ISE PI SUMMIT 2008

Increasing the Impacts and Communicating the Value of Informal Science Education

July 25-26, 2008
Washington, DC
Dear 2008 Informal Science Education Principal Investigators Summit Participants:

On behalf of the Directorate for Education and Human Resources at the National Science Foundation (NSF), I want to welcome you to the 2008 Informal Science Education (ISE) Principal Investigators Summit, led by the Division of Research on Learning in Formal and Informal Settings (DRL). The Summit’s theme, Increasing the Impacts & Communicating the Value of Informal Science Education, resonates with NSF’s Strategic Outcome Goal on Learning, Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens. Your participation in this Summit is a reflection of your dedication to this goal and to improving the STEM learning enterprise.

One impressive characteristic of the informal science education field is its diversity, with respect to the kinds of goals and visions it embraces, the projects that are conducted, the variety of organizations involved, the backgrounds of professionals, and the audiences it serves. It has often been noted that creative work thrives on diversity, and the field’s commitment to innovation and collaboration certainly bears witness to that. We fully expect that the Summit, being representative of the range of NSF/ISE-funded projects, will be an opportunity for you, and for us, to learn from and be inspired by one another.

We welcome your comments and suggestions as we all strive to increase the impacts and communicate the value of informal science education.

Sincerely,

Cora B. Marrett
Assistant Director
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FRIDAY July 25, 2008

8:00–9:00 Registration MARRIOTT FOYER, MEZZANINE LEVEL
Optional: Setup for Project Showcase.

9:00–10:00 Opening Plenary Session SALON 1
Welcome & Introductions
Featured Speakers —
Cora Marrett, NSF, and Joan Ferrini-Mundy, NSF
Getting Involved with CAISE

10:00–10:30 Morning Refreshments FOYER
Optional: Register for InformalScience.org and ExhibitFiles.org.

10:30–12:15 Morning Plenary Session SALON 1
Informal Science Education Town Hall Meeting
The Forthcoming National Research Council (NRC) Report on Learning Science in Informal Environments

12:15–1:15 Lunch FOYER
Optional: Setup for Project Showcase.
1:15–2:30 Breakout #1 (Concurrent Sessions)

Workshops
Visitor Studies 101: Evaluating Impact  TAFT ROOM
Beyond Counting Hits: Strategies for Evaluating ISE Websites  BALCONY A

Discussion Groups
More Time, More Money, More Freedom: The Three Secrets to Successful Collaboration Across Institutions and Industries  TAYLOR ROOM
Integrating Traditional Ways of Knowing with Western Science  SALON 1, TABLE 1
Public Engagement with Science: An Emerging Role for ISE?  TRUMAN ROOM
Environmental Literacy: Taking Action through ISE  TYLER ROOM
ISE Project Monitoring System: Individual Sessions  SALON 1, TABLES 2 & 3

2:30–4:00 Project Showcase & Refreshments
See handout for project locations.

4:00–5:15 Breakout #2 (Concurrent Sessions)

Workshops
Methods and Instruments: How About Tools?  TAFT ROOM
Evaluation 101: Everything You Need to Know to Get Started  BALCONY A

Discussion Groups
Religion and Science: Beyond the Evolution-Creationism Wars  SALON 1, TABLE 1
Public Participation in Research: Citizen Science and Beyond  TAYLOR ROOM
Portraying Science as a Human Endeavor  TRUMAN ROOM
Learning Across Formal and Informal Settings: How Do We Connect?  TYLER ROOM
ISE Project Monitoring System: Individual Sessions  SALON 1, TABLES 2 & 3

5:15–5:45 Afternoon Plenary Session  SALON 1
Thoughts from Today and for Tomorrow

5:45–6:30 Free Time & Walk to the National Zoo

6:30–9:00 BBQ Dinner at the National Zoo  GREAT MEADOW
Cash bar; musical instruments welcome
# AGENDA-AT-A-GLANCE

