
MNT^eSIG

MICRO NANO TECHNOLOGY
education
SPECIAL INTEREST GROUP

mntesig.net



2019 Community Asset Book

As part of the MNT^eSIG Community Meeting

July 23, 2019

St. Louis, Missouri



MNT^eSIG Program Agenda

Hyatt Regency Hotel, Parkview Room

July 23, 2019

7:00-8:00 - Check-in if you have not done so, at the HI-TEC registration desk.

7:00-8:00 - Poster setup, *see Poster Committee members for assistance.*

7:45-8:25 - Continental Breakfast – Grand D Foyer

Bring coffee with you to the MNTeSIG meeting room.

8:30-9:00 - Welcome, acknowledge committees, & Introductions, review of the asset book.

9:00 – 9:45 Keynote

Micro – Nano and the Emerging Sensor Based Economy

Todd Christenson, Ph.D.

CTO, co-Founder & Chairman Emeritus, HT MicroAnalytical Inc.

Few emerging technologies have impacted the world as broadly as the micro-nano field. Enabling to many breakthroughs which are providing 'abundance' via democratization of communication, healthcare, transportation, food and water access, energy and clean environment the micro-nano field is proving to be central to the betterment of our future. Having worked as an engineer and researcher in the MEMS field for 35 years the speaker will present a view of what appears to be tremendous untapped opportunity to provide further dramatic positive influences on human welfare. Resulting economic and job growth impact will be discussed and the skillsets required to surmount the challenges in meeting this growth will be outlined.

10:00 – 10:30 Break- Posters available for viewing, Grand D Foyer

10:30 – 11:00 - Lightning Round #1: Shivakumar Mathapathi

Presentations are strictly limited to 7 minutes each

1	Tony Dalessio	SUNY Erie Community College	Micro-credentials, a life preserver for drowning nano programs?
2	Elena Brewer	SUNY-Erie Community College	Lessons Learned from a Collaboration with Normandale Community College
3	Marco Curreli	Omni Nano	Digital Curricula and Textbook for Online and Hybrid Nanotechnology Courses
4	Jared Ashcroft	Pasadena City College	Combined Fundamental Science and Nanotechnology OER Laboratory Manual

11:00-11:30 – Lightning Round #2: Bob Ehrmann

Presentations are strictly limited to 7 minutes each

5	Zekaria Besir	Pasadena City College	Effectiveness on Nano-based Undergraduate Research in Increasing Student Success
6	Ahmed Khan	IEEE/WL/NSU	In Quest of Universal Nanotechnology Standards
7	Salahuddin Qazi	SUNY, NY	Online Visualization and Simulation Tools for Nanotechnology Education
8	Shivakumar Mathapathi	Sonoma State University, CA	Internet of Nano Things (IoNT)

12:00 – 1:00 Lunch – Park View

1:00 – 1:30 Overview of National Center proposal: Jared Ashcroft

1:30 – 2:30 MNTeSIG moving forward, needs, objectives, activities, measurable outcomes

- Curriculum Development
- Faculty Professional Development
- Outreach and program building, include student input
- Industry involvement
- Growing MNTeSIG community
- Other

2:30 – 3:00 Report of the working groups; how do we move it forward?

- Needs, activities to address needs, outcomes anticipated
- Who, what, when?

3:00 – 3:15 Break – Park View

3:15 – 4:00 Keynote

The Quantum Industry Needs a Skilled Workforce—And Soon
Celia Merzbacher, Associate Director, Quantum Economic Development Consortium

The Quantum Economic Development Consortium (QED-C) is an industry consortium, supported by government, with the mission of enabling a robust U.S. quantum industry, including growing the workforce. Advances in quantum information science and technology (QIST) have broad applications—for sensing, communications, and computing. Companies across the supply chain expect to grow but the pipeline of talent at all levels, from technician to post-doctoral, is insufficient. The type of companies that are part of the quantum industry, as well as the QIST workforce needs will be presented.

4:00 – 4:15 Time for Evaluation (Paper or Plastic)

4:15-4:30 Wrap-up - Feedback – Be ready to be called on!

Accepted Posters

Yawen	Li	Lawrence Technological University	Nanotechnology Minor Program at Lawrence Technological University
Zekaria	Beshir	Pasadena City College	Active Learning Interdisciplinary Nano-Education Butterfly Lab
Vanessa	Wolf	Pasadena City College	The Role of Remote Access Technology in S*T*EM Education
Nancy	Louwagie	Normandale Community College	Pathways to "and through" a Vacuum Technician Education
Elena	Brewer	SUNY-Erie	Addition of a New Plasma Course to EET Program
Elwin	Cheung	Pasadena City College	Increasing Student Success in STEM Using Active Learning Pedagogy
Pallavi	Sharma	University of New Mexico	Bi-Morph Cantilever – Understanding Micro Sensors and Actuators

LIST OF PRESENTATIONS

Tony Dalessio

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SUNY Erie Community College

Title: Micro-credentials, a life preserver for drowning nano programs?

Abstract: Many early adopters of micro/nano technology programs are having difficulty staying afloat. The lack of marketing, the extreme breadth of applications, and the public lack of knowledge all contribute to low enrollments. Can micro-credentials be part of the solution? SUNY Erie is going to find out. Micro-credentials are under development that will provide basic nanotechnology skills to students in science majors, students at other colleges that need the skills to become more attractive to graduate program, and up-skill employees in local industry, none of whom need a formal degree or certificate.

Impact: It will allow more students to fit micro/nano courses into their current program of study, or gain a new skillset in a shorter time period.

