

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

Denver, CO

July 12, 2022

1. Introduction

- Chair Branislav Notaros called the meeting to order
- Welcome to members and guest introductions

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

- Overview of URSI, USNC, and USNC Commission B officers
- Call for nominations for new Commission members - more nominations are needed
- Guests introduced – Dave Michelson, Roberto Gralia, Kenneth Sherman, Mohammad Alchebed, Aklesh Lakhatia
- 2023 USNC-URSI awards call for nomination
- Review of AP-S/URSI 2022 Denver symposium. There were 934 in-person presentation papers, 347 virtual papers requested before the virtual request deadline, 90 virtual requests after the deadline. 1460 registrations, 608 student registrations, 331 registrations covering virtual registrations. Registrations should reach 1500 by Friday. Plenary sessions offered on Thursday
- Future URSI meetings listed, including AP-S/URSI 2022 Denver

3. Membership Committee Report, Steven Weiss

- Nomination for Lauren Linkous, Early Career Member, approved by vote

4. Technical Activities Report, Satish Sharma

- AP-S/URSI 2022 statistics reviewed for URSI papers. 139/150 URSI papers were accepted. In 2021, there were 288/313 URSI papers accepted, with 109/132 from Commission B. In 2020, there were 152/206 URSI papers accepted

- Reviewed statistics for 2022 NRSM. 304/309 papers were accepted
 - 2023 NRSM special sessions listed. Contact Satish Sharma at ssharma@sdsu.edu with special session proposals
 - Thanks to TAC members and special session proposal reviewers
5. Old business
- None
6. New business
- Student paper competition – students must submit the advisor letter with the paper. Advise students to include the letter describing the advisor role with the submission
 - Adequate funding is available to support over 100 students
 - Should the student travel grant program be extended to cover the AP-S/URSI Meeting. All Commissions participate in the Boulder meeting. Discuss this during the January Boulder meeting
 - EMTS 2023 Vancouver meeting, May 22-26 – Dave Michelson – invitation to attend the meeting, high quality student competition, good environment for students
 - John Volakis, request for venue suggestions and session topics for a future meeting in the Mediterranean region
 - The Boulder NRSM will be hybrid moving forward
7. Meeting adjourned

Minutes taken and respectfully submitted by Karl Warnick, Secretary.

Guests in attendance: Ifana Mahbub, David Michelson, Kenneth Sherman, Ryan Green, Mohamed Alkhatib

Members in attendance: Branislav Notaros, Karl Warnick, Leo Kempel, Yang Li, Steven Weiss, Susan Hagness, Atef Elsherbeni, Stefano Selleri, Richard W. Ziolkowski, Jeffrey Nanzer, Stuart Long, Erdem Topsakal, John Young, David Jackson, Mohammadreza Imani, Gary Brown, Sembiam Rengarajan, Satish Sharma, Maria Pour, Jim Breakall, Ting-Yen Shih, Yahya Rahmat-Samii, Sima Noghianian, Ahmed Kishk, Ramakrishna Janaswamy, Reyhan Baktur, Peder Hansen, Deb Chatterjee, Andrew Peterson, Donald R. Wilton, Shanker Balasubramaniam, W. Ross Stone



Board on International Scientific Organizations

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

National Academy of Sciences



USNC-URSI B
FIELDS AND WAVES

USNC-URSI Commission-B Business Meeting

Tuesday, July 12, 2022, 5:00 – 6:00 PM MT

APS/URSI 2022, Hyatt Regency Denver, Room Mineral D

Branislav (Bane) Notaros

Commission B Chair

Colorado State University

notaros@colostate.edu



- Welcome to members and guests
- (Minutes from Boulder winter meeting already reviewed and approved)
- CHAIR REPORT
- COMMITTEE REPORTS
 - Membership Committee (Steven Weiss)
 - Technical Activities Report (Satish Sharma)
- Old business
- New business
- Adjourn



We are collecting attendance electronically. Here is Attendance Poll:

To record your
attendance,
enter this link:



bit.ly/usnc-ursi-b

Or scan this code:



Would you like to
introduce your Guest?



