



International Union of Radio Science U.S. Commission B

B. Notaros, Chair
K. Warnick, Secretary
S. Sharma, Technical Activities Chair

R. Baktur, Vice-Chair
S. Weiss, Membership Chair

Please reply to: Karl Warnick, warnick@ee.byu.edu

USNC-URSI Commission B Business Meeting Minutes 2022 National Radio Science Meeting (Virtual) Boulder, CO January 6th, 2022

1. Introduction

- Chair Branislav Notaros called the meeting to order
- Welcome to members and guest introductions
- Approval of the 2021 IEEE APS/URSI Commission B meeting minutes. Moved, seconded, approved

2. Chair Report, Branislav Notaros (see attached slides for details)

- Minutes are posted on the National Academies website
- Moving forward, rather than approving minutes much later at the next business meeting, minutes will be approved by email shortly after the meeting, including a note that if we don't hear from members by a certain date, we consider the minutes approved
- Overview of URSI, USNC, and USNC Commission B officers
- Call for Commission membership and URSI Individual Membership
- Moment of silence for deceased Commission members
- Review of USNC-URSI awards, including four new awards
- NRSM 2022 Overview. Hybrid meeting leads to additional costs and higher registration fees
- NRMS 2023 date options are Jan. 4-7 or Jan. 11-14. Second week in January avoids having the meeting when many universities start the teaching term. Moved, seconded, and passed to recommend Jan. 11-14

- Do we want to continue to have virtual tutorials, exhibits, etc. in the future? Business meetings in hybrid format are valuable. Moved, seconded, and passed to support continuing some conference elements, particularly business meetings in hybrid form
 - NRSRM 2023 plenary topics and speakers. Suggestions included James Webb telescope, Event Horizon Telescope, high power microwaves and biological effects
 - NRSRM 2023 tutorial topics. Software defined radios. Tutorials are attended by half students and half industry/academics
 - NRSRM 2023 call for special sessions and organizers
 - To involve more early career members (ECMs), should we create ECM leadership positions within the commissions? Early Career Representatives (ECR) have been a good way to get involved. Moved, seconded, and approved to create a USNC Commission B ECR position
 - Commission B logo competition. Logo #6 of the submissions received the most votes. Moved, seconded, and approved to adopt the winning logo
 - Future URSI meetings listed, including AP-S/URSI 2022 Denver
3. **Membership Committee Report, Steven Weiss (see attached slides for details)**
- Request for replacements for long-serving committee members Ed Rothwell and George Hanson
 - Steve Weiss presented applications for nominees
 - Moved, seconded, and approved to accept the committee recommendations
 - Suggestion to acknowledge new members in a future plenary session
4. **Technical Activities Report, Satish Sharma (see attached slides for details)**
- NRSRM 2022 statistics reviewed
 - Thanks to TAC reviewers and Commission officers for help with reviews and session formation. Please contact Satish if you are interested to volunteer as a reviewer or organize a special session for NRSRM 2023
5. Old business
- None
6. New business
- Richard Adler passed away Dec. 30. J. Bach Anderson also passed away recently
7. Meeting adjourned

Minutes taken and respectfully submitted by Karl Warnick, Secretary.

Guests in Attendance: Prabhat Baniya, Jakob Kunzler, David Garren, Jonathan Chisum, Logan Voigt, Mohammad Al-Khaldi, Wei Wang, Nathaniel Ashcraft

Members in Attendance: Branislav Notaros, Karl Warnick, Danilo Erricolo, Ronald Pogorzelski, W Ross Stone, Satish Sharma, Prof. Jim Breakall, Reyhan Baktur, Stuart Long, Sima Noghanian, Michael Havrilla, Andrew Peterson, Kubilay Sertel, Susan Hagness, George Trichopoulos, David Jackson, Sembiam Rengarajan, Niru Kamrun Nahar, Jamesina Simpson, Richard W. Ziolkowski, John Volakis, Asimina Kiourti, Ronald Pogorzelski, Steven Weiss, Gary Brown, Yahya Rahmat-Samii, David Le Vine, Leo Kempel, Dimitrios Tzarouchis, Atef Elsherbeni, Kurt Oughstun, Don Wilton

USNC-URSI Commission-B Business Meeting

Thursday, January 6, 2022
5:00 – 6:00 p.m. MST

2022 USNC-URSI National Radio Science Meeting
January 4-8, 2022

Branislav (Bane) Notaros
Commission B Chair
Colorado State University
notaros@colostate.edu



- Welcome to members and guests
- Approval of the minutes of the January 5, 2021 meeting
- CHAIR REPORT
- COMMITTEE REPORTS
 - Membership Committee (Steven Weiss)
 - Technical Activities Report (Satish Sharma)
- Old business
- New business
- Adjourn



We will be collecting attendance electronically. Here is a QR code:

USNC-URSI Commission B
Business Meeting Attendance Poll
Jan. 6, 2022



Would you like to introduce your Guest?



Approval of Minutes from our Jan. 5, 2021 Business Meeting

- provided for your review on 12/22/2021 at:
<https://byu.app.box.com/s/jjmh2qt2ctl0obkyfq8b2ujjmxish47>

QR code for the 2021 business meeting minutes

USNC-URSI Commission B
Business Meeting Minutes - Jan. 5 2021



Approval of Minutes (cont'd)



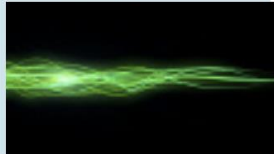
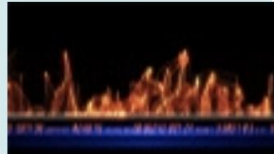
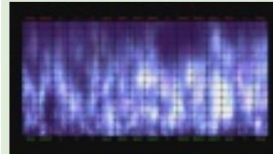
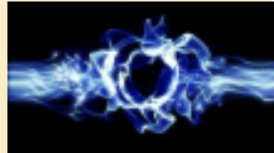
- All our minutes are posted on the new website (scroll down to “past events”):
<https://www.nationalacademies.org/our-work/usnc-ursi-commission-b-fields-and-waves>
- Moving forward, Karl will send the minutes (after they have been reviewed by the commission leadership) to the commission members soon after the meeting. The email will ask for any corrections and additions in a way that it constitutes a formal approval vote, something like “if we don't hear back from you by....”
- With this, we will consider the minutes approved and send to National Academies for posting, at which point the official approved minutes will be available for the membership much earlier than in the past.



