



**Godson Ebenezer Adjovu**

[adjovg1@unlv.nevada.edu](mailto:adjovg1@unlv.nevada.edu) | Civil & Environmental Engineering | University of Nevada, Las Vegas

Research Interests: Remote sensing in water quality monitoring

Poster Number: **#1**

Poster title: **Remote Sensing and Machine Learning Approach to Water Quality Monitoring**

Godson Ebenezer Adjovu received his bachelor's degree in civil engineering in 2016 from the Kwame Nkrumah University of Science and Technology, Ghana; his master's degree in civil engineering in 2020 from Tennessee Technological University; and he expects to complete his PhD in civil and environmental engineering in 2023 at the University of Nevada Las Vegas (UNLV). Through the incorporation of remote sensing and machine learning techniques, he is developing estimative models to improve sustainable management of the Colorado River Basin's water quality. His future research plan includes utilizing unmanned aerial vehicles to improve the temporal and spatial resolution of images collected over bodies of water to improve the efficiency, scalability, and overall accuracy of remote sensing-based machine learning models. In 2022–2023 alone, Adjovu will have received at least ten academic awards, scholarships, and fellowships. He is president of the African Student Alliance at UNLV until May 2023, which he helped establish, and the chapter won three awards under his leadership. In his role as vice president of the Graduate and Professional Student Government (2022–2023), he was part of the lobbying efforts for better housing and higher graduate stipends during the March 2023 session of the Nevada State Legislature. He also chaired the sponsorship committee of the student government. As a future faculty member, he will support and mentor students from all backgrounds and advocate for increased diversity in engineering.



**Mario de Lucio**

[mdeluci@purdue.edu](mailto:mdeluci@purdue.edu) | Mechanical Engineering | Purdue University

Research Interests: Computational biomechanics

Poster Number: **#2**

Poster title: **Modeling Large-Volume Subcutaneous Injection of Monoclonal Antibodies with Anisotropic Porohyperelastic Models and Data-Driven Tissue Layer Geometries**

Mario de Lucio Alonso received his bachelor's (2017) and master's (2019) degrees in civil engineering from the University of Coruña, Spain, and he currently is a PhD student in mechanical engineering at Purdue University, where he is involved in a \$92.5M collaborative project with Eli Lilly to develop improved delivery of injectable medicines to treat cancer, infectious and autoimmune diseases, diabetes, and COVID-19. His computational research spans various disciplines within the domain of high-fidelity numerical modeling, demonstrating applications in civil, mechanical, and biomedical engineering. His research has addressed abdominal aortic aneurysms, drug transport and tissue mechanics, hydraulic models to reduce the impact of floods and improve disaster resilience, and additive manufacturing technologies via 3D printing. His future research will revolve around advanced computational tools to study complex physical phenomena across multiple fields, with projects that incorporate new algorithms and numerical methods and high-performance computing and parallelization. As a prospective faculty member committed to promoting DEI in research, teaching, and engagement, de Lucio Alonso will stress the importance of practicality. On the research side, he will use inclusive approaches to address real-world problems while also promoting equal opportunities for URMs. In the classroom, he will design learning experiences that enable students to apply critical thinking to actual challenges and effectively navigate conflicting perspectives.



**Julia Coutinho Amaral**

[coutij@rpi.edu](mailto:coutij@rpi.edu) | Transportation | Rensselaer Polytechnic Institute

Research Interests: Urban transportation planning

Poster Number: **#3**

Poster title: **The Effect of Time of Travel on the Performance of Port Related Truck Traffic**

Julia Amaral received a bachelor's degree in civil engineering (2014) and a master's degree (2018) in transportation engineering from Universidade de São Paulo, Brazil. She is currently a PhD student in transportation engineering at Rensselaer Polytechnic Institute (RPI), where she focuses her research on demand management strategies to promote sustainable transportation of both freight and passengers. Her most recent work in freight transportation entailed using GPS data to estimate savings in operational costs, fuel consumption, and emissions by shifting the time of travel of freight vehicles to ports. For her doctoral dissertation, she developed mathematical models for park-and-ride systems to encourage commuters to shift from private vehicles to public transportation to alleviate traffic congestion and lower emissions. In future research, she is eager to explore innovative transportation strategies that optimize resource allocation, reduce emissions, promote equity, and enhance overall system efficiency. She has served as president of the Women Transportation Seminar RPI chapter, and during the pandemic, remotely taught physics to low-income students from Brazil to help prepare them for admissions exams. As a professor, she will make learning content relatable and grounded in practical activities that resonate with students' experiences. Additionally, she will continue to actively engage in organizations that support minorities and foster their career advancement.



**Alejandro Palacio-Betancur**

[ajp7096@psu.edu](mailto:ajp7096@psu.edu) | Civil and Environmental Engineering | The Pennsylvania State University

Research Interests: Development of Smart Structures Technology

Poster Number: **#4**

Poster title: **Resilient Smart Structural Systems For Civil Infrastructure Under Multihazards**

Alejandro Palacio Betancur received his bachelor's degree from Universidad Nacional de Colombia in civil engineering in 2016, his master's degree from the University of Kentucky (UK) in civil engineering in 2020, and currently is a PhD student in civil engineering at Pennsylvania State University. His research focuses on structural health monitoring and structural control to improve their behavior during natural hazards. His work has produced six first-author peer-reviewed journal papers, and during his first semester as a master's student, his research was published in *Mechanical Systems and Signal Processing*. Future exploration will extend to the development, promotion, and implementation of smart structure technology to mitigate multi-hazard effects of natural disasters and cyberattacks. His paper at the 2021 ACM SIGSAC Conference on Computer and Communications Security was the first to identify the vulnerability of smart structures in cyber-attacks. Palacio Betancur is a visitor scientist at Albert-Ludwigs-University, Germany, a founding member of the Structural Engineers Association student chapter at UK, and has been involved in forensic engineering via Structural Extreme Event Reconnaissance (StEER) since 2022. As a student who has cultivated his education across three universities in different countries and demographics, he will be a professor who addresses challenges that arise from cultural differences and diverse personal identities.



