Equity, Diversity, and Inclusion in Large-Scale Scientific Collaborations
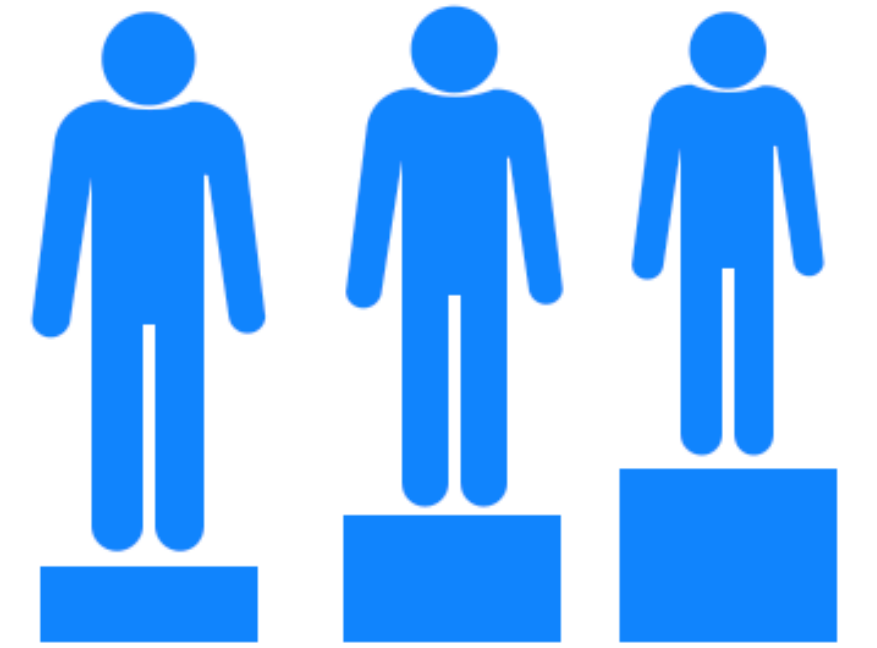
Erica Caden, she/her
erica.caden@snolab.ca

NNN25, Sudbury, Canada

What do we mean when we talk about Equity, Diversity, Inclusion?

Equity

- Ensures everyone has access to the same opportunities to grow, thrive, and do their best work

- Advantages and barriers exist for some groups, and that therefore we do not all start from the same place

Diversity

- Encompasses all the ways that individuals or groups are uniquely different from one another

- Can include race, ethnicity, gender, age, national origin, religion, disability, sexual orientation, socioeconomic status, education, marital status, language, and other factors that influence our ideas, values, perspectives, and experiences

Inclusion

- Fostered by creating an environment where any individual or group feels safe, welcomed, respected, valued, and empowered to not only fully participate but also to succeed

- Commitment to creating a workplace that respects and embraces the differences of every member of our team

Important to International Communities

Canadian Subatomic Physics LONG-RANGE PLAN 2022–2026

- We recommend ... regular data-gathering and analysis, **targeted initiatives to enhance equity, diversity and inclusion** within community activities...
- We recommend that the subatomic physics community **promote balanced representation in high visibility leadership roles,** as individuals in these positions are important role models...

A NEW ERA OF DISCOVERY — THE 2023 LONG RANGE PLAN FOR NUCLEAR SCIENCE — 2023 | VERSION 1.5

- The highest priority of the nuclear science community in this Long Range Plan includes expanding policy and resources to **ensure a safe and respectful environment for everyone**...
- The funding agencies could supply significant help by providing guidance and trained individuals to **assist physics entities in drafting community agreements.**

Pathways to Innovation and Discovery in Particle Physics — Report of the 2023 Particle Physics Project Prioritization Panel

- Invest in initiatives aimed at developing the workforce, broadening engagement, and **supporting ethical conduct in the field.**
- **Discrimination, harassment, or bullying in a scientific collaboration harms individuals, disrupts scientific progress, and is therefore scientific misconduct.**

European Astroparticle Physics Strategy 2017-2026 — APPEC

- APPEC insists that the scientific community **follows the APPEC, ECFA and NuPECC diversity charter.** This charter should be updated following the latest insights into diversity, equity and inclusion.
- APPEC **encourages collaborations to establish a diversity charter and a code of conduct...**

Solvay Conference, 1927

nEXO

SNO

Interesting Problems often require Large Collaborations to solve them.

Physics Collaborations are unique organizations that can play an important role in advancing EDI ideas.

Host laboratories can also play a role with the EDI policies they have for collaborations building experiments on their sites.

A collaboration Code of Conduct should:

- be endorsed by the entire collaboration and approved by the collaboration's governance committee (i.e.: scientific board or executive committee)

- provide a commitment to maintaining a strong and healthy collaboration via open and respectful communication, maintaining a strong set of values

- be clear what it will not tolerate actions such as intimidation, offensive behavior, bullying or any misconduct/mistreatment of any kind

- describe the processes for any collaboration members to escalate any issues and the dispute resolution mechanisms available

- describe how often collaboration members should be reviewing the CoC so that the policy and values set out in the CoC are always top of mind

Code of Conduct Examples

- BELLE II

- DUNE

- IceCube

- PIONEER

- nEXO

- SBND
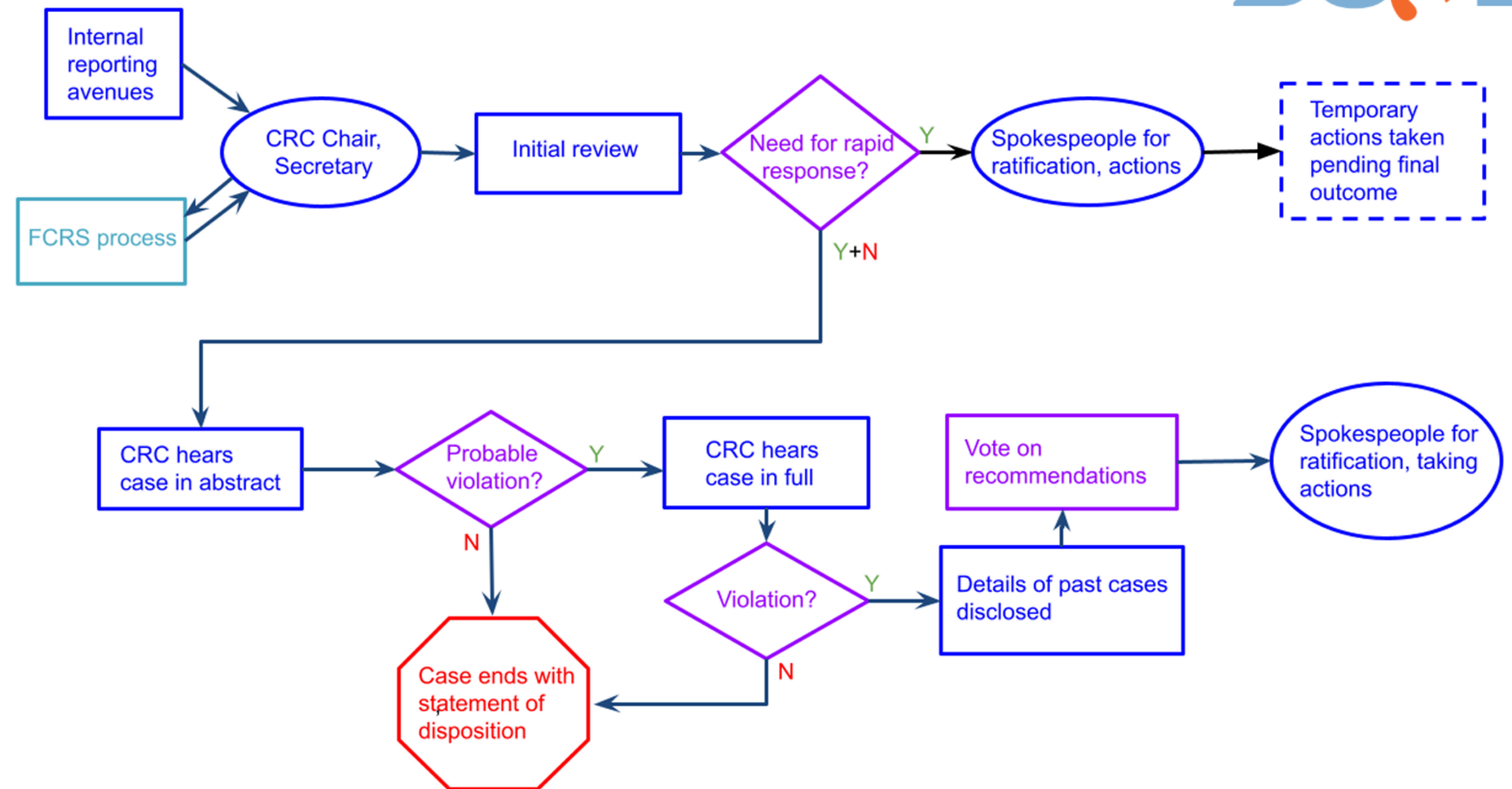
DUNE Case Review Committee Process

