# Welcome to the 2022 USNC-URSI NRSM!

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The following information is intended to facilitate your arrival.

**LOCATION OF MEETING**
All scientific sessions will be held at the **University of Colorado Boulder** campus in the Engineering Center (1111 Engineering Drive). The Plenary will be held in the Mathematics Auditorium (Math 100). http://www.colorado.edu/campusmap/map.html?bldg=EC&x=15&y=8.

**ON-SITE REGISTRATION**
Conference registration check-in will be available for the following:

Tuesday, January 4, 8:00–15:00 in the Engineering Center main lobby (University of Colorado), and then will move to the Embassy Suites (2601 Canyon Blvd.) from 16:00–21:00.

Wednesday, January 5 in the Engineering Center main lobby (University of Colorado) from 07:30 to 10:30 and will continue during the remainder of the meeting in the Engineering Center (ECCR) Room 135.

**OFFICE INFORMATION**
USNC-URSI NRSM Office location is in the classroom wing of the Engineering Building Room 135. The hours for this office are below.

| | |
|---|---|
| Wednesday, January 5: | 11:00 - 17:00 |
| Thursday, January 6: | 07:30 - 17:00 |
| Friday, January 7: | 07:30 - 17:00 |

A University staff member will be available during these hours to assist you.

**INTERNET ACCESS**
Access wireless service on campus by selecting UCB Guest Wireless from your available Wi-Fi network options and accepting the terms and conditions upon opening your web browser. You will be prompted to re-accept these terms and conditions periodically. For additional information and needing assistance go to NRSM website: https://www.nrsmboulder.org/logistics.

**RECEPTION**
A light reception with cash bar (non-hosted bar) will be held in the Byron R. White Club (Folsom Stadium Club) on Wednesday, January 5, from 19:00 - 21:00. Please be prepared to show a government ID/passport and wear conference badge in order to consume alcohol. The legal age to drink in Colorado is 21.

Guests are welcome to attend, but you must indicate on the registration form that you will be bringing a guest. Otherwise, they will not be allowed to attend, due to the alcohol policy of the university. There is no extra cost.

**PARKING**
Virtual parking permits are available for purchase online. Please follow the instructions below to purchase your permit:

- Go to our Parking Services website: https://cuboulder.pmreserve.com/
- You will be directed to a page with all of our event parking groups. Click on **USNC-URSI National Radio Science Meeting** and follow instructions from there.
- The $19.00 rate offered is good for the week of NRSM.
- The site is much like any online shopping site. Pick your item add it to the cart and proceed to check out.
- Provide the vehicle license plate information to be valid. It is recommended **if renting a vehicle wait to purchase parking permit** until you have the actual license plate information.
- Complete the purchase and print a copy of your permit/receipt. Please display the printed copy on your dashboard as a backup confirmation of your virtual permit.

  **This is not required** but will help the parking patrol team determine if you accidentally made a typo in your license plate number.
- Please note the specific lot number that you have been assigned to. You must park in the lot assigned to you at the time of purchase. Be sure license plate is viewable from the drive lane.
- **All sales are final**

Please note that **enforcement will be handled through the license plate number**. You will **need to have vehicle make/model/color/plate information at the time of purchase**. You must have this information in order to purchase the virtual permit. Please ensure that all information provided is accurate to avoid a citation. For those renting vehicles, follow the above process once you have secured the vehicle in order to have information needed to complete purchase.

**ACCOMODATIONS**
Participants must make their own housing arrangements. Blocks of rooms have been set aside at local hotels and special group rates have been arranged.
Visit https://www.nrsmboulder.org/logistics for lodging options.

**AIRPORT & LOCAL TRANSPORTATION**
*Shuttles will not be provided from hotels to the university.*

All major airlines have flights into Denver International Airport (Airport code DEN, locally called DIA). A variety of surface transportation is available from DIA to Boulder.
The Regional Transportation District SkyRide (RTD city bus route “AB”) is the least expensive and travels to Boulder via Denver and U.S. 36. Travel time is approximately 90 minutes. Once in Boulder, exit at the Boulder terminal and take a taxi or city bus to your hotel. RTD Bus Schedule.

**Green Ride** shuttle is a locally owned and operated shuttle service that focuses on resource sustainability and minimizing environmental impact. It is recommended that you make a reservation online via the following website for outgoing service from DIA to Boulder: Green Ride Reservations.

**SuperShuttle** provides transport from the airport to most local hotels: SuperShuttle Reservations.

**Rental cars** are available at the airport. We do suggest advance reservations. Boulder is located 26 miles northwest of Denver via U.S. 36. If you decide to take a taxi from the airport, be sure to agree upon the fare with the driver prior to departure from the airport.