**SATURDAY July 26, 2008**

<table>
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<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tr>
<td>6:00</td>
<td>National Zoo Grounds Open</td>
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<tr>
<td>8:00–9:00</td>
<td>Continental Breakfast <strong>NATIONAL ZOO VISITOR CENTER</strong></td>
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</table>
| 9:00–11:00 | Morning Plenary Session **NATIONAL ZOO VISITOR CENTER AUDITORIUM**                         | CAISE and Its Work
|          | Discussing the Framework for Evaluating Impacts of Informal Science Education Projects    |                                               |
| 11:00–12:30 | Box Lunch                                                                                   | Optional: Setup for Project Showcase at Marriott. |
| 11:15–12:15 | Education at the National Zoo: A Walking Tour                                              | **NATIONAL ZOO VISITOR CENTER**               |
|          | This tour is limited to 20 people.                                                         |                                               |
| 12:30–1:00 | Walk to Marriott                                                                            |                                               |
| 1:00–2:15 | Breakout #3 (Concurrent Sessions)                                                          | **NATIONAL ZOO VISITOR CENTER**               |
|          | Discussing the Framework for Evaluating Impacts of Informal Science Education Projects     | See the signs at the registration table for topic locations. |
| 2:15–3:45 | Project Showcase & Refreshments                                                             | See handout for project locations.            |
| 3:45–5:00 | Breakout #4 (Concurrent Sessions)                                                          |                                               |
|          | Workshops                                                                                   | **NATIONAL ZOO VISITOR CENTER**               |
|          | Ethical and Practical Solutions for Evaluation Studies **TAFT ROOM**                       |                                               |
|          | “Big Ideas” for ISE Projects **BALCONY A**                                                  |                                               |
|          | Working with the ISE Project Monitoring System **BALCONY B**                               |                                               |
|          | Discussion Groups                                                                           |                                               |
|          | Sustaining Access to ISE for People with Disabilities **SALON 1, TABLE 1**                |                                               |
|          | Bringing New Visualization Technologies into ISE Institutions **TAYLOR ROOM**              |                                               |
|          | Knowing When and How to Scaffold Learning: A Dialogue about Teaching and Learning Using Digital Data **TRUMAN ROOM** |                                               |
|          | Taking ISE to the Next Level: What Happens After the Sound Bite? **SALON 1, TABLE 2**    |                                               |
|          | Assessing the Impacts of Online Professional Communities for Informal Science Education **TYLER ROOM** |                                               |
|          | Working with Your Program Officer **SALON 1, TABLE 4**                                    |                                               |
| 5:00–5:30 | Closing Plenary Session **SALON 1**                                                        | Increasing the Impacts and Communicating the Value of Informal Science Education |
AGENDA—AT-A-GLANCE

Smithsonian National Zoological Park

The Zoo is located at
3001 Connecticut Avenue NW
Washington DC  20008
SESSIONS for Friday, July 25

Registration 8:00–9:00 a.m.
Marriott Foyer (Mezzanine Level)
Optional: Setup for Project Showcase.

Opening Plenary Session 9:00–10:00 a.m.
Salon 1
Welcome & Introductions
Wendy Pollock, CAISE PI, Association of Science-Technology Centers
Al DeSena, Coordinator, Lifelong Learning Cluster, Division of Research on Learning in Formal and Informal Settings, NSF

Featured Speakers
Cora Marrett, Assistant Director, Directorate for Education and Human Resources, NSF
Joan Ferrini-Mundy, Division Director, Division of Research on Learning in Formal and Informal Settings, NSF

Getting Involved with CAISE
Kevin Crowley, CAISE Co-PI, University of Pittsburgh

Morning Refreshments 10:00–10:30 a.m.
Foyer
Optional: Register for InformalScience.org and ExhibitFiles.org.

Morning Plenary Session 10:30 a.m.–12:15 p.m.
Salon 1
Informal Science Education Town Hall Meeting
NSF ISE Program Officers
The Forthcoming National Research Council (NRC) Report on Learning Science in Informal Environments
Sue Allen, Exploratorium
Bruce Lewenstein, Cornell University
Tom Keller, National Academy of Sciences

Lunch 12:15–1:15 p.m.
Foyer
Optional: Setup for Project Showcase.
Breakout #1  1:15–2:30 p.m.
(Concurrent Sessions)

There are three workshops and five discussion groups to choose from for Breakout #1. Please note that the Financial Practices workshop is repeated in Breakout #2.