**Surabhi Bhadauria**

[sbhadaur@purdue.edu](mailto:sbhadaur@purdue.edu) | Aeronautics and Astronautics Engineering | Purdue University

Research Interests: Cislunar Space Surveillance

Poster Number: #5

Poster title: **Cislunar Space Surveillance**

Surabhi Bhadauria received her bachelor's degree in materials and metallurgical engineering in 2016 from Punjab Engineering College, India. Through Purdue University's School of Aeronautics and Astronautics, she earned her master's degree in 2020 and currently is a PhD student working on the design of sensor networks for the detection of space debris in the cislunar region. For her PhD, she is exploring the astrodynamics and space situational awareness, with a particular focus on the new field of Cislunar Space Domain Awareness. She aims to enhance surveillance capabilities and collision avoidance strategies in cislunar space, ultimately fostering safe exploration and utilization of this region, and expand her understanding of space traffic management by leveraging machine learning and data fusion techniques. Through the Gifted Education Research and Resource Institute's Super Saturday program, she designed and taught a course that combined STEM fields with art, and she has coordinated events and projects for the Purdue chapter of Asha for Education, which promotes literacy among underprivileged children in India. As a future faculty member, Bhadauria will strive to create a student-centered environment that celebrates diversity and encourages individual voices to be heard. She will empower students to actively participate in their learning journey, collaborate with their peers, and take ownership of their education.



**Arkaprabha 'Arka' Bhattacharyya**

[bhatta23@purdue.edu](mailto:bhatta23@purdue.edu) | Civil Engineering | Purdue University

Research Interests: Disaster Risk Reduction

Poster Number: **#6**

Poster title: **Towards Resilience Against Natural Hazards**

Arkaprabha "Arka" Bhattacharyya earned his bachelor's degree in civil engineering in 2016 from Jadavpur University, India. He has continued his civil engineering studies at Purdue University, receiving his master's degree in 2020 and now pursuing his PhD. In addition, he earned a graduate certificate from the Purdue Systems Collaboratory in 2022. His research is focused on making communities and infrastructure resilient to natural hazards such as floods and hurricanes. For his dissertation, he is developing a big data-driven decision-making model that can be used for flood risk reduction planning. He also has worked on a project through a grant from the Indiana Utility Regulatory Commission that analyzes the socio-economic and demographic disparities in power outages and energy insecurity. His future research will encompass infrastructure vulnerabilities, more effective disaster evacuation methods, and the role of disaster risk financing mechanisms. Bhattacharyya, who worked as a senior civil engineer in India for two years, has attended an ADVANCE workshop on faculty diversity and served as a mentor to help incoming graduate students navigate their new landscape. In his future DEI-centered classroom, he will work to build the confidence of women and URMs by highlighting the success stories of established professionals in STEM who are from underrepresented groups.



**Oriana Calderón**

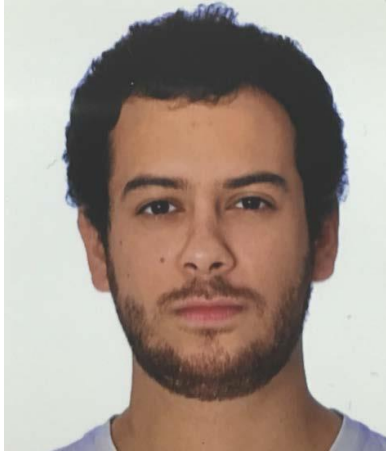
[caldeo@rpi.edu](mailto:caldeo@rpi.edu) | Transportation | Rensselaer Polytechnic Institute

Research Interests: Sustainable Urban Logistics

Poster Number: **#7**

Poster title: **Ph.D. in Transportation Engineering | Supply Chain Optimization**

Oriana Calderón earned bachelor's degrees in economics (2005) and industrial engineering (2006) at Universidad del Valle, Colombia, and received her MBA (2015) at Universidad ICESI, Colombia. In 2023, she earned her PhD in transportation engineering from Rensselaer Polytechnic Institute (RPI), where she is starting a postdoctoral fellowship. Her primary research objective is contributing to the advancement of sustainable cities through sustainable supply chains. She developed a novel freight pricing model to induce order consolidation, reduce trips, and lower emissions. She also is engaged in projects related to panic buying during the COVID-19 pandemic and how it disrupted supply chains and hindered access to critical resources. Future research will include the examination of cross-country panic buying behavior during different stages of the pandemic and using AI to develop early warning systems. As president of RPI's chapter of the Women in Transportation Seminar, Calderón encourages female students' participation in the transportation industry. She was selected for the "To My Younger Self" mentoring program and received scholarships from Amazon Supply Chain Optimization Technologies and INFORMS — both of which recognized her efforts in underrepresented populations. As a future engineering professor, she will incorporate DEI topics into her course content, addressing issues such as the lack of transportation access in underserved areas.



**Hernando Maldonado Colmán**

[hm2524@princeton.edu](mailto:hm2524@princeton.edu) | Mechanical and Aerospace Engineering | Princeton University  
Research Interests: Combustion, Turbulence, Pollutants, Numerical Modeling, Simulations

Poster Number: **#8**

Poster title: **Large Eddy Simulation of the evolution of soot size distribution in turbulent nonpremixed flames using the Bivariate Multi-Moment Sectional Method**

Hernando Maldonado Colmán earned a degree in electromechanical engineering in 2014 from the Universidad Nacional de Asunción, Paraguay. In 2017, he received his master's degree in energy, and in 2021, his PhD in combustion, both from Université Paris-Saclay, France. Currently, he is a second-year postdoctoral research associate at Princeton University, where he is working on the computational modeling of pollutants in turbulent reacting flows. In less than two years, he has published three papers and will publish three more in the coming months. With research that focuses on combustion science, he is passionate about the decarbonization of energy systems and fire safety aspects in engineering — areas in which he hopes to make contributions in clean and safe technologies aimed at curbing climate change. Having been educated on three continents, Maldonado Colmán is trilingual in English, Spanish, and French, allowing him to connect with a wide range of students. To be an effective faculty member, he will strive to be equal parts adviser, role model, supportive advocate, and exemplary teacher. He is devoted to providing an inclusive environment where all students feel valued and empowered to succeed, and he plans to employ innovative teaching strategies that allow for diverse learning styles.





**Mbaye Diouf**

[dioufi93@gmail.com](mailto:dioufi93@gmail.com) | Optical Physics | Brown University

Research Interests: Infrastructure inspection using novel technologies

Poster Number: **#9**

Poster title: **Theoretical Modeling of Photonics Crystal Fiber for Supercontinuum and Application of Space-Time Light Sheet for Metrology**

Mbaye Diouf received his bachelor's degree in physics and chemistry in 2011 and his master's degree in atomic and nuclear physics in 2014, both from the University of Cheikh Anta Diop (UCAD), Senegal. He earned his PhD in 2017 from UCAD/Engineering School of Communication of Tunis (Sup'Com), Tunisia. He is a senior research associate at Brown University, where he — almost single-handedly — designed and built the PROBE Lab and has trained and mentored many of the lab's students. His current and future research will broadly target optics and photonics, including nonlinear optics, light sheet microscopy, multiphoton microscopy, and supercontinuum laser sources. He led the first-ever discovery of space-time wave packets, which he experimentally proved to be classically entangled in both space-time and space-polarization. In addition, he has been a critical contributor for the development of a pulse oximeter that will work accurately across all skin tones. He co-invented the prototype currently being tested in a Rhode Island hospital — drawing considerable media attention and leading to a filed patent. An active member of OPTICA, he co-founded and served as the inaugural president of the Senegalese OPTICA student chapter. Trilingual in Wolof, French, and English, Diouf intends to prioritize DEI in his research, teaching, and leadership, particularly for those on the periphery of higher education.



