

**CENTER FOR THE ADVANCEMENT OF INFORMAL SCIENCE EDUCATION (CAISE)  
FELLOWS PROGRAM SUMMARY REPORT  
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*“It was a good incremental introduction to NSF and CAISE. Getting to know important people, people I know are on the radar, and to be in communication with them, is really unique.” – 2009-2010 CAISE Fellow*

This report is a summary of the activities of the Center for the Advancement of Informal Science Education (CAISE) Fellows program up to the date of CAISE’s Reverse Site Visit to the National Science Foundation (NSF) on April 16 of 2010. The report also includes a brief synthesis of NSF’s feedback from the site visit and some suggested future directions by the CAISE Co-Principal Investigators based on that feedback, input from past and present CAISE Fellows and Inverness Research Associates’ evaluation of the program.

The original statement of purpose of the CAISE Fellows program was to “broaden the participation and build capacity of professionals in informal science education (ISE) who are from underrepresented groups and regions of the US.” In so doing, the program was designed “to develop and support diverse leadership across the spectrum of the ISE field—leaders who, together, represent the diversity of our communities as well as the breadth of the ISE field.” The hypothesis was that CAISE Fellows would infuse new energy and ideas into the field and to provide new models for ISE sector-crossing professionals. In order to achieve these goals, the program’s initial activities focused on knowledge building, networking and mentorship.

The CAISE Leadership and Diversity Committee conducted recruitment for Fellows through open calls for applications. The criteria for selection of the Fellows was their ethnic, gender, geographic and ISE sector diversity, as well as evidence that candidates were at a point in career trajectory when they would be able to optimize the experience for themselves and make unique contributions to CAISE activities and thinking. There have now been two cohorts of Fellows in the program, 9 Fellows in the 2008-2009 cohort and 11 in the 2009-2010 cohort. Fellows from the first year were invited to reapply to the program for a second, and 4 Fellows from the first cohort remained in the second. A total of 15 Fellows have participated to date. The majority of Fellows in both cohorts are situated primarily in museums, science centers and their related community programs. Mass media, journalism and cyber-enabled sectors are also represented, although to a lesser degree. Overall demographics of the Fellows in both cohorts are as follows:

- Gender: 73% female 27% male

- Geography: 45% from EPSCoR states. EPSCoR, The Experimental Program to Stimulate Competitive Research, was initiated in 1979 by the National Science Foundation (NSF) as an infrastructure-building effort to encourage local action to

develop long-term improvements in selected states' science and engineering enterprise. The program targets those jurisdictions that have historically received lesser amounts of NSF Research and Development (R&D) funding. Twenty-five states, the Commonwealth of Puerto Rico and the U. S. Virgin Islands currently participate in EPSCoR. EPSCoR states represented in the CAISE Fellows program are Hawaii, Louisiana, Mississippi, Montana, New Hampshire and Vermont.

- Ethnicity: 45% of Fellows identify as racial/ethnic minorities

This table shows the spread of the sector affiliations, experience and interests of both cohorts of CAISE Fellows. Those from EPScOR states are also identified, and those who identified as non-white are designated as minority.

Name	Yrs.	Museum	Cyber	Acad.	Comm.	Media	Journalism	EPScOR	Minority	Gender
Jennifer Adams	08-10	x		x	x				x	F
Alysia Caryl	09-10	x			x				x	F
Sarah Garlick	08-10				x	x	x	x		F
Kantave Greene	08-10			x	x			x	x	M
Rose High Bear	09-10		x		x	x		x	x	F
Rose Honey	09-10			x	x			x		F
Ka'iu Kimura	08-09	x			x			x	x	F
Sherry Marshall	08-09	x			x			x		F
Sandra Martell	08-09	x		x						F
Trevor Nesbit	08-10	x	x					x		M
Rebecca Prosino	09-10	x						x		F
Madlyn Runburg	09-10	x								F
Christina Soontornvat	08-10	x			x				x	F
Hi'ilani Shibata	08-09	x			x			x	x	F
Steven Williams	09-10	x		x						M

