SUNY POLY

2024-25 Annual Report

OFFICE OF RESEARCH

A Year of Growth, Impact, and Innovation

The 2024-25 academic year was an exciting one for campus research with the creation of the new SUNY Poly Office of Research (OOR), led by Dr. Michael Carpenter, who was promoted last October to Vice President for Research. Forming part of the Strategic Plan's pillar of Academic Excellence, the OOR seeks to support investments across campus that will enable the growth of cutting-edge, multidisciplinary initiatives in research and education.

Soon after its creation, the OOR expanded to welcome Susan Head as Vice President for Research Finance and Business Administration; Sabrina Doré as Grant Writer; and Nicolette Lamascola as Administrative Assistant. Thus, the OOR is primed and ready to support faculty members as they drive forward impactful research that not only enhances our academic community but also contributes meaningfully to society at large.

In January, the OOR signed a partnership with Hanover Research (HR) to increase the quality, volume, and success rates of grant applications. In the first half of 2025, some 40+ faculty members benefited from this partnership through such support as full proposal reviews by HR Grants Consultants, HR webinars, and HR self-paced grantsmanship courses.

With the support of SUNY, we have been able to increase the research capacity of our campus through the development of seed grants. While in Spring '24 we initiated a seed grant program that resulted in 11 awards totaling $441K, in the '24-25 academic year we expanded these efforts to include two rounds of Center seed grants with each Center being awarded between $150-250K. With these funds, 14 Research Centers were established. Each of the Centers was founded with the following objectives: to create a dynamic environment for partnerships; to provide funds to catalyze research, scholarship, and innovation; to streamline and unify diverse faculty and program initiatives; and to cultivate both short-term and long-term visionary levels of research with broad community impacts. We are very excited to see each of these Centers grow towards sustainability and their broad impacts across campus, the Mohawk Valley community, and beyond.

SUNY Poly is gearing up to utilize Governor Hochul's $44 million investment in our campus. These funds will expand the current health sciences wing and update nursing labs in Donovan Hall and help establish a robotics and advanced manufacturing research and education lab. The State investment, through a partnership between Semikron Danfoss and SUNY Poly, will also lead to the creation of a 5,000-sq ft Semiconductor Processing to Packaging Research, Education, and Training Center in the Quad C building. This facility will focus on high quality research programs as well as preparing the future semiconductor workforce. Regarding the changing landscape for federal funding, SUNY Poly's strategy for securing external funding is to continue to submit proposals to federal funding agencies, while also prioritizing non-federal solicitations posted by private foundations, corporations, and other non-government

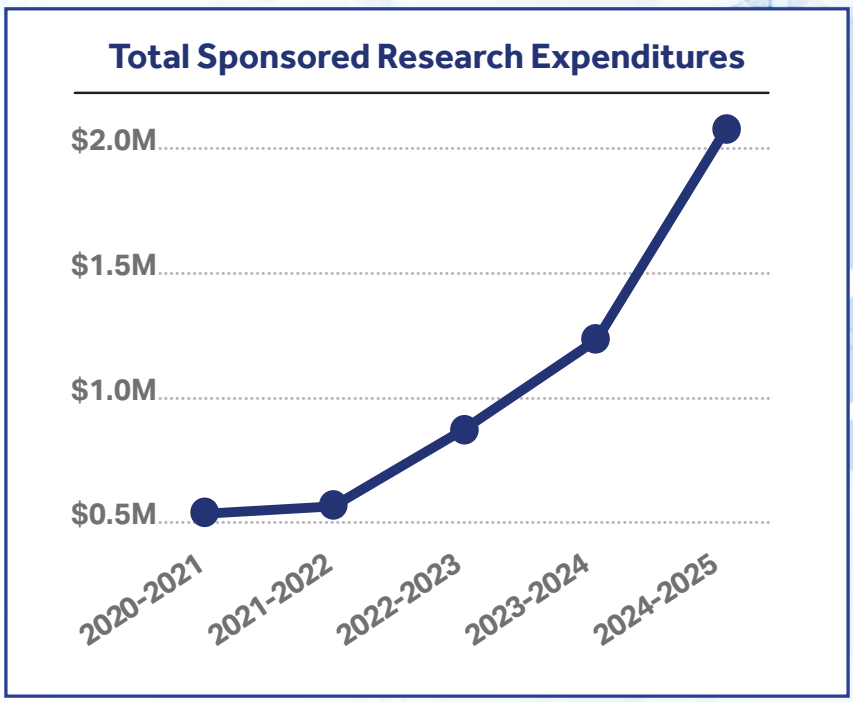
From left, Sabrina Doré, Susan Head, Dr. Michael Carpenter, and Nicolette Lamascola.

entities. With our close connection to Industry, ongoing efforts are aimed at solidifying collaborative partnerships, which entail research and workforce development programs, collaborative lab space and equipment, and internships for students.

