

NNCI Education and Outreach

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Coordinated Infrastructure

NNCI Education and Outreach Mission

- Build a skilled workforce
- Provide resources to enhance knowledge of nanotechnology and its application to real-world issues
- Inform the public in order to support the continued and safe growth of nanotechnologies

NNCI E&O

Network of 16 sites with 16 individual E&O programs

- Monthly calls
- Share best practices
- Opportunities to promote other sites' activities
- Regional collaborations
- Central, searchable location for educational resources

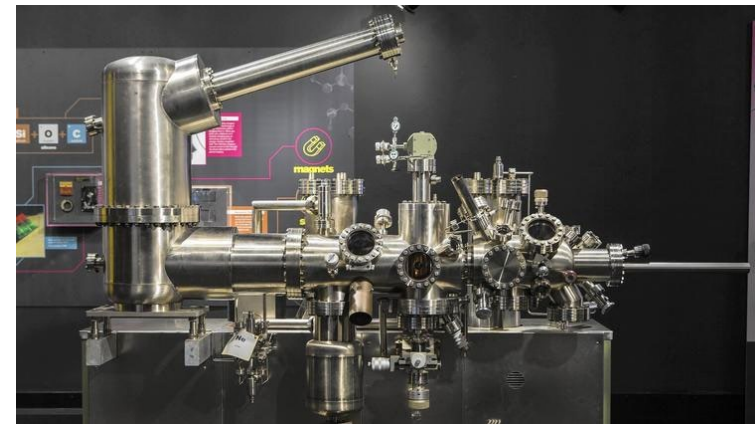
NNCI E&O – Year Three

October 2017 – July 2018

VERY busy year

More than 46,500 reached

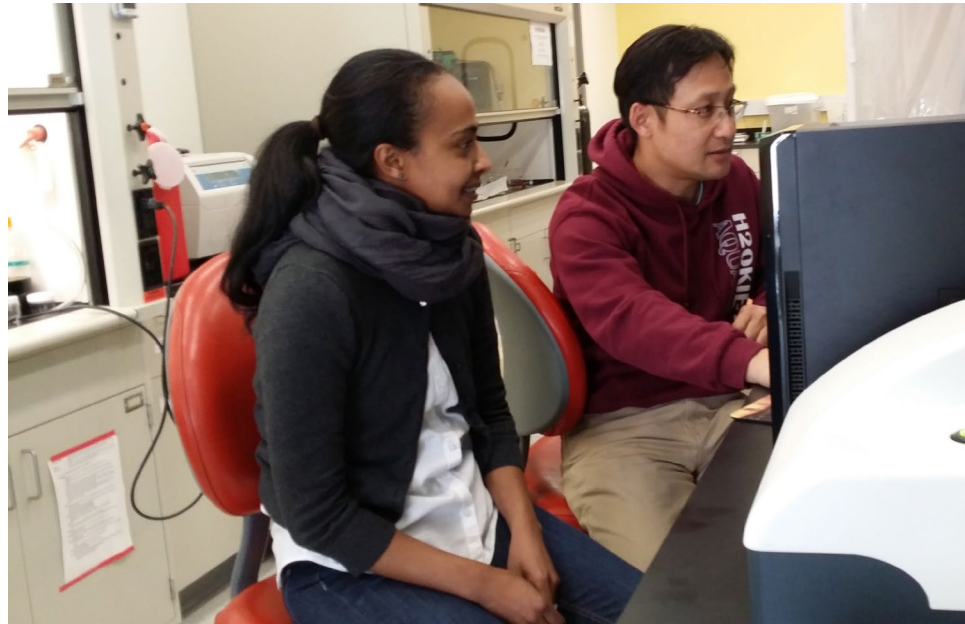
- 13 of 16 sites reporting
- Does not include:
 - NNF's traveling exhibit (51,000)
 - NanoEarth's Pulse on the Planet
 - SHyNE's NUCAPT's display at O'Hare
 - CNF's *Nanooze* exhibit at Epcot and *Nanooze* print editions



Diversity

Examples: (not inclusive)