International Union of Radio Science (URSI)

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).

SCIENTIFIC COMMISSIONS

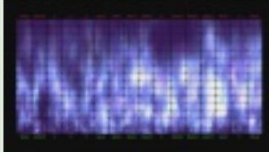
Commission A  Electromagnetic Metrology	Commission B  Fields and waves	Commission C  Radiocommunication Systems and Signal Processing	Commission D  Electronics and Photonics	Commission E  Electromagnetic Environment and Interference
Commission F  Wave Propagation and Remote Sensing	Commission G  Ionospheric Radio and Propagation	Commission H  Waves in Plasmas	Commission J  Radio Astronomy	Commission K  Electromagnetics in Biology and Medicine



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International Union of Radio Science (URSI)

Officers of International URSI:

- P. L. E. (George) Uslenghi, University of Illinois at Chicago
 - President of URSI
- Patricia Doherty, Boston College
 - Vice-President of URSI
- W. R. (Ross) Stone, San Diego, CA
 - Assistant Secretary General – Publications and GASS
- John Volakis, Florida International University
 - URSI Commission B Chair



U.S. National Committee for URSI

This U.S. National Committee (USNC) represents the URSI at the national level.

USNC is appointed by the National Academy of Sciences, Engineering, and Medicine (NASEM) and represents U.S. radio scientists in URSI.

Website: www.usnc-ursi.org

Archive: www.usnc-ursi-archive.org

*The National
Academies of* | SCIENCES
ENGINEERING
MEDICINE



USNC-URSI Leadership (2022-2023)

4 Officers + 2 National Academies Staff



Michael Newkirk

USNC Chair

The Johns Hopkins University
Applied Physics Laboratory
Michael.Newkirk@jhuapl.edu



Jamesina Simpson

USNC Secretary and Chair-Elect

Dept. of Electrical and Computer Engineering
University of Utah
Jamesina.Simpson@utah.edu



Sembiam Rengarajan

USNC-URSI

Immediate Past Chair



Gary Brown

USNC-URSI

Accounts Manager



Kathie Bailey

The National Academies

BISO Director



Ana Ferreras

The National Academies

Senior Program Officer

USNC-URSI Commission B Leadership



Branislav Notaros

Chair

ECE Dept.

Colorado State University

E-mail: notaros@colostate.edu



Satish Sharma

Technical Activities Chair

ECE Dept.

San Diego State University

E-mail: ssharma@sdsu.edu



Reyhan Baktur

Vice Chair

ECE Dept.

Utah State University

E-mail: reyhan.baktur@usu.edu



Karl Warnick

Secretary

ECE Dept.

Brigham Young University

E-mail: warnick@ee.byu.edu



Steven Weiss

Membership Committee Chair

Army Research Lab

E-mail: steven.j.weiss14.civ@mail.mil

<https://www.nationalacademies.org/our-work/usnc-ursi-commission-b-fields-and-waves>

Membership in USNC-URSI Commission B

- Nominations for (**full, associate, or early career**) membership in Commission B should be submitted online.
- Applications are due by **December 1** of each year to be considered during the January meeting (unless the January meeting is not being held as was the case in 2020) or by **May 1** of each year to be considered during the summer AP-S/URSI joint symposium.
- Nomination form at:
<https://www.nationalacademies.org/our-work/usnc-ursi-commission-b-fields-and-waves>

Individual Membership in URSI (International)

- By application through www.ursi.org
 - Requirements similar to USNC membership

Recently Deceased Members

- Gerald Burke, Tatsuo Itoh, Tapan Sarkar, Allen Taflove – Commission B



Please pause for a moment of silence

2023 USNC-URSI Awards

- At the January 2021 Business Meeting, USNC-URSI voted to establish several new awards in addition to the Booker award
 - Awarded each triennium, in the year of the URSI GASS (at the preceding NRSM)
- The new awards are:
 - **Chair's Award (plaque)**
 - **Distinguished Radio Science Award (plaque + \$1500)**
 - **Outstanding Educator Award (plaque + \$1000)**
 - **Impact Award (plaque + \$1000)**
- Details with the nomination form will be sent to Commission Chairs
- Nominations due to USNC-URSI Awards Committee Chair **15 August 2022**
- Please encourage your members to nominate a colleague!

