



SPECTRUM 

SpectrumX: An NSF Spectrum Innovation Center

Center Meeting - Day 1

University of Colorado Boulder + Remote
June 16-17, 2022

Agenda

Time (local mountain time)	Topic	Lead/Presenting
12:00 PM	Engineering Center Lab Tours?	
2:00 PM	Intro & Welcome	Nick Laneman /Scott Palo/NSF
2:15 PM	Education & Workforce Development	Valarie Bogan
3:00 PM	Broadening Participation	Tanya Ennis
3:45 PM	Break & Networking	
4:00 PM	Policy	Monisha Ghosh
4:45 PM	Summary / Day 1 Wrap-Up	Nick Laneman /Scott Palo
5:00 PM	Transit to Hotel/Down Time	
7:00 PM	Group Dinner Location: "BJ's Westminster, CO"	Any/All In Person

Reminders

Did you pay for parking? Access code E48734867

WIFI - Eduroam -or- UCB Guest (select UCB Guest, then open a web browser page, then click “agree”)

Zoom - Everyone please log into zoom + mute microphone & speaker, consider using Chat & Raising Hand, consider adding affiliation to your name

Disclaimer - Zoom is being recorded, and SX Marcomm is taking photos

Videography - Please consider signing up:

https://docs.google.com/spreadsheets/d/1-fn_9MtcTCRbSyQDsMe9M5W-EmlratXo-hc7kMKqfMk/edit?usp=sharing

Restrooms - across the hall

Need anything? Please don't hesitate to ask Josh or Tiffanie

University of Colorado Land Acknowledgement

As we gather, we honor and acknowledge that the University of Colorado's four campuses are on the traditional territories and ancestral homelands of the Cheyenne, Arapaho, Ute, Apache, Comanche, Kiowa, Lakota, Pueblo and Shoshone Nations.

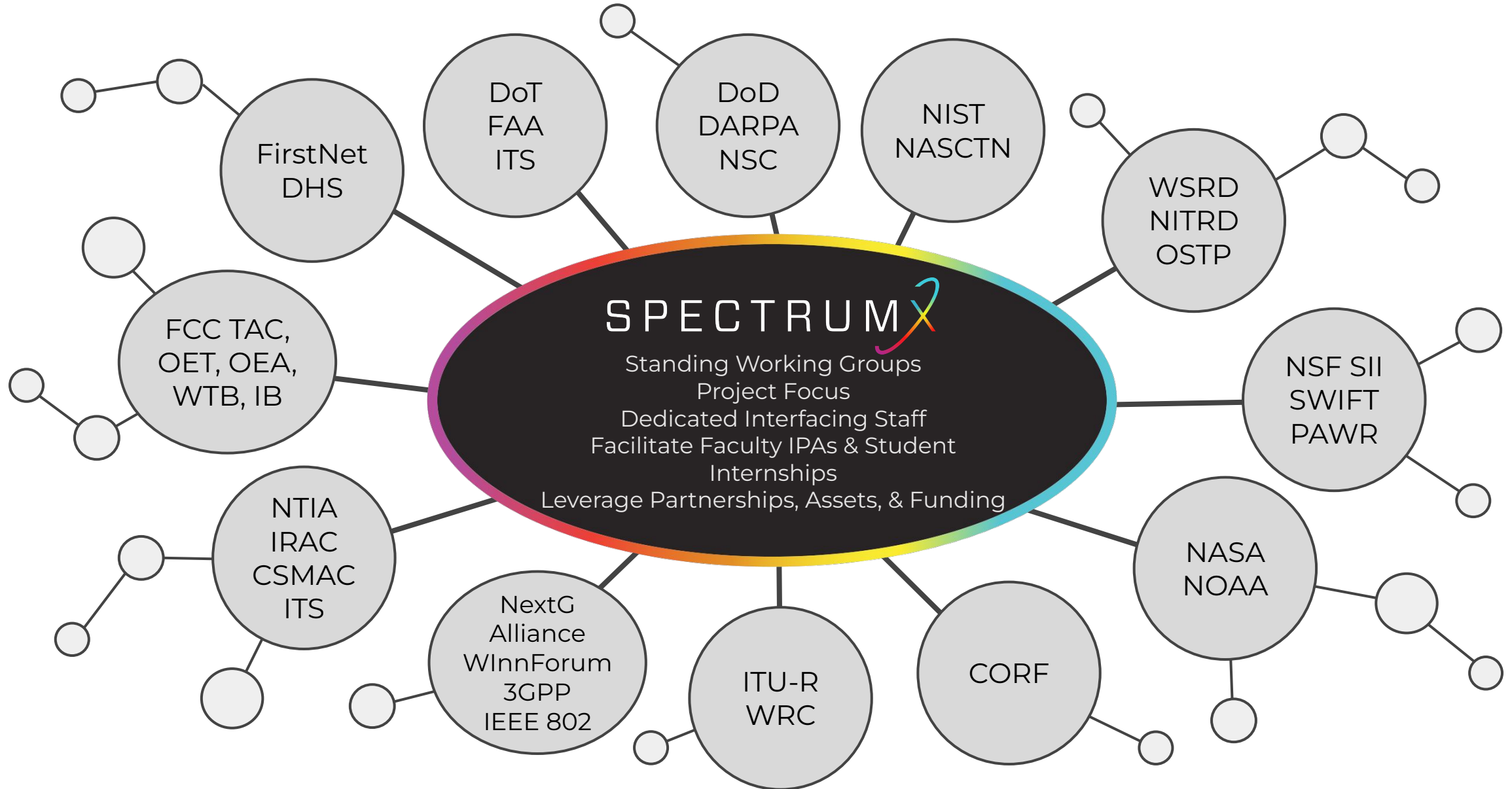
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Welcome & Meeting Introduction