WORKSHOPS

Visitor Studies 101: Evaluating Impact

Ellen Giusti
Independent Consultant

Taft Room

Your project is in a museum or science center, and you know how to create good programs and exhibits. But now NSF is asking you to evaluate the impact of those programs and exhibits. Where do you start? With Visitor Studies 101.

This workshop will introduce the four basic phases of evaluation: (1) front-end, used during design development, (2) formative, used during design implementation, (3) remedial or corrective, and (4) summative. Participants will learn how to establish a project’s learning goals and then use the new NSF report, Framework for Evaluating Impacts of Informal Science Education Projects, to measure what they have achieved.

This workshop will provide participants with an overview of exhibition and program evaluation, beginning with the differences between basic research and program evaluation. Attendees will learn that funders’ requirements are not the only or even the principal reason to conduct evaluation—rather, evaluation is the “right thing to do” for anyone concerned with successful outcomes in informal education. Attendees will come away with the basic concepts and tools needed to work with a professional evaluator. To be defined and discussed: evaluation terminology, quantitative vs. qualitative methods, and the pros and cons of various data collection and analysis approaches.

Visitor Studies 101 will have an informal seminar-type format rather than a lecture, with plenty of opportunity for questions and comments from the participants. Participants will take away a substantial handout developed by the presenter in collaboration with Smithsonian Institution colleagues Zahava Doering and Andrew Pekarik.
Beyond Counting Hits: Strategies for Evaluating ISE Websites

Saul Rockman  
*Rockman et al*

Jennifer Borse  
*Rockman et al*

Balcony A

People are clicking on your ISE website. What does that actually tell you about the impact your site is having on the public understanding of science and technology?

In this workshop, participants will be introduced to the range of issues in and approaches for the evaluation of ISE websites. As part of this workshop, presenters will provide participants with a worksheet to help them define the outcomes they want from their websites and the kinds of data that can be used to capture impacts and outcomes. The presenters seek to narrow the range of expectations to those that are more realistic and to encourage efforts that identify meaningful short- and long-term outcomes rather than just counting hits, page views, stickiness, and other trivial data. For summative outcomes, the focus will be on what data can be captured on the websites, what can be linked to web interactivity, and what can lead to offsite actions that can be tied back to the site. Examples will include ISE websites for media and museums.

The workshop will introduce participants to a wide variety of evaluation tools and practices, including open source tools and proprietary ones. Among the topics discussed will be evaluation planning, user profiles, formative evaluation, beta tests, usability/navigation, universal design, web log analysis, assessments of learning, and off-site actions.


Pamela Hawkins  
*Division of Grants and Agreements, NSF*

Tarsha Johnson  
*Division of Grants and Agreements, NSF*

Carol Orlando  
*Cost Analysis and Audit Resolution Branch, NSF*

Beatriz Azor  
*Cost Analysis and Audit Resolution Branch, NSF*

Balcony B

Sound financial practices and reporting are crucial to effective grant management. This workshop, led by staff from NSF’s Office of Budget, Finance, and Award Management (BFA) Division of Grants and Agreements (DGA) and Cost Analysis and Audit Resolution Branch (CAAR), focuses on NSF financial management, requirements, and the strategies and tools to help make the process effective and (relatively) painless. Examples of tools and good practice are included. Questions are welcome.
**DISCUSSION GROUPS**

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**More Time, More Money, More Freedom: The Three Secrets to Successful Collaboration Across Institutions and Industries**

Jared Lipworth  
*Thirteen/WNET*

Taylor Room

No, this is not a marriage counseling session. Building on an informal presentation of case studies from the outreach efforts for two public television projects (*Innovation* and *The Human Spark*), this session will explore the obstacles to successful collaboration between television producers and science museums, as well as the benefits to each organization when these obstacles are overcome. Join us for a frank discussion about what works, what doesn’t, and what we can all do better.

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**Integrating Traditional Ways of Knowing with Western Science**

Bonnie Sachatello-Sawyer  
*Hopa Mountain*

Salon 1, Table 1

In this roundtable, we will discuss best practices for integrating traditional ways of knowing with Western science in informal science education programs. Insights from Hopa Mountain, a nonprofit that invests in rural and tribal citizen leaders who are working to improve education, ecological health, and economic development, and the NSF-funded Native Science Field Centers project will start the conversation.

