



University of
Pittsburgh®

FUELING OUR FUTURE.

Fifth Annual Internal Funding Showcase

SEPT. 18, 2024

11:30 a.m.- 1:30 p.m.

University Club, Ballrooms A and B

Sponsored by the Office of the Provost and the
Office of the Senior Vice Chancellor for Research



HAIL TO Pitt

WELCOME TO FUELING OUR FUTURE 2024

THE INTERNAL FUNDING SHOWCASE

Welcome to the annual University of Pittsburgh Internal Funding Showcase. We congratulate this year's awardees and hope that this showcase helps to give everyone attending a view into the early stages of some of the most exciting and innovative projects unfolding here at Pitt.

Now in their fifth year, Pitt Momentum Funds have awarded \$7.6 million to nearly 200 projects involving faculty from all schools, the regional campuses and collaborators from more than a dozen community partner organizations. Momentum Funds support projects across multiple scales:

- Arts and Humanities Microgrants support projects, fund works in progress or test project ideas in cases where a smaller grant with fast decision making could be transformative. The fall and spring award cycles for microgrants support these rapid decisions. This year, the Mascaro Center for Sustainable Innovation has generously cosponsored two visual arts projects that explore environmental topics.
- Priming Grants support scholarly projects by individuals or small groups of faculty members.
- Teaming Grants support the team formation, strategic planning and building of partner ecosystems essential for the success of large multidisciplinary projects.
- Scaling Grants support the detailed project planning, gathering of proof-of-concept results and reduction of technical risk that positions teams to competitively pursue large, complex extramural funding.

This year, as in prior years, we welcomed proposals related to the Year Of theme selected by the Office of the Provost. Our panel today will showcase three projects aligned with the Year of Discourse and Dialogue theme, with the hope that they will inspire new Pitt Momentum Funds proposals as the Year of Discourse and Dialogue continues through to the 2024-25 academic year.

We also want to highlight the Pitt Seed program, another important source of internal funding. Pitt Seed wraps design thinking, project management training and coaching around nascent projects with the potential for institutional transformation. Included in our showcase is a cohort of semifinalists selected to launch their pilot projects. These semifinalists are now completing their projects and dedicating the remainder of this calendar year to performance metrics and data analyses. Each will be invited to present their scale-up plan and request follow-on funding during the 2025 fiscal year.

We extend our deep appreciation and thanks to the reviewers of all the proposals we received and to the dedicated faculty coordinators for each of the Pitt Momentum Funds tracks. Without their dedication and hard work, these awards would not be possible.

With thanks and best wishes,



A handwritten signature in black ink that reads "Joseph J. McCarthy".

Joseph J. McCarthy
Provost and Senior Vice Chancellor

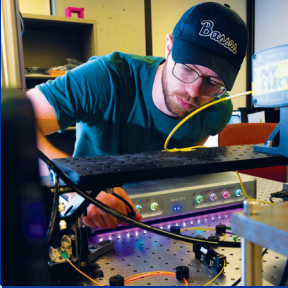


A handwritten signature in black ink that reads "Rob A. Rutenbar".

Rob A. Rutenbar
Senior Vice Chancellor for Research



HAIL TO Possible



AGENDA

Program and Poster Sessions, Ballroom B (second floor)

11:30-11:40 a.m. Welcome to the Internal Funding Showcase

- Joan Gabel, Chancellor

11:40 a.m.-noon Panel Discussion: Year of Discourse and Dialogue

Panelists

- Ricky Burgess: Addressing Workplace Bias through Bystander Training (Priming Grant)
- Michael Lotze: Pittsburgh Deep Learning Triangulum (Teaming Grant)
- Joy Priest: A Black Surrealism (Arts and Humanities Microgrant)

Moderators

- Carissa Schively Slotterback, Dean and Professor, Graduate School of Public and International Affairs
- Clyde Pickett, Vice Chancellor for Equity, Diversity and Inclusion

Noon-12:45 p.m. Poster Sessions

Posters will be presented via six virtual monitors along the outside of the ballroom. Each presenter will provide a three-minute presentation and then have two minutes for Q and A.

Lunch and Networking, Ballroom A (first floor)

12:45 p.m.-1:30 p.m. Reception





Arts and Humanities Microgrants

The Arts and Humanities Microgrants support smaller-scale projects for individual faculty or teams in the arts and humanities. The microgrants are intended to support a variety of research and creative activities in the humanities, specifically to enhance and expand internal funding opportunities for faculty. Microgrants function as a resource to support projects, fund works in progress or test project ideas in cases where a smaller grant with fast decision making could be transformative. Awards are made twice per year for \$3,000 for one year.

FALL 2023

Africanizing Tastes and Consumer Power in 19th-20th-century Southeastern Ghana

Dela Kuma, Department of Anthropology

The work is an ethnoarchaeological and historical book project on the examination of “nkudzedze,” which is the embodiment and indigenous conceptualization of tastes by the people of Amedeka in southeastern Ghana. The last two centuries in Ghana marked a period of extended trade following the 1807 abolition of the Atlantic slave trade, described by historian Robin Law as the era of “legitimate” trade. This era was characterized by the global demand and export of botanical commodities (e.g., palm oil, palm kernel oil), which were provisioned by hinterland economies, including Amedeka. However, hinterland peoples’ active participation and embodied practices were an often-silenced aspect of these encounters. As expected in any form of cultural contact, the socioeconomic exchanges impacted daily life in Ghana at different rates and scales. This project will combine community-based archaeology with local epistemologies as an alternative archive that underscores the embodied practices of local people in forming and maintaining trade networks and will trace the materiality of nkudzedze through the consumption and/or rejection of multiple regional and imported goods excavated from Amedeka to engender socioeconomic practices and problematize the Western lens of taste and knowledge production in Ghana and West Africa.

Authoring Autism in France

Kaliane Ung, Department of French and Italian

Health care professionals and patients at the Excellence Center for Autism in Tours, France, will be interviewed on the new approaches to neurodivergence as part of Emmanuel Macron’s new five-year plan for autism. This fieldwork will contribute to a book manuscript titled “Authoring Autism in France,” which analyzes the literary representation of neurodivergence as well as first-person accounts of autistic patients.

Black Power and the Italian Radical Left

Rachel Love, Department of French and Italian

This project will explore how Black American protest movements provided a rich source of political inspiration for the Italian New Left in the 1960s and 1970s. Information will be extracted from translated works by prominent Black activists, records of visits of Black intellectuals to Italy, films documenting African American movements for Italian audiences and recorded albums.

Black Surrealism

Joy Priest, Department of English

Did the Black Surrealist movement, which emerged among poets in the Caribbean during the interwar period, identify a counterpart in the United States, and, if so, what did it look like? How did the theoretical concerns of Black Surrealism produce formal concerns in the literature? Along the lines of this year's Year of Discourse and Dialogue theme, and according to then Provost Ann Cudd in 2023, this inquiry seeks to "harness the power of differing views and perceptions" within the under-investigated tradition of Black Surrealism, which sought to manifest a new social movement in the aftermath of a global pandemic, climate catastrophe, war and ideological extremism. Funds for this project will support archival research at the Schomburg Center for Research in Black Culture and the New York Public Library, which houses archives for Aimé Césaire (poet and leader of the Black Surrealist movement in Martinique) and other relevant thinkers. This research will produce material for two projects: a poetry collection that employs the themes and craft techniques of this tradition and a collection of critical essays that map a poetic lineage to Black Surrealism, illuminate an attempt by Black poets to make an intervention into climate catastrophes and develop a new poetics.

This project supports the Year of Discourse and Dialogue.