Elena Brewer

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SUNY Erie Community College

Title: Lessons Learned from a Collaboration with Normandale Community College

Abstract: This presentation will discuss the lessons learned from a classroom partnership between SUNY-Erie and Normandale Community College in offering an introductory vacuum course in Spring 2018. The following points will be outlined: logistics of offering and running the course via telepresence mode such as course schedules, program curriculums, shared online managements systems, student registration process, faculty compensation; equipment logistics for vacuum trainer at the remote site; student and faculty assessments of the partnership and next steps in the partnership development; and the changes to the Electrical Engineering Technology program that resulted from this partnership.

Impact: In Spring 2018, several EET students benefited from collaborative introductory vacuum course offered via novel remote educational mode with hands-on vacuum trainer experiments.

Marco Curreli

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Omni Nano

Title: Digital Curricula and Textbook for Online and Hybrid Nanotechnology Courses

Abstract: Omni Nano has created the first digital curricula for online/hybrid nanotechnology courses at the high school and undergraduate levels, aligned with both NGSS and ASTM standards for nanotechnology workforce education. Because our resources are entirely digital, they are easy to distribute as well as easy to translate. Our flexibly modular, student-centered materials include everything required to teach nanotechnology, whether as a stand-alone class or integrated into another science class. Our fully digital package browses well across desktop and mobile applications; compatibility with popular learning management systems like Canvas and Schoology make its adoption and use both simple and straightforward.

Impact: We have demonstrated a positive effect on students' educational and professional interests, inspiring 11,000+ students to pursue a wide variety of STEM fields.

Jared Ashcroft

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Pasadena City College

Title: Combined Fundamental Science and Nanotechnology OER Laboratory Manual

Abstract: Community Colleges across California have been working on a Nanotechnology based Open Education Resource (OER) manual to be used in undergraduate chemistry, physics and biology courses that utilizes the RAIN Network. Descriptions of the labs and access to the text will be shared.

Impact: Faculty can use the RAIN based labs in their courses.

Zekaria Beshir

Pasadena City College

Title: Effectiveness on Nano-based Undergraduate Research in Increasing Student Success

Abstract: As an African American student, undergraduate research has inspired me to pursue a graduate degree in Chemical Engineering. This presentation is aimed at describing the benefits and challenges of working on research projects at a Community Colleges as well as discussing these issues as an underrepresented minority student in STEM.

Impact: Share methods and success on recruitment and retention of minorities in STEM.

Ahmed Khan

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IEEE/WL/NSU

Title: In Quest of Universal Nanotechnology Standards

Abstract: This presentation will explore the urgent need to develop specific universal standards to ensure safety for researchers working with nanostructures and for consumers using nanotechnology based products. To develop universal standards, the following questions need to be answered by the all stakeholders: of nanotechnology:

- How should we manage exposure to nanowaste by humans and environment?
- How should people be educated about the potential benefits and risks of nanotechnology?
- How can schools promote best practices in lab safety protocols?
- What are some design factors that must be considered in building laboratories that will provide safe environment for researchers?

Impact: Educate professors & students about the required safety protocols for nanotechnology research.

Sala Qazi

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SUNY, NY

Title: Online Visualization and Simulation Tools for Nanotechnology Education

Abstract: The short presentation will cover the availability of free online visualization and simulation tools. Such tools (a) enhance students understanding of abstract nanoscience concepts, (b) enable professors to teach and design difficult concepts without buying the expensive equipment. These tools include 21 Remote Access Instruments in Nanotechnology (RAIN) nodes for accessing visualization instruments. In addition, over 500 simulation tools are available through nanoHUB resource which allows students to simulate, learn and explore nanotechnology related areas.

Impact: Students and educators will understand the use of RAIN and nanoHUB, and Will be able to simulate, learn and explore various nanoscale phenomena.

Shivakumar Mathapathi

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Sonoma State University

Title: Internet of Nano Things (IoNT)

LIST OF POSTERS

Elena Brewer

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SUNY Erie Community College

Title: Addition of New Plasma Course to EET Program

Abstract: The Electrical Engineering Technology (EET) department at SUNY Erie began work on an elective course sequence in Vacuum and Thin Film Technology for the EET program. In Spring 2018, an Introduction to Vacuum Technology course in collaboration with Normandale Community College was introduced and taught. In Summer 2018, a Plasma and Thin Films Deposition technical elective course with laboratory component was developed as part of SUNY Performance Improvement Fund grant. This course was offered for the first time in Spring 2019. This poster will outline major points in development of the plasma course and how it complements the EET program.

Impact: This course is offered to EET students as technical elective and provides them with necessary skills for employment in companies using thin film deposition equipment.

Zekaria Beshir

Pasadena City College

Title: Active Learning Interdisciplinary Nano-Education Butterfly Lab

Abstract: Butterfly wings are utilized to explore colors of nature. The interdisciplinary lab combines natural selection, chemical composition and nano-photonics as a way to demonstrate how the nano-world effects the properties of life. Experiments and data will be shared to show effectiveness of combining these topics into science curriculum.

Impact: The lab modules can be used in STEM curriculum to teach about how nano effects everyday life.

Yawen Li

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Lawrence Technological University

Title: Nanotechnology Minor Program at Lawrence Technological University

Abstract: A Nanotechnology Minor program was established at Lawrence Technological University (LTU) with the goal of attracting undergraduates to the study of nanoscale science, engineering, and technology, and developing a highly competitive workforce to engage in the nanotechnology revolution with complex problem-solving skills. The program represents cross-disciplinary collaboration by faculty members in the College of Engineering and College of Arts and Sciences. We present in this poster our nanotech curriculum and our outreach activities including the Nanotech summer camp. We will also discuss opportunities and challenges we are facing when growing this program.