Nick Laneman, Center Director

Scott Palo, Associate Director

World's Largest Academic Hub in the Spectrum Ecosystem





J.N. Laneman



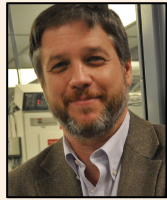
M. Ghosh



B. Hochwald



J. Tullis



R. Weikle



S. Barker



S. Bowers



A. Lichtenberger



C. Shen



N. Sidiropoulos



D. Cabric



S. Pamarti



A. Fourie



A. Beasley



B. Hawkins



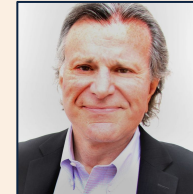
G. Schoenthal



T. Marzetta



S. Katti



T. Hazlett



J. Hesler



S. Palo



T. Ennis



S. Fox



T. Barton



P. de Vries



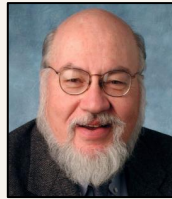
A. Gasiewski



K. Gremban



D. Grunwald



D. Hatfield



J. Morton



Z. Popovic



R. Rodriguez Solis



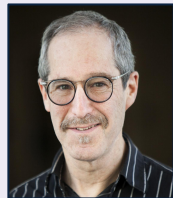
W. Lohmeyer



R. Berry



D. Guo



M. Honig



A. Sahai



M. Zheleva



K. Akiyama



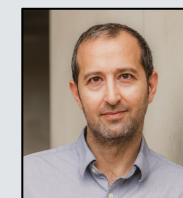
P. Erickson



F. Lind

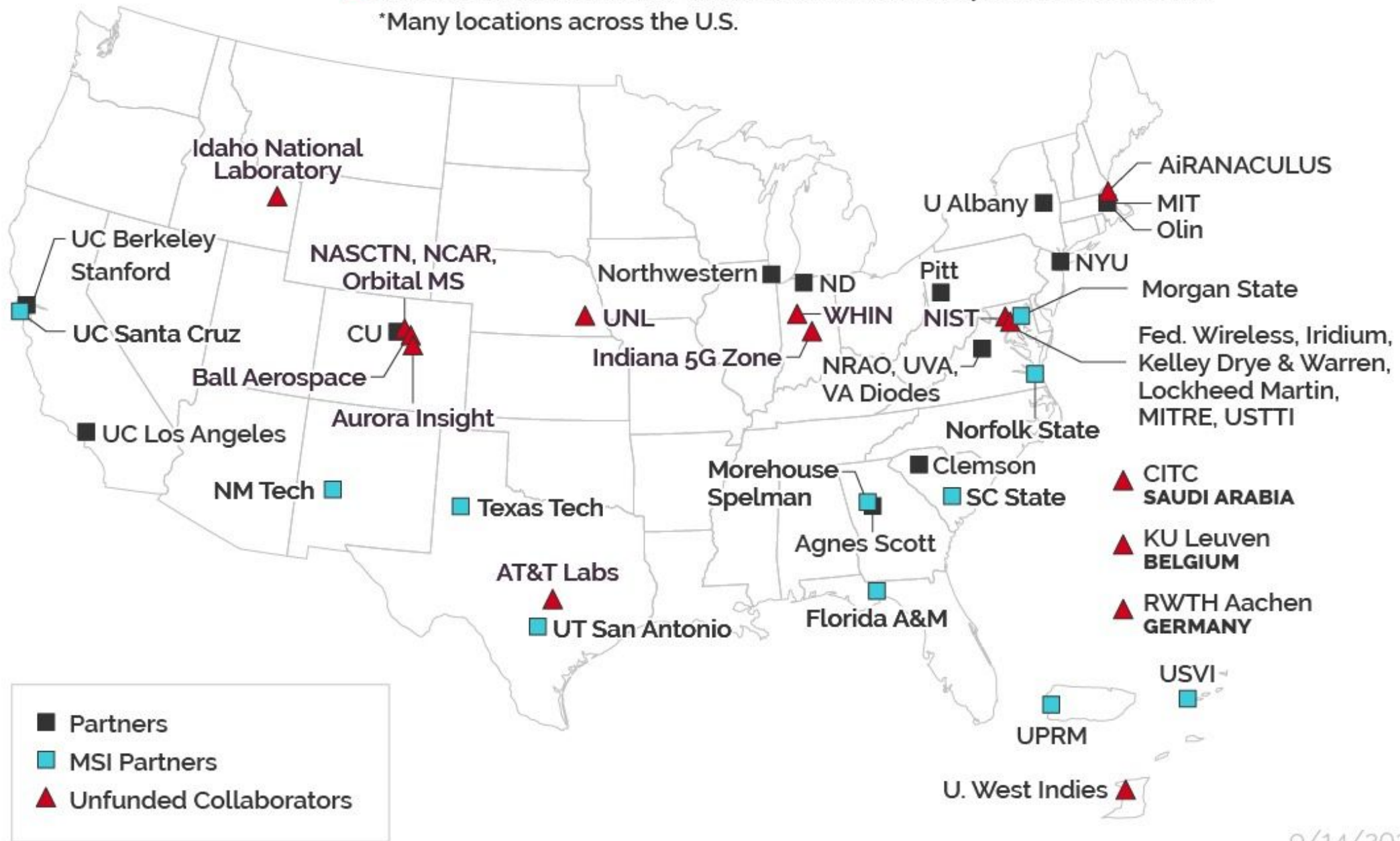


M. Weiss

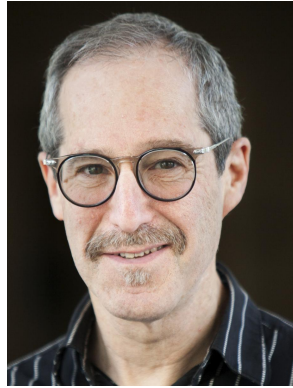


I. Murtazashvili

▲ National: American Tower, Crown Castle, National Spectrum Consortium
 *Many locations across the U.S.