Cruel Girlhood: Violent Practices in Imagining Chinese Schoolgirls

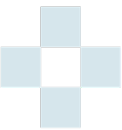
Lidong Xiang, Department of English

This project explores how gender-based violent practices construct and criminalize Chinese schoolgirls' identities across urban geopolitics, making the functions of power visible as demonstrated in restrictions and resilience. By examining culturally significant and intentionally resistant novels and films published between 1992 and 2021, this project illuminates the contested cultural imaginations of Chinese schoolgirls and uncovers perpetuated ideological patterns by connecting the past with the present. Derived from the shaming punishments of the Socialist era, violent practices have evolved into various contemporary forms such as intimate and internalized manipulation, intergenerational oppression of feminine desires and nonnormative behaviors, material and infrastructural violence embedded in bodies and spatial relations. The tension between the idealized view and the stigmatization of Chinese schoolgirls is associated with various and perpetuated violent practices across decades of fantasizing about Chinese girlhood and is integrated into the broader cultural logic and the political climate. Tracing the trajectory of the Chinese schoolgirl figure under different predominantly violent practices since republican China, the archival research contextualizes the literary and visual analysis of newspapers and periodicals discussing schoolgirls, women's autobiographical writings about their girlhood and those written by girls themselves, contemporary children's books and adult novels and cinematic narratives of schoolgirls.

Reclaiming: 5 x (00:08:46 of Ju Ju)

Michael Sawyer, Department of English

Police violence has proven to be an intractable problem in our society. In the wake of the protest against police violence against Black people in 2020, a sonic exploration composition of the soundscape of this phenomenon was created with multiple Grammy Award-winning jazz musician Nicholas Payton. The sound experiment takes found sound from incidents of police violence that are then paired with a score composed and performed by Payton. The piece in its first iteration is eight minutes and 46 seconds long to mirror the reported time of the murder of George Floyd. The installation runs through five cycles that are improvised/remixed and that allow listeners to experience it differently each time. The exhibit was presented as a work in progress at the Onassis Foundation's ONX Studios in New York City in February 2024 and will be installed for Black History Month in Santa Fe, NM in February 2025 by the city's art council.





Snakes and Psychology in the Archives

Calum Matheson, Department of Communication

How have mainstream academics studied outsider communities that have been pathologized as “extreme” or “crazy”? Psychological studies done on serpent-handling churches navigated the expectations of academic propriety, including neutrality, while studying a sect rendered abject even by other Appalachian Christians, who are themselves stereotyped and sometimes derided in mainstream U.S. culture. In the 1960s, Nathan Gerrard gathered data and composed psychological reports on serpent handling that remain unpublished. Fortunately, they are available, along with his research materials, in two Charleston, West Virginia, archives, one at the University of Charleston and another maintained by the West Virginia Department of Arts, Culture, and History. This project will study these archives for a book project about patterns of language in outsider communities and a spinoff article on the pathologizing aspects of psychiatric discourses that are applied to serpent handlers and other small American religious sects.

The Business of Media Diversity

Elfriede Fursich, Department of Communication

This project delves into the complex intersection of media, diversity and political economy, shedding light on the intentional inclusion of diverse characters in contemporary media content and its commodification. In an era in which the representation of diversity has gained significant prominence, the commodification of such representation warrants closer analysis. Drawing from case studies about cable channels and interviews with media creatives responsible for diversity issues, this project scrutinizes the economic logic of diversity representation in scripts, journalism and advertising. This research seeks to understand how diversity has become a unique selling point, particularly in the context of targeting millennials and younger audiences.

The International Bestsellers Data Project

Sean DiLeonardi, Humanities Division, Pitt-Greensburg

This project offers the first combined quantitative study and critical analysis of the international bestseller, a cultural phenomenon that is key to understanding contemporary literary production. By aggregating monthly bestseller lists in fiction from 45 countries from the last decade (2013-22), the project comprises an original data set of 7,500 titles and at least 76,000 data points. This data set enables the tracing of literary imports and exports; the identification of top international novels and authors of the last decade; and the alignment of these findings with additional information on author nationality, author gender and publisher. While analysts of contemporary publishing demonstrate how the 20th-century process of corporate conglomeration continues to dominate 21st-century literary production, scholars of the contemporary novel have turned their attention to digital media—from Amazon to BookTok—that have upturned traditional publishing practices. This project contributes to both sides of this discussion, clarifying broad trends in multinational publishing that take part when new and old processes collide. By combining data analysis with interviews with industry professionals and traditional literary scholarship, the project maps international networks of literary circulation, clarifying how the novel, even in the digital age, remains central to global popular culture.

The Queer Underground

David Tenorio, Department of Spanish and Portuguese

This project examines two types of videos recorded inside Mexico City's subway stations, namely a dance performance by trans artist Lia Garcia and same-sex cruising by local men. It provides insights into the queer underground, defined as a field of dancing where bodies move across an underground city infrastructure, producing spaces that resist and fade away from neoliberal tactics of sexual commodification. As such, this project contends that touch enacts ways of moving across underground infrastructures, and the overall contribution of this project offers general readers a reconsideration of how queer and trans folk in the Global South enact ordinary risk-seeking practices of playfulness and touch to undo the paralyzing effects of economic violence. Ultimately, the queer underground recalibrates the capacity to feel and build solidarity alongside sexual minorities whose everyday moves are blocked by the attendant aggressions of neoliberal capitalism.

UPJ Theatre Combat Education Initiative

John Teacher, Humanities Division, Pitt-Johnstown

The theater department is a vibrant part of the Pitt-Johnstown campus that supports humanities education. What is the impact of stage combat training upon nonverbal communication characterization and nonverbal storytelling skills? Through this project, stage combat equipment will be purchased and used in independent study by students and faculty to develop new choreography skill sets and concepts. Faculty will obtain certifications in stage combat from the Society of American Fight Directors and bring training and experience back to UPJ students in support of scholarly, creative and artistic endeavors. The project will recruit new students to the department, collaborate with nationally recognized stage combat trainers and bring the public to campus to help develop the project and students.

SPRING 2024

Beyond the Institution

Omid Shekari, Department of Studio Arts

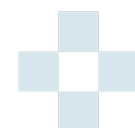
Centrum in Port Townsend, Washington, is a well-known and respected art space. This project provides a two-week residency and exhibition in the Centrum space. During this residency, several artworks will be made and installed. Similarly, the project funds a trip to a three-person exhibition at the Detroit Contemporary in the fall of 2024, curated by Kemuel Benyehudah, the Motown Museum associate curator.

Beyond the Rust Belt: Reinterpreting Labor and Land in the UAG Collection

Alex Taylor, Department of History of Art and Architecture

This project seeks to use works of art to spur new socially and environmentally conscious thinking to recontextualize the intersections of labor and land, investigating artistic images of agricultural and industrial labor through a contemporary lens by considering their underlying implication in systems of human displacement, material extraction and ecological damage. Funding will cover a two-day scholarly symposium and collection-based workshop at the University Art Gallery (UAG). The first day of the event will bring together eight to 10 academics and museum-based practitioners to present new perspectives on labor and land in American art. An object-based workshop will then focus on a neglected group of 44 paintings of Pennsylvania industry and agriculture from the late 1940s, bringing them out of long-term storage so that scholars and students can discuss them and connect with other related local collections. The project will reinterpret key works in the collection through the lenses of sustainability and migration and discuss the often-heroic images of white men taming the earth.

This project is co-supported by the Mascaro Center for Sustainable Innovation.



