

Joining forces for public engagement



Science museums and other educational institutions can provide an effective means of sharing the story of science with the public.

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Here's a voicemail message I was happy to receive not long ago:

"Hi Carol Lynn. My name is Professor X. We're about to submit a very large grant proposal based around nano research, and it would be great if we could establish some links with the Museum of Science. If you can give me a call..."

The US National Science Foundation (NSF) requires investigators to include in their research proposals plans for addressing the 'broader impacts' of research. This may include efforts to better integrate research with state and local initiatives, with undergraduate and K-12 teaching, and with outreach to the broader community to enhance science literacy, increase public understanding of research, and encourage young people to consider careers in science and engineering.

One of the routes the NSF suggests for pursuing community outreach is through partnerships with science museums and other 'informal science education' institutions (ISEIs). These organizations specialize in developing programs and exhibits that attract and engage public and school audiences in learning about ourselves, our world, and the science and technology we use to shape that world, emphasizing the potential for discovery, innovation, problem-solving, and societal impact.

One way of conceptualizing partnerships between research centers and ISEIs is to think of the research center as providing the *story content* and the ISEI as providing the *story-telling experience*. Or, because ISEI so often features 'constructivist', hands-on approaches, one might think of the research centers as providing *knowledge and resources* and ISEIs as providing *immersive experience and practice*. Another key element the ISEI brings to the partnership is audience. The Association of Science-Technology

Centers reports that over 70 million people visited its member institutions in 2006 alone. Science museums are open, welcoming, public places. Even a simple research talk for a public audience is likely to reach many more people in a science museum than in a campus lecture hall.

The Materials Research Society recognized the outreach potential of science museums when it partnered with the Ontario Science Centre to produce the traveling exhibit *Strange Matter*. Over 1.8 million people have visited this exhibit in 25 science museums across the US, Canada, and Puerto Rico. Collateral student-teacher materials and a website extend its impact, while the MRS has also mobilized its extensive network of volunteers to provide face-to-face encounters between researchers and visitors at every science museum site.

When Cornell researchers applied for NSF funding for a nanobiotechnology center, they included a plan to address broader impacts through developing a traveling exhibit on nanoscale science in collaboration with the Ithaca Sciencenter. The resulting exhibit, *It's a Nanoworld*, proved engaging enough to land a berth at the Epcot Center, ensuring a continuing flow of family audiences into the realm of the very small, as well as NSF funding for a second exhibit, *Too Small To See*.

But research-ISE partnerships can do more than focus on single educational products for widescale distribution. The Museum of Science in Boston has pioneered an alternative type of community-based outreach partnership, producing an ongoing series of constantly evolving programs, workshops, forums, and media geared toward family, adult, and professional audiences. Two nanoscale science and engineering research centers (one based at Harvard and the other at Northeastern and the University of Massachusetts-Lowell) included the museum in

planning their NSF research proposals, and funded full-time museum staff and resources.

These two partnerships have had a tremendous impact, engaging the citizens of our community and elsewhere in nanoscale research, its applications, and implications. Over the past six years, more than 40 000 people attended over 1000 staff presentations and guest researcher events; about 28 000 adults viewed each of the more than 50 nano *SciTech Today* cable TV segments; 5000-7000 people downloaded some 30 nano podcasts; and 260 teachers attended the museum's yearly Nanotech Symposium for Educators.

Now that the NSF has directly funded a coalition of science museums and research centers, led by the Museum of Science, to build a Nanoscale Informal Science Education Network (NISE Net, www.nisenet.org) sharing tools, knowledge, and professional capacity, one of NISE Net's chief aims is to foster the development of additional community-based, research center/ISE partnerships, to sustain public engagement on a regional basis. These partnerships require careful planning and budgeting well in advance of submitting research proposals. So, when Professor X called me back the Monday following his Friday call and left another voicemail...

"I was just hoping to get in touch with you today regarding this grant proposal we're putting together and submitting by the end of the day..."

...my heart sank. I vowed to work to get the message out to my colleagues in research:

"Yes! We in the science museum world wish to work with you, to cultivate a culture of partnership and join our respective talents and resources to engage our communities in science and engineering. But *please* call us early in the proposal development process!"