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**Public Engagement with Science: An Emerging Role for ISE?**

Larry Bell  
*CAISE Inquiry Group Leader, Science Museum, Boston*

Bruce Lewenstein  
*Cornell University*

Cynthia Needham  
*ICAN Productions*

Truman Room

How are ISE projects stepping beyond the traditional goals of increasing public understanding of the natural and humanmade worlds as well as beyond the traditional approaches of one-way communication and discovery learning? In this discussion session, we will identify the goals and techniques that drive “public understanding of science” (PUS) and those that drive “public engagement with science” (PES). Participants from all sectors of ISE are invited to share experiences and brainstorm ideas about ISE projects that facilitate more open exchanges between science and society.

This session will inform a CAISE Inquiry Group on PES that will lead to several products, including a white paper on PES and recommendations to funders.
Environmental Literacy: Taking Action through ISE

Linda Rhoads  
*Environmental Education Association of Oregon*

Ari Epstein  
*Massachusetts Institute of Technology*

Tyler Room

Climate changes, air and water concerns, and other environmental challenges are pressing and complex issues. Our leaders and residents face the challenge of balancing the economies within which we thrive, the communities where we reside, and the natural resources on which we depend. What roles can ISE play in addressing environmental literacy?

ISE Project Monitoring System: Individual Sessions

Gary Silverstein  
*Westat*

John Wells  
*Westat*

Salon 1, Tables 2 & 3

Staff from Westat will be available to meet with individual ISE projects that (1) have questions about their submissions to the Project Monitoring System, (2) have questions about their project’s impacts and indicators, (3) would like to discuss their upcoming submissions, and/or (4) would like to provide feedback on the navigation and/or content of the online system.

Project Showcase & Refreshments 2:30–4:00 p.m.

See handout for project locations.
Breakout #2 4:00–5:15 p.m.
(Concurrent Sessions)

There are three workshops and five discussion groups to choose from for Breakout #2.

WORKSHOPS

Methods and Instruments: How About Tools?

Terrie Nolinske
TNI Consultants LLC

Taft Room

Evaluating the impact of informal science education projects isn’t easy. Fortunately, there are a variety of methods available that can be used by project leaders to assess program efficacy.

This workshop will include an overview of methods used in data collection with an emphasis on in-person interviews, telephone interviews, focus groups, and questionnaires. Methods such as journals, portfolios, and observations with follow-up interviews may also be discussed. Participants will work in small groups to identify the advantages and disadvantages of each method of evaluation and will share their findings with the group at large. Participants will examine resources related to survey research and evaluation, including online sources.

The format for this workshop is interactive and hands-on. Lectureettes will alternate with discussions, case studies, and individual and group activities, such as reflections and problem solving. Participants are encouraged to bring examples of instruments they have used or are using. They are also encouraged to share their experiences and start to apply what they learn to their respective settings during the workshop. Participants will leave with a comprehensive set of handouts and resources.

Evaluation 101: Everything You Need to Know to Get Started

Saul Rockman
Rockman et al

Jennifer Borse
Rockman et al

Balcony A

You know almost exactly what you want to do to improve the public understanding of science and technology. But you don’t have much of an idea about how to start to evaluate your project, to improve its effectiveness, and then to prove its success. Evaluation 101 to the rescue.

This workshop will begin with “Why do an evaluation?” and “What is an evaluation?” and quickly follow with “How would this work with a planetarium show, website, or television show?” We will help participants identify the products or processes in their ISE initiatives. The rationale will include interactive discussions of the value of improving the product, communicating its impact or value, responding to questions about the initiative, clarifying the content and presentations to better serve the needs of the audience, and building the next program or media product.
The workshop will be based on the content of EvaluationSpringboard.org, an existing, freely available, and accessible website. Topics include creating a logic model, formulating and prioritizing evaluation questions, human subjects and informed consent, identifying evaluation types, identifying evaluation methods, planning for and collecting data, analyzing and interpreting data, and reporting and using findings. The labs match the content covered in the recent Framework for Evaluating Impacts of Informal Science Education Projects.