NRSM 2022 Overview

- In a July Executive Council meeting and subsequent email vote, the majority favored:
 - Planning for a hybrid meeting given uncertain COVID future, and
 - Maintaining a 3-day schedule of sessions
- A hybrid NRSM includes additional costs not seen in the past
 - A/V equipment, licenses & labor for hybrid presentations in meeting rooms
 - Relocation of reception to adapt to local policies
- USNC-URSI still prioritizes student support: up to \$600 each
 - 78 students received complimentary student registration
 - Another 18 that traveled will also receive partial reimbursement of costs
- \$8K received from four Sponsors
- Registration fees had to be increased above previous levels to account for these new costs

2022 NRSM Statistics

Category	2019	2021	2022
Total Submissions	342	236	309
Total Accepted	341	229	304
Total Withdrawn	0	10	9
Total Presented	341	219	295
Number of Sessions	46	40	47
Number of Special Sessions	?	20	21
Registrations - Total	365	361	368*
- ECMs/Students/Retirees	175	96	178*
- Member/Non-Member	190	265	190*
- In-person	365	-	191*
- Online	-	361	177*

*preliminary, as of 4 January 2022

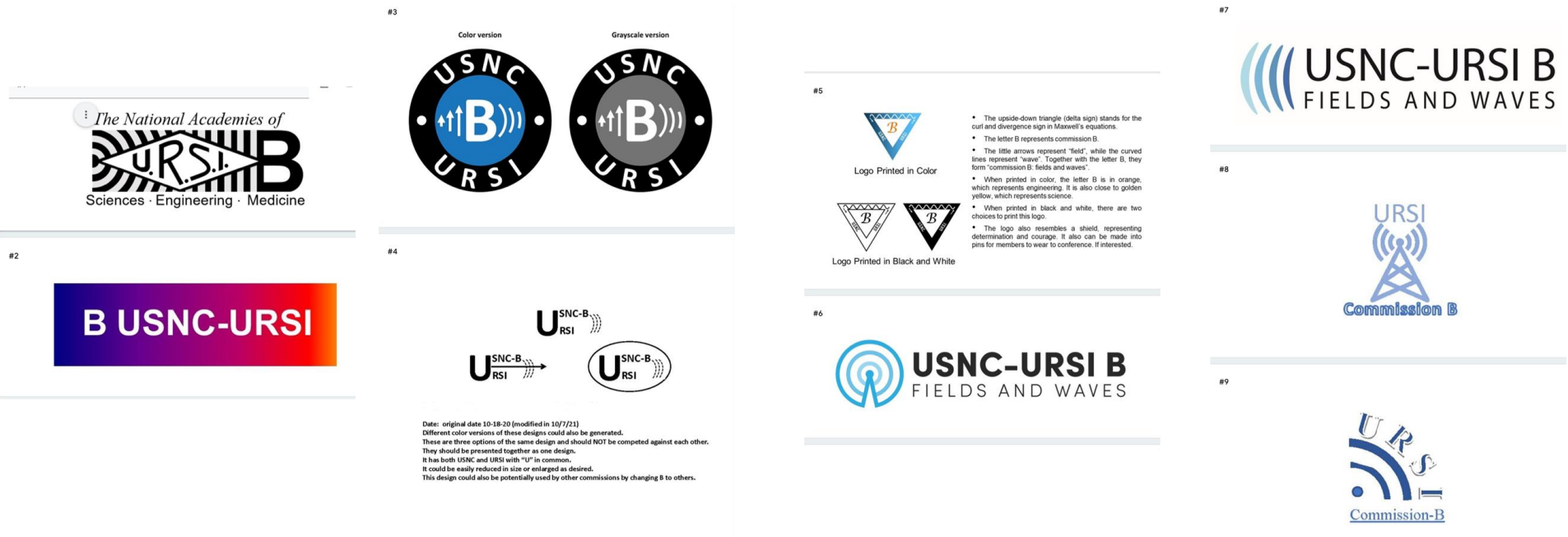
Discussion/Action Items

1. 2023 provides two options for the NRSM. Does your Commission prefer 4 – 7 or January 11 – 14? (Wed-Sat); CU Boulder classes begin 17 January
2. Do we want to continue having virtual components for the conference (tutorials, exhibitors, etc.)?
3. What are your ideas for plenary topics/speakers for the 2023 NRSM?
4. What are your ideas for tutorials for the 2023 NRSM?
5. Please list potential special sessions and their organizers for your Commission for 2023.
6. To involve more early career members (ECMs), should we create ECM leadership positions within the USNC-URSI commissions?



