

# NNCI – Education and Outreach

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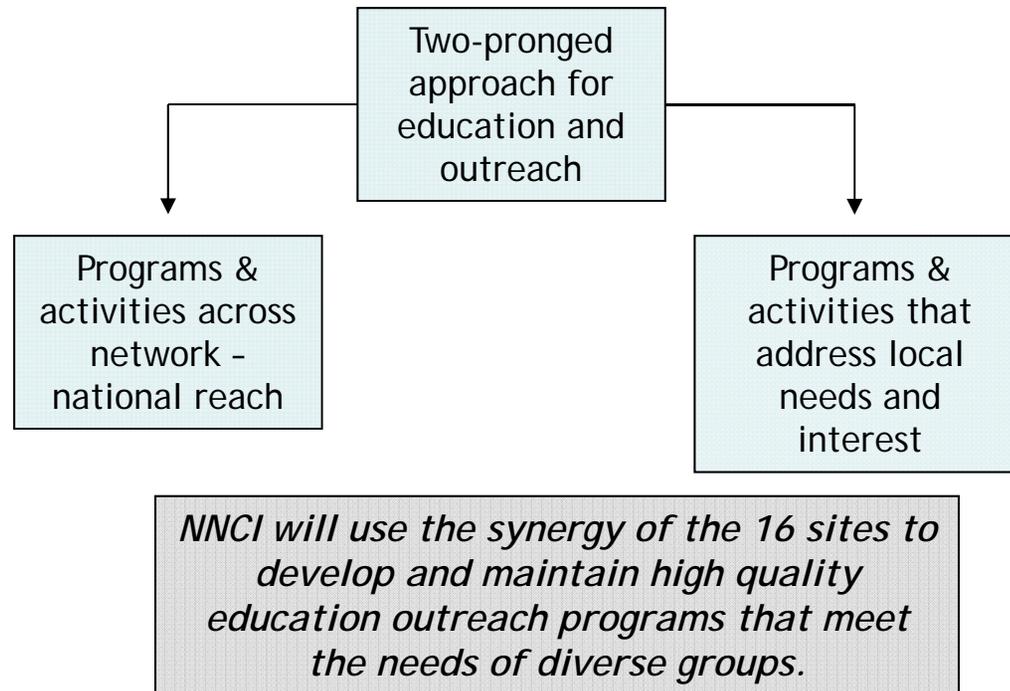
# NNCI Education & Outreach Mission



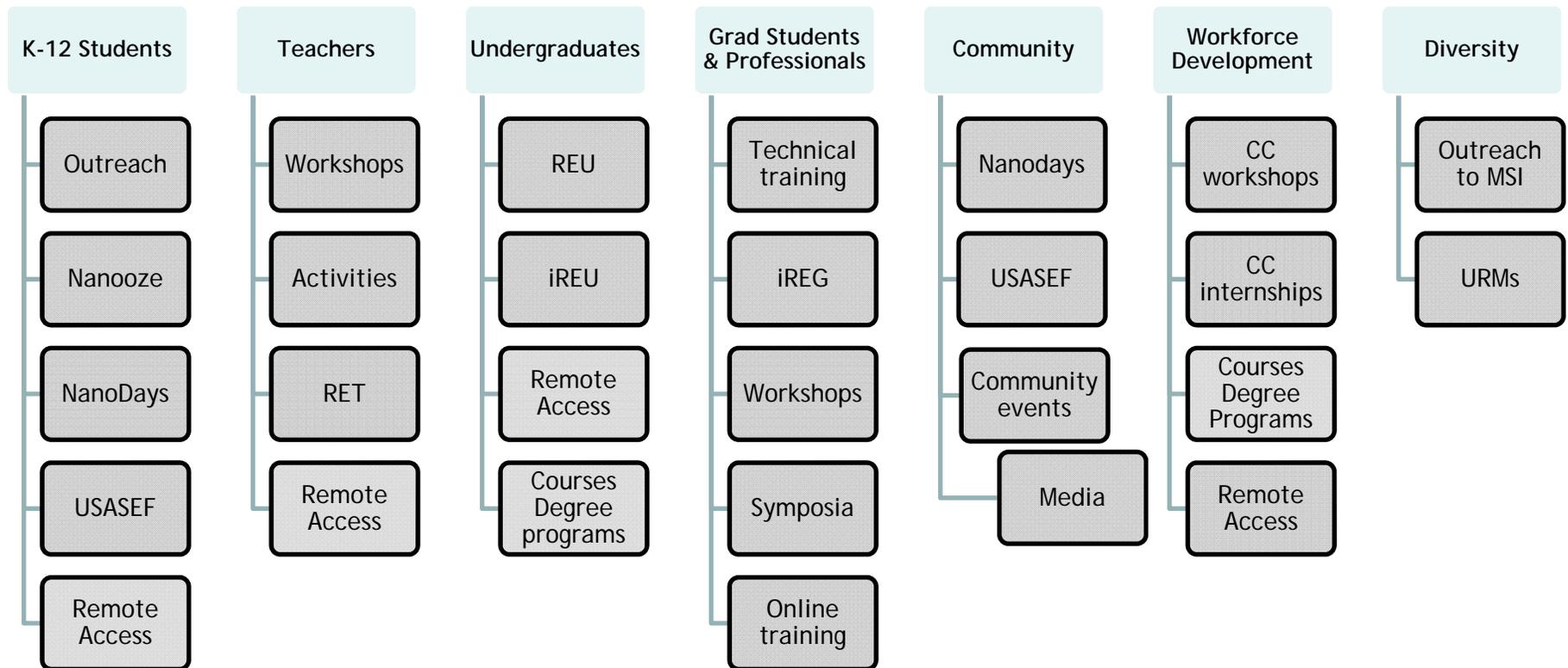
- Offer education and training to address the growing need for a skilled workforce and informed public
- Provide resources, programs, and materials to enhance knowledge of nanotechnology and its application to real-world issues
- Believe that a strong US economy requires a STEM-literate workforce ready to meet the technological challenges of a nano-enabled economy as well as an informed citizenry that supports continued and safe growth of nanotechnologies.

