

Materials & Nanoscience Outreach News

*Materials and Nanoscience outreach and education activities
in Nebraska*

Recent Outreach Activities

Nanotech Facilities Workshop and Minicourses

Sponsors of a one day Nanotech Workshop and a three day Minicourse during 2016 were the University of Nebraska, the Nebraska Center for Materials and Nanoscience, and the Nebraska Nanoscale Facility (NNF) which is supported by the National Science Foundation and part of NSF's National Nanotechnology Coordinated Infrastructure (NNCI). As a regional center of excellence for instrumentation and service NNF is designed to help provide the western region of the Midwestern United States with the infrastructure for transformative advances in the fabrication, understanding, and utilization of materials, devices and nanotechnology.

Activities included presentations by university and industry speakers, tours of the fabrication and characterization facilities, and an overview of new equipment and measurement techniques. Attendees met technical personnel who assisted or performed measurements for company users so they could have the opportunity to get first-hand knowledge of the potential benefits to their business and/or research and how to become new users of the facilities. Faculty, students, postdocs, and industry representatives learned more in depth information about equipment, processes and opportunities at the University of Nebraska.



Administrative Support Available for NCMN Member Outreach Activities

NCMN offers additional outreach help, including some administrative services to NCMN faculty members in fulfilling the Broader Impacts outreach component in NSF grants. **Contact:** Terese Janovec, Assistant Director and Education/Outreach Coordinator, 855 N. 16th Street, Room N201C, phone: 402 472-2716, fax: 402 472-6148, e-mail: tjanovec3@unl.edu.

Training for Teachers



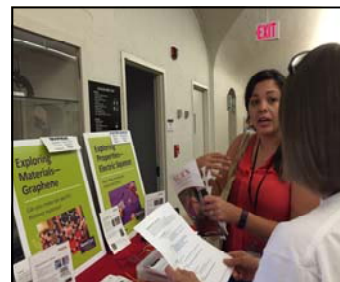
K-12 Science Education Summit

The statewide summit conference held at Innovation Campus engaged science education stakeholders from across the state, including NDE officials, school district science directors, ESU science staff developers, science teacher educators, K-12 science teachers, and UNL faculty and students, around the Next Generation Science Standards and innovative instructional resources. STEM/Nano activities were showcased to interested science educators through breakout sessions and a booth.

Omaha/Lincoln Teacher Training Fairs and Workshops

We continued to provide teacher training workshops throughout the year in the Lincoln and Omaha area giving teachers and preservice teachers the opportunity to experience STEM/Nano concepts through a variety of presentations, tours, and hands on activities using kits that covered chemistry, physics, and engineering topics.

We also had the opportunity to resource Lincoln Public School science teachers with STEM/Nano related information at their annual pre-term meeting on UNL's City Campus. NCMN, partnered with MRSEC to provide interactive materials and other tools to share with teachers.



Training for K-12 Students



Lincoln Literacy Program

In an effort to reach underrepresented students and immigrants we partnered with the Lincoln Literacy organization to provide science programming to adult students and their children. NCMN staff provided a series of hands on activities tailored for those who did not speak fluent English. The lessons were centered around science kits covering subjects such as Nanosand, Invisibility, UV bracelets, and more.



After School Program

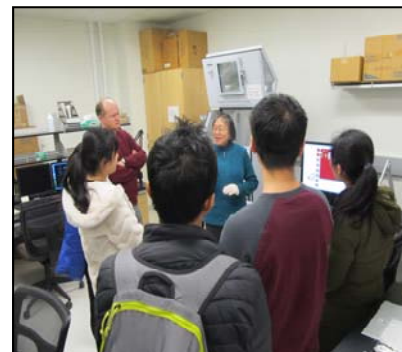
Faculty members, and NCMN students and staff provided regular programming during the school year for a Nanoscience After School Program at Culler Middle School. One hour presentations were given to students who had limited knowledge of nanoscience. Information included videos, hands-on activities, giveaways and discussions of nano applications which provided a broad overview of nanoscience/nanotechnology and possible careers.



Students gained a more comprehensive understanding through activities that introduced them to the unique properties at the nanoscale. Professors presenting were from the Chemistry, Engineering, and Physics departments with help from NCMN Undergraduate Outreach Fellows and staff. This year a Science Fair was added to give students a venue to share what they had learned during the semester. Videos are at <https://mediahub.unl.edu/channels/313>.

Graduate and Undergraduate Nanotechnology Classes

A variety of undergraduate and graduate level classes periodically used the Voelte-Keegan Nanoscience Center facilities this year as part of their class curriculum covering topics such as MicroFab taught by Dr. Sidy Ndao, Engineering and Nanotechnology led by co-instructors Prof. Yongfeng Lu and Dr. Lisha Fan in the Electrical & Computer Engineering Department. Students learned first hand how to use technically high levels of nano related equipment available at the University of Nebraska.



Southeast Community College Class



Dr. Rebecca Lai (UNL Chemistry) provided a class using Harry Potter books which have captured the imaginations of millions of readers of all ages, including many engineers and scientists. Southeast Community College was an ideal place to introduce all ages of students to the magic of Hogwarts that exists in our own world (aka science and technology). Alchemical concepts and their relation to modern chemistry were covered in the class, including the chemistry of gold and the elixir of life. Other nano related topics such as food chemistry, invisibility cloak, disappearing ink, and fireworks were also discussed.

NanoArt Exhibit and Contest

To celebrate the aesthetic appeal and creativity of nanoscience, University of Nebraska graduate, undergraduate students or post-graduate scholars in 2016 entered original artwork of their own creation in the form of static visual images that portrayed or represented nanoscience research at the University of Nebraska. Artwork was based on calculations, on imaging data, or on a conceptual model. Judging focused on both aesthetic impact and the effectiveness in communicating aspects of nanoscience. The top images chosen are now part of a traveling Nanoart Exhibit which has been displayed in a variety of venues.



Astronomy Day



The University of Nebraska State Museum hosted its annual Astronomy Day celebration to hundreds of visitors. NCMN participated in the event, which included a booth with information, hands-on activities, and games about carbon nanotubes, metals that change shape on their own, and space elevators which are now a possibility because of new and innovative materials.

Nano Outreach Upcoming Events 2017

Nebraska Association for the Gifted Conference (NAG)

February 23 & 24
Embassy Suites, Omaha

Women in Science Conference

April 1
City Campus Union

NanoDays

March 25
Gateway Mall

Traveling Nano Exhibit

- Jan-April
Wayne State Museum, NE
- May-August
Lincoln Children's Museum

NNF Nanotech Workshop

May 10
Voelte-Keegan Nano Center

High School Internship Program

June-August
UNL Faculty Labs

Nanotech Minicourse

June 20-22
Voelte-Keegan Nano Center

Nebraska Center for Materials and Nanoscience *Bridging Nanoworld Opportunities in Nebraska...*

The Nebraska Center for Materials and Nanoscience (NCMN) at the University of Nebraska is a multidisciplinary research organization involving 100 faculty members from the Departments of Physics and Astronomy, Chemistry, Electrical Engineering, Mechanical and Materials Engineering, Chemical & Biomolecular Engineering, and others. The NCMN strives for excellence in research, graduate and postdoctoral education and service in materials science and engineering, and nanoscience. It is on the forefront of research in a high-priority national program, the National Nanotechnology Initiative. The NCMN also works with state and national industries in support of Nebraska's overall economic development.

NCMN

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