Partnerships to reach new audiences with NISE Net mini-grants

NISE network
NANOSCALE INFORMAL SCIENCE EDUCATION

NSF

www.nisenet.org

Description of brown bag

Creating meaningful partnerships can be a challenging endeavor. Join us in a conversation as we explore what some institutions have done with mini-grant awards in developing partnerships to reach new audiences in nano education. Participants will be have opportunities to share lessons learned from partnerships of their own and how they've met challenges head on.

Year 8 NISE Network Teams

Network Community

Community

RISE

Website

Public Engagement

NanoDays

Programs

Exhibits

Building Capacity

Online Brown-Bags

Team-Based Inquiry Professional Development

Inclusive Audiences

Universal Design Workshop

Bilingual Workshop

Knowledge for the Field

Evaluation

Research

Network Leadership

NEG NOG

Administration

Project Coordination

Inclusive Audiences

To increase professional and institutional capacity to effectively engage underserved and underrepresented audiences in nano topics.

Inclusive Audience Goals

Strategies

- Help define target public audiences
- Serve as a resource and audience advocate
- Identify, create, and share resources, tools, and guides
- Provide diversity and audience engagement PD opportunities
- Share successful efforts to reach underserved audiences
- Foster partnerships with other ISE's & CBO's

Opportunity for Reaching Diverse Audiences

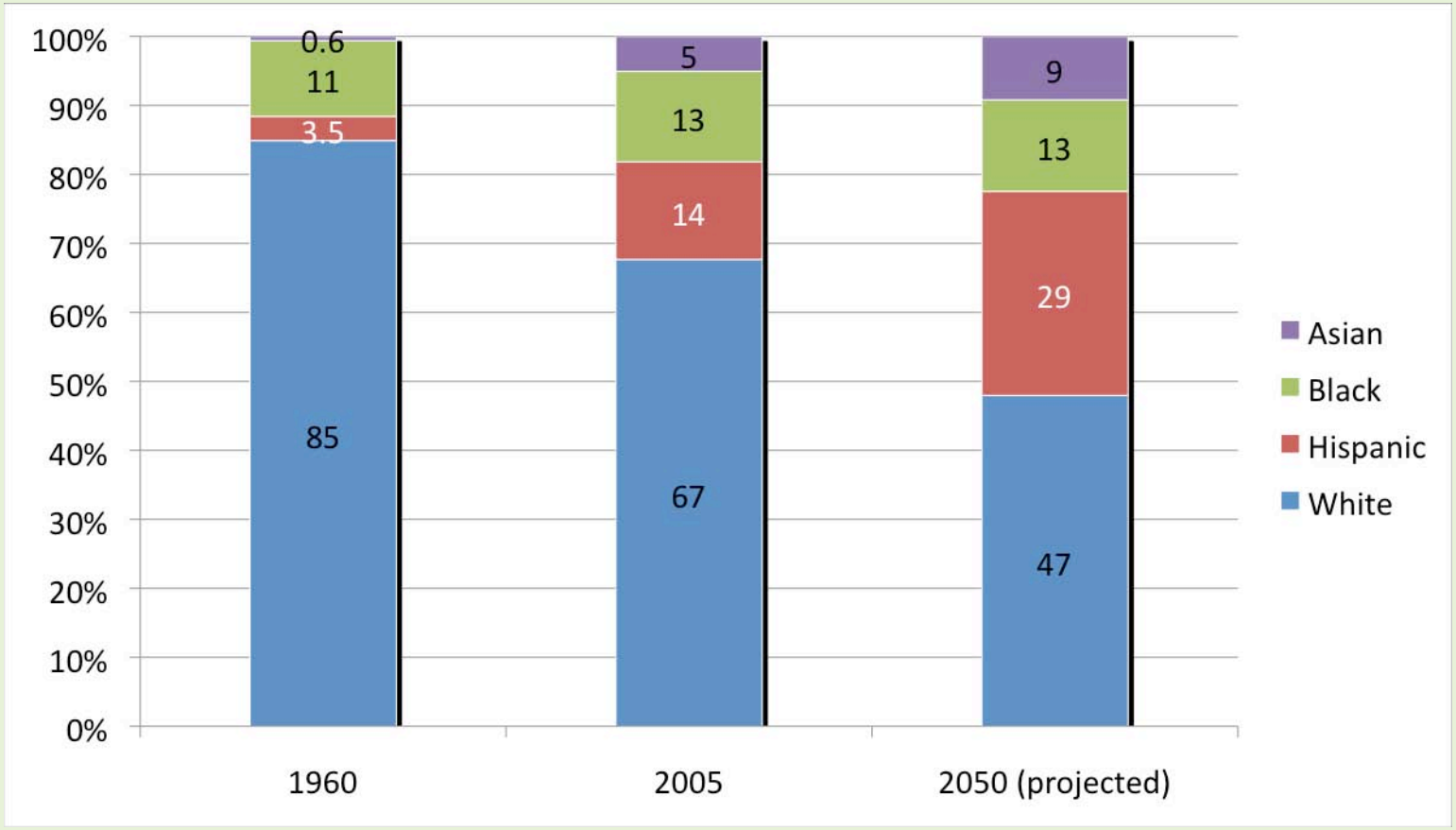
Why use an Inclusive Audiences approach?

- ISE's are uniquely situated to educate the public, inspire youth, and provide access to learning experiences.
- Inclusive approaches help reach all audiences more effectively.
- NISE Net seeks to address the information gap and inspire future STEM leaders.
- It allows us to go beyond education and inspiration to **equity**, empowerment and social justice.

Why Partner to Reach Underserved Communities?