El Alto: An Aymara City Where Literature and Architecture Meet at 13,313 Feet Above Sea Level

Elizabeth Monterios, Department of Spanish and Portuguese

A concise characterization of El Alto, Bolivia, would be that of a city rich in history, culture and fascinating features such as the Neo-Andean architecture and the emergence of a vigorous Aymara literature written both in Spanish and Aymara language. Until now, however, no studies have yet connected the two art forms that are transforming the cultural landscape of the city: literature and architecture. Funding will cover a three-week archival research trip at three Aymara cultural centers created by young Aymara writers: Casa de las Culturas Wayna Tambo, Centro Cultural Jach'a Tunupa and Centro Cultural de Arte Urbano La Cueva. Archival documentation will be collected and assessed to establish linkages among organizations and activities. Documents relevant to study the intersectionality that literary and architectural art forms have on indigenous thought will be identified and also used to explore how that intersectionality materializes in the daily experience of living in an Aymara city. Interviews will be gathered with Freddy Mamani, the self-taught Aymara architect who created the neo-Andean architectural style, and Rafael Bautista, the Aymara philosopher who articulated an Andean philosophical framework for reading neo-Andean architecture. Findings will be shared at conference such as those of the Latin American Studies Association, Andean Conference of Latin American Literatures and Bolivian Studies Association.

Future Studio: Regional Environmental Justice Interventions

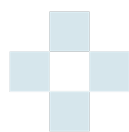
Aaron Henderson, Department of Studio Arts

This microgrant funds a series of workshops and events between Future Studio and residents of Beaver County, Pennsylvania, and East Palestine, Ohio. Future Studio is a project that plans and implements art and design collaborations with local communities. These workshops and events will focus on creative opportunities to build community and raise awareness about the environmental justice issues they are undergoing.

Greater Japan Muslim League and the Making of the Modern Muslim World

Peng Hai, Department of History

When did East Asian Muslims enter the imaginary of the modern Muslim world? In the first half of the 20th century, the expansion of the imaginary of the Muslim world began to encompass not only the traditional Ottoman regions of southeast Europe, western Asia and northern Africa but also the vast space of eastern Eurasia, including China's northwestern frontier and Japan's colony of Manchuria. While existing studies tell the story of Japan's role in early 20th-century Muslim affairs as one of diplomatic intrigue and imperial ambition, not enough credit has been given to imperial Japan's handmaiden role in shedding light on previously little-known Muslim demographics in East Asia. Chinese sources reveal Japan's outreach to Chinese-speaking Muslims after it occupied Manchuria and north China in the 1930s. They also show that the Chinese hajj makers frequently encountered Turkic Muslims from Xinjiang (Uyghurs) on their Middle Eastern trips. This project seeks to reach the origin of Japan's interwar Muslim policy to find out this Uyghur connection. Hosted by Waseda University in Tokyo, the archives of the Greater Japan Muslim League documented everything historians want to know about the scope, scale and details of the operation of imperial Japan's outreach to the different Muslim communities around the world, from North Africa to British India, from Kabul to Harbin. A preliminary examination of the Greater Japan Muslim League's archival catalogue shows that imperial Japan sponsored several hajj-making delegations of Chinese Muslims and Japanese converts as well as Uyghurs. In the meantime, it also sent geological survey teams to Xinjiang to find oil and coal reserves in the Uyghur homeland. A thorough examination of the archival materials will uncover the full extent of imperial Japan's involvement in making the large but variegated Muslim community in East Asia a visible section of the modern Muslim world.



Greenways

Sarah Moore, Film and Media Studies Program

Through videos and photographs, an ongoing project that documents and tells the story of golf courses that have been rewilded across the country will be expanded. Funding will cover travel to Ohio, New York and eastern Pennsylvania to film and photograph in a handful of protected green spaces that used to be golf courses. As local and national attention continues to focus on sustainable initiatives, these golf course transformations will provide a moment of hope and will highlight the hard work that goes into saving local land.

This project is co-supported by the Mascaro Center for Sustainable Innovation.

Player Computer: Gameplay, AI and the Birth of Computational Media

Zachary Horton, Department of English

Player Computer explores the inception and growth of the digital computer (1940-75) and artificial intelligence (AI) as driven by cultural forms of play. While traditional histories of the computer and AI have located their development within the context of wartime innovation, this long-researched project examines a different and surprisingly overlooked influence: gameplay. From economic game theory to most of the early milestones in AI, computing innovation in the 1940s through the mid-1960s followed blueprints of play. This project meticulously traces a new genealogy of computational media driven by archival research into the papers of the principal architects of digital computing and AI. It then examines the general public's encounter with computing and AI in the 1950s to the early 1970s through notions of agonistic play and contests of intelligence in public exhibitions, journalism, cinema and literature. Player Computer argues that the logics of gamified social media and AI chatbots were enabled by the architecture and social imaginary of the computer from its very inception and are actually the end of a long cultural genealogy. Recontextualizing computers as game players points toward strategies from the past to regain agency in this not-so-new cultural game.

The Beautiful Island Beyond the Seas

Michael Meyer, Department of English

Funding supports a general audience nonfiction book about the history of foreign encounters in Taiwan following the route of the first American expedition on the island, circa 1867-74. By following in the footsteps of Charles Le Gendre, the book highlights the major events over the past 150 years and the elements of the island's geography and culture that have changed or remained the same.

The Cathedral of Learning: A New Vision for the American University

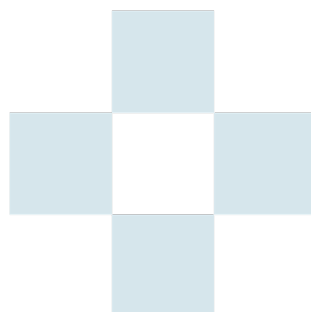
Christopher Drew Armstrong, Department of History of Art and Architecture

In September 2026, the University of Pittsburgh will celebrate the centennial of the groundbreaking of the Cathedral of Learning. Connected to the milestone, this project funds a scholarly book project that will place the Cathedral of Learning and the University of Pittsburgh into larger national and global contexts of architectural thought and university history in the period between the world wars. The starting point for understanding the Cathedral of Learning and the Nationality Rooms that it houses are the industrial and immigrant histories of the greater Pittsburgh region and the aspirations of the University following World War I to shape a better future for its community. The vicissitudes of the design and construction process reveal a range of opportunities and fault lines that contributed to shaping the building and the University. Most striking was the University's commitment to engagement on regional and international scales, bringing both local constituents and far-flung interlocutors into the design and fundraising for the building.

The Fight for Desegregation: Race, Freedom and the Theater After the Civil War

Michelle Granshaw, Department of Theatre Arts

This project presents a new history of desegregation, protest and theater. After the Civil War, the theater became a pivotal site for Black American protest and the reimagining of U.S. life after emancipation. Across the country, Black Americans fought for equal access to the theater. Black Americans' theater fight was inextricably tied to the fight for equal rights across all aspects of U.S. society, but their actions also participated in a nationwide effort to legitimize the public experience of Black pleasure and amusement in everyday life. White supremacist ideology and the negative stereotypes it shaped often equated Black leisure and enjoyment with laziness and, ultimately, criminality. Black Americans challenged ideas of freedom and citizenship linked solely to political rights and worked to shatter negative associations with Black enjoyment. This project argues that the expectations, experience and conventions of theater provided a unique opportunity to push back at segregation and that Black activist actions reimagined Black enjoyment in public spaces. This book also argues how in response to Black Americans' actions, white theater artists, managers and owners reinforced and reestablished racist theatrical practices that continue to shape the institutional structures and expectations of U.S. theater.





PRIMING GRANTS

Priming Grants provide up to \$25,000 per year to support significant and innovative scholarship by individuals or small groups of faculty members at all ranks at the University of Pittsburgh. In constructing each year's portfolio of awards, attention is given to supporting early career faculty and areas where opportunities for extramural funding are extremely limited. Proposals are reviewed in four tracks: Creative Arts, Performing Arts and Humanities; Engineering, Technology, Natural Sciences and Mathematical Sciences; Health and Life Sciences; and Social Sciences, which include the fields of business, policy, law, education and social work.

