Professional Development

NPDP Nanotechnology Professional Development Partnership

Beginning on Oct. 11, 2019 at 11:00 a.m. EDT

Introduction to Nanotechnology Workshop

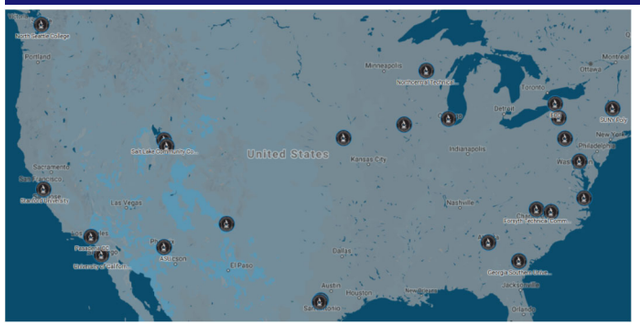
This workshop is designed for Post-Secondary and Secondary STEM educators; Guidance Counselors; School Administrators, and others. There is no cost to participate in this workshop if you application is accepted. Applications must be submitted by **October 4, 2019** in order to be considered.

Participants will be using a free video conferencing app through zoom.us which will include breakout sessions, polls, discussion groups, etc. Participants will be given opportunities to interact with the lecturers, other participants, and remotely accessible nanotechnology equipment. Participants will be required to have a computer with webcam, microphone, speakers and internet access.

The workshop will be held on four Friday sessions (Oct. 11, 18, Nov. 8, 15) from 11 am - 4 pm EDT.

To register, visit: https://forms.gle/qXv62uR7u93pm6qz7.

RAIN Partners Around the U.S.



Arizona State University (NCI-SW at ASU) | Cattaraugus-Allegany-Erie-Wyoming Board of Cooperative Educational Services (CABOCES) | Coppin State | Erie Community College (ECC) | Forsyth Tech Community College | Georgia Institute of Technology | Georgia Southern University | Nebraska Nanoscale Facility | Norfolk State University (SCENE) | Northcentral Technical College (NTC) | Northwest Vista College, Workforce Programs | North Seattle College (NSC—SHINE) | Oakton Community College (O.R.A.N.G.E.) | Pasadena City College (PCC) | Penn State University (CNEU—NACK Network) | Research Triangle Nanotechnology Network (RTNN) | Salt Lake Community College (SLCC) | Stanford University (nano@Stanford | SUNY Polytechnic Institute | University of Iowa | University of California San Diego | University of Texas at San Antonio (UTSA) | University of New Mexico (SCME) | Utah Valley University (UVU)

Let us Know

We hope you enjoyed this edition of the RAIN newsletter. We look forward to sharing our news and updates with you this year. We would really like to hear from you; if there is some subject or topic that you would like us to discuss or look into, please let us know. You can contact any member of the RAIN leadership team (http://nano4me.org/remoteaccess#Partners) if you would like to become a RAIN partner. Visit and like us on Facebook: www.facebook.com/nanotechnology.rain.

Regards,
The RAIN Leadership Team

PennState College of Engineering

The NACK Network, in the Penn State College of Engineering, is committed to supporting the development of two-year degree programs in micro and nanotechnology across the country by offering academic and educational resources.

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NANOWIRE

RAIN's Quarterly Newsletter

REMOTE ACCESS INSTRUMENTS FOR NANOTECHNOLOGY — RAIN

NACK NETWORK — Building College-University Partnerships for Nanotechnology Workforce Development

RAINdrops

It's time for the fall 2019 issue of NANOWIRE of the Remotely Accessible Instruments for Nanotechnology (RAIN Network). I'm happy to report RAIN partnerships and effective usage by educators across the nation continue to grow.

In this issue, we officially welcome another RAIN partner—Utah Valley University—to the RAIN Network. Please welcome Paul Weber and the UVU team to RAIN.

RAIN is sprouting more than crops in our nation's breadbasket. Read on and learn how our RAIN node at the University of Nebraska partnered with 4H to show 190 students how specialized nano equipment can be used to analyze environmental materials and new products being developed in our society.

It will again be RAIN-ing all across America on October 9th. As part of National Nanotechnology Day (10^{-9}) multiple RAIN sites will be holding an Open House for classrooms across the country. Think about dropping by and testing the waters.

Have you been wanting to improve your nano-literacy or would you like one of your colleagues to do so? If yes, think about attending the Nanotechnology Professional Development Partnership's Introduction to Nanotechnology Workshop. The workshop will consist of four Friday four-hour sessions of live-stream lectures and labs. Register now as the first session begins on October 11.

Speaking of professional development, have you ever wondered how photonics is and will continue to impact technology, as well as education? If you have, please think about attending the NACK webinar featuring Dr. Robert Geer of SUNY Polytechnic Institute on October 17.

Remember, to learn more about utilizing RAIN in your classroom or schedule a session(s), visit nano4me.org/remoteaccess. The RAIN team is dedicated to continuous improvement and meeting the needs of educators and students across the country. Please engage with us and give us your feedback and constructive suggestions. Visit and like us on Facebook at facebook.com/nanotechnology.rain to find more exciting news and updates about the fascinating world of micro and nanotechnology.