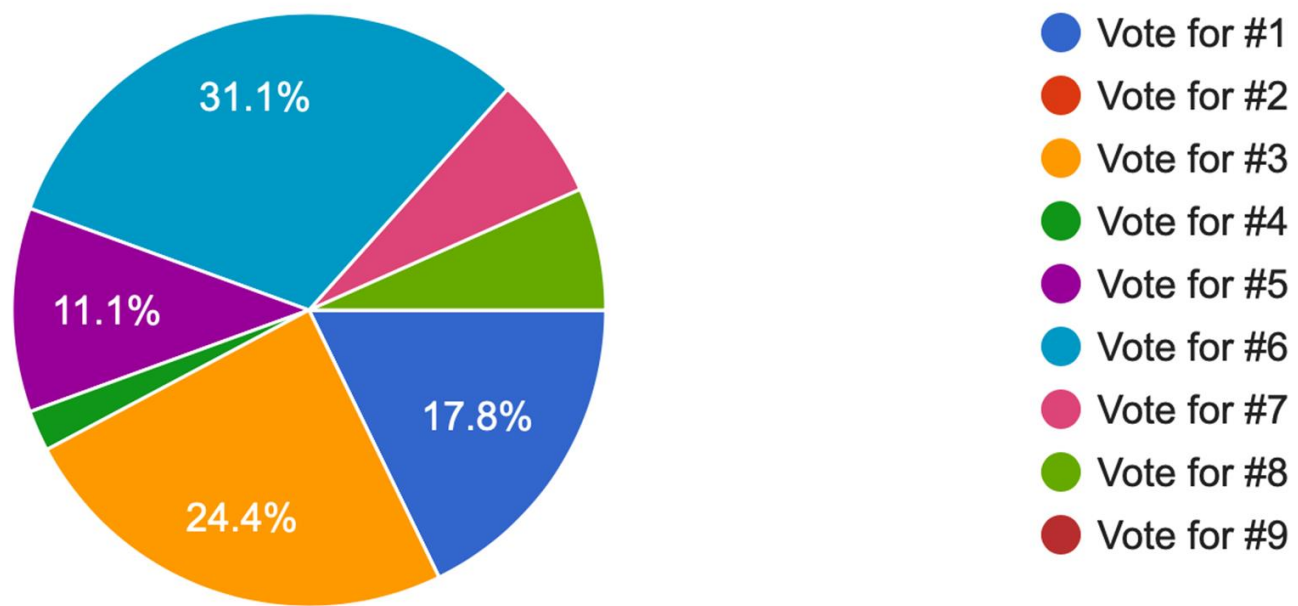
USNC-URSI Commission B Logo Competition

- Initiated by Jamesina Simpson in 2020.
- Conducted by Reyhan Baktur (with help from B. Notaros and K. Warnick) in 2021.
- Received 9 entries, by 7 contestants.



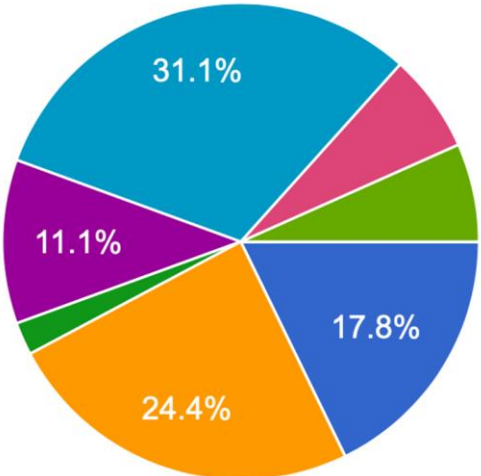
- Fully blind voting process.
- 45 members voted.

Now please vote here.
45 responses



Honorable
Mentions

2nd, 3rd, 4th places



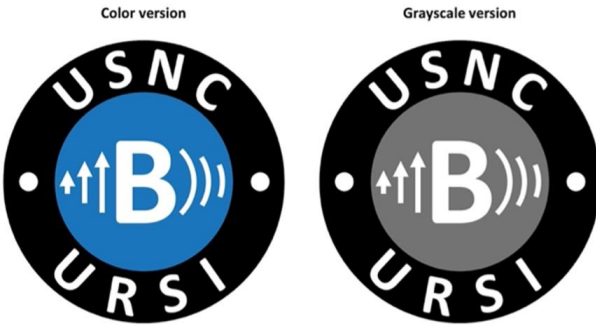
- Vote for #1
- Vote for #2
- Vote for #3
- Vote for #4
- Vote for #5
- Vote for #6
- Vote for #7
- Vote for #8
- Vote for #9

Branislav Notaros

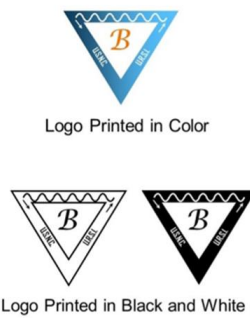
Ryan Green

Reyhan Baktur

#3



#5



- The upside-down triangle (delta sign) stands for the curl and divergence sign in Maxwell's equations.
- The letter B represents commission B.
- The little arrows represent "field", while the curved lines represent "wave". Together with the letter B, they form "commission B: fields and waves".
- When printed in color, the letter B is in orange, which represents engineering. It is also close to golden yellow, which represents science.
- When printed in black and white, there are two choices to print this logo.
- The logo also resembles a shield, representing determination and courage. It also can be made into pins for members to wear to conference. If interested.



- #6, by Karl Warnick.
- Congratulations!

#6



USNC-URSI B
FIELDS AND WAVES

Future URSI Meetings

- EMTS 2022, Late May, 2022, Sofia, Bulgaria
- AT-AP-RASC 2022, May 29-June 3, Gran Canaria, Spain
- XXXV URSI GASS 2023, August 19-26, 2023, Sapporo Convention Center, Sapporo, Japan
- AT-RASC 2024, May 2024
- AP-RASC 2025, August 2025, Sydney, Australia
- XXXVI GASS 2026, August 15-22, 2026, ICE Krakow Congress Center, Krakow, Poland

Upcoming Meetings



<https://www.atrasc.com/home.php>

Call for Papers

URSI combined AT-AP-RASC 2022

May 29 – June 3, 2022

ExpoMeloneras Convention Centre, Gran Canaria

The triennial URSI Atlantic Radio Science Conference (URSI AT-RASC) is one of the URSI flagship conferences besides the URSI General Assembly and Scientific Symposium and the AP-RASC conference (Asia-Pacific Radio Science Conference).



Due to the COVID-19 pandemic, this 3rd URSI AT-RASC was moved from 2021 to 2022 and URSI AP-RASC (the Asia-Pacific Radio Science Conference) cannot be held in Australia as planned due to current travel restrictions.

The combined 2022 AT-AP-RASC event, hosted in Gran Canaria, will offer a hybrid format, offering on-site as well as online participation and aims to receive submissions from worldwide within the domains covered by all ten Commissions of URSI.