- **Minutes from our Jan. 6, 2022 Business Meeting**, held in conjunction with the NRSM 2022 Boulder, were already provided to you and approved back in January.
- The email asked you for any corrections and additions in a way that it constitutes a formal approval vote, “if we don't hear back from you by...”
- Minutes approved and sent to National Academies for posting. Unfortunately, they have not been posted as of today.
- You can see them again here:

<https://byu.app.box.com/s/761gnk9s70vxjg1j49wdgfon041bj47u>

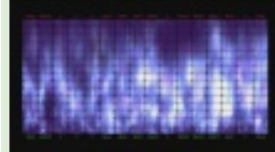
(I have sent you this link in the Invitation email for this meeting)



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).

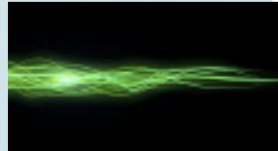
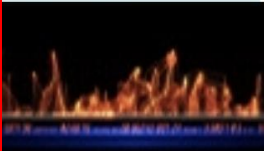
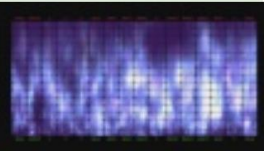
SCIENTIFIC COMMISSIONS

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

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

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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>

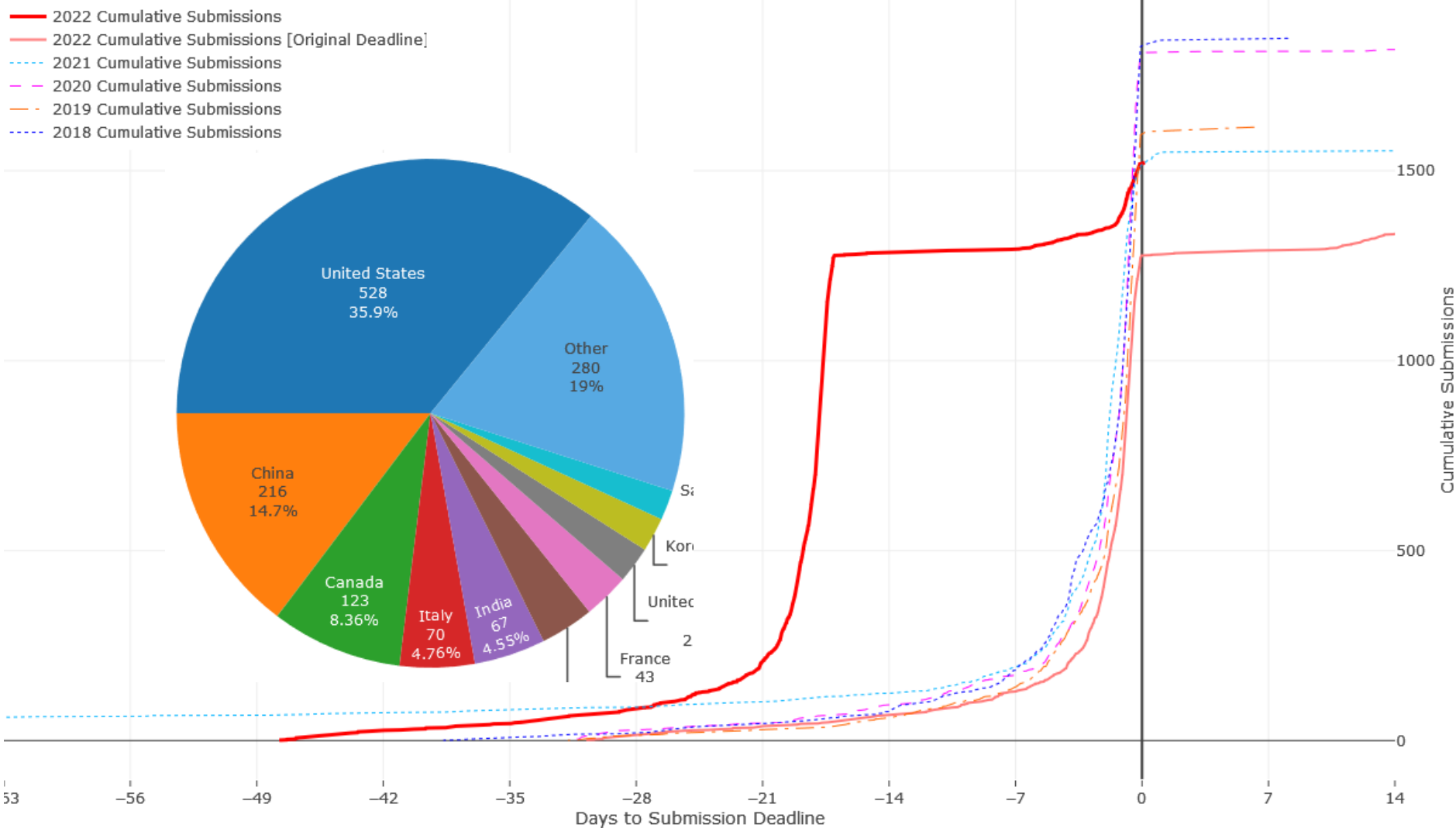
Individual Membership in URSI (International)