Impact: Students interested in nanotechnology gain comprehensive theory and hands-on skills through this program, which enhances their competitiveness in the high-tech job market.

Vanessa Wolf

Pasadena City College

Title: The Role of Remote Access Technology in S*T*EM Education

Abstract: Utilization of remote access instrumentation in conjunction with active learning lab activities has been studied in K-12 classrooms. Data will be shared that shows the effectiveness of using the Remotely Accessible Instruments in nanotechnology (RAIN) Network in teaching student about Technology Education and as a resource in Educational Technology.

Impact: Effectiveness of using RAIN in K-12 and College STEM classrooms.

Nancy Louwagie

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Normandale Community College

Title: Pathways to "and through" a Vacuum Technician Education

Abstract: Vacuum technicians fill the critical role of maintaining complex equipment used in the semiconductor, solar, and defense industries. Normandale provides one of the few vacuum technology education programs in the United States. Pathways to the program have broadened through partnerships with industry and academic institutions. A telepresence delivery model provides a pathway for students and incumbent workers around the country to take classes in real time while practicing hands-on with a Vacuum Equipment Trainer system. The initial Foundations class includes a concept inventory that helps students chart a pathway through the vacuum technology curriculum for rapid entry into the workplace.

Impact: Normandale has enrolled and provided instruction to individuals who work as technicians at manufacturing and research organizations in the college's vacuum technology courses.

Vanessa Wolf
Pasadena City College

Title: Increasing Student Success in STEM Using Active Learning Pedagogy

Abstract: With intentions to improve success and retention rates in the educational setting, active learning has been the focus of debate in recent years as opposed to traditional methods of instruction. Costs and questions of whether active learning shows significant improvement in student performance brings doubt regarding which method is superior. One solution to this dilemma is utilizing the strengths of both active learning and traditional lecture. Previous studies show that, under specific niches, active learning is found to provide significant improvement. At a California Community College, archived data showing general Chemistry courses from Fall 2011 to Winter 2018 terms are analyzed by success and retention rates which were calculated and categorized by the type of class (active learning or traditional class) and by student gender and ethnicity. In addition, students in general Chemistry courses were surveyed to evaluate which activities were found to be the most enjoyable and helpful. Students from both traditional and active learning classes were compared.

Impact: Results from our data show that certain classes and students prefer one method over the other, suggesting revision of teaching systems to tailor to specific learning needs.

Pallavi Sharma
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University of New Mexico

Title: Micro Bi Morph Cantilever – Understanding Micro Sensors & Actuators

Abstract: Come see how the bi-morph cantilever can be used to teach a wide range of STEM and technical concepts used in the emerging and exploding field of the internet of Everything. This poster will include micro sensors and actuators and how they work.

Impact: This cantilever is a core device used for micro sensing (atomic force microscopes). This microdevice can be actuated as well as be used as a sensor. Attendees will see sample devices.

LIST OF CONTACTS

Kate Williams Alcott



Associate Director, Northeast Advanced Technological Education Center (NEATEC)
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SUNY Polytechnic Institute, Utica, NY

NEATEC's mission is to attract and train a technician workforce for the semiconductor/advanced manufacturing industries. To that end, I work with three specific cohorts to build a pipeline of talent, transitioning soldiers from Fort Drum, high school students including those from the refugee community and college students. Activities to support this outreach include providing Advanced Manufacturing Technician training for soldiers, mentoring a refugee robotics team and hosting a Manufacturing Day Expo. Before joining NEATEC in 2013, I worked for an educational consulting firm as a trainer and curriculum developer.

Jared Ashcroft



Professor
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Pasadena City College

Jared obtained his PhD in Chemistry from Rice University in 2006 and was a postdoctoral fellow at the Lawrence Berkeley National Laboratory (LBL) in the National Center for X-ray Tomography (NCXT) from 2006-2007. At Rice and LBL Jared developed bioconjugates of nanomaterials (fullerene, nanotubes and titanium based) to biomolecules (cancer antibodies and streptavidin). For over ten years Jared has been teaching Chemistry in California. Since 2011, he has taught chemistry for the Natural Science Division at Pasadena City College. He has worked on NSF, NIH and HSMI grants with the focus being nanotechnology and mentoring students for the Early Career Undergraduate Research Experience Program. He is also the two time defending MNT golf champion and plans to retain his trophy.

Dr. Osama Awadelkarim



Professor of Engineering Science and Mechanics
Director of the Center for Nanotechnology Education and Utilization (CNEU) and the Nanotechnology Applications and Career Knowledge (NACK) Center
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Pennsylvania State University

Dr. Awadelkarim received his Ph. D. from the J. J. Thompson Physical Laboratory at Reading University, U. K. Prior to joining Penn State, Dr. Awadelkarim worked as a Senior Research Scientist at Linkoping University and the Swedish Defense Research Establishment. His research interests are in electronic materials and devices, nanoelectronics, and nano/microelectromechanical systems (N/MEMS). Dr. Awadelkarim was selected by the National Academy of Sciences as a Jefferson Science Fellow at the United States Department of State. Dr. Awadelkarim worked as a Consultant and Senior Science Advisor to the Bureau of African Affairs and the Bureau of Oceans and International Environmental and Scientific Affairs at the United States Department of State. Dr. Awadelkarim is a Member of the Board of Directors for the Arab Science and Technology Foundation and a Fellow of the African Scientific Institute.