NEW !! In addition to the topics covered by the URSI commissions, this 2022 AT-AP-RASC will have a plenary focus session on “Artificial Intelligence for Radioscience” and a dedicated General Lecture as part of the scientific program of the conference

Important deadlines

Paper submission
January 15, 2022

Notification
February 23, 2022

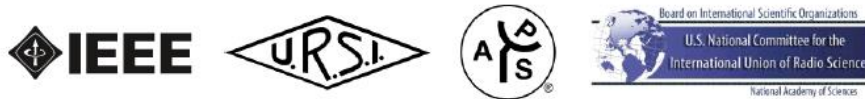
Early bird & Author
registration
March 28, 2022

Conference start
May 29, 2022

AP-S/URSI 2022 Denver

IEEE International Symposium
on Antennas & Propagation
& **USNC-URSI**
Radio Science Meeting

JULY 10-15, 2022 • DENVER



www.2022apsursi.org





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USNC-URSI Commission B
Business Meeting Attendance Poll
Jan. 6, 2022



Commission-B
Business Meeting

Committee Report



Board on International Scientific Organizations

U.S. National Committee for the
International Union of Radio Science

National Academy of Sciences

Membership Committee: Steven Weiss

Commission-B
Business Meeting

Committee Report



Board on International Scientific Organizations

U.S. National Committee for the
International Union of Radio Science

National Academy of Sciences

Technical Activities Report: Satish Sharma



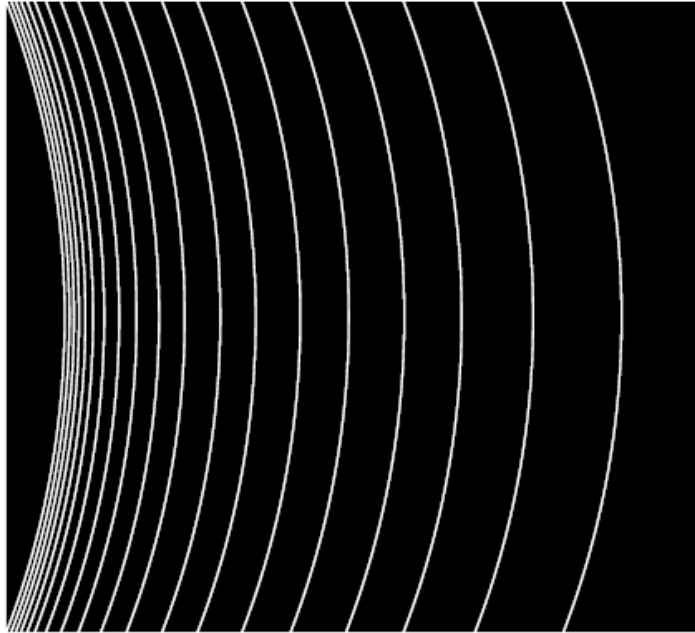
- ❖ Old Business?
- ❖ New Business?
- ❖ Adjourn

USNC-URSI National Radio Science Meeting



*The National
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SCIENCES
ENGINEERING
MEDICINE



4–8 January 2022

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

2022 USNC-URSI National Radio Science Meeting
January 4-8, 2022
University of Colorado at Boulder

URSI Commission-B Technical Activities Report

**6 January 2022
Boulder
(Hybrid Meeting)**

**Satish K. Sharma
San Diego State University**

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2020 National Radio Science Meeting

Was co-organized with IEEE AP-S/URSI 2020 so no individual statistics

*preliminary, as of 4 January 2022

2022 USNC-URSI Business Meeting

	2022	2021	2019	2018	2017	2016	2014	2013	2012
Total No. of papers	295	219	341	414	421	375	399	364	369
Total No. of sessions	47	40	46	59	56	49	54	47	47
Total No. of travel grants	--	22	109	128	137	122	115	100	104

National Radio Science Meeting Conference Statistics

Year	# Papers	# Sessions	# Travel Grants
2011	358	49	113
2012	369	47	104
2013	364	47	100
2014	399	54	115
2015	NARSM	NARSM	NARSM
2016	375	49	122
2017	425	56	137
2018	414	59	128
2019	341	46	109
2020	NARSM	NARSM	NARSM
2021	219	40	22
2022	295	47	--

- In 2022, one page abstracts: ... and two page summaries: ..
- In 2021, one page abstracts: 159 and two page summaries: 60
- In 2019, one page abstracts: 283 and two page summaries: 58
- In 2018, one page abstracts: 356 and two page summaries: 61

2017, 2018, 2019 & 2021 National Radio Science Meeting Conference Statistics

2017		2018		2019		2021	
Country	Papers		Papers		Papers		Papers
United States	404	United States	390	United States	321	United States	206
Canada	6	Canada	9	Canada	16	Canada	9
South Africa	4	Taiwan	3	South Africa	2		
Kuwait	3	Russian Federation	2	Spain	1		
?	2	Czech Republic	2	Australia	1		
Japan	1	Japan	2			Others	21
France	1	France	2				
China	1	Turkey, South Korea, Nigeria, India, China (1 each)	5				
Brazil	1						
Australia	1						
Total	424	Total	416	Total	341	Total	219

Will populate with 2022 data once available

2020: NARSM

2017: About 5% of the papers (20 papers) have come from outside the U.S.

2018: About 6% of the papers (25 papers) have come from outside the U.S.

2019: About 6% of the papers (20 papers) have come from outside the U.S.

2021: About 13% of the papers (30 papers) have come from outside the U.S.

Commission B Special Sessions, 2022 USNC-URSI NRSN, Boulder, Colorado
7 special sessions (38 papers), B regular sessions: 43 papers, (total URSI: 47 sessions, 295 papers)

1. Low-Profile Millimeter-Wave/Terahertz Antennas for Mobile and Space Applications (TITLE CHANGE)

Goutam Chattopadhyay, JPL-NASA and Satish K. Sharma, San Diego State Univ. (5 papers)

2. High Power Electromagnetics (Joint Commission B and E Session):

D. V. Giri, Pro-Tech and R.L. Gardner (No session)

3. Antennas and Systems for Specialized Platforms: UAVs, UUVS, and SmallSats

Reyhan Baktur, Utah State University and David R. Jackson, University of Houston (9 papers: Combined with #4)

Combined Session title: Antennas and Systems for Specialized Platforms and Extreme/Harsh Environments