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

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!

AP-S/URSI 2022 Denver Submitted Papers Statistics



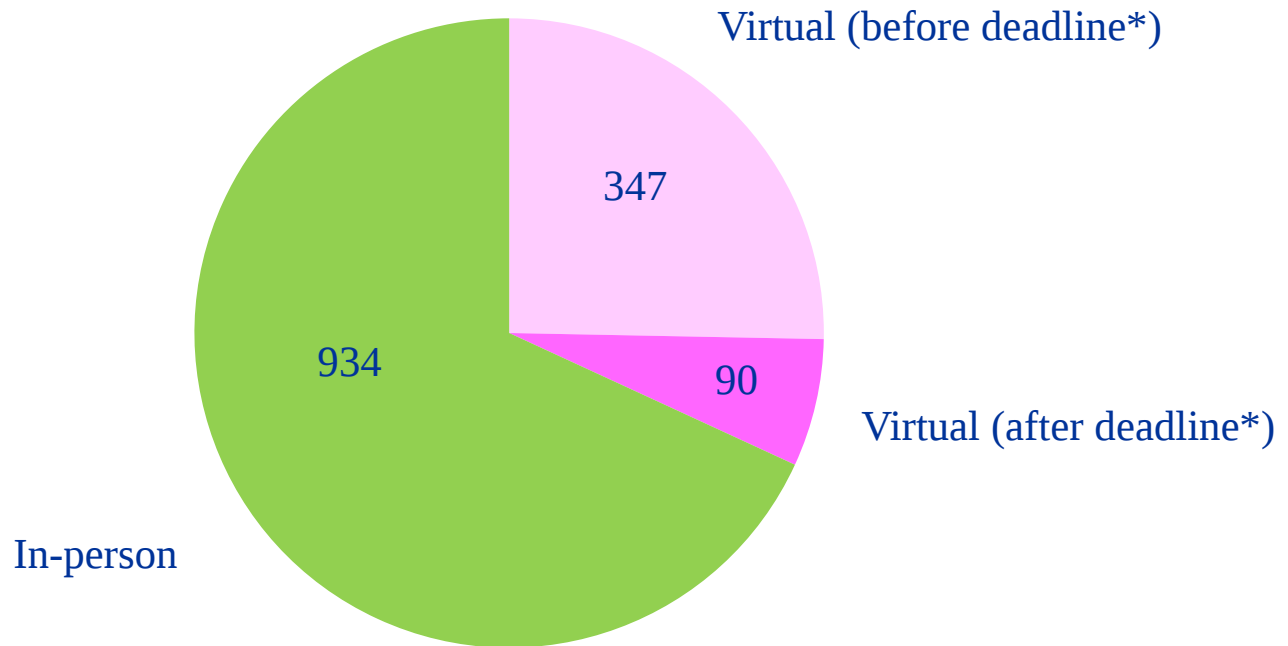
AP-S/URSI 2022 Denver Virtual Papers

Paper Stats	
Type	Count
Accepted	1371
Registered	1370

Total = 1371
Virtual = 437
In-person = 934

32% virtual

Virtual / In-person Paper Breakdown



*The original deadline for submitting a virtual request was May 20.