Car Rentals:

- eGo CarShare: www.carshare.org
- Zipcar: www.zipcar.com

**Boulder Local Buses**: https://bouldercolorado.gov/services/bus
**Boulder B-Cycle** (a community non-profit bike sharing system): www.boulder.bcycle.com/

**WEATHER**

Boulder's weather in January is notorious for its unpredictability and can range from snow and freezing temperatures to mild, balmy weather with temperatures near 60°F (16°C). Normally, however, the weather is sunny and rather cool (40°F or 4°C) during the month, with little snow. Participants should bring appropriate clothing.

**SUSTAINABILITY**

CU Boulder is +a leader in climate and energy research, interdisciplinary environmental studies, and in engaging in sustainability and "green" practices on campus. Bring a reusable water bottle and refill free, use the recycling bins across campus, and compost where available. We encourage visitors to consider the purchase of carbon offsets for travel. For more information about CU Boulder's sustainability initiatives and carbon-offset purchases, visit the following websites:

| | |
|---|---|
| Research, Degrees, Outreach & Operations: | http://www.colorado.edu/sustainability |
| The Environmental Center: | http://www.colorado.edu/ecenter |
| Colorado Carbon Fund (carbon offsets): | http://www.coloradocarbonfund.org |
| Native Energy (carbon offsets): | http://www.nativeenergy.com |

**HEALTH & SAFETY INFORMATION**

- Campus and Off-Campus Emergencies 911
- CU Police Department (On-Campus, Non-Emergency) 303-492-6666
- City of Boulder Police Department (Non-Emergency) 303-441-3333
- Boulder Community Hospital 303-415-7000
  4747 Arapahoe Ave, Boulder, CO 80303

**PUBLIC HEALTH RESPONSE**

The NRSM will adhere to all University of Colorado Boulder, Boulder County and Colorado state guidelines and recommendations prior to, during and after the conference, to ensure the safety of all participants. As we have learned in this past year, policies currently in place are subject to change based on University of Colorado Boulder, Boulder County and Colorado state and public

health orders. At this time, we cannot speculate what changes may be made to current policies, if any. We will do our best to communicate any updates and appreciate your flexibility. We encourage you to check this site prior to planning your travel to Boulder, and to review the links below for the latest available information.

**Related resources:**
Public Health Advisory for Boulder County – COVID-19 Surge for Boulder County and Colorado (10/29) **-** Public Health Advisory for Boulder County (govdelivery.com)

*The following public health orders remain in effect in Boulder County:*

- ***Masks are required for all individuals 2 and older in all public indoor spaces in Boulder County, regardless of vaccination status****, except for approved vaccine verified facilities and events. See Public Health Order 2021-08*

University of Colorado Boulder Current Public Health Measures
Boulder County Public Health Dial
Boulder County Indoor Mask Order
Boulder County COVID-19 Information
Colorado Department of Public Health and Environment's Executive and Public Health Orders

## CAMPUS CLOSURES, EXTREME WEATHER, AND OTHER EMERGENCIES

**Be in the know. Know what to do.**
CU Conference Services is committed to keeping our guests notified with up-to-date and real-time information in the infrequent event of campus closures, extreme weather and other emergencies. CUCS accomplishes this goal by automatically signing up on-site clients and adult attendees to our automated **RAVE Alert System**. All adult's (18 +) e-mail and/or cell phone number provided at registration/check-in are sent to the CU Boulder Alert administrator to be included in the alert database. Individuals are active in the database only for the duration of the event or program on campus. Depending on the contact information provided, alerts are sent straight to either e-mail accounts and/or mobile devices via our text messaging service.

The University of Colorado Boulder is committed to providing timely warnings and/or emergency notifications for situations that represent a serious or continuing threat to the campus community and visiting guests. If warranted, warnings may be followed by a clarification and/or instructional statement from CU Conference Services administration.

**How to find additional information in an emergency**

- **On your mobile device**—Watch for text or e-mail alerts in the case of a campus closure or if there is a threat to personal safety.
- **On the web**—Visit www.colorado.edu for detailed campus closure and emergency information and updates.
- **On the phone**—Call the campus info line at **303-492-INFO (4636)** for recorded information and updates relating to campus alerts.
- **By e-mail**—Check your e-mail after an emergency for support and resource information.
- **On social media**—Like CU Boulder on Facebook and follow @cuboulder and @cuboulderalerts on Twitter.

**SMOKING**
The University is a smoke-free environment; smoking is not permitted anywhere on campus. Electronic cigarettes are included in the smoking ban.

**ALCOHOL & DRUG POLICY**
The University of Colorado Boulder is committed to excellence in all aspects of personal and academic life. We recognize that alcohol abuse and misuse is a significant impediment to achieving this excellence. Therefore, CU-Boulder permits only the responsible, legal consumption of alcohol. The university complies with all federal, state, and local laws concerning alcohol and illegal drugs.