## History

CAISE Project Director Ellen McCallie, CAISE Manager John Baek and Preeti Gupta, Director of Education at the New York Hall of Science originally developed the CAISE Fellows Program. Throughout the first year of the program, John Baek played a major mentoring role for the Fellows. The core of activity was an online leadership seminar series that took the form of monthly teleconferences, which were intended to acquaint Fellows with various aspects of CAISE, the National Science Foundation

and the field of ISE writ large. Other activities included participation in the 2008 ISE Principal Investigator (PI) summit and an ISE proposal-writing exercise in which proposal idea development provided a boundary object for dialogue and iteration. A Fellows Ning site was established in August 2008 as a tool for intra-group sharing of ideas and reflections. Throughout the first year, CAISE Manager John Baek recruited a variety of ISE professionals as additional mentors to help Fellows with their ISE proposal development and to provide general feedback on their ideas and questions.

The CAISE 2008 Informal Science Education Principal Investigator (ISE PI) Summit provided a venue to seed and establish these relationships. Evaluation conducted by Inverness Research in the first year of the program found that Fellows highly valued their experience and that three Fellows completed ISE proposals to submit to NSF by the end of that year. They also found that Fellows welcomed the idea of more structured opportunities for mentorship and intra-program community building, and that there was potential benefit in Fellows being more deeply integrated into the core intellectual work of CAISE.

With the departure of John Baek in the second year of CAISE, Laura Huerta Migus, ASTC's Director of Equity and Diversity assumed responsibility as the new Fellows Program Advisor. In response to Inverness' formative evaluation, the structure of program evolved to integrate Fellows into the three CAISE "Inquiry Groups"- Policy Study, Infrastructure and Learning- in order to further develop their capacity as emerging ISE thought leaders.

The inquiry groups are comprised of ISE professionals from across sectors that meet to address their areas of interest and to produce products, activities and documents. As members of the inquiry groups, Fellows took part in the group meetings, phone conferences and in each group's respective project work. These projects included "white paper" writing in the Policy Study Inquiry Group, conducting "Everyday Science" interviews in the Infrastructure Inquiry Group and participating in the *Learning Science in Informal Environments*<sup>1</sup> book club and ISE timeline activities in the Learning Inquiry Group. All Fellows were also involved in their respective inquiry groups' preparation and participation in the 2008 & 2010 ISE PI Summits.

### **Informal Science Education Principal Investigator Summits**

CAISE Fellows attended pre-Summit workshops in both 2008 and 2010 (CAISE holds PI summits every other year). During the 2008 workshop, Fellows received an introduction and overview of the NSF ISE program from NSF Program Officer Sylvia James and met with members of the CAISE Leadership and Diversity committee. The Fellows also worked on "elevator speeches" for the posters they created to explain their proposed ISE projects at a Summit poster session. During the Summit,

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<sup>1</sup> *Learning Science in Informal Environments: People, Places and Pursuits*. Bell, Lewenstein, Shouse, and Feder, *Editors*. (2009) Committee on Learning Science in Informal Environments, National Research Council

they provided input on each other's proposal ideas as advisors, evaluators and partners and had the opportunity to receive feedback from a variety of seasoned ISE professionals who toured the posters. Fellows also attended Summit workshops on evaluation, financial management and evaluating impacts of ISE projects.

The 2010 CAISE PI Summit pre-summit workshop gave the Fellows the opportunity to discuss their experiences so far in the fellowship, with Laura Huerta Migus and each other, with a focus on the extent to which the fellowship activities had provided quality professional development experiences. The main activity of the workshop was to share experiences about the process of participating in the inquiry groups. Fellows explained the roles they played in preparing their inquiry groups' participation in the Summit. Policy Study Inquiry Group Fellows researched and co-wrote white papers on policy issues and challenges related to ISE. Fellows in the Infrastructure Inquiry Group conducted and analyzed "Everyday Science" interviews with subjects from across the country. Learning Inquiry Group Fellows helped to synthesize key learning issues from the NRC *Learning Science in Informal Environments* publication to be discussed in the Summit's breakout sessions.