Virtual (as of 14:54 on Saturday 9 July): 437
Virtual by reason of COVID: 247
Virtual by reason of VISA: 190

Online Discussion for All Papers

Virtual Attendance of Some Short Courses

Virtual Presentations for All Authors

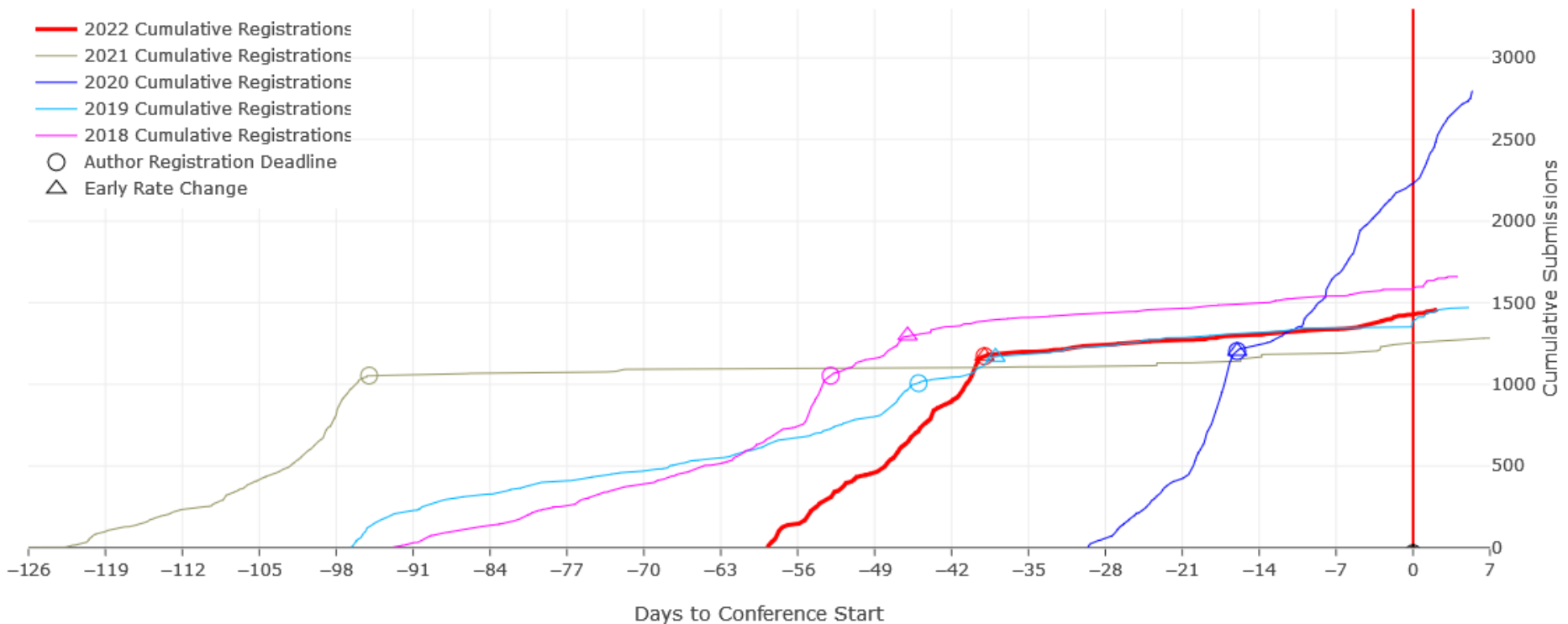
AP-S/URSI 2022 Denver Registrations

1460 Registrations

608 Student Registrations

331 Registrations Covering Virtual Papers

Registrations over Time



Plenary Session

An AP-S/URSI 2022 Denver Plenary Session (the first one in recent memory) will be held on **Thursday July 14, from 15:20 – 17:20**, in Centennial A/B/C. It will consist of three talks as follows:

15:20 – 16:10

AP-S Distinguished Industry Speaker Series Talk: Amazon's Project Kuiper: Overcoming Antenna Design Challenges to Advance Global Broadband Connectivity and Reach Unserved and Underserved Communities – Nima Mahanfar, Amazon Project Kuiper.

16:10 – 17:00

AP-S/URSI 2022 Keynote Talk: Antennas Outside of the Box – Dev Palmer, DARPA Microsystems Technology Office.

17:00 – 17:50

AP-S/URSI 2022 Keynote Talk: Event Horizon Telescope Imaging of Black Holes: How Antenna Arrays Discovered a Black Hole at the Center of Our Galaxy! – Geoffrey Bower, Event Horizon Telescope Collaboration.