**Brian Do**

[brian.do@yale.edu](mailto:brian.do@yale.edu) | Mechanical Engineering | Yale University

Research Interests: Soft Robotics

Poster Number: **#10**

Poster title: **Variable Stiffness and Shape Changing Robots**

Brian Do has received three degrees in mechanical engineering — a bachelor's from Georgia Institute of Technology (2017) and master's (2019) and PhD (2023) from Stanford University. Currently, he is a postdoctoral fellow at Yale University, and he will begin as an assistant professor in the summer of 2024 at Oregon State University. During his PhD, he explored three main topics related to soft robotics: changing the stiffness of soft growing “vine” robots; novel macro-mini pouches for soft wearable haptic displays; and bistable tapes to create a lightweight 3-degree-of-freedom manipulator. In the future, he aims to fabricate soft robots from inexpensive materials to broaden access for underserved populations. His goal is to create human-centered robots, allowing for new capabilities in manipulation, locomotion, and disaster response. A first-generation college student, he has led more than two dozen outreach events for his lab, including serving as president of Stanford Splash, which invites Bay Area youth to attend classes taught by Stanford students. At Georgia Tech, he was the community outreach chair for the Society of Women Engineers, organizing events for hundreds of Atlanta students. Do will leverage his faculty position to push for broader reforms to support DEI, and he plans to organize initiatives that promote retention of URMs and broaden participation in STEM.



**Emily Garcia**

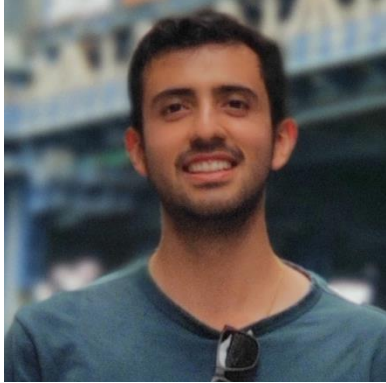
[garc611@purdue.edu](mailto:garc611@purdue.edu) | Industrial Engineering | Purdue University

Research Interests: Healthcare Decision-Support Systems Optimization

Poster Number: **#11**

Poster Research Area: **Computerized clinical decision support systems, or CDSS, represent a paradigm shift in healthcare today. CDSS are a form of health information technology developed to augment clinicians in their complex decision-making processes.**

Emily Garcia earned her bachelor's degree in industrial engineering and operations research in 2020 at the University of California, Berkeley, and currently is a fourth-year PhD student and National Science Foundation Graduate Research Fellow in industrial engineering at Purdue University. She is focused on optimizing health interventions in the form of computer decision-making support systems (CDSS) that identify acute care patients for early discharge to reduce health disparities common among older adults. In the next five years, she aims to further investigate how CDSS can be better integrated to balance the needs of patients and caregivers. At Purdue, she founded and established the Society for Hispanic Professional Engineers graduate chapter, in which she secured funds to fully fund eight graduate students' attendance at the national convention. In 2022-23, she was the College of Engineering's sole graduate student mentoring fellow, developing and facilitating a DEI seminar series, the results of which are being presented and published by the American Society for Engineering Education. For Garcia, a first-generation Latina scholar, effective teaching means kindling curiosity, triggering critical thinking, and engaging students' natural creativity. As a professor, she will strive to expand recruitment and retention of URMs, and her courses will highlight recent trends in technology and foster early research ideas.



**Carlos Rivera-González**

[carlos.rivera@utoronto.ca](mailto:carlos.rivera@utoronto.ca) | Transportation | University of Toronto

Research Interests: Sustainable Urban Freight

Poster Number: **#12**

Poster Research Interests and Approach: **Urban economics; transportation accessibility; the interaction between land use, transportation, and supply chain efficiency**

Carlos Rivera-González earned his bachelor's degree (2013) and master's degree (2015), both in civil engineering from Universidad de los Andes, Colombia, and his Ph.D. in transportation engineering in 2022 from Rensselaer Polytechnic Institute (RPI). His dissertation work produced the first analytical model to support Freight Efficient Land-Use (FELU) design and planning. In addition, he developed a variation of the model that incorporated environmental justice components to protect vulnerable areas with marginalized populations from being selected as optimum locations for distribution centers. Currently, he is a postdoctoral fellow at the University of Toronto, where he is the project manager of both the Freight Data Warehouse and City Logistics for the Urban Economy. His future plan is to create a research center to influence policies that could have tremendous impacts on the sustainability of metropolitan areas. He has been a reviewer for eight academic journals, serves on two committees for the Pan-American Society of Transportation Research, and is a founding member of RPI's chapter of Women in Transportation Seminar. In his teaching, Rivera-González has leveraged his research to stress the importance of equitable, diverse, and inclusive solutions for transportation problems. He hopes to cultivate his lifelong love of learning to ignite his students' curiosity through challenging, yet doable projects based on real case scenarios.



**Luis E. Paniagua-Guerra**

[paniagua\\_luis@outlook.com](mailto:paniagua_luis@outlook.com) | Mechanical Engineering | The Pennsylvania State University  
Research Interests: Energy Transport Processes across Interfaces

Poster Number: **#13**

Poster title: **Multiscale Characterization of Soft-Hard Interfaces**

Luis E. Paniagua-Guerra earned his bachelor's degree in mechanical engineering in 2018 from the University of Guanajuato, Mexico. Through Pennsylvania State University's Department of Mechanical Engineering, he earned his master's degree in 2020 and expects to complete his PhD in October 2023. While still a college senior in Mexico, he undertook rigorous training in molecular dynamics modeling, and by the time he arrived at Penn State, he and his adviser had a paper accepted for publication. To sponsor his doctoral education, Paniagua-Guerra wrote a research proposal to secure funding from the Mexican counterpart of the National Science Foundation. His research projects include liquid cooling of electronics, dielectric properties of aqueous organic materials, mechanical properties of 2D materials, and nanoscale fluid dynamics. Going forward, he aims to establish an inclusive research group to bridge nanoscale and macroscale physics, targeting applications in surface wetting control, water filtration, drug delivery, and liquid cooling solutions for high-density power electronics. As a future faculty member, his primary goal is to provide students with the technical knowledge, critical thinking skills, and creativity required to face current challenges of existing and emerging technologies. He will welcome students from all backgrounds and perspectives, promote open communication and constructive feedback, and instill engineering foundations, ethics and sustainability.