The 2025 Student & Faculty Project Showcase was held on April 29 with 45 presentations that included both posters as well as project demonstrations. The event allowed students from the Summer '24 Undergraduate Research Program (SURP) to display their innovative projects to peers, faculty, and local industry partners.

SUNY Poly continues to have an active summer internship program, which welcomes 25 undergraduate students into the research labs of 19 faculty, spanning the College of Engineering, Arts and Sciences, Business, and Health Sciences.

As we wrap up AY 2024-25, the Office of Research commends the campus community for its incredible work and dedication to discovery and research advancement! Combined, there were over 100 scholarly works, 6 technology disclosures, 2 patent filings and 41 proposals submitted by faculty and staff for external funding. The increase in proposal submissions over the years has likewise led to increased research expenditures by 68% for a total of $ 2.1Million in '24-25. The campus has more than doubled research expenditures in the last two years, and given the excellent work of our faculty and students, we are on track to double them yet again in the coming two years. With these strides SUNY Polytechnic is clearly entering a new era of growth as a destination for impactful research programs.



Scholarly Works	2023-24	2024-25
Active Contracts	26	35
Proposals Submitted	42	41
Technology Disclosures	1	6
Patent Filings	0	2

Fourteen New Research Centers to Expand Innovation, Interdisciplinary Collaboration

In a bold stride toward shaping the future of interdisciplinary research, SUNY Polytechnic Institute (SUNY Poly) has launched 14 new research centers over the 2023-2025 academic years. These centers represent one of the most significant research expansions in SUNY Poly's history, supported in part by historic increases in state funding to SUNY campuses. While the development of these centers has been driven by faculty expertise and strategic planning, this enhanced state support has played an important role in making their creation possible.

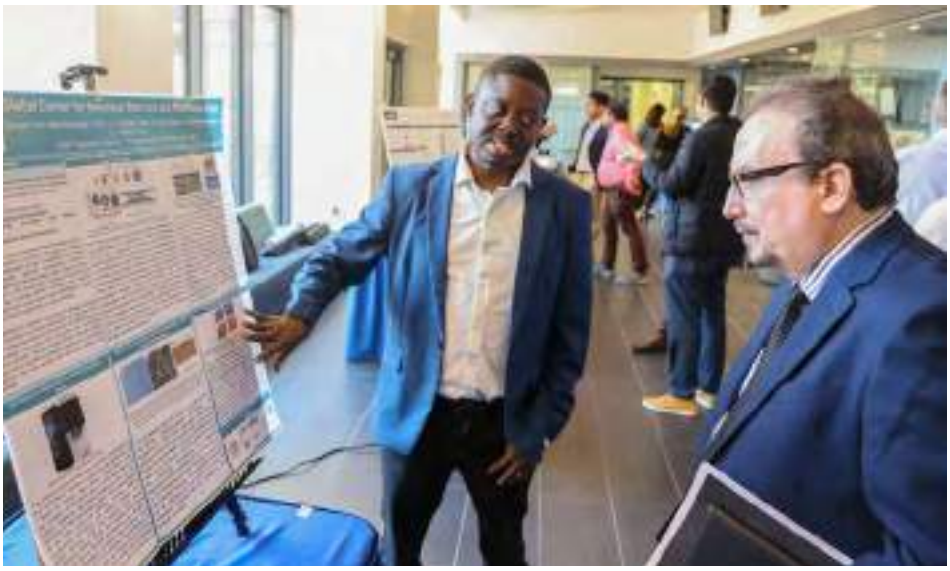
These centers span a wide range of focus areas, from artificial intelligence and semiconductors to health innovation and the arts, reflecting SUNY Poly's commitment to aligning with state, national, and global priorities.

Among the new additions is the **Artificial Intelligence Exploration (AIX) Center**, co-directed by Drs. Steven Schneider and William Thistleton. AIX supports AI research through labs focused on foundation models, user experience, and applications development. Similarly, the **Center for Safe and Secure AI Robotics (CESSAIR)**, directed by Dr. Emilio Cobanera, advances autonomous robotics with a clear emphasis on safety and societal benefit.

In materials and manufacturing, the **Global Center for Advanced Materials and Manufacturing (GCAMM)**, led by President Dr. Wole Soboyejo, connects researchers across disciplines to develop cutting-edge solutions for global challenges. The **Center for Advanced Semiconductor Materials and Devices (CASMAD)** and **Wireless and Intelligent Next Generation Systems (WINGS)**, under the leadership of Drs. Iulian Gherasoiu and Arjun Singh, respectively, are pushing boundaries in semiconductor innovation and terahertz communications.

The **Center for Health Innovations and Humanitarian Engineering**, led by Dr. Joanne Joseph, bridges health sciences and engineering to address pressing physical, mental, and environmental health needs.

SUNY Poly Postdoctoral Researcher Dr. Tabiri Asumadu, left, discusses his research with Dr. Abdullah Eroglu, Dean of the College of Engineering.