Ideas for EDI Initiatives

EDI Committee	Newsletter	Climate Survey
Junior Board Members	Mentorship Program	EDI Lessons Learned
Board Diversity	Authorship Policy	Onboarding
EDI Lectures and Workshops	Distribution of Conference Talks	Accommodation Security

Onboarding to a Collaboration

- Is there a code of conduct?

- What are the passwords to access internal webpages?

- Where is the calendar of group meetings?

- How do you earn authorship?

- Are there shift requirements?

- Is there a "young" members group?

- To whom do you go with a problem?

AI generated image: Draw a picture of a person being welcomed onto a train called "Physics Collaboration"

Collaboration Newsletters

newsletter

Home ⌄ 🔍

July-August 2025 Newsletter
[#28 Issue]

Dear nEXO collaborators,

As the new academic year begins and fall approaches, we're excited to share the latest updates, opportunities, and resources to support and celebrate our vibrant community. With several exciting initiatives and milestones on the horizon, we look forward to continuing this journey together. Don't forget to share your news, accomplishments, and events with us. We love showcasing the incredible work happening across the collaboration.

About us: The Information Hub sub-committee is in charge of creating a collection of resources for hiring and disseminating general resources within the collaboration. We found that the best way to share these great resources was to create a monthly newsletter. This newsletter is meant to promote opportunities for our community, such as job listings or award opportunities, share relevant news and resources, but also to stay up-to-date with upcoming conferences deadlines and celebrate our collaborators' accomplishments.

Publication Policies

- Are you opt-in, or opt-out?

- After how long do new collaborators get to sign papers?

- When do former collaborators roll off the list?

- Is authorship tied to shifts taken or other service work?

- What is the timeline for internal publication review?

- Is the author list accessible to everyone for verification?

- How are paper review committees formed?

- How are talks allocated?

Junior Board Members

- Organize regular lunch/dinner at collab meetings

- Learn how collaborations are run

- Understand leadership structure

From the SNO+ Collaboration Bylaws:

Two voting "Young Members" will be elected annually by the Collaboration to represent the Graduate Students, Research Associates, Postdoctoral Fellows, and untenured Faculty in the discussions of the Board, and to provide technical and scientific expertise. ...
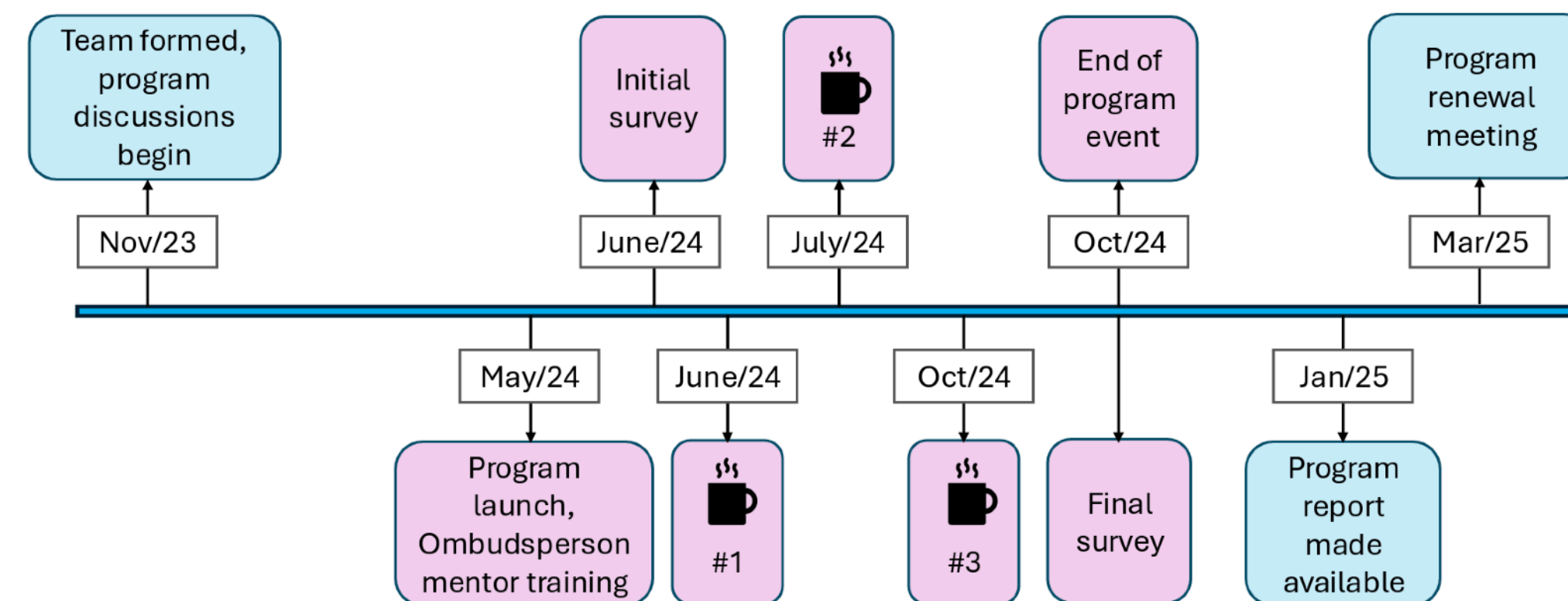
An explicit goal for these elected positions is to provide representation for those members listed above..
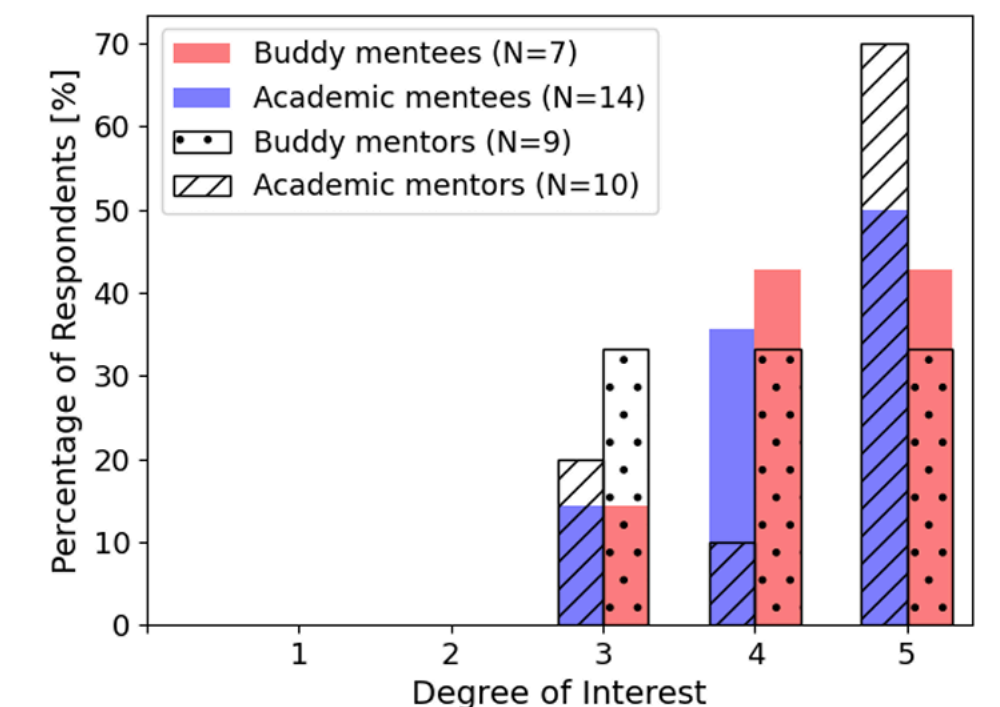
Mentorship Programs