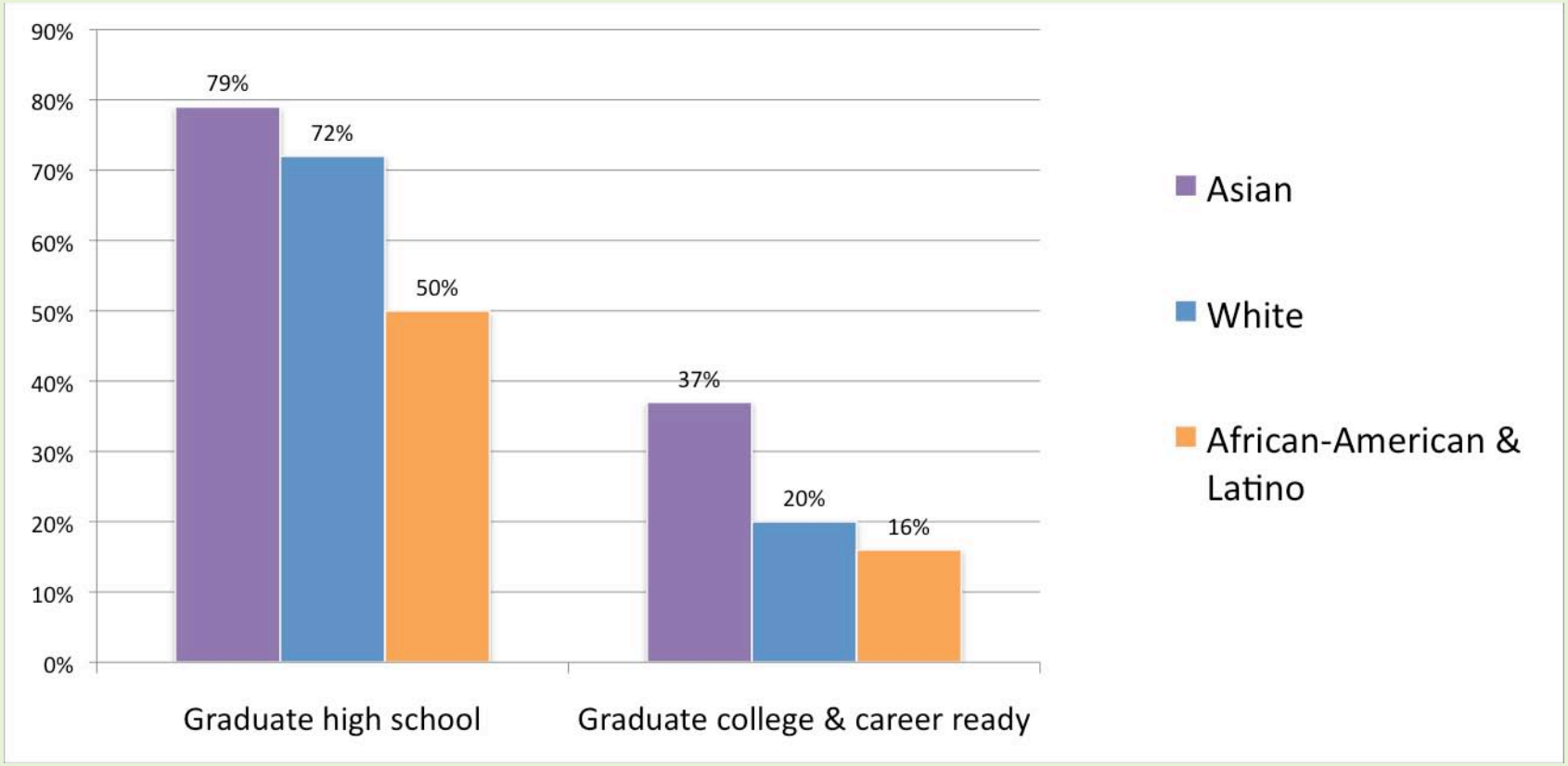
- Leverages partners' existing, trusted relationships.
- Partner organizations can serve as cultural brokers.
- Increases impact and perceived value of ISEs in the community.
- Leads to new opportunities for funding/revenue.

Changing Demographics in U.S.



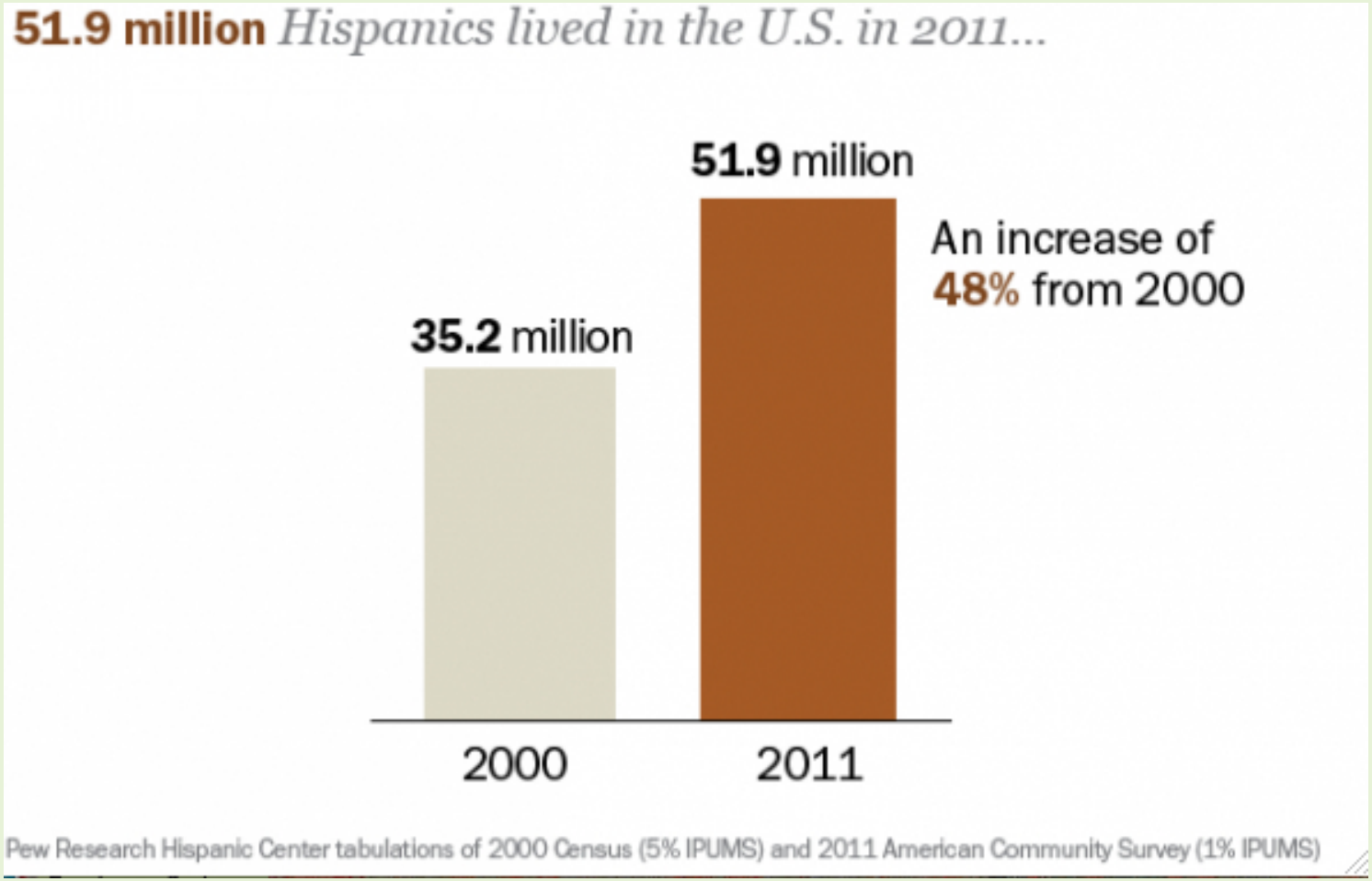
Source: Pew Research Center, US Population Projections, 2008

