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American Academy of Mechanics
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CONFERENCE ANNOUNCEMENT

FIRST AMERICAN ACADEMY OF MECHANICS CONFERENCE

On June 17-20, 2008 the Inaugural Conference of the American Academy of Mechanics will be hosted in New Orleans, Louisiana. Following this conference this event will be hosted in the USA every four years to coincide with the ICTAM conference. This meeting will help the mechanics communities with applications in solids, fluids, bio, etc. to interact and set new challenging concepts and refinements in the existing areas of Mechanics.

This conference will be on all topics addressing mechanics of fluids, solids, biomechanics, macro-, micro- and nano-mechanics, etc. This addresses both Characterization and Assessment of Systems and will cover a broad spectrum of topics in solid and structural mechanics, materials, and fluid mechanics.

Important Deadlines

Submission of Abstracts.....Dec 1, 2007
Acceptance of Abstracts.....Jan 1, 2007
Submission of Papers.....Jan15, 2007(Optional)
Reviews sent to Authors.....Feb 15, 2008
Final Acceptance of Papers.....March 15, 2008

A list of proposed minisymposium topics and more details about the conference may be found at <http://firstaam2008.lsu.edu> . Questions may be addressed to Dr. George Z. Voyiadjis:

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SELECTION OF THE EDITOR

The following is an excerpt from “Bringing Nano to the Public: A Collaboration Opportunity for Researchers and Museums,” edited by Susan E. Koch. The full text is available on the Internet at <http://www.mrsec.wisc.edu/Edetc/reprints/guidebook2006.pdf> .

Bringing Nano to the Public through Informal Science Education

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ABSTRACT

Researchers in nanoscale science and engineering communicate all the time. We give talks, present lectures and write papers regularly. But the general public—the consumers who will use the products of our work and the voters who indirectly set the national research agenda—do not often hear us. Informal science education—including museums, TV, public lectures, popular press, etc.—is a way to connect with broader audiences in a variety of fun and effective ways. Museums, which are visited by hundreds of millions of people each year in the U.S., are popular because they are skilled at making abstract and complex phenomena comprehensible to people from all walks of life, and making the whole experience fun. This talk will provide an introduction to what museums call the “informal science education” field, describe how researchers can get involved with museums to present nano to the public, and provide background about how museums work. It will also review what the public currently understands about nanoscale science and engineering and the challenges that these (mis)understandings create for museums and researchers

INTRODUCTION

This talk is based on a bookletⁱ that invites scientists and engineers who work in nanoscale science and engineering to collaborate with museums to present nanoscience and technology to the general public. It is written by a researcher for other researchers, and it's designed as an introduction to what museums call the “informal science education” field. This field includes the presentation of science in museums, community centers, the media, and other places where people come to learn something *and* have fun. This booklet describes how researchers can get involved with museums to present nano to the public, and provides background about how museums work. It also reviews what the public currently understands about nano and the challenges that these (mis)understandings create for museums and researchers. The Nanoscale Informal Science Education (NISE) Network hopes that it will motivate you to consider collaborating with your local museum(s) to help engage the public in nanoscale science, engineering, and technology. The bookletⁱⁱ is available in PDF format at: <http://www.mrsec.wisc.edu/Edetc/reprints/guidebook2006.pdf>

WHY SHOULD RESEARCHERS CARE ABOUT INFORMAL SCIENCE EDUCATION?

Researchers communicate all the time. We give talks, present lectures and write papers regularly. But the audiences we speak with generally consist of our peers or students who are experienced learners in our research areas. The general public—the consumers who will use the products of our work and the voters who indirectly set the national research agenda—do not hear us. Earth scientist Chris Paola from the University of Minnesota notes that “At present, the great majority of scientific researchers interact with the public on only a limited basis, if at all. In the long run, this situation is not good for either the research community or the public that funds it.”ⁱⁱⁱ

Informal science education—including museums, TV, public lectures, popular press, etc.—is a way to connect with broader audiences in a variety of fun and effective ways. More than 286 million people visit museums each year in the US.^{iv} Museums have a long tradition of credible public service in the area of informal education in the arts, humanities, and sciences, and they have credibility with scientists and engineers, as well.^v

Museums are popular because they are skilled at making abstract and complex phenomena comprehensible to people from all walks of life, and making the whole experience fun. Museums are creative spaces, trusted by the public, and they can provide a bridge between the research lab and everyday life.

WHAT ARE THE BENEFITS OF PARTNERING WITH MUSEUMS?

Perhaps the most important reason for getting involved in informal science education is that having an informed public is a good thing. We need scientifically literate people with a basic vocabulary of terms and a general understanding of the process of scientific inquiry, or as Jon Miller, Director of the Center for Biomedical Communications at Northwestern University, states, “a level of understanding [...] sufficient to read and comprehend the Tuesday science section of *The New York Times*.”^{vi} Unfortunately, only about 17% of US adults can be classified as scientifically literate today, but the good news is that this figure has been climbing over the last two decades.^{vii}

One benefit of a more scientifically literate public is increased support for funding of research. A substantial majority of Americans support government spending for scientific research, including basic scientific research.^{viii} The better our research and its implications for society are understood, the better the general public can make responsible decisions about public funding.

Another motivating factor is to encourage the next generation of scientists. We need children to consider and pursue careers in science and engineering. The best way to maintain their interest during their formative years is for them to have multiple, positive interactions with science. Museums provide an indispensable way for kids to have fun, memorable science experiences that may ultimately attract them to careers in science.