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**Financial Practices and Reporting: Strategies and Tools to Support Good Business Practice**

**Pamela Hawkins**  
*Division of Grants and Agreements, NSF*

**Tarsha Johnson**  
*Division of Grants and Agreements, NSF*

**Carol Orlando**  
*Cost Analysis and Audit Resolution Branch, NSF*

**Beatriz Azor**  
*Cost Analysis and Audit Resolution Branch, NSF*

Balcony B

Sound financial practices and reporting are crucial to effective grant management. This workshop, led by staff from NSF’s Office of Budget, Finance, and Award Management (BFA), Division of Grants and Agreements (DGA), and Cost Analysis and Audit Resolution Branch (CAAR), focuses on NSF financial management, requirements, and the strategies and tools to help make the process effective and (relatively) painless. Examples of tools and good practice are included. Questions are welcome.

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**DISCUSSION GROUPS**

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**Religion and Science: Beyond the Evolution-Creationism Wars**

**Tom Rockwell**  
*Exploratorium*

Salon 1, Table 1

How do these two cultural forces—religion and science—coexist, collide, and cooperate?

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**Public Participation in Research: Citizen Science and Beyond**

**Rick Bonney**  
*CAISE Inquiry Group Leader, Cornell Lab of Ornithology*

**Taylor Room**

Laypeople have been collecting scientific information for decades. However, data collection projects that allow participants to learn science content and processes while helping to generate scientific knowledge is more recent. Such efforts include citizen science, community science, civic science, and participatory action research. How can these and related projects involve the public in comprehensive investigations that include all of the steps in the scientific process—not just collecting...
data, but also analyzing and interpreting it, discussing results, drawing conclusions, and asking new questions? Bring your ideas to help shape a CAISE Inquiry Group that will lead to several products, including a white paper and recommendations to funders.

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**Portraying Science as a Human Endeavor**

**Jim Metzner**  
*Jim Metzner Productions, Inc.*

**Jeremy Monroe**  
*Freshwaters Illustrated*

Truman Room

Sharing science can include more than “science content.” It can focus on processes and passions that drive scientists. For three years the *Pulse of the Planet* radio series has equipped scientists to record audio diaries and write blogs. Both of these techniques provide an insider’s view of the scientific endeavor. Through television, *Freshwaters Illustrated* has explored ways scientists can share their passion for science, while remaining cognizant of their credibility and reputation. Join PIs from these two NSF funded ISE projects to explore lessons learned and future possibilities.

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**Learning Across Formal and Informal Settings: How Do We Connect?**

**Bronwyn Bevan**  
*CAISE Inquiry Group Leader, Exploratorium*

**Diane Miller**  
*St. Louis Science Center*

Tyler Room

Science is perceived by many as a set of facts and procedures that requires prodigious memorization skills and shirts that carry pocket pens. This conception of science is developed, in large part, by the way science is taught and experienced in schools. People who come to our institutions might have other ideas about science, but what about those that don’t? How can informal science institutions contribute to the reshaping of science education in school and afterschool settings so that it becomes more meaningful, relevant, and engaging for more people, particularly those who are underrepresented in the sciences?

A CAISE Inquiry Group is forming to develop a white paper, with recommendations for funders, that will explore how informal science institutions and schools can work together to transform how science is experienced and learned by children in the nation’s classrooms and afterschool programs. Help us shape this paper by joining us to identify the important questions, conflicts, and opportunities that need to be considered.

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**ISE Project Monitoring System: Individual Sessions**

**Gary Silverstein**  
*Westat*

**John Wells**  
*Westat*

Salon 1, Tables 2 & 3

Staff from Westat will be available to meet with individual ISE projects that (1) have questions about their submissions to the Project Monitoring System, (2) have questions about their project’s impacts and indicators, (3) would like to discuss their upcoming submissions, and/or (4) would like to provide feedback on the navigation and/or content of the online system.
Afternoon Plenary Session  
5:15–5:45 p.m.
Salon 1

Thoughts from Today and for Tomorrow

John Falk  
CAISE Co-PI, Oregon State University  
This is your opportunity to provide formative feedback in preparation for Day 2 of the ISE PI Summit 2008.

Free Time & Walk to the National Zoo 5:45–6:30 p.m.