Likewise, the **Center for Design, Interdisciplinary Research, Engineering, Art and Media (DREAM)**, headed by Dr. Ana Jofre, infuses the arts into the technological core of SUNY Poly's research, while the **Center for Business and Applied Ethics**, directed by Dr. Jim Staihar, explores the moral dimensions of innovation and entrepreneurship.

The **Center for Smart Infrastructure and Sustainability (CSIS)** and the **Diversity, Equity, Inclusion, and Belonging (DEIB) Research Center**, led by Drs. Zhanjie Li and Byeongdon Oh, respectively, emphasize SUNY Poly's investment in creating sustainable and inclusive futures through research, education, and community engagement.

Building on this momentum, SUNY Poly launched four additional centers in early 2025: the **Applied Electromagnetics and RF Circuits (AE&RFC) Research Center** under Dr. Abdullah Eroglu, the **Center for Cybersecurity Research and Innovation (CCRI)** under Dr. Mahmoud Badr, the **Center for Intelligent Manufacturing (CIM-A2SAP)** under Dr. Jasim Uddin, and the **Center for Nature Inspired Engineering (CNIE)** under Dr. Xinrui "Sarah" Niu.

Members of the WINGS Research Center demonstrate one of the projects they are working on.

Together, these 14 centers are emblematic of SUNY Poly's strategic vision: expanding research capacity, fostering interdisciplinary excellence, and driving innovation for societal impact. With a 119% increase in sponsored research over the past three years, SUNY Poly continues to chart a course as a leader in research, discovery, and innovation.

SUNY Poly Postdoctoral Researcher Dr. Tabiri Asumadu, left, and Dr. Sarah Osafo, right, with SUNY Poly President Dr. Winston Soboyejo.

Coating the Future

New research involving SUNY Polytechnic Institute President Dr. Winston Soboyejo and Postdoctoral Research Dr. Tabiri Asumadu, in collaboration with peers at the University of Ghana and Worcester Polytechnic Institute, has been published in Scientific Reports (a journal from the Nature portfolio). Dr. Sarah Akua Osafo (University of Ghana) is the lead author of the paper, and will be joining SUNY Poly as a postdoctoral researcher later this summer. The study introduces an innovative, eco-friendly method to enhance the performance and longevity of titanium-based dental implants, focusing on improving the biocompatibility and mechanical resilience of Ti-6Al-4V alloy implants using hydroxyapatite (HA) coatings derived from biowaste.

Titanium alloys are widely used in dental implants for their strength and corrosion resistance. However, these materials are bioinert and do not naturally integrate with bone tissue. To address this challenge, the researchers applied a hydroxyapatite coating, a material chemically similar to human bone, through a sustainable process known as pack cementation.

Unlike conventional methods, this approach utilizes waste materials such as bovine bones and eggshells to produce the HA coatings. This not only reduces environmental impact but also offers a scalable, cost-effective solution for improving implant performance. Through advanced testing methods, including scanning electron microscopy (SEM), X-ray diffraction (XRD), and mechanical wear simulations, the coated implants demonstrated enhanced surface strength, improved osseointegration, and greater resistance to friction and wear under simulated body conditions.

The findings contribute valuable insights into the development of next-generation biomedical implants that are both high-performing and environmentally sustainable. By combining natural material recycling with durable coating technologies, this research supports efforts to create longer-lasting, more affordable, and more biocompatible dental solutions.

This project was supported by a SUNY Poly Seed Grant, and sponsored by Assistant Professor of Mechanical Engineering Technology Dr. Jiayue (Joyce) Shen, who will be involved in the next phase of the project, using these coatings to make sensors for disease diagnoses.

Additional authors of the paper include Dr. Desmond Klenam, Precious Etunosa, John David Obayemi, Benjamin Agyei-Tuffour, Abu Yaya, David Dodoo-Arhin and Stanley Chijioke Eluu.

Faculty Feature: Dr. Xinrui (Sarah) Niu

Dr. Xinrui (Sarah) Niu

Dr. Xinrui (Sarah) Niu is a Professor of Mechanical Engineering at SUNY Polytechnic Institute and Director of the Center for Nature Inspired Engineering (CNIE). Her research advances nature-inspired materials and structures to promote wellness, energy efficiency, and environmental sustainability. She investigates the mechanical and physical behaviors of these materials, with expertise spanning smart manufacturing, nonlinear elasticity, and polymer-based composites.

At SUNY Poly, Dr. Niu leads multidisciplinary projects that combine theory with practical innovation. CNIE, founded under SUNY Poly's strategic initiative in Autonomous Advanced Manufacturing, focuses on developing bioinspired materials for applications such as dental technologies, flexible electronics, robotics, coatings, and liquid storage. The center's long-term goal is to evolve into a research and education hub for designing and producing next-generation structural materials through nature-based mechanisms.

Before joining SUNY Poly, Dr. Niu served as a tenured Associate Professor and earlier as an Assistant Professor at the City University of Hong Kong, where she was the department's sole female tenure-track faculty member upon hire. She began her career as an R&D engineer at MicroPort Medical (Shanghai), contributing to the design of biodegradable stents and overseeing a company-wide finite element analysis platform to support endovascular innovations.