17:50 - 19:20 University-Industry Reception

Attendance, again

We are collecting attendance electronically. If you have not done it yet, here it is again:

To record your
attendance,
enter this link:



bit.ly/usnc-ursi-b

Or scan this code:





Membership Committee: Steven Weiss



Technical Activities Report: Satish Sharma



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

USNC-URSI Membership Application

Response ID:221 Data

1. Board on International Scientific Organizations

1. Application for Membership in (select one):

Commission B: Fields and Waves

2. Category of membership for this nomination:

Early Career Member

3. Nominee:

First Name : Lauren

Last Name : Linkous

4. Nominee's Citizenship:

U.S. Citizen

5. Nominee's Information:

Organization : Virginia Commonwealth University, College of Engineering

Address : 601 W Main St, Richmond, VA 23284

Phone : (434) 882-2746

E-mail : linkouslc@vcu.edu

6. A Member of the Commission who knows the Nominee:

First Name : Jeanne

Last Name : Quimby

Organization : NIST

Phone : (303) 497-4217

E-mail : jeanne.quimby@nist.gov

Membership level of nominator (Full, Associate, or Early Career) : Full

A Member of the Commission who knows the Nominee:

(optional) - do not complete if self-nominating

7. Briefly describe your educational background, including institution(s), degree(s), and years attended:

2012- Winter 2014. Piedmont Virginia Community College Fall, earned AS in Engineering

2015-2018. Virginia Commonwealth University. Earned B.S in Electrical Engineering, and B.S in Physics

2018- present. Virginia Commonwealth University. Expected Ph.D in Engineering May 2023.

8. Briefly describe your work / research-related radio science experience:

Very new to practical radio science, approximately 6 months, but I have 10+ years experience with 3D printing (primarily FDM and SLA), metal casting, mixed-material composition projects, and outreach to K-12 on these subjects. In the last few months I have been working on creating tools using these skills to make teaching basic radio science more accessible to both K-12 students and teachers.

9. List your recent journal publications:

1. N. Zohrabi, L. Linkous, et al., "Towards Sustainable Food Security: An Interdisciplinary Approach," 2021 IEEE SmartWorld, Ubiquitous Intelligence & Computing, Advanced & Trusted Computing, Scalable Computing & Communications, Internet of

People and Smart City Innovation (SmartWorld/SCALCOM/UIC/ATC/IOP/SCI), 2021, pp. 463-470, doi: 10.1109/SWC50871.2021.00069.

2. Zohrabi, N., Martin, P.J., Kuzlu, M., Linkous, L., Eini, R., Morrissett, A., Zaman, M., Tantawy, A., Gueler, O., Al Islam, M. and Puryear, N., "OpenCity: An Open Architecture Testbed for Smart Cities." 2021 IEEE International Smart Cities Conference (ISC2). IEEE, 2021.

3. R. Eini, L Linkous, N. Zohrabi, S. Abdelwahed. "Smart Building Management System: Performance Specifications and Design Requirements". Elsevier. Journal of Building Engineering. 2021. 10.1016/j.jobbe.2021.102222.

4. R. Eini, L. Linkous, N. Zohrabi, S. Abdelwahed, "A Testbed for a Smart Building: Design and Implementation", Proceedings of the 4th International Workshop on Science of Smart City Operations and Platforms Engineering, April 15-18, Montreal, QC, Canada, 2019.doi>10.1145/33132237.3313296

5. L. Linkous, N. Zohrabi, S. Abdelwahed. "Health Monitoring in Smart Homes Utilizing Internet of Things" Medical Cyber Physical Systems in Internet of Medical Things Workshop, CHASE 2019, Washington, D.C. 2019.

10. List all of your conference presentations, giving a complete citation for each:

April 12, 2018- CPS-IoT Week 2019, presented "A Testbed for a Smart Building: Design and Implementation" at 4th International Science of Smart City Operations and Platforms Engineering Conference (SCOPE 2019) workshop in Montreal, Canada. (R. Eini, L. Linkous, N. Zohrabi, S. Abdelwahed, "A Testbed for a Smart Building: Design and Implementation", Proceedings of the 4th International Workshop on Science of Smart City Operations and Platforms Engineering, April 15-18, Montreal, QC, Canada)

September 27, 2019 - Medical Cyber Physical Systems in Internet of Medical Things Workshop (MCPS) at IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE 2019), presented "Health Monitoring in Smart Homes Utilizing Internet of Things" in Washington D.C 2019