- Recruitment from URM serving institutions/conferences/programs; AISES, ABRCMS, Warrior Scholar Program
- Building relationships with organizations like 4H & Girl Scouts
- Direct efforts towards Title I schools
- Eval. WG discussion on collecting this information
- Tribal colleges call



K-12 Students

Examples: (not inclusive)

- Participation in science festivals, science celebrations, STE(A)M days, National Nanotechnology Day, Nano Days
- After school programs
- Sci & Eng summer camp programs
- High School student interns
- Career Fairs
- Off and on site visits w/ tours



K-12 Students

- NNF Nebraska After School Program
 - 9 sessions
 - 20-25 middle school students
 - Title I school

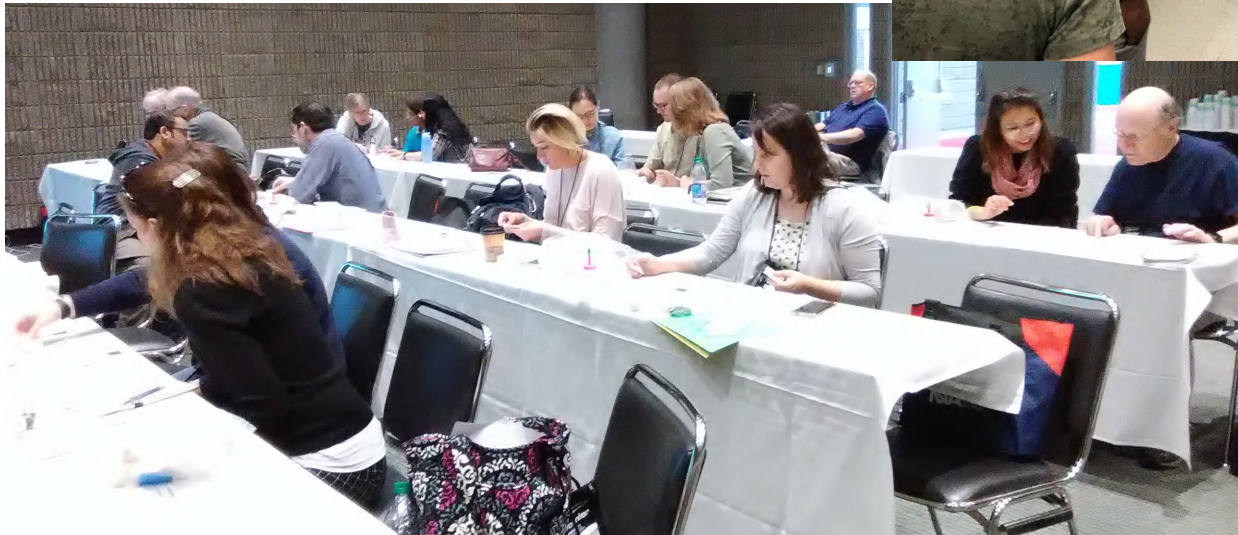


- All thought they learned a lot about science
- 80% “plan to be a scientist or engineer in the future”

K-12 Teachers

Examples: (not inclusive)

- Resource creation
- Booths at conferences
- Educators in Residence
- Workshops
- RET



K-12 Teachers

- **Nano@Stanford** – Nanoscience Summer Institute for Middle School Teachers
 - 15 teachers, 5 from Title I schools
 - 4 days

“we got to play AND learn”



“I am comfortable in my understanding of nanoscience”