Andrew Bell



Department Chair – Engineering
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Ivy Tech Community College – Northeast

Andy Bell has a BS and MS degrees in Electrical Engineering from SMU and RPI respectively and has completed all the course work for a PhD in Systems Engineering from Stevens Institute of Technology. He worked in industry for 30 years on space and defense programs at GE and ITT before starting in 2011 as the department chair for the engineering programs at Ivy Tech Community College – Northeast. His faculty website is at <http://faculty.ivytech.edu/~abell118/>.

Dr. Elena Brewer



Assistant Professor
brewer@ecc.edu.
Chair of Electrical Engineering Technology
SUNY – Erie Community College

Dr. Brewer has 14+ years of experience teaching science and technology classes in a community college setting. She has been involved in development and teaching of nanotechnology, vacuum and plasma courses at SUNY-Erie since 2014. Dr. Brewer has substantial experience working with various clean room equipment (characterization: AFM, SEM, ellipsometer, contact and optical profilometer; fabrication: sputter coater, thermal evaporator, spin coater, UV chamber and UV mask aligner) and is willing to conduct equipment demonstrations via the RAIN network.

Amy Brunner



Program Manager
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Lockheed Martin in Santa Barbara, California

Amy Brunner is a Program Manager at Lockheed Martin in Santa Barbara, California. Her 18-year career has spanned both academia and industry in various engineering and engineering management roles. After leaving education she continues to have a passion for encouraging students of all ages and backgrounds to pursue careers in micro and nanotechnology. Outside of work, she volunteers for the United Way, Girls Inc, and 4H programs and is constantly looking for opportunities to merge community programs with education institutions and industry partners. Amy is honored to be a part of this year's MNT Special Interest group to support programs such as these that fostered her own development and opened the many doors to a fulfilling and diverse career in state of the art technologies.

Billie Copley



Project Manager at Nano Link
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Dakota County Technical College

Project Manager of Nano-Link: Center for Nanotechnology Education, graduate of the Dakota County Technical College Nanoscience Technology program, Mom of four, rock hound and amateur wood building hobbyist.

Dr. Marco Curreli



Executive Director and Founder
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OMNI NANO

Dr. Marco Curreli is a nanotechnology educator, researcher, and speaker. He is the Founder and Executive Director of [Omni Nano](https://www.omninano.org), a nonprofit organization that teaches students the STEM skills they need for the “careers of the future.” Omni Nano’s first-of-its-kind nanotechnology curriculum has been adopted by dozens of institutions in the US and around the world. Dr. Curreli also teaches at West LA College and UCLA Extension, where he is spearheading efforts to develop nanotechnology certificate programs. He holds a BS in Chemistry from Cal State LA and a PhD in Chemistry from USC. LinkedIn: <https://www.linkedin.com/in/marco-curreli/>.

Anthony P. Dalessio



Professor of Electrical Engineering Technology and Nanotechnology
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SUNY Erie Community College

Tony Dalessio earned a BS and MS in Electrical Engineering from SUNY at Buffalo. He worked in biomedical electronics and microwave communications before moving to Erie CC in 2003. Currently very interested in printed and flexible electronics, and how to work on a grant to launch a CubeSat while still contributing to the various NSF-ATE projects, centers, and the MNTeSIG community.

Robert K. Ehrmann



Managing Director
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Penn State Center for Nanotechnology Education and Utilization

Robert K. (Bob) Ehrmann is the Managing Director at the Penn State Center for Nanotechnology Education and Utilization (CNEU). The CNEU is the home of the Nanotechnology Applications and Career Knowledge (NACK) Support Center a National Science Foundation funded Advanced Technological Education National Center. The NACK Support Center has a national mission to provide nanotechnology workforce infrastructure and to facilitate the development of nanotechnology workforce education programs at community and technical colleges and universities across the nation. In addition to this national mission, PSU/CNEU through its 18 credit Nanofabrication Manufacturing Technology (NMT) capstone semester has provided nanotechnology workforce education to over 925 students, through a statewide education-industry partnership consisting of degree programs at post-secondary institutions across Pennsylvania.

Mr. Ehrmann has over 23 years of experience in industry before he joined the PSU CNEU. Mr. Ehrmann worked for Corning, Inc. where he held multiple positions in engineering, product development as well as management positions in engineering, production and project management. Mr. Ehrmann earned a BS in Ceramic Engineering from Rutgers University as well as an MBA West Virginia University.

Dr. Tanya Faltens



Educational Content Creation Manager
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Network for Computational Nanotechnology (Purdue University)

Dr. Tanya Faltens is the Educational Content Creation Manager for the Network for Computational Nanotechnology (NCN), which created the open-access nanoHUB.org cyber-platform. She assists faculty in using nanoHUB resources, looks for new content appropriate for nanoHUB, and runs NCN's Undergraduate Research Experience program. Dr. Faltens' technical background is in Materials Science and Engineering (Ph.D. UCLA 2002). She has taught undergraduate engineering courses (MTE, ECE and FYE) and mentored capstone research projects at Cal Poly Pomona and has several years' experience in hands-on informal science education, including working at the Lawrence Hall of Science at UC Berkeley.

Hua-Jun Fan



Professor
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Prairie View A&M University

Dr. Hua-Jun Fan, a chemistry professor at Prairie View A&M University, is one of students' favorite professors on campus. He is creative in assisting student learning and a strong advocate of undergraduate research. He introduced various teaching techniques such as the Process Oriented Guided Inquiry Learning (POGIL), peer led team learning (PLTL) model, context-led approaches (CLA), modified flipped classroom model, and Vernier Technology into the classroom and laboratory. Dr. Fan was 4-time winner of the Most Outstanding Teaching Award of College and finalist for the President's Most Outstanding Teaching Award. He also received Outstanding Service Recognition for his Service-Learning and Community Service at Prairie View A&M University.