SpectrumX Leadership



Mike Honig
Research Director



Anja Fourie / Valarie Bogan
Education & Workforce
Development Director



Dr. Tanya Ennis
Broadening Participation
Director



Monisha Ghosh
Policy Outreach
Director



Josh Tullis
Collaboration, Innovation, &
Commercialization Director



Bobby Weikle
Steering Committee
Chair



Scott Palo
Associate Director



Nick Laneman
Center Director

SpectrumX EAB Members



Stephanie Adams



Susan Avery



Julius Knapp



Ruth Milkman
Vice Chair



Janice Obuchowski



Charla Rath



Rick Reaser



Dennis Roberson
Chair



William Webb



Jonas Zmuidzinas

SpectrumX Meeting Observers



**Derek Khlopin
(NTIA)**



**Ira Keltz
(FCC)**



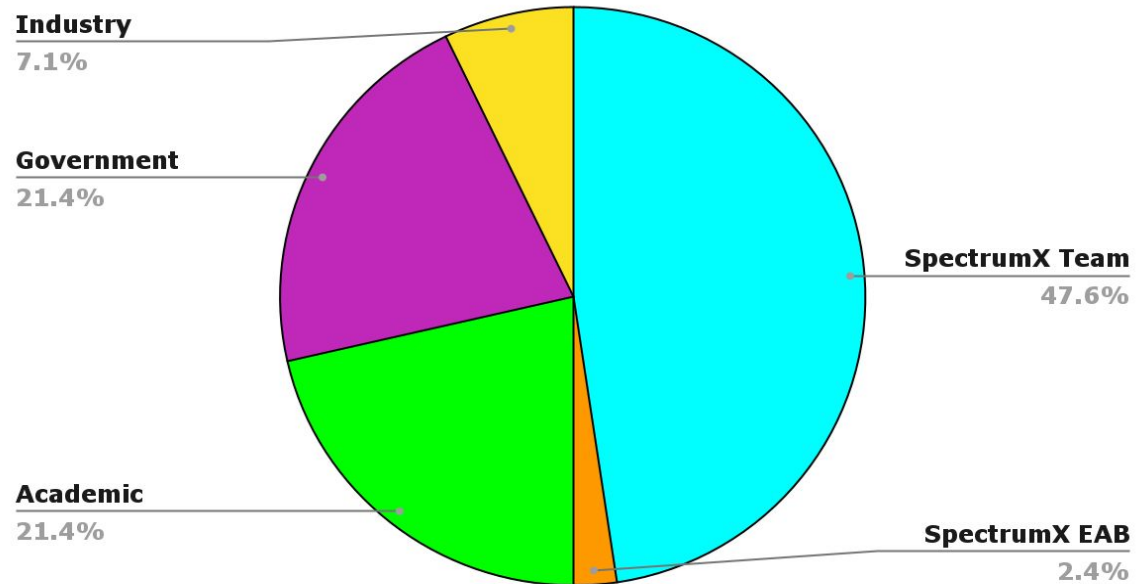
**Jonathan
Williams
(NSF)**



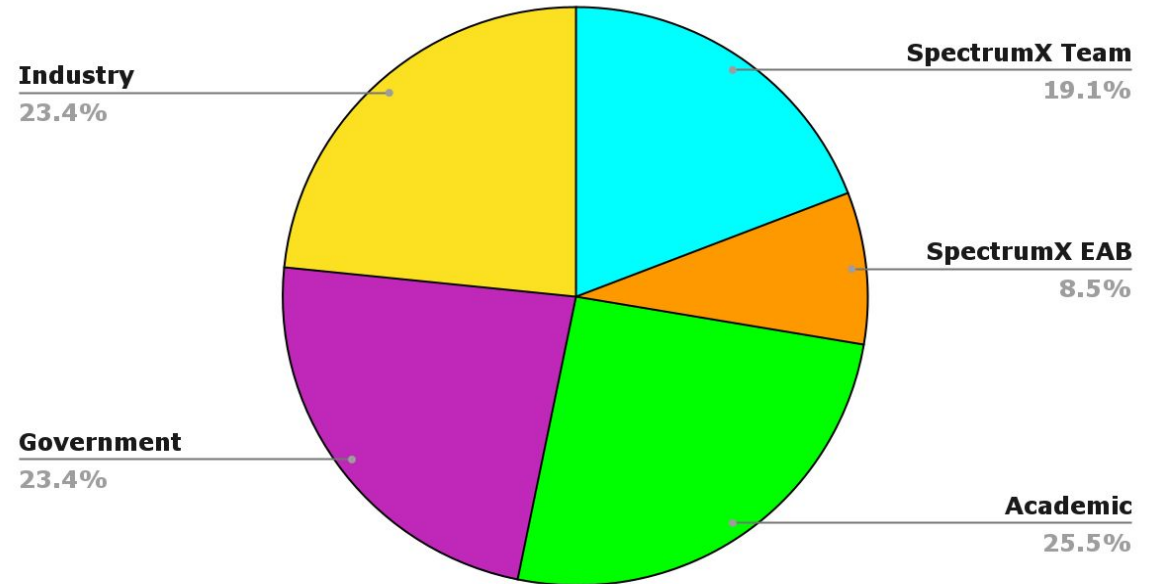
**John Chapin
(NSF)**

SpectrumX: Building Community

In-Person Attendees (42)



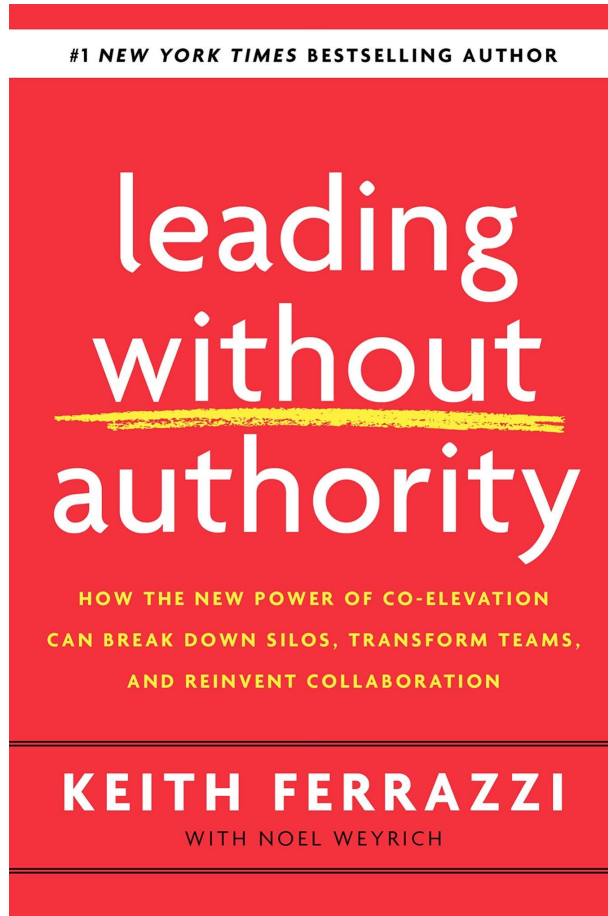
Remote (48)