**Carmen A. Haseltine**

[haseltine@wisc.edu](mailto:haseltine@wisc.edu) | Electrical Engineering | University of Wisconsin, Madison

Research Interests: Critical infrastructure analysis and operations research

Poster Number: **#14**

Poster title: **Dynamic Modeling for Critical Infrastructure Security**

Carmen Haseltine earned her bachelor's degree in electrical engineering from Louisiana State University in 2009, her master's degree in applied mathematics from the University of West Florida in 2018, and currently is a fifth-year PhD student in electrical engineering at the University of Wisconsin-Madison. There, her research focuses on security analysis of critical infrastructure systems through stochastic modeling. Recently, she has explored election security, creating mathematical models to improve equity in the voting-by-mail (VBM) process. Her initial work, presented at EAAMO'21, earned the best poster award, and her future research is poised to provide critical tools for security practitioners seeking to cost-effectively manage risks in infrastructure systems. Since 2022, Haseltine has been a diversity, equity, and inclusion ambassador for INFORMS, where she has developed materials and led a project to introduce students from traditionally underrepresented backgrounds to the field of operations research. The seven years she spent as an engineer in the power system industry led to her doctoral work and 2021 published paper on a new risk analysis technique addressing the dynamic factors impacting grid performance in regions afflicted by climate change. As a professor, it is her desire to create inclusive learning environments through group assignments and collaborative projects aimed at addressing equity.



**Pablo Orosa Iglesias**

[porosaig@purdue.edu](mailto:porosaig@purdue.edu) | Civil Engineering | Purdue University

Research Interests: Civil Engineering, Materials, Pavements

Poster Number: **#15**

Poster Research Topics: **Civil Engineering Materials Waste Valorization, Recycling, Reusing Pavement Mechanical Performance Pavement Management Systems**

Pablo Orosa Iglesias earned his bachelor's degree in civil engineering technology (2014), and both his master's degree (2016) and PhD (2022) in civil engineering —from the University of A Coruña, Spain. His dissertation addressed mechanical behavior of cold in-place recycled asphalt mixtures with bitumen emulsion, for which he is nominated for the Extraordinary PhD Award through his alma mater. He has published nine journal papers with another five manuscripts under review or in preparation. In Spring 2022, he was a visiting scholar at Purdue University, where he now is a postdoctoral research assistant working on projects funded by the Joint Transportation Research Program and Alcoa Foundation as well as a Ministry of Science and Innovation project in Spain. Future research will involve developing new approaches to transform the current paving sector through three main areas: waste valorization and circular economy; pavement resiliency and durability; and sustainability and carbon footprint reduction. He takes pride in guiding and supporting master's and PhD students — all of whom are from different cultures, backgrounds, and genders. Iglesias, who speaks Spanish, Galician, English, Portuguese, and French, aspires to be a faculty member who will develop equitable engineering practices, challenge and dismantle stereotypes, and create a learning environment based on adaptive teaching, active learning, and group projects.



**Joseph Andrew James**

[ajjoseph@vt.edu](mailto:ajjoseph@vt.edu) | Civil Engineering | Virginia Tech

Research Interests: Improve Residential Energy Awareness Data Visualization

Poster Number: **#16**

Poster title: **Alternative Data Visualization Mediums Improves Residents' Energy Awareness to Create A Societal Change**

Joseph Andrew James received his bachelor's degree in mechanical engineering in 2017 from Clemson University, and at Virginia Tech, he earned his master's degree in 2021 in civil engineering construction engineering and management and is pursuing his PhD in the same field. Before entering graduate school, he worked as a customer solution engineer, and in his first year, developed a new prototype for a commercial air purification system that outperformed the original model. In his current work, he promotes societal change by conducting research in marginalized communities. He utilizes data visualization strategies with the goal of bridging the gap between residents and their understanding of how energy is consumed throughout their homes. He likens his approach to looking through a VR headset and seeing energy flow through wires to various home appliances. In partnership with a local high school, James created a VR learning platform for computer science skill development and followed it up with a three-part workshop to inform students about IT careers in VR. In the future, he hopes to work with the DoE and utility companies on a policy to change the face and utilization of utility bills. Once a professor, he plans to develop new classes and workshops centered around diversity and interdisciplinary work with other departments.





**Rebecca Kassa**

[rebecca.kassa@ku.edu](mailto:rebecca.kassa@ku.edu) | Civil Engineering | University of Kansas

Research Interests: Teamwork Optimization in Design and Construction

Poster Number: **#17**

Poster title: **Team Personality and Team Dynamics in Design and Construction Project Teams**

Rebecca Kassa earned her BSc in civil engineering in 2016 from Addis Ababa University, Ethiopia, and her master's degree in civil engineering in 2019 from Pan African University, Kenya. Currently, she is a PhD student in construction engineering and management at the University of Kansas, where she is studying optimization of team dynamics on design and construction projects and also is pursuing a graduate certificate in educational psychology. Her work seeks to optimize team performances by assessing human personality, behavioral diagnostics, and emotional intelligence appraisals. She looks forward to contributing research that improves project outcomes, increases productivity, and reduces risks in the construction industry. Her ambition is to build an internationally known research program for construction team studies. At Kansas, she is president of the Architectural Engineering Institute, delivering an invited presentation at the organization's annual conference as well as at the Associated Schools of Construction Conference. Along with her team, she has prepared eight journal articles and seven conference proceedings. Nine of them have been published, accepted, or publicized, and the remaining six are under review. Kassa believes diverse opinions contribute to vibrant academic dialogues, encourage creativity, and improve problem-solving abilities, and she is excited to create an inclusive curriculum that represents various perspectives.



**Natalya Kublik**

[nmohrkub@asu.edu](mailto:nmohrkub@asu.edu) | Materials Science and Engineering | Arizona State University

Research Interests: Nanomanufacturing, Additive Manufacturing, Metal LPBF

Poster Number: **#18**

Poster title: **Laser-Matter Interactions in AM of Highly Reflective Metals**

Natalya Kublik received her bachelor's degree in environmental engineering in 2017 and master's degree in materials science in 2019, both from Universidade Federal de Mato Grosso do Sul, Brazil. Currently, she is a PhD candidate (ABD status) in materials science and engineering at Arizona State University (ASU), where she is exploring the use of ultra-black metallic powders to reduce reflected power losses in laser-matter interactions common in metal additive manufacturing processes and laser welding. Her work produced the discovery of a new laser powder bed fusion (LPBF) regime that can accomplish printing speeds two to four times faster than state-of-the-art pure copper printing. In her lab at ASU, she leads regular meetings with Oak Ridge National Laboratory and the National Institutes of Standards and Technology, and through the Leadership Circle in the MSE Graduate Student Community, she organized a career path roundtable of successful professionals. Being a first-generation college student who grew up surrounded by socio-economic and inequality barriers, Kublik learned that underprivileged individuals can indeed thrive when provided a favorable environment — a revelation that will continue to motivate her to help others in similar scenarios. As a professor, she will implement sustainable learning to encourage independent study for deeper understanding and brainstorming within groups to build interpersonal skills.