Dr. Niu earned a Ph.D. in Mechanical Engineering from Princeton University, an M.S. in Mechanical Engineering from the University of Notre Dame, and both B.E. and M.E. degrees from Tsinghua University in Engineering Mechanics and Solid Mechanics.

She has published over 40 journal articles, authored book chapters, and holds several patents. Her professional service includes editorial work for Scientific Reports, previous leadership roles in the Hong Kong Society of Theoretical and Applied Mechanics, and peer review for more than 40 SCI-indexed journals. Dr. Niu is recognized for her commitment to innovation, collaboration, and advancing engineering solutions inspired by the natural world.

Shaping the Future of Business

SUNY Poly recently announced a transformative $500,000 pledge from New York State Technology Enterprise Corporation (NYSTEC) to support the establishment of a cutting-edge interdisciplinary business center. In honor of this significant contribution, the new center, set to be housed in Donovan Hall, will be named the NYSTEC Business Center of Excellence.

The NYSTEC Business Center of Excellence will serve as a hub for innovation, entrepreneurship, and interdisciplinary education, integrating cutting-edge fields such as artificial intelligence, business ethics, and financial market innovation.

The Interdisciplinary Business Center Campaign has raised $785,000 to date through pledges and gifts from NYSTEC, Steve '06 and Gina '03 Surace, and many other generous supporters. Steve and Gina Surace, co-chairs of this campaign, have made the creation of the trading room within the Center possible through their extraordinary generosity, contributing $100,000 in addition to the substantial support provided by NYSTEC.

Gifts towards the project have also been made by Greg '15 & Maryrose '05 Raab, the Community Foundation, M&T Bank/Partners Trust Bank Charitable Fund, Robert Ablett Memorial Fund, Community Investment Fund, Senator James H. Donovan Memorial Fund, Jerome '75 & Donna Donovan, First Source Federal Credit Union, and Joseph M. Asselta Charitable Trust.

From left, SUNY Poly President Dr. Winston Soboyejo, NYSTEC CEO Kevin Owens, NYSTEC CFO Jasminka Husic, and SUNY Poly VP of Institutional Advancement Andrea LaGatta.

From left, SUNY Poly VP of Institutional Advancement Andrea LaGatta, Gina and Steve Surace, and SUNY Poly President Dr. Winston Soboyejo.

Scholarly Snapshots

Addressing Climate Resilience Through Structural Design

Dr. Ahmed Abdelaal

Dr. Ahmed Abdelaal, Assistant Professor of Mechanical Engineering Technology at SUNY Poly, was recently awarded $397,410 from the National Institute of Standards and Technology (NIST) to lead research on the effects of climate change on atmospheric icing and its implications for structural design standards. The project, conducted in collaboration with researchers from the National Science Foundation's National Center for Atmospheric Research (NSF NCAR), will examine how increased atmospheric moisture and changing precipitation patterns could lead to more extreme freezing rain events, posing new challenges to infrastructure resilience. Of the total award, SUNY Poly received $197,410, and NCAR will receive $200,000 as a sub-awardee.

Using high-resolution climate modeling data from the NA-CORDEX archive, the team will assess historical and projected ice loads on buildings through the year 2100. The research aims to inform national building codes by contributing to the 2028 update of ASCE Standard 7, which will include new guidance on climate-related hazards such as freezing rain, snow, and flooding. This project underscores SUNY Poly's growing role in climate adaptation research and reflects a commitment to addressing real-world challenges through interdisciplinary collaboration. The outcome will help ensure that future structural designs are prepared to withstand a changing climate, protecting communities and enhancing public safety.

Examining Trauma and Social Connection in Psychedelic-Assisted Therapy

SUNY Polytechnic Institute Assistant Professor of Community and Behavioral Health and Sociology Dr. Jarrett Rose is advancing research at the intersection of trauma, memory, and social healing through psychedelic-assisted therapy (PAT). In two recent peer-reviewed publications, Dr. Rose contributes valuable insights into how psychedelics may help address emotional and psychological wounds.

His article in The Journal of Psychedelic Studies, titled "Memory, trauma, and self: Remembering and recovering from sexual abuse in psychedelic-assisted therapy," examines how psilocybin sessions helped two women access repressed memories of childhood trauma. By interrogating the association between traumatic memory recovery, autobiographical narrative, and healing, the study contributes to a better understanding of how psychedelics may offer healing where traditional PTSD treatments fall short.

In Sociology of Health & Illness, Dr. Rose published "From Isolation to Social (and Psychedelic) Integration: A Sociology of Collective Effervescence and Therapeutic Community in Psychedelic-Assisted Therapy." Through interviews and ethnographic fieldwork at a psilocybin retreat, he explores how communal bonding, trust, and shared emotional experiences amplify therapeutic outcomes.

