION TRANSMITTER
Randall E. Wall4,1, Mark Golkowski1, Maria Spasojevic2, Andrew Gibby3
1Electrical Engineering, University of Colorado - Denver, Denver, CO
2Electrical Engineering, Stanford University, Stanford, CA
3Arion Systems, Inc., Chantilly, VA

16:20 H4-4
LABORATORY STUDY OF CHIRPING WHISTLER WAVES
Erik M. Tejero*, Chris Crabtree4, Lon Enloe5, Bill Amatucci1, Guru Ganguli1, Mark Golkowski4
1Plasma Physics Division, Naval Research laboratory, Washington, DC
2Electrical Engineering, University of Colorado Denver, Denver, CO

16:40 H4-5
CHARGE-CONSERVING RELATIVISTIC PIC ALGORITHM ON UNSTRUCTURED GRIDS
Dong-Yeop Na1, Haksu Moon4, Fernando L. Teixeira1, Yuri A. Omelchenko2
1ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH
2Trinum Research Inc., San Diego, CA

Session HE1: Lightning and its Interactions with the Ionosphere
Room 151

Co-Chairs: Joseph Dwyer, University of New Hampshire; Robert Moore, University of Florida; Carl Siefring, Naval Research Laboratory

13:20 HE1-1
LOW-FREQUENCY LIGHTNING DETECTION NETWORK IN KAZAKHSTAN FOR ATMOSPHERE, LITHOSPHERE AND IONOSPHERE RESEARCH SUPPORT
Anatoliy Lozbin1, Alexander Inchin1, Pavel Inchin1, Anatoly Steletsov2
1Scientific Space System Lab, Institute of Space Techniques and Technologies, Almaty, KAZAKHSTAN
2Physical Sciences, Embry-Riddle Aeronautical University, Daytona Beach, FL

13:40 HE1-2
REPORT OF A SECOND TERRRESTRIAL GAMMA RAY FLASH INDUCED BY ROCKET-AND-WIRE TRIGGERED LIGHTNING
Brian Hare1, Martin Uman1, Joseph Dwyer2, Douglas Jordan1, Jaime Caicedo1, Felipe Carvalho1, Robert Wilkes1, Daniel Kotovsky1, William Gamero1, John Pilkey1, Terry Ngin1, Robert Moore1, Hamid Rassoul3, Steve Cummer4, Eric Grove5, Mike Biggerstaff6, Amitabh Nag7
1University of Florida, Gainesville, FL
2University of New Hampshire, Durham, NH
3Florida Institute of Technology, Melbourne, FL
4Duke University, Durham, NC
5Naval Reasrch Laboratory, Washington, DC
6Oklahoma University, Norman, OK
7Vaisala, Helsinki, FINLAND
14:00 HE1-3
ROLE OF MAGNETOSPHERIC DUCTS IN OBSERVA-
TIONS OF ENERGETIC ELECTRON PRECIPITATION IN
THE CONJUGATE HEMISPHERE
Hamid T. Chorsi*1, Mark Golkowski1, Robert C. Moore2
1Electrical Engineering, University of Colorado Denver, Denver, CO
2Electrical and Computer Engineering, University of Florida, Gainesville, FL

14:20 HE1-4
RELATIVISTIC FEEDBACK DISCHARGES DRIVEN BY
POSITIVE LEADERS
Joseph R. Dwyer*
University of New Hampshire, Durham, NH

14:40 HE1-5
X-RAY SOLAR FLARE INDUCED IONOSPHERIC PER-
TURBATIONS OBSERVED BY VLF SFERICS
Jackson C. McCormick*, Morris B. Cohen
Electrical and Computer Engineering, Georgia Tech, Atlanta, GA

15:00 Break

15:20 HE1-6
RARE TYPES OF TRANIENT LUMINOUS EVENTS
OBSERVED ABOVE TWO FLORIDA STORMS ON 12 SEP-
TEMBER 2014
Ningyu Liu*1, Levi D. Bogg5, Michael Splitt2, Steven Laurant1,2,
Chad Glenni1, Hamid K. Rassoul1, Steven A. Cummer3
1Physics and Space Sciences, Florida Institute of Technology, Melbourne, FL
2Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL
3Electrical and Computer Engineering, Duke University, Durham, NC

15:40 HE1-7
MODIFICATION OF THE LOWER IONOSPHERIC CON-
DUCTIVITY BY THUNDERSTORM ELECTROSTATIC
FIELDS
Mohammad A. Salem*, Ningyu Liu, Hamid K. Rassoul
Physics and Space Sciences, Florida Institute of Technology, Melbourne, FL

16:00 HE1-8
POLARIZATION OF VLF TRANSMITTER SIGNALS AS
AN IONOSPHERIC DIAGNOSTIC
Morris Cohen*, Mark Golkowski2
1Electrical and Computer Engineering, Georgia Tech, Atlanta, GA
2Electrical Engineering, University of Colorado Denver, Denver, CO

16:20 HE1-9
EFFECTS OF CONDUCTIVITY PERTURBATIONS IN TIME
DEPENDENT GLOBAL ELECTRIC CIRCUIT MODEL
Jaroslav Jansky*, Victor P. Pasko
CSSL, Penn State University, University Park, PA

16:40 HE1-10
OBSERVATIONS AND SIMULATIONS OF WHISTLER-
MODE WAVES INSIDE DENSITY DUCTS
Miles T. Bengtson*, Sara A. Rosborough, Roxanna L. Stein,
Morgan M. Matheny, Anatoly V. Streltsov
Embry-Riddle Aeronautical University, Daytona Beach, FL

Session HG1: Ionospheric Modification and Remote Sensing
Room 245

Co-Chairs: Anatoly Streltsov, Embry-Riddle Aeronautical University;
Michael Sulzer, Arecibo Observatory;
Paul Bernhardt, NRL;
Valery Zavorotny, NOAA/Earth System Research Laboratory

13:20 HG1-1
HF-DRIVEN PLASMA TURBULENCE AND ARTIFICIAL
IONOSPHERIC LAYERS
Evgeny V. Mishin*, Todd R. Pedersen
Air Force Research Laboratory, Albuquerque, NM

13:40 HG1-2
THE FUTURE OF HAARP IN ALASKA
Robert P. McCoy*
Geophysical Institute of University of Alaska Fairbanks, Fairbanks AK

