

National Science Foundation Advisory Committee for Cyberinfrastructure (ACCI)

Spring (VIRTUAL) Meeting, April 28th-29th, 2022

Meeting Minutes

Day 1 (April 28th, 2022)

ACCI Welcome and Committee Introductions

Dr. Ruth Marinshaw, Dr. Karen Willcox, co-Chairs, ACCI

Co-chair, Dr. Ruth Marinshaw, began the ACCI 2022 Spring meeting by greeting everyone on behalf of the co-chairs and all the ACCI members. Dr. Marinshaw expressed her expectations for the next two days of the ACCI meeting and went through the agenda. She introduced the three new Advisory Committee members as well as the current members and concluded by thanking everyone for their participation.

Members in attendance are listed in the minutes in the Appendix.

Updates from the Office of Advanced Cyberinfrastructure

Dr. Manish Parashar, Office Director, Office of Advanced Cyberinfrastructure (OAC)

Dr. Manish Parashar began by greeting the ACCI members and all the attendees. He introduced Dr. Amy Walton, the newly appointed Deputy Office Director for the Office of Advanced Cyberinfrastructure, as well as other new OAC personnel. Dr. Parashar then provided updates on the impact of the cyberinfrastructure ecosystem on science, transforming science and engineering via cyberinfrastructure, the COVID-19 HPC consortium, the advanced computing ecosystem (including Leadership Class Computing and Advanced Computing Systems and Services), large facility data lifecycles, and lowering barriers to computing access. He also reported on actions to strengthen the cyberinfrastructure professionals workforce, the focus on pathways to translation, and the National Artificial Intelligence Research Resource (NAIRR).

Before the next speaker began, Dr. Michael Heroux asked Dr. Parashar to explain what NSF efforts are available now and in the future regarding sustainability plans. Dr. Parashar responded that NSF has partitioned actions related to sustainability into areas such as software, data, and people, and is addressing each of these issues while educating the community.

Updates from the CISE Directorate

Dr. Margaret Martonosi, NSF Assistant Director for Computer & Information Science & Engineering (CISE) Directorate

Dr. Margaret Martonosi, who leads CISE, began by thanking the ACCI members for their hard work. Dr. Martonosi provided updates on the CISE organization, NSF solicitations, and the FY 2022 and 2023 budget status. Dr. Martonosi then discussed CISE in a post-Moore world, the transcendence of artificial intelligence, and CISE's sociotechnical frontier, including how computing can help sustainability and

other climate issues. Dr. Martonosi concluded by emphasizing the need for people to participate in advanced degree programs and encouraged applications for CSGrad4US graduate fellowships.

Reproducibility & Sustainability Working Group Deliverables

Presentation & Discussion

Dr. Michael Heroux and Working Group (WG) Representatives

Dr. Michael Heroux provided an overview of a report that has been prepared by the Reproducibility and Sustainability Working Group. The Reproducibility Opportunities Report summarized OAC research opportunities, infrastructure opportunities, and programmatic opportunities, and concluded with questions for the committee regarding next steps.

A question from the public asked if the report would be available to the public. Dr. Heroux noted that the draft report was available in the minutes of the September ACCI meeting, and the final report will be available to the public.

Dr. Marinshaw asked Dr. Heroux to elaborate on the roles and responsibilities around trusted computational results. Dr. Heroux noted that in a scientific economy some aspects are of higher value than others, so we need to think about how to invest in transparency -- who should be involved, in what, and who can support it. Dr. Heroux suggested additional workshops and discussions to discuss what can be done.

Dr. Duncan Watts asked how the incentives across the system can be changed to encourage transparent behavior? Dr. Juliana Freier responded that including reproducibility as a standard component of computational environments reduces the burden on researchers. There is no magic bullet, and the community needs to address transparency from many different angles. Incentives from NSF and other funding agencies provide an opportunity to influence this process, by evaluating whether researchers have followed their data management plans.

Dr. Watts followed up by asking how to deal with the problems that arise when the data that is used for computational research is proprietary. Dr. Heroux noted that the entire community doesn't need to have access to the information, but someone will need to have access, whether it is the authors, or someone else who is trusted. The technical approach can be there, but the sociological element is sometimes missing. Dr. Parashar mentioned that two recent NSF solicitations include reproducibility and transparency.