Patrick Fontenot



Dean of Workforce Education and Training
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Northwest Vista College

Patrick Fontenot believes that computer literacy is important to each student, regardless of what career they choose. In fact, he says, everyone benefits from understanding and appreciating this rapidly changing field. As the Dean of Workforce Education and Training, Pat leads a wide range of programs and services to students, businesses and community members. He provides strategic direction to his team of directors, coordinators, faculty and staff to ensure that the programs offered incorporate the latest technology and training. Pat and his team work closely with local employers, the Texas Workforce Commission and the Texas Higher Education Coordinating Board to ensure that all of the technical programs at Northwest Vista College prepare graduates for high demand jobs and lead to employment opportunities in fields such as Information Security, Nanotechnology, Digital Media, 3D Animation, Advanced Water Treatment, Clinical Research and many others.

William Emmanuel Ghann



Research Faculty, Center for Nanotechnology
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Coppin State University, Baltimore, MD

William Emmanuel Ghann received his B.S. degree in Chemistry at the University of Cape Coast in Ghana. He earned his masters at East Tennessee State University in Johnson City and obtained his Ph.D. in chemistry at the University of Maryland, Baltimore County under the supervision of Dr. Marie-Christine Daniel Onuta. He is currently a research faculty member at the Center for Nanotechnology at Coppin State University. His research interest includes multifunctional gold nanoparticles for imaging, dye sensitized solar cells, and terahertz spectroscopy.

Richard Hill



Master Tech Support Specialist II / Assistant Professor Part time
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Erie Community College North Campus, Williamsville, NY

I have been a technician for 27 years and working in the Electrical Engineering Technology Department for Erie Community College since 2001. I have been involved with Nanotechnology for the last Six years. I have received training from Penn State's National Nanotechnology Applications and Career Knowledge (NACK), University of New Mexico's Southwest Center for Microsystems Education (SCME) and various equipment manufacturers. The equipment I have training on consists of SEM, AFM, interferometer, mask aligner, spectrophotometer, optical microscope, profilometer, ALD, elipsometer, thermal evaporator, sputter tools, RIE tool and vacuum systems.

Jonathan S. Friedman



Director, Puerto Rico Photonics Institute
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Universidad Metropolitana

Jonathan Friedman is the Founding and Executive Director of the Puerto Rico Photonics Institute at the Universidad Metropolitana in San Juan, Puerto Rico. He joined UMET from the Arecibo Observatory, where he spent 26 years as a researcher, studying the upper atmosphere and near-space environment using optical remote sensing techniques, primarily high-spectral-resolution resonance lidar.

NT Izuchi



Tenured Professor of Computer Systems Engineering
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Quinsigamond Community College in Worcester, MA

NT Izuchi is a tenured Professor of Computer Systems Engineering and has served as the department chair for both the Computer Information Systems programs and the Telecommunications and Computer Systems Support Technology programs at Quinsigamond Community College in Worcester, MA. He was a past President of the Faculty Senate at QCC. Born in Nigeria, he moved to the United States in the mid-seventies to further his education. He attended the University of Massachusetts for his undergraduate degree and Bryant College (now Bryant University), and Northeastern University Graduate School of Engineering where he obtained his graduate degrees.

Daniel Kainer



Director
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Lone Star College Biotechnology Institute (LSCBI)

Dr. Daniel Kainer has served as director of the Lone Star College Biotechnology Institute (LSCBI) since 2009, where he has initiated LSCBI-sponsored undergraduate research initiatives centered primarily on algae biotechnology, including a current project involving the effects of zero-gravity on algal physiology. For a history of these unique community college-based initiatives see the following reference:

Kainer, D.B. Undergraduate Research: A Platform to Enhance Community College STEM Education. *Industrial Biotechnology*. October 2013, 9(5): 289-292.

Dr. Kainer is married to a pharmacogenomics laboratory manager and has three daughters who keep him busy when he is not teaching or supervising research projects.

Ahmed Kamal



Associate Professor
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Tennessee Tech University

Research/Innovation/Creative Interest Areas: Modeling and simulation the biomedical control system in health and disease, Using Nanotechnology devices (Biosensors) to detecting the biological signals, Advanced methods of Biomedical Signals, Nonlinear modeling of Biomedical Systems, Assessment of Autonomic function in Parkinson's Disease

Dr. Ahmed S. Khan



Professor of Electronics and Electrical Engineering
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DeVry's College of Engineering and Information Sciences

Dr. Ahmed S. Khan, a Professor of Electronics and Electrical Engineering in DeVry's College of Engineering and Information Sciences, has been selected as Fulbright Specialist Scholar (2017-2020) by U.S. Department of State's Bureau of Educational and Cultural Affairs (ECA). Dr. Khan has Thirty-five years of experience in research, instruction, curricula design & development and program accreditation, management and supervision. He has authored many research papers and books on many technical topics, including the most recent book Nanotechnology: Ethical and Social Implications. Dr. Khan is a senior member of IEEE, ASEE, and serves as a program evaluator for ABET.

Saiful I. Khondaker



Professor of Nanoscience, Physics, and Electrical Engineering
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University of Central Florida, Orlando, FL

Dr. Saiful Khondaker is a professor of nanoscience, physics, and electrical engineering at the University of Central Florida (UCF). He received Ph.D. degree in 1999 from the Cavendish Laboratory of the University of Cambridge, UK. Khondaker is an expert in the fabrication and electron transport investigation of nanoscale electronic devices. He published more than 85 peer reviewed journal articles (6000+ citations and $h = 35$), delivered 60 invited talks at national and international conferences and prestigious institutions. He received NSF CAREER award (2008), UCF research incentive awards (2010, 2015), JSPS invitational fellowship (2016), and US Airforce Summer Fellowship (2016 - 2018).

