

Midwest Conference for Nanotechnician Programs
Illinois Science + Technology Park, Skokie, IL
October 10, 2014

Time	Presentation	Email	Affiliation
7:30-8:30am	Registration & Breakfast		
8:30-8:40am	Welcome - Tom Hamel Bob Sompolski	thamel@oakton.edu sompolski@oakton.edu	Oakton Community College, Des Plaines, IL
8:40-9:20am	Deb Newberry	deb.newberry@dctc.edu	Dakota County Technical College, Rosemount, MN
<p>Nano-Link The Nano-Link Center began in the fall of 2008 and is a collaboration involving 11 educational institutions. Nanotechnology, dealing with materials at the molecular and atomic level, is multi - disciplinary and will impact dozens of market segments. This expansive scope drives the need for nano savvy employees in biotechnology, material science, photonics, energy, electronics and many other areas. Our goal is to promote nanotechnology education at multiple grade levels by providing comprehensive resources for students and educators. These resources are supported by hands on educator workshops and on-line content and activity kits. We work with various industry partners to ensure our curricula help students gain skills, knowledge and abilities required to support the economic growth of companies involved in nanotechnology. We also support informal education by providing demonstrations and exhibits to civic organizations, high schools and museums.</p>			
9:20-10:00am	Maria Sabatello	tsabatello@maine207.org	Maine East High School, Park Ridge, IL
<p>Excite Your Science Students! Nanotechnology : Curriculum Integration & Remote Access Excite your students early in the year during your review of metrics and conversions by introducing nanotechnology. Challenge them with the question, “ How Smooth is Smooth? “ and pass around CDs. Then, show a CD sample as seen under the atomic force microscope (AFM) through remote access of Oakton Community College’s equipment. Challenge them to see, feel or even measure the distance between the lines or tracks on which data is stored. Then, measure the distance live using the AFM without leaving your classroom or buying expensive equipment. Then, just when your students think they know physical and chemical properties, synthesize some gold and silver nanoparticles, observe their color, estimate their size by filtration and measure their size using the Qnano. Discuss how the size of nanoparticles affects the color seen in many pieces of art. Even decorate plastic to look like stained glass using nanoparticles !</p> <p>Use the scanning electron microscope (SEM) to analyze the composition of surfaces containing nanoparticles during the bonding unit. As the students explore the properties of memory metal, the SEM can measure the percent of the nickel and the titanium in the alloy. In addition, students can prepare a hydrophobic surface on a piece of copper metal and demonstrate the Lotus effect as they spray it with water. The SEM analysis reveals the silver nanoparticles as well as the copper on the surface.</p> <p>Showing videos of products on the market which contain nanoparticles, such as Never Wet, excites students and shows the relationship of nanotechnology to their everyday lives.</p>			

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10:00-10:40am	Nhon Vo	nvo@nanoal.com	NanoAI LLC, Skokie, IL
<p>NanoAI LLC NanoAI is a fast-growing start-up company at the intersection of nanotechnology, energy and green-tech dedicated to making lightweight, scalable, high-performance, heat-resistant aluminum superalloys for light-weight automobile brake rotors, high strength electric cables, and other applications. NanoAI has been awarded government grants from Department of Energy and National Science Foundation for its breakthrough technology. Its clients include the US government agencies and Fortune 500 companies.</p> <p>NanoAI designs and produces novel, castable aluminum superalloys, which exhibit high-strength, coarsening-resistant nano-precipitates with tailored compositions and size distributions.</p>			
10:40-10:50am	AM Break		
10:50-11:30am	Gokul Gopalakrishnan Yan Wu	gopalakrishg@uwplatt.edu wuy@uwplatt.edu	University of Wisconsin-Platteville, Platteville, WI
<p>Microsystems and Nanotechnology Education at the University of Wisconsin-Platteville The Microsystems and Nanomaterials (MSNT) program at the University of Wisconsin – Platteville offers three degree options: an emphasis in MSNT within the Engineering Physics major, a minor, and a standalone B.S. degree. The program offers five core courses and two research classes, including a capstone research project undertaken in the final year. All of the courses have laboratory sections and two additionally involve a significant design component. The MSNT laboratory is a clean-facility that provides the students with exposure to microelectronics and nanomaterials fabrication and characterization techniques, from lithography, deposition and etching, to electron and atomic force microscopy. In this presentation I will describe the curricula and lab facilities, and discuss student outcomes that we have observed so far.</p> <p>Teaching Nanofabrication Process Design and Diagnosis using Nano-sphere Lithography Principle and Applications of Nanotechnology is a course where students fabricate and characterize nanoscale structures using a variety of techniques from biology, chemistry, and materials science. One outcome of this course is that student will be able to design and conduct nanofabrication process as well as to analyze and interpret material characterization data. We have developed a lab module that emphasizes process design and diagnosis using nano-sphere lithography. In this lab, we challenge students with the task of creating arrays of nano-sized metal cone structures from thin film deposition and template masking with nanospheres (nanosphere lithography). Only the concept and the physical requirements of nanosphere lithography are explained. It is scheduled in the later half of the course after students have learned several fabrication skills including spin coating, thin film deposition via physical sputtering and thermal evaporation, lift-off process, and surface treatment with oxygen plasma. By this time, they also have learned several characterization tools such as scanning electron microscope, stylus profilometer, and contact angle goniometer. Students need to choose the fabrication tools, design process parameters, use metrology data to verify fabrication results step by step, and perform failure analysis. On the contrary to a ‘cook-book’ laboratory, this lab is designed to excise students’ problem solving skills. We will share how we constructed the lab and what learned from teaching the lab.</p>			