Most recently, Dr. Rose was invited to speak at the 16th Annual California Cognitive Science Conference at UC Berkeley, where he presented on the culture, cognition, and connectedness in PAT.

Dr. Jarrett Rose

In The Field with Dr. McLain

The research of Dr. Adam McLain, an Associate Professor of Biology at SUNY Poly, centers on evolutionary biology and applied population genetics in primates (mainly lemurs), with a particular focus on the small-statured species endemic to Madagascar. His work has significantly contributed to the understanding of lemur biodiversity, including the formal identification of new species such as the Groves' dwarf lemur (Cheirogaleus grovesi).

Dr. McLain spent the first half of summer conducting field research in Madagascar, continuing his long-term efforts to clarify the evolutionary relationships among dwarf lemur populations.

His current project focuses on the Nosy Hara dwarf lemur, a cryptic population whose taxonomic status remains uncertain. Researchers are unsure whether this group represents a distinct species, a subspecies, or a population introduced by humans. Dr. McLain is collecting and analyzing DNA samples to help resolve these questions and determine the evolutionary history and classification of this elusive lemur. His findings may provide important insights into the conservation and management of Madagascar's unique primate biodiversity.

Dr. Adam McLain, Associate Professor of Biology

Student Spotlights

Amna Khan

Amna Khan, a senior at SUNY Poly, is conducting cutting-edge biomedical research at the Masonic Medical Research Institute (MMRI), working closely with Saravanakkumar Chennappan, Ph.D., research scientist in MMRI Executive Director and Director of Research Dr. Maria Kontaridis' laboratory.

This semester, Amna's work focused on a group of genetic conditions known as RASopathies—developmental disorders caused by mutations in the RAS signaling pathway, a key system that helps regulate cell growth and communication.

To investigate how these genetic mutations affect cellular function, Amna uses kidney cells in the lab and introduces fluorescent tags to specific proteins involved in the RAS pathway. These tags allow her to observe protein behavior in real-time under a fluorescence microscope, providing critical insight into how cellular signaling goes awry in individuals with RASopathies. Her hands-on work not only advances our understanding of these complex conditions but also lays the groundwork for the development of future treatments.

Reflecting on her experience, Amna shares that working directly with advanced lab techniques—such as cell culturing, DNA transfections, and live-cell imaging—has been both challenging and deeply rewarding. "It's exciting to see the results of my experiments unfold under the microscope," she says. "Knowing that this work could one day help people makes it all the more meaningful."

Looking ahead, Amna plans to build on the foundational experiments she has conducted this semester by continuing her research through MMRI's Summer Fellowship Program. With a strong commitment to scientific inquiry and a growing set of technical skills, Amna is well on her way to making a lasting impact in the world of genetic research.

Seth Walther

SUNY Poly physics student Seth Walther recently presented his research at the American Physical Society's Global Physics Summit in Anaheim, California—an international gathering of scientists spanning all fields of physics.

Working under the mentorship of Assistant Professor Dr. Shing Chi Leung, Seth investigated how primordial black holes—hypothetical early-universe objects and dark matter candidates—could trigger white dwarf explosions. Using multi-dimensional hydrodynamic simulations, he analyzed the physical changes inside a star during such an encounter, identifying key mass thresholds that could lead to a Type Ia supernova.

Seth's research began through SUNY Poly's 2024 Summer Undergraduate Research Program and continues this year with the goal of a peer-reviewed publication. "This experience has opened my eyes to the scope of physics beyond the classroom," he says. "I'm grateful for the mentorship and excited to keep going."

"Being able to be a part of physics research has greatly strengthened by ability to understand higher-level physics and mathematics, which benefits my engineering classes/career," he added. "Giving a talk at conference level has also helped me become a better speaker and presentation giver and strengthened my writing ability."

Seth, a rising junior, is continuing his research with Dr. Leung as part of the 2025 Summer Undergraduate Research Program.

Bao Do

Recent SUNY Poly graduate Bao Do spent his final semesters immersed in innovative, hands-on research focused on improving accessibility for people who are blind or have low vision. Working alongside Dr. Kristina Boylan, Bao began his research in Spring 2024 with the development of an audio-tactile map designed for the Gannett Gallery. The project aimed to help blind and low vision visitors navigate the space more independently and confidently, combining spatial design with sensory input to increase access to the arts.

Building on this early success, Bao continued his work over the summer as part of SUNY Poly's Summer Undergraduate Research Program (SURP). During that time, the team conceptualized and prototyped two additional tools: the Refreshable Braille Analog Tablet and Transparent Braille Pages. Both were created using campus 3D printing technology and thoughtfully designed to support accessible reading. The Transparent Braille Pages allow braille readers to access tactile text while still seeing visual content (such as images or print) through the transparent surface, often enhanced with contrast-adjusting color filters. Bao led the design and fabrication process for each prototype, translating abstract ideas into tangible, functional solutions using computer modeling and 3D printing.