4. Antennas and Sensors for Harsh Environment

Sima Noghanian, Phoenix Analysis and Design Technologies; and Sayan Roy, South Dakota School of Mines

5. Multiscale and Stochastic Modeling in Computational Electromagnetics (5 papers)

Ata Zadehgo, University of Idaho and Johannes Russer, Technical University of Munich

6. 5G and Millimeter Wave Antennas and Applications (5 papers)

Adrew Chrysler, Idaho State University, and Ting-Yen Shih, University of Idaho

7. Complex EM and Meta Structures (8 papers)

Filippo Capolino, University of California, Irvine and Ashwin Iyer, University of Alberta

8. Novel Electrically Small Antennas and Matching Networks (NEW) (6 papers)

Ashwin Iyer, University of Alberta and Ting-Yen Shih, University of Idaho

Commission B Special Sessions, 2021 USNC-URSI NRSN, Boulder, Colorado

7 B special sessions: 44 papers, B regular sessions: 41 papers (total URSI: 40 sessions, 219 papers)

1. Antennas and Sensors for Harsh Environment (4 papers)

Sima Noghanian, Wafer LLC and Sayan Roy, South Dakota School of Mines and Technology (sima_noghanian@ieee.org and Sayan.Roy@sdsmt.edu)

2. Low-Profile Antennas from Gigahertz to Terahertz (5 papers)

Goutam Chattopadhyay, JPL-NASA and Satish K. Sharma, San Diego State Univ. (goutam.chattopadhyay@jpl.nasa.gov and ssharma@sdsu.edu)

3. High Power Electromagnetics (Joint Commission B and E Session) (9 papers)

D. V. Giri, Pro-Tech and R.L. Gardner (giri@dvghi.com and blitz32schreiber@gmail.com)

4. Wireless Communications for Specialized Platforms and Environments (Antennas for CubeSats and UAVs) (5 papers)

Reyhan Baktur, Utah State University and David R. Jackson, University of Houston (reyhan.baktur@usu.edu and djackson@uh.edu)

5. Multiscale and Stochastic Modeling in Computational Electromagnetics (6 papers)

Ata Zadehgoi, University of Idaho and Johannes Russer, Technical University of Munich (azadehgoi@uidaho.edu and jrusser@tum.de)

6. 5G and Millimeter Wave Antennas and Applications (5 papers)

Adrew Chrysler, Idaho State University, and Ting-Yen Shih, University of Idaho (chryandr@isu.edu and tshih@uidaho.edu)

7. Complex EM and Meta Structures (10 papers)

Filippo Capolino, University of California, Irvine and Ashwin Iyer, University of Alberta (f.capolino@uci.edu and iyer@ece.ualberta.ca)

Commission B Special Sessions, 2019 USNC-URSI NRSM, Boulder, Colorado

4 B special sessions: 35 papers, 7 B regular sessions: 55 papers (total URSI: 46 sessions, 341 papers)

Special Session Title	No. of Papers	Organizers
1. 5G and Massive MIMO Antennas and Systems (CANCELLED)	0	Shubhendu Bhardwaj, Florida Int. Univ., and Ghanshyam Mishra, San Diego State University
2. Astronomical Phased Arrays: From Theory to Practice (Commission B/J) (CANCELLED)	0	Karl Warnick, BYU and Juming Diao, UCLA
3. Metamaterials and Metasurfaces: Theory & Applications	10	Filippo Capolino, UC Irvine & Ashwin Iyer, Univ. of Alberta
4. Wearable, Implants, and Body-Area Networks (B/K)	10	Bashir Morshed, Univ. of Memphis & Ryan Green, Virginia Commonwealth University
5. Antennas for Specialized Platforms: SmallSats, UAVs, and UUVs	5	Reyhan Baktur, Utah State, & David Jackson, Univ. of Houston
6. Techniques for Modeling of Waves in Plasmas (BGH) (CANCELLED)	0	Robert Marshall, Robert Lysak, Mark Golkowski, Vijay Harid
7. Low-Profile Antennas from Gigahertz to Terahertz	10	Goutam Chattopadhyay, JPL-NASA and Satish K. Sharma, San Diego State University

Commission B Special Sessions, 2018 USNC-URSI NRSM, Boulder, Colorado
10 B special sessions, 70 papers, 8 B regular sessions, 51 papers (total URSI: **59 sessions, 414 papers**)

Special Session Title	No. of Papers	Organizers
1. Millimeter-Wave and 5G Antennas and Systems	6	Shubhendu Bhardwaj, Florida Int. Univ., & Joshua Kovitz, Georgia Tech
2. Nonmagnetic and Nonreciprocal Devices	7	Ethan Wang, UCLA, & Andrea Alu, Univ. of Texas
3. Advances in Computational Electromagnetics on Modern Computers	5	Ali Yilmaz, Univ. of Texas, & Zhen Peng, Univ. of New Mexico
4. Emerging Applications of Phased Arrays	7	Karl Warnick, BYU, & Elias Alwan, Florida Int. Univ.
5. Adv. Theory & Applications of Metamaterials	9	Filippo Capolino, UC Irvine, & Ashwin Iyer, Univ. of Alberta
6. Adv. Analysis, Design, & Appl. of WG Structures	10	Michael Havrilla, Air Force Ins of Tech, & Edward Rothwell, Michigan State
7. Wearable Antennas and Electronics	7	Asimina Kiourti, Ohio State, & Bashir Morshed, Univ. of Memphis
8. Antennas for Specialized Platforms: SmallSats, UAVs, and UUVs	5	Reyhan Baktur, Utah State, & David Jackson, Univ. of Houston
9. 3D Printed Antennas	9	Hao Xin, Univ. of Arizona, & Jacob Adams, North Carolina State
10. Techniques for Modeling of Waves in Plasmas (BGH)	5	Robert Marshall, Robert Lysak, Mark Golkowski