A Human Skin Model of Tick-borne Virus Transmission

Priscila Da Silva Castanha, Department of Infectious Diseases and Microbiology

Simon Barratt-Boyes, Department of Infectious Diseases and Microbiology

Powassan virus (POWV) is an emerging tick-borne virus of public health concern. Infection can cause severe neuroinvasive disease, with half of the survivors experiencing long-term neurological sequelae. The skin is the primary site of virus transmission following the bite of a POWV-infected tick. However, the early interactions between skin-resident immune cells and POWV remain elusive due to the lack of translational models. This proposal builds on and extends previous work with human skin model systems to investigate the initial events influencing POWV transmission at the host-pathogen interface. The central hypothesis is that POWV infects and exploits skin-resident cells and existing cellular defenses to facilitate viral dissemination in human skin. The expected outcomes are the revealed contribution of each individual cell type within the skin to virus tropism and the identification of early immune markers of POWV infection. These results will provide the basis for future grant proposals centered upon understanding the complex early virus-host-vector interactions critical for the successful transmission of POWV. These studies promise to inform the rational design of potential therapeutic targets against tick-borne viruses of global relevance.

Addressing Workplace Bias through Bystander Training

Ricky Burgess, Joseph M. Katz Graduate School of Business

Rickquel Tripp, Department of Emergency Medicine

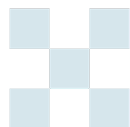
This project seeks to better understand the factors that influence intervention by witnesses of racial discrimination. While scholars have shown that members of stigmatized groups pay a cost for confronting the discrimination that they face (Heckman et al., 2017), there is emerging evidence that bystanders who confront racial discrimination can shift the beliefs of discrimination perpetrators while experiencing less punishment (Czopp, Monteith, and Mark, 2006). To this end, Rickquel Tripp and Emilia Diego developed the Upstander training to encourage employees to intervene during incidents of discrimination and have delivered the training broadly to both the University of Pittsburgh School of Medicine and UPMC employees and students. The proposed project seeks to evaluate the efficacy of the Upstander training and explore the mechanisms that influence intervention behavior by witnesses of racial discrimination. Specifically, the project explores both immediate and long-term efficacy of the training as well as the psychological and contextual factors through which the training may impact employee behaviors. This project will advance both knowledge about bystander intervention to racial discrimination and efforts at the University of Pittsburgh School of Medicine and UPMC to create a more inclusive workplace climate through meaningful discourse and dialogue.

This project supports the Year of Discourse and Dialogue.

Atomistic Insight into the Interface Atomic Mixing between Substrate and Additively Manufactured Titanium Alloy

Susheng Tan, Department of Electrical and Computer Engineering

This project aims to reveal the interface inter-atomic mixing phenomenon by studying microstructural evolution at the interface of a substrate and an additively manufactured titanium alloy. The project will identify the critical role of the recently developed additive manufacturing techniques for producing high-strength, high-ductility titanium alloys. Advanced electron microscopic characterization techniques, including scanning electron microscopy, transmission electron microscopy and scanning transmission electron microscopy, combined with X-ray energy dispersive spectroscopy, X-ray wavelength dispersive spectroscopy, electron backscatter diffraction and electron energy loss spectroscopy, will be employed to explore two specific phenomena at the micro to atomic scales. These include the chemical composition and microstructure at the interface and the role of manufacturing parameters in refining the evolving duplex microstructure. This research will advance the ability to develop titanium alloys with high strength and high ductility.





Augmenting STEM Education in Rural Sierra Leone

Kuo-Ting Huang, Department of Information Culture and Data Stewardship

Luís Oliveira, Department of Computer Science

Luke Charlesworth, Department of Computer Science

Christopher Kefalos, Department of Electrical and Computer Engineering

Macrina Lelei, University Center for International Studies

This project aims to ameliorate STEM education in Sierra Leone's underprivileged rural communities by introducing remote-learning technologies. Using refined RACHEL (Remote Area Community Hotspot for Education and Learning) devices and solar power equipment, the initiative aspires to mitigate educational resource and funding deficiencies in three rural primary schools: DEC Kabala, Fadugu and Senekedugu. A pilot implementation was conducted in Kabala village in May 2023, establishing the initial framework for deploying these systems and identifying unexpected challenges. A subsequent intervention will feature optimizations in technology and infrastructure for elevated security and efficiency, advancement of technical proficiency among educators and learners through collaborative training modules and the customization of content to amplify STEM learning outcomes. Through academic enrichment, the initiative seeks to empower students with the critical baseline skills they need to become future innovators evoking socioeconomic change for their communities. The objective is to create a replicable model that can be applied to address educational imbalances in similarly resource-constrained communities throughout sub-Saharan Africa, driving forward the broader developmental goals of the region. This project demonstrates the power and potential positive long-term effects of learning technology in combating educational inequality and poverty in Sierra Leone and beyond.

Determining Change Agents: Understanding and Enhancing the Environment for BIPOC (Black, Indigenous and People of Color) in Engineering

Linda DeAngelo, Department of Educational Foundations, Organizations, and Policy

BIPOC faculty are integral to higher education's success yet face persistently hostile, racially charged environments. Encountering microaggressions, tokenism and excessive service demands, they often experience reduced belongingness, retention rates and tenure prospects, notably within STEM disciplines. This quantitative study employs a quasi-experimental design that will use descriptive statistics gauging faculty perceptions of their environment and their readiness to drive equitable change and propensity score matching and regression techniques to uncover specific experiences and institutional factors shaping faculty commitment and preparedness to advocate for diversity, equity, inclusion and belonging (DEIB) initiatives. Surveying BIPOC and white faculty at the top 25 U.S. engineering colleges, this research targets institutions wielding significant influence. With an anticipated 10% response rate from about 7,000 engineering faculty, the sample will enable nuanced analysis by race, gender, rank and appointment type, illuminating the current landscape and strategic intervention areas. The analysis includes an environmental scan and an inferential investigation, leveraging established quantitative methods. This research contributes empirical evidence that promotes DEIB practices in academia, striving for inclusive and supportive academic environment for all faculty. The findings aim to inform actionable strategies to advance equity and inclusivity in higher education.



Dialogue, Discourse and Diversity: Changing Social Judgments through Listening Effort

Marta Ortega-Llebaria, Department of Linguistics

Melissa Marks, Behavioral Sciences Division, Pitt-Greensburg

Scott Fraundorf, Department of Psychology

Teachers and nurses working in the community are likely to encounter varied accents and dialects. Unfamiliar accents often demand heightened listening effort, potentially reducing perceptions of speaker competence. Encouragingly, a 2023 Nature scientific report suggests that increased exposure to such accents decreases listening effort and positively influences judgments of speaker competence, carrying substantial implications for social justice. However, further research is imperative to comprehensively grasp the factors affecting the listening effort necessary for developing effective tools against language discrimination. This project tests two pivotal factors—listeners’ language ideologies and attitudes—and their impact on both perceived and actual listening effort in the context of education and nursing students at the Greensburg campus. These students have limited exposure to nonnative speakers compared to Oakland peers but will serve increasingly diverse populations susceptible to accent-based bias. Funding will go toward elucidating how training influences students’ listening effort, social judgments and the evolution of their ideologies and attitudes while pinpointing which students benefit most from this training.

This project supports the Year of Discourse and Dialogue.