Goals of this Meeting

- Celebrate progress, collect feedback, & update plans
- Identify gaps, new opportunities, & solutions
- Engage more constituents in SpectrumX, particularly industry & government agencies collaborating on our projects
- Continue strengthening team & building sense of community

Spirit of Co-Elevation®



- Everyone can Lead
- Commitment to a Shared Mission
- Care about Each Other
- Generosity & Service Mindset
- **Transparency & Accountability**
- **Radical Candor**
- Going Higher Together

SPECTRUM The logo for SPECTRUM features the word "SPECTRUM" in a white, sans-serif font. To the right of the text is a stylized graphic consisting of a curved line that transitions through a color gradient from purple to blue, green, yellow, and orange.

Education and Workforce
Development

Interim Director: Valarie Bogan
vbogan@nrao.edu

EWD Mission and Vision

VISION

A diverse, competitive STEM workforce with transferable skills relevant for a rapidly changing workplace and society.

MISSION

Establish, grow and sustain an intentional network of diverse partners that use innovative approaches to spectrum research, education and workforce development to identify, recruit, train, retain and accelerate the progress of students from underrepresented minority groups in fields required for spectrum research.

EWD Plan Scope of Work

Curriculum	Research and Training	Mentoring	Professional Development	Outreach
Grade 6-12	Exchange Program	Multi-tier Mentors	Soft Skills	Home Community
Undergraduate	OSSTP Fellowship	Mentor Selection	Role Modelling	Career Fairs
Masters	UbiNET Summer School	Mentor Training	Individual Development	Citizen Science Project

EWD Plan Timeline

Scope of Work	Year One				Year Two				Year Three				Year Four				Year Five			
Needs Analysis	Light Blue				Grey				Grey				Grey				Grey			
Grade 6-12 Curriculum	Light Blue				Light Blue				Dark Blue				Dark Blue				Dark Blue			
Undergraduate Curriculum	Light Blue				Light Blue				Dark Blue				Dark Blue				Dark Blue			
Masters Curriculum	Light Blue				Light Blue				Dark Blue				Dark Blue				Dark Blue			
Research and Training Experiences	Grey				Light Blue				Dark Blue				Dark Blue				Dark Blue			
Mentoring Program	Light Blue				Light Blue				Dark Blue				Dark Blue				Dark Blue			
Professional Development Program	Light Blue				Light Blue				Dark Blue				Dark Blue				Dark Blue			
Outreach	Light Blue				Light Blue				Dark Blue				Dark Blue				Dark Blue			
Evaluation	Light Blue				Light Blue				Dark Blue				Dark Blue				Dark Blue			
Key	Planning				Implementation				Execution											

Curriculum: Grades 6-12

Grades 6 -12 Scope of Work

Curriculum

Grade 6-12

- Led by NRAO Curriculum Specialist in collaboration with EWD WG and EWD Curriculum PT
- Developed by cohort of eight educators during a paid 10-week in-person and virtual summer residency in Y1
- 16 activity-based lesson plans for middle and high school
- TeachEngineering to edit, format, peer review and align each lesson plan developed (NGSS and partner IHE states/territory standards)
- UPRM to prototype lesson plans by Q3 of Y2 through Centro Universitario para el Acceso
- TeachEngineering to provide virtual educator training for 28 educators at feeder schools in Q4 of Y2 to prepare educators for the use of the lesson plans by Y3.
- Publish to SpectrumX, TeachEngineering and Superknova websites

Accomplished

- Eleven educators selected
- Workshop developers identified

Within the Next Year

- Training program June 27 - August 8
- TeachEngineering edit, align to standards, and format lessons
- UPRM pilot lessons
- Uploaded to TeachEngineering and Superknova

Get Involved

- Provide a workshop for the program
- Identify an educator interested in using the curriculum

Curriculum: Undergraduate

Undergraduate Scope of Work

Curriculum

Undergraduate

- Led by NRAO Curriculum Specialist in collaboration with EWD WG and EWD Curriculum PT
- Eight asynchronous, interdisciplinary undergraduate courses (1-2 credits each) to include in Bachelor's degree or add as a certification
- EWD Director to lead negotiations with each partner institution and liaise with the relevant course approval authority to assist faculty with course approval
- NRAO's Curriculum Specialist to collaborate with the EWD Curriculum PT to:
 - develop curriculum framework for the respective courses
 - select best quality existing courses from SpectrumX partner institutions and collaborators (e.g. NTIA)
 - identify courses that do not exist or are not to the required quality
 - recruit leading instructors from amongst partner institutions or external content specialists to develop course content by the end of Y1
- Course content, multimedia production, prototyping, and marketing of the courses will be completed by the end of Y2
- Min 100 students from SpectrumX partner institutions to complete one or more of these courses by the end of Y5

Accomplished

- Needs analysis
- Government, Industry, and SpectrumX survey

Within the Next Year

- Determine the curriculum frameworks
- Identify the format of the courses
- Recruit course developers
- Create the content

Get Involved

- Join the curriculum project team
- Apply to develop a course
- Share the openings with colleagues