- Support and enhance personal and professional development for postdocs, graduate and undergraduate students

- Make new connections to form unbiased relationships that will build networks and provide novel learning opportunities and career development

- Each pair had six lunches funded by TRIUMF to facilitate their meetings.

Skill development goals:

	Career Planning	Networking	Sci Comm	Relationship Building	Job Search	Leadership	Other
Mentee	☑	☑	☑	☐	☐	☐	☑
Mentor A	☑	☑	☐	☐	☑	☑	☐
Mentor B	☑	☑	☑	☑	☐	☐	☐

Team formed, program discussions begin — Nov/23

Initial survey — June/24

☕ #2 — July/24

End of program event — Oct/24

Program renewal meeting — Mar/25

May/24 — Program launch, Ombudsperson mentor training

June/24 — ☕ #1

Oct/24 — ☕ #3

Final survey

Jan/25 — Program report made available

"To what extent did your mentor (mentee) show interest in helping (allow you to help) you reach your goals?"

- Buddy mentees (N=7)
- Academic mentees (N=14)
- Buddy mentors (N=9)
- Academic mentors (N=10)

Percentage of Respondents [%] vs Degree of Interest
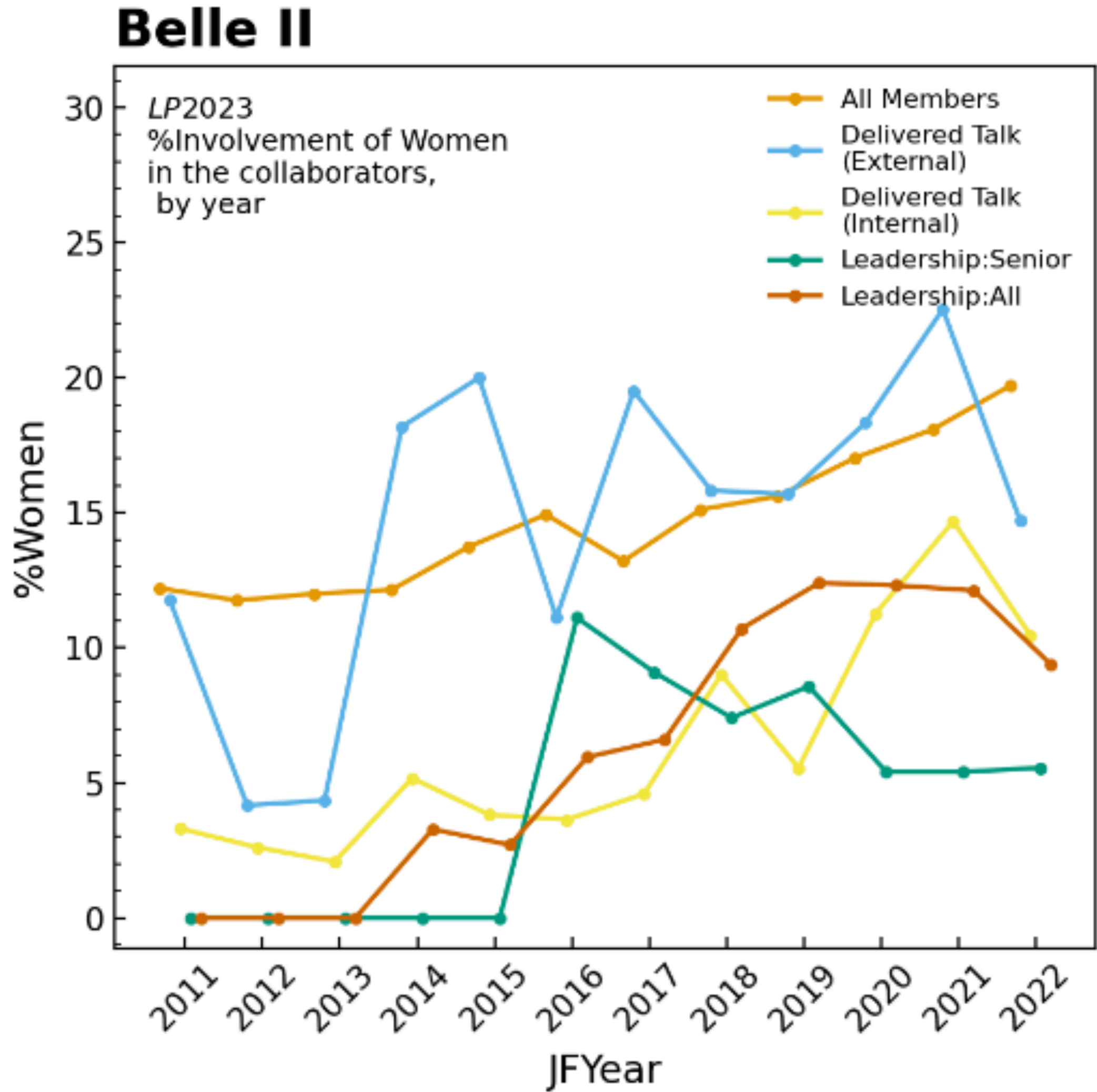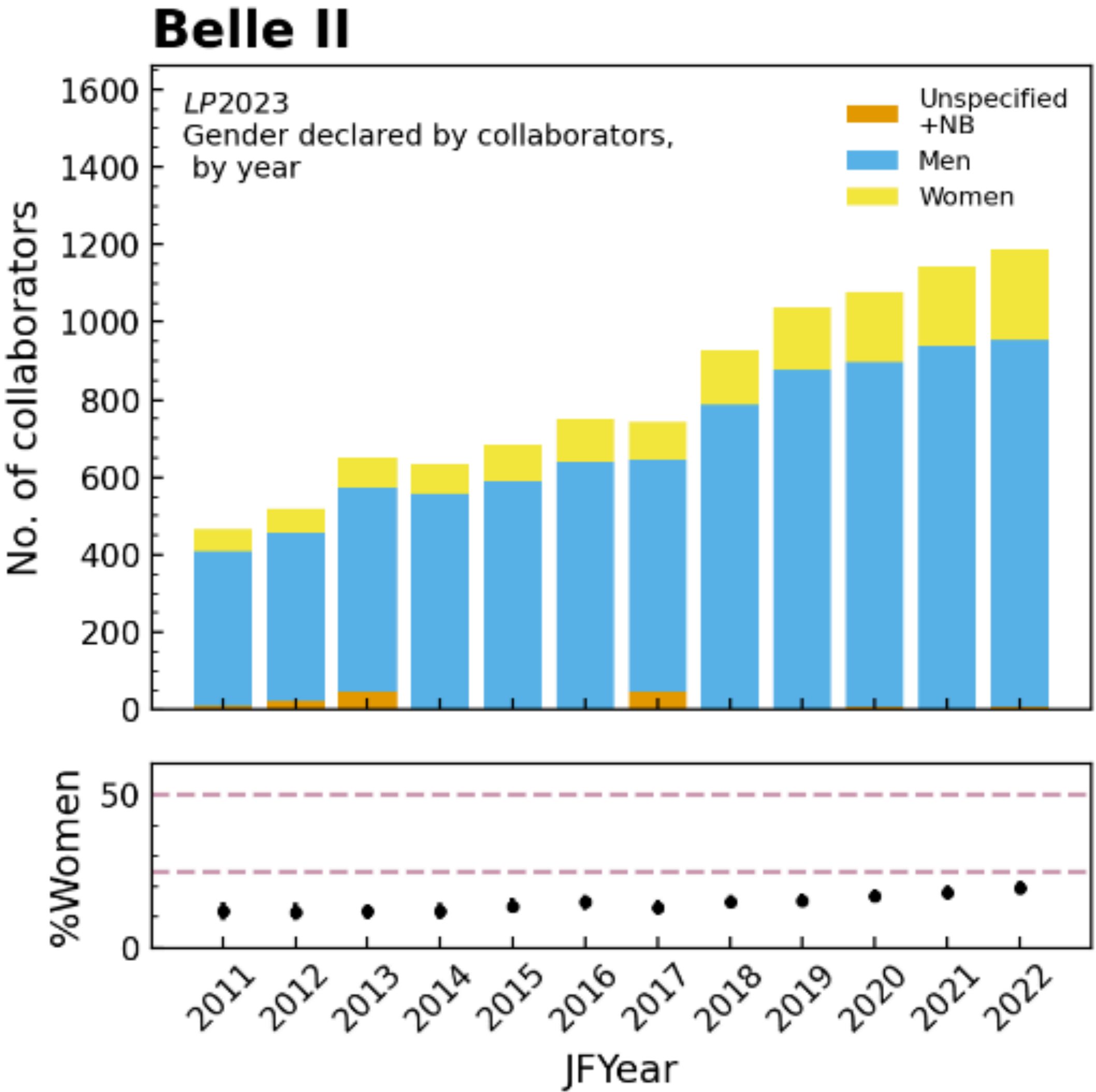
CAP Congress Presentation

EDI Seminar Series

- Regular seminars on a wide array of topics given by internal and external speakers

- Learn more about EDI from experts

- Develop awareness within the collaboration to inspire action and cultural change