# NNCI E&O

- 16 sites with 16 individual E&O programs
- Common themes across the site programs which lend themselves to collaboration and support



# NNCI Education Programs by Audience



# NNCI E&O – Year One

- September 15, 2015 – September 14, 2016
- VERY busy and productive year
- ~295,000 were reached in the first year
  - 245,000 - Pulse on the Planet and NanoExhibit
  - 15 of 16 sites reporting
  - **Does not include:**
    - 3-5 million who visit Epcot annually
      - *Nanooze* exhibit
    - *Nanooze* print editions

# E&O Highlights

- SENIC and CNF - co-exhibited at the USASEF; NanoBus visited schools
- SHyNE - *Take Our Sons and Daughters to Work Day*
- NanoEarth – I0 - Pulse on the Planet radio shows
- MONT – *Material Characterization Using Electron Microscopy and Spectroscopy* webinar
- RTNN - Hands-on nanotechnology workshop for community college faculty
- KY MMNIN – NanoDays at Kentucky Science Center
- MANTH – New REU program with 6 students



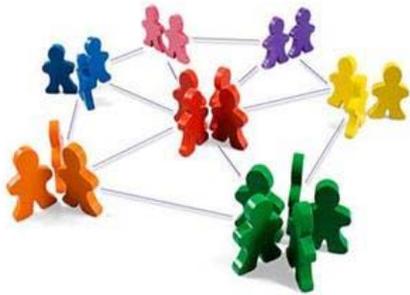
# E&O Highlights

- NCI-SW – Remote Access to Equipment and Virtual Field Trip
- SDNI – STEM in your Backyard
- MINIC – Outreach events with Science Museum of Minnesota (NanoDays)
- CNS – Research Experience for Veterans
- NWN I – NNCI booth at American Indian Science and Engineering Society national meeting
- TNF – AFM and Nanolithography workshops for professionals
- NNF – Traveling Nanoscience Exhibit



# Coordinating 16 sites - Working groups

1. REU (lead Lynn Rathbun)
2. K-12 students & community now **merged** with K-12 teachers & RET (lead Jim Marti)
3. Community College/Workforce Development
  1. Has not met; WD Subcommittee
4. Evaluation and Assessment (lead Nancy Healy)
5. Diversity
6. Online courses



# REU Working Group

- Collected site descriptions for NNCI.net REU page (11 sites)
  - Common site to search nano-focused REU programs
  - Links to each site's REU page/application
  - URL on NSF REU page
- Georgia Tech will host the first NNCI REU Convocation
  - August 6-8, 2017
    - 6 of 11 have committed
      - KY MMNIN, SENIC, CNF, RTNN, NNF, MANTH
- Coordination Office – post survey of 2016 participants/PIs/Mentors
  - Primary purpose:
    - Longitudinal study
    - international REU



