

## *Materials & Nanoscience Outreach News*

*Materials and Nanoscience outreach and education activities  
in Nebraska*

### **Recent Outreach Activities**

#### **Native American Youth Leadership Camp**



As part of a leadership camp for Native American youth, NCMN worked with MRSEC to share a variety of fun nanoscience activities to middle and high school students at Innovation Campus. ‘Nanostations’ provided interesting demos and activities about nano and nature for student exploration which included information about DNA, light, self-assembly, and piezoelectricity.



#### **NANO Goes International**



We were very excited to travel internationally and share information and activities about nanoscience at [SenEcole – Fete de la Science](#), a 3 day exhibition in Senegal, Africa. Over 300 students and visitors explored Nano/STEM kits about Thin Films, Invisibility, Liquid Crystals, Nano Sand, Transmission Electron Microscopes, and 3D Imaging. Dr. Sidy Ndao, a NCMN faculty member, made presentations during the event which supports future African

#### **Nebraska Robotics Expo and Nano**

The annual [Nebraska Robotics Expo](#) at the Strategic Air and Space Museum provided a unique venue to share what’s happening in the Nano/STEM areas to Expo participants, spectators, and parents. Nebraska youth were given demonstrations and interactive activities about opportunities and careers in chemistry, physics, and engineering.



#### **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](mailto:tjanovec3@unl.edu).

## Training for Teachers



Efforts by UNL's College of Education and Human Sciences were complimented by providing nanoscience related resources for preservice teacher training. Students used Nano/STEM kits to prepare lessons themed around nanoscientists for a K-3 elementary school summer camp. Curriculum units were made that either built to a cumulative nano lesson or lessons that integrated nano throughout. The students taught and then made modifications to their lessons based on their own learning experiences. Preservice teachers visiting from a South Korea exchange program observed their American counterparts in action and had an opportunity to also learn about how nanotechnology is used in improving circuits, creating invisibility, and cleaning water.



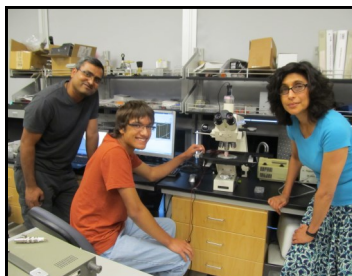
Teachers from Millard, Seward, Elkhorn and UNL preservice teachers participated in workshops learning how to use STEM nanokits and lessons covering a variety of nanoscience topics. Steve Wignall, Seward High School science teacher provided presentations and one on one coaching on how to use the kits to enrich and support current nanoscience curriculum.



## Training for Students

Our third Summer High School STEM/Nano Internship program was held for 8 weeks from June through July 2015. Lincoln area junior and senior high school students received training in experimental and theoretical techniques in Chemistry, Physics, and Engineering labs at UNL. Faculty advisors and graduate student mentors worked with students on specific research projects which students presented in a final poster at the Nebraska Summer Research Symposium.

Students, 6-9th grade, were part of a weeklong Teaching Camp sponsored by the College of Education and Human Sciences in June. NCMN provided a session to the junior high students about what's happening in the materials and nanoscience world. Students toured facilities which included scanning probe and electron microscopes, a world class cleanroom, laser equipment, and more. Students also received training on how to use prepackaged "nanokits" to teach others about nanotechnology concepts.



## Training for Facility Users

Many new users were able to attend our annual Facility Training in August. Basic information and usage about equipment was covered. The workshop was free and attendees had the opportunity to receive a general overview of services offered in Electron Microscopy, X-Ray Characterization, Scanning Probe & Materials Characterization, Nanomaterials & Thin Film Preparation, and Nanofabrication areas.



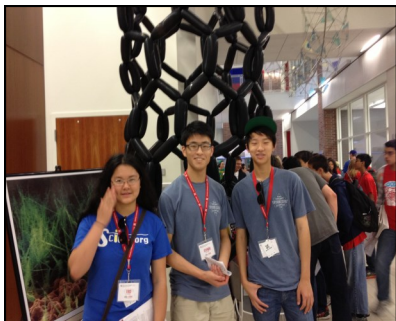


## Discover Engineering Days



NCMN and MRSEC partnered with the College of Engineering to introduce Nebraska middle school students and their teachers to the various fields in engineering and nanoscience at the University of Nebraska–Lincoln. Events were filled with hands-on activities and presentations that apply math, science and creative thinking skills.

## 2015 National & Nebraska Science Olympiad



An interactive booth of activities about carbon structures, memory metals and metal organic frameworks was presented at the 2015 National Science Olympiad and hosted by UNL.

More than 2,000 middle and high school students from across the nation competed in categories ranging from earth science and chemistry to physics and engineering. The national tourney which is held at a different university each year, is the culmination of regional and state tournaments.

## GMAG Grant supports STEM/Nanoscience Journalism

A recent grant from the American Physical Society has enhanced the science learning for Lincoln Public School students. During hands-on activities and engaging presentations students now are also capturing information through the use of iPads and wearable GoPro cameras. After the activities are completed, students interview each other about what they have learned from the subject discussed. These simple interviews are then edited into short video clips or vlogs and uploaded to a website where they are made accessible to students, teachers, and the public. Check out some of the videos at this website.



<http://mediahub.unl.edu/channels/313>

## NCMN Outreach Upcoming Events 2016

**Nebraska Robotics Expo**  
February 20  
Strategic Air & Space Museum

**Nebraska Association for the Gifted Conference (NAG)**  
February 25 & 26  
Embassy Suites, Omaha

**Nano & Lincoln Literacy Program**  
February 18—March 17  
Culler Middle School

**Explore Science Night**  
March 2  
Culler Middle School

**NNF Nanotech Workshops**  
March 22 & 23  
Voelte-Keegan Nano Center

**Traveling Nano Exhibit**

- Feb-April  
Edgerton Center, Aurora, NE
- April-August  
Kearney Children's Museum

**Teacher Workshop**  
April 20  
Edgerton Explorit Center  
Aurora, NE

**Noncredit Nano Class**  
May 10, 6:30 pm  
Southeast Community College

**Nanotech Minicourse**  
May 17-19  
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**  
**Dr. David Sellmyer, Director**  
**N201A Voelte-Keegan Nanoscience Center**  
**P.O. Box 880298**  
**University of Nebraska**  
**Lincoln, Nebraska 68588-0298**

**Terese Janovec**  
**NCMN Education and Outreach**  
**Phone: 402-472-2716**  
**Fax: 402-472-6148**  
**E-mail: [tjanovec3@unl.edu](mailto:tjanovec3@unl.edu)**