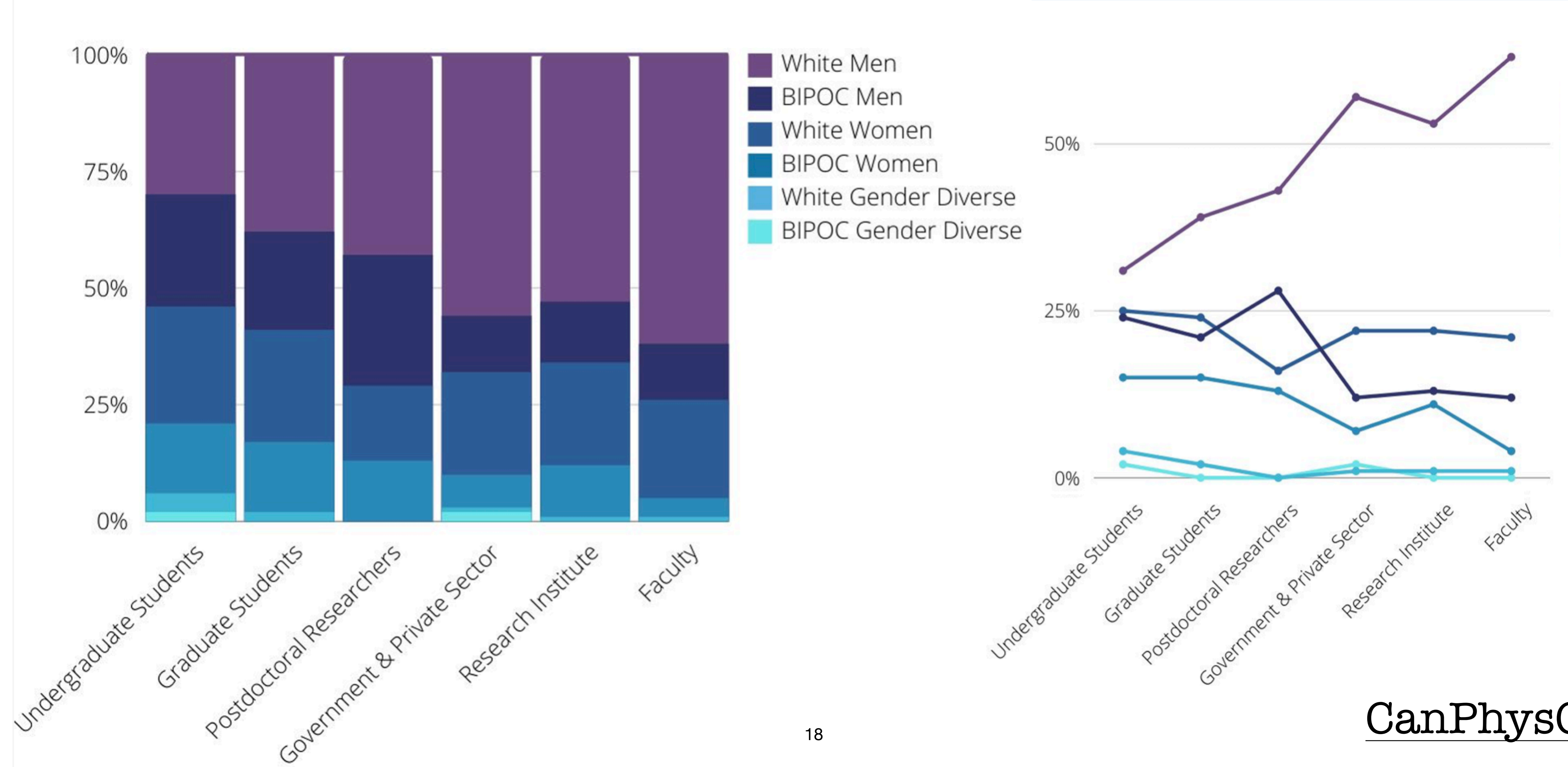- Motivate involvement in EDI activities/ subgroups
