Broadening our Broader Impacts: Building Infrastructure for Creative Outreach through Informal Science Institutions

National Alliance for Broader Impacts
May 1st, 2019
● How can researchers and ISIs get connected?
  ○ Jamie Bell [resource center]

● How should researchers approach a partnership with an ISI?
  ○ Kari Roberts [research lab]

● How can ISIs help researchers broadly engage underserved audiences?
  ○ Kalie Sacco [science museum]
But first… what is informal science education?

Informal science education (ISE) is **lifelong learning** in science, technology, engineering, and math (STEM) that takes place across a multitude of **designed settings** and **experiences outside of the formal classroom**.
How can researchers and ISIs get connected?

Jamie Bell
Project Director and PI
CAISE: convene, connect, characterize, communicate, curate, collect, collaborate, catalyze,.....

NABI Summit 2019
Jamie Bell, Project Director, CAISE
CAISE works in cooperation with the National Science Foundation (NSF) Advancing Informal STEM Learning (AISL) program.

Any opinions, findings, and conclusions or recommendations expressed are those of the authors and do not necessarily reflect the views of NSF.

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NSF-Funded Resource Centers

Center for Innovative Research in CyberLearning (CIRCL, circlcenter.org)
Supports NSF’s Cyberlearning program.

Community for Advancing Discovery Research in Education (CADRE, cadrek12.org)
Supports NSF’s Discovery Research preK-12 (DRK-12) program.

CS for All Teachers (csforallteachers.org)
Supports all teachers interested in teaching computer science to preK through high school students.

EvaluATE (www.evalu-ate.org)
Supports NSF’s Advanced Technological Education (ATE) program.

Math and Science Partnership Network (MSPnet, hub.mspnet.org)
Supports NSF’s Math and Science Partnership and STEM+C programs.

STEM Learning and Research Center (STELAR, stelar.edc.org)
Supports NSF’s Innovative Technology Experiences for Students and Teachers (ITEST) program.
Informal STEM Learning

- Botanical gardens & nature centers
- Cyberlearning & gaming community
- Events & festivals
- Making & tinkering spaces
- Media (TV, radio, film, social)
- Parks
- Public libraries
- Science centers & museums
- Youth & community programs
- Zoos & aquariums

The NSF AISL program funds multiple project types in these settings.

The next proposal deadline is November 6, 2019.

Learn more here and consider applying.
InformalScience.org is a collection of project, research, and evaluation resources designed to support the informal STEM education community in a variety of learning environments.

Learn more »

Search the Collection

Keyword

Filter by:

PROJECTS
RESEARCH
EVALUATION

Advanced Search

GO
2019 NSF AISL PI MEETING

It was with great pleasure that the Center for Advancement of Informal Science Education (CAISE) hosted the 2019 National Science Foundation (NSF) Advancing Informal STEM Learning (AISL) program Principal Investigator (PI) Meeting February 11-13, 2019, at the Westin Alexandria in Alexandria, VA. All current PIs of NSF AISL and Science Learning+ projects were invited to attend.

CAISE Director and PI, Jamie Bell, wrote a brief blog summarizing the activities and features of the 2019 NSF AISL PI meeting. Read his full summary here.

Watch highlights from the meeting

Watch the highlight video and keynote, download summaries of the concurrent sessions, and view the meeting program: informalscience.org/about-caise/pi-meetings/2019-pi-meeting

Start with Jamie’s blog recap
Meeting Themes

1. Identity, Interest and Engagement
2. Broadening Participation in STEM

informalscience.org/about-caise/pi-meetings/2019-pi-meeting
FIND A SCIENCE CENTER

For participants in the reciprocal free admission program, please visit the Travel Passport Program page. Please note that not all ASTC-member science centers and museums participate in the Travel Passport Program.

SEARCH SCIENCE CENTERS

Country/Area
(Any Country/Area)

U.S. State (if applicable)
(Any U.S. State or Territory)

Keyword Search by name, institution, or city (not required)

astc.org/about-astc/about-science-centers/find-a-science-center/
Map current and needed efforts

Develop resources to:

a) strengthen broadening participation efforts and

b) advance equity in STEM learning

aaas.org/programs/center-public-engagement-science-and-technology
Map current and needed efforts

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Partnerships for Broader Impacts Design

popnet.pacificsciencecenter.org/bid
SciStarter is the best way to recruit the right volunteers for your citizen science project or event.

Promote Your Project

Find and Engage Participants

Manage your Project

scistarter.org/for-researchers
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[Link: http://www.stemap.org/]
Public engagement with science (PES) is a powerful framework for informal science education, science communication, and developing the broader impacts of research. PES emphasizes the importance of fostering mutual learning between scientists and publics, and recognizes that mutual learning refers not only to knowledge, but also to perspectives and worldviews.

Hubbard Brook Roundtables

PES developed by science communication practitioners at a long-term ecological research site in New Hampshire’s White Mountains. Hubbard Brook Roundtables use facilitated dialogue events to engage scientists, educators, and community members in discussions about the science and management of the forest.