# Longitudinal Tracking Study

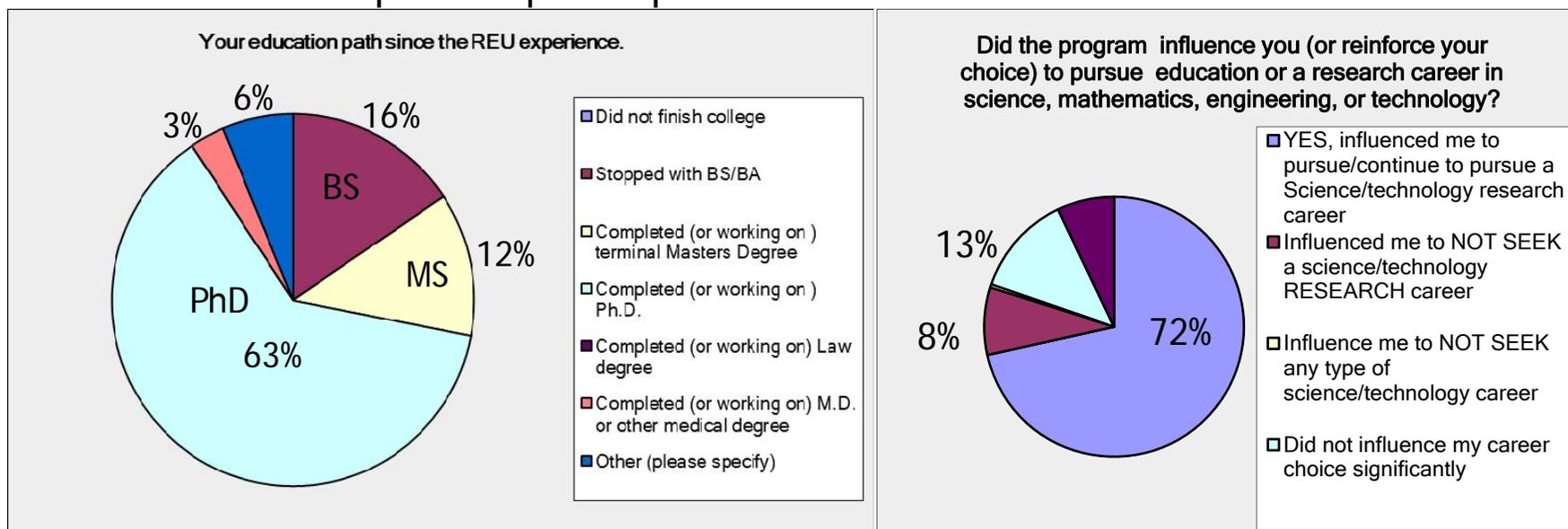
## *A little history:*

- In 2007, NNIN began a formal study of all NNIN/NNUN students who had been out of the program for 4 or more years.
  - 1997 - 2012
- Response from 723 in the target years (~75%).
- Brief Survey Monkey “check in” – link on our home page will be developed.
  - Solicited by email
- Provides:
  - Email address/contact information
  - Feedback information (program and performance)
  - Education and career information



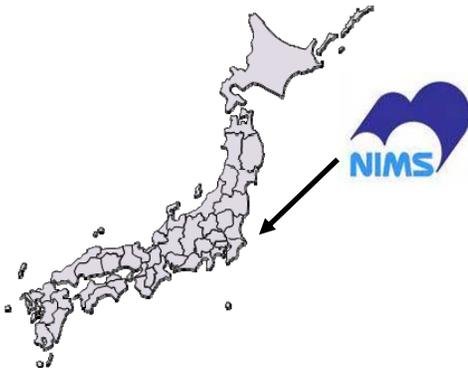
# Longitudinal Study

## Education path of participants



# international REU (iREU)

- IRES award to CNF to support 5-6 students each summer
- In collaboration with the National Institute for Materials Science (NIMS) in Tsukuba, Japan