Reflecting on his experience, Bao said the research not only strengthened his technical and design skills but also confirmed his passion for exploration and problem-solving. "By spending time in the lab, thinking through each challenge, I realized how much I enjoy research," he shared. "This project helped me see how I can apply what I've learned to make a real difference, and it helped me figure out what I want to do next."

Bao will begin graduate studies in mechatronics and robotics at NYU this fall. He was also honored at SUNY Poly's Academic Awards with the College of Engineering Dean's Award, in recognition of his outstanding academic performance and his dedication to research that serves others.

With a strong foundation in accessible design, a clear sense of direction, and a deep curiosity for what comes next, Bao Dao is poised to continue developing technologies that make the world more inclusive… one prototype at a time.

Ryan Primus

Ryan Primus, a recent grad of SUNY Poly's 4+1 BS/MS computer science program, was one of two recipients of this year's Chancellor's Award for Student Excellence. His standout achievement is applying artificial intelligence to next-generation wireless systems.

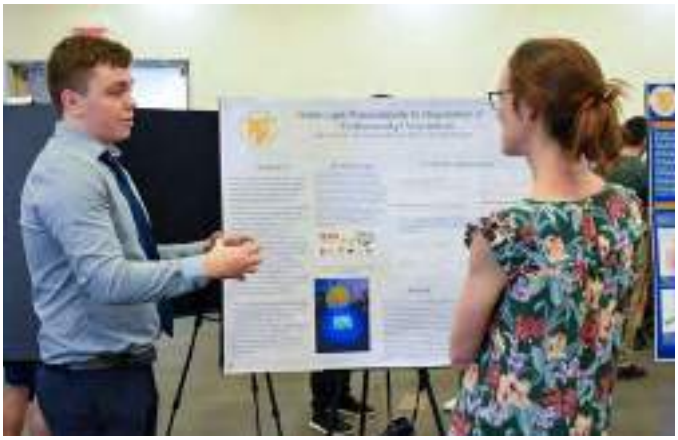
After transferring to SUNY Poly as a sophomore, Ryan found his academic focus in AI and machine learning, leading to a research collaboration with Dr. Arjun Singh, Director of the Wireless Interdisciplinary Next Generation Systems (WINGS) Lab. Their work explores AI-driven solutions for terahertz and 6G communication systems and has taken Ryan to the international stage—including a presentation in Abu Dhabi and an upcoming appearance at ICMLCN in Barcelona.

Complementing his academic success, Ryan has interned at Hinge and Andro, using machine learning to analyze radio frequency signals. Upon graduation, he has started a machine learning engineering internship in NYC. Ryan exemplifies the innovation and drive at the heart of SUNY Poly research.

Faculty and Staff Show Off Research

Over 40 SUNY Poly faculty and staff participated in the Student Faculty Research Showcase on April 29.

Organized by the Committee on Research, Scholarship, and Creative Work, the event serves as a platform for students and faculty from all four SUNY Poly colleges to display their innovative projects to peers, faculty, and local industry partners.



Dr. Rebecca Weldon, right, looks on as a student explains his research.

Ariana Huhko and Noah Breedy show off their project which incorporated computer science elements and pinball.

Dr. Joanne Joseph talks to students in the Community Behavioral Health Program about their research.

Lab for Health and Bioinformatics Launched

The purpose of the Lab for Health and Bioinformatics is to move forward the SUNY Poly Strategic Plan in advancing health sciences and bioinformatics. The Lab's mission is to interact with internal and external biologists and other scientists and assist them in computational data processing and interpretation of their experiments. The unique advantage the in-house lab brings to the school and external actors is maintained interaction with scientists rather than offering a one-time service. They also aim to train graduate students in bioinformatics skills positioning them for success in this area.

Pictured are Dr. Amirhossein Manzourolajdad, left, and Dr. Jerome Niyirora, who are among four directors, including Dr. William Thistleton and Dr. Nic DePaula, that recently launched SUNY Poly's Lab for Health and Bioinformatics.

Introducing SUNY Poly's Wolfspeed Endowed Chairs

SUNY Poly recently announced the exciting news of two faculty members' appointments as Wolfspeed Endowed Chairs. Dr. Mohammed Jasim Uddin has been named the Dr. John Palmour SUNY Polytechnic Endowed Chair, and Dr. Bongmook Lee has been named the Dr. John Edmond SUNY Polytechnic Endowed Chair.

Dr. Mohammed Jasim Uddin

These prestigious three-year appointments are supported through a historic gift from Wolfspeed to establish endowed chair positions, enhancing SUNY Poly's ability to attract and retain top research talent. While maintaining their core faculty responsibilities, endowed chairs receive a yearly research stipend that serves as discretionary research support they manage and administer. In addition to advancing their scholarly work, endowed chairs actively engage with Wolfspeed through events and annual reporting, helping to strengthen this strategic partnership.