Tips for Convening a Roundtable Dialogue Event

- 1-1.5-day facilitated dialogue events
- 12-25 invited participants
- Focus on science, issues, and questions
- Inclusive and diverse perspectives
- High-quality facilitation

informalscience.org/tips-convening-roundtable-dialogue-event
Explora! Broader Impacts Example

Explora in Albuquerque, NM collaborated with scientists from NM EPSCoR on the broader impact portion of their *Energize NM* project.
Explora Broader Impacts Example

• Explora! staff teach a seminar class, called “Communicating Science” at UNM.
• The class covers using these same communication tools for successful grant writing, teaching, mentoring, and other aspects of academia.
Check out our resource page!

- Short video “What Scientists Should Know about Informal STEM Education”
- Helpful ISE resources to support scicomm, engagement, outreach, and broader impacts efforts

informalscience.org/projects/scientists-and-public-engagement
2018 Year in ISE

informalscience.org/year-in-ISE
Access the full text of more than 2,000 peer-reviewed journals through EBSCO's Education Source database. This includes titles like *Science Education*, *Cultural Studies of Science Education*, *Science Communication*, and *Science Scope*.
Stay Connected with CAISE

Monthly newsletter  @informalscience  facebook.com/informalscience

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How should researchers approach a partnership with an ISI?

Kari Roberts
Director of Evaluation and Postdoc Liaison
Center for Integrating Research and Learning
Some Do’s and Don’ts for Working with ISIs

Do:

- Do some basic research before meeting with the ISI staff
- Bring your own ideas to the table
- Take advantage of the staff’s education expertise
- Offer some budget to the project
- Ask the staff for recommendations on evaluation
- Discuss IP and grant authorship early

Don’t:

- Write the ISI into the grant without meeting with them
- Wait until too close to the grant deadline to meet with ISI staff
Need a Broader Impact?

Funding agencies are increasingly interested in how your research will benefit society. Go on this flow chart adventure to find out what programs and tools might best fit your vibe.

1. **Do you need broader impacts for your grant proposal?**
   - **NO.**
   - **YES!**

2. **Do you want to be in the spotlight in front of a crowd?**
   - **No.**
   - **Yes.**

3. **What style of event do you want to be a part of?**
   - **Fantastic.**
   - **Excellent.**

4. **Do you want to talk to members of the general public?**
   - **No.**
   - **Yes.**

5. **Are you ready to interact with hundreds of people in the most thrilling day ever?**
   - **Yay!**
   - **HECK YEAH. Sign me up!**

6. **What type of mentor are you looking for?**
   - **A future scientist.**
   - **A science teacher.**

7. **What skill are you most comfortable with?**
   - **No problem.**
   - **Writing.**

8. **Are you afraid to look eyes with your adoring fans but still want to reach the masses?**
   - **No.**
   - **Yes.**

9. **I could tell you were destined for stardom.**
   - **Pick up your pen and wield its power.**

10. **Do you want to engage in radio/television interviews about your work and the lab?**
    - **Yes.**
    - **No.**

11. **You should create a Science in a Sentence video with the public affairs department.**
    - **You’ve got a few options. You can mentor and supervise a high school or college intern during the Fall, Spring or Summer semesters. You might also enjoy serving as a mentor during the Fall Semester with middle school students.**

12. **We’ve got the perfect audience picked out for you. You should conduct a science activity in a K-12 classroom, summer camp, or at a science event that serves K-12 students and parents.**
    - **You’re going to have so much fun when you facilitate a hands-on activity during the annual Open House event in February or another large community event.**
    - **I’ve got just the thing. Serve as a mentor during the summer with undergraduates in the 10-week REU program.**
How can ISIs help researchers engage broadly underserved audiences?

Kalie Sacco
Special Projects Coordinator

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY
The Lawrence Hall of Science

UC Berkeley’s public science center: A window into the University’s research.

Learning Lab: We design, develop, test, and disseminate materials, methods, and tools.

Global impact: 12 million learners worldwide are impacted by Hall products or experiences.
The Strengths of ISIs

- ISIs meet learners where they are.
  - Media environments (Gilliam et al, 2017)
  - Ongoing need for content

- ISIs have developed strategies for engaging underrepresented groups.
  - Cultural competency (Thiry et al, 2015; Ciechanowski et al, 2015)
  - Partnerships to foster recruitment (Martin, Erete, & Pinkard, 2015)
  - Role models (Weber, 2011)

- ISIs bridge gaps that exist in school ecosystem, potentially reaching more diverse learners.
  - Longitudinal experiences (Rahm & Moore, 2015; Adams, Gupta, & Cotumaccio, 2014)
  - Democratizing effects (Calbrese Barton, Tan & Greenberg, 2017)
Unique Projects and Products

- Language support
  - BUILD 1.0 and 2.0
  - Curriculum for English Language Learners

- Broad reach and infrastructure
  - Science festivals
  - Library exhibits
  - School outreach and festivals

- Research and evaluation support
  - Best practices
  - Cultural competency
Breakout Discussion
Thank you!

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