Enhancing Reentry Support Programs through Community-based Participatory Action Research

Aakash Gautam, Department of Computer Science

How can we codesign support structures centered on digital literacy and financial well-being to empower returning citizens (formerly incarcerated individuals) in their reentry journey? Previous research highlighted the multifaceted challenges that returning citizens face during their reentry journey, including support programs that prioritize supervision over service, unresponsive support systems, limited access to resources, financial struggles exacerbated by restricted employment opportunities and technological barriers. Such structural issues call into question society’s ability to truly provide second chances to returning citizens. This project proposes to undertake a participatory action research approach, working with local nonprofits, Pitt’s Community Engagement Centers, educators and returning citizens in designing socio-technical approaches to assist returning citizens in Western Pennsylvania during their reentry journey. Funding is pivotal in enabling close collaboration with community partners in and around Pittsburgh, development of digital tools and accompanying learning materials to bolster ongoing reentry support efforts and evaluation of the approach, laying the groundwork for potential scalability through larger federal grants. The project engages with local organizations and community members and aligns with Pitt’s values and Year of Discourse and Dialogue initiative.

Entrepreneurial Ecosystems and Immigrant Latina/o/x Entrepreneurs

Ashley Gomez, Joseph M. Katz Graduate School of Business

How do Latina/o/x entrepreneurs come to understand, participate in and advance their business ventures within an entrepreneurial ecosystem in a region with an emerging Latina/o/x population? Latina/o/x businesses start at a faster rate across various industries than the national average. Despite the significant economic contributions made by Latina/o/x-owned businesses, they face increased economic vulnerability and encounter unique challenges on their path to realizing their full potential. This study aims to investigate the obstacles and support systems experienced by Latina/o/x entrepreneurs using the entrepreneurial ecosystem as an analytical lens. To gather comprehensive insights, data will be collected from Latina/o/x entrepreneurs and other key stakeholders through in-depth interviews, ethnographic observations and surveys and by analyzing existing archival data. The findings of this study will provide valuable insights to the scholarly community and be used to assess and propose practical solutions for driving social change, promoting inclusivity in innovation and enhancing entrepreneurship opportunities for underserved populations. The project will focus on the Latina/o/x communities in Allegheny County, where the Latina/o/x population grew 80% between 2010 and 2020.

Examining Multidimensional Sleep Health and Stakeholder Engagement to Inform a Behavioral Sleep Health Intervention among Nurses Working Night and Rotating Shifts

Christopher Imes, Department of Acute/Tertiary Care

Paul Scott, Department of Health and Community Systems

Nursing demands long hours of stressful work—often in irregular shifts—that disrupts healthy sleep patterns and places nurses at risk for fatigue and decreased cognitive performance, leading to workplace injuries and medical errors. The innovative Multidimensional Sleep Health (MDSH) framework concurrently examines multiple dimensions of sleep (e.g., regularity, satisfaction, alertness, timing, efficiency and duration). While MDSH represents a continuum of sleep health for everyone, there is a need to define its dimensions further for shift workers. The Transdiagnostic Intervention for Sleep and Circadian Dysfunction (Trans-C) is a behavioral sleep intervention targeting MDSH. A previous pilot study demonstrated that an adapted Trans-C intervention improved MDSH in a non-shift-working sample. This current study will have two phases. The first phase will describe the MDSH of nurses engaged in shift work and include interviews exploring the meaning of the sleep health and its dimensions in the context of shift work. The second phase will work with stakeholders to identify the strengths, weaknesses and alternatives of our existing Trans-C intervention to meet the unique needs of shift-working nurses. This study will provide the necessary data and intervention refinement required to seek external funding to pilot test the adapted Trans-C intervention.

Expanding the Impact of Accessible Open-source Chemistry Software: New Capabilities for Avogadro

Christopher Wilmer, Department of Chemical and Petroleum Engineering

Geoffrey Hutchison, Department of Chemistry

One of the most popular pieces of open-source chemistry software in the world, Avogadro, was created at Pitt by Geoffrey Hutchison and now has more than 2.1 million downloads. Avogadro is an advanced molecule editor and visualizer designed for cross-platform use in computational chemistry, molecular modeling, bioinformatics, materials science and related areas. It offers flexible high-quality rendering and a powerful plug-in architecture. Avogadro is used in high school classrooms and university research labs to pursue frontier problems in all fields of chemistry. It is imperative to expand Avogadro's capabilities to stay relevant with the ever-advancing research frontier. This project adds new features to Avogadro to facilitate the building of complex molecular and materials systems. Most molecular chemistry editors are only practical for building small, simple molecules, and there is a need for tools that can handle larger molecules interacting with complex substrates, other biomolecules or catalysts. Funding will help to develop the necessary prototype features and subsequently submit a strong proposal to the National Science Foundation's Cyberinfrastructure for Sustained Scientific Innovation program.

Exploring Immersive Behavior Vignettes

Elaine Wilson, Education Division, Pitt-Johnstown

Stephan Ohl, Engineering and Computer Science Division, Pitt-Johnstown

Can immersive extended reality (XR) behavior vignettes improve preservice teachers' abilities to observe and correctly identify the functions of behavior? Disruptive changes in society and technology led to an increase in problematic behavior in the classroom. The COVID-19 pandemic amplified these already existing problems. Project activities will include displaying problematic student behavior vignettes to preservice teachers using immersive XR technology to improve their ability to observe problematic behavior, identify the functions of behavior and self-assess their reactions to problematic behavior. This will improve preservice teachers' classroom management skills through a better understanding of the spatial-temporal dimensions of the behavioral aspects of communication in the classroom. Funding will allow for the development of a catalog of behavior in closed agile feedback loops with classroom teachers, behavior specialists, related service professionals and researchers. The catalog will consist of real observed instances of problematic behaviors sampled from classrooms and after-school programs of low-income urban and rural school districts. Workflows will then create three-dimensional versions of behavior vignettes and program software applications for immersive display.



Forward Genetic Screen to Identify Novel Factors Involved in R-loop Formation and Resolution

Anthony Schwacha, Department of Biological Sciences

Andreas Vogt, Department of Computational and Systems Biology

DNA damage is the basis for many types of human disease. One such form of DNA damage, the R-loop, is a stable nucleic acid structure in which transcribed RNA remains abnormally attached to its DNA template. The presence and/or defective repair of this structure leads to DNA breaks and deleterious changes to the genetic code. However, a comprehensive catalog of the relevant cellular factors and a proposed mechanism behind R-loop formation and resolution remains incomplete and controversial, in large part due to the lack of a simple and easily quantifiable R-loop assay. To address this deficiency, a simple assay for R-loop quantitation in living cells (RNaseH-GFP) has been developed. Unlike the current standard R-loop assay (immunofluorescence using the S9.6 antibody), this new assay is compatible with forward genetic screening. This project plans to identify novel genes that modulate either R-loop formation or resolution using high-content imaging. To comprehensively assess the contribution of all genes, the new assay will be used to screen the budding yeast knockout collection, a systematically constructed group of about 6,000 mutants that contain null or conditional alleles of each yeast gene.

Green Chemistry in Undergraduate Research

Manisha Nigam, Natural Sciences Division, Pitt-Johnstown

Matthew Tracey, Natural Sciences Division, Pitt-Johnstown

This project will purchase and integrate an industrial microwave to achieve short reaction times in green chemistry experiments at the University of Pittsburgh at Johnstown (UPJ). An industrial microwave is a form of green technology that will replace traditional heating sources such as hot plates and will be used for undergraduate research. UPJ research laboratories currently do not include equipment of this type, and neither do the other campuses in the area. UPJ is a recent signee of the Green Chemistry Commitment through Beyond Benign, a nonprofit organization dedicated to empowering educators with resources to integrate green chemistry into chemistry education. This project aligns with the Pitt Sustainability Plan and supports the University's commitment to sustainable principles in preparing students to lead lives of impact through a supportive environment-focused approach to learning inside and outside the classroom. An industrial microwave for the UPJ research laboratory will enable the faculty and students to use efficient new ways to implement tenets of green chemistry. This research focuses on green chemistry and sustainability to develop experiments highlighting green chemistry principles, improving synthetic organic reactions with green alternatives and developing new reaction methodologies.