Workforce Readiness



Source: Greene & Forster, "Public High School Graduation & College Readiness Rates in the US, Manhattan Institute for Policy Research,

Growing Hispanic Population in U.S



Changing Demographics in Museums

Changing composition of America (U.S. Census Bureau/Reach Advisors).

Source: Museums and Society 2034, Center for the Future of Museums, AAM

Demographic Resources

- US Census Bureau
  http://www.census.gov/main/www/access.html
- Pew Research Center
  http://pewresearch.org
- Pew Research Hispanic Center
  http://www.pewhispanic.org/
- Center for the Future of Museums

http://www.aam-us.org/resources/center-for-the-future-of-museums

- Local United Ways, School District Planning and Evaluation (school population data)

Partnerships for Equity Resources

Process Evaluation of the Diversity, Equity, and Access Working Group's Partnership Pilot Project :
http://www.nisenet.org/catalog/tools_guides/process_evaluation_diversity_equity_access_working_groups_partnership_pilot_pro

Collaboration: Critical Criteria for Success:
http://astc.org/pubs/browse_publications.htm

Equity of Effort:

Serving Underserved Audiences

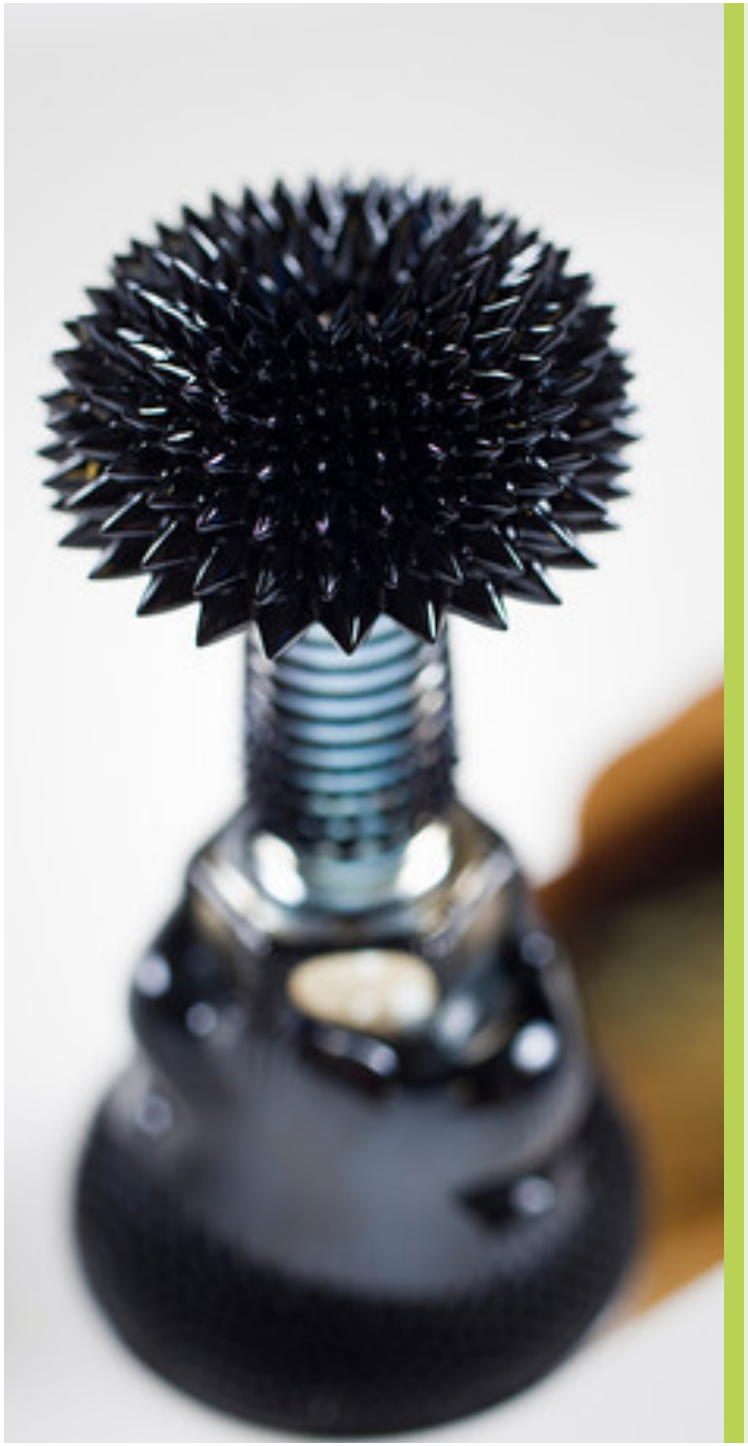
Our work is a journey…

Exploring Terms

Share Out Activity:

Using the chat box, take some time to define the following terms.

