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

National Alliance for Broader Impacts
May 1st, 2019

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

NATIONAL HIGH
MAGNETIC FIELD LABORATORY

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INFORMAL SCIENCE

- How can researchers and ISIs get connected?
  - Jamie Bell [resource center]

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

Image c/o InformalScience.org

- How can ISIs help researchers broadly engage underserved audiences?
  - Kalie Sacco [science museum]

But first… what is informal science education?

Nature Centers

Media

Museums

Digital Environments

After-school

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**.

Zoos / Aquaria

Public Lectures

Gardens

Festivals & Events

Maker-spaces

How can researchers and ISIs get connected?

Jamie Bell
Project Director and PI

INFORMAL SCIENCE

NSF-Funded Resource Centers

caise | center for advancement of informal science education

Supports NSF's Advancing Informal STEM Learning (AISL) program.

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

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

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

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

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

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

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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.

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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

Highlights of the 2019 NSF AISL Principa...   Watch later   Share

2 0 1 9
NSF Advancing Informal
STEM Learning Program
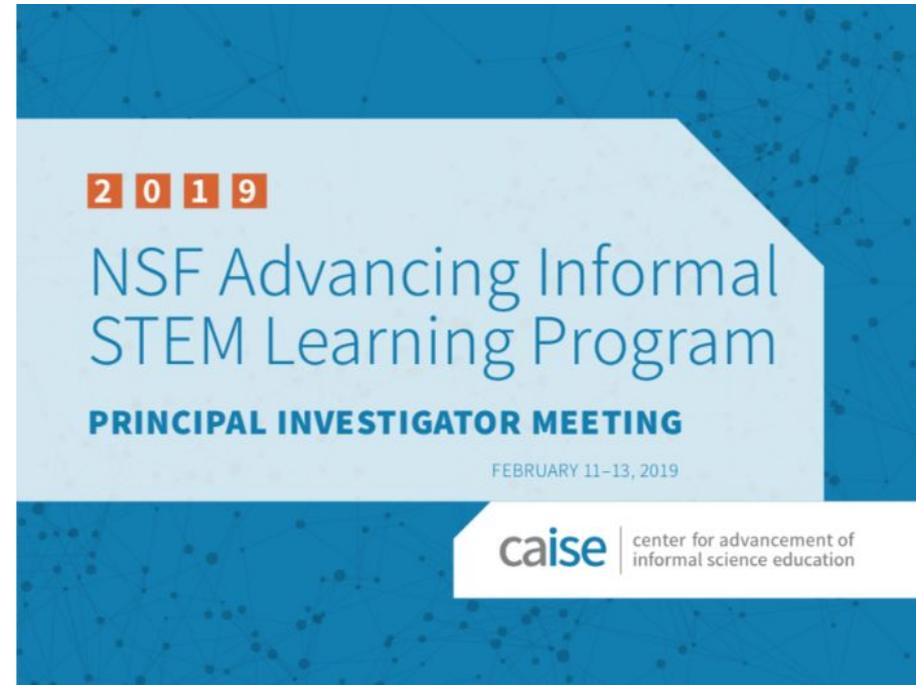**PRINCIPAL INVESTIGATOR MEETING**
FEBRUARY 11-13, 2019

Start with Jamie's blog recap

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

Meeting Themes

1. Identity, Interest and Engagement

2. Broadening Participation in STEM

informalscience.org/about-caise/pi-meetings/2019-pi-meeting

astc.org/about-astc/about-science-centers/
find-a-science-center/

● ● ●

Women in STEM: Be a role model for middle school girls as a AAAS IF/THEN Ambassdor -- Apply Now!

Photo credit: Atlantic Photography Boston

PROGRAMS

Center for Public Engagement with Science & Technology

f ✉

The Center for Public Engagement with Sc...
provides scientists with communication re...

aaas.org/programs/
center-public-engagement-science-and-technology

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Programs and Activities   Exhibits   Media   Professional Development   Evaluation and Research   Kits   About

GUIDES AND VIDEOS
Professional Development

Resources designed for educators and scientists to improve their capacity to engage the public in current science and technology.

Learn More!