2<sup>nd</sup> year high quality experience in NSE research



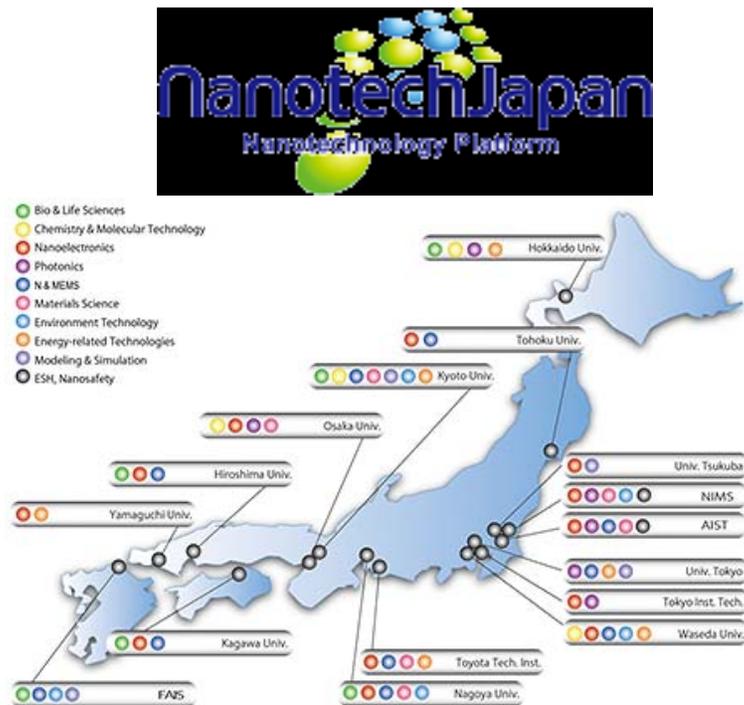
Encourage & support promising students in STEM pipeline



Developing future STEM leaders with global awareness

# international Research Experience for Grad Students (iREG)

NIMS – coordinating site for Japan's Nanotechnology Platform



- NIMS recruits graduate students to come to NNCI sites
- Japan pays all of students' expenses
- NNCI sites provide research projects for students
- NNCI sites provide training and lab access

# K-12 and Community Working Group

Identified and reviewed NNCI E&O programs;  
recommended programs worthy of scale up



- NanoDays
- Funding needed to expand kits



- RET & RET-like programs
- Lasting impact on schools
- Requires supplemental funding



- Videos for teacher training
- Use on campus students to make videos

# K-12 and Community Working Group



- Nano Camps
- Half day – multi day camps



- Remote access & traveling tools
- Technical obstacles with school bandwidth



- Activity kits for school use
- NNCI serve as a clearinghouse for nano-activities

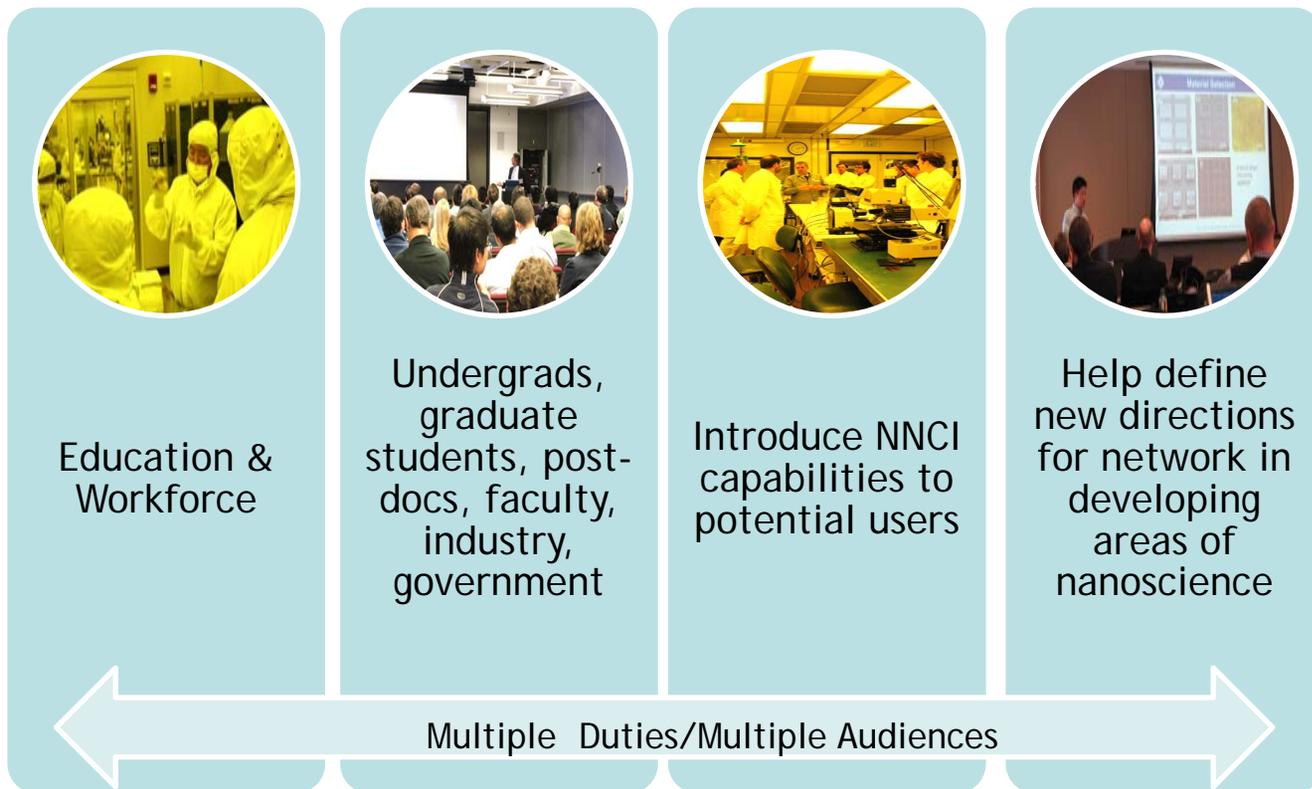
Topics for discussion  
Education Breakout