Innovating Small-animal Monitoring for a Sustainable Future

In Hee Lee, Department of Electrical and Computer Engineering

Ecosystem services worth \$130 trillion annually are jeopardized by climate change and human activities. To secure these benefits for future generations, we need effective action. Monitoring wild animal behavior is vital for assessing ecosystem health, especially that of smaller creatures sensitive to environmental shifts. However, current monitoring technology is primarily tailored for larger animals, lacking the capacity to track their smaller counterparts effectively. Therefore, an urgent need exists to create a specialized miniature system for smaller animals. Without this tool, crucial data may be missed, leading to misguided conservation decisions. A long-term objective of this project is to develop highly effective small-animal monitoring systems. The project centers on creating a reliable and energy-efficient semiconductor sensing system for butterflies and frogs, hypothesizing that system reliability can be achieved by optimizing at various levels (circuitry, system design and application). This research represents a departure from conventional approaches, placing a strong emphasis on design optimization to enhance both reliability and energy efficiency. The expected outcomes encompass the development of a novel miniature system catering to butterflies and frogs. These achievements will markedly augment the capacity to gauge the impact of climate change and human activities on ecosystems.



MAPI Study: Linking Neighborhood Violence to Mexican Adolescent Psychological and Immune Health

Andrea Medrano, Department of Psychology

Gabriella Alvarez, Department of Psychology

Violence is considered a global health crisis that particularly affects poor Latin American populations (Human Rights Watch, 2023), yet there is scarce research conducted in the global south in Mexico. Given the pivotal changes in the physiological and psychological development of adolescence, it is crucial to understand the effects of violence exposure as well as factors that may protect adolescents from adverse outcomes to develop culturally informed and sensitive interventions for Latino/as inside and outside the U.S. context. This project is investigating the links between multiple forms of violence in neighborhoods (e.g., community violence, sexual harassment) and Mexican adolescents' psychological (e.g., anxiety, depression, PTSD) and immune health (e.g., markers of inflammation). Drawing from a resilience and strengths-based perspective, potentially protective factors, such as close parent-adolescent relationship, familismo and school belonging, will also be examined. Students (aged 11-18) from two public schools in Uruapan, Michoacan, Mexico, will be recruited to participate in surveys followed by a serum blood draw to assess levels of pro-inflammatory cytokines. This will be the first comprehensive survey-based and biomarker collection study with Mexican adolescents to examine protective factors in the links between neighborhood violence and psychological and immune health.



Measuring Power Outage Frequency and Duration, Assessing the Social and Technical Drivers of Power Restoration Timescales and Predicting Future Power Outages

Fernando Tormos Aponte, Department of Sociology

To what extent are marginalized communities disproportionately burdened with power outages? What are the social drivers and consequences of energy inequality? This project combines NASA's Black Marble data products (satellite images of nighttime nightlights), electric utility data and electricity customer outage self-reports to develop a novel approach to measuring power outage frequency and duration, assessing the social and technical drivers of power restoration timescales and predicting future power outages at neighborhood scales. The project innovates by integrating these distinct Earth science observations to cross-validate, confirm the reliability of, build on the strengths of and address the shortcomings of these data products. This project is designed to address existing power outages and energy inequality data barriers and inform grid resilience investments. This project will achieve its objectives through two key strategies: data integration and scenario optimization. It will integrate diverse sources of power outage data, addressing concerns about underreporting and data transparency. It will identify last-mile outages and their patterns, inform grid resilience investments and analyze the factors affecting outage duration. It will also explore innovative policy solutions to address disparities in government and utility response, ultimately aiming to reduce loss of life, property damage and disruptions to global supply chains.

Measuring the Shear Creep Characteristics of Rocks through Novel Laboratory Experiments

Guanyi Lu, Department of Civil and Environmental Engineering

Recent advancements in subsurface fluid injection, such as carbon dioxide sequestration and enhanced geothermal systems, for global energy transition toward more sustainable futures have emphasized the need for a better understanding of injection-induced stresses and the associated geo-hazards. A critical indicator leading to large-scale earthquakes and seismic events is the shear stress developed in underground fault systems. The frictional behavior of faults in rocks is well known to follow a time-dependent rate-and-state friction law in response to the shear stress acting on the fault plane. However, the time-dependent anisotropic creep characteristics of the rock matrix, which transfers significant stresses from the sources of tectonic movements (or human-related activities) onto the fault planes, remains underexplored. This project aims to develop a novel laboratory setup for measuring the creep behavior of rocks subjected to sustained pure shear stresses. The test data will be used to determine the anisotropic creep properties, thereby advancing the understanding of subsurface stress evolution as a precursor to seismic events. Moreover, by integrating the time-dependent behaviors of both rock mass and fault planes, our revolutionary test results will largely enhance the prediction of fault slip and its seismic risks during naturally occurring and human-related earthquakes.

Mental Health and Community Health Workers' Performance

M. Yasir Khan, Department of Economics

Community health workers provide preventive services to mothers and children in resource-scarce and difficult environments in rural Pakistan. As a result, many workers are stressed and unable to perform to their full potential. This project studies whether providing psychological support through an intervention developed following the Problem Management Plus approach of the World Health Organization can help workers improve their mental well-being and whether that translates into better performance on the job. The intervention will be delivered as a mix of in-person and phone call sessions, keeping the lessons from this pilot relevant for low-resource settings. Randomly selected households will be surveyed to collect information on the performance of workers to construct outcome variables. The project will be implemented as a pilot and, depending on the results, be scaled up in partnership with the Department of Health in Pakistan.

Models of Different Time Scales and the Importance of Time Synchrony in Ecology

Sabrina Streipert, Department of Mathematics

This proposal aims to develop a mathematical theory to investigate the dynamics of interacting processes that operate on different time scales. As of now, the modeling of interacting processes requires consistency of the time domain across processes. For example, a system of differential equations describes all modeled processes continuously, and a system of difference equations describes all modeled processes discretely. There are several reasons for choosing one modeling framework over the other, including model complexity and accuracy, data availability, computational benefits, modeling purpose, etc. What if interacting processes suggest different modeling frameworks? That is, what are the effects of two interdependent processes, where one is modeled discretely and the other is modeled continuously? This proposal's scope is to develop a mathematical theory that enables the modeling of intertwined processes on a mixed time domain, which will answer questions like the above. The proposed mathematical theory will provide a modeling framework to investigate, for example, environmental changes on species using tractable mathematical techniques despite the nonautonomous model structure. It is also the first step toward investigating time synchrony of species within an ecosystem and derive a corresponding intrinsic, species-dependent time resilience measure.

Racial Bias Impacts on Mental Health: Can Child Media Representation Help?

Claire Duquenois, Department of Economics

Can child media reduce peer prejudice and foster better mental health for minority populations? The representation of minority characters and egalitarian minority-white interactions on "Sesame Street" was distinctive in the mass media landscape of 1969, when it started airing. This project will explore the effects of early childhood exposure to "Sesame Street" on adult mental health. By exploiting both technologically induced variation in broadcast reception and cohort variation in exposure, this project will provide the first causally identified evidence of the mental health impacts resulting from a reduction in prejudice in an individual's environment. Preliminary results show that white preschool-age children exposed to "Sesame Street" exhibit reductions in their implicit biases as adults and that exposure to "Sesame Street" had important impacts on adult mental health with differential effects by race. The restricted-use Behavioral Risk Factor Surveillance System and the National Health Interview Survey will be acquired to fully explore these early results. While numerous psychological and medical studies have shown a strong correlation between racial discrimination and poorer mental health (Williams et al., 2019; Paradies et al., 2015), there is a pressing need for causally identified research that employs quasi-experimental methods to explore the mental health impacts of changes in exposure to racial biases.