September 8, 2021 - 2021 IEEE International Smart Cities Conference (ISC2), presented "OpenCity: An Open Architecture Testbed for Smart Cities" . (Zohrabi, N., et al., "OpenCity: An Open Architecture Testbed for Smart Cities." 2021 IEEE International Smart Cities Conference (ISC2). IEEE, 2021. (presented online))

January 6, 2022 -L. Linkous, J. D. Lundquist, E. Topsakal, "3D Printed Modular Antennas". 2022 USNC-URSI National Radio Science Meeting. Boulder, Colorado Jan 4- 8 2022. , (Session B8, paper 6)

11. List all of your conference presentations that were made at an URSI conference (either in the U.S. or elsewhere) in the commission for which you are applying for membership. Give complete citations.

L. Linkous, J. D. Lundquist, E. Topsakal, "3D Printer Modular Antennas". 2022 USNC-URSI National Radio Science Meeting. Boulder, Colorado Jan 4- 8 2022. , (Session B8, paper 6)

12. List all URSI conferences attended, URSI-related business meetings attended, sessions chaired in an URSI conference, and any other URSI activities in the U.S. or elsewhere.

USNC-URSI 2022 NRSM

13. List your recognitions (honors, awards that you belong to, societies, patents, patents applied for, or other recognitions or pertinent information):

IEEE student member

President of VCU Engineering Graduate Student Association

2.

Question 5

Question 32

3. Thank You!

Commission A

Commission B

Jan 16, 2022 22:35:25 Success: Email Sent to: notaros@colostate.edu,reyhan.baktur@usu.edu

Commission C

Commission D

Commission E

Commission F

Commission G

Commission H

Commission J

Commission K

Full Member - Acknowledgement Email

Associate Member - Acknowledgement Email

Question 5 Filled - Early Career Member - Acknowledgement Email

Question 32 Filled - Early Career Member - Acknowledgement Email

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

JULY 10-15, 2022 • DENVER



URSI Commission-B Special Sessions & Stats

**12 July 2022
Denver
(In-person Meeting)**

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



2022 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting

10-15 July 2022 • Denver

Papers submitted, accepted, rejected, and withdrawn

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

Submitted	Accepted	Rejected	Withdrawn
Total Submitted: 1473	Total Accepted: 1370	Total Rejected: 103	Total Withdrawn: 87
- AP Submitted: 1160	- AP Accepted: 1082	- AP Rejected: 78	- AP Withdrawn: 65
- URSI Submitted: 313	- URSI Accepted: 288	- URSI Rejected: 25	- URSI Withdrawn: 22
- URSI from US: 169	- URSI from US: 164	- URSI From US: 05	- URSI from US: 04
- URSI from non-US: 144	- URSI from non-US: 124	- URSI From non-US: 20	- URSI from non-US: 18

Sessions		
AP-S	140	Includes SS
URSI	59	Includes SS
URSI US	52	Includes SS
URSI Non-US	45	Includes SS

SS: Special Session

2022 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, **Denver**

URSI	Submitted Papers	Accepted Papers	Withdrawn Papers	Sessions
A	15	13	00	04
B	150	139	10	26
C	29	21	01	04
D	--	--	--	--
E	10	09	01	02
F	25	24	01	06
G	--	--	--	--
H	--	--	--	--
J	--	--	--	--
K	31	30	01	07
URSI Special	53	52	01	22
Total	313	288	22	71

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: 1773	Total Accepted: 1502	Total Rejected: 271	Total Withdrawn: 46
- AP Submitted: 1239	- AP Accepted: 1072	- AP Rejected: 167	- AP Withdrawn: 36
- URSI Submitted: 267	- URSI Accepted: 215	- URSI Rejected: 52	- URSI Withdrawn: 5
- URSI from US: 87	- URSI from US: 72	- URSI From US: 15	- URSI from US: 1
- URSI from non-US: 180	- URSI from non-US: 143	- URSI From non-US: 37	- URSI from non-US: 4

	Sessions	
AP-S	133	Includes SS
URSI	52	Includes SS
URSI US	26	Includes SS
URSI Non-US	39	Includes SS

SS: Special Session

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

URSI	Submitted Papers	Accepted Papers	Withdrawn Papers	Sessions
A	14	10	0	05
B	132	109	03	29
C	22	16	02	05
D	--	--	--	--
E	07	07	0	03
F	22	17	0	07
G	--	--	--	--
H	--	--	--	--
J	--	--	--	--
K	19	16	0	03
URSI Special	49	39	0	20
Total				