Curriculum: Masters

Masters Scope of Work

Curriculum

Masters

- Led by Notre Dame Learning in collaboration with EWD WG and EWD Curriculum PT
- Develop three asynchronous, interdisciplinary graduate courses (3-4 credits each) to include in an existing Master's degree or add as a certification
- ND to lead negotiations with each partner institution and liaise with the relevant course approval authority to assist faculty with course approval
- In Y1, ND Learning to lead efforts to:
 - design, develop and deliver the online Master's courses
 - collaborate with EWD Curriculum PT to develop curriculum frameworks
 - recruit instructors from SpectrumX partner institutions or external content specialists to develop course content
 - finalize MoUs or contracts with partner institutions and specialists for the use or development of course materials and instructor time
- ND will manage the development of course content, multimedia production, prototyping, and marketing of the courses by the end of Y2
- Courses will be offered via the ND Learning e-learning platform from Y3 onward
- SpectrumX partner institutions guaranteed 10 enrollments per year in Y3-5 for these courses at a reduced rate per credit
- Min. 100 and max. 500 students in Years 3-5

Accomplished

- Needs analysis complete
- Government, industry and SpectrumX surveys
- General topics for the courses selected
- Format for courses identified
 - Coursera
 - Curriculum guide for partner institutions

Within the Next Year

- Solidify the content for each course
- Recruit course developers
- Create content

Get Involved

- Join the curriculum project team
- Apply to develop a course
- Share the openings with colleagues

Mentoring

Mentoring Scope of Work

Mentoring

Multi-tier Mentors

Mentor Selection

Mentor Training

- Led by NRAO Broadening Participation Projects Manager in collaboration with EWD WG and EWD Mentoring PT will manage
- Each SpectrumX summer student is matched with a tier mentor at their RTE host institution and a peer mentor from their RTE cohort for the summer
- Mentors will be recruited from alumni, graduate students and faculty at the partner institutions, as well as professionals in industry, and will be interviewed to set-up a suitable match with a student
- Min. 30 mentors will participate in annual mentor training (Y3) designed by the UCSC Vera Rubin Presidential Chair for Diversity in Astronomy.
- Training will cover topics such as cultural competence, stereotyping and bias, and institutional barriers, and prepare mentors to support first-generation and URM students
- Y3 mentors will train new mentors at their institution in Y4 and Y5

Accomplished

- Identified partner institution for the mentorship program
- Statement of work with UC Santa Cruz
- Created the framework for the implementation of the program

Within the Next Year

- Piloting departmental needs analysis
- Research best practices for individual mentor training for URM students
- Pilot three mentoring workshops

Get Involved

- Identify URM students in department to take survey
- Departments participate in mentoring survey
- Volunteer to be a mentor and participate in mentor training

Professional Development

Professional Development Scope of Work

Professional Development

Soft Skills

Role Modelling

Individual Development

- Led by NRAO Broadening Participation Projects Manager in collaboration with EWD WG and EWD Professional Development PT
- Identify high-level STEM competencies necessary for graduates entering the spectrum workforce, e.g. project management
- Design program that will train undergraduate and graduate students in technical and soft skills such as critical thinking, science communication and teamwork
- Min. three hybrid model workshops per year
- Virtual positive role-modeling Q&A sessions once a month
- Graduate students will be required to complete a self-assessment and develop an individual development plan (IDP) in conversation with their advisor

Accomplished

- Surveys of government, industry, and SpectrumX members
- Initial workshops on communicating your message to the general public, communicating your message to peers, and stress management developed
- Plans to pilot with a select group of SpectrumX institutions

Within the Next Year

- Create a detailed implementation plan
- Identify presenters with expertise in specific topics
- Develop a technical writing workshop

Get Involved

- Volunteer to create the workshop on technical writing
- Suggest topics for future workshops
- Provide resources so students can learn more about these topics
- Volunteer to give a role modeling talk

Outreach

Outreach Scope of Work

Outreach

Home Community

Career Fairs

Citizen Science Project

- Two URM students per quarter (in Y3-Y5) from SpectrumX partner institutions will conduct a five-day “Hometown Outreach Tour” in their home communities, incl. informal one-hour talks at a community hall (required) and at Grade 6-12 schools
- As a role model, they will use their own story to explain why a student’s success relies on cultural capital and the support of their families and community
- Supported by materials identified or developed by the EWD Working Group and Diversity WG
- MIT, ND, NRAO, U Albany and UPRM will collaborate to continue the development of the NRAO Spectrum Monitoring Citizen Science Project prototyped using the NRAO’s NSF NRDZ grant
- Enables the general public to build a sensor from a pre-configured kit, monitor the spectrum in a specific geographic location, submit data via an app, and access data via an API.
- Kit includes a handbook for the general public, and a handbook and curriculum content/activities for middle / high school educators.
- Include work already done by, e.g. ARDC, ElectroSense, Spectrum Safari, etc.
- Kits will be distributed to a minimum of 14 partner institution feeder schools in Y3
- SpectrumX will collaborate to implement public outreach events, e.g., a hackathon, using data generated through the project.

Accomplished

- Initial citizen science project complete

Within the Next Year

- Pilot initial project at 22 institutions
- Develop supplemental activities

Get Involved

- Volunteer to be a pilot institution (exclusions apply)
- Contribute an additional activity to the existing set

SpectrumX EWD

Regular Participants & Key Contributors



N. Laneman



S. Palo



T. Ennis



A. Fourie



R. Rodríguez Solís



M. Ghosh



A. Sahai



V. Bogan



D. Rowland



J. Bates

Get Involved

- Working Group meetings 3rd Tuesday every month
- Project teams are forming
 - Curriculum (6-12, Undergrad, Grad, and Citizen Science)
 - Mentoring and PD
- Contact Valarie for more information (vbogan@nrao.edu)

Questions or Comments

SpectrumX - Broadening Participation

Tanya Ennis, CU Boulder, Director of Broadening Participation

SpectrumX Center Team Meeting

Broadening Participation Working Group

Dr. Tanya Ennis

SpectrumX Center Broadening Participation Director

University of Colorado Boulder

GOAL: Broadening Participation Success

- To develop and welcome a diverse, creative, and talented workforce for the SpectrumX Center and the electromagnetic radio spectrum field
- NSF is funding this professional development opportunity for which you may be able to get credit on your institutional annual report
- We will be educated with tools and better prepared to support students from underrepresented groups effectively
- A higher probability of success in recruiting, hosting, advising and mentoring underrepresented students