Browse by Kit

Browse by Topic

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FEATURED NEWS

Newsletter: April 2019

April 3, 2019 | Kayla Berry

Check out this month's NISE Network e-newsletter for the latest project and professional development opportunities, upcoming events, comm announcements, science news, and mu

View

NEWSLETTER

FEATURED PRODUCTS

NISE Network Fact Sheets and Brochure for Partners

nisenet.org

Welcome to The Portal to the Public Network

popnet.instituteforlearninginnovation.org

PORTAL
to the Public

Partnerships for Broader Impacts Design

popnet.pacificsciencecenter.org/bid

Science Festival Alliance

Satellite

sciencefestivals.org/festivals

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SCIENCE FESTIVALS | FESTIVALS
INTERACTIVE MAP

SCIENCE FESTIVALS MEMBER MAP

The festivals appearing on this map (and our calendar) are independently organized members of the Science

BECOME A MEMBER

National Girls Collaborative Project

ABOUT   GET INVOLVED   PROGRAM DIRECTORY   EVENTS   RESOURCES   BLOG   GLOBAL   DONATE

Advancing the Agenda in Gender Equity

Encouraging girls to pursue careers in Science, Technology, Engineering, and Mathematics.

FIND
A Collaborative in your Area.

SUBMIT
Your Program to our Directory.

CONNECT
With Resources and Partners.

ngcproject.org

STEM Ambassadors and Community Partners

AMBASSADOR PROGRAM
STEM
BRIDGING SCIENCE & SOCIETY

DEPARTMENT OF BIOLOGY
COLLEGE OF SCIENCE | THE UNIVERSITY OF UTAH

http://www.stemap.org/

HUBBARD BROOK

RESEARCH FOUNDATION

Insights from the Hubbard Brook Roundtables:

A public engagement with science program at the Hubbard Brook Experimental Forest in New Hampshire

Tips for Convening a Roundtable Dialogue Event

February 2018

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 knowled[...]
perspectives and wo[...]

Hubbard Brook Rou[...]
PES developed by science communication practitioners at a long-term ecological research site in New Hampshire's White Mountains. Hubbard Brook Roundtables use facilitated

- 1–1.5-day facilitated dialogue events
- 12–25 invited participants

Explora! Broader Impacts Example

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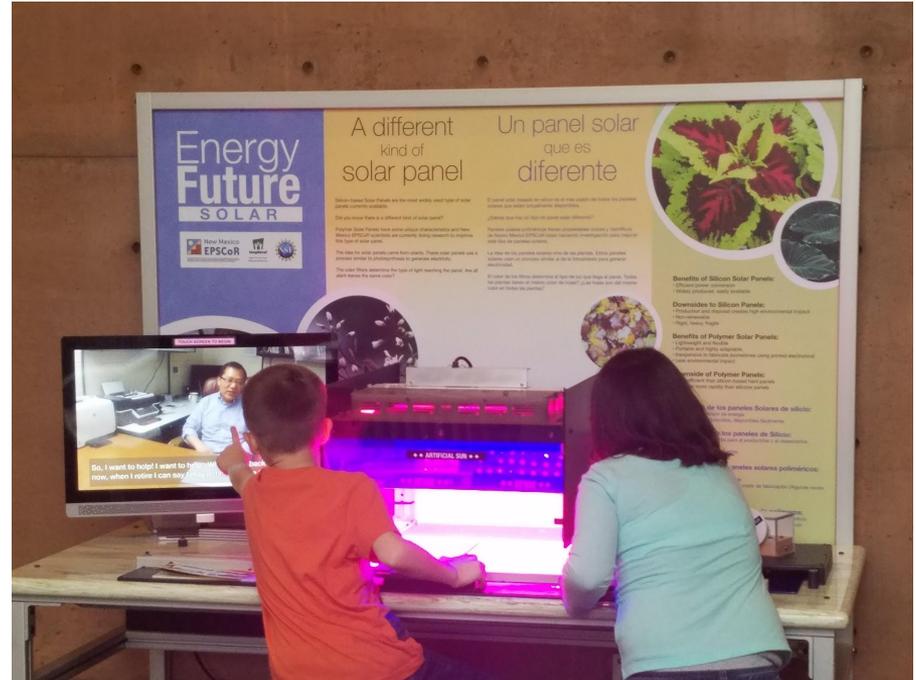
Explora Broader Impacts Example

- 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.

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Check out our resource page!