Equality/Equity

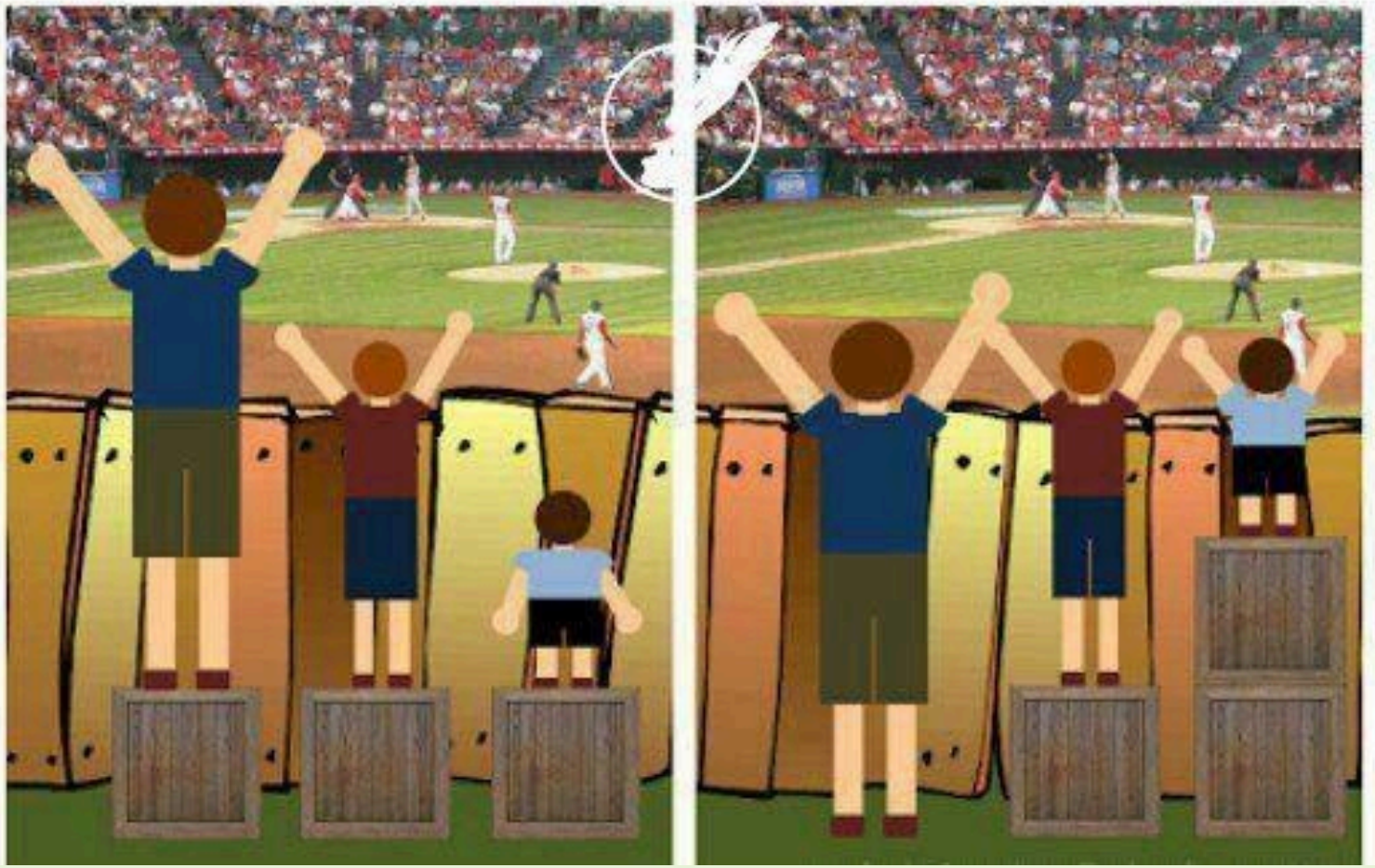


A Question of Equity

- Acting Equitably implies taking actions
  - that differentiate needs and
  - that apply policies and practices according to the different needs of groups
- Equity of Effort to reach underserved audiences

Equality

Equity



Exploring Strategies: Partnership Case Studies

Nano Kits for Montana Teachers

A 2012 NISENet mini-grant

Nano Kits for Montana teachers

Goal: Reach out to underserved and under-represented audiences who are unable to travel to the MSU campus for NanoDays in an in-depth and meaningful way.

- **10 kits (9 schools, 1 "home" kit) designed for middle school**
- **Kits included four activities, supplies for a class of 30 and nano background materials**

