

Nanotechnology Collaborative Infrastructure Southwest (NCI-Southwest)

NCI Southwest



Intel offers strategic funding for evidence-based, data-driven solutions that promote inclusion of marginalized, and disadvantaged groups.

At its core, the National Nanotechnology Coordinated Infrastructure (NNCI) exists to help scientists and engineers from around the country access the state-of-the-art resources necessary to participate in the nanotechnology revolution.

We build a southwest regional infrastructure for nanotechnology discovery and innovation, to address societal needs through education and entrepreneurship, and to serve as a model site of the NNCI.

www.ncisouthwest.org
Dr. Trevor Thornton



NCI-Southwest Director Dr. Trevor Thornton and Dr. Zach Holman were recently awarded an Intel Mindshare grant to continue their work supporting training opportunities for students enrolled in undergraduate and associate degree programs related to semiconductor manufacturing and characterization. Their proposal, "Broadening Participation in Science and Engineering Higher Education at ASU," aligns with Intel's quest to find and support talented students with a skill set appropriate for semiconductor manufacturing and ambition to become scientists, engineers, and technicians. This ASU NanoFab and AEP collaboration will support Cleanroom Work Experience Internships and Research Experiences for Undergraduates, with emphasis placed on achieving a diverse cohort of REU students and interns to support learning from the broadest perspectives and advancement of knowledge with the most inclusive understanding possible. Unique to this opportunity for students will be the engagement of Intel in offering facility tours, suggesting research project topics, reviewing applications, participating in industry-focused talks, and general support of the student participants' learning. For more details, contact PI Dr. Trevor Thornton.

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Rio Salado College: Nano knows No Limits

With support from the National Science Foundation, Rio Salado College offers certificate programs and associate degrees in manufacturing microtechnology, nanotechnology, and photonics. This hybrid model of online courses and in-person labs at Arizona State University has classes starting every Monday. Pictured here, Rio Salado student Evan is completing his Ellipsometry Lab at the ASU Eyring Center.



NCI-Southwest participates in Az HSI Summit

The AZ HSI Summit is a conference for faculty, staff, administrators, students, and community partners to showcase and exchange evidence-based practices that effectively and intentionally support Latinx students and build capacity among faculty & staff to teach and lead at HSIs. It also creates opportunities for networking and community building across AZ HSIs and Emerging HSIs.



NNCI Funds Graduate Student Research

Evangeline Amonoo graduated from the University of Ghana with her undergraduate degree in materials science and engineering before beginning her graduate studies at Arizona State University in materials science and engineering. With a research focus on creating electrical devices on diamond, Evie is excited to explore the creation of high-power electronics like fast-switching diodes and high-frequency devices that can be used in the aerospace and semiconductor industry.



2022 Colloquia Series

iMIRA! materials science research & diversity center partners with NCI-Southwest and APMS to bring expert speakers in fields spanning materials science, medicine, physics, chemistry, space science, engineering, and more.

Check out current and past speakers by visiting <https://mira.nau.edu/colloquia/>.



Keyence VHX-7000 Microscope for Nanofabrication

Located at ASU's Advanced Electronics and Photonics Core Research Facility, the Keyence is a high-magnification optical microscope with a 4k display, considerable depth of field, and up to 6500x magnification. With a motorized XYZ stage, it can auto-focus and allow for fiducial alignment, ideal for inspecting a specific cell or die on a wafer. The Z stage allows for in-focus images of samples with topology, and omnidirectional lighting data is captured at the click of a button. To learn more, visit <https://cores.research.asu.edu/nanofabrication>.

SEED Funding Grants

The NCI-Southwest supports external users of the NanoFab and Eyring Materials Center. If you are a potential new user from a university or small business you may be eligible for a Seed Funding grant. To learn more, visit <http://ncisouthwest.org/seed-grants/>



NCI-Southwest is now on LinkedIn.
[linkedin.com/company/nci-southwest](https://www.linkedin.com/company/nci-southwest)



Broadening Participation in STEM through Education & Outreach

NCI-Southwest supported Maricopa County Supt Steve Watson's office with recent teacher professional development initiatives during Az Bioscience Week. Using the Educator PRO Connect platform, the experience brought awareness to college and career pathways in nanotechnology and nanomaterials engineering.

EDUCATOR PRO CONNECT

Help guide students towards their future careers with the new, free platform that matches teachers with industry professionals—
EducatorPROConnect.org

Dr. Raj Chakraborty, General Manager for Laser Components Detector Group, shared how significant advances in modern technology related to optical detection and imaging systems have helped medical professionals unveil novel means of diagnoses down to the cellular level. Dr. Raj Chakraborty commits to continuing his support as a guest speaker in Arizona classrooms through the Educator Pro Connect Platform.