2022 version of this symposium we have

B	150	139	10	26
URSI	Submitted Papers	Accepted Papers	Withdrawn Papers	Sessions

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

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

URSI	Submitted Papers	Accepted Papers	Withdrawn Papers	Sessions
A	21	16	5	2
B	206	152	47	27
C	33	29	4	4
D	47	36	8	6
E	2	1	0	0
F	39	27	9	6
G	2	2	0	0
H	3	3	0	1
J	20	19	1	4
K	19	16	3	2
URSI Special	57	45	12	2
Total	449	346	89	54

2022 version of this symposium we have

B	150	139	10	26
URSI	Submitted Papers	Accepted Papers	Withdrawn Papers	Sessions

2019 IEEE International Symposium on Antennas and Propagation/USNC-URSI National Radio Science meeting, July 7–12, 2019, **Atlanta**, Georgia

Papers submitted, accepted, rejected, and withdrawn
(Breakdown: AP, URSI, URSI from US authors, URSI from non-US authors)

Submitted	Accepted	Rejected	Withdrawn
Total Submitted: 1590	Total Accepted: 1516	Total Rejected: 74	Total Withdrawn: 47
- AP Submitted: 1245	- AP Accepted: 1179	- AP Rejected: 66	- AP Withdrawn: 32
- URSI Submitted: 345	- URSI Accepted: 337	- URSI Rejected: 8	- URSI Withdrawn: 15
- URSI from US: 203	- URSI from US: 202	- URSI From US: 1	- URSI from US: 10
- URSI from non-US: 142	- URSI from non-US: 135	- URSI From non-US: 7	- URSI from non-US: 5

2019 IEEE AP-S International Symposium & USNC-URSI Meeting, **Atlanta**, Georgia

URSI	Submitted Papers	Accepted Papers	Withdrawn Papers	Sessions
A	36	34	2	5
B	183	173	6	24
C	18	14	2	2
D	-	-	-	-
E	6	6	1	1
F	34	32	2	3
G	-	-	-	-
J	-	-	-	-
K	12	12	0	3
URSI Special	56	56	2	0
Total	345	327	15	38

2022 version of this symposium we have

B	150	139	10	26
URSI	Submitted Papers	Accepted Papers	Withdrawn Papers	Sessions

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

2020 National Radio Science Meeting

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

2022 USNC-URSI Business Meeting

	2022	2021	2019	2018	2017	2016	2014	2013	2012
Total No. of papers	307	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	307	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, **2023 USNC-URSI NRS**, Boulder, Colorado
6 special sessions as of May 1, 2022

1. Low-Profile Millimeter-Wave/Terahertz Antennas for Mobile and Space Applications

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

2. Wearable antennas for WiFi, IoT, and 5G applications (Joint Commission B and K Session)

Sima Noghanian, CommScope, (sima_noghanian@ieee.org) and Yahia Rahmat-Samii, University of California, Los Angeles (rahmat@ee.ucla.edu)

3. Antennas and Systems for Specialized Platforms and Environments

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

4. Multiscale and Stochastic Modeling in Computational Electromagnetics

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

5. Novel Electrically Small Antennas and Matching Networks

Ting-Yen Shih, University of Idaho (tshih@uidaho.edu) and Kai Ren, Wentworth Institute of Technology (renk@wit.edu)

6. Complex EM and Meta Structures

Filippo Capolino, University of California, Irvine (f.capolino@uci.edu) and Juan Sebastian Gomez Diaz, University of California, Davis (jsgomez@ucdavis.edu)

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 Zadehgol, University of Idaho and Johannes Russer, Technical University of Munich (azadehgol@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

Special Sessions for National Radio Science Meeting 2023

- Please contact Satish K. Sharma within two weeks if you are still interested in organizing special session for the NRSM 2023.
- Thank you Technical Activities Committee (TAC) Reviewers for your service to Commission B papers reviewer activity
- Thank you USNC-URSI Commission B Officers for your help in reviewer and session building activities
- Hope to see you all at NRSM 2023 in Boulder during January 10-14, 2023 and IEEE AP-S/URSI Joint Symposium 2023 in Portland
- Email: ssharma@sdsu.edu

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