14:00 HG1-3
THE CHARGED AEROSOL RELEASE EXPERIMENT
(CARE II) TO STUDY ARTIFICIAL DUSTY PLASMAS
AND IRRREGULARITIES IN THE UPPER ATMOSPHERE
Paul A. Bernhardt*1, Carl L. Sierfin1, Stanley J. Brzcin1,2,
Robert H. Holworth2, Todd Anderson2, Asti Bhatt3
1Plasma Physics Division, Naval Research Laboratory, Washington, DC
2Earth and Space Sciences, University of Washington, Seattle, WA
3Radar Science, SRI International, Menlo Park, CA

14:20 HG1-4
AZIMUTH AND FREQUENCY DEPENDENCE OF
ELF/VLF WAVES GENERATED AT THE HAARP FACILI-
TY BY IONOSPHERIC ELECTROJET MODULATION
Mark Golkowski1, Ashanqui S. Maxworth1, Morris B.
Cohen*, Robert C. Moore2
1Electrical Engineering, University of Colorado Denver, Denver, CO
2Electrical and Computer Engineering, University of Florida, Gainesville, FL

14:40 HG1-5
MORPHOLOGY OF TLEs PRODUCING THUNDER-
STORM OVER INDIAN REGION
Ajeet K. Maurya*1,2, Rajesh Singh2, Morris B. Cohen1,
Torsten Neubert3, Oliver Charnion3
1School of Electrical and Computer Engineering, Georgia Institute of
Technology, Atlanta, GA
2Dr K S K Geomagnetic Research Laboratory., Indian Institute of
Geomagnetism, Allahabad, INDIA
3Solar System Physics, Technical University of Denmark, Lyngby, DENMARK

15:00 Break

15:20 HG1-6
MODIFICATION OF THE IONOSPHERE BY THE PRE-
CURSORS OF STRONG EARTHQUAKES
Galina Y. Khachikyan1*, Beibit T. Zhumabayev1, Anatoly V.
Streltsov*2
1Institute of Ionosphere, Almaty, KAZAKSTAN
2Embry-Riddle Aeronautical University, Daytona Beach, FL

21
15:40 J3-5
SETI INSTRUMENTATION FOR BREAKTHROUGH LISTEN
David H. E. MacMahon*
Radio Astronomy Lab, University of California, Berkeley, CA

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

Co-Chairs: David DeBoer, University of California Berkeley; Frank K. Schinzel, University of New Mexico

15:20 J4-1
NEW COOLED FEEDS FOR THE ALLEN TELESCOPE ARRAY
Jack Welch*1, Matt Fleming*, Chris Munson3, Jill Tarter3
1Radio Astronomy Laboratory, University of California Berkeley, Berkeley CA
2Mines Engineering, Antioch, CA
3SETI Institute, Mountain View, CA

15:40 J4-2
ANTENNA SPECIFICATIONS FOR THE NEXT-GENERATION VERY LARGE ARRAY
Robert J. Selina, Jim Jackson*, Wes Grammer
New Mexico Electronics Division, National Radio Astronomy Observatory, Socorro, NM

16:00 J4-3
OPTIMIZATION OF SMALL REFLECTOR ANTENNAS FOR RADIO ASTRONOMY
Ahmed M. Soliman*, Sander Weinreb
Electrical Engineering, California Institute of Technology, Pasadena, CA

16:20 J4-4
THE STARBURST CORRELATOR: A VERSATILE DIGITAL BACK-END FOR WIDEBAND INTERFEROMETRY
Ryan Monroe*1, Jackie R. Villadsen 1, Anthony C. Readhead1, Dale E. Gary2, Stephen J. S. Muchovej1, Loko Kung1, James Lamb1, Gregg W. Hallinan1, Sander Weinreb1
1California Institute of Technology, Pasadena, CA
2New Jersey Institute of Technology, Newark, NJ

17:00 J4-6
THE EXPANDED LONG WAVELENGTH ARRAY (ELWA)
Frank K. Schinzel*
University of New Mexico, Albuquerque, NM
13:20 K1-1
SIMULATION AND EXPERIMENTAL RESULTS FOR HELICAL-ANTENNA RF COILS IN ULTRA-HIGH-FIELD MAGNETIC RESONANCE IMAGING APPLICATIONS
Pranav S. Athalye*, Nada J. Sekeljic, Milan M. Ilic, Andrew J. Kiriluta, Pierre-Francois Van de Moortele, Branimir M. Notaros
1Electrical and Computer Engineering, Colorado State University, Fort Collins, CO
2School of Electrical Engineering, University of Belgrade, Belgrade, Serbia, YUGOSLAVIA
3Radiology, Massachusetts General Hospital, Boston, MA
4Radiology, University of Minnesota, Minneapolis, MN

13:40 K1-2
MICROWAVE INVERSE SCATTERING ALGORITHM WITH FULL-CAVITY NUMERICAL CHARACTERIZATIONS
Guanbo Chen*, John Stang, Mahta Moghaddam
Electrical Engineering, University of Southern California, Los Angeles, CA

14:00 K1-3
APPLICATION OF NON-CONTACT THERMOACOUSTIC IMAGING FOR EMBEDDED EXPLOSIVE DETECTION
Siddhartha Sirsi*, Ahmed H. Abdelrahman, Xiong Wang, Yexian Qin, Russel S. Witte, Hao Xin
1Electrical and Computer Engineering, University of Arizona, Tucson, AZ
2Medical Imaging, College of Medicine, University of Arizona, Tucson, AZ

14:20 K1-4
EXPERIMENTAL STUDY FOR MICROWAVE-INDUCED THERMOACOUSTIC TOMOGRAPHY
Ryan T. Jacobs*, Mark Golkowski, Yiming Deng, Mohand Alzuhiiri, Xiaoye Chen
Electrical Engineering, University of Colorado Denver, Denver, CO

14:40 K1-5
NUMERICAL MODEL FOR MICROWAVE INDUCED THERMOACOUSTIC IMAGING
Mohand Alzuhiiri*, Yiming Deng, Mark Golkowski, Ryan Jacobs
Electrical Engineering, University of Colorado Denver, Denver, CO

15:00 Break

15:20 K1-6
3D PRINTED MICROWAVE HYPERThERMIA APPLICATOR FOR CHEMO-THERMOTHERAPY OF THE BREAST
Umar Hasni, Christopher J. Deloglos, Afroditi V. Filippas, Erdem Topsakal
Electrical & Computer Engineering, Virginia Commonwealth University, Richmond, VA