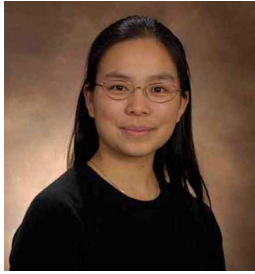
Michael Lesiecki



Principal at Luka Partners LLC
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Lesiecki has over 20 year's experience as a Principal Investigator, managing grants and managing grant evaluation and grant evaluators. He has led proposal development teams for TAACCCT and NSF grants and served as a reviewer for the NSF, NIH and ED grants. He has 27 peer reviewed publications in the area of Chemical Physics, has presented over 50 webinars, and presented at national conferences in the US and internationally. Mike started Luka Partners LLC in 2017 to focus on evaluation and specialized web services. He remains a co-Principal investigator for the NACK Support Center

Yawen Li



Associate Professor
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Lawrence Technological University

Dr. Yawen Li is an associate professor in the Biomedical Engineering Department at Lawrence Technological University (LTU). Her research interests are in biomaterials, tissue engineering and MEMS. Since joining LTU, she has created and taught a variety of courses including Biomaterials, MEMS, MEMS Lab, Tissue Engineering, Tissue Engineering Lab, Biotransport, and Intro to Nanotechnology.

Barbara C. López



Program Manager for the Support Center for Microsystems Education
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University of New Mexico

Barbara López is a Research Engineer at the University of New Mexico and has been working for the Southwest Center for Microsystems Education since its inception in 2004 as a curriculum developer, instructional designer, and instructor.

Currently, Barb is the Program Manager for the Support Center for Microsystems Education and a PhD student in the Organization, Information, & Learning Science department at the University of New Mexico. She has a B.S. and M.S. in Mechanical Engineering and has 10 years industry and government experience.

Nancy Louwagie



Chair, Engineering Technology Programs
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Normandale Community College, Bloomington, MN

Chair of the Engineering Technology Programs Department at Normandale Community College in Bloomington, MN. I have been chair of the department for seven years and an instructor at Normandale for 14 years. Prior to Normandale, I worked as a Quality Assurance Engineer at a medical device company. Normandale's Engineering Technology Programs Department offers two AAS degree programs: (1) Computer Technology and (2) Vacuum and Thin Film Technology. Normandale's Vacuum and Thin Film Technology program has received three NSF-ATE project awards. I am the PI for the currently funded NSF-ATE DUE #1700624 DELIVER project.

Abe Michelen



Managing Director & Co-PI of Northeast Advanced Technological Education Center (NEATEC)
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Abe is the original awardee and the Managing Director and Co-Principal Investigator (Co-PI) of the Northeast Advanced Technological Education Center (NEATEC). He is a retired professor of Electrical Engineering at a local college in Troy, New York, where he taught courses on semiconductor manufacturing, nanotechnology, electromechanical systems and analog and digital electronics, among others. A graduate of Rensselaer Polytechnic Institute Abe is the author of two textbooks and of many technical conference papers. He is a senior engineer at IEEE GlobalSpec, where he manages databases of semiconductor, photovoltaic and software products, and regularly publishes technical articles on IEEE publications.

Gary J. Mullett



Professor
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Gary J. Mullett, a Professor of Electronics Technology and Co-Department Chair, presently teaches in the Electronics Group at Springfield Technical Community College (STCC) located in Springfield, MA. Since the mid-1990s, he has been active in the NSF's ATE and CCLI programs as a knowledge leader in the wireless telecommunications field. His current interests are: the development of novel and innovative systems-level approaches to the education of technicians, applications of the emerging field of wired and wireless networked embedded controllers and sensor/actuator networks, and cyber-physical system applications in the context of the Internet of Things (IoT).

Mike Opp



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Mike Opp is the Vice President of Academic Affairs at Dakota County Technical College in Rosemount, Minnesota. He has worked with Nano-Link and NSF since 2003 when he was the college's Dean of Transportation and Industry. He has an automotive service diploma, bachelor's degree in Vocational Technical Teacher Education, and a doctorate in Adult and Higher Education.

He worked as an automotive technician and automotive technology instructor in South Dakota, a state supervisor for trade and technology education in Washington state before moving to Minnesota.

Dr. Matthias W. Pleil



Principal Investigator – SCME
Research Professor and Lecturer
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Matthias Pleil, Ph.D. is the Principal Investigator for two NSF funded centers, the Southwest Center for Microsystems Education (2004-2018) and the Support Center for Microsystems Education (2017). He is a University of New Mexico Research Professor and Lecturer (Mechanical Engineering) and Cleanroom Manager (MTTC). He teaches several engineering courses and promotes micro and nanotechnology. He has been a faculty member at Central New Mexico Community College in both the Schools of Applied Technologies and Math, Science and Engineering (MSE). He has 12 years of experience in Semiconductor Manufacturing Engineering from Texas Instruments and Philips Semiconductors. Dr. Pleil received his Ph.D. in Physics in 1993 from Texas Tech University, where he completed original research on Time-Resolved Fluorescence Spectroscopy.