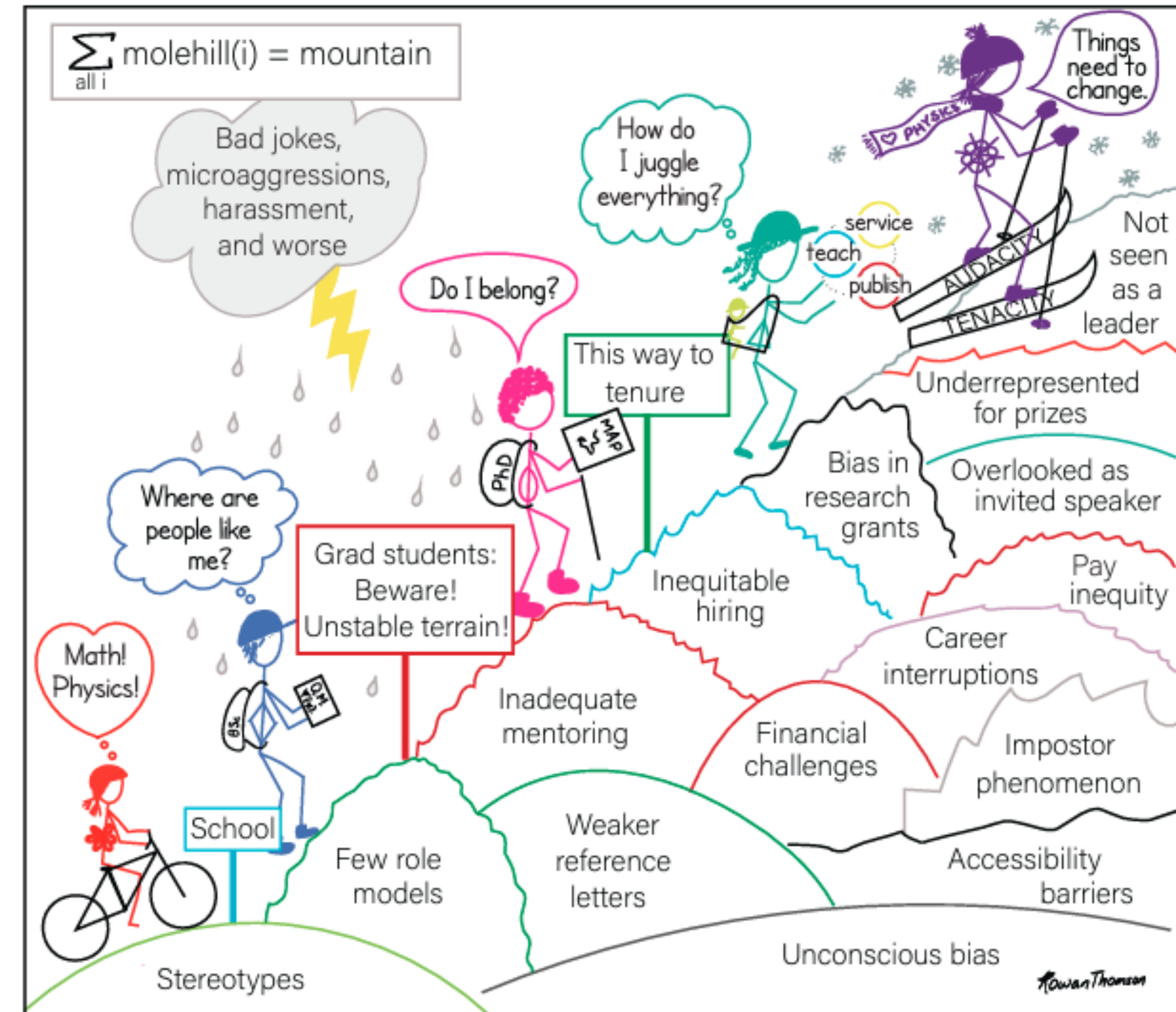
Physics Today
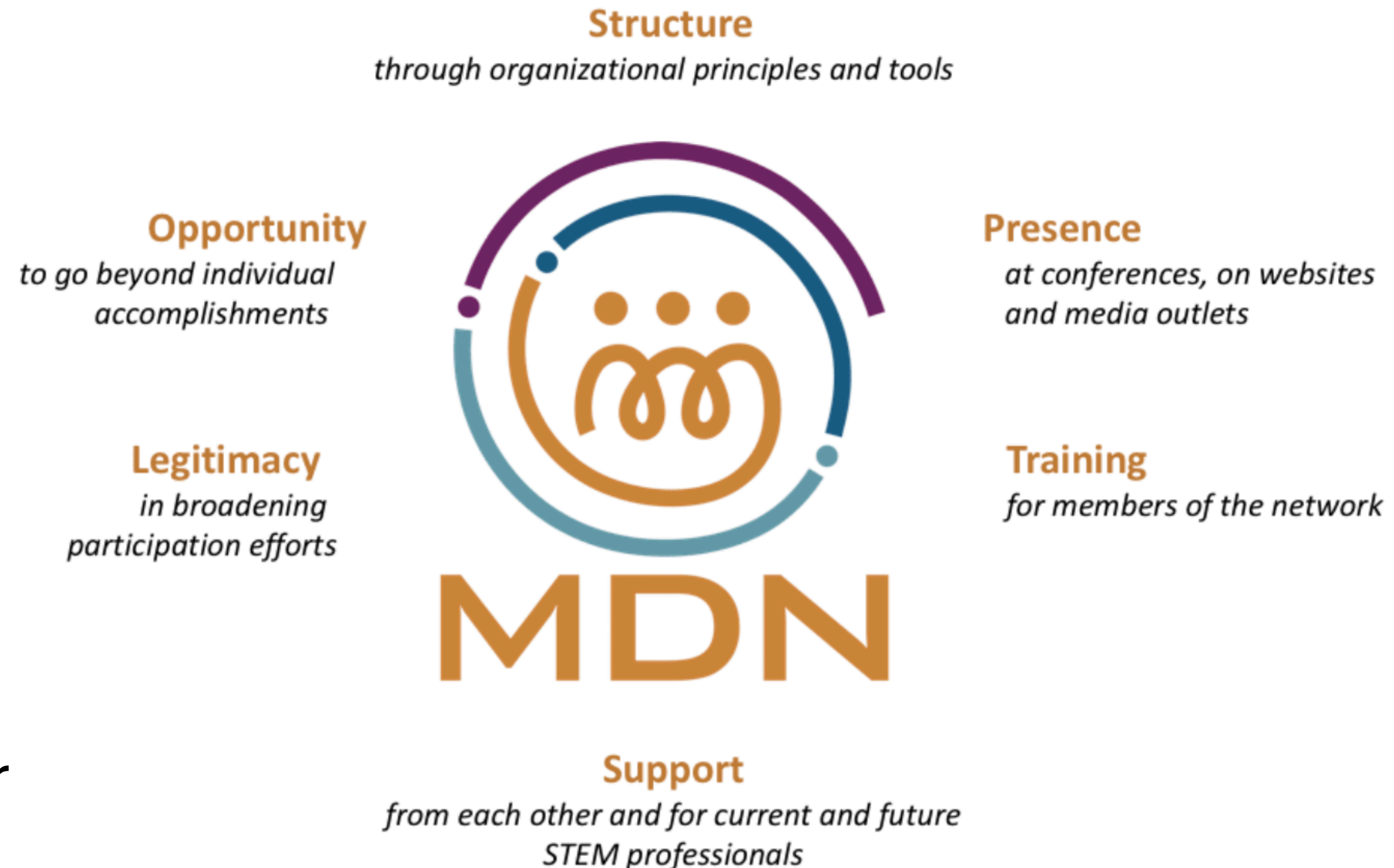75, 1, 42 (2022)