Nalini Nadkarni, **Professor of Biology**
University of Utah
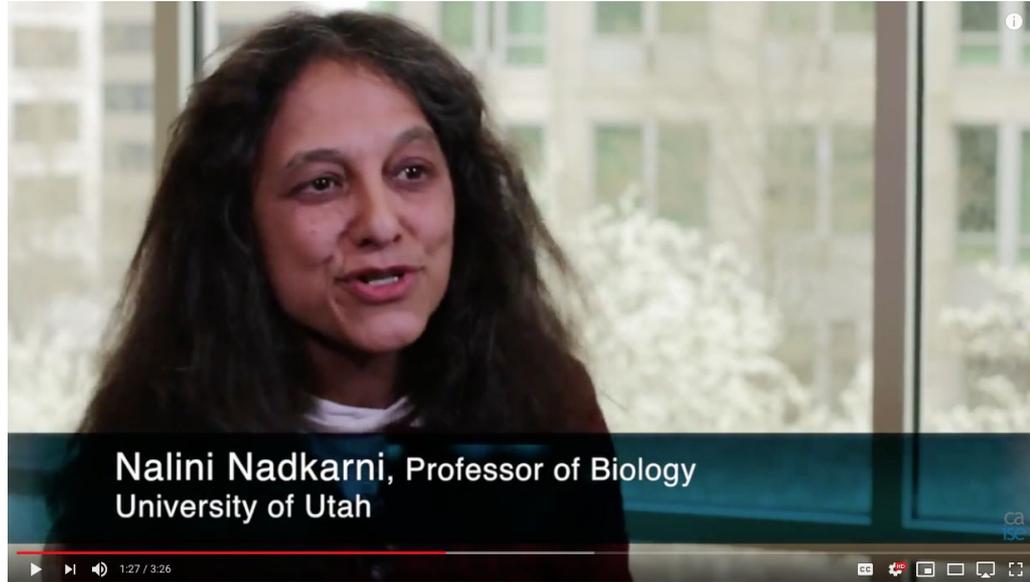
- Short video "What Scientists Should Know about Informal STEM Education"

- Helpful ISE resources to support scicomm, engagement, outreach, and broader impacts efforts

informalscience.org/projects/scientists-and-public-engagement

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Accessing Peer-Reviewed Literature on EBSCO

[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

How should researchers approach a partnership with an ISI?

Kari Roberts
Director of Evaluation and Postdoc Liaison
Center for Integrating Research and Learning

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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.

START HERE

So you need broader impacts for your grant proposal?

NO. → Well, that was easy. Save me for your next grant proposal.

YES!

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

Do you want to make a big impact on one or two people?
- **No**
- **Yes** → Sweet. You should mentor.

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

No → I've run out of options. Go back and explore other paths.

What style of event do yout to be a part of?
- A tour of the lab → **Fantastic** → Anyone who works here can **give a tour.** You can lead special visitors, student groups or even lead the monthly public tour.
- A talk about your specific area of research → **You're gonna be great.**
- A hands-on activity that shows how fun and inspiring science can be → **YIPPEE!**

Do you want to talk to members of the general public?
- **No**
- **Yes** → Get your powerpoint ready because you should join the **Speakers Bureau** or present your research at a quarterly **Science Café.**

During the summer you can **present your research to the MagLab's REUs, RETs, and Interns.** For the rest of the year, you can **present to local science teachers.**