During the Summit itself, Fellows attended Neil deGrasse Tyson's keynote speech, inquiry group plenary talks and follow-up breakout sessions and brief talks on "Hot Topics in ISE." They also participated in workshops on "Developing Measurable Impacts and Indicators" and "Managing Financial Practices and Reporting" for NSF and concurrent sessions on either "Networking Around Evaluation" or interest-driven Roundtable Discussions.

In a post-2010 summit meeting with Laura Huerta Migus, CAISE Fellows expressed having been inspired and motivated by their interactions with Summit attendees and each other. Some themes that emerged from the discussion were:

- A sense of ownership and commitment of the Fellows to the program, especially in shaping the future of the program, nurturing the emerging CAISE Fellows network, and mentoring future Fellows.
- The opportunity to leverage the diverse portfolio of resources and expertise of the Fellows cohort for larger projects and funding opportunities
- The idea of Fellows convening book clubs on *Surrounded by Science*<sup>2</sup> for local ISE professionals

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<sup>2</sup> *Surrounded by Science: Learning Science in Informal Environments*. Fenichel and Schweingruber. (2010) National Research Council. *Surrounded by Science* is the follow-up "practitioners volume" to *Learning Science in Informal Environments: People, Places and Pursuits*.

- The general desire to take the knowledge and experiences gained through the fellowship and participation in the Summit back to their home institutions and local ISE communities
- The idea of CAISE Fellows initiating an inquiry group around “professional pathways in ISE”.

One notable gap in the experience was the lack of recognition/visibility of the Fellows during the Summit. Some Fellows’ perception was that although many of the Summit speakers focused on the need for development of new and diverse leadership in ISE, the investment that CAISE had made in the Fellows program was underrepresented and hence a missed opportunity.

### **Evaluation**

At the end of the second year of the Fellows program, Inverness began looking at the knowledge and experience that the Fellows gained, the contributions they made and the impact on Fellows personally and professionally as a result of the experience. Findings from that year suggested that the new, firsthand exposure to field leaders in the Inquiry Groups, and the opportunity to take part in discussions about critical issues and ideas facing the field resulted in experience and knowledge that was highly valued by the Fellows.

Fellows overall felt they were able to make contributions to the Inquiry Groups that they were attached to, some to a greater or lesser degree depending on the activity or the context. Activities that fostered a strong sense of contribution included having a common document around which to discuss ideas, such as the *Learning Science in Informal Environments* publication, conducting interviews, writing papers and opportunities to bring their “view from the trenches” as practitioners from a wide variety of sector, geographic and audience contexts.

In terms of impact, Inverness found that in the second year of the program Fellows gained new levels of confidence, awareness and professional cache that they were able to bring to the contexts in which they work, and that their overall experience was one of broadening professional development.

### **Leveraging the Experience (vignette)**

Some Fellows have been able to leverage the knowledge and contacts gained from their CAISE fellowship to work in more “sector-savvy” ways. One example is the experience of Sarah Garlick, a second-year Fellow who is a geologist, author, journalist and director of a non-profit educational foundation- the Geoscience Outreach Foundation in Intervale, New Hampshire. She thinks of herself as a storyteller, connector and bridge-builder:

*I'd describe myself as a former geologist who now works as a science writer and a director of a science education non-profit. As I've entered and explored this ISE field, I've been struck by how little interaction there is between ISE professionals and science professionals—the scientists actually doing the primary research. I think there are many reasons for this disconnect: the institutional barriers, educational barriers, etc. And I think some of those same barriers exist within the ISE field, among the different sectors, which is perhaps why the field as a whole has had a bit of an identity crisis over the years. So there seems to be a clear need here, and an opportunity. In a nutshell, what I've been trying to do with my organization and my career is to work outside of all those silos as a connector — connecting the scientists with the museum professionals and the television/film professionals and the community organizers, and in turn, connecting those ISE professionals with each other. As I see it, the basis for this whole effort — the reason I think it can actually work and have an impact on the field — is that it all comes back to basic storytelling. All of the best ISE practices, it seems to me, are governed by their own overarching stories. So in the end I don't pigeonhole myself as an exhibit designer or a film director (although in practice I end up contributing to those efforts) — what I am is a storyteller. I recognize a good story, one that has the potential to have impact, and then I go about finding the experts (the museum people, the media people, etc.) who can help me tell that story to the widest audience possible.*