SpectrumX Center: Broadening Participation Parallel Tracks



Track 1: Intercultural Competence Assessment

Intercultural Development Inventory (IDI)



Track 2: Diversity, Equity, and Inclusion (DEI) Education

Improving Intercultural Competence through Education



Track 3: Broadening Participation with RADIAL Partnerships

Build Meaningful and Reciprocal Relationships
Distribute Resources and Opportunities Equitably



Short-Term Roadmap for Broadening Participation

Track 1: Intercultural
Competence
Assessment

Required: 2.5 hours
completed by
December 2022

Total Required: 5.5 hours

Total to Host REU student in the summer 2023:
7.5 hours + required mentorship training by
NRAO

**Additional Suggested/Recommended to Host
REU student in 2023:** 9.5 hours + required
mentorship training by NRAO

Track 2: DEI Education
Workshops

- **Required:** 3 hours
completed by June 1, 2023
- **To host REU student in the
summer 2023:**
Additional 2 hours
completed by June 1, 2023
- **Additional Suggested/
Recommended to host REU
student in the summer
2023:**
2 additional hours
completed by June 1, 2023

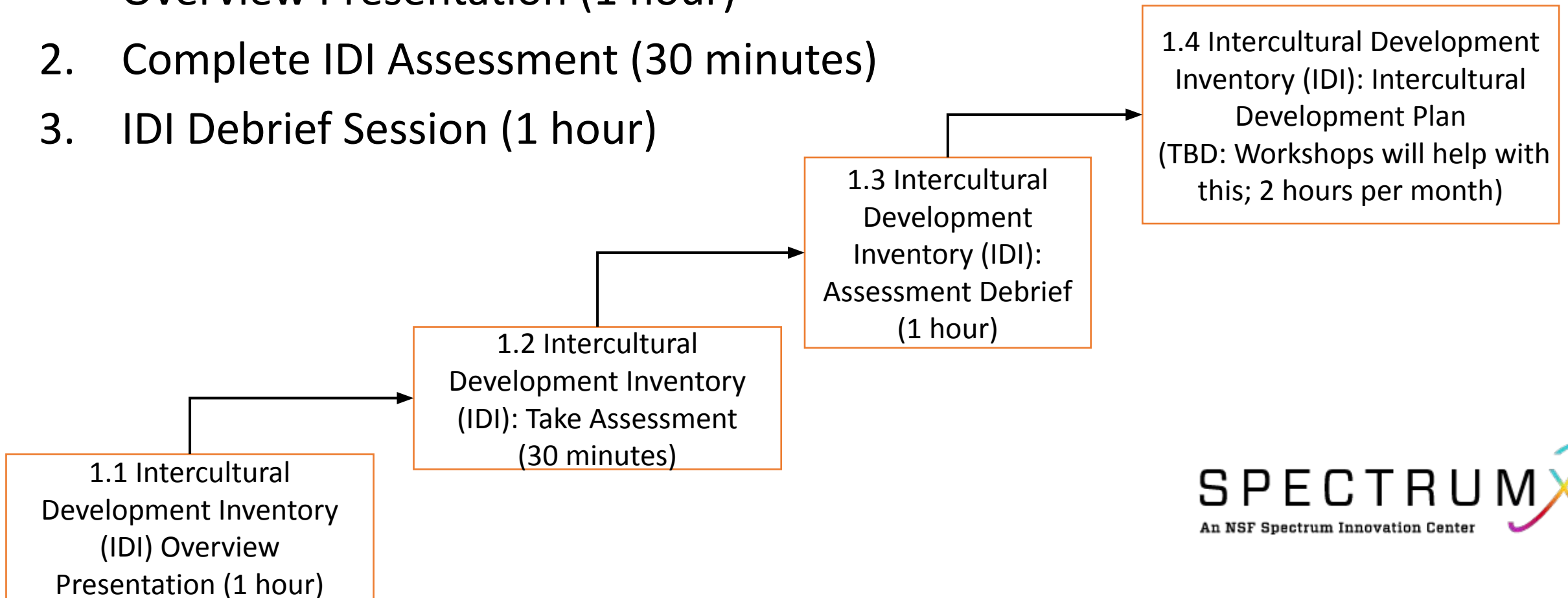
Track 3: Broadening
Participation with RADIAL
(MSI) Partners

- Build and foster strong
foundation of partnership
- **To host REU student in the
summer 2023:**
Mentorship training as
determined by NRAO: TBD

Track 1: Intercultural Competence Assessment

Sequential Activities

1. Intercultural Competence: Intercultural Development Inventory (IDI) Overview Presentation (1 hour)
2. Complete IDI Assessment (30 minutes)
3. IDI Debrief Session (1 hour)



Metrics on Track 1: Intercultural Competence Assessment

	1.1 Intercultural Development Inventory (IDI) Overview	1.2 Intercultural Development Inventory (IDI): Take Assessment	1.3 Intercultural Development Inventory (IDI): Assessment Debrief (1 hour)
Directors	100%	100%	91%
Research Team Leads	100%	100%	100%
Project Team Leads	80%	80%	80%
SpectrumX Center remaining members	0%	0%	0%

Track 1: Getting Started with the Intercultural Competence Assessment

- Attend the Intercultural Development Inventory Presentation (by August 15, 2022)
- Take the IDI assessment using the link and code sent via email (by October 15, 2022)
- Once you complete the assessment, you will debrief your results with a QA (by December 1, 2022)
- IDI Qualified Administrators (QAs)
 - Tanya Ennis, University of Colorado Boulder
 - Natasha Williams, University of Pittsburgh
 - Meara Habashi, University of Virginia
 - Dr. Isa Rodriguez, University of Puerto Rico Mayagüez

Track 2: Diversity, Equity, and Inclusion (DEI) Education – Workshops

To develop and welcome a diverse, creative, and talented workforce for the SpectrumX Center and the electromagnetic radio spectrum field



We will be educated with tools and better prepared to support students from underrepresented groups effectively



Track 2: Diversity, Equity, and Inclusion (DEI) Education – Workshops

All SpectrumX Center members must complete the basic workshops by December 1, 2022 (Check your email to register for “*Journey to Inclusive Cultures 101 and 102*”):

- The Journey to Inclusive Cultures 101 (1 hour): Scheduled June 29, 2022
- The Journey to Inclusive Cultures 102 (1 hour): Scheduled July 13, 2022
- Understanding Implicit Bias (1 hour): TBD

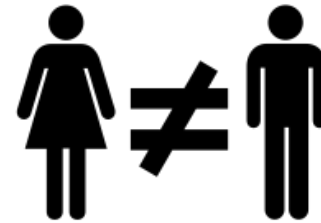
A total of 3 hours by December 2022 (average 30 minutes per month)

****Additional sessions for each workshop will be scheduled**

Track 2: Diversity, Equity, and Inclusion (DEI) Education Workshops – Preparing for REU students

If you are welcoming REU students in the summer 2023, you must complete these additional workshops by June 1, 2023 before resources are distributed to host an REU student (A total of 3 hours).