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Time	Presentation	Email	Affiliation
11:30am-12:10pm	Lisa del Muro	lisa.delmuro@d214.org	Wheeling High School, Wheeling, IL
Implementation of Nanoscience Class into a High School Classroom the Struggles and Victories In the 2013-2014 school year Wheeling High School implemented a nanoscience class as a capstone course for the seniors. However, the journey began long before 2013 in all our science classrooms and will continue into the future. In this presentation you will learned what worked and didn't work in implementation, how to avoid some struggles, and what both teachers and administrators should know before implementing a nanotechnology course.			
12:10-1:10pm	Lunch		
1:10-1:50pm	Kurt Carlson	kcarlson15@cvtc.edu	Chippewa Valley Technical College, Eau Claire, WI
Flexible Model for Nano and Other Engineering Technology Programs At Chippewa Valley Technical College in Eau Claire, WI, the Nano Engineering Technology program needed more students, but not necessarily more graduates. To save the program, CVTC used Nano Engineering Technology as a model for other engineering degree programs which share some classes and resources resulting in more choices for students and more specialized grads for industry. Other colleges might use the model to support their own programs which could benefit from a "lean education" makeover.			
1:50-2:30pm	Ahmad Audi	aaudi@clcillinois.edu	College of Lake County, Grayslake, IL
New Nano Proposed certificate and Nano AAS Degree at CLC We will share the curriculum of the new proposed certificate and new proposed degree we developed at College of Lake County. The new degree and certificate will help the students get the skills they need in a more time efficient way and will get enough credit to continue their studies if they choose to do so but taking the common core science classes. The new curriculum reshuffles the previous curriculum that Harper AAS degree was based on and offers more flexibility for the students to tailor it to their ambitions. We are hoping the new curriculum will also foster better cooperation with the schools in the area. This will help students streamline their studies and helps the program with enrollments, retention, and completion.			
2:30-2:40pm	PM Break		

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2:40-3:20pm	David Giljohann	dgiljohann@aurasense.com	AuraSense Therapeutics, Skokie, IL
AuraSense Therapeutics AuraSense Therapeutics is a biopharmaceutical company developing a new class of nucleic acid- termed "Spherical Nucleic Acid" (SNA). SNAs provide a 3D presentation of oligonucleotides which are able to enter cells, tissues and cross barriers such as the skin. These structures have demonstrated potential in cancer and skin disease models, and AuraSense Therapeutics will be taking these nanoconstructs into clinic in 2015.			
3:20-4:00pm	Angie Etzwiler Anna Klein	aetzwiler@maine207.org aklein@maine207.org	Maine East High School, Park Ridge, IL
What Teachers Often Ask What teachers often ask is, How can I incorporate new technology, such as Nanotechnology into my science curriculum? In this project, students explore various applications of nanotechnology through problem-based learning and present their findings through a poster gallery walk. Afterwards, a two-stage guided-inquiry lab experiment is conducted to introduce students to applications of nano-assembled capsules in the medical field.			
4:00pm	Dismissal		