**Damilola Christianah Lawore**

[dlawore@purdue.edu](mailto:dlawore@purdue.edu) | Biomedical Engineering | Purdue University

Research Interests: Microbiome systems/synthetic biology & Cancer pharmacogenomics

Poster Number: **#19**

Poster title: **Female Gynecological Cancers and Microbiome: A systems and synthetic biology approach to identify early diagnostics and therapeutic opportunities.**

Damiola Christiana Lawore earned her bachelor's degree in 2016 from the University of Ibadan, Nigeria, and her master's degree in 2021 from Western Illinois University. She currently is a PhD candidate in biomedical engineering at Purdue University, where the focus of her thesis project is the pharmacobiome — a new foundational paradigm for microbiome systems biology. She is enthusiastic about exploring ways engineering can solve medical problems and improve the health of society by focusing on conditions prevalent in underrepresented groups. Her long-term goal is to use a systems biology approach for early diagnosis of ovarian cancer. In 2022, she served as a GradTrack mentor at Purdue, where she guided and encouraged underrepresented students interested in attending graduate school. In her future classroom, Lawore will create an environment where all students feel esteemed, regarded, and empowered to contribute. She envisions teaching courses that interconnect biological science, data science, and engineering, and she will encourage students to work on multidisciplinary projects to provide them with a broader perspective and promote innovation. Inside and outside of academic circles, she will support those who encounter boundaries in pursuing engineering careers by providing resources, ensuring that voices are heard, and recommending opportunities for professional development and advancement.



**Cameron Lewis**

[camlew40@gmail.com](mailto:camlew40@gmail.com) | Electrical and Computer Engineering | Howard University  
Research Interests: FPGA SLAM-based Autonomous Platform

Poster Number: **#20**

Poster title: **Implementation of a Graph Network Bundle Adjustment on a FPGA to Accelerate ORB-SLAM2**

Cameron Lewis received his bachelor's degree in computer engineering in 2019 from Howard University, where he is a fourth-year electrical engineering PhD student focused on reconfigurable hardware to create real-time autonomous platforms. In 2023, he published and twice presented his work on implementing a field programmable gate array (FPGA)-based bundle adjustment on a FPGA-based simultaneous localization and mapping (SLAM) autonomous platform. He is a current fellow of both the Howard Hampton Morgan Alliance for Graduate Education and the Professoriate and the National GEM Consortium — both of which are dedicated to increasing the number of URMs pursuing and earning advanced degrees in STEM disciplines. An active mentor at Howard, Lewis has helped facilitate two SLAMERS Virtual Boot Camps as well as NASA RockOn!, in which he guided 20 undergraduates in building a payload that was flown at NASA's Wallops Flight Facility. He has completed both software and hardware internships at Johns Hopkins University, Qualcomm, Boeing, CoachMePlus, and MITRE, held a variety of leadership positions with the National Society of Black Engineers, and was a four-year member of the Howard men's varsity basketball team. He looks forward to teaching the next generation of students about the fundamentals of electrical and computer engineering.



**Said Cifuentes Maury**

[said.cifuentes@upr.edu](mailto:said.cifuentes@upr.edu) | Bioengineering | University of Puerto Rico

Research Interests: Biomaterials & Cell Manufacturing

Poster Number: **#21**

Poster title: **Development of a Culture Substrate for the Scale-Up Expansion of Human Mesenchymal Stromal Cells for Therapeutic Applications**

Said Cifuentes Maury received his bachelor's degree in mechanical engineering in 2009 from Universidad del Atlántico, Colombia. At the University of Puerto Rico, Mayagüez Campus, he earned his master's degree in mechanical engineering in 2016 and his PhD in bioengineering in 2023. During his bachelor's degree, he designed and constructed an electromechanical manipulator with six degrees of freedom. For his PhD, he worked on a National Science Foundation-sponsored project focused on low-cost culture substrates for the expansion and potency of mesenchymal stem cells to increase affordability of this therapy for autoimmune and inflammatory conditions. In a short span of time, he has published a first-author journal article, was selected for oral presentations at the Biomedical Engineering Society and Cell Culture Engineering XVII conferences, and began a new research collaboration with TEGA Therapeutics. His future research will concentrate on the investigation of advanced manufacturing techniques, such as 3D bioprinting, to fabricate complex biomaterial structures with controlled mechanical and biological properties. His goal is to convert his work with tissue engineering and translational medicine into practical solutions for underserved populations. Once securing a faculty position, he will actively mentor URM students in their research endeavors and engage with local schools and community organizations to promote STEM education among underrepresented groups.



**Sushant Mehan**

[sushantmehan@gmail.com](mailto:sushantmehan@gmail.com) | Agricultural and Biological Engineering | Colorado State University  
Research Interests: Water Resources Engineering

Poster Number: **#22**

Poster Topic: **Water Resources Engineering**

Sushant Mehan earned his bachelor's degree (2011) and master's degree (2014), both in agricultural engineering from Punjab Agricultural University, India. At Purdue University in 2018, he earned a PhD in agricultural and biological engineering, and he currently is a postdoctoral fellow through a funded collaboration between USDA-Agricultural Research Service and Colorado State University. His research plan entails advancing the field of water resources management through geospatial analysis, hydrologic modeling, remote sensing products, wireless sensor networks, data analytics, integrated watershed modeling, and the development of decision support systems. Before moving to Colorado, he worked as an agricultural engineer for two years, completed a postdoctoral appointment at Ohio State University, and worked as a research associate at the University of Wisconsin. He has published 19 peer-reviewed journal articles and four book chapters, received more than \$2M in funding as the primary applicant/co-PI, and filed an international patent for a soy-based filtration system. He was named Early Career Engineer of the Year in 2022 from the Association of Agricultural, Biological, and Food Engineers of Indian Origin, of which he has served as president, vice president and secretary. Promoting DEI is a fundamental aspect of Mehan's teaching philosophy, and he aims to create a transformative learning environment for students while incorporating research-based teaching methodologies.