**LAW RELATED TO ALCOHOL & DRUG USE**
Persons under 21 years of age cannot legally possess or consume alcoholic beverages. The furnishing of alcoholic beverages to underage persons is prohibited. Individuals who are of legal drinking age may possess and consume alcohol only in the privacy of their room with the door closed in their assigned residence hall room or at official conference catered events. Alcohol cannot be consumed or carried in open containers on any street, sidewalk, alley, automobile, or public area on campus. Any participant who consumes or possesses alcohol contrary to the above are subject to request for departing the premises and, upon request, shall leave the premises immediately.

The possession, use, sale, manufacturing, or distribution of Illegal ("Illegal" means unlawful under Colorado state law or federal law) drugs in the residence halls, including marijuana and drug paraphernalia including but not limited to pipes, hookahs, bongs, water pipes, etc. is not permitted. Marijuana remains a controlled substance under the federal Controlled Substance Act and, accordingly, is Illegal. Any participant who involves themselves in the use of possession of Illegal drugs are subject to the campus's request to depart the premises and, upon request, shall leave the premises. A participant may also be subject to legal action.

Possession of firearms, explosives, fireworks, incendiary devices, ammunition, other weapons, or instruments designed to look like any of the above will result in the possible immediate removal from campus.

**PRINTING, COPYING, FAXING AND SHIPPING SERVICES**
- FedEx Office Print & Ship Center
  2616 Baseline Rd, Boulder, CO 80305 (south end of campus)
  303-494-2622

**FURTHER ASSISTANCE**
For further assistance, please email Christina Patarino at nrsmboulder@colorado.edu. To make a change in your registration, please email CU Conference Services at conferences@colorado.edu.

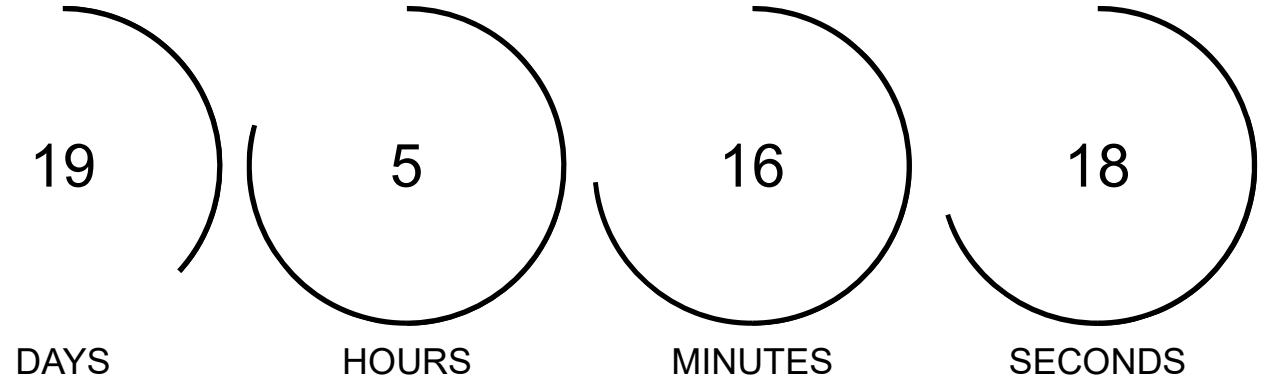
For detailed conference information visit the USNC-URSI NRSM web page at http://www.nrsmboulder.org/

***We look forward to seeing you in Boulder!***

Conference Services
UNIVERSITY OF COLORADO **BOULDER**



You are now registered! See you in...




**January 4, 2022—**
**January 8, 2022**

**Add to Calendar**

## Registration Summary

Review your registration information below

### Bharath Keshavamurthy

bkeshav1@asu.edu

Address

GWC 325, Arizona State University
650 E. Tyler Mall
Tempe, Arizona 85281
USA

Phone

7657758910

## Agenda

| Item | Price |
| --- | --- |
| **Admission Item** | |
| In-Person Full-Time Student Registration | $0.00 |

Add Another Regisrant

Submit Payment | Modify Registration | Cancel Registration

You will receive a confirmation email with your registration details.