BBQ Dinner at the National Zoo 6:30–9:00 p.m.  
Great Meadow at the National Zoo  
Cash bar; instruments welcome
SESSION for Saturday, July 26

National Zoo Grounds Open 6:00 a.m.
National Zoo
Wander the grounds of the National Zoo. Note: While the grounds open at 6 a.m., animal houses open at 10 a.m.

Continental Breakfast 8:00–9:00 a.m.
National Zoo Visitor Center

Morning Plenary Session 9:00–11:00 a.m.
National Zoo Visitor Center Auditorium

CAISE and Its Work
Ellen McCallie, CAISE Director

Discussing Framework for Evaluating Impacts of Informal Science Education Projects
David Ucko, Deputy Director, Division of Research on Learning in Formal and Informal Settings, NSF
Alan Friedman, CAISE Co-PI, Visitor Studies Association
Sue Allen, Exploratorium
Lynn Dierking, Oregon State University
Gary Silverstein, Westat
Al DeSena, Coordinator, Lifelong Learning Cluster, Division of Research on Learning in Formal and Informal Settings, NSF

Box Lunch 11:00 a.m.–12:30 p.m.
National Zoo Visitor Center
Optional: Setup for Project Showcase at Marriott.

Education at the National Zoo: A Walking Tour 11:15 a.m.–12:15 p.m.
Amy Miller
Education Manager, Friends of the National Zoo
Visitor Center
This tour is limited to 20 people.

Walk to Marriott 12:30–1:00 p.m.
Breakout #3 1:00–2:15 p.m.  
(Concurrent Sessions)

Discussing the *Framework for Evaluating Impacts of Informal Science Education Projects*

See signs at the registration table for topic locations.

Project Showcase & Refreshments 2:15–3:45 p.m.

See handout for projects and locations.

Breakout #4 3:45–5:00 p.m.  
(Concurrent Sessions)

There are three workshops and six discussion groups to choose from for Breakout #4.

*WORKSHOPS*

**Ethical and Practical Solutions for Evaluation Studies**

Josh Gutwill  
*Exploratorium*

Taft Room

With the line between research and evaluation blurring, more ISE projects are employing evaluation and must now meet formal requirements for protecting human subjects. What ethical and legal considerations do you need to take into account in order to evaluate the effectiveness of your work in informal science education? What steps should you take to deal with the federal government’s requirements? In this workshop, we will discuss a range of topics related to these requirements and how PIs can effectively address them.

By reviewing different evaluation scenarios, participants will consider the ethical tensions that commonly emerge in informal learning environments. For example, how can we adequately protect the privacy of visitors, participants, or viewers while still capturing the details of their interactions? How can we obtain informed consent to participate without disrupting the experience in the free-choice learning setting?

Participants will leave the workshop with an understanding of when and how to apply the federal guidelines for the protection of human subjects and how to work well with IRBs.
“Big Ideas” for ISE Projects

Beverly Serrell
Serrell and Associates
Balcony A

You are an informal science education professional, and you have a proposal or a grant for an NSF-supported project. That’s fine, but what’s your Big Idea?

The concept of a “Big Idea” is widely applicable to many informal science education programs. Similar to a thesis statement, a big idea clearly delineates the content and subject of the program you are offering. Stated as a sentence, it gives the subject momentum and direction. The benefits of having a Big Idea are many: Visitors, viewers, or participants in an ISE program enjoy clearer messages and better program organization, and ISE professionals share a clearly articulated vision for the program. One of the most important functions of a Big Idea is what it tells you to leave out.

The workshop will include a presentation of the background and current issues, discussion of a hand-out of Big Idea exemplars, and plenty of time for Q&A.

Working with the ISE Project Monitoring System

Gary Silverstein, Westat
John Wells, Westat
Balcony B

Staff from Westat will present preliminary findings from the pilot study of the ISE Project Monitoring System. During this session, they will also be discussing the challenges that projects encountered—most notably delineating measurable impacts and indicators for their projects. Finally, they will be soliciting feedback from projects about additional assistance and guidance that would enhance the capacity of projects to respond to individual items (or the overall system).