Commission B Regular Sessions, 2017 USNC-URSI NRSM, Boulder, Colorado
10 regular sessions, **75** papers (total URSI: **56** sessions, **421** papers)

Regular Session Title	No. of Papers	Chairs
1. B3: Antennas	10	Dejan Filipovic, University of Colorado Boulder; Karl Warnick, Brigham Young University
2. B4: Scattering	5	Alex Yuffa, National Institute of Standards and Technology; Piergiorgio Uslenghi, University of Illinois at Chicago
3. B5: Liquid Metal Antennas	5	Jacob Adams, North Carolina State University; William Davis, Virginia Tech
4. B6: Complex Media and Nanoelectromagnetics	10	Edward Kuester, University of Colorado Boulder; Christos Argyropoulos, University of Nebraska-Lincoln
5. B8: Inverse Scattering and Remote Sensing	5	Piergiorgio Uslenghi, University of Illinois at Chicago; Pai-Yen Chen, University of Texas at Austin
6. B9: Antenna Arrays I	9	Randy Haupt, Colorado School of Mines; Dejan Filipovic, University of Colorado Boulder
7. B13: Antenna Measurements and Simulations	8	Steven Weiss, US Army Research Lab; Jeanne Quimby, NIST
8. B14: Antenna Arrays II	8	Dejan Filipovic, University of Colorado Boulder; Gokhan Mumcu, University of South Florida
9. B16: Microstrip Antennas and Printed Devices	9	Erdem Topsakal, Virginia Commonwealth University; Ozlem Kilic, The Catholic University of America
10. B17: Numerical Methods	6	Atef Elsherbeni, Colorado School of Mines; Melinda Piket-May, University of Colorado

2021 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting

4-10 December 2021 • Singapore

Papers submitted, accepted, rejected, and withdrawn

(Breakdown: AP, URSI, URSI from US authors, URSI from non-US authors)

Submitted	Accepted	Rejected	Withdrawn
Total Submitted:	Total Accepted:	Total Rejected:	Total Withdrawn:
- AP Submitted:	- AP Accepted:	- AP Rejected:	- AP Withdrawn:
- URSI Submitted:	- URSI Accepted:	- URSI Rejected:	- URSI Withdrawn:
- URSI from US:	- URSI from US:	- URSI From US:	- URSI from US:
- URSI from non-US:	- URSI from non-US:	- URSI From non-US:	- URSI from non-US:

2020 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting

5-10 July 2020 • Montréal, Québec, Canada

Papers submitted, accepted, rejected, and withdrawn

(Breakdown: AP, URSI, URSI from US authors, URSI from non-US authors)

Submitted	Accepted	Rejected	Withdrawn
Total Submitted: 1798	Total Accepted: 1514	Total Rejected: 100	Total Withdrawn: 184
- AP Submitted: 1349	- AP Accepted: 1168	- AP Rejected: 86	- AP Withdrawn: 95
- URSI Submitted: 449	- URSI Accepted: 346	- URSI Rejected: 14	- URSI Withdrawn: 89
- URSI from US: 213	- URSI from US: 159	- URSI From US: 3	- URSI from US: 51
- URSI from non-US: 236	- URSI from non-US: 187	- URSI From non-US: 11	- URSI from non-US: 38

2021 IEEE AP-S/URSI Singapore
URSI B Sessions – UB (13 sessions, 109 papers)

1. MO-UB.1P: Antenna Arrays (10)
2. MO-UB.2P: Millimeter-Wave and Terahertz Antennas (5)
3. TU-UB.1A: Electromagnetic Interaction and Coupling (5)
4. TH-UB.2A: Time-Domain Methods I (5)
5. TH-UB.1A: Frequency-Domain Methods (10)
6. TH-UB.3A: Propagation, Scattering, Imaging and Remote Sensing I (10)
7. TH-UB.2P: Wireless Communications and Sensing Networks (5)
8. TH-UB.1P: Antenna Theory, Design and Measurements (10)
9. FR-UB.1A: Microstrip Antennas and Printed Devices (10)
10. FR-UB.2A: Metamaterials and Metasurfaces (10)
11. FR-UB.3A: Propagation, Scattering, Imaging and Remote Sensing II (9)
12. FR-UB.1P: Metamaterials and Wave-Guiding Structures (10)
13. FR-UB.2P: Modeling, Optimization and Machine Learning II (10)

2020 IEEE AP-S/URSI Montreal
URSI B Sessions – UB (27 sessions, 152 papers)

WEP-UB.6A: Time-Domain Methods

[THP-UB.2P: Hybrid Methods I](#)

THP-UB.1P: Efficient Computational Methods

[TH-UB.2P: Nanoscale Electromagnetic Modeling](#)

TUP-UB.1P: Guided Waves and Waveguiding Structures

[TH-UB.2A: Imaging, Inverse Scattering, and Remote Sensing](#)

WE-UB.1P: Millimeter Wave and THz Antennas

[TU-UB.1P: Microstrip Antennas and Printed Devices](#)

TU-UB.2P: MIMO Antennas and Systems

[WE-UB.3A: Frequency Domain Methods](#)

WEP-UB.4A: Integral-Equation Formulations, Bases, and Integration Techniques

[WEP-UB.5A: Integral-Equation Methods](#)

TH-UB.1A: Antenna Design I

[TH-UB.1P: Antenna Design II](#)

FR-UB.1A: Antenna Design III

[MO-UB.1P: Antenna Analysis, Synthesis and Measurement](#)

FR-UB.2P: Electromagnetic Interaction

[WEP-UB.1A: Metamaterials I](#)