- Understanding Racism (1 hour)
- Understanding Sexism (1 hour)
- Understanding Microaggressions (1 hour)



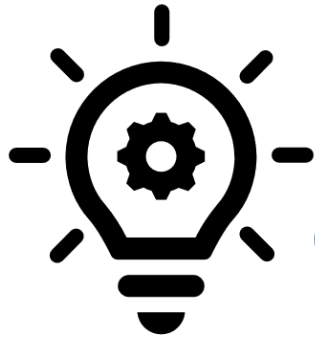
It is recommended (not required) that you choose 2 of these (a total of 2 hours) by June 1, 2023 (for welcoming REU students):

- Interrupting Racism (1 hour)
- Interrupting Sexism (1 hour)
- Understanding Intersectionality (1 hour)

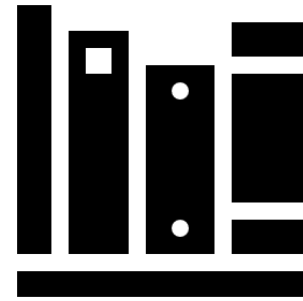


Track 2: Diversity, Equity, and Inclusion (DEI)

Education Other Independent Learning Opportunities



Inclusive Language –
Pearls of Wisdom
(posted weekly in Slack
in the #dei channel)



Reading Circles:
broken down by
Chapters
(BlindSpot)



Educational
Videos and Films
including
TedTalks



Speakers
and
Conferences



Listening to
Podcasts

Resources available in Broadening Participation Working Group Folder:

SpectrumX Intranet/Working Folders/Broadening Participation/DEI
Resources/SpectrumX DEI Resources for Website

Short-Term Roadmap for Broadening Participation

Track 1: Intercultural Competence Assessment

Required: 2.5 hours completed by **December 1, 2022**

Total Required: 5.5 hours

Total to Host REU student in the summer 2023: 7.5 hours + required mentorship training by NRAO

Additional Suggested/Recommended to Host REU student in 2023: 9.5 hours + required mentorship training by NRAO

Track 2: DEI Education Workshops

- **Required:** 3 hours completed by **June 1, 2023**
- **To host REU student in the summer 2023:**
Additional 2 hours completed by **June 1, 2023**
- **Additional Suggested/Recommended to host REU student in the summer 2023:**
2 additional hours completed by **June 1, 2023**

Track 3: Broadening Participation with RADIAL (MSI) Partners

- Build and foster strong foundation and partnerships with RADIAL partners
- **To host REU student in the summer 2023:**
Mentorship training as determined by NRAO: **TBD**

Track 3: Broadening Participation with RADIAL Partners



Establish a strong foundation by clarifying partnership and expectations between SpectrumX, NRAO and RADIAL Partners

Identify key stakeholders and faculty partners

Present the goals and objectives of the SpectrumX Center



Host Brown Bag sessions to meet and engage in meaningful dialogue (July 6 and August 3)

Identify key stakeholders and faculty partners

Share faculty and student opportunities

Listen to RADIAL Partners ideas



Build relationships with RADIAL Partners

Invite MSI faculty to participate in WG and PT groups and meetings

Identify Research Resources and Projects for MSI faculty engagement

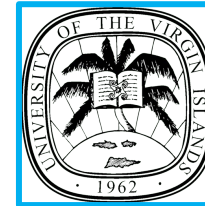
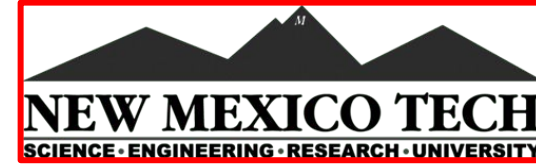
NRAO to develop mentorship model



Share faculty and student opportunities

Listen to RADIAL Partners ideas

Outline mutually beneficial opportunities, projects, research and funding between RADIAL Partners and other SpectrumX Center institutions



SpectrumX Center: Broadening Participation Parallel Tracks



Track 1: Intercultural Competence Assessment

Intercultural Development Inventory (IDI)



Track 2: Diversity, Equity, and Inclusion (DEI) Education

Improving Intercultural Competence through Education



Track 3: Broadening Participation with RADIAL Partnerships

Build Meaningful and Reciprocal Relationships
Distribute Resources and Opportunities Equitably



Timeline

Intercultural Competence Assessment: Completed and Debriefed by December 1, 2022

- Attend the Intercultural Development Inventory Presentation **(by August 15, 2022)**
- Take the IDI assessment using the link and code sent via email **(by October 15, 2022)**
- Once you complete the assessment, you will debrief your results with a QA **(by December 1, 2022)**

DEI Educational Workshops: Completed by June 1, 2023

- The Journey to Inclusive Cultures 101 (1 hour): Scheduled June 29, 2022 (additional sessions TBD)
- The Journey to Inclusive Cultures 102 (1 hour): Scheduled July 13, 2022 (additional sessions TBD)
- 1 workshop once a month during BP WG meetings: Wednesdays @1:30 PT/2:30 MT/3:30 CT/4:30 ET
 - Understanding Implicit Bias (1 hour): TBD
 - Understanding Racism (1 hour): TBD
 - Understanding Sexism (1 hour): TBD
 - Understanding Microaggressions (1 hour): TBD