Claire Porter asked why the working group had taken this topic on in the first place. Dr. Heroux noted that reproducibility and sustainability seemed to be the timeliest of recommendations to make to the NSF. Dr. Parashar elaborated that these conversations and other deeper dives have helped NSF understand how these mechanisms are integrated into programs and how NSF can be involved in these programs. Dr. Parashar concluded by reviewing some of the questions he initially posed at the 2018 ACCI meeting (when he first became OAC Office Director); these questions that led to the development of some of the subsequent working groups.

Cyberinfrastructure and Major Facilities: Cyberinfrastructure Compass Center of Excellence (CI CoE)

Dr. Ewa Deelman, USC Information Sciences Institute and Principal Investigator for CI Compass

Dr. Ewa Deelman provided an update on CI Compass, an NSF Center of Excellence for navigating and supporting the major facilities data lifecycle. Dr. Deelman discussed the activities of the center, its relationship to major facilities, working group activities and outputs, and engagements.

Dr. Willcox asked if designing the cyberinfrastructure at the same time as the physical system has been considered? Dr. Deelman explained that she sees some of that now that there is a push to merge into one CI platform as well as a focus on identifying a process for designing cyberinfrastructure for others. She noted that the community should address mid-size to large scale facilities with a plan and needs to know how to identify the types of situations needing assistance.

Dr. Heroux asked how well the workflows and metadata provide for replay; Dr. Deelman explained that the major facilities review the data seriously and she believes they do a very good job at this.

Claire Porter asked about scalability and what opportunities there were for smaller research groups who could not invest as many CI hours or dollars? Dr. Deelman responded that CI Compass has a topical working group that helps with identity management and has prepared recordings that are available to review for projects. Dr. Deelman planned to reach out to mid-scale facilities and other projects for collaboration and other opportunities where the center can make people aware of what is available.

Preparation for Visit by the NSF Office of the Director

ACCI Members

Dr. Willcox reviewed the time and expectations for the NSF Director visit, identified three questions for discussion with the Director, and designated ACCI members who would ask these questions of the NSF Director. Dr. Willcox then addressed a comment from David Lassner about initiating a new ACCI working group focused on trust in computational simulations. Dr. Parashar explained that there are ongoing discussions in the NAIRR, and the interim report should come out in May.

Visit from NSF Office of the Director

Dr. Sethuraman Panchanathan, Director, NSF, Dr. Karen Marrongelle, NSF Chief Operating Officer, and Mr. Brian Stone, NSF Chief of Staff

The session began with Dr. Willcox introducing the new ACCI members. Director Panchanathan highlighted the ACCESS grant announcement and emphasized that the National Science Foundation is everywhere, not just in Washington, D.C. The Director then discussed how climate science is a science-wide problem and how NSF is approaching the problem and finding solutions. All fields of science need to invest in cyberinfrastructure to avoid being caught off guard and mentioned the pandemic as an example. The Director emphasized the need for a strong cyberinfrastructure framework.

Dr. Birali Runesha followed up by asking if the Director could comment on the OSTP document that was released earlier in 2022. The Director explained that agencies are trying to collaborate on policies to allow scientists to focus on their research. The Director emphasized that they are working with

academic leaders to obtain input on how to move forward without impeding the scientific and research process.

Dr. Marinshaw asked if and how scientists and researchers are included in conversations that advisory committees are having? The Director explained that training, education, and policies are informed by all levels of academia, from research scientists to chancellors. The goal is to include the people who are going to do the research to ensure whatever is done by NSF is implementable.

Claire Porter asked how NSF provides infrastructure in support of Open Science. The Director stated that OAC continues to manage aspects of the NSF-funded public access policies. Dr. Parashar continued that NSF has been creating infrastructure to support Open Science, along with guidance and community building to support Open Science.

Anita Nikolich asked if there will be any industry co-funding in cyberinfrastructure. The Director recognized the value and importance of cyberinfrastructure and how this impacts what may be done at various levels for support. He concluded that NSF launched the first new directorate in 31 years (Technology, Innovation and Partnerships) to allow more partnership opportunities and that NSF will continue to fight for more funding.

Final Thoughts and Adjourn for the Day

Dr. Karen Willcox concluded the day by reviewing the agenda for Day 2.