15:40 K1-7
THE EFFECT OF GLUCOSE ON THE ELECTRICAL PROPERTIES OF BLOOD PLASMA
Arthur W. French, Afroditi V. Filippas, Erdem Topsakal
Virginia Commonwealth University, Richmond VA
FRIDAY MORNING, 8 January 2016

Session B15: Antenna Design and Measurements
Room IB40

Co-Chairs: Dejan Filipovic, University of Colorado Boulder; Sembiam Renganarajan, California State University Northridge

08:20  B15-1
LOW PROFILE META FERRE T STATE BELT ANTENNA FOR FIXED WING AIRCRAFT AT HF
Gregory Mitchell*
U.S. Army Research Laboratory, Adelphi, MD

08:40  B15-2
DESIGN AND PRACTICAL REALIZATION OF A TOP LOADED MONOPOLE ANTENNA FOR HF VEHICULAR COMMUNICATIONS
Bradley F. Allen*, Maxim Ignatenko, Dejan S. Filipovic
Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO

09:00  B15-3
IMPROVED DESIGN OF AN ULTRA-WIDEBAND PLANAR SLOT ANTENNA
William O. Coburn*
RDRL-SER-M, U.S. Army Research Laboratory, Adelphi, MD

09:20  B15-4
A 370 GHZ ON-CHIP RECTANGULAR-WAVEGUIDE-BASED SLOT ANTENNA
Saman Jafarlou*, Peyman Nazari, Payam Heydari
University of California Irvine, Irvine, CA

09:40  B15-5
FABRICATION AND TESTING OF A VEHICULAR LOW-PROFILE HF DOUBLE HALF LOOP ANTENNA
Richard Smith*, Saurabh Sanghai, Maxim Ignatenko, Dejan Filipovic
Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO

11:00  B15-8
OPTIMIZATION OF CIRCULARLY POLARIZED PATCH AND ANNULAR RING ANTENNAS FOR IMPEDANCE MATCHING AND AXIAL RATIO
Jahn H. Habib*1,2, Gregory Mitchell1, Theodore K. Anthony1, Amir I. Zaghloul1,2
1SEDD, U.S. Army Research Laboratory, Adelphi, MD
2Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA

11:20  B15-9
A NON-RESONANT SHORT MONOPOLE ANTENNA WITH LUMPED CIRCUIT FOR WIDEBAND IMPEDANCE MATCHING
Omid Manoochehri*, Farhad Farzami1, Amin Darvazehban2, Danilo Erricolo1
1Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL
2Electrical and Computer Engineering, Amirkabir University of Technology, Tehran, IRAN

11:40  B15-10
ADDRESSING MUTUAL COUPLING BETWEEN UWB PLANAR MONOPOLE ELEMENTS WITH AND WITHOUT METALLIC ENCLOSURES
Seth A. McCormick*, Amir I. Zaghloul
U.S. Army Research Laboratory, Adelphi, MD

Session B16: Terahertz Antennas and Applications
Room 200

Co-Chairs: Kubilay Sertel, The Ohio State University; Hao Xin, University of Arizona

08:20  B16-1
DESIGN, FABRICATION, AND PERFORMANCE OF TER-AHERTZ ANTENNAS
Goutam Chattopadhay*1
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

08:40  B16-2
MICROFLUIDIC BASED HIGH GAIN BEAM-SCANNING ANTENNA ARRAYS FOR MM-WAVES AND BEYOND
Gokhan Mumcu*
Electrical Engineering, University of South Florida, Tampa, FL

09:00  B16-3
MONOLITHIC UWB PHASED ARRAYS FOR MMW AND THZ APPLICATIONS
Seckin Sahin*, Niru K. Nahar, Kubilay Sertel
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

09:20  B16-4
FAR-FIELD AND NEAR FIELD PERFORMANCE CHARACTERIZATION OF A THZ IMAGING SYSTEM
Mingguang Tuo*1, Jitao Zhang1,2, Min Liang1, Wei-Ren Ng1, Michael E. Gehm1,2,3, Hao Xin1
1Electrical and Computer Engineering, University of Arizona, Tucson, AZ
2Bioengineering, University of Maryland, College Park, MD
3Electrical and Computer Engineering, Duke University, Durham, NC
09:40 B16-5
ON-WAFER, NON-CONTACT CHARACTERIZATION OF DIFFERENTIAL-MODE MMW AND THZ DEVICES AND INTEGRATED CIRCUITS
Cosan Caglayan*, Kubilay Sertel
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

10:00 Break

10:20 B16-6
NON-CONTACT CHARACTERIZATION OF TERAHERTZ CIRCUITS USING E-PLANE PROBES
Georgios C. Trichopoulos*
Electrical, Computer, and Energy Engineering, Arizona State University, Tempe, AZ

10:40 B16-7
THZ SPATIAL FILTER WITH BIMATERIAL SWITCHING
Varittha Sanphuang*, Niru K. Nahar, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

Session C3: Advances in Radar Processing, Measurements, and Modeling Techniques
Room 1B51
Co-Chairs: Tegan Webster, U.S. Naval Research Laboratory; Amir Zaghoul, U.S. Army Research Laboratory

08:20 C3-1
INVESTIGATION ON MEAN RADAR CROSS SECTION TROPOSPHERIC SCATTERING LOSS USING INTELLIGENTLY DISTRIBUTED ADHOC POLYMORPHIC ANTENNA ARRAYS
Kristopher R. Buchanan*1, Nam Nicholas Mai2, John Rockway1, Greg Huff3, Oren Sternberg1
1Electromagnetics Technology Branch, SSC-Pacific, San Diego, CA
2Electrical and Computer Engineering, Johns Hopkins University, Ellicott, MD
3Electrical and Computer Engineering, Texas A&M University, College Station, TX

08:40 C3-2
PRF SET SELECTION FOR MULTISTATIC RADAR
Paul Rademacher*, Tegan Webster, Thomas Higgins
Radar Division, United States Naval Research Laboratory, Washington, DC

09:00 C3-3
INVESTIGATION OF HUMAN MICRO-DOPPLER FEATURES IN FOLIATED ENVIRONMENTS
Willis Troy*, David Lin, Michael Thompson, Li Yang
Electrical and Computer Engineering, Baylor University, Waco, TX

09:20 C3-4
COEXISTENCE BETWEEN RADAR AND LTE-U SYSTEMS: SURVEY ON THE 5 GHz BAND
Mina Labhi1, Anothony F. Martone2, Jeffrey H. Reed1, Amir I. Zaghoul1,2
1Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA
2U.S. Army Research Laboratory, Adelphi, MD