*In the case of my work with the University of Tennessee, our project originated from wanting to tell a compelling story about mountains — about how the Earth's tallest mountains have been built and about the "extreme" fieldwork that geologists are conducting in the high Himalaya. That story evolved to a comparison between the Appalachian Mountains and the Himalayan Mountains, what we felt was an unusual spin to the mountain-uplift narrative; something that had the potential to pique audience interest; and a human-interest story about a young, up-and-coming geologist eager to prove himself and a senior geologist toward the end of his career.*

*The project evolved from there... We brought in a production company from Los Angeles who specializes in human-interest stories and who had demonstrated that they could work in difficult environments. At the time, I was also reading a lot about the benefits and drawbacks of different ISE platforms, so I brought up with the project team the need to do more than just a one-way transmission, in the form of a feature film. This led us proposing the project to the wonderful staff at the McClung Museum in Knoxville. They were thrilled to help design, build, and schedule an exhibit about the geology of the Himalaya and the Appalachians. They allowed my collaborator (UTK geologist Micah Jessup) and I to be creative about coming up with exhibit ideas to tell the story we were trying to tell — and they had the expertise to tell us what could work, what probably wouldn't and what were standard practices in the museum field. The museum is now committed to developing the exhibition in house, and is currently seeking funding to begin development.*

## **Reverse Site Visit Presentation**

In preparing for the Reverse Site Visit to the National Science Foundation, the CAISE PI, Co-PIs and Inverness Research looked at both the data and anecdotal indicators of two cohorts of Fellows' experience and reached a consensus on some possible future directions for the program to take. The background data and these suggestions were presented to the Reverse Site Visit panel and NSF program officers on April 16, 2010:

- Expand the program cohort to 12 Fellows. The second cohort of 11 seemed to provide a strong sense of critical mass and community
- Extend the Fellowship to a two-year experience, with overlapping alumni serving as mentors. Fellows who remained in the program for a second year conveyed a sense of a deeper experience that benefited themselves, the inquiry groups and CAISE. This structure would also allow for strategic incremental experiences that scaffold on each other.
- Provide an initial in-person community-building orientation, separate from the ISE PI summits. Fellows highly valued and seemed to benefit from their direct experience of each other.
- Facilitate and support cross-sector, 1-month residencies or "externships" that mutually benefit Fellows and externship sites (e.g. a Fellow who works in science journalism could be attached to a science center) The Fellows who entered the program with previous cross sector experience seemed to be able to build on it through CAISE activities and make valuable contributions to conversations and products.

## **Reverse Site Visit Feedback**

In response to the CAISE staff and Co-Principal Investigators' Reverse Site Visit to the National Science Foundation on April 16, 2010, NSF has recommended that the Fellows program continue and expand, but that CAISE should "position Fellows more deliberately as one subcategory of ISE professionals". Other recommendations were that Fellows should be engaged in activities that concretize the work of CAISE, such as writing reviews of projects in the existing portfolio and that science, technology, engineering and math (STEM) researchers always be included in the mix.

From that feedback, the CAISE PI and Co-PIs proposed a Fellows Program that focuses on emerging professionals as well as established "influentials" who are ISE storytellers, and who serve as bridges between their home domains and other ISE sectors. They also reaffirmed that the CAISE Fellows Program must continue to infuse new ideas into CAISE, connect CAISE to STEM researchers and to ensure that

the work of CAISE reflects what is most vital in the current pool of potential NSF Principal Investigators, both within and beyond the ISE program itself.