Tiny Tea Cups

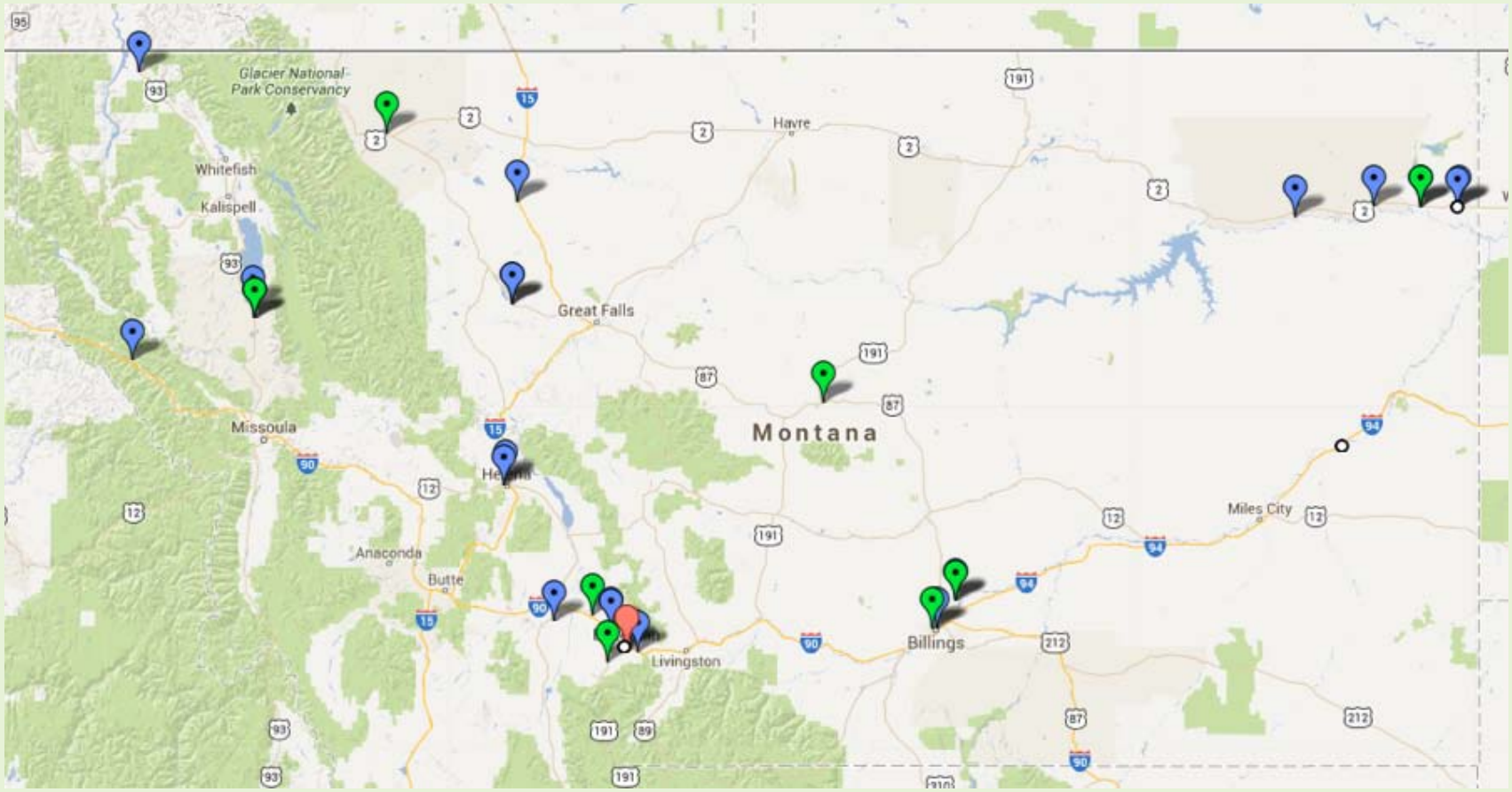
Scented Balloons

NanoSand

Thin Films

Challenges

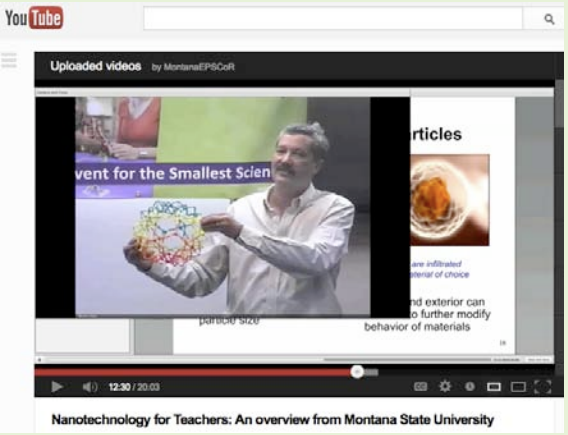
- Many rural and tribal communities are very far from campus
- These communities have little interaction with scientists and student role models
- Teachers and students have little if any background in nano



Overcoming challenges

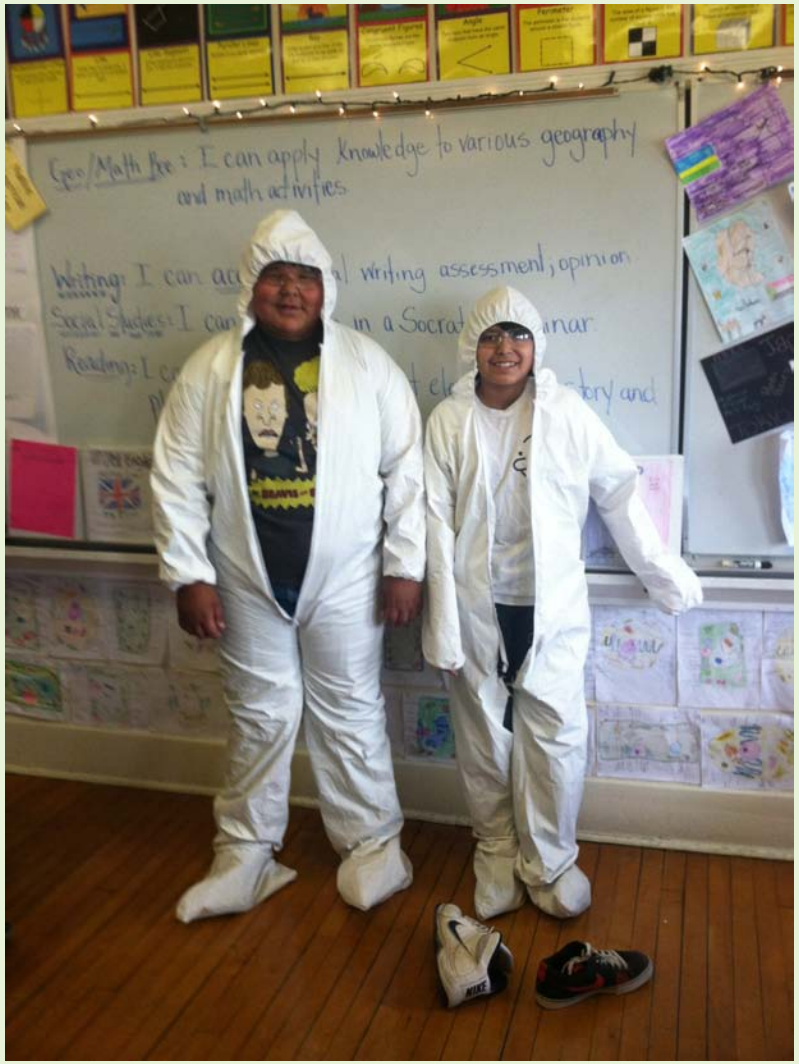
- Chose schools based on geographic, demographic and economic need
- Chose teachers we had worked with previously
- Used distance learning technologies and in-person visits