09:40 C3-5
AIRBORNE MULTISTATIC POLARIMETRIC RADAR MODELING
Tegan Webster*
Radar Division, U.S. Naval Research Laboratory, Washington, DC
10:40 F4-7
TROPOSPHERIC WATER AND CLOUD ICE (TWICE)
INSTRUMENT DEVELOPMENT FOR 6U CUBESAT DEPLOYMENT: BACK-END ELECTRONIC DESIGN AND TESTING
Mehmet Ogut1, Xavier Bosch-Llus1, Steven C. Reising1, Pekka Kangaslahti2, Erich Schlecht3, Sharmila Padmanabhan4, Richard Cofield2, Nacer Chahat2, Jonathan Jiang2, Shannon T. Brown2, William R. Deal3, Alex Zamora3, Kevin Leong3, Sean Shih3, Gerry Mei3
1Microwave Systems Laboratory, Colorado State University, Fort Collins, CO
2Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
3Northrop Grumman Aerospace Systems, Redondo Beach, CA

11:00 F4-8
PRECISION DESIGN, ANALYSIS AND MANUFACTURING OF QUASI-OPTIC LENS/REFLECTOR ANTENNA SYSTEMS FOR CUBESAT MMW/MMW RADOMETERS
Lavanya Periasamy*, Albin J. Gasiewski
Electrical, Computer, and Energy Engineering, University of Colorado, Boulder, CO

11:20 F4-9
NWP-BASED SIMULATION OF MICROWAVE IMAGING CUBESAT FLEET OBSERVATIONS
Kun Zhang*, Albin J. Gasiewski
Electrical, Computer, and Energy Engineering, University of Colorado at Boulder, Boulder, CO

11:40 F4-10
GPS RADIO OCCULTATION ON A CUBESAT PLATFORM
Anne Marinan*, Kerri Cahoy
1AeroAstro, Massachusetts Institute of Technology, Cambridge, MA
2Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA

Session F5: Propagation Modeling and Measurements
Room 1B51

Co-Chairs: Mark McFarland, Institute for Telecommunication Sciences; Michael Newkirk, The Johns Hopkins University - Applied Physics Laboratory

10:20 F5-1
A SIMPLIFIED PROPAGATION CHANNEL MODEL FOR EVALUATING MRC DIVERSITY CHARACTERISTICS IN SIMO OFDM WITH INSUFFICIENT GUARD INTERVAL
Le T. Phuc*, Yingxian Zheng, Yoshio Karasawa
Advanced Wireless and Communication Research Center, University of Electro-Communications, Tokyo, JAPAN

10:40 F5-2
IN-BUILDING PATH LOSS MODEL ANALYSIS: TESTING ASSUMPTIONS AND IDENTIFYING OUTLIERS IN PROPAGATION MODELS
Mark A. McFarland*, Bob Johnk1, Jaydee Griffith1, Ken Baker2
1Theory Division, Institute for Telecommunication Sciences, Boulder, CO
2Interdisciplinary Telecom Program, University of Colorado Boulder, Boulder, CO

11:00 F5-3
AN OPEN PATH THZ TRANSMISSOMETER FOR DETERMINISTIC AND RANDOM PROPAGATION STUDIES
Lawrence J. Scally1, Albin J. Gasiewski1, Ali Gorashi1, Dean Pirio1
1Colorado Engineering, Inc., Colorado Springs, CO
2Electrical, Computer, and Energy Engineering, University of Colorado Boulder, Boulder, CO

11:20 F5-4
ESTIMATING REFRACTIVITY FROM PROPAGATION LOSS IN TURBULENT MEDIA
Mark A. Wagner*,1, Peter Gerstoft1, Ted Rogers2
1Scripps Institute of Oceanography, University of California San Diego, La Jolla, CA
2Space and Naval Warfare Systems Command, Point Loma, CA

Session GH1: Meteors, Orbital Debris, and Dusty Plasmas
Room 105

Co-Chairs: Julio Urbina, Penn State; Christopher Crabtree, Naval Research Laboratory

08:20 GH1-1
THE DUST ACCELERATOR FACILITY AT THE UNIVERSITY OF COLORADO
Mihaly Horanyi*
Physics, University of Colorado Boulder, Boulder, CO

08:40 GH1-2
PRELIMINARY EXPERIMENTS ON SOLITON GENERATION AND DETECTION IN SIMULATED LEO PLASMA FOR ORBITAL DEBRIS DETECTION
Eric D. Gillman*, Erik Tejero, Chris Crabtree, Guru Ganguli, Bill Amatucci
Plasma Physics, Naval Research Laboratory, Washington, DC

09:00 GH1-3
GROUND-BASED AND MICROGRAVITY STUDIES OF DUSTY PLASMA INSTABILITIES USING PARTICLE IMAGE VELOCIMETRY (PIV)
Edward Thomas1, Uwe Konopka1, Spencer LeBlanc1, Taylor Hall1, Brian Lynch1, Markus Thomas2, Christina Knapek3, Mikhail Pustylnik3, Martin Fink3, Hubertus Thomas3
1Auburn University, Auburn, AL
2Justus-Liebig-Universitat, Geissen, GERMANY
3Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Oberpfaffenhofen, GERMANY

09:20 GH1-4
ALL-SKY TRACKING OF IRREGULARITIES ASSOCIATED WITH MID-LATITUDE SPORADIC-E USING THE LONG WAVELENGTH ARRAY RADIO TELESCOPE
Joseph Helmboldt1, Gregory Taylor2, Sophia Cockrell2
1Naval Research Laboratory, Washington, DC
2University of New Mexico, Albuquerque, NM

09:40 GH1-5
NUMERICAL SIMULATIONS OF METEOR HEAD PLASMA RADAR CROSS SECTIONS
Robert A. Marshall*,1, Sigrid Close*, Paul Bernhardt3, Peter Brown4
1Aerospace Engineering Sciences, University of Colorado Boulder, Boulder, CO
2Aeronautics and Astronautics, Stanford University, Stanford, CA
3Naval Research Laboratory, Washington, DC
4Physics and Astronomy, University of Western Ontario, London, ON, CANADA
10:00 Break

10:20 GH1-6
RANGE-SPREAD METEOR ECHOES FROM NON-FIELD-ALIGNED IRREGULARITIES
Ana M. Tarano*
Aeronautics and Astronautics, Stanford University, Stanford, CA