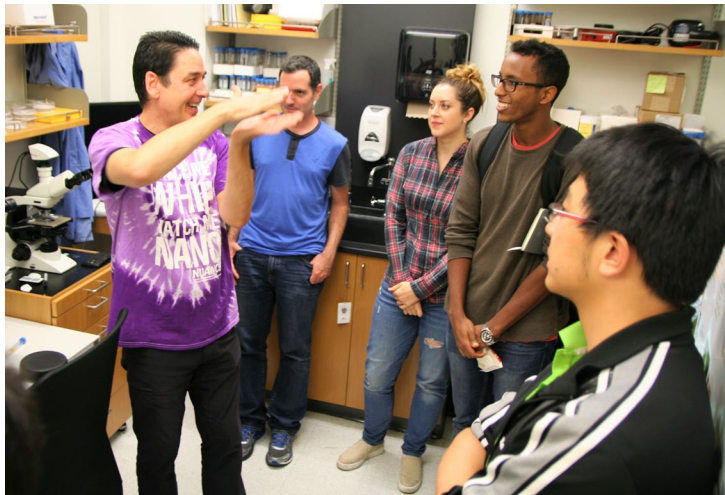
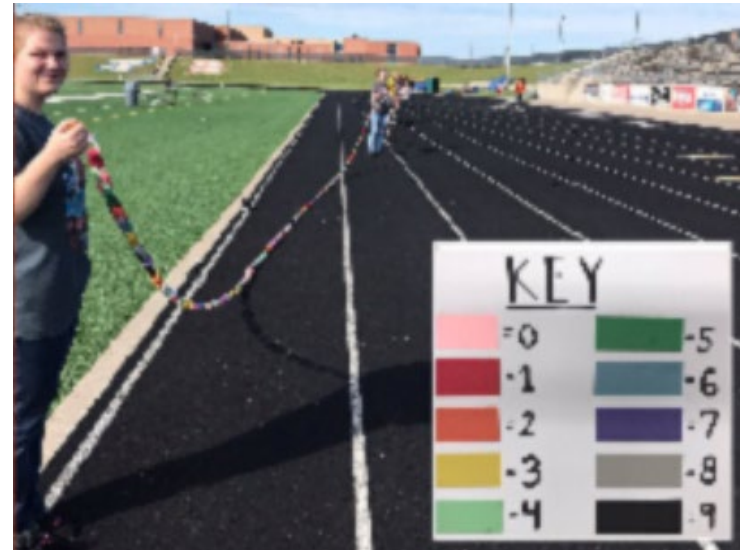
Pre: ~20% neutral, 25% somewhat disagree, 55% strongly disagree

Post: ~5% strongly agree, 90% somewhat agree, 5% neutral

K-12 and Public

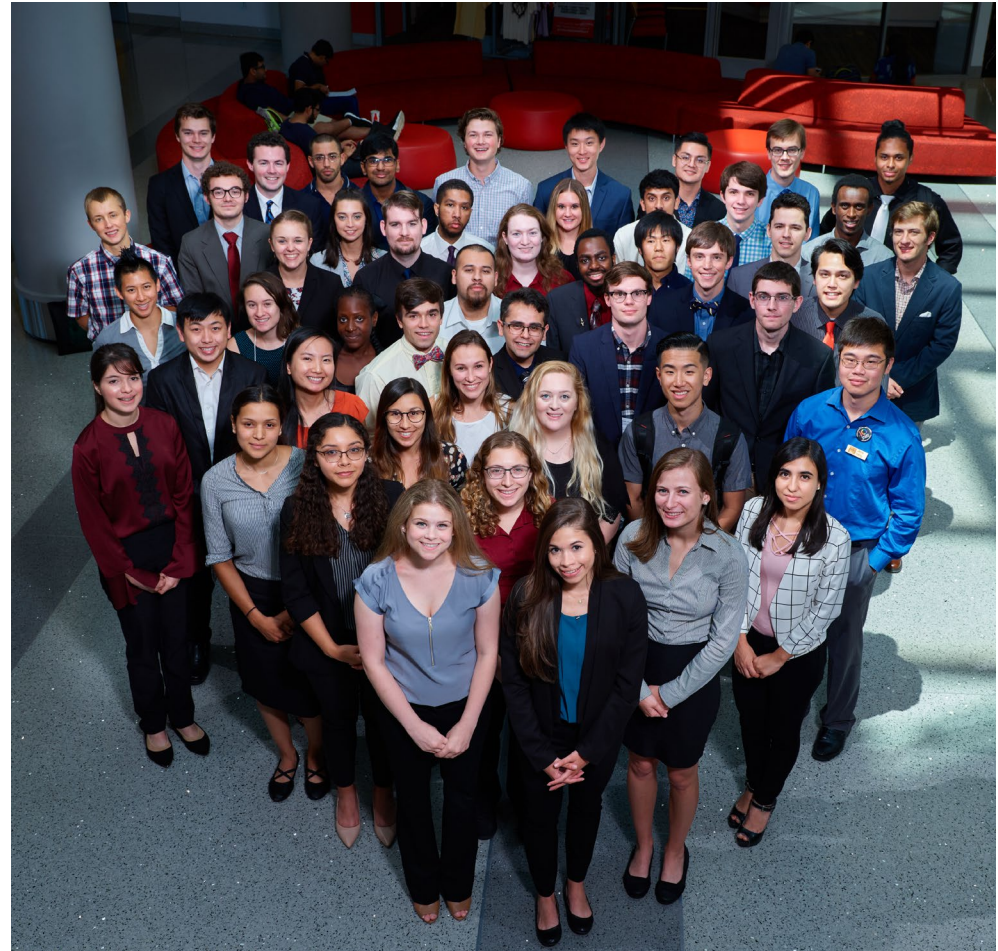
Examples: (not inclusive)