Belle II Demographics Survey

Canadian Physicist Demographics by Career Stage

Multimessenger Diversity Network

- LIGO, VERITAS, Vera C. Rubin Observatory, IceCube

- Fermi Gamma-ray Space Telescope, LISA, NANOGrav, Pierre Auger Observatory, Neil Gehrels Swift Observatory

- MDN fosters EDI through shared practices across multimessenger collaborations

- Set up as a community of practice, where people share their knowledge and experiences with each other

Structure
through organizational principles and tools

Opportunity
to go beyond individual accomplishments

Presence
at conferences, on websites and media outlets

Legitimacy
in broadening participation efforts

Training
for members of the network

MDN

Support
from each other and for current and future STEM professionals

2107.12179

SNOWMASS White Paper

Diversity, Equity, and Inclusion in Particle Physics

COMMUNITY PLANNING EXERCISE: SNOWMASS 2021

C. Bonifazi, J. S. Bonilla, M.-C. Chen, Y. H. Lin

K. A. Assamagan, E. V. Hansen, S. Meehan, E. Smith

- Bring awareness

- Create pathways

- Engage communities

- Engage outside experts

- Restructure the culture

- Enact the agency of individuals

2209.12377

Part of a Research Topic

Science And Technology In Deep Underground Laboratories

37k views   **19** articles

Enhancing equity, diversity, and inclusion in physics: perspectives from North American underground laboratories

Erica Caden [1*]   S   Samantha Kuula [1]   Rochelle Zens [2]

1. SNOLAB, Lively, Canada
2. Sanford Underground Research Facility, Lead, United States

📊 **Article metrics**   **1,5k** Views   **301** Downloads   **View details**

SURF Underground Research Facility

- Čhaŋgléška Wakȟáŋ the ethnobotanical garden at SURF, highlights the connections between past and present.

- The garden demonstrates the capacity to collaborate with communities, employees, visitors, and researchers

- Čhaŋgléška Wakȟáŋ is an outdoor space that both honors the history of South Dakota's Black Hills while recognizing the potential for scientific learning above and below our feet


SanfordLab

EDI at SNOLAB

- Appointment of EDI Officer
- Washroom accessibility
- Panel participation
- Conference support
- Self-reporting
- Improve ASR process
- Outreach participation
- Policy review
- Land acknowledgment
- Dimensions Charter

- Gender Neutral washroom u/g
- Upgrade Travel Policy
- EDI Statement
- Update strategic documents
- Live captioning
- Name and gender changes
- EDI training
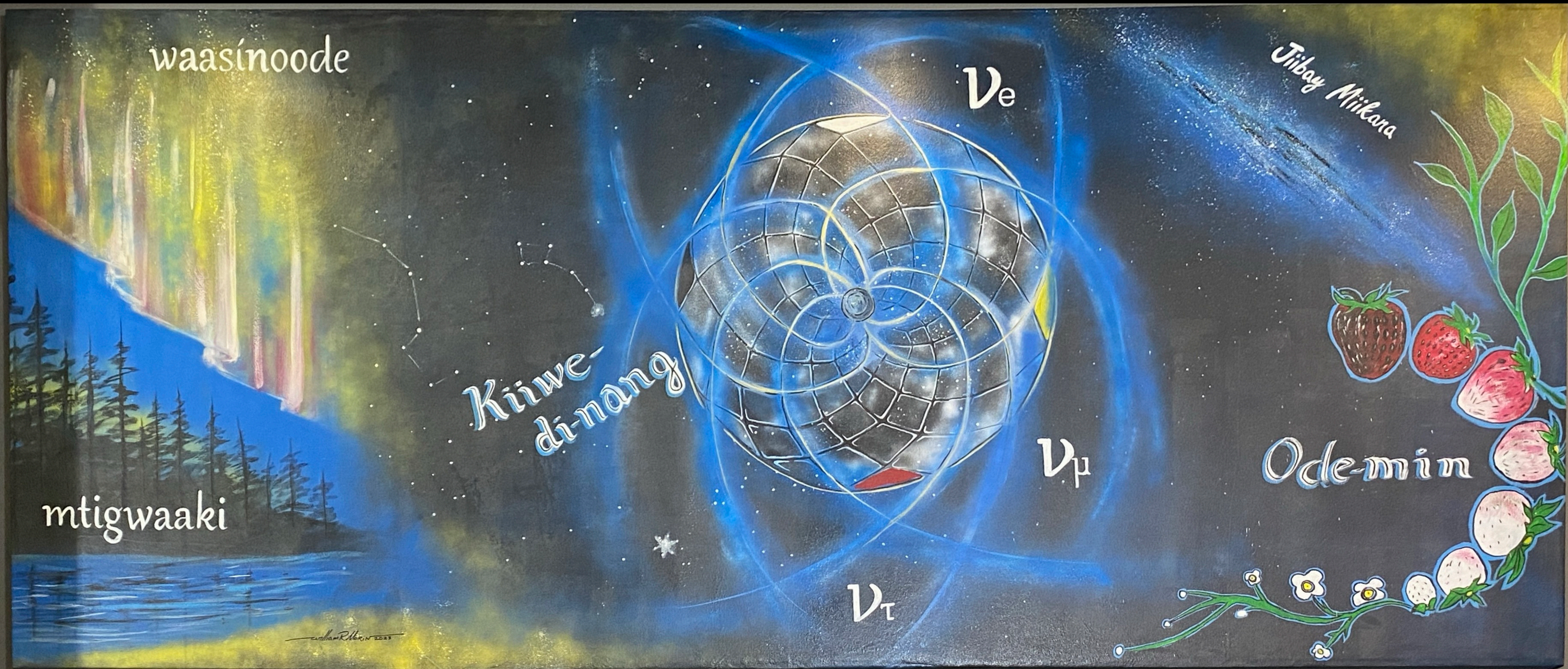- EDI poster campaigns
- SNOLAB experiment policies