10:40 GH1-7
EFFECT OF NEUTRAL WIND SPEEDS ON THE CREATION OF METEOR TRAIL ECHOES
Julio V. Urbina*1, Freddy R. Galindo1, Lars P. Dyrud2, Jonathan Fentzke1
1Electrical Engineering, Penn State, University Park, PA
2OmniEarth, Arlington, VA

11:00 GH1-8
EFFECT OF PLASMA TURBULENCE ON THE EVOLUTION OF SPECULAR METEOR ECHOES
Julio V. Urbina*1, Freddy R. Galindo1, Lars P. Dyrud2, Jonathan Fentzke1
1Electrical Engineering, Penn State, University Park, PA
2OmniEarth, Arlington, VA

11:20 GH1-9
A BAYESIAN APPROACH TO SINGLE MEASUREMENT BLIND SOURCE SEPARATION
Andrew Nuttall*, Sigrid Close
Aeronautics and Astronautics, Stanford University, Stanford, CA

Session HFG1: GNSS, Radio Beacons and Remote Sensing Room 245

Co-Chairs: Valery Zavorotny, NOAA/Earth System Research Laboratory; Paul Bernhardt, Naval Research Laboratory; Anthea Coster, Massachusetts Institute of Technology

08:20 HFG1-1
EARTH REMOTE SENSING WITH THE GLOBAL NAVIGATION SATELLITE SYSTEM REFLECTOMETRY
Cinzia Zuffada1, Rashmi Shah1, Zhijin Li1, Maria Paola Clarizia1, Steve Lowe1, Clara Chew1
1Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
2University of Michigan, Ann Arbor, MI

08:40 HFG1-2
GNSS-REFLECTOMETRY WITH NASA’S SOIL MOISTURE ACTIVE/PASSIVE MISSION
Stephen T. Lowe*, Samuel Chan, Stephan Esterhuizen, Adam Freedman, Shadi Oveisgharan, Larry Young
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

09:00 HFG1-3
AN EXAMINATION OF TDS-1 GNSS-R RETURNS OVER LAND SURFACES
Jeonghwan Park1, Joel T. Johnson1, Andrew O’Brien1, Stephen T. Lowe1, 2
1ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH
2Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

09:20 HFG1-4
SENSITIVITY OF GNSS REFLECTED SIGNALS TO CHANGES IN LAND SURFACE CHARACTERISTICS, AS RECORDED BY TECHDEMOSAT-1
Clara C. Chew*, Cinzia Zuffada, Anthony J. Mannucci, Rashmi Shah
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

09:40 HFG1-5
MEASUREMENT OF SURFACE REFLECTIVITY USING SIGNALS OF OPPORTUNITY
Rashmi Shah*1, Simon Yueh1, Xiaolan Xu1, Yunjin Kim1, Kelly Elder2, James Garrison3, Abi Komandur4
1Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
2United States Forest Service, Fort Collins, CO
3Aeronautics and Astronautics, Purdue University, West Lafayette, IN

10:00 Break

10:20 HFG1-6
CONSTELLATION OBSERVING SYSTEM FOR METEOROLOGY, IONOSPHERE AND CLIMATE: OVERVIEW OF THE COSMIC-2 MISSION
William S. Schreiner*
University Corporation for Atmospheric Research, Boulder, CO

10:40 HFG1-7
PROPCUBE RADIO BEACONS SATELLITES FOR IONOSPHERIC AND RADIO ASTRONOMICAL APPLICATIONS
Paul A. Bernhardt*1, Namir Kassim2, Mike Sulzer2, John Abel3
1Plasma Physics Division, Naval Research Laboratory, Washington, DC
2Aeronomy, Arcibo Observatory, Arcibo, PUERTO RICO
3Nanosat, TVYAK, Irvine, CA

11:00 HFG1-8
DISTRIBUTION OF COMMON-VOLUME LEO-BASED AND GROUND-BASED GNSS IONOSPHERE OBSERVATIONS
Brian Breitsch*
Electrical Engineering, Colorado State University, Fort Collins, CO

11:20 HFG1-9
A COMBINED GROUND AND SPACE IONOSPHERIC OBSERVATION NETWORK WITH INTER-SEGMENT COORDINATION (IONIC)
Andrew K. Kennedy*, Kerri L. Cahoy
Aeronautics and Astronautics, Massachusetts Institute of Technology, Cambridge, MA

11:40 HFG1-10
RECENT ADVANCES IN LARGE-SCALE GNSS PROCESSING
Anthea Coster*, Juha Vierinen, William Rideout, Victor Pankratius, Frank Lind, Philip Erickson
MIT Haystack Observatory, Westford, MA

Session J5: Timing and Transients Room 265

Co-Chairs: Paul Demorest, National Radio Astronomy Observatory; Peter Williams, Harvard

08:20 J5-1
TIMING AND TRANSIENTS
Paul Demorest*
National Radio Astronomy Observatory, Socorro, NM
FRIDAY MORNING, continued

08:40 J5-2
CHALLENGES AND SOLUTIONS: DESIGNING THE PULSAR SEARCH SUBELEMENT FOR THE SKA
Mitchell Mickaliger1,2, Time Domain Team1
1The University of Manchester, Manchester, UNITED KINGDOM
2Various, Various, UNITED KINGDOM

09:00 J5-3
ON THE BLIND DETECTION OF FRBS THROUGH SPATIAL FOURIER TRANSFORMS
Marwan Alkhweldi1, Richard Prestage2, Ryan Lynch2, Natalia A. Schmid3
1Computer Science and Electrical Engineering, West Virginia University, Morgantown, WV
2National Radio Astronomy Observatory, Green Bank, WV

09:20 J5-4
SEARCHING FOR SLOW AND FAST TRANSIENTS WITH THE VLA LOW BAND IONOSPHERIC AND TRANSIENT EXPERIMENT
Emil Polisensky1, Namir Kassim1, Wendy Peters1, Scott Hyman2,3, Paul Ray4, Julia Deneva3, Fernando Cardoso5, Simona Giacintucci2, Joseph Helmboldt1, Tony Mroczkowski1,2, Emily Cleland1, Tracy Clarke1
1Remote Sensing Division, Naval Research Laboratory, Washington, DC
2Engineering and Physics, Sweet Briar College, Sweet Briar, VA
3Computational Physics Inc, Springfield, VA
4Space Sciences Division, Naval Research Laboratory, Washington, DC
5National Research Council Postdoc, Washington, DC
6West Virginia University, Morgantown, WV
7Thomas Jefferson High School for Science and Technology, Alexandria, VA