- Nanooze - Web site  
[www.nanooze.org](http://www.nanooze.org)
- Nanooze - in print
  - Since 2008
  - Free to teachers
  - 1MA in print
- Nanooze - exhibit
  - Disneyworld - Epcot
  - Funding to Cornell to upgrade
    - NSF Disney Science Portal
      - Showcasing NNCI, NNI, & NSF directorates
    - Nanooze (print/website)
    - Current components – interactive experiences with discoveries



# NNCI Workshops and Symposia



# Goldschmidt 2017



- Goldschmidt –
  - international conference on geochemistry and related subjects,
  - organized by European Association of Geochemistry and Geochemical Society.
- Two day workshop
  - *Nanoscience in the Earth and Environmental Sciences— Research and Teaching Opportunities*
    - Intro to nanoscience and applications to Earth system
    - Teaching nanoscience across geosciences
    - SEI of nanoscience

Organizers: David Mogk (MONT), Mike Hochella (NanoEarth); Nancy Healy (SENIC)

# Collaboration with National Nanotechnology Coordination Office (NNCO)



- National Science Teachers Association annual conference
  - Joint booth -2016 & 2017
- NNI booth highlights NNCI, NNCO, and nanoHub
  - NNCI will sponsor a teacher workshop at NSTA 2017 (March/April in LA)
    - Presented with NNCO
    - Secondary science teachers

# Collaboration with NNCO

- **NanoDay - 10/9/2016**
  - Site events
  - NanoNuggets – short informational videos
    - CNF, KY MMNIN, MINIC, NCI-SW, NNF, and RTNN
    - ~40 videos
      - ASU video was highlighted on the White House Blog
    - <http://www.nano.gov/node/41>
- **Ask a Nano Expert**
  - NSF's Generation Nano contest in collaboration with NNI
  - NNCI site directors answered questions
  - [https://www.nsf.gov/news/special\\_reports/gennano/ask.jsp](https://www.nsf.gov/news/special_reports/gennano/ask.jsp)
  - VIP tour
- **Teaching Nano and Emerging Technologies Network - Webinar**
  - February 16 webinar will be presented by NNCI (NH)



# Collaboration with nanoHub

- NNCI Education Page
  - Group – NNCI Education
    - [https://nanohub.org/groups/nnci\\_education](https://nanohub.org/groups/nnci_education)
    - Uploading NNIN curriculum materials



# NNCI Education Portal

- “Learn” link on the main web page
- Phase I sections:
  - What is Nanotechnology?
  - Site Education program descriptions
  - REU
  - Education articles
  - Nanooze
- Upcoming – Phase 2
  - Educators – K-16
    - Will contain all of the NNIN curriculum materials
  - Students – K-12
  - Students – post secondary
  - Education Videos

Thanks to all of the NNCI Education  
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