



The National Academies of
SCIENCES • ENGINEERING • MEDICINE



National Radio Science Meeting

January 4-8, 2022

University of Colorado at Boulder

Meeting website: www.nrsmboulder.org

USNC-URSI website: www.usnc-ursi.org

This open scientific meeting is sponsored by the U.S. National Committee (USNC) for the International Union of Radio Science (URSI). The USNC-URSI is appointed by the National Academies of Sciences, Engineering and Medicine, and represents U.S. radio scientists in URSI. Through technical co-sponsorship of the meeting by the IEEE Antennas and Propagation Society, authors will have their choice of submitting one-page abstracts that are not submitted to IEEE Xplore, or two-page summaries that may be submitted to IEEE Xplore. At least one author is required to register for each presented abstract or summary. While USNC-URSI encourages in-person attendance for all presenters, a fully-hybrid meeting is being planned to allow for authors to present remotely, and for all attendees to participate fully in the conference. Papers must be presented for their corresponding summaries to be included in the proceedings and submitted to IEEE Xplore. Abstracts or summaries on any topic in the interest area of a Commission are welcome. Contact the appropriate USNC-URSI Commission Chair listed below or visit the meeting website for further information.

USNC-URSI Chair (2018-2021): Sembiam R. Rengarajan, (818) 677-3571, srengarajan@csun.edu
USNC-URSI Chair (2022-2023): Michael H. Newkirk, (240) 228-6976, Michael.Newkirk@jhuapl.edu

PLENARY THEME: RF Spectrum Use, Management, and Interference Mitigation

Shannon Blunt, University of Kansas

Andy Clegg, Google and Baylor University

Harvey Lizst, National Radio Astronomy Observatory

ABSTRACT AND SUMMARY SUBMISSION

The organizers of this meeting require the use of electronic submission. Details and instructions may be found at the conference website, www.nrsmboulder.org. Authors may choose to submit to special sessions in addition to the general topics listed below. A list of special sessions will be available on the conference website. All abstracts or summaries must be submitted online by **Sunday, September 19, 2021**. If you have any questions on abstract/summary submission or the technical program, please direct them to the USNC-URSI Secretary, at Michael.Newkirk@jhuapl.edu. Abstracts must have a minimum of 250 words. You will not be able to submit an abstract that does not meet the minimum length requirements. After abstract or summary submission is complete, please note that registration is required to attend any session of the meeting or to present a paper. More information about USNC-URSI is available at www.usnc-ursi.org.

ERNEST K. SMITH USNC-URSI STUDENT PAPER COMPETITION

Prizes will be awarded to three student papers. Awards will be made for First Prize in the amount of \$1000, Second Prize at \$750, and Third Prize at \$500. The deadline for submission of **full papers** on the meeting website is **September 19, 2021**. Please see www.nrsmboulder.org for additional information, or contact the Student Paper Chair, Prof. Erdem Topsakal, Dept. of ECE, Virginia Commonwealth University, etopsakal@vcu.edu. Student papers will be presented at a separate session and awards will be presented during the conference. Student Paper Competition participants will have the option of submitting their full papers for publication in a special section of the journal *Radio Science*.

Questions?

For questions concerning conference logistics, please contact Christina Patarino at:
Phone: (303) 492-5151
E-mail: nrsmboulder@colorado.edu

**Abstract / Summary Submissions and
Student Paper Competition Submissions
are due by
September 19, 2021
This is a FIRM DEADLINE!
Please visit www.nrsmboulder.org**

COMMISSION TOPICS

COMMISSION A, Electromagnetic Metrology

Jeanne Quimby, 303-497-4217, jeanne.quimby@nist.gov
Incoming Chair (2022-2023): Chris Anderson

TOPICS

Antennas
Bioeffects and medical applications
EM-field metrology
EMC and EM pollution
Impulse radar
Interconnect and packaging
Materials
Microwave to submillimeter measurements/standards
Millimeter-wave and sub-mm wave communications
Noise
Planar structures and microstrip circuits
Quantum metrology and fundamental concepts
Time and frequency
Time domain metrology

COMMISSION B, Fields and Waves

Branislav Notaros, 970-491-3537, notaros@colostate.edu

TOPICS

Antennas:
Antenna theory, design, and measurements
Antenna arrays and systems
Microstrip and printed antennas, circuits, and devices
Antenna feeds and reflector and reflectarray antennas
Propagation, Scattering, Sensing:
Electromagnetic propagation, scattering, and interaction
Guided-wave structures and systems
Imaging, inverse scattering, and remote sensing
Wireless sensors, networks, and communication
Numerical Methods:
Integral-equation methods
Finite-element, finite-difference, and hybrid methods
Computational electromagnetics, analysis, and optimization
Theory, Materials, Education:
Electromagnetic theory
Metamaterials and complex media
Electromagnetics education
Devices, Systems, Applications:
RF and microwave devices, structures, and systems
THz and optical antennas, devices, and systems
Biomedical applications of fields and waves