Demo of four activities by middle school teacher

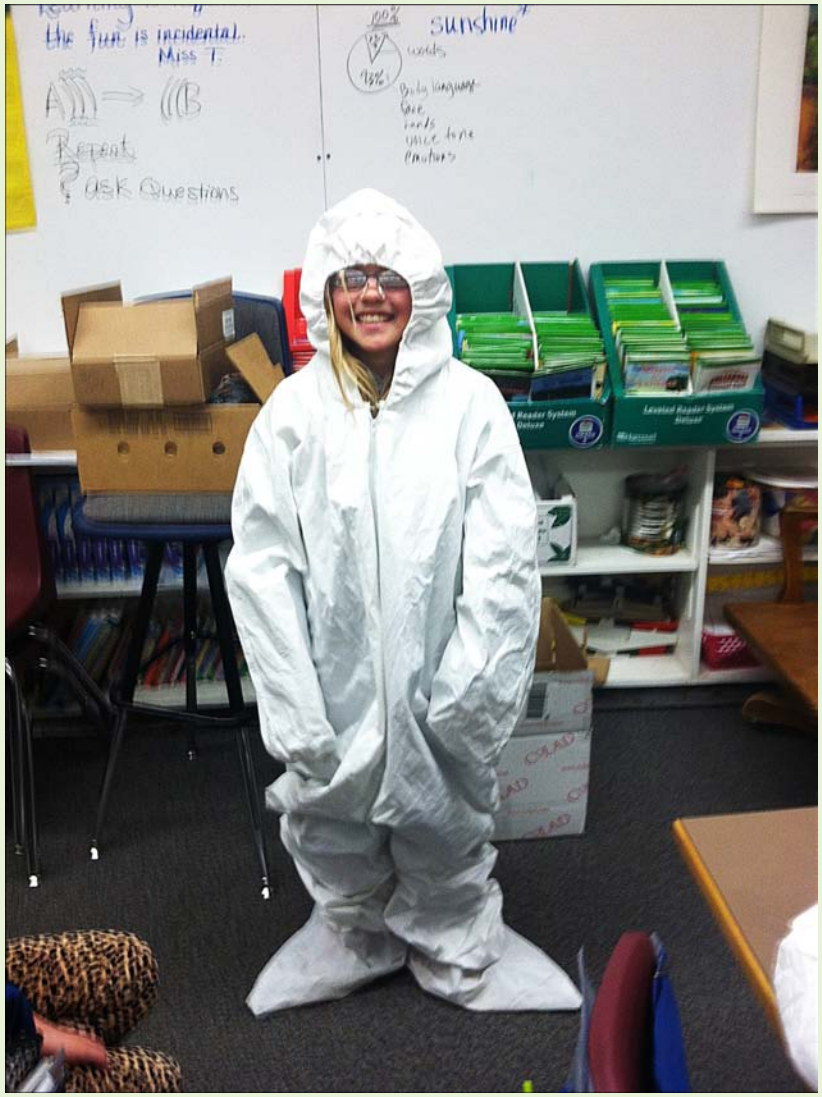


Overview of Nano by MSU physics professor

Intern visited 2 schools and 1 camp


Geo/Math Res: I can apply knowledge to various geography and math activities
Writing: I can
writing assessment, opinion
Social Studies: I can
in a Socrat
inar
Reading: I c
tory and


NanoDays
Exploring Materials—Hydrogel
Try this!
What's going on?
How is this nano?


The fun is incidental.
Miss T.
Retest
Ask Questions
Sunshine
words

Evaluation:

- Average of 87 students and 7 adults used each kit
- Used for 2 to 5 hours of class time
- All responding teachers said they would use the kits in future years and would recommend the program to other teachers.

Findings and tips:

- Time was the biggest constraint
- Time of year matters for teachers' schedules, but there is not a consistent time of year that works for all
- Elementary schedule is more flexible than middle school
- Consider choosing activities that all take the same amount of time in case teachers set them up as stations
- Consider adding additional items so teachers can set up multiple stations

For more information, contact

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taylor@montana.edu

http://youtu.be/gXxIdrkok98

http://youtu.be/trQBZvL5kJc

Or find both videos at Youtube.com/MontanaEPSCoR

Partnerships to Reach New Audiences with NISE Net Mini Grants

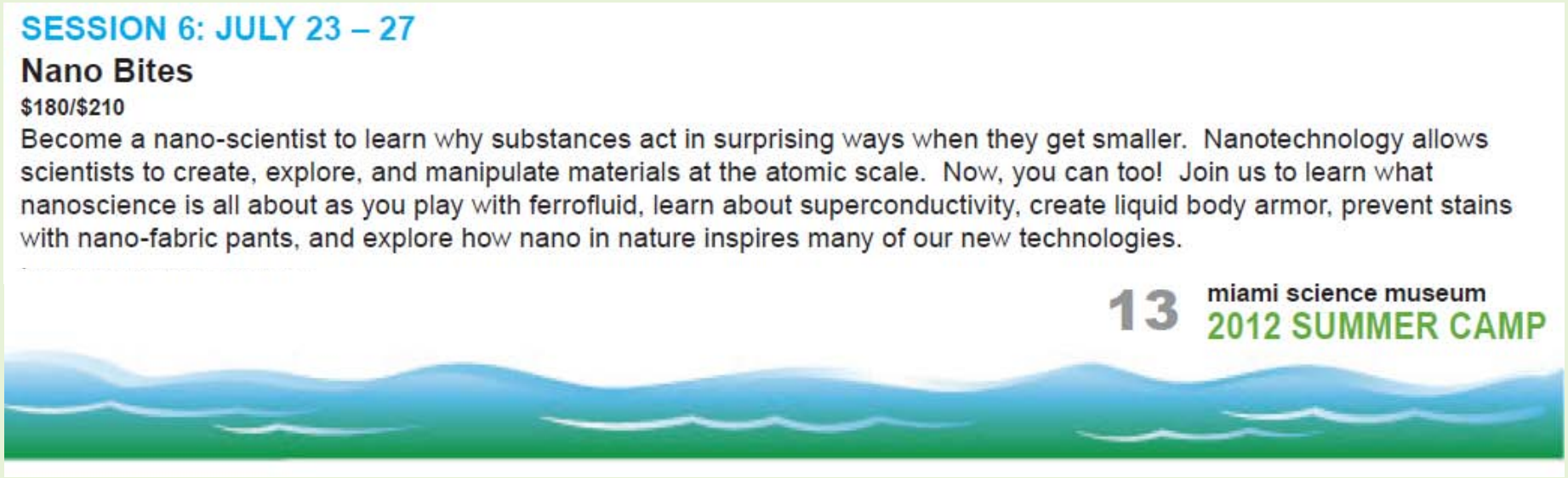
NANO BITES

Karlisa Callwood
Public Programs Manager
Miami Science Museum
July 2, 2013

Objective of Mini Grant

- Develop and deliver a nanoscience themed class during our 2012 summer camp
- Introduce nanoscience and technology education to camp participants, including underserved youth

Description of Class



SESSION 6: JULY 23 – 27

Nano Bites

$180/$210

Become a nano-scientist to learn why substances act in surprising ways when they get smaller. Nanotechnology allows scientists to create, explore, and manipulate materials at the atomic scale. Now, you can too! Join us to learn what nanoscience is all about as you play with ferrofluid, learn about superconductivity, create liquid body armor, prevent stains with nano-fabric pants, and explore how nano in nature inspires many of our new technologies.