SNOLAB EDI Action Plan

Prepared by the EDI Task Force in April 2021

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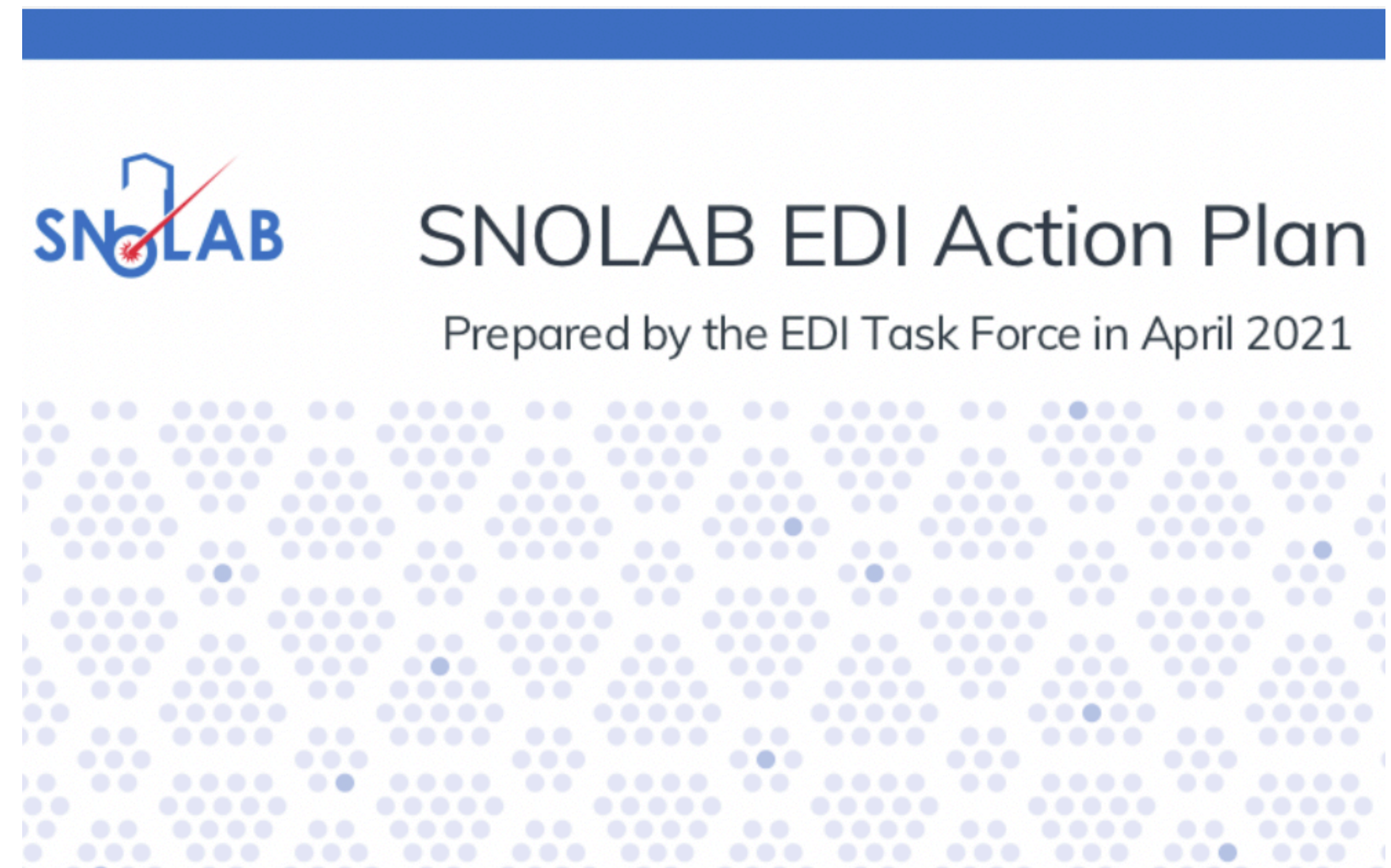
SNOLAB
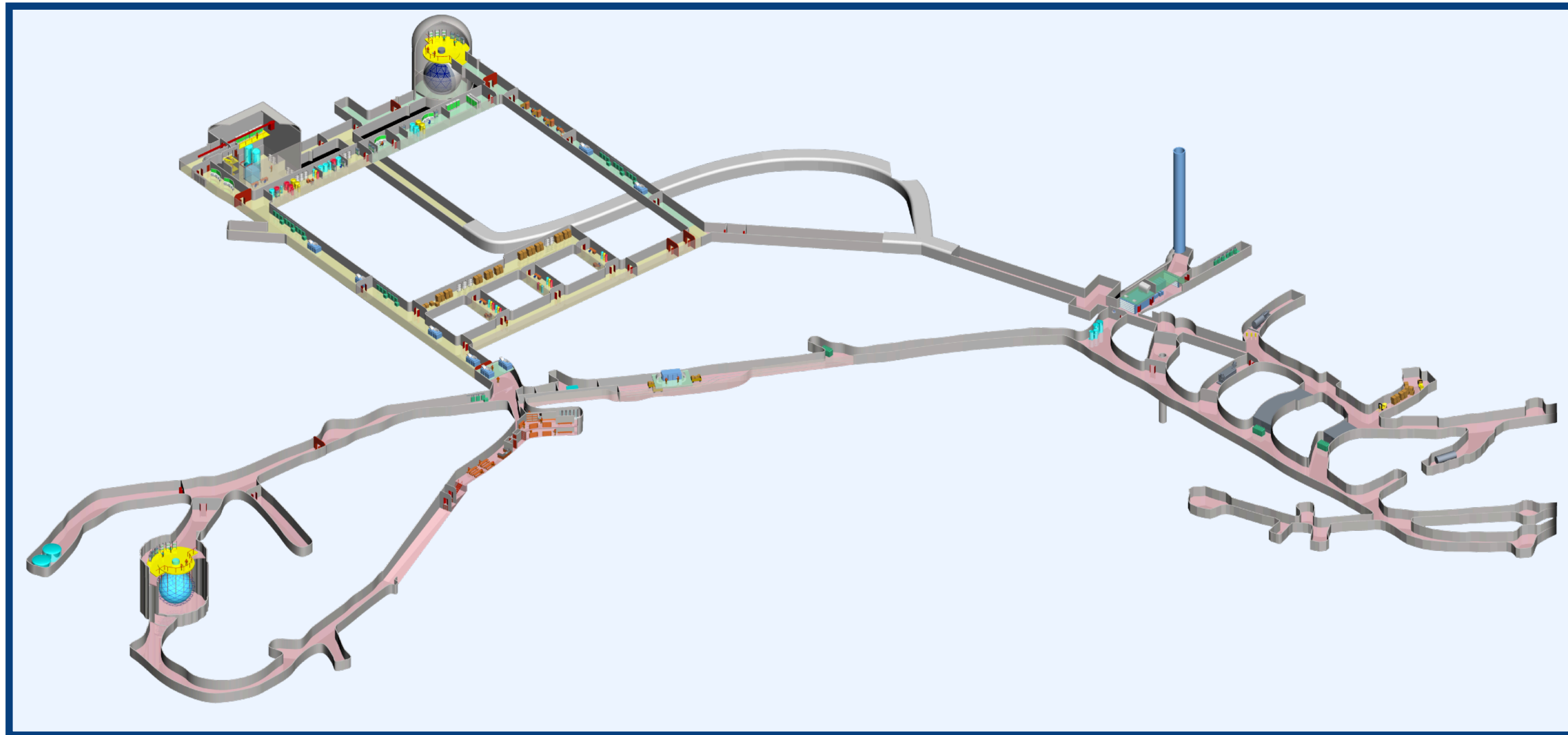
Underground, ultra clean facilities have unique challenges

Star Stories

Agaashiinyi: It is Small - Will Morin

Summary

- Efforts to advance EDI are mandated in our community planning.