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.
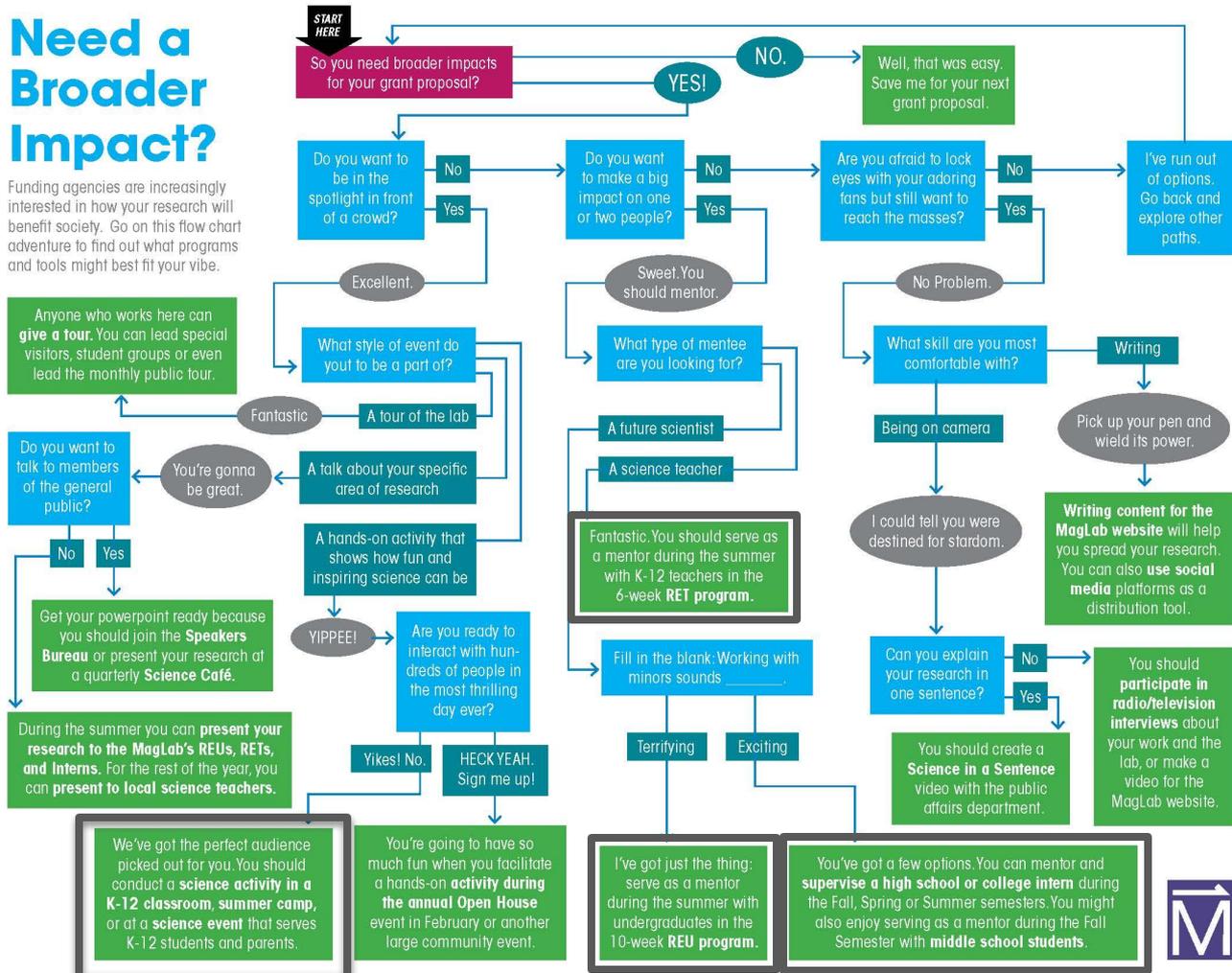
Are you ready to interact with hundreds of people in the most thrilling day ever?
- **Yikes! No.**
- **HECK YEAH. Sign me up!** → You're going to have so much fun when you facilitate a hands-on **activity during the annual Open House** event in February or another large community event.

What type of mentee are you looking for?
- A future scientist
- A science teacher → Fantastic. You should serve as a mentor during the summer with K-12 teachers in the 6-week **RET program.**

Fill in the blank: Working with minors sounds _____.
- **Terrifying** → I've got just the thing: serve as a mentor during the summer with undergraduates in the 10-week **REU program.**
- **Exciting** → 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.**

What skill are you most comfortable with?
- Being on camera → I could tell you were destined for stardom.
- Writing → Pick up your pen and wield its power. → **Writing content for the MagLab website** will help you spread your research. You can also **use social media** platforms as a distribution tool.

Can you explain your research in one sentence?
- **No** → You should **participate in radio/television interviews** about your work and the lab, or make a video for the MagLab website.
- **Yes** → You should create a **Science in a Sentence** video with the public affairs department.

The Lawrence Hall of Science

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

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

Global impact: 12 million learners worldwide are impacted by Hall products or experiences.

equity • learning • innovation • leadership • excellence

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
  - BUILDS 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

Image c/o Lawrence Hall of Science 2019/2020 School Programs Brochure

Breakout Discussion

Thank you!

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