DR. RAJ CHAKRABORTY
LASER COMPONENTS DETECTOR GROUP
LIFE SCIENCES/MEDICINE



DR. REBECCA COOK
INanoBIO

Dr. Rebecca Cook, Research Scientist for INanoBIO, represented the nanotechnology workforce on a Career Panel Q&A during Az Bioscience Week. INanoBIO is one of the NCI-Southwest ASU NanoFab user groups eager to support STEM education by participating in the event.

NCI-Southwest joined Arizona Science Center for the Educate to Innovate Conference to inspire, innovate, and educate Arizona teachers through hands-on kits and remote access to Scanning Electron Microscopy.



NCI-Southwest joined ¡MIRA! for Indigenous Peoples' Day Phoenix Fest organized by Cahokia SocialTech + ArtSpace and held on October 10th to celebrate and honor this nation's First Peoples.



The 2022 STEM & Innovation Summit organized by Scitech Institute was an exciting opportunity to come together as a community to support STEM education, entrepreneurship, and innovation.



10th Annual Winter School on Emerging Technologies: Accelerating Impactful Scholarship January 3-10, 2023

Call for Applications! Deadline to apply is Monday, Oct 24, 2022.

The Winter School will give junior scholars and scientists an introduction to and practical experience with methods and theory for better understanding the social dimensions of emerging technologies. The 2023 Winter School will be focused on the broad notion of impact with an aim to explore ways for participants to increase and diversify the impact of their work. The National Nanotechnology Coordinated Infrastructure Coordinating Office is now supporting the winter school, run by the School for the Future of Innovation in Society at Arizona State University.

What to expect:

This year's program will include a series of interactive sessions with academic scholars to explore a variety of ways in which research can have a positive impact beyond the specific studies involved. During the Winter School, you will be able to exchange and engage with an interdisciplinary community of young scholars from around the World, discussing ways in which your academic work connects to pressing issues about and around emerging technologies. Ample work time and breaks are built into the Winter School schedule to encourage participants to guide their own learning experience throughout the week. Mentorship sessions with attending faculty will also be offered.

Why apply?

The Winter School is an immersive experience for scholars to share their own unique research and learn from peers and experts. The faculty at the Winter School will offer theoretical framings, analytical tools and hands-on lessons in how social science, natural science, and engineering research on emerging technologies can have a greater impact on the world. Participating in the Winter School will enrich your networks and provide ample opportunities to share ideas, collaborate with peers, and develop proposals to enhance the impact of your work.

Who should apply?

Applicants should be advanced graduate students or recent PhDs (post-doc or untenured faculty within three years of completing a PhD at time of application) with an expressed interest in studying emerging technologies such as nanotechnology, robotics, synthetic biology, geoengineering, artificial intelligence, etc. Applicants may come from any discipline and must be demonstrably proficient in English.

Where?

The program will spend its tenth consecutive year at Saguaro Lake Ranch in Mesa, AZ with access to Sonoran Desert hiking, kayaking on Saguaro Lake, horseback riding and relaxing by the Salt River. Check out their website at <http://www.saguarolakeranch.com/>

Program Cost:

The program fees for accepted students will be covered by the NNCI including seven nights at Saguaro Lake Ranch, meals and local transportation from Tempe, Arizona. Participants will be responsible for their own travel to Phoenix, Arizona and should arrive before 1pm on January 3rd.

To Apply:

Visit <https://sfis.asu.edu/events/winter-school/> to access an application and learn more about the 2023 Winter School program.

Participants are requested to be fully vaccinated before they arrive at the ranch.

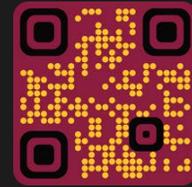
To Learn More, visit:



ASU Core Research Facilities 1st Annual Industry Week is Oct 17-21

ASU's Knowledge Enterprise Core Research Facilities invite you to attend daily seminars hosted by one of our advanced manufacturing, semiconductor, microelectronic, prototype development and materials characterization external user groups.

To register, visit: <https://tinyurl.com/CoreIndustryWeek>



Join Core Research Facilities as they explain unique and new capabilities and interesting projects advancing research and development. While the event will be geared towards industry, all are invited!

Agenda:

Monday, October 17th: **The Instrument Design and Fabrication Facility**

Tuesday, October 18th: **Eyring Materials Center**

Wednesday, October 19th: **Advanced Electronics and Photonics Facility**

Thursday, October 20th: **The NanoFab Facility**

Friday, October 21st: **Solar Fabrication Facility**

Daily talks begin at 12 noon and last 45 minutes.