- Collaborations can have solid actions to increase the equity and inclusion of their collaborations.

- Surveys can measure demographics and gauge the climate of the collaboration.

  - Generate ideas for initiatives

- Underground labs have unique opportunities for implementing EDI.

Summary

- Efforts to advance EDI are mandated in our community planning.

- Collaborations can have solid actions to increase the equity and inclusion of their collaborations.

- Surveys can measure demographics and gauge the climate of the collaboration.

  - Generate ideas for initiatives

- Underground labs have unique opportunities for implementing EDI.

- Think about the actions that can be implemented in your collaboration.

Possible Components of EDI Plan or Roadmap

Buffet Lunch Approach

- **EDI Committee:** This could be an organizing body that oversees the creation of other topics listed here and generates other ideas.

- **Junior Board Members:** Giving early career scientists a chance to be part of the decision-making and let them learn how experimental leadership works.

- **Newsletter:** This is a way to share information broadly and regularly with the collaboration, without additional meetings.

- **Board Diversity:** Appreciating that this is hard to act on collaborations could minimally conduct a yearly survey of who is represented to support targeted recruitment of new members to ensure diversity.

# Possible Components of EDI Plan or Roadmap

Buffet Lunch Approach

- **Climate Survey:** SNOLAB can support this with an existing survey to gather data on the demographics of the collaboration, sentiments about the collaboration culture, and actionable ideas for improving both.

- **Onboarding:** Ensuring there is a defined and welcoming onboarding process.

- **Housing/Accommodations/Security:** How can you make sure students and collaboration members are safe, and have access to other resources, when they are working on site and living in shared housing?

- **Distribution of conference talks:** How are these talks assigned? What review and oversight are there on the content and delegation?

Possible Components of EDI Plan or Roadmap

Buffet Lunch Approach

- **Mentorship program:** Do you have a program to mentor early career members?

- **Authorship Policy:** How are collaborators named as authors on papers? When do they rotate on and off the list? Is an author required to opt-in to every paper? How is the author-list organized, and does that change per paper? Are technical staff allowed on the list? Undergraduate students?

- **EDI lectures and workshops:** This is an opportunity for the collaboration to learn about EDI issues. Speakers can be external, or collaboration members can conduct their own research on the subjects.

- **EDI Lessons Learned:** What has been learned from the other initiatives? Were they successful in increasing the diversity/equity/inclusion of your collaboration? What metrics are you measuring, how, and how often?

https://www.weforum.org/agenda/2020/08/science-stem-support-inclusion-diversity-equality/
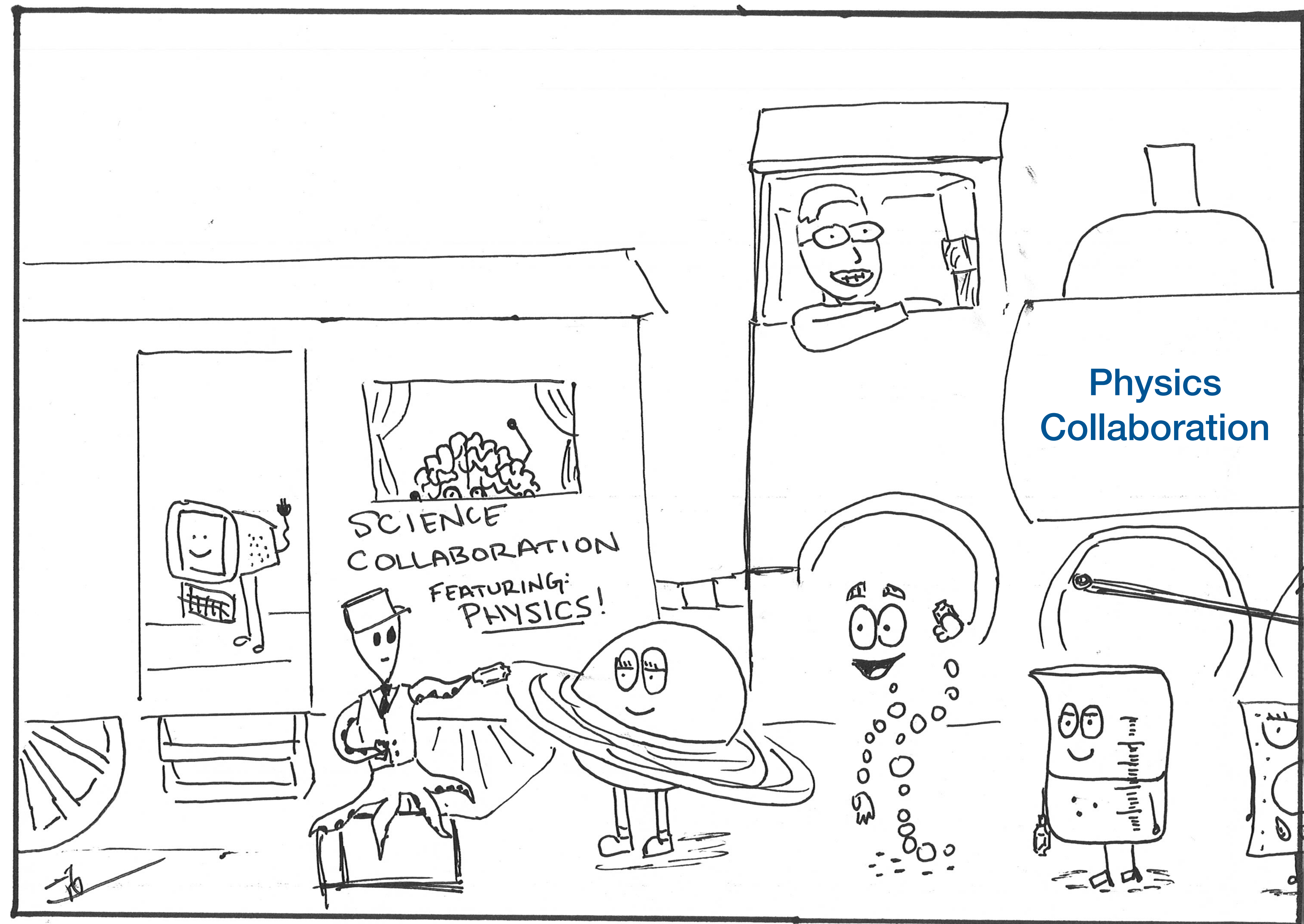
nEXO DEI Committee

Summer 2023 Collab Meeting
McGill Univ., Montreal, QC

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