09:40 J5-5
PULSAR AND FAST RADIO BURST SCIENCE: THE CHIME TELESCOPE AND THE PALFA SURVEY
Erik C. Madsen*
Physics, McGill University, Montreal, QC, CANADA

Session J6: New Telescopes, Techniques, and Observations II
Room 265

Co-Chairs: Hsin C. Chiang, University of KwaZulu-Natal;
David DeBoer, University of California Berkeley

10:20 J6-1
THE VLA LOW BAND IONOSPHERIC AND TRANSIENT EXPERIMENT (VLUITE): A NEW COMMENSAL SYSTEM ON THE NRAO VLA
Tracy Clarke1,2, Namir Kassim1, Paul Ray2, Wendy Peters1, Simona Giacintucci2, Joseph Helmboldt1, Tony Mroczkowski1, Emil Polisensky1
1Remote Sensing, Naval Research Laboratory, Washington, DC
2Space Sciences, Naval Research Laboratory, Washington, DC
3Computational Physics Inc, Springfield, VA
4NRC, Washington, DC

10:40 J6-2
PRELIMINARY MEASUREMENTS WITH THE EDGES LOW-BAND INSTRUMENT
Raul A. Monsalve1, Judd D. Bowman1, Alan E. Rogers2, Thomas J. Moczizen1
1School of Earth and Space Exploration, Arizona State University, Tempe, AZ
2Hytest Observatory, Massachusetts Institute of Technology, Westford, MA

11:00 J6-3
HIRAX: THE HYDROGEN INTENSITY AND REAL-TIME ANALYSIS EXPERIMENT
Hsin C. Chiang*
Astrophysics & Cosmology Research Unit, University of KwaZulu-Natal, Durban, SOUTH AFRICA

11:20 J6-4
CONSTRAINING IGM HEATING WITH THE 21CM POWER SPECTRUM; PREDICTIONS AND FIRST OBSERVATIONS WITH THE MWA
Aaron Ewall-Wice1, Joshua Dillon1,2, Jacqueline Hewitt1, Adrian Liu2, Agy Loeb3, Andre Mesinger4, Abraham Neben1, Andre Offringa5, Jonathan Pober6,7, Max Tegmark1
1MIT Kavli Center for Astrophysics and Space Research, MIT, Cambridge, MA
2Astronomy, Berkeley, Berkeley, CA
3Center for Astrophysics, Harvard University, Cambridge, MA
4Scuola Normale Superiore, Pisa, ITALY
5Netherlands Institute for Radio Astronomy, Dwingaloo, NETHERLANDS
6Physics, University of Washington, Seattle, WA
7Physics, Brown University, Providence, RI

11:40 J6-5
ATACAMA LARGE MILLIMETER/SUBMILLIMETER ARRAY (ALMA): STATUS AND DEVELOPMENT
Pierre Cox*, Stuartt Corder, John Carpenter
Joint ALMA Observatory, Santiago de Chile, CHILE

Session K2: Implanted Sensors and Propagation Inside the Human Body
Room 155

Co-Chairs: Ozem Kilic, The Catholic University of America;
Majid Manteghi, Virginia Tech

08:00 K2-1
HUMAN VITAL SIGN DETECTION USING FAST FOURIER TRANSFORM
Tuan Phan*, Quang Nguyen, Nghia Tran, Ozem Kilic
Electrical Engineering and Computer Science, The Catholic University of America, Washington, DC

08:40 K2-2
SIMULATION OF DYNAMIC ON-BODY WAVE PROPAGATIONS WITH EXPERIMENTAL VERIFICATIONS
George Lee*, Brian Garner, Yang Li
Engineering and Computer Science, Baylor University, Waco, TX

09:00 K2-3
EFFECTS OF BODY POSITION AND MOTION ON ON-BODY WIRELESS CHANNELS
Erik V. Forrister*
Mechanical Engineering, Baylor University, Waco, TX
A WIRELESS POWER TRANSFER SYSTEM FOR IMPLANTED DEVICES
Majid Manteghi*
Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA

MINIATURIZED FULLY-PASSIVE BRAIN IMPLANT FOR WIRELESS ACQUISITION OF LOW-LEVEL NEUROPOTENTIALS
Cedric W. Lee*, David E. Liske, Asmina Kiourti, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

A DEFORMABLE ANTENNA FOR STOMACH IMPLANTS
S. Dubey*
Electrical Engineering, University of Texas at Arlington, Arlington, TX

FRIDAY AFTERNOON, 8 January 2016
Session B17: Antenna Arrays
Room 1B40

13:20 B17-1
A PATTERN-RECONFIGURABLE, WIDEBAND, HIGH GAIN, PARASITIC ARRAY ANTENNA
Yen Le*, Sungkyun Lim
Electrical Engineering, Georgia Southern University, Statesboro, GA

13:40 B17-2
BANDWIDTH ENHANCEMENT OF PLATFORM-MOUNTED HF ANTENNAS USING THE THEORY OF CHARACTERISTIC MODES
Ting-Yen Shih*, Nader Behdad
Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, WI

14:00 B17-3
18-40 GHz PHASED ARRAY ANTENNA USING PRINTED CIRCUIT BOARD FABRICATION AND SURFACE-MOUNT MEMS PHASE SHIFTERS
Anas J. Abumunshar*, Woong-Gi Yeo, Ninh K. Nahar, Kubilay Sertel
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

14:20 B17-4
A NOVEL ARRAY WITH 6:1 BANDWIDTH AND 70 DEGREE SCANNING USING FSS SUPERSTRATE
Erkin Yetisir*, Nima Ghahchechian, John J. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

MODAL ANALYSIS OF A PLANAR, PRINTED ARRAY FOR WEATHER MEASUREMENT
Matilda Livadaru*, John L. Volakis
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

INVESTIGATION OF MODAL BEAM GENERATION FROM ORTHOGONAL MODES OF THE CIRCULAR CANONICAL FAMILY RANDOM ARRAY TOPOLOGY
Nam Nicholas Mai*1, Kristopher Buchanan2
1Electrical and Computer Engineering, Johns Hopkins University, Ellicott City, MD
2Electromagnetics Technology Division, SPAWAR, San Diego, CA

INVESTIGATING BEAMFORMING GAINS OF FREQUENCY DIVERSE INTELLIGENTLY DISTRIBUTED ADHOC POLYMORPHIC ANTENNA ARRAYS
Timi Adeyemi*, Kris Buchanan, Nicholas Johnson, Michael Civerolo, John Rockway
Spawar System Center Pacific, San Diego, CA
FRIDAY MORNING, continued