Topics include equipment and capabilities, how the Core Facilities work with external companies, various staff and faculty projects, and new equipment.

After each seminar, you will have the opportunity to sign up for a 20 minute, private 1:1 session to further discuss how Core capabilities align with your research and development interests.

You will also learn how to sign up for a tour of each of the hosting Core Facilities.

For more information about ASU's Core Research Facilities visit:

<https://cores.research.asu.edu/>

Email: corefacilities@asu.edu

Eyring Materials Center Diana Convey retiring

Diana Convey grew up on the west side of Phoenix with four brothers and a sister at a time when her high school was so crowded that the school day was split into two sessions.



She attended classes during the morning session, which freed up her time to play sports in the afternoons. She played almost every sport offered to female students, with volleyball being her favorite.

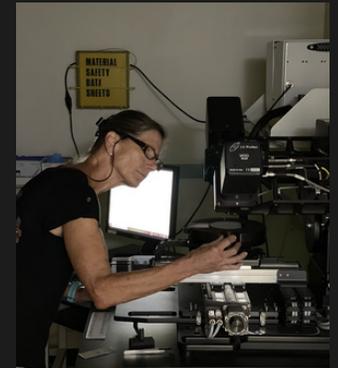
"I started playing sports at a very young age; being an athlete came naturally. In high school, I was voted the top female athlete. But there were very few high school conference sports back then, so we just competed against ourselves within this very large high school. We had what was called the Girls Athletic Association. My dream was to play volleyball at the collegiate level."

By her senior year, Phoenix Union High School District opened Trevor Brown High School, where Diana attended and was part of the first graduating class. While sports remained core to her heart, academics were a priority to her family. After graduating from Trevor Brown, Diana continued her studies at Glendale Community College. While at GCC she played five varsity sports while enrolled in a physical education associates' program. She enjoyed school and was particularly fond of math, but dreamed of a career revolving around athletics. GCC awarded her a scholarship which paid for her tuition and books upon transfer to ASU to continue her degree. After her graduation from GCC, Diana bartended at the Holiday Inn on Apache and Rural to help pay her way at ASU.

"I always considered myself a frustrated athlete. I graduated from high school ahead of Title 9 and the opportunities that were afforded women in athletics and their careers. My dream of playing Volleyball for ASU just wasn't in the cards. My family couldn't afford for me to play club sports when I was younger, which was critical if you wanted the proper coaching and training to be a collegiate athlete. So, when I came to ASU for college, I started focusing more on running, which ended up being a great thing."

It was during her senior year at ASU that Diana discovered teaching sports was not as meaningful to her as playing them. Soon after graduating from ASU, a friend told her about an opening for a job at Motorola. Diana recalls the job being a bit outside of her comfort zone. It was a technician position that centered around technology. But ultimately, she took a chance and started working for Motorola in 1981. By 1982, Diana was married and quickly working her way up the different grades of the technician ladder. She started off in Optoelectronics, learning lithography and wet and dry etching. She recalls her experiences at Motorola's Semiconductor Research Lab on 52nd Street and McDowell, specifically learning to work with gallium arsenide as a faster, brighter, cheaper alternative to silicon.

"I learned by interacting with brilliant people, scientists, and engineers. Everything was exciting in the world of research and development— new characterization techniques and the development of photonics, lasers, and detectors."



Diana was also enjoying success outside of Motorola. She played volleyball with colleagues, joined city sand volleyball teams and at the local parks. She continued running competitively, completing about 20 marathons and ultramarathons combined, and numerous 5, 10, 20Ks and half marathons. Her husband Tom attended the APS Solar & Electric 500 at PIR and became interested in electric vehicles and their future.

"One of our smaller vehicles I used to commute in was a little 1985 Chevy Sprint. My husband converted that Chevy Sprint, which at the time had over 100,000 internal combustion engine miles on it, to a full-electric vehicle. And it was a very clean, custom job. It was great. In fact, so great that I started driving it to work. I then advocated for Motorola to install electric vehicle chargers back in 1992. He and I never thought it would take this long to have electric vehicles mainstream because we'd been encouraging their use for years. The last time I went to a gas station was probably 2016."

Cont.

Diana worked for Motorola for 28 years. In those 28 years, she led her own research and worked on her own projects. Eventually, she was a key member of a small characterization lab and eventually found herself at the top of the technician ladder. But Motorola had no glass ceiling for Diana. They created a position for her to transition to an engineering role.