DISCUSSION GROUPS

Sustaining Access to ISE for People with Disabilities

Ellen Rubin
CAISE Inquiry Group Leader, Consultant

Christine Reich
CAISE Inquiry Group Leader, Museum of Science, Boston

Mary Ann Steiner
University of Pittsburgh
Salon 1, Table 1

A number of NSF-funded ISE projects have made efforts to increase access to ISE for people with disabilities. What are the features of successful projects, and what conditions make it likelier that these efforts will be sustained? Come connect with others working in this arena, share your experiences, and contribute to the work of a CAISE Inquiry Group on accessibility. The group will report findings and recommendations later this year.
Bringing New Visualization Technologies into ISE Institutions

Patrick Hamilton  
*Science Museum of Minnesota*

Taylor Room

Remote sensing devices (from seismometers to satellites) now collect gigantic streams of data that monitor the daily status of our planet. Communication/computer systems and networks translate these data into visual representations. Scientific visualizations are powerful tools for aiding researchers in increasing scientific understanding our world. How might these tools (e.g., Science on a Sphere™, Rain Table, Geowall, Corewall) be used to translate large datasets into ISE experiences that are compelling and meaningful to our audiences? Can the inherent digital nature of this technology reduce upfront production costs and shorten the time needed to produce new science content while also enabling wider and faster distribution? What roles might the ISE community play in ensuring that large datasets and scientific visualizations benefit large public audiences?

Knowing When and How to Scaffold Learning: A Dialogue about Teaching and Learning Using Digital Data

Judith Lombana  
*Museum of Science and Industry, Tampa*

Doris Ash  
*University of California Santa Cruz*

Truman Room

We ask one of the central questions in learning and teaching in informal settings: How can we help ISE educators to know how and when to scaffold social activity of groups and individuals during their activities in places like museums, gardens, zoos, and aquariums? This discussion group will explore the following questions using video and audio data gathered at the Museum of Science and Industry at the *Kids in Charge* exhibition.

1. Noticing family dynamics—how to “read” social activity
2. Knowing when to interact—how to understand when to interact based on a preliminary read
3. Knowing how to interact—how to know when it is appropriate to guide families to specific content or when to help them problem solve.

Taking ISE to the Next Level: What Happens After the Sound Bite?

Thomas Antonio  
*College of Santa Fe*

Salon 1, Table 2

After your grant is over and the excitement begins to diminish, how do you keep the science fresh and exciting for both the staff delivering the message and the public who receives it? What works? What doesn't? Come share both your successes and your challenges.
Assessing the Impacts of Online Professional Communities for Informal Science Education

Marti Louw  
CAISE Inquiry Group Leader, University of Pittsburgh

Kevin Crowley  
CAISE Co-PI, University of Pittsburgh

Tyler Room

Do online communities aimed at professional audiences have field-changing effects? In May, the University of Pittsburgh Center for Learning in Out-of School Environments (UPCLOSE) hosted a two-day CAISE Inquiry Group on the topic of assessing the impacts of online professional communities for informal science education. In this discussion group, we will share our findings and continue the conversation about the potential value and impact of online communities. What would you consider evidence of success for an online community and how we can measure it? What are the right units of analysis to consider when measuring the impacts of online communities—the individual, the group, or the field? Do the impact categories described in the new Framework for Evaluating Impacts of Informal Science Education Projects capture the collective efficacy, participatory, and social capital aspects of what online communities might offer?

Working with Your Program Officer

Valentine Kass  
Program Director, NSF

Salon 1, Table 4

Are you new to NSF ISE awards? Do you have questions about annual reports or working with your program officer? Drop by for informal conversation.

CLOSING PLENARY SESSION  5:00–5:30 P.M.