**Your Confirmation Number is:**

PRNV6MGHZCF

# 2022 USNC-URSI National Radio Science Meeting

| | Time [MST] \ Room | 105 | 150 | 151 | 155 | 200 | 245 | 265 | 1B40 | 1B51 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tuesday, 4 January | 08:30-11:30 | **Short Course<br>Joint MIMO-Radar-MIMO-Communications for Autonomous Vehicles<br>(Hybrid)** | | | | | | | | |
| | 12:30-14:20 | **Tutorial I<br>HFSS Demo<br>(Hybrid)** | | | | | | | | |
| | 14:40-16:30 | **Tutorial II<br>Near-Field Measurements: Principles & Demo<br>(*In-Person* Only)** | | | | | | | | |
| Wednesday, 5 January | 08:00-08:10 | **Opening Welcome (Streamed from Math 100)** | | | | | | | | |
| | 08:20-12:00 | B1 - Antenna Theory, Design, and Measurements | F1* - Advances in GNSS-R and SoOP Systems: Techniques and Applications I | G1* - New Applications of SmallSat Sensors<br>G2 - Meteoroids and Orbital Debris | A1 - Antennas<br>A2 - Materials | B2 - Numerical Methods<br>B4* - 5G and Millimeter Wave Antennas and Applications | H1* - Heliospheric Observations of Waves in Plasmas | J1 - New Telescopes, Techniques and Technologies and Observatory Reports I | B3* - Complex EM and Meta Structures | D1 - Electronics and Photonics |
| | 12:10-13:00 | **Women in Radio Science (WIRS) Invited Speaker** | | | | | | | | |
| | 13:10-14:50 | B5* - Low-Profile Millimeter-Wave / Terahertz Antennas for Mobile and Space Applications | F2* - Advances in GNSS-R and SoOP Systems: Techniques and Applications II | | A3* - Multiband Antenna Array Challenges and Solutions | B6 - Electromagnetic Theory annd Techniques | H2* - Active Experiments in Laboratory and Space Plasmas | J2 - New Telescopes, Techniques and Technologies and Observatory Reports II | B7* - Multiscale and Stochastic Modeling in Computational Electromagnetics | D2* - Millimeter-Wave and Terahertz Systems for Space Applications |
| | 15:10-16:50 | **Student Paper Competiton (Math 100)** | | | | | | | | |
| | 17:00 | | Commission F | | Commission A | | | | | |
| | 18:00 | Commission C&E | | | | | | Commission J | | |
| | 19:00-20:00 | **WIRS Speaker Meet & Greet for all *Virtual* Attendees** | | | | | | | | |
| | 19:00-21:00 | **Reception for all *In-Person* Attendees at the Folsom Stadium Club** | | | | | | | | |
| Thursday, 6 January | 08:20-11:30 | **Plenary Session (Math 100)<br>Meeting Highlight Plenary Talks<br>Student Paper Competition Awards Ceremony** | | | | | | | | |
| | 11:40-13:10 | **Student Mentoring Lucheon (Lunch provided for all students, UNSC-URSI Officers, and Commission Chairs)** | | | | | | | | |
| | 13:10-16:50 | A4* - Inventive Approaches in Advanced Communications<br>K1* - Dosimetry and Exposure Assessment | F3 - Refractivity Characterization and Numerical Weather Prediction | G3 - Radar and Radio Techniques | C1 - Radar<br>C2 - RF Spectrum | B8 - Analysis and Design of Antennas and RF Components | H3* - Lightning and Plasma Phenomena of the Thermosphere | J3 - New Telescopes, Techniques and Technologies and Observatory Reports III | B9* - Novel Electrically Small Antennas and Matching Networks | D3* - Broadband and Multiband Amplifiers |
| | 17:00 | | | Commission G | | | | | Commission B | |
| | 18:00 | Commission K | | | | | Commission H | | | Commission D |
| | 19:00 | **WIRS Business Meeting (Room 150)** | | | | | | | | |
| | 20:00 | **WIRS *In-Person* Reception (Location TBA)** | | | | | | | | |
| Friday, 7 January | 08:00-08:10 | **Closing Day Remarks (Streamed from Math 100)** | | | | | | | | |
| | 08:20-12:00 | K2 - Human Body Interaction with Antennas and Other Electromagnetic Devices | F4 - Microwave Remote Sensing of the Earth | G4 - Ionospheric Imaging<br>G5 - Ionospheric Modeling and Data Assimilation | C3 - RF Antenna Design and Systems<br>E1 - RF Spectrum and RF Systems in Noise | B10 - Antenna Arrays: Approaches, Realizations, and Applications | J4* - New SETI Technologies | J5* - Imaging Black Holes: the EHT and Beyond I | B11* - Antennas and Systems for Specialized Platforms and Extreme/Harsh Environments | |
| | 12:10-13:00 | **Hans Liebe Lecture (Math 100)** | | | | | | | | |
| | 13:10-16:50 | K3 - Electromagnetic Imaging and Sensing | F5 - Propagation and Remote Sensing in Complex and Random Media | | | J6* - New Frontiers in Solar Radio Physics† | H4* - Physics of the Radiation Belts | J7* - Imaging Black Holes: the EHT and Beyond II | B12 - Structures and Circuits for RF Sensing, Radar and STAR Applications | |

*** Denotes a special session** **†Session J6 will extend to 17:50**