New RAIN Partner

Thanks to a 3-year NSF-ATE grant, Utah Valley University has been developing course material, laboratories and virtual reality modules that simulate equipment used in nanotechnology fabrication and characterization processes. A key product of this project is the first nanotechnology course offered at UVU, which will happen during the 2019-2020 academic year. UVU is pleased to partner with the RAIN network to make instrumentation – such as our Tescan Vega-3 electron microscope – accessible to the nanotechnology education community.

A novel feature of this project has been the development of virtual reality training modules that simulate our nanotechnology processes and equipment with high fidelity. Students learn the elements of safely operating the electron microscope, sputter coating unit, and photolithography process by completing tasks in VR modules, before they complete laboratory exercises. The end results are greater confidence in proper use of the equipment, and greater efficiency and safety during laboratory periods.

UVU serves as a dual role integrated university and community college for our service area. Our region of Utah has several significant hi-tech companies – such as the IM Flash memory chip fabrication facility in Lehi, UT, with $600 million annual revenue and 1,450 employees – that have urgent needs for technicians trained in the basic processes of nanotechnology. The professional development trainings, educational resources and networking opportunities accessible to UVU through our collaboration with NACK have been invaluable in establishing our own nanotechnology training program.

Professional Development

The NACK Support Center is pleased to collaborate with the Nanotechnology Collaborative Infrastructure Southwest (NCI-Southwest) Center at Arizona State University to co-produce our 2018-19 webinar series. Visit nano4me.org/webinars for more information and to register.

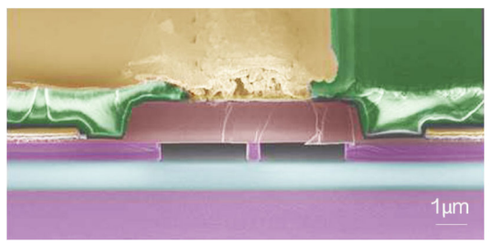
Integrated Nanophotonics: The Transition to High-Volume Manufacturing and Implications for Workforce Education

Date: Thursday, October 17, 2019

Time: 1:00 p.m. EST

Length: 60 minutes

Presenter: Robert Geer, PhD, Professor of Nanoscale Science, SUNY Polytechnic Institute



Description: Integrated Nanophotonics refers to the integration of photonic systems (e.g. optical devices, laser sources, and optical detectors) on a silicon or silicon compatible chip that can be interfaced with conventional integrated circuit technology. By leveraging recent advances in Si chip technology integrated nanophotonics is currently transitioning to high-volume manufacturing. This presentation provides an overview of integrated nanophotonics technology and several key aspects of manufacturing and quality control (testing). The implications of this technology regarding relevant skill standards for technicians is described as well as core elements of potential technician education modules required to support this exciting new field.

RAIN Outreach

Nebraska Nanoscale Facility and 4-H Summer Partnership

Nebraska Nanoscale Facility (NNF), in partnership with the University of Nebraska Extension Office and 4-H program provided remote analysis services through RAIN to youth in Omaha this summer. Fourteen schools and various programs throughout Omaha participated in the Engineering with Nano Power experience. Students were introduced to how specialized nano equipment can be used to analyze environmental materials and new products being developed in our society. Using the XRF a variety of materials were examined and their compositions discussed in the classroom after utilizing the remote technical capabilities of the XRF. Youth were able to connect and relate with a real nanoscientist using the RAIN platform. A variety of questions helped students engage with the remote session such as: *Why is analyzing samples important? What can you do with the info? What does this analysis tell us and how do you became a nanoscientist*?

Over 190 students, 4th-8th grade, were able to experience the RAIN sessions, about 45% were females and 70% from underrepresented groups. We believe the RAIN sessions with enthusiastic teachers and scientists working together can have a positive impact on STEM identity formation and career orientation for youth!

RAIN Open House

In celebration of National Nanotechnology Day, RAIN, with our partners, will be hosting simultaneous remote access demo sessions. On **October 9, 2019, from 11 AM to 2 PM EDT**, teachers, students and anyone who is interested will have the opportunity to experience some of the most up to date microscopy technology available.

You will access and control microscopes and analytical tools to look at nano-sized materials from the ease of classrooms, or even home computers, all across the country. You control the tools over the internet in real-time and with the assistance of an experienced engineer at the microscope advising over video conferencing software.

Participation is easy, register your group, your class or yourself at https://forms.gle/5pmwZZX1iaYPZ7Uu9. Registration is not required, but helps us plan for staffing needs. On October 9, go to https://psu.zoom.us/j/929612856, where you can enter a live remote access session. Most sessions last from 30 to 60 minutes. Many teachers project the session in their classroom.

Partners participating at this time: Georgia Institute of Technology, Georgia Southern University, SUNY Erie Community College, San Diego Nanotechnology Infrastructure at University of California—San Diego, Nebraska Nanoscale Facility, Arizona State University and Penn State University.