Day 2 (April 29th, 2022)

Update from the Learning & Workforce Development Working Group

Dr. Deborah Dent and WG Representatives

The session began with an introduction of the working group members. Dr. Debroah Dent gave a presentation on the CI Workforce Working Group. Lisa Arafune summarized the NSF Workforce 2020 Report findings on Workforce Development, Gwen Jacobs discussed the EPSCoR Expectations on Workforce Development, Dana Brunson summarized the Campus Research Computing Consortium (CaRCC) and RCD-NEXUS, Sharon Broude Geva discussed CI Leadership Workforce Sustainment, Dr. Dent provided an overview of the Minority Serving-Cyberinfrastructure Consortium, Joel Cutcher-Gershenfeld summarized the Research Computing and Data (RCD) Pulse Survey, and Alan Blatecky identified the Missing Millions Report – High Level Take-Aways.

Dr. Heroux noted that he would like to see the working group take on the role of versatile technologies and improving diversity and access and identify who can participate and how. Alan Blatecky added that this topic was discussed in a series of interviews with individuals.

Update from the Advisory Committee for Polar Programs (AC-OPP)

Dr. Patrick Heimbach, Member of ACCI and AC-OPP

Dr. Patrick Heimbach presented an update on the potential for joint activities between the OPP and the OAC advisory committees. Dr. Heimbach noted that either a subcommittee or a working group could

address the issues, but a joint working group between the OPP and OAC would be most effective. The main objective would be to address the challenges and opportunities that do not currently have a home at the NSF. Dr. Heimbach explained that there is a need to identify how or where in OAC the problem lives and how it fits into the NSF and other directorates for collaborative purposes.

Technology, Innovation and Partnerships (TIP) Directorate Briefing

Dr. Erwin Gianchandani, Assistant Director, TIP

Dr. Erwin Gianchandani provided an overview of the TIP Directorate mission, vision, functional themes, and exemplar programmatic. He explained how the NSF funds projects for the duration of their lifecycle. Dr. Gianchandani noted that NSF will continue to strengthen and scale foundational investments in addition to the translational work.

Open Discussion with OAC and CISE Management

ACCI Members & NSF Staff

The open discussion began by the co-chair, Dr. Ruth Marinshaw, thanking OAC leadership for their presentations. Next, Dr. Marinshaw moderated the discussion between NSF staff and the ACCI members. Discussion points included an overview of NSF cross-directorate activities; how NSF supports computational science; the need for common terms for cyberinfrastructure (CI) professionals; how academic institutions can help NSF to facilitate and maintain assistance to the academic community; and the possibility of the Learning & Workforce Development Working Group defining terms for the CI professional community.

Reflect on Meeting and Plan ACCI Engagements for the Fall

Dr. Ruth Marinshaw & Dr. Karen Willcox

The ACCI Co-chairs combined the last two sessions (Reflect on the Meeting and Planned ACCI Engagements for the Fall and Wrap Up, Next Steps, and Adjourn) into one discussion.

The ACCI Committee discussed workforce issues and nomenclatures that were highlighted during the Open Discussion with OAC and CISE Management. Dr. Dent reviewed the next steps for the Learning & Workforce Development Working Group. Discussion continued with ideas for additional working group(s) activities and tasks, including a draft of common terms for CI professionals. Dr. Marinshaw concluded the conference with tentative dates for the next ACCI meeting in September.

The meeting concluded at 4:00 PM EDT.

APPENDIX 1: Members in attendance

Anita Nikolich
Claire Porter
David Lassner
Deborah Dent
Duncan Watts
Hakizumwami Runesha
Juliana Freire
Karen Willcox
Michael Heroux
Padma Raghavan
Patrick Heimbach
Rommie Amaro
Ruth Marinshaw
Susan Gregurick
Tilak Agerwala
Tiziana DiMatteo

APPENDIX 2: NSF ADs/Office Heads and OAC Staff

NSF ADs/Office Heads

NSF Staff	Title
Manish Parashar	Office Head / OAC
Margaret Martonosi	Assistant Director / CISE
Amy Walton	Deputy Assistant Director/CISE
Erwin Gianchandani	Assistant Director / TIP
Brenda Williams	Directorate Administrative Coordinator/CISE
Joydip Kundu	Deputy Assistant Director/CISE
Steven Ellis	Program Director / BIO

OAC Staff

Alan Sussman
Alejandro Suarez
Amy Walton
Appolinaire Abo
Bogdan Mihaila
Carl Anderson
Deborah White-Wilkins
Edward Walker
Kevin Thompson
Manish Parashar
Robert Beverly
Robert Chaddock
Seung-Jong Park
Thomas Gulbransen
Juan Li
Andrey Kanaev
Bonnie Mountain
Gabrielle Marshall