Salon 1

Increasing the Impacts and Communicating the Value of Informal Science Education

Wendy Pollock, CAISE PI, Association of Science-Technology Centers

Al DeSena, Coordinator, Lifelong Learning Cluster, Division of Research on Learning in Formal and Informal Settings, NSF
# PROJECTS

<table>
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<tr>
<th>Award #</th>
<th>Title</th>
<th>Project Representatives</th>
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<tbody>
<tr>
<td>9901978</td>
<td>Lives In Science</td>
<td>David Condon</td>
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<tr>
<td>9909405</td>
<td>“The Human Body” - A Large Format Film</td>
<td>Greg Andorfer</td>
</tr>
<tr>
<td>0000636</td>
<td>Parent Partners in School Science (PPSS)</td>
<td>Dale McCreedy</td>
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<tr>
<td>0103678</td>
<td>A Proposal to Support the Next Generation of Curriculum Materials in Science, Mathematics and Technology</td>
<td>Mary Koppal</td>
</tr>
<tr>
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<td>Outdoor Exploratorium: Experiments in Noticing and Understanding</td>
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<td>Flight of the Butterflies</td>
<td>JoAnna Baldwin-Mallory</td>
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<td>Ellen Horne</td>
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<td>Project WISE: Working in Informal Science Education</td>
<td>Gregory DiLisi</td>
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<td>Roadside Heritage: Informal Science Education in the Eastern Sierra Nevada Byways</td>
<td>Paula Williams</td>
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<td>Cyberchase Season 6: Get Active With Math!</td>
<td>Frances Nankin</td>
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<td>The Black Hole Experiment Gallery: Testing the theories of gravity and of free-choice learning</td>
<td>Roy Gould</td>
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<td>Citizen Science Laboratory at Hacienda La Esperanza Reserve</td>
<td>Lee Ann Rodriguez Luisa Rosado</td>
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<td>Eileen Smith</td>
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<td>Informal Science Education Resource Center (ISERC)</td>
<td>Wendy Pollock John Falk Kevin Crowley Alan Friedman</td>
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<tr>
<td>Award #</td>
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<td>PPE (Preschoolers, Parents, and Educators: Strategies to Support Early Science Literacy)</td>
<td>Gail Ringel</td>
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<td>Dennis Schatz</td>
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<td>Tom Keller</td>
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<td>Richard Hudson</td>
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<td>Walter Wolfram</td>
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<td>Marlene Kliman, Martha Merson</td>
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<td>Nancy Maryboy</td>
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<td>Jim Metzner</td>
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<td>David Condon</td>
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<td>Ari Epstein</td>
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<td>Dale McCreedy</td>
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<td>Leonisa Ardizzone, Kathryn Slocum</td>
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<td>Using Informal Explorations of Living Phenomena to Enhance Science Learning</td>
<td>Bernard Zubrowski</td>
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<td>A Participatory Model for Integrating Cognitive Research into Exhibits for Children</td>
<td>Marta Biarnes</td>
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<td>Michelle Hall, Michael Mayhew</td>
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<td>“Indonesian Origins: Genes, Languages and Culture” video programs</td>
<td>A. Ashley Stinnett</td>
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<td>Carl Batt</td>
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<td>Finding NEO: asteroids, lightcurves, and amateur astronomers</td>
<td>James Harold</td>
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<td>Holly Walter Kerby</td>
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<td>Richard Nelson</td>
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<td>IPY: Ice Planet Earth</td>
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<td>Geoffrey Haines-Stiles</td>
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<td>Christopher Neill</td>
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<td>Ice Stories: A Public Educational Resource for IPY</td>
<td>Mary Miller</td>
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<td>Moving Mountains: An education-outreach video for the Geosciences</td>
<td>Vivian Trakinski</td>
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<td>Conference on Museums and New Family Audiences—Building Relationships</td>
<td>Minda Borun</td>
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<td>Walter Staveloz</td>
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<td>Interactions in Understanding the Universe (I2U2)</td>
<td>Mark SubbaRao</td>
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<td>Making Natural Connections: An Authentic Field Research Collaboration</td>
<td>Susan Flowers</td>
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<td>The City as Learning Lab: Spreading Technological Fluency Through Creative Robotics</td>
<td>Kevin Crowley, Marti Louw</td>
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Founded in 2007 with support from the National Science Foundation (NSF), CAISE is devoted to advancing and improving informal science education (ISE) in its many and varied forms—among them film and broadcast media, science centers and museums, zoos and aquariums, botanical gardens and nature centers, digital media and gaming, science writing, and youth, community, and after-school programs. CAISE studies issues and trends in informal science education, documents the impact and value of ISE, offers professional development opportunities for those working with and seeking NSF support, and provides a collective voice for the field.

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