The Creation of a Reliable and Valid Cross-cultural Religious Fundamentalism Scale

Russell Phillips, Behavioral Sciences Division, Pitt-Greensburg

Michael Lucci, Natural Sciences Division, Pitt-Greensburg

Bryan McCarthy, Humanities Division, Pitt-Greensburg

During the Year of Discourse and Dialogue, in order to better understand growing conservative religions across the world and their influence on politics, it is worth asking what the aspects are that make up religious fundamentalism/nationalism, what items are best contained in a reliable and valid scale of this construct and what the correlates and potential causes of this phenomenon are. This research builds on the lead investigator's peer-reviewed publication reviewing existing fundamentalism measures, theory and research and initial empirical studies carried out with expert and college student samples. The project endeavors to assess fundamentalism and its correlates in community samples across cultures and religions (Indian Hindus, Turkish Muslims and American Christians), with the goal of creating a measure of religious fundamentalism that is more complete and less biased than existing measures and that is relevant across cultures and religions. It also aims to identify causes and implications of fundamentalism. Research findings may be published in leading peer-reviewed social science of religion journals, helping to better understand right-wing conservative religions in order to improve dialogue with such groups.

This project supports the Year of Discourse and Dialogue.

Understanding Death in the Andes: Indigenous and Western Conceptions of Life, Death and Religiosity, 16th-21st Centuries

Elizabeth Monasterios, Department of Spanish and Portuguese

Gonzalo Lamana, Department of Spanish and Portuguese

This project explores Andean ideas and practices about death vis-à-vis Western philosophical traditions. Iberian accounts of the conquest and colonization of the Inca Empire abound in descriptions of Andean religiosity and dead-living interactions. Early modern clergymen and chroniclers repeatedly pointed out that the most notable thing in this part of the New World were the funerary customs and the love with which the dead were treated, as if they were still alive. Fascinating and disturbing, these practices challenged Christian theology and politics. The project recovers these baffling practices in terms of ontological questions that continue to challenge the legacy of the Enlightenment's humanism. The project builds on extensive scholarship on Andean ontologies and uses recent findings and analysis of a never-before-seen colonial manuscript about death in the Andes to provide a strong foundation upon which to embark on this project.



TEAMING GRANTS

Teaming Grants, which provide up to \$60,000 per year, support the formation of new multidisciplinary collaborations to successfully pursue large-scale extramural funding. Team- and community-building activities may include inviting external speakers, creating a working paper series and organizing a workshop. Teaming Grants, like Scaling Grants, are specifically designed to further the goal of the Plan for Pitt to engage in research of impact by positioning the University to participate in large research collaborations.

Artificial Intelligence Integrated in Learning of Rehabilitation Science Skills

Reivian Berrios Barillas, Department of Physical Therapy

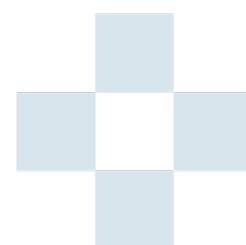
Peter Brusilovsky, Department of Informatics and Networked Systems

Scott Fraundorf, Department of Psychology

Kim Nixon-Cave, Department of Physical Therapy

Lindsay Clare Matsumura, Department of Teaching, Learning, and Leading

Can artificial intelligence (AI) improve the learning experience for the next generation of physical therapy students? Occupations for physical therapists are expected to grow 15%, which is much faster than average job growth. The University of Pittsburgh is committed to providing for this need by adding a hybrid Doctor of Physical Therapy program, which admitted its third cohort this year. Using AI with hybrid learning, this research investigates students' academic performances and learning perceptions with intelligent tutoring systems in a human anatomy course. This course is critical for many subsequent courses and provides essential knowledge that influences students' clinical abilities. The team will evaluate various AI mechanisms for tracking time spent on difficult concepts for high- and low-achieving students and for creating intelligent textbooks with ChatGPT to provide feedback. Predictive AI models will be integrated with visual dashboards for the instructor and students to help each student understand the best progression for personalized learning. This project develops the infrastructure for intelligent mechanisms that can assist in early detection of knowledge gaps and facilitate early remediation.



Creating Synergies and Collaborations to Advance Race-based Research at the University of Pittsburgh

Kyaïen Conner, Center on Race and Social Problems

Ron Idoko, Center on Race and Social Problems

Catherine Koverola, Center for African Studies

Tiffany Gary-Webb, Department of Epidemiology

Gabby Yearwood, Department of Anthropology

Zuly Inirio, Center for Ethnic Studies Research

T. Elon Dancy, Center for Urban Education, School of Education

Felix Germain, Department of Africana Studies

How can the University of Pittsburgh lead the charge with respect to race-based research? Racism continues to be one of America's longest-standing social problems, and inequities related to race remain pervasive. Pitt's strategic plan describes enhancing justice, diversity, equity and inclusion efforts. One strategy to address this priority is through the conduct of rigorous empirical research that systematically studies the impact of race and racism on critical outcomes (within the University system and in the community at large) and evaluates innovative solutions. Home to six academic centers with a racial equity lens spanning the disciplines, Pitt is well situated to be the epicenter for race-based research in the United States. This proposal leverages directors and associate directors of the race-based centers across Pitt for strategic planning and visioning (identify common goals, priorities and areas of research synergy), research team development (creation of multidisciplinary teams to work on proposal development), mentorship and support from program officers (attain guidance toward the development of competitive external empirical research and pipeline education/training grants) and the development of a race-related research database (create a localized repository of race-related research and scholarship that will further amplify the work of local race-based research and create meaningful connections to external race-based researchers).

Pittsburgh Deep Learning Triangulum

Michael Lotze, Department of Surgery

Julie Fiez, Department of Psychology

Harinder Singh, Department of Immunology

Natasa Miskov-Zivanov, Department of Electrical and Computer Engineering

Discourse and dialogue among the fields of immunology, neuroscience and artificial intelligence (AI) have the potential to generate breakthroughs in understanding and development of new deep learning methods and their biological and clinical applications to diseases with substantial unmet clinical need, such as cancer and Alzheimer's. The award will be used to launch the Pittsburgh Deep Learning Triangulum (PDLT), a truly unique constellation of faculty whose interests in the immune system, nervous system and AI converge on biological and computational systems evolved or designed to capture, process and act on diverse types of information. Such learning can be retained as memory for recall responses and used to explore previously unencountered contexts. Biological and artificial learning systems are strongly dependent on complex cellular interactions, including neural networks and coevolving microbiomes. By coalescing relevant Pitt and Carnegie Mellon University colleagues and stimulating vigorous dialogue, the group will identify the most challenging problems in learning and the neuroimmune and AI interfaces whose solutions would be transformative. PDLT will develop stakeholder relationships with sponsors such as the Chan-Zuckerberg Foundation, the Advanced Research Projects Agency for Health, Wellcome Leap or the Allen Institute to enable new frameworks for deep learning and their applications.

This project supports the Year of Discourse and Dialogue theme.



SCALING GRANTS

Scaling Grants, which provide up to \$400,000 over two years, support detailed project planning, the gathering of proof-of-concept results and the reduction of technical risk so that teams can competitively pursue an identified large extramural funding opportunity. Scaling Grants are specifically designed to further the goal of the Plan for Pitt to engage in research of impact by positioning the University to participate in large research collaborations.