This isn't all altruism; doing outreach in informal settings can also provide a number of personal benefits to researchers. When kids get excited about the work that we do, we share in that excitement and become energized by it. Creating effective ways to talk to general audiences about science and engineering concepts helps us to develop better explanations, demonstrations and visuals that can also be used in the undergraduate and graduate classrooms. Informal science education experiences can even have unanticipated positive effects on research because of the questions posed by novice audiences and the connections made with others in related fields. Finally, outreach can provide connections with informal science education colleagues and open up avenues for collaboration that will address broader impacts requirements for proposals to the National Science Foundation and other agencies.

OK, BUT DO MUSEUMS EVEN CARE ABOUT NANOSCALE SCIENCE AND ENGINEERING?

Nanoscale science is a perfect subject to bring to the public. We are currently in the early stages of public awareness, and the term is new and has few negative connotations. You might hear a middle-school student mutter “I hate chemistry,” but they are not saying “I hate nanotechnology.” Yet. This gives us an opportunity to inform and educate while people’s minds are still open. However, we cannot treat the public as naïve and only present the hype and provide positive spin to our work. “A strong belief in the benefits of science and technology does not mean that individuals have no reservations about the impact of science and technology.”^{ix} Thus, it is important to present a balanced picture of potential benefits and risks.

Museums are interested in bringing nanoscale science to the public because they are aware of its wide-ranging implications both within scientific disciplines and in the larger society as a whole. One of museums’ main purposes is to offer experiences and products that interest and engage the public, and presenting current science and technology topics is one way to do this.

Nanotechnology is a particularly challenging topic for museums because the science is very complex and museums sometimes don’t have content experts on their staff. To help visitors engage with nanoscale phenomena, we need sustained relationships bringing informal science education institutions together with universities, research centers, scientific societies and individual researchers.

THE NISE NETWORK: RESEARCHERS AND MUSEUMS WORKING TOGETHER

These needs prompted the National Science Foundation to call for proposals that “...intended to foster public awareness, engagement, and understanding of nanoscale science, engineering, and technology through establishment of a Network, a national infrastructure that links science museums and other informal science education organizations with nanoscale science and engineering research organizations.”^x Funding was granted to the network plan developed by the Museum of Science (Boston, MA), the Science Museum of Minnesota (St. Paul, MN) and the Exploratorium (San Francisco, CA). The Nanoscale Informal Science Education (NISE) Network, established in 2005, brings the education and research communities together to create new ways to communicate the work of nanoscale scientists and engineers, inform the public about advances in the scientific research, and capture the imagination of youth who may choose careers in nanoscale science and engineering. There are three major project deliverables:

- A set of interactive exhibits and programs that effectively communicate and engage the public with nanoscale science and engineering;
- Essential new knowledge about design for learning in these subject areas; and
- A sustainable network of new relationships, alliances and professional development.

There are over 500 museums, science centers, zoos, aquariums, nature centers and other similar institutions in the US.^{xi} You can connect with a museum near you by:

- Visiting the Association of Science-Technology Centers’ website and using their “Find a Science Center” search tool at http://www.astc.org/sciencecenters/find_scicenter.htm to locate a museum near you.
- You can also hook up with a museum through the NISE Network. To connect with the network send an email to nisenet@mos.org or phone 617-589-4411. The NISE Network website is located at www.nisenet.org.
- If you are a member of the Materials Research Society, you can also Connecting with the NISE Network as an advisor through the Materials Research Society website at: http://www.mrs.org/nise_survey.

When you contact museums, you will usually be connected with the museum’s Volunteer Coordinator (if the museum is medium or large), or directly with Exhibits or Program staff (if the museum does not have specialized staff for coordinating volunteers). You will be asked about your science and

education background, the kinds of help you would like to provide, and the amount of time you have to contribute. With that information, the museum will determine where your skills could be best used. Because some museums do not have specialized staff to work with volunteers, it can sometimes take some time to make connections with just the right people. If you are having trouble with this, working through the MRS or the NISE Network can help you connect more directly to the appropriate museum staff.

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ⁱ W.C. Crone, "Bringing Nano to the Public: A Collaboration Opportunity for Researchers and Museums," Susan E. Koch, Editor, Nanoscale Informal Science Education Network, Science Museum of Minnesota, St. Paul, MN, 2006. Available at <http://www.mrsec.wisc.edu/Edetc/reprints/guidebook2006.pdf>

ⁱⁱ Ibid.

ⁱⁱⁱ Chris Paola: Improving public understanding of scientific research: a view from the research side, p. 145-152. In *Creating connections: museums and the public understanding of current research*, David Chittenden, Graham Farmelo, and Bruce Lewenstein, Editors (AltaMira Press, Walnut Creek, CA, 2004), p. 145.

^{iv} ASTC: *Sourcebook of Science Center Statistics* (Association of Science-Technology Centers, Washington, D.C., 2004)

^v Albert A. Einsiedel Jr., Edna F. Einsiedel: Museums as Agora: diversifying approaches to engaging publics in research, p. 73-86. In *Creating connections: museums and the public understanding of current research*, David Chittenden, Graham Farmelo, and Bruce Lewenstein, Editors (AltaMira Press, Walnut Creek, CA, 2004), p. 80.

^{vi} J.D. Miller: Public understanding of, and attitudes toward, scientific research: what we know and what we need to know, *Public Understanding of Science*, 13, 273-294 (2004), p. 274.

^{vii} Ibid.

^{viii} Ibid., p.286.

^{ix} Ibid.

^x National Science Foundation: *Nanoscale Science and Engineering Education Program Solicitation 05-543* (National Science Foundation, Arlington, VA, 2005)

^{xi} ASTC: *Sourcebook of Science Center Statistics* (Association of Science-Technology Centers, Washington, D.C., 2004)