- Science Festivals
- Science Cafes
- Exhibits
- Nano journalism
- Nano Days
- National Nanotechnology Day



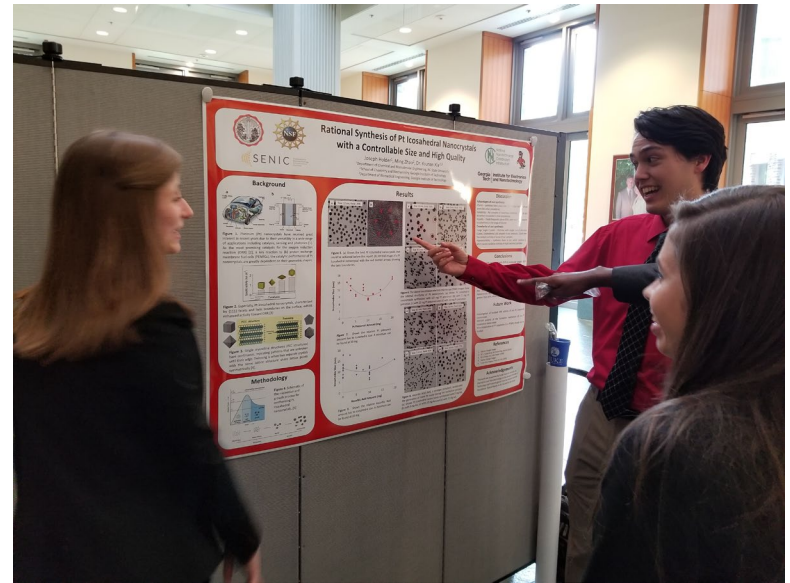
Research Experience for Undergraduates

- 13 of 16 sites – REU programs
- Listed on NNCI.net with link to each site's program and application
- Listed on NSF REU website



NNCI REU Convocation

- RTTN August 5-7, 2018
- 10 sites participated
 - CNF; CNS; KY-MMNIN; MANTH; MONT; NCI-SW; NNF; RTNN; SENIC; TNF
 - 45 REUs
 - 6 iREUs
 - Unable due to scheduling conflict
 - SDNI, NNI, SHyNE
- Oral presentations
- Poster Sessions



Workforce Development (post-secondary)

Examples: (not inclusive)

- Internships for students
- Course development
- Remote access
- Tours
- Workshops for educators
- REU/V opportunities