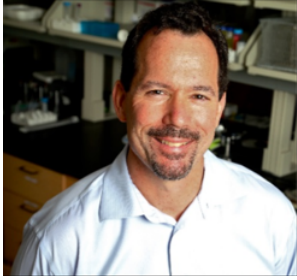
Salahuddin Qazi



Professor Emeritus
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State University of New York Polytechnic Institute at Utica, New York

Sala Qazi is a Professor Emeritus at the State University of New York Polytechnic Institute at Utica, New York, on whose faculty he served for nearly 30 years. After retiring and relocating to Maryland, he formed an LLC (NS Technological Consultant) to consult in technology and higher education. During his tenure at SUNY Poly, he was chairman of the EET department, coordinator of photonics program and Director of the Master of Science program in advanced technology, which he helped to develop. Professor Qazi earned his Ph.D., degree in Electrical Engineering from University of Technology, Loughborough, U.K.

Stephen E. Sadow, PhD



Professor of Electrical Engineering
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Dr. Sadow's research interests are to develop wide-bandgap semiconductor materials for biomedical and MEMS/NEMS applications. His group has demonstrated the compatibility of 3C-SiC to numerous cell lines and in-vivo in two animal models. His prior expertise was in the growth of SiC epitaxial films on Si substrates. Presently he is pioneering the use of SiC for biomedical applications, having demonstrated that 3C-SiC is both bio- and hemo-compatible. His group has demonstrated several advanced biomedical devices, such as microelectrode arrays (MEAs), neural probes, in-vivo and non-invasive glucose sensors, and impedance-based biosensors.

Jim Schifley



CTE Administrator
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Cattaraugus-Allegany BOCES, Western New York

James Schifley is the CTE Administrator for Curriculum for Cattaraugus-Allegany BOCES, a Career and Technical Education school in Western New York.

After ten years as a CAD Technician, designer, and inspector for an environmental engineering firm, Mr. Schifley joined CA BOCES in 1995 as a CAD instructor for 14 years. The curriculum was changed to Project Lead the Way which he taught for seven years. Mr. Schifley has an Associate's degree in Drafting, a bachelor's Degree in Technical/Vocational Educational Studies, and a Master's in Educational Leadership. He has led the Nanotechnology initiative at CA BOCES since its inception in 2014.

Pallavi Sharma



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Pallavi Sharma is a Ph.D. student in Mechanical Engineering Department at University of New Mexico. She received her M. Tech and Bachelor of Engineering in Mechanical Engineering from National Institute of Technology, India. She is currently a Research Assistant for the SCME.

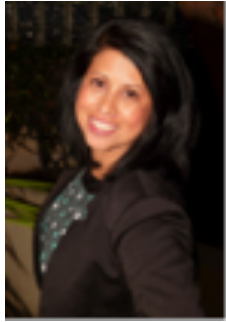
Quinn Spadola



Educator and Outreach Coordinator
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Georgia Institute of Technology.

Quinn Spadola is a biophysicist who discovered her love of science education and outreach while completing her PhD at Arizona State University. Afterward, Dr. Spadola attended Montana State University's Science and Natural History Filmmaking MFA program. She became an AAAS Science and Technology Policy Fellow in the National Nanotechnology Coordination Office in 2014 and then joined the staff there as Education and Outreach Coordinator, and Technical Advisor to the Director in 2016. She is now Director of Education for the National Science Foundation-supported National Nanotechnology Coordinated Infrastructure and its Southeastern Nanotechnology Infrastructure Corridor site at the Georgia Institute of Technology.

Anna Tanguma-Gallegos



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SFAz Center for STEM @ASU
Research Program Manager
Community College STEM Pathways

Anna Tanguma-Gallegos brings 10 years of STEM strategic planning and program management experience in higher education environments and initiatives. Anna has a history of promoting and increasing enrollment in the programs she manages, as well as developing collaborative relationships with corporate and community members. In her role at SFAz Center for STEM @ASU Anna, specializes in various aspects of recruitment within the NanoTechnology field.

Ray Tsui



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Arizona State University

Ray Tsui is the Education and Outreach Coordinator for the Nanotechnology Coordinated Infrastructure Southwest. Based at Arizona State University, the NCI-SW is the southwest regional node of the National Nanotechnology Coordinated Infrastructure (NNCI) funded by the National Science Foundation. During the summer, the NCI-SW offers non-residential programs in Research Experiences for Undergraduates (REU) and for Teachers (RET). The NCI-SW is also a member of the Remotely Accessible Instruments for Nanotechnology (RAIN) Network that offers online access to advanced microscopes and analytical instruments. Prior to joining ASU, Ray was a Fellow of the Technical Staff at Motorola Labs where, over a period spanning three decades, he was actively involved in the fabrication and study of nanostructures for advanced electronic devices and systems. Ray received B. S. degrees in Physics and Electrical Engineering from Washington University, St. Louis, and a Ph. D. in Electrical Engineering from the University of Southern California.

Rick Vaughn



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Rio Salado College

Dr. Rick Vaughn holds a Ph.D. in Mathematics from the University of California, Davis where he specialized in Topology and Geometry. His dissertation is entitled "*Planar Soap Bubbles*". After 13 years as residential faculty at Paradise Valley Community College, he moved to Rio Salado College to be the Faculty Chair for STEM Initiatives. At Rio, he has spearheaded the approval, creation, and development of a unique, hybrid, two-year program in Nanotechnology. A regular contributor

Paul Weber



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Paul is an associate professor at Utah Valley University in Orem, Utah. Originally from Minnesota (B.S., Bemidji State University) he completed his doctorate in experimental particle physics at CU Boulder, he switched over to teaching at the small college and university level. At UVU, he works with thin film deposition, and is a co-PI on a nanotechnology education initiative through an NSF-ATE grant, which will offer its first course in Fall 2019. Recently, he has worked with a student to add UVU's scanning electron microscope to the RAIN network.