“At the time, the process for becoming an engineer at Motorola was a bit nerve-wracking for me. I had to step outside of my comfort zone, stand in front of a board of my peers, present my work history, and prove my work was significant enough to be an engineer. But I did it. Training as an athlete prepared me for moments like that.”

A Celebrated career from Motorola to ASU Engineer



As Motorola fell on hard times, Diana found herself to be the last person remaining employed in the characterization lab. Motorola asked Diana to stay on board to help find homes for some of the larger pieces of equipment they still had on-site, the XPS, AFM, SEM, UV-VIS—tools she knew very well.

“Unbeknownst to me at the time, Motorola was also negotiating on my behalf for a job to follow those large, high-priced pieces of equipment. I was very humbled by the fact that they thought that much of me to actually include my skillset in these conversations. Nate Newman, who was the director of the Leroy Eyring Center for Solid State Science, which is now Eyring Materials Center, met me at the lab while I was working. He was interested in transitioning the equipment to ASU. He was also, apparently, impressed by my knowledge and experience with the equipment. And so, I made the transition from corporate to academia. After I left Motorola, I found a home at ASU.”

As Diana adjusted to work at ASU, she trained on and eventually managed newer, state-of-the-art instruments. She supported multi-million dollar research projects that supported students' education. Diana recalls one particular project.

“I was supporting a student working with Prof. Ron Dorn of the School of Geographical Sciences. The student was analyzing how ant secretions broke down the earth. They wanted to use an atomic force microscope to measure the depth of the wearing of calcium silicate rocks. They had to polish and cut multiple rock samples into a size that would fit the microscope. Then, he imaged hundreds of sites on many samples. This is very tedious work. Eventually, we came up with a grid pattern to use on the calcium silicates to make the analysis methodical.”

And while working at ASU, Diana continued running, which she credits for her stamina, energy and focus while on the job.

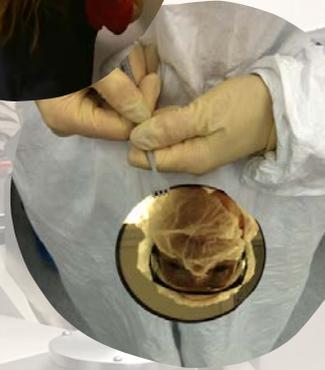
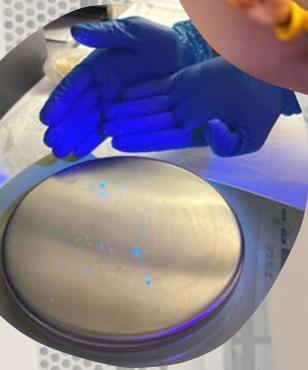
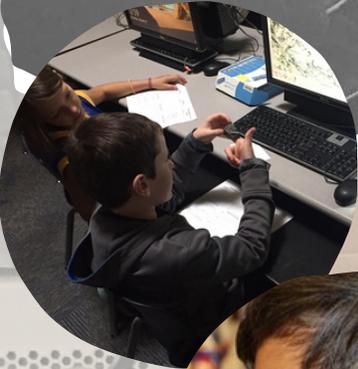
“I brought a lot of discipline to my jobs, even those completely outside my comfort zone. I learned a lot of soft skills through sports and running, and brought these skills to every project that I worked on. Hopefully, I'm sharing that message with the students of ASU when I train them. I learn so much from them, that I hope they feel like I do—like we are learning everything together.”

Today, Diana still trains for races in the scenic mountains behind her home in Laveen, a place that keeps her close to nature. She and her husband maintain their own 1.1-acre property and grow vegetables in their backyard garden. Her principles of sustainable living are important parts of her daily life.



“ASU has removed a lot of the barriers for students. There are so many opportunities for you as a graduate from ASU to use the skills you learn to achieve outside of your perceived academic area or line of work. Expand those skills. And remember what you enjoyed and were good at a younger age, and just go out into the world and pursue those on your own. Never be afraid to go outside your comfort zone. You never know where it will take you. Don't hesitate to bring a little bit of your emotion, that excitement with you to everything you do. I've always lived by that, especially at Motorola. Let your work speak for itself. To expand on that, regarding your work, Matshona Dhliwayo says, “If poor, it will remain silent. If average, it will whisper. If good, it will talk. If great, it will shout. And, if genius, it will sing.” That's the message I share with my students at ASU nowadays. Your soft skills are very valuable. Get excited about what you do. And if sports help you get excited like they did for me, keep playing.”

EXPLORE Nanotechnology



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Classroom Visits

Remotely Accessible
Instruments for
Nanotechnology (RAIN)

Tours of STEM
Research Facilities



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