Establishing Next-generation Intracortical Microstimulation for Research and Clinical Applications

Alberto Vazquez, Department of Bioengineering

Robert Gaunt, Department of Physical Medicine and Rehabilitation

Takashi Kozai, Department of Bioengineering

Omar Gharbawie, Department of Neurobiology

Brian Hooks, Department of Neurobiology

Electrical stimulation is one of the most widely used tools for modulating brain activity for scientific discovery and clinical applications. Experiments in small animals are used to inform eventual translation to humans for research or clinical purposes. A major challenge with electrical stimulation is determining how knowledge gained in one species or model system translates to other species with different neural circuits, cortical organization or size. Unless this barrier is removed, we lack knowledge about how to achieve the full potential of electrical stimulation as an investigative tool of neural mechanisms in healthy brains, as a treatment for diseased brains and as a neural interface. This project challenges these barriers by investigating intracortical microstimulation (ICMS) in sensorimotor cortex scale across three common species with distinctive brain sizes: humans, nonhuman primates (NHP) and mice. Two major questions animate the proposal: How does ICMS activate cells and circuits in the cortex, and how does activation of these cells and circuits drive behavior and perception? The research team brings together the expertise and infrastructure needed to conduct integrated experiments in humans with implanted microelectrodes, in NHPs and in mice with genetic, optical and microelectrode tools.

The Rust to Resilience (R2R) Environmental Chemical Research Center

Alison Sanders, Department of Occupational and Environmental Health

Melissa Bilec, Department of Civil and Environmental Engineering

Daniel Bain, Department of Geology and Environmental Science

The Rust to Resilience (R2R) Environmental Chemical Research Center at the University of Pittsburgh is a new center that will leverage epidemiologic, toxicologic, environmental science and engineering expertise to examine two major classes of ubiquitous chemicals that predominate the approximate 100 Pennsylvania Superfund sites statewide and are detected ubiquitously among human populations: metals and per/poly-fluoroalkyl substances (PFAS). The overarching goal of the R2R Center is to characterize the prevalence, adverse health effects and chronic disease mechanisms of the most prevalent legacy and emerging toxicants in populations, waterways and soil in Pennsylvania while developing novel remediation strategies. The project will assess geospatial associations of these chemicals and their mixtures in Pennsylvania soils and waters with adverse maternal cardiometabolic health outcomes before and after delivery as well as employ novel methods for the remediation of mixtures and mixture components from soil and water. The center's proposed synergies will provide urgent action-oriented guidance to improve public health and establish new tools to better understand and reduce the environmental risks to vulnerable populations in Pennsylvania and globally. The center will provide broadly applicable road maps to safely transition from rust to resilient and sustainable regional, national and global public health.





PITT SEED GRANTS

Supporting the Plan for Pitt

Pitt Seed operates in tandem with the University's strategic plan and is predicated upon engagement across all campuses. Established in 2018, Pitt Seed is an annual internal funding mechanism open to faculty and staff. Pitt Seed supports the Plan for Pitt by building proofs of concept with potential to improve University of Pittsburgh business operations through broad, impactful and sustainable ideas. Funded projects span vast activities, including process improvement, diversity and inclusion, community and industry partnership and development and outreach.

CommUniversity Initiative

Keith Caldwell, Office of Engagement and Community Affairs

Kelly Prothro, Hill District Community Engagement Center

Marlo Hall, Hill District Community Engagement Center

Ervin Dyer, Department of Africana Studies

Jennifer Keating, Department of English

Stephanie Dangel, School of Law

CommUniversity classes were first developed by the Africana studies department to introduce more voices of the African diaspora into our students' learning. When the Community Engagement Centers were launched, Africana studies brought back the format to enhance student learning and forge community connections. Since 2020, these classes also have been offered in partnership with faculty from several disciplines, including English, law and business. These courses require significant planning and application of best practices in community engagement and innovative instruction. This initiative will work with a transdisciplinary team of faculty, staff and residents to develop a framework to support the expansion of these courses.

Planting SEEDs, Growing Teachers: Creating a Pipeline

Melissa Marks, Behavioral Sciences Division, Pitt-Greensburg

Jessica McCormick, Behavioral Sciences Division, Pitt-Greensburg

Beth Tiedemann, Office of the Registrar, Pitt-Greensburg

Kearsten Adams, Academic Advising Center, Pitt-Greensburg

Planting SEEDs fulfills the mandates of Pennsylvania Senate Bill 99 while tackling the disparity among schools, promoting diversity in teaching and increasing enrollment in teacher education programs. Pennsylvania Senate Bill 99 mandates that local districts create “agreements with an institution of higher education ... in order to allow resident students to attend the institution of higher education while the resident students are enrolled in the school district.” Planting SEEDs will accomplish this by analyzing the newly approved Educators Rising curriculum for consistency within our own education program’s state-mandated competencies to promote a high school-to-university teacher/education pipeline, working with local districts to develop a means of implementation per Senate Bill 99 mandates and providing University credits for introductory Pitt-Greensburg education courses to promote equity and opportunity for a wide range of high school students in Southwestern Pennsylvania.

Project SOAR: Fostering Leadership, Resiliency and Network for Students at Pitt-Johnstown

Manisha Nigam, Natural Sciences Division, Pitt-Johnstown

Tuangtip Klinbubpa-Neff, Humanities Division, Pitt-Johnstown

Cynthia Ofori-Boateng, Engineering and Computer Science Division, Pitt-Johnstown

Project SOAR will work with the academic and student affairs offices, admission and financial aid offices, local high schools and local organizations to engage with students from Pitt Success programs as well as marginalized women students in the STEM (science, technology, engineering and mathematics) fields. Project SOAR will offer these students an enrichment program that creates a safe environment encompassing peers and faculty mentors. Students will strengthen their leadership skills via professionals who train them and build a solid foundation for their future career paths. This will foster a sense of community service in these students, with the expectation that they will help other students like them on campus and in neighboring high schools.

STEM through Games Program for High School Students

Dmitriy Babichenko, Department of Informatics and Networked Systems

Jacob Biehl, Department of Information Culture and Data Stewardship

Tinukwa Boulder, Department of Teaching, Learning, and Leading

Jessica Fitzpatrick, Department of English

Veena Vasudevan, Department of Teaching, Learning, and Leading

STEM through Games will develop and pilot an immersive media design and research program that introduces high school students to computational thinking, foundations of programming and cross-disciplinary academic STEM research through the implementation of digital games and immersive technologies such as augmented and virtual reality.





TC2: True Coequal x Transformative Collaborations

Melissa Lenos, Humanities Engage Program, Kenneth P. Dietrich School of Arts and Sciences

Jon Woon, Department of Political Science

Colin Allen, Department of History and Philosophy of Science

Aaron Brenner, University Library System

Michael Colaresi, Department of Political Science

Alison Langmead, Department of Information Culture and Data Stewardship

Adam Lee, Department of Computer Science

Annette Vee, Department of English

TC²: True Coequal x Transformative Collaborations seeks to stimulate, guide and support interdisciplinary projects between the humanities and other graduate programs. This project will provide opportunities and resources to graduate students and faculty mentors dedicated to pushing the boundaries and inherent limitations of discrete academic fields to develop the collaborative relationships—and resulting skills—of fully interdisciplinary research.

[For a listing of all previous Microgrant and Momentum Funds winners, please visit Internal Funding Showcase | Pitt Research | University of Pittsburgh.](#)

[For more information about the Pitt Seed program, please visit Pitt Seed | Plan for Pitt | University of Pittsburgh.](#)



Sponsored by the Office of the Provost
and the Office of the Senior Vice Chancellor for Research

The University of Pittsburgh is an affirmative action, equal opportunity institution. Published in cooperation with the Office of University Communications and Marketing. 114747-0924