WEP-UB.3A: Guided Wave and High Frequency Techniques

[WEP-UB.2A: Metamaterials II](#)

TH-UB.3P: Optimization, Nanoscale and Nonlinear Electromagnetics

[FR-UB.1P: Fundamental Aspects in Electromagnetics](#)

WE-UB.2A: Special Topics in Antenna Matching

[WE-UB.1A: Advanced Manufactured Structures](#)

FR-UB.2A: Topics in Sensing Techniques and Networks

[FR-UB.3A: Antennas and Propagation Aspects](#)

MO-UB.1A: Wireless System Performance

MO-UB.1A: Metamaterials

MO-UB.2A: Frequency Selective Surfaces and Filters

MO-UB.3A: Antenna Theory and Design I

MO-UB.1P: THz, Millimeter-Wave and Nanoscale EM

MO-UB.2P: Antenna Array I

MO-UB.3P: Time-Domain Methods

MO-UB.4P: Frequency Domain Methods

MO-UB.5P: Antenna Theory and Design II

MO-UB.6P: Antenna Theory and Arrays

TU-UB.1A: Cognitive Radio I

TU-UB.2A: Antenna Array II

TU-UB.3A: Hybrid Methods II

TU-UB.1P: Wireless Communications

TU-UB.2P: Antenna Array III

WE-UB.1A: MIMO Antennas and Systems

WE-UB.3A: Microstrip Antennas and Printed Devices

WE-UB.2A: EBG, UWB and RFID based Antennas

WE-UB.1P: Fast Methods

WE-UB.2P: Integral Equation Methods I

TH-UB.1A: Theoretical Electromagnetics III

TH-UB.2A: Guided Wave and Waveguiding Structures

TH-UB.1P: EM Interaction and Coupling

TH-UB.2P: Propagation Phenomenon and Effects

FR-UB.1A: Imaging, Scattering and Remote Sensing

2021 IEEE AP-S/URSI Montreal
AP-S/URSI Joint Special Sessions – (7 sessions, 52 paper)

AP-S/URSI Joint Special Sessions

1. MO-SP.2P: 5G and 6G Antenna Systems for Mobile Devices: Relevant Technologies (10)
2. TU-SP.2A: 5G and 6G Antenna Systems for Mobile Devices: Innovative Approaches (5)
3. TU-SP.3A: Low Cost Antenna Design and Analysis (5)
4. TU-SP.2P: Beam-Steerable Antenna Systems for Communications (9)
5. WE-SP.1A: Workshop: Quantum Technology Related to Electromagnetics (8)
6. TH-SP.1P: Electromagnetics Education (5)
7. TH-SP.3P: Machine Learning for Inverse Scattering and Imaging (10)

For Reference:

2012 APS/URSI Chicago, IL: **13** APS/URSI Joint Special Sessions
2013 APS/URSI Orlando, FL: **10** APS/URSI Joint Special Sessions
2014 APS/URSI Memphis, TN: **16** APS/URSI Joint Special Sessions
2015 APS/URSI Vancouver, Canada: **19** APS/URSI Joint Special Sessions
2016 APS/URSI Puerto Rico: **16** APS/URSI Joint Special Sessions
2017 APS/URSI San Diego: **18** APS/URSI Joint Special Sessions
2018 APS/URSI Boston: **16** APS/URSI Joint Special Sessions **(+2 are APS only)**
2019 APS/URSI Atlanta: **19** APS/URSI Joint Special Sessions
2020 APS/URSI Montreal: **11** APS/URSI Joint Special Sessions

2020 IEEE AP-S/URSI Montreal
AP-S/URSI Joint Special Sessions – (11 sessions)

AP-S/URSI Joint Special Sessions

WE-SP.1P: Emerging Active and Passive Metasurfaces for 5G, Beyond 5G, and 6G

WE-SP.2P: Electromagnetics in MIMO Antenna Design and Channel Modelling

TU-SP.2P: Reconfigurable Antennas for Compact Devices

MO-SP.1A: Artificial Intelligence Applications in Electromagnetics

MO-SP.2P: Mathematical Methods for Array Processing and its Applications

WE-SP.2A: Emerging Technologies for Biomedical Applications

TU-SP.1P: Low Frequency Antennas for Tactical Communications and Networking

FR-SP.1P: Foldable and Physically Reconfigurable Origami Antennas

MO-SP.2A: Cybersecurity and Broadband-Multiband Electromagnetic Systems — for Privacy-Protection and High-Performance in Wireless 5G and Others

FR-SP.2P: GNSS antennas, antenna systems and applications

TH-SP.2P: Quantum Technologies Related to Electromagnetics

Comments From Lance Cotton:

There were 13 "joint topics". That means there were 7 AP-S only topics.

Of those 13, one was a tribute session that was canceled. One was session that was jointly offered, but contains only URSI papers, so I do not consider it joint.

The tribute session was: Waves in Random Media - A Tribute to Tatarskii
(It is not currently in the program)

Special Sessions for National Radio Science Meeting 2023

- **Thank you, the TAC reviewers** (J. Young, S. Roy, S. Das, P. Majumdar, K. Debbarma), and **URSI Commission B Officers** (B. Notaros, R. Baktur, J. Simpson, K. Warnick, S. Sharma), for their help with reviews and session forming during the URSI/IEEE AP-S Sym 2021 and NRSM 2022
- Please contact Satish K. Sharma if you are interested in volunteering as a reviewer for the commission B papers.
- Please contact Satish K. Sharma if you are interested in organizing special session during the NRSM 2023.
- Hope to see you all at URSI/IEEE AP-S Sym 2022 (Denver) and NRSM 2023 (Boulder)
- Email: ssharma@sdsu.edu