**Aishwarya Menon**

[menon54@purdue.edu](mailto:menon54@purdue.edu) | Chemical Engineering | Purdue University

Research Interests: Surgical tissue adhesives and sealants

Poster Number: **#23**

Poster Title: **Revolutionization Tissue Repair with Advanced Functional Adhesives**

Aishwarya Menon received her B.Tech. in plastics engineering in 2013 from Central Institute of Plastics Engineering and Technology, India, her M.Tech. in polymer science and technology in 2015 from the Indian Institute of Technology, and her PhD in nanoscience and engineering in 2019 from the Indian Institute of Science. Since 2021, she has been a Lillian Gilbreth Postdoctoral Fellow at Purdue, where she is developing strong wet-tissue adhesives to replace sutures, staples, and screws used in surgeries or to repair injuries. She has demonstrated that her bio-based glue can stop an actively leaking hole in less than a minute, and she is working with Purdue Veterinary Clinical Sciences to test the glue's ability to close wounds on the backs of rats. Long-term, her research will focus on marrying tissue adhesives with nanotechnology for improved functionality. She has volunteered with Purdue's Introduce a Girl to Engineering Day and organized two science camps for high school students from lower-income communities in India. She plans to create a highly inclusive work environment and lead a research group comprised of students from diverse ethnic and cultural backgrounds and sexes. She aspires to be a professor who prioritizes her students' personal and professional challenges and provides them with enough flexibility and resources to succeed.



**Francisco Montalvo**

[fmontalv@purdue.edu](mailto:fmontalv@purdue.edu) | Civil Engineering | Purdue University

Research Interests: Water treatment technologies and public health

Poster Number: **#24**

Poster title: **Point-of-Use Systems for the Removal of Emerging Contaminants in Drinking Water in South America**

Francisco Montalvo is an experienced engineer with a diverse academic background and a passion for teaching and learning. He holds a bachelor's and master's degree in Mechanical Engineering from Purdue University (2008 and 2018) and is currently pursuing a Ph.D. in civil engineering, specializing in ecological sciences and engineering. His research focuses on improving water supply in developing regions through point-of-use filtration technology, combining experimental research with public health through a partnership with the Pan-American Health Organization, a branch of the WHO. Francisco has contributed to experiential learning and diversity initiatives at Purdue University through project-based learning and international exchange programs. He co-led the Global Engineering Alliance for Research and Education (GEARE) program and is the co-founder of the Milestones micro-certification initiative, aimed at advancing hands-on, skills-based learning within the College of Engineering. Currently, a lecturer in the School of Mechanical Engineering, he teaches Introduction to Design and mentors industry-sponsored projects, while contributing to curricular development in the Design and Manufacturing area. With industry experience as a program manager for Siemens Professional Education in Germany, Francisco brings practical expertise and global awareness to his work. He aspires to become a faculty member who offers personalized mentorship, encourages hands-on learning, and bridges the gap between engineering theory and application, all while fostering inclusion and collaboration.





**Maithilee Motlag**

[maithilee@alumni.purdue.edu](mailto:maithilee@alumni.purdue.edu) | Industrial Engineering | Micron Technology Inc.

Research Interests: Computational Material Science • Laser Nanomanufacturing • Semiconductor Process Simulations

Poster Number: **#25**

Poster title: **Laser shock nanostraining of 2D Materials and Van der Waals Heterostructures**

Maithilee Motlag is a Test Chip Vehicle Integration Lead at Micron Technology Inc. and serves as the technical point of contact for the NAND test chip vehicle development and NAND product enablement. Previously, she was an Advanced Material Modeling Engineer Postdoc at Micron Technology Inc., where she implemented Multiphysics modeling methods to facilitate Technology Pathfinding of next generation memory semiconductor manufacturing processes. Her Ph.D. research provides a systematic understanding of the effect of laser shock process on Van der Waals materials and demonstrated the modulation of mechanical and optoelectronic properties. She has authored 11 publications in journals such as Nature Communications, Advanced Materials, Advanced Sciences and was also the recipient of Purdue Bilisland Dissertation Scholarship. During her time at Purdue, she served as a President for Industrial Engineering Graduate Student Organization and President for Industrial Engineering Graduate Women's Group. She received the Purdue Outstanding Service Award and McDonnell Douglas Scholarship for her active involvement and service in STEM outreach. Dr. Motlag has a Ph.D. in IE (2021) and a MS in ME (2013) from Purdue University, U.S.A and a B.E. in ME from Cummins College of Engineering for Women, India (2012). Dr. Motlag is passionate about working towards K12 initiatives focused on nanotechnology and semiconductor manufacturing and aspires to be a strong role model for the future women in STEM.



**Kaustubh G. Naik**

[naik26@purdue.edu](mailto:naik26@purdue.edu) | Mechanical Engineering | Purdue University

Research Interests: Energy Storage and Conversion

Poster Number: # 26

Poster title: **Energizing the Future: Mechanistic Insights into Energy Storage Systems**

Kaustubh G. Naik earned a dual degree (BTech and MTech) in mechanical engineering in 2019 from the Indian Institute of Technology (IIT) Kharagpur, and he now is a fourth-year PhD student in mechanical engineering at Purdue University. His research on batteries for electric vehicles has taken its lead from the drastic effects of climate change on a global scale arising from the excessive use of fossil fuels. He strongly believes that electrochemical energy storage systems can play a pivotal role in facilitating the switch to clean energy alternatives and making them affordable and accessible to all sections of the population. His work in mechanistic physics-based modeling for solid-state batteries, which Purdue recognized through the 2023 Bilsland Dissertation Fellowship, has culminated in five first-author publications in high-impact journals, multiple conference presentations, and a collaboration with Nissan Motors. Naik, who credits his own mentors for his academic success, describes the time he spends mentoring students as “easily my favorite part of the day”. As a faculty member, he plans to work on the development of novel battery chemistries that utilize earth-abundant materials and environment-friendly extraction methods, building cheaper batteries and reducing the carbon footprint. He hopes to build a diverse research group consisting of students from underrepresented sections of society so that he can equip them with the scientific tools needed to bring the clean energy transition to their communities.



**Johnson Oluwatuyi Nelson**

[john3119@purdue.edu](mailto:john3119@purdue.edu) | Mechanical Engineering | Purdue University

Research Interests: Renewable energy resilient structure in extreme environment

Poster Number: # 27

Poster title: **Evaluating the dynamics loads of 2 blades and 3 blades wind turbines on different hurricanes category and power generation**

Johnson Oluwatuyi Nelson received his bachelor's degree in mechanical engineering in 2018 from Obafemi Awolowo University, Nigeria, and he currently is a PhD student in mechanical engineering at Purdue University, where he is studying computational fluid mechanics and energy conversion. In his work, he has conducted numerical analyses of wind turbines for extreme weather conditions, evaluated stresses, and demonstrated the suitability of two-blade horizontal axis wind turbines in regions prone to hurricanes. He also has worked on bio-inspired mangroves for coastal protection, resulting in co-authoring a journal paper with senior PhD students and collaborators. Additionally, he has worked on experimental studies of CO<sub>2</sub> capture in a model wind turbine array. Future research will use reliable and affordable renewable energy technologies to address bio-inspired and resilient structures and coastal and freshwater crises in off-grid regions of developing countries. Within the Blue Integrated Partnership consortium, he promoted events, recruited URM student participation, and was a 2022 Medici Scholar in the Summer Institute for Climate Change and Sustainability. He aspires to be an influential faculty member who helps students from diverse backgrounds master engineering fundamentals. Through field trips, practical projects, and other hands-on experiences, his students will be equipped to address real-world problems.