Broadening Participation with RADIAL Partnerships: TBD (in progress/stay tuned)

Contact Information

Dr. Tanya Ennis (she/her/hers)

Tanya.ennis@colorado.edu

tennis@spectrumx.org

(303)735-2142

SpectrumX Policy Outreach Overview

Monisha Ghosh, Policy Outreach
Director

SpectrumX Policy Outreach Goals

- Arranging meetings and workshops between member institutions and collaborating organizations to explore synergies and approaches to **enhance and accelerate the spectrum management process**.
- Moderating conversations with the Federal stakeholders involved (e.g. FCC, NTIA, Congressional Committee staff, OSTP, State Department) about **best practices and communication bottlenecks affecting both spectrum use and coexistence**.
- Summarizing upcoming ITU meetings, NTIA initiatives, and FCC NPRMs for monitoring and strategic planning by SpectrumX members.
- Delivering white papers and formal comments summarizing the **challenges and opportunities as well as the technical and policy options** developed by SpectrumX.

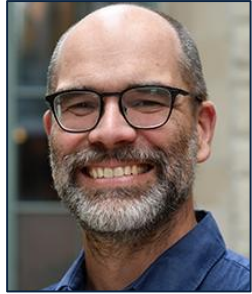
SpectrumX Policy Outreach OKRs

Working Group / Project Team	Objectives	Key Results Summarized by Quarter					
		Year 1				Year 2	
		Q1 (Oct - Dec 2021)	Q2 (Jan - Mar 2022)	Q3 (Apr - Jun 2022)	Q4 (Jul - Sep 2022)	Q1 (Oct - Dec 2022)	Q2 (Jan - Mar 2023)
Policy Outreach Working Group (PWG)	Develop an effective Working Group & support team led by PO Director	Participated in Kickoff Event	Engage consultants		Evaluate effectiveness outreach programs		
		Created PWG Implementation Plans, OKRs	Plan workshop on cellular/radar altimeter interference				
			Resume Working Group meetings				
	Summarize US and global spectrum issues for Center participants	Meetings with FCC, NTIA, other regulatory agencies, stakeholders	Review and summarize FCC proceedings of interest	Review and summarize FCC proceedings of interest	Review and summarize FCC proceedings of interest	Review and summarize FCC proceedings of interest	Review and summarize FCC proceedings of interest
			Identify new research areas with policy impact	Identify new research areas with policy impact	Identify new research areas with policy impact	Identify new research areas with policy impact	Identify new research areas with policy impact
	Communicate Center results to US policy makers	Meet with project teams to decide policy deliverables	Create a policy blog		Edit and publish 3 blog entries		Edit and publish 3 blog entries
			Engage with project teams to reinforce policy deliverables	Collect policy highlights	Collect policy highlights	Collect policy highlights	Collect policy highlights
	Develop balanced talking points on spectrum issues for the media and general public		Develop guidelines and high-level talking points for designated experts to represent SpectrumX while avoiding policy advocacy	Update priority issue list and designated list of experts			
				Write specific talking points for 2 issues		Write specific talking points for 2 issues	

SpectrumX Policy Outreach Regular Participants & Key Contributors



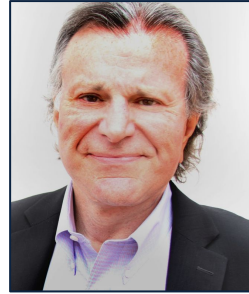
S. Palo



R. Berry



M. Weiss



T. Hazlett



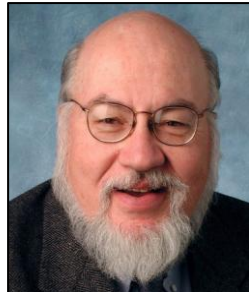
P. Erickson



P. Kolodzy



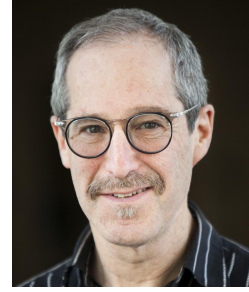
M. Ghosh



D. Hatfield



A. Sahai



M. Honig



W. Lohmeyer

Progress

- Progress

- Biweekly meetings since January 2022.
- In-depth policy and technical discussions on recent policy issues:
 - C-band/ radar altimeter, NGSO NPRM, Receiver Standards NOI.
- Facilitated presentations in the Radio Shop Chat Forum from EU policy makers and Keysight on next generation wireless spectrum needs.
- Planning workshop on Spatial Interference Modeling.
- Facilitated presentations to the FCC Technological Advisory Council (TAC) by SpectrumX members: Phil Erickson, Dale Hatfield, Tom Hazlett.
- Discussions with APCO (Association of Public Safety Communications Officials) on 6 GHz interference concerns and how SpectrumX can help.

Future Plans

- Future plans

- Create a policy blog with contributions from SpectrumX team as well as outside experts on current topics of interest.
- Extract policy deliverables from ongoing research projects and make them available to policy makers, e.g. via comments to the FCC.
- Leverage the work being done in the FCC TAC groups to inform ongoing projects in SpectrumX, e.g. the focus on 7 – 24 GHz for next generation wireless.
- Incubate new projects with the specific purpose of addressing ongoing and future policy debates: e.g. 5G/mmWave, 5G/RadAlt

How SpectrumX can have maximum policy impact in the future

- Look forward: 7 – 24 GHz will be the new band for next generation wireless.
 - Will almost certainly be shared: incumbents are primarily satellite, microwave links, deep space exploration, federal users.
 - Sharing mechanisms used in the past: TVWS, 6 GHz AFC, CBRS (ESC +SAS) may not apply.
 - Many experimental licenses in 12.75 – 13.25 GHz: are there co-channel or adjacent channel passive applications that could be impacted? The time to do this research is now.
 - Scant data on where incumbents are deployed and sensitivity to interference: measurement data, and novel sharing mechanisms specific to incumbents in the band could be extremely influential in future rulemaking.
- Policy impact requires different deliverables: measurements and sharing mechanisms need to be in a form that rule-making can leverage.

Day 1 Wrap-Up