Dr. Lee, Associate Professor of Engineering Technology, conducts cutting-edge research in wide- and ultra-wide bandgap semiconductor devices and wearable sensor systems. With over 100 peer-reviewed publications and significant funding from federal, state, and industry partners, Dr. Lee has made seminal contributions to next-generation power electronics, Si-CMOS/memory technologies, wearable sensors and systems, ultra-low power gas sensors, and nanoelectronics. He holds two patents and is a co-founder of Olftech, an innovative startup specializing in sensor technologies. He is a senior member of IEEE and an active contributor to the field through advisory roles and mentorship.

Dr. Uddin, Professor of Mechanical Engineering, has a distinguished record in materials science and engineering. With more than 90 ISI-indexed journal publications, four Unites Patents, and over $20 million in research funding, Dr. Uddin's research focuses on sustainable technologies, including semiconductor

Dr. Bongmook Lee

nanomaterials manufacturing, solar energy, green energy solutions, and biomedical sensors. He has mentored dozens of undergraduate and graduate students, four postdoctoral scientists, and served in leadership roles at previous institutions. His extensive editorial contributions to major journals, including Nature publications, reflect his international standing in the scientific community. He was recently awarded as an Editor of Distinction with the journal of Nature Scientific Reports.

From left, Dr. Mohammed Jasim Uddin, Jim Oerth, Dr. John Edmond, Dr. Winston Soboyejo, and Dr. Bongmook Lee

Examining the Impact of 'STEM Immigration' on Inclusive Workforce Development

Dr. Byeongdon Oh, Assistant Professor of Sociology – Social Justice & Change and Founding Director of the Diversity, Equity, Inclusion, and Belonging (DEIB) Research Center at SUNY Polytechnic Institute, has published a study exploring how immigration intersects with race and gender diversity in the U.S. STEM workforce. The article, titled "STEM Immigration and U.S. STEM Workforce Development at the Intersections of Race/Ethnicity, Gender, and Immigration Status," appears in the journal Socius: Sociological Research for a Dynamic World.

In this study, Dr. Oh introduces the concept of "STEM immigration," which refers to the increasing influx of foreign-born individuals entering the United States to pursue STEM degrees or careers. Facilitated by policies like Optional Practical Training (OPT), H-1B visas, and pathways to permanent residency, STEM immigration has become a significant driver of U.S. workforce development. His analysis—based on a nationally representative dataset—reveals that immigrant men and women from non-White racial and ethnic backgrounds are as likely or more likely than their U.S.-born White counterparts to hold STEM degrees. However, disparities by race and gender are more pronounced among immigrants, especially among the 1.25th generation, referring to those who complete their K–12 education abroad before entering higher education in the U.S. The findings underscore the limitations of social interventions that have focused narrowly on U.S.-born individuals in efforts to foster a more diverse and inclusive STEM workforce.

Looking ahead, Dr. Oh plans to expand this research by analyzing nationally representative statistical data and conducting in-depth interviews with STEM workers at SUNY Poly and other institutions. The goal is to gain a deeper understanding of the nuanced barriers and experiences within STEM immigration and its impact on U.S. STEM workforce development.

Dr. Byeongdon Oh

AI in Action

Since the launch of SUNY Poly's Artificial Intelligence Exploration (AIX) Center, Co-Directors Dr. Bill Thistleton and Dr. Steven Schneider have fostered community collaboration, engaging with internal and external stakeholders about their use of AI and how the center can be a resource for them.

Overall, AIX focuses on driving artificial intelligence (AI) research and practice. They aim to deepen exploration with AI, identify innovative AI techniques and develop practical applications, all while facilitating collaboration across academia, industry, and international partners. The center's three key programs—the Laboratory, the Accelerator, and the Studio—create a continuous cycle of research and development. The Lab works on the creation of scalable AI models. The Accelerator transforms AI theory into practical AI applications. The Studio offers a dedicated space for participants to engage with AI and researchers to explore those experiences.

Dr. Steven Schneider, pictured above, talks with visitors from Upstate Caring Partners.

SUNY Poly faculty and external partners discuss white paper ideas.

Lighting the 'SPARK'

The Office of Research hosted its first SPARK Workshops June 23-26 to strengthen industry and government collaborations, develop interdisciplinary proposals for external grants, and create white papers for major funding agencies. The workshops were attended by more than 50 SUNY Poly faculty members over the 4-day event. During the workshops, 34 participants presented their research and collaboration interests during 5-min. "speed talks"; plenary speakers, from such federal agencies as the National Science Foundation and US Army DEVCOM, shared insight into how to secure funding for future research; and white paper breakout sessions offered researchers time to draft project pitches for interdisciplinary and collaborative research.

Indium Corporation's president and CEO, Ross Berntson, spoke at a dinner that gathered campus researchers and external collaborators from across all disciplines. The Office of Research thanks everybody who helped make the first round of SPARK workshops a success and looks forward to doing it all again in a few months!

SUNY Poly President Dr. Winston Soboyejo speaks to SPARK attendees.