**Chinasa T. Okolo**

[cto9@cornell.edu](mailto:cto9@cornell.edu) | Computer Science | Cornell University

Research Interests: Human-AI Interaction in the Global South

Poster Number: **#28**

Poster title: **Navigating the Limits of AI Explainability: Designs for Novice Technology Users in Low-Resource Settings**

Chinasa T. Okolo earned a Bachelor's degree in Computer Science from Pomona College in 2018 and a Master's degree in Computer Science from Cornell University in 2021. She will complete her Ph.D. in Computer Science from Cornell University in Summer 2023. Her research leverages ethnographic methods to understand how frontline healthcare workers in rural India perceive and value AI. She also examines how explainability can be best leveraged in AI-enabled technologies deployed throughout the Global South, focusing on healthcare. Outside of her dissertation focus, Chinasa has researched factors impacting the effective adoption and successful implementation of AI in Africa and has worked with international organizations such as the African Union to expand digital inclusion and develop strategic AI policy measures. Her work has been supported by funding from The National GEM Consortium, Oracle, NANOG, the National Science Foundation, and Google and covered in venues like VICE, Bloomberg, and VentureBeat. Chinasa has received numerous awards from Cornell for her on-campus and global mentoring efforts. As a professor, Chinasa aims to develop and teach human-centered computing courses where students are encouraged to pursue interdisciplinary collaborations and engage in experiential learning opportunities.



**Anjolaoluwa Popoola**

[apopoola3@gatech.edu](mailto:apopoola3@gatech.edu) | Industrial and Systems Engineering | Georgia Institute of Technology  
Research Interests: Machine learning in healthcare and social welfare

Poster Number: **#29**

Poster title: **Mitigating Underreported Error in Food Frequency Questionnaire Data Using a Supervised Machine Learning Method and Error Adjustment Algorithm**

Anjolaoluwa Popoola earned her bachelor's degree in mathematics in 2019 from Lincoln University of Pennsylvania and her master's degree in operations research in 2021 from Georgia Institute of Technology, where she currently is a third-year PhD student addressing machine learning (ML) methodologies and algorithms to solve prevalent challenges in healthcare and social welfare. Her projects have included: using ML to mitigate measurement errors and missing data in food frequency questionnaire data; developing models to forecast future housing prices, expectations, and possible volatility; and spearheading a predictive model for homelessness among youth who age out of foster care. In the future, she hopes to explore the use of ML in glucose management. She has volunteered at the Data Science for Social Good program, served as a mentor for the George Fellows Leadership Program, and founded the PhD Mentorship Program. In addition, she is vice president of the Georgia Tech INFORMS chapter and has assisted with the ISyE DEI Fellows Program. She wants to be an empathetic, equitable, and practical professor who is a mentor and resource to her students, regardless of background. She aspires to foster a thriving learning environment where teamwork and community are encouraged, and impactful work and learning are prioritized.



**Shawn Reggeti**

[regge001@umn.edu](mailto:regge001@umn.edu) | Mechanical Engineering | University of Minnesota

Research Interests: Engines, fuels, spray combustion, optical diagnostics

Poster Number: **#30**

Poster title: **Clean & Sustainable Energy • Alternative Fuels: Carbon-Free and e-Fuels • Internal Combustion Engines • Fuel Sprays • Optical Diagnostics**

Shawn Reggeti earned his bachelor's degree in mechanical engineering in 2017 from the University of Kansas, and at the University of Alabama, he earned his master's degree (2021) and PhD (2022) in mechanical engineering. During his PhD, he received the Most Valuable Technical Paper Award at ASME's 2020 ICE Fall Conference. Currently, he is a postdoctoral researcher at the University of Minnesota, where he is exploring ammonia combustion in spark-ignition engines. In his first year, Reggeti has submitted two papers accepted in popular journals and presented work at three conferences. His future research will investigate the performance of carbon-free fuels in innovative combustion and power generation devices. By building an experimental facility equipped to safely handle ammonia, he will study high-pressure ammonia injection — a topic that has seen little exploration. He also is interested in examining combustion and power generation devices such as burners, gas turbines, and the internal combustion engine, as well as the fundamental study of alternative fuels through experiments and computational fluid dynamics. As a professor, he seeks to discourage “plug and chug” memorization tactics and move students toward a physical understanding of engineering analysis for more effective career preparation. He will prioritize inclusivity in his classroom by catering to a variety of learning styles and creating opportunities for all students to feel comfortable participating.



**Salvador Rojas**

[rojas23@purdue.edu](mailto:rojas23@purdue.edu) | Mechanical Engineering | Purdue University

Research Interests: Programmable Structures, Bioinspired, Robotics, Origami, Dynamics

Poster Number: **#31**

Poster title: **Bioinspired Smart Materials and Architectures**

Salvador Rojas earned his bachelor's degree (2016) and master's degree (2018), both in mechanical engineering at California State University (CSULA). Currently, he is a fifth-year PhD student in mechanical engineering at Purdue University studying origami-like structures from biological examples, such as the folding mechanisms in insect wings, to establish design principles to simplify the actuation and control of robotic systems. He won the Best Paper Award for Reconfigurable Mechanisms on this topic at ReMAR 2021. Future work will include studying controllable, rigid, and soft robotic structures and designing large, deployable, and sophisticated shape-targeting structures. A first-generation college student and former foster youth, Rojas worked as a manufacturing engineer intern for the entirety of his undergraduate education. A Lambert Fellow and recipient of the George Washington Carver Fellowship at Purdue, he also is a mentor in the Programmable Structures Lab, tutored Purdue athletes, and served as a graduate ambassador in the First-Generation Student Success program. In fall 2024, he will assume a tenure-track faculty position at CSULA, where he envisions developing a self-sustainable, grant-funded lab program. He will prioritize multicultural/multiethnic student collaborations, foster STEAM education through engineering design principles, and promote professional growth to prepare students to be future engineers, entrepreneurs, and community leaders.