13 miami science museum
2012 SUMMER CAMP

- Components
  - Hands-on activities and experiments
  - Nano Exhibits
  - Activities from Nano Days kits
  - Nano Theater Shows

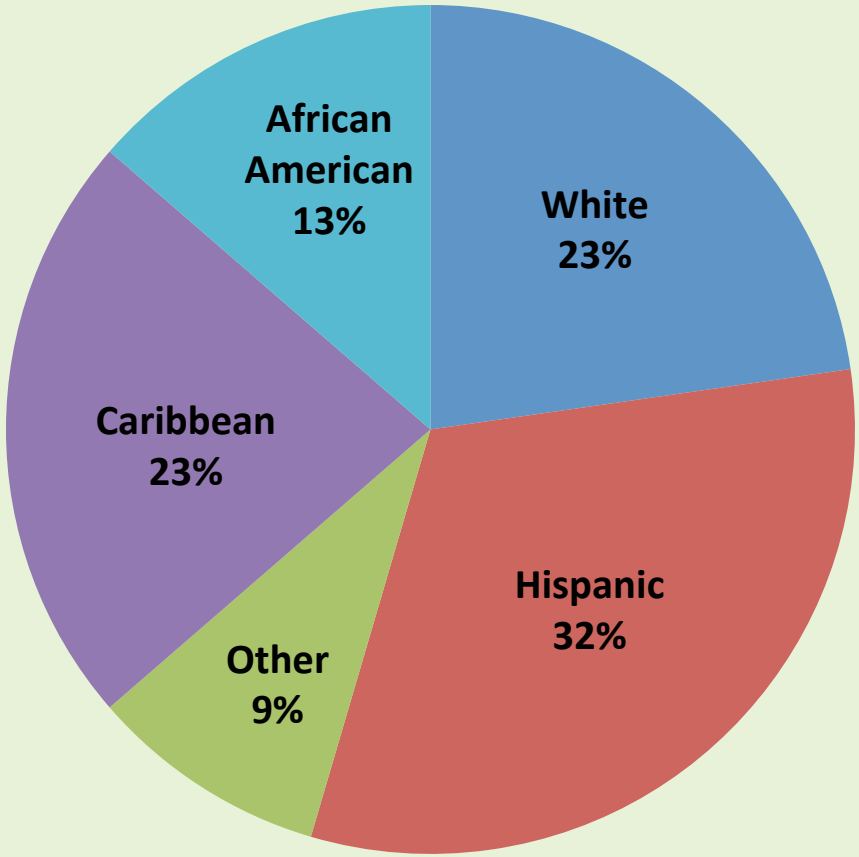
- Culminating Activity: Develop own hands-on nano-themed demo, skit, or presentation; some in additional languages

Department of Cultural Affairs

- Cultural Affairs offers funding to provide Summer Arts and Science Scholarships to underserved youth (SAS-C)
- To reach additional new audiences, we paired Nano Bites summer offering with the Scholarship
- Allowed us to reach students who were economically and geographically disadvantage, as well as some with disabilities.

Description of Participants

- 6^{th}-8^{th} grade: 20 student
- 4^{th}-5^{th} grade: 15 students



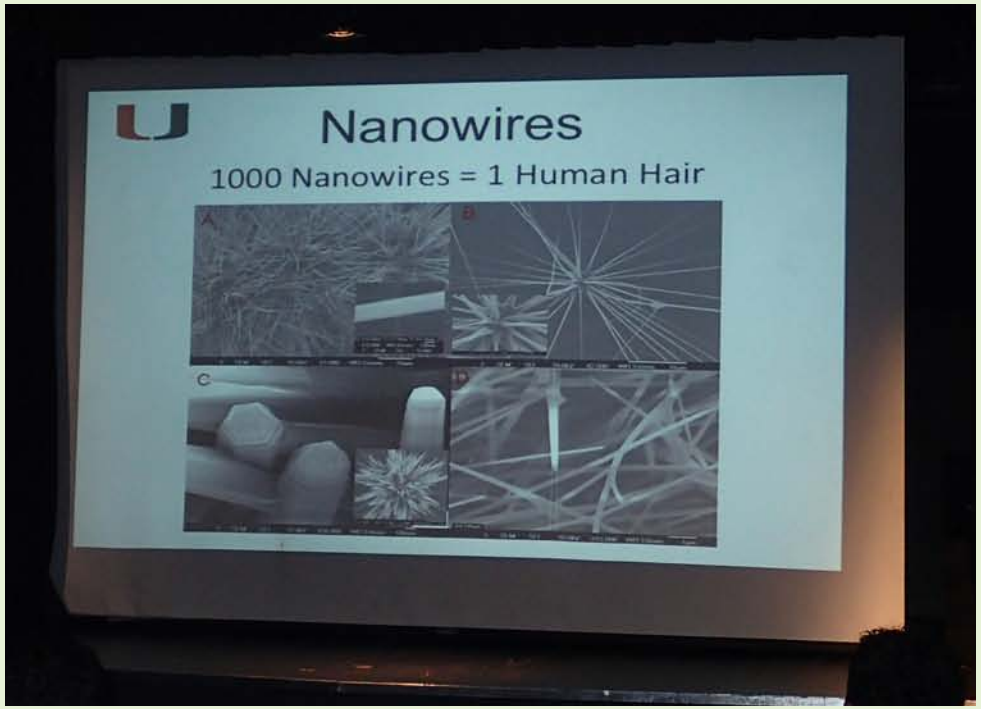
FIU Motorola Nanofabrication Laboratory

- Students in Material Advantage Club showcased research to students.

- Support throughout the year
  - Nano Days – 2011, 2012, 2013
  - National Chemistry Week 2012 (Nano Theme)

Dr. John T. McDonald Biomedical Nanotechnology Institute

- New Partnership
- Provided students, professors, and researchers for Nano Days 2013



Max Planck Foundation – Photo Exhibition

- Showcased a collection of 40 photos taken on the micro- and nano- scale by scientists from around the world