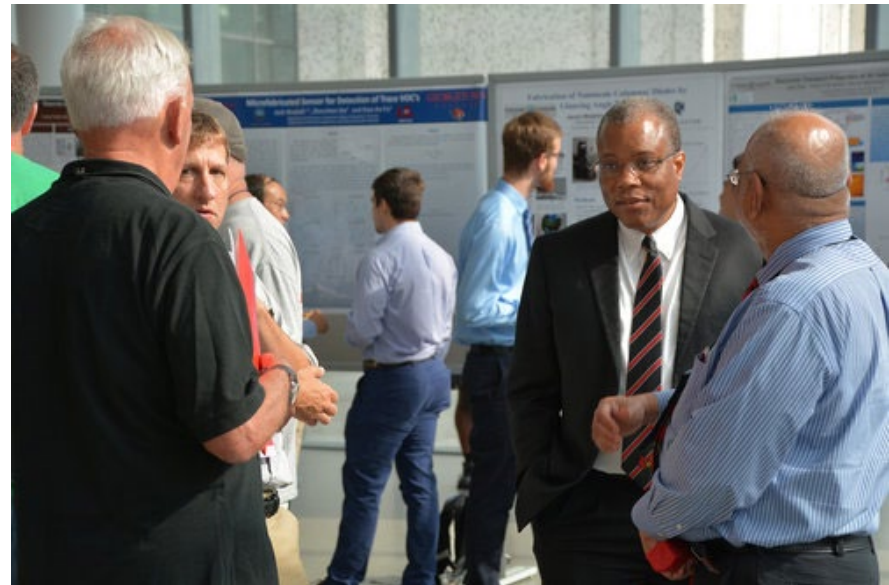
Workforce Development

- **MANTH partnership with Community College of Philadelphia**
 - Last summer there was a focus group to determine local needs
 - Nanotechnology course working through CCP approval
 - Planning to be offered this spring
 - Advanced Manufacturing course being developed as a result to follow-up meeting on workforce needs
- **RTNN Nanotechnology Workshop for Community College Educators**
 - Two days with 9 educators
 - Focus on incorporating nanotechnology and nanoscience into basic science curricula
 - overview on nanotechnology, specific characterization instruments, nano applications across a variety of fields, hands-on work in a clean room
- **Penn State's Nanotechnology Applications and Career Knowledge (NACK)**
 - NNCI sites participating in RAIN: SENIC, RTNN, NNF, NCI-SW, Nano@Stanford
 - Possible joint workshop at SACNAS 2019

Undergrads, Grads, Professionals

Technical workshops, short courses, seminars, webinars, internships, and symposia

- All sites providing events
- Wide range of topics and technical levels
- Examples: (not inclusive)
 - KY MMNIN – NANO + AM Symposium
 - NanoEarth – Nanotechnology Entrepreneurship Challenge
 - MiNiC – presented MN Dept. of Employment & Economic Development Start-up Week
 - SENIC – Graduate Researchers In Nanotechnology Group
 - TNF – Undergraduate Internship Program



Evaluation and Assessment WG

- Surveyed Ed & Outreach Coordinators on assessment needs/questions
- Workshop on evaluation during annual meeting
- Evaluation Matrix exercise
- Q&A



Online Technical Learning WG

Content hosted on MOOC; includes text, videos, presentations, quizzes, etc.

- RTNN - Nanotechnology: A Maker's Course
- Nano@Stanford - Nanofabrication & Nanocharacterization Course

Goals:

- Development and sharing of educational materials
- Lowers barriers for training
- Content to start with fundamental knowledge and refine to school-specific

Please contact Angela Hwang for more information (aahwang@stanford.edu)

The screenshot shows a video player interface for a course titled "Nanotechnology: A Maker's Course". The video is titled "Introduction to Nano Fabrication Tools" and is currently at 3:46 of a 11:37 duration. The video content shows a woman, Nan Jokerst, speaking and gesturing towards a diagram of a cleanroom environment. The diagram includes a scale bar of 100 μm. The interface includes a sidebar with a table of contents, a "Practice Quiz" section, and a "Downloads" section. The "Downloads" section includes links for "Lecture Video", "Subtitles (English)", and "Transcript (English)".

Item	Duration
Welcome to the Course	4 min
Introduction to RTNN	2 min
Learning Objectives for Introduction	18 min
What is Nanotechnology?	7 min
Introduction to Nano Measurement Tools	5 min
Introduction to Nano Fabrication Tools	11 min
Practice Quiz: Practice Quiz for Introduction	7 questions

Essential Technologies for Nano

Learn more about the Research Triangle Nanotechnology Network facilities and how you can access them

Module Assessment: Introduction and Essential Technologies for Nano Quiz

Downloads

- Lecture Video [mp4](#)
- Subtitles (English) [WebVTT](#)
- Transcript (English) [txt](#)

Would you like to help us translate the transcript and subtitles into additional languages?

Thank You!

Questions?