14:00 F6-3
EVALUATION OF THE SMAP L1 RADAR BACKSCATTER DATA AND EFFECTS OF TERRAIN TOPOGRAPHY ON SOIL MOISTURE ESTIMATION
Ruzbeh Akbar*, Mahta Moghaddam
Electrical Engineering, University of Southern California, Los Angeles, CA

14:20 F6-4
SOIL MOISTURE RETRIEVAL USING L-BAND SMAP RADAR DATA: FORWARD MODEL EVALUATIONS AND INVERSION IMPROVEMENTS
Seungbum Kim1, Jakob Van Zyl1, Mahta Moghaddam2, Leung Tsang3, Dara Entekhabi3, Simon Yueh1
1Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
2University of Southern California, Los Angeles, CA
3University of Michigan, Ann Arbor, MI

14:40 F6-5
MODELING AND ANALYSIS OF COHERENT BISTATIC SCATTERING FROM CROPLANDS AND FORESTS
Amir Azemati*, Mahta Moghaddam
Electrical Engineering, University of Southern California, Los Angeles, CA

15:00 Break

15:20 F6-6
POST-BETA STATUS OF THE SMAP PASSIVE SOIL MOISTURE PRODUCT
Steven Chan1, Rajat Bindlish2, Peggy O'Neill3, Eni Njoku1, Tom Jackson3, Andreas Colliander4, Fan Chen2
1Electrical and Computer Engineering, George Washington University, Washington, DC
2Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO
3Electrical, Computer and Energy Engineering, University of Central Florida, Orlando, FL
4Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

15:40 F6-7
ANTENNA PATTERN CORRECTIONS FOR THE COMBINED RADAR / RADIOMETER (COMRAD) GROUND-BASED SMAP SIMULATOR
Mehmet Kurum1, Roger Lang1, Peggy O'Neill2, Alicia Joseph2, Michael Cosh3, Wasy Wasylikwskyj4, Mehmert O gut4
1Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
2NASA Goddard Space Flight Center, Greenbelt, MD
3Hydrological Sciences Laboratory, NASA Goddard Space Flight Center, Greenbelt, MD
4Hydrology and Remote Sensing Laboratory, USDA-ARS, Beltsville, MD

16:00 F6-8
PALS (PASSIVE ACTIVE L-BAND SYSTEM) SOIL MOISTURE MEASUREMENTS IN SMAPVEX15 (SMAP VALIDATION EXPERIMENT 2015)
Andreas Colliander1, Sidharth Misra1, Thomas Jackson2, Chun-Sik Chae1, Michael Cosh2, Wade Crow2, Simon Yueh1
1Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
2Hydrology and Remote Sensing Laboratory, USDA ARS, Beltsville, MD

16:20 F6-9
L-BAND SOIL MOISTURE MAPPING USING A SMALL UNMANNED AERIAL SYSTEM
Eryan Dai1, Albin J. Gasiewski1, Maciej Stachura2, Jack Elston2
1Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO
2Black Swift Technologies (BST) LLC, Boulder, CO

16:40 F6-10
A NONLINEAR COUNTS TO ANTENNA TEMPERATURE ALGORITHM FOR A TOTAL POWER RADIOMETER WITH EXTERNAL CALIBRATION AND NOISE DIODE INJECTION
Faisal A. Alquaied1, W Linwood Jones
Electrical and Computer Engineering, University of Central Florida, Orlando, FL

Session F7: Complex and Random Media

Room 150

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

13:20 F7-1
NONLOCAL CONTRIBUTIONS TO 1-D ROUGH SURFACE SCATTERING
Gary S. Brown*, Kevin Diomedi
Electrical and Computer Engineering, Virginia Polytechnic Institute & State University, Blacksburg, VA

13:40 F7-2
PROBABILITY DENSITY FUNCTIONS OF BISTATIC ROUGH SURFACE SCATTERED FIELDS USING THE SMALL SLOPE APPROXIMATION
Hongkun Li*, Joel T. Johnson
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

14:00 F7-3
SENSITIVITY ANALYSIS OF P-BAND INTERFEROMETRIC SAR RESPONSE TO SOIL MOISTURE PROFILES AND SUBSURFACE RANDOM MEDIA
Richard H. Chen*, Mahta Moghaddam
Electrical Engineering, University of Southern California, Los Angeles, CA

14:20 F7-4
ROBUST NUMERICAL SPECTRAL-DOMAIN MODELING OF SUBSURFACE EM SENSORS IN PLANAR-LAYERED MEDIA BASED ON THE COMPLEX-PLANE METHOD OF WEIGHTED AVERAGES
Kamlesh K. Sainath*, Fernando L. Teixeira
Electrical and Computer Engineering, ElectroScience Laboratory, The Ohio State University, Columbus, OH

14:40 F7-5
BEAM FORMATION FOR ENHANCING EARLY/TIME DIFFUSION IN SHORT OPTICAL PULSE PROPAGATION THROUGH RANDOM PARTICULATE MEDIA
Elizabeth Bleszynski*, Marek Bleszynski, Thomas Jaroszewicz
Monopole Research, Thousand Oaks, CA

15:00 Break
15:20 F7-6
DOMAIN DERIVATIVES IN SCATTERING FROM ROUGH SURFACES
Saba Mudalian
Sensors Directorate, Air Force Research Laboratory, Dayton, OH

15:40 F7-7
ROBUST SPECTRAL-DOMAIN METHODOLOGY FOR NUMERICAL MODELING OF REMOTE SENSORS: APPLICATION TO CSEM PROSPECTION OF MARINE HYDROCARBON RESERVES
Kamalesh K. Sainath*, Dong-Yeop Na, Fernando L. Teixeira
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

16:00 F7-8
AN AUTONOMOUS CRYOBOT SYNTHETIC APERTURE RADAR FOR SUBSURFACE EXPLORATION OF EUROPA
Omkar P. Pradhan*, Albin J. Gasiewski, Srikumar Sandeep
Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO

16:20 F7-9
CALIBRATION OF THE ULTRA-WIDEBAND SOFTWARE DEFINED MICROWAVE RADIOMETER FOR ICE SHEET THERMOMETRY
Mark J. Andrews*, Joel T. Johnson, Hongkun Li, Mustafa Aksoy
ElectroScience Laboratory, Electrical and Computer Engineering, The Ohio State University, Columbus, OH