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MNT^eSIG

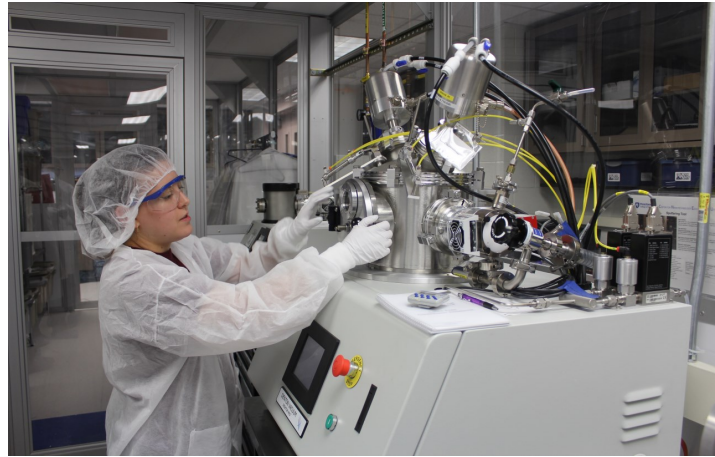
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MNT Centers



The **Nanotechnology Applications and Career Knowledge (NACK) Support Center** has assisted more than 300 post-secondary institutions through guidance in planning and design, instruction at educator workshops, and distribution of adaptable curriculum materials to foster nanotechnology workforce education.

Educator, Student, and Industry resources at:
nano4me.org



NACK, MNT educators, industry and government facilitated the creation of **nanotechnology workforce education standards** as guidance for foundational material for MNT programs. Six standards are published and available via **ASTM International** (www.astm.org):

- health and safety
- infrastructure
- material properties and effects of size
- characterization
- pattern generation
- materials synthesis and processing

Stackable credentials for the MNT workforce:

- are being facilitated by the NACK Support Center and the MNT community.
- are performance-based assessment tests.
- are industry endorsed.
- are to be administered and awarded by ASTM International.

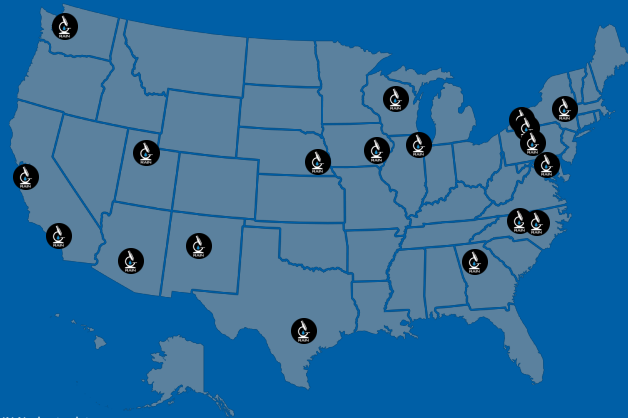


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- Expanding library of remote friendly experiments.
- Growing number of nodes across the nation.
- Efficient outreach / technology interaction tool.
- Enables nation-wide micro- and nano-technology facility networking.
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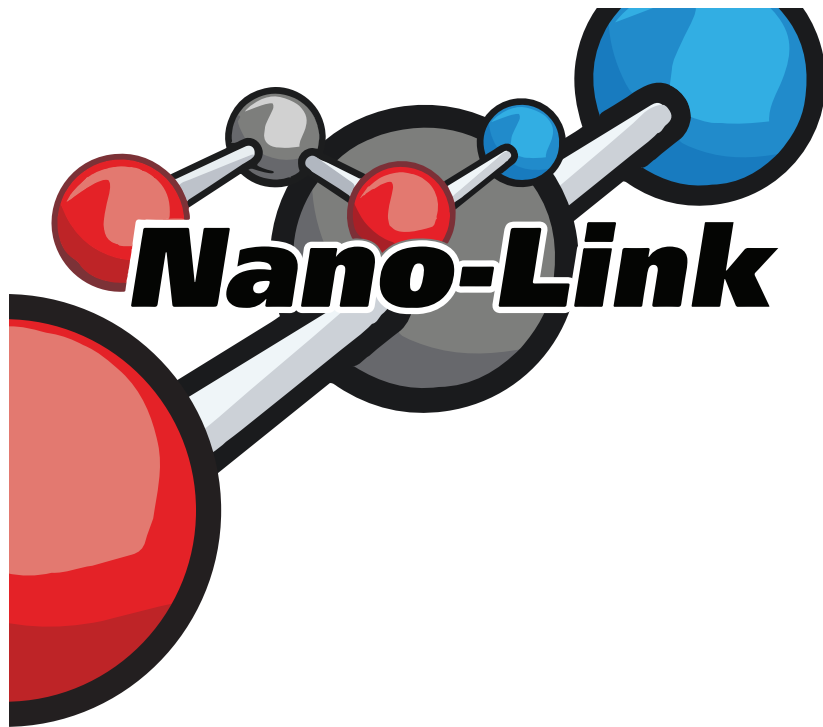
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RAIN Nodes to date:

Arizona State University (AZ) | Cattaraugus Allegany BOCES (NY) | Coppin State University (MD)
 Erie Community College (NY) | Forsyth Technical Community College (NC) | Georgia Institute of Technology (GA)
 Nebraska Nanoscale Facility (NE) | Northcentral Technical College (WI) | North Seattle College (WA—SHINE)
 Oakton Community College (IL) | Pasadena City College (CA) | Pennsylvania State University (PA)
 Research Triangle Nanotechnology Network (NC) | Salt Lake Community College (UT) | Stanford University (CA)
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Regional Center for Semiconductor and Nanotechnology Education

» Partner-based Experiential Learning

» Outreach, Awareness, Recruitment

» Attracting students to STEM careers



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