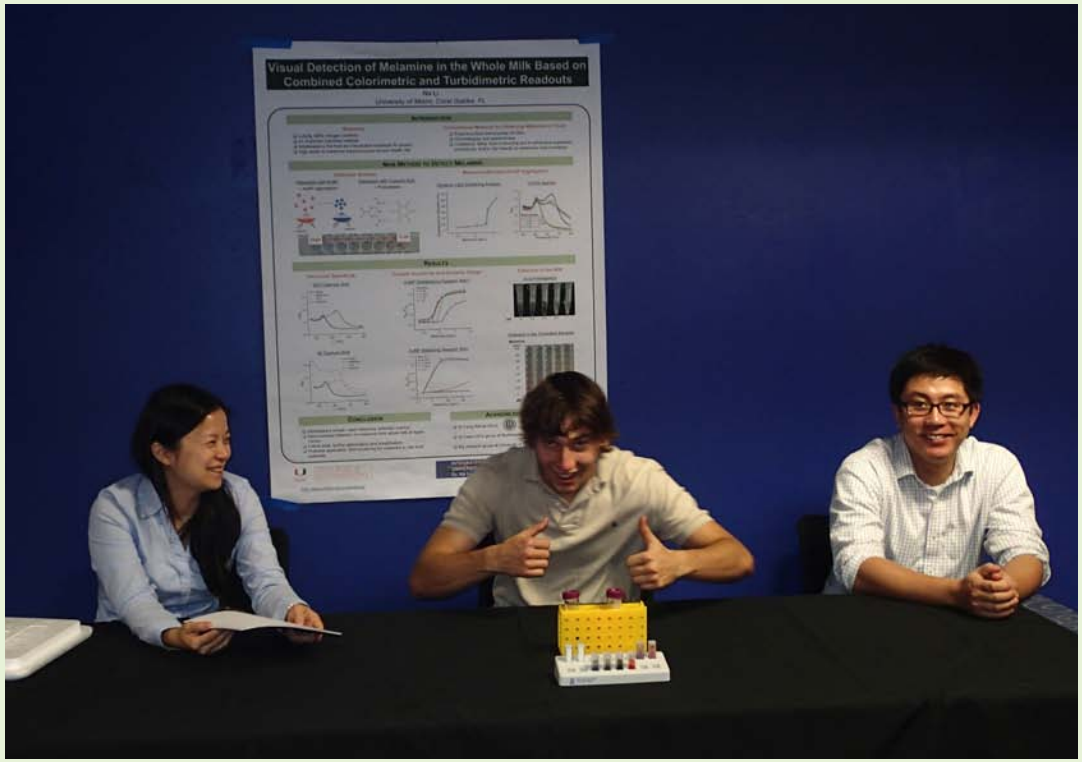
Max Planck Foundation – Photo Exhibition

- Served as a backdrop for our Nano Days 2012
- Used as resource for Nano Bites Summer Camp Class

Considerations and Challenges

- They need us as much as we need them
  - Similar goals of reaching underserved populations
  - Broader Impacts Requirements

- Ensuring what is provided is appropriate for the intended audience
  - “Nano” Talks
  - Engaging Demos



Nano Bites – Week at a Glance

Day 5: Innovations and Societal Implications

- Nano Innovations
- Implications
- Presentation of Final Projects

Saint Louis Science Center

Nano Mini-grant: Partnerships and Audiences

Paul Freiling
Director, Engineering Education
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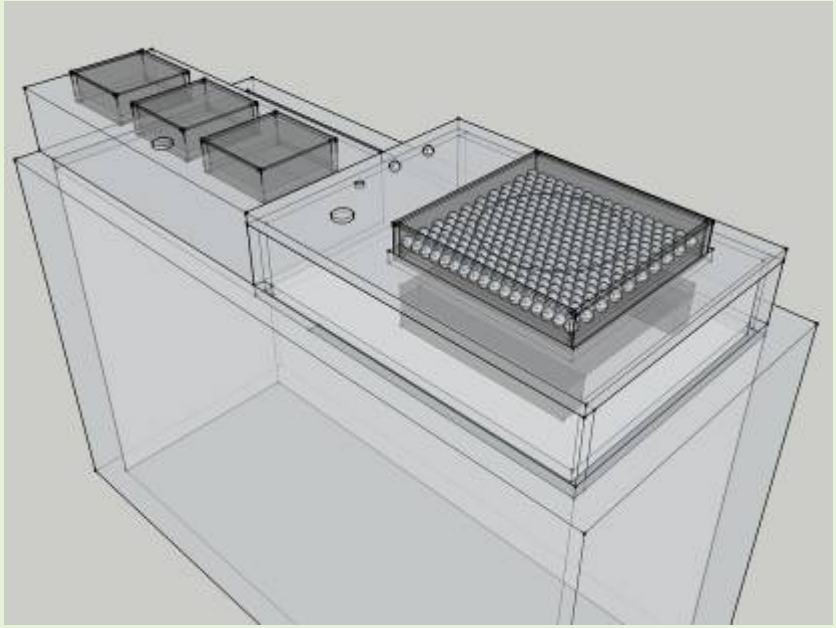
www.slsc.org

NISE network

Nano Prototype Exhibit Mini-grant

Develop a Nano exhibit prototype to introduce Saint Louis Science Center visitors to nanotechnology.

Exhibit Concept: It is difficult to work with atoms at the nano scale because their behavior is Bumpy, Sticky and Shaky.



Nano Prototype Exhibit Partnerships

New partnerships were developed with area university nano scientists and graduate students.

University Partnerships Successes

- Role as Science Advisors
- Deeper Understanding of Nano Research
- Bridge between Institutions

University Partnerships Challenges

- Time
- Communicating to the Public
- Partnership Turnover

Nanotechnology Camp Mini-grant

Develop a lab based nanotechnology camp (ages 14–18) that provides campers with a real world learning environment.

Nanotechnology Camp Mini-grant
New Audience Approaches

- Real World Learning Environment
- Reach Socio-economically Disadvantaged
- Market through Community Partners:
  - Schools
  - Churches
  - Centers/Boys and Girls Clubs

Society of Hispanic Professional Engineers (SHPE)

A partnership focused on connecting the SLSC more deeply with the St. Louis area Hispanic community.

Cultural Events and Community Partnership Successes

- Increased relevance to local and international communities
- Increased public and institutional awareness and understanding of cultural communities located in the St. Louis area
- Community and School Outreach support

Characteristics of Successful Partnerships

- Shared goals
- Realistic expectations
- Formalize & plan
- Time commitment
- Organic Relationships
- Mutual respect
- Perseverance

Challenges to Partnership

- Forced partnership
- High turnover
- Exclusive self-interest
- Difference in institutional cultures and assumptions
- Lack of trust

Let’s hear from you!

Thank you to our Presetners!

Karlisa Callwood – Miami Science Center

Suzi Taylor – Montana State University

Paul Freiling – Saint Louis Science Center

Veronika Nunez – Oregon Museum of Science and Industry (OMSI)

Timothy Hecox – OMSI

Priya Mohabir – New York Hall of Science

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