16:40 F7-10
INDOOR SENSING WITH UWB OFDM RADAR: EXPERIMENTAL FREQUENCY-DOMAIN APPROACH
Dmitriy Garmatyuk1, Saba Mudalian*2, Melissa Simms1
1Miami University, Oxford, OH
2Air Force Research Laboratory, WPAFB, OH

Session G1: Space Plasma Measurement Techniques Room 105

Co-Chairs: Tom Gaussiran, ARL/UT; Philip Erickson, MIT Haystack Observatory

13:20 G1-1
RESULTS OF COHERENT BACKSCATTER RADAR IMAGING USING CAPON'S METHOD AND MEASUREMENTS MADE BY THE SAO LOUIS RADAR INTERFEROMETER
Gebreab K. Zewdie*, Fabiano S. Rodrigues
Electrical and Computer Engineering, The University of Texas at Dallas, Dallas, TX

13:40 G1-2
MODIFICATION OF THE LF TRANSMIT SITE AT DIXON TO SUPPORT RF PROPAGATION AND IONOSPHERIC RESEARCH
Doeg Rodriguez1, Nicholas Lumdsen*1, Peder Hansen2, Laura Lukes3, Jill Nelson4, K. C. Kerby-Patel5, Filip Czrowy5, William Liles6, John D. Rockway1
1SC Pacific, San Diego, CA
2Long Wave Inc., Oklahoma City, OK
3George Mason University, Fairfax, VA
4University of Massachusetts at Boston, Boston, MA
5Independent, Reston, VA

14:00 G1-3
AN MF/HF ANTENNA ARRAY FOR RADIO AND RADAR IMAGING OF THE IONOSPHERE
Terence Bullet1, Bjorn Gustavsson2, Brett Isham3, Vasyl Beliye4
1University of Colorado / NOAA, Boulder, CO
2University of Tromso, Tromso, NORWAY
3Interamerican University of Puerto Rico, Bayamon, PUERTO RICO
4Pinhole AS, Tromso, NORWAY

14:20 G1-4
MEAN SPECTRAL CHARACTERISTICS OF ACOUSTIC GRAVITY WAVES IN THE THERMOSPHERE-IONOSPHERE DETERMINED FROM DYNASONDE DATA
Catalin Negrea*1,2,3,4, Nikolay A. Zabotin1,2
1Electrical, Computer and Energy Engineering, University of Colorado at Boulder, Boulder, CO
2Cooperative Institute for Research in Environmental Sciences, University of Colorado at Boulder, Boulder, CO
3Space Weather Prediction Center, National Oceanic and Atmospheric Administration, Boulder, CO
4Institute of Space Science, Magurele, IF, ROMANIA

14:40 G1-5
MEASURING IONOSPHERIC RESPONSE TO SOLAR FLARE WITH DYNASONDES
Nikolay A. Zabotin*, Terence W. Bullet
Electrical, Computer and Energy Engineering, University of Colorado Boulder, Boulder, CO

15:00 Break

15:20 G1-6
THE IMPULSE RESPONSES OF ELECTRONICALLY SCANNED AND DISH BASED ISR
John P. Swoboda*, Joshua Semeter
Electrical and Computer Engineering, Boston University, Boston, MA

15:40 G1-7
ATMOSPHERIC PLANETARY WAVES IMPACT ON IONOSPHERIC CORRECTION IN GPS
Andrey N. Lyakhov1, Tatiana V. Losseva1, Alexei Chernemen2
1Institute of Geospheres Dynamics, Moscow, RUSSIAN FEDERATION
2Aerophysics and Space Research, Moscow Institute of Physics and Technology, Moscow, RUSSIAN FEDERATION

16:00 G1-8
ON THE STATISTICS OF INTENSITY SCINTILLATIONS FOR A TWO-COMPONENT IRREGULARITY POWER LAW SPECTRUM
Charles S. Carrano*, Charles L. Rino
Institute for Scientific Research, Boston College, Chestnut Hill, MA

16:20 G1-9
IMPACTS OF IONOSPHERE-THERMOSPHERE COUPLING ON IONOSPHERIC PREDICTABILITY IN AN ENSEMBLE DATA ASSIMILATION AND FORECASTING SYSTEM
Chih-Ting Hsu*, Tomoko Matsuo2, Wenbin Wang3, Xinan Yue4, Jann-Yenq Liu1
1Institute of Space Science, National Central University, Taoyuan, TAIWAN
2Space Weather Prediction Center, National Oceanic and Atmospheric Administration, Boulder, CO
3U.S. Air Force Academy, Colorado Springs, CO
4COSMIC program office, University Corporation for Atmospheric Research, Boulder, CO
15:40 J7-6
UNRAVELLING THE MYSTERIES OF STAR AND PLANET FORMATION WITH ALMA
Doug I. Johnstone*
National Research Council Canada - Herzberg Astronomy and Astrophysics, Victoria, BC, CANADA

15:40 J7-7
SPECTRAL OBSERVATIONS OF STAR FORMATION WITH ALMA
James Di Francesco*
National Research Council of Canada, Victoria, BC, CANADA

16:00 J7-8
GETTING THE MOST OUT OF YOUR ALMA DATA WITH ADMIT: THE ALMA DATA MINING TOOLKIT
Leslie Looney*1, Lee Mundy2, Doug Friedel3, Peter Teuben2, Marc Pound2, Lisa Xu1, Kevin Rauch2, Robert Harris1, Jeff Kern3
1 University of Illinois Urbana-Champaign, Urbana, IL
2 University of Maryland, College Park, MD
3 National Radio Astronomy Observatory, Socorro, NM

16:20 J7-9
PROBING MASSIVE STAR CLUSTER FORMATION WITH ALMA
Kelsey Johnson*
Astronomy, University of Virginia, Charlottesville, VA

16:40 J7-10
GALAXY EVOLUTION ACROSS COSMIC TIME: THE IMPORTANT ROLE OF ALMA
Caitlin M. Casey*
Astronomy, University of Texas at Austin, Austin, TX

17:00 J7-11
DETECTING DARK MATTER SUBHALOS WITH ALMA OBSERVATIONS OF GRAVITATIONALLY LENSED GALAXIES
Yashar Hezaveh*
Kavli Institute for Particle Astrophysics and Cosmology, Stanford University, Stanford, CA

SATURDAY MORNING, 9 January 2016

08:00 – 11:00 USNC-URSI Executive Council, Breakfast Meeting, Millennium Hotel