Summer Undergraduate Research Program *(SURP)*

This year, 25 SUNY Poly students are participating in the 10-week Summer Undergraduate Research Program (SURP), which pairs qualified undergraduate students with faculty mentors, providing the opportunity to conduct research across a range of disciplines from artificial intelligence (AI), cybersecurity, biology, mathematics, physics, psychology, engineering, etc. The program, generously supported by the SUNY Chancellor's Summer Research Excellence Fund, SUNY Poly Provost Office, State funding and industry partners, allows students to engage in an innovative hands-on experience. Pictured is the 2025 cohort of students, faculty mentors and President Winston Soboyejo, at the kickoff luncheon.

2025 SURP participants with their faculty mentors and President Dr. Winston Soboyejo.

Ariel Cruz, under the tutelage of Dr. Mahmoud Badr, is focused on a project detecting electronic theft.

Marie- Jinoue Plantin is working with Dr. Pallavi Gupta-Bouder in studying the impacts of PFAS on germination.

Pierre-Alain Gbalou, working with Dr. Shing Chi Leung, is using Python coding to simulate earthquakes and avalanches, predicting when these events could occur.

Vito Valenzano, left, explored smart infrastructure with Dr. Abolfazl Karimpour.

Dr. Singh Awarded Three Major Research Grants

Dr. Arjun Singh

Dr. Arjun Singh, a leading professor of Electrical and Computer Engineering and Director of the university's Wireless Intelligent Next Gen Systems (WINGS) Research Center, has been awarded three major research grants totaling $425,000 to propel the development of next-generation wireless communication technologies.

Dr. Singh is the recipient of a prestigious $175,000 award from the National Science Foundation's Computer and Network Systems Division (NSF CRII: NeTS program) for his solo-led project titled "Deployable Near-Field Sub-Terahertz Communication Systems." This NSF-funded effort focuses on improving wireless link performance at terahertz (THz) frequencies by addressing near-field propagation challenges, such as wavefront distortion, ultra-wide bandwidth management, and the impact of device movement. This is critical for deploying mobile THz systems.

He also received a $50,000 award from the State University of New York's Technology Accelerator Fund (SUNY TAF) to support a groundbreaking project that explores a new paradigm in wireless communication: transmitting information via the wavefront rather than the waveform. Dr. Singh serves as SUNY Poly's Principal Investigator (PI) for this joint project, which is conducted in collaboration with Dr. Jonathan Bird at the University at Buffalo.

Dr. Singh is also part of a $200,000 NSF AI-Planning project, "Collaborative Research: Planning: AI-Ready: DHARMA. AI – Digital Hardware + Analog-RF for Multifunctional Apertures with AI." Led by Florida International University with Northeastern and Princeton as partners, the project will develop an AI-enhanced wireless testbed and is part of the NSF's recent initiative on expanding AI-ready testbeds. SUNY Poly's $30,000 share will support Dr. Singh's leadership in creating a specialized AI expert system—similar to a GPT but trained for near-field THz communication—that will be a resource for researchers nationwide.

Dr. Robert Edgell Presents Aviation and Space Research at AIAA Conference

Dr. Robert Edgell

Dr. Robert Edgell, Professor of Technology Management in the College of Business, recently presented two original research papers at the American Institute of Aeronautics and Astronautics (AIAA) Aviation and Ascend 2025 Co-Conferences, a premier global gathering for advancing aerospace systems, policy, and sustainability. Both papers have now been published in the conference proceedings and are available for public access.

The AIAA Aviation and Ascend Co-Conferences, held earlier this summer, convened leading researchers, engineers, policymakers, and industry experts to explore critical challenges and opportunities shaping the future of aviation and space. Dr. Edgell's work addressed two timely topics, sustainable aviation and the commercialization of orbital space, through a sociotechnical lens.

Research on Sustainable Aviation Presented within the Aviation program, Dr. Edgell's paper, The Future of Sustainable Aviation: Navigating the Sociotechnical Matters of Concern, examines four dominant "Matters of Concern" (Innovating, Operationalizing, Prognosticating, and Synchronizing) influencing the sector's transition toward sustainable operations. Using dictionary-based text analysis of 781 documents, the research maps how these concerns co-occur and interact within a complex system of stakeholder debates. The study proposes a transition-centric Multi-Criteria Decision Analysis (MCDA) framework and underscores the vital role of Public-Private Enterprises in aligning innovation, infrastructure, policy, and public trust.

Research on Space Commercialization Presented within the Ascend program, the second paper, The Early Public-Private Challenge of Commercializing Orbital Space: Comsat-Intelsat and Matters of Concern, investigates the Comsat-Intelsat Network (CIN), the first and only public-private enterprise implemented in outer space. The study identifies four key Matters of Concern—commercialization, stabilization, prognostication, and systematization—that shaped CIN's development. The findings highlight the need for adaptive governance, inclusive coordination, and strategic foresight in structuring future public-private enterprises for cislunar and interplanetary missions.

His involvement at the conference was funded by a seed grant received by SUNY Poly's Sustainable Aerospace Energy Center, where Dr. Edgell serves as PI.


JAMES H. DONOVAN HALL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