COMMISSION C, Radio-communication Systems and Signal Processing

Eric L. Mokole, 703-983-3349, eric.mokole@outlook.com
Incoming Chair (2022-2023): Jean-Francois Chamberland

TOPICS

Addressing digital divide through radiocommunication systems
Artificial intelligence/Machine learning for RF systems
Cognitive radio
Computational imaging and inverse methods
Computational resource management
Distributed sensor networks
Dynamic spectrum networks
Physics-based signal processing
Quantum RF theory/Technologies/Applications
Radar systems
Radar target detection, localization, and tracking
RF spectrum convergence/Harmony/Maneuver
Sensor array processing and calibration
Signal processing for radar remote sensing
Software-defined and cognitive radio/Radar/Sensing
Statistical signal processing of waves in random media
Synthetic aperture and space-time processing

COMMISSION D, Electronics and Photonics

Negar Ehsan, 301-286-8406, negar.ehsan@nasa.gov
Incoming Chair (2022-2023): Jonathan Chisum

TOPICS

Electronic devices, circuits, and applications
Photonic devices, circuits, and applications
Physics, materials, CAD, technology and reliability of electronic and photonic devices, in radio science and telecommunications
Wide bandgap materials
THz electronics
Reconfigurable RF

COMMISSION E, Electromagnetic Environment and Interference

Larry Cohen, 202-404-7726, lawrence.cohen@nrl.navy.mil
Incoming Chair (2022-2023): Charles Baylis

TOPICS

Radio-communication systems (IoT, 5G, NextG, MIMO, MISO) in presence of noise
Radiofrequency (communication, radar, sensing, calibration, surveillance, telemetry, etc.) in presence of noise
Radiofrequency spectrum, medium utilization, and convergence (cognitive and cooperative techniques, electromagnetic spectral harmony)
Scientific basis and effects of natural and intentional emissions on system performance
Electromagnetic modeling of systems and environments (artificial, composite noise, terrestrial and planetary noise of natural origin)
Electromagnetic compatibility in computational electromagnetics, education, measurement technologies, standards, and radiation hazards
High-power electromagnetic effects of transients on electronic systems
Signal and power integrity

COMMISSION F, Wave Propagation and Remote Sensing

Kamal Sarabandi, 734-936-1575, saraband@umich.edu
Incoming Chair (2022-2023): Thomas Hanley

TOPICS

Point-to-point propagation effects:
Measurements Mobile/fixed paths
Propagation models Horizontal/slant paths
Multipath/mitigation Surface/atmosphere interactions
Land or water paths Numerical weather prediction
Scattering/diffraction Dispersion/delay
Indoor/outdoor links Natural/man-made structures
Microwave remote sensing of the earth:
Atmospheric sensing Ocean and ice sensing
Field campaigns Interferometry and SAR
Subsurface sensing Scattering/diffraction
Radiation and emission Propagation effects
Urban environments Soil moisture & terrain
Propagation and remote sensing in complex and random media

COMMISSION G, Ionospheric Radio and Propagation

Attila Komjathy, 818-393-6828,
attila.komjathy@jpl.nasa.gov
Incoming Chair (2022-2023): Thomas Gaussiran

TOPICS

Ionospheric imaging
Ionospheric morphology
Ionospheric modeling and data assimilation
Meteoroids and orbital debris
Radar and radio techniques for ionospheric diagnostics
Space weather – radio effects
Transionospheric radio propagation and systems effects

COMMISSION H, Waves in Plasmas

Mark Golkowski, 303-315-7577,
mark.golkowski@ucdenver.edu

TOPICS

Chaos and turbulence in plasmas
Plasma instabilities
Spacecraft-plasma interactions
Solar/planetary-plasma interactions
Space as a research laboratory
Space environment modeling and forecasting
Wave-wave and wave-particle interactions
Waves in space and laboratory plasmas

COMMISSION J, Radio Astronomy

Jeff Mangum, 434-296-0347, jmangum@nrao.edu
Incoming Chair (2022-2023): Alyson Ford

TOPICS

Imaging Black Holes: The ngEHT and Beyond
New Frontiers in Solar Radiophysics
New SETI Technologies and Instrumentation
New Telescopes, Techniques, and Technologies and Observatory Reports
Timely Technical Tutorials

COMMISSION K, Electromagnetics in Biology and Medicine

Majid Manteghi, 540-231-6834, manteghi@vt.edu
Incoming Chair (2022-2023): John Stang

TOPICS

Biological effects
Dosimetry and exposure assessment
Electromagnetic imaging and sensing applications
Human body interactions with antennas and other electromagnetic devices
Therapeutic, rehabilitative and other biomedical applications