**Juan Sebastian Rubio**

[juan.s.rubio@outlook.com](mailto:juan.s.rubio@outlook.com) | Mechanical Engineering | Johns Hopkins University

Research Interests: High-speed multiphase flows in extreme environments

Poster Number: **#32**

Poster title: **Multiphase Flows in Extreme Environments**

Juan Sebastian Rubio earned his associate degree in pre-engineering in 2016 from Broward College, Florida, and his bachelor's degree in mechanical engineering in 2019 from Georgia Institute of Technology. Currently, he is a fourth-year PhD student in mechanical engineering at Johns Hopkins University, where he investigates high-speed particle-laden flows. He has led and worked on three NASA projects and collaborated with the University of Michigan, Stevens Institute of Technology, CDF Research Corporation, and HZDR, a German research lab. His future agenda includes delving deeper into the interactions between particles and complex flow structures and multiphase flows in extreme environments. He is the co-president of the Mechanical Graduate Student Association at Johns Hopkins, in which he designated a DEI chair to serve as a voice for URM students, secured \$32,000 for events and activities, and succeeded in talks that resulted in increased yearly stipends for all ME graduate students. As a first-generation college student and minority in academia, Rubio values the transformative power of creating an inclusive and compassionate community. He will employ handwritten lecture notes to enhance engagement, supplement lectures with videos and demonstrations, and emphasize connections between new concepts and previous material. He is committed to learning his students' names, being a dependable resource, and paying attention to visual cues to promptly address confusion.





**José Capa Salinas**

[jcapasal@purdue.edu](mailto:jcapasal@purdue.edu) | Civil Engineering | Purdue University

Research Interests: Infrastructure inspection using novel technologies

Poster Number: **#33**

Poster title: **Leveraging UAS for Infrastructure Resilience**

José Capa Salinas received his bachelor's degree in 2017 from Universidad Técnica Particular **de Loja**, Ecuador, and his master's degree in 2021 from Purdue University — both in civil engineering. For his PhD in civil engineering, he remains at Purdue, where he also is pursuing a certificate in teaching and learning in engineering. In 2015, he earned a technical baccalaureate in music from Conservatorio de Música Salvador Bustamante Celi, Ecuador, and he is a cellist with the Purdue Symphony Orchestra. His research involves using uncrewed aircraft systems (UAS) to inspect structures for possible defects and provide adequate maintenance. In the future, he will explore novel applications of UAS inspection, improve routine and fracture-critical inspections, and update hazard maps in bridge design. Capa Salinas, a Fulbright Scholar and licensed **UAS** remote pilot, **is a member of the committee on Seismic Design and Performance of Bridges at TRB. He serves as a voting member in one subcommittee and as an associate member in three ASCE/SEI 7-28 subcommittees.** He is a lead instructor for Purdue's Summer College for High School Students, a current mentor with Skype a Scientist, and **a returning mentor for the GradTrack program.** As a professor, he will provide mental health and diversity resources, communicate his support for LGBTQ+ individuals, extend flexibility for veterans, and accommodate people with disabilities. His aim is for students to leave his classroom saying they "loved every moment here."



**Parisa Sarikhani**

[psarikh@emory.edu](mailto:psarikh@emory.edu) | Biomedical Engineering | Emory University

Research Interests: Machine Learning and Computational Neuroscience

Poster Number: **#34**

Poster title: **Precision Neuromodulation Therapies Using Artificial Intelligence**

Parisa Sarikhani earned her bachelor's (2014) and master's (2017) degrees in electrical and computer engineering from Shiraz University, Iran. At Emory University, Georgia, she earned a master's degree in 2022 in computer science and informatics and will receive her PhD in the same discipline later in 2023. She has dedicated her research focus to the intersection of machine learning (ML), reinforcement learning (RL), optimization, and neuroscience to advance the field of neuromodulation by developing precision neuromodulation therapies. She successfully developed, implemented, and evaluated a fully automated deep brain stimulation programming framework for tremor suppression, which holds the potential to revolutionize the standard of care. Additionally, she is working on an open-source translational AI compute platform to enable R&D of intelligent closed-loop neuromodulation systems for a broader community with diverse expertise. Her internship at Abbott Neuromodulation has fueled her passion to explore and advance the field of spinal cord stimulation for chronic pain management, and her future research will be devoted to increasing fairness, accessibility, and transparency in healthcare. An active mentor, Sarikhani's mentees include students recently accepted into PhD programs. Through mentorship, hands-on projects, and tailored initiatives, she hopes to inspire and empower women and other underrepresented groups to excel in engineering and STEM careers.



**Aryssa Simpson**

[asimpso3@ncsu.edu](mailto:asimpso3@ncsu.edu) | Biomedical Engineering | UNC-Chapel Hill/NC State University

Research Interests: Mechanotransduction, Fibrosis (Uterine), 3D In Vitro Systems

Poster Number: **#35**

Poster title: **Utilizing Novel Material Platforms for Study Fibrotic Related Diseases and Disorders**

Aryssa Simpson earned her bachelor's degree in chemical engineering in 2020 from the University of South Florida. Currently, she is a third-year PhD student in the Joint Department of Biomedical Engineering at the University of North Carolina (UNC) and North Carolina State University (NCSU), where she is developing a novel microgel thin film system, in combination with DNA origami, that allows for fine control of mechanics and growth factor receptor patterning to control cell responses in wound healing. Moving forward, she is interested in cellular signaling mechanisms involved with uterine fibroids — a disorder that predominantly affects minority women. In 2022 and 2023, Simpson planned and led a biomedical engineering residential summer camp for local youth, securing more than \$10,000 in corporate sponsorships to cover fees for nine URM students. She is the science outreach chair for NCSU's BME Graduate Student Association, where she is working to expand diversity and minority engagement at UNC and NCSU. In service to Alliances for Graduate Education and Professoriate – NC, she encourages and supports doctoral completion among URM students. As a future engineering faculty member, her goal is to advocate, implement, and encourage diversity, develop courses to provide interactive and equitable engineering education, and open doors for those whose doors are traditionally closed.



**Aaron Michael West Jr.**

[amwestjr@mit.edu](mailto:amwestjr@mit.edu) | Mechanical Engineering | Massachusetts Institute of Technology  
Research Interests: Robotics, Controls, Human Motor Control, Rehabilitation

Poster Number: **#36**

Poster title: **Fundamentals of Human Motor Control and Robotic Systems**

A. Michael West Jr. received his bachelor's degree in mechanical engineering from Yale University in 2018, and his master's degree from the Massachusetts Institute of Technology (MIT) in 2020. He is currently a fifth-year PhD candidate in mechanical engineering at the Massachusetts Institute of Technology (MIT) studying human motor control and robotics. His research seeks to better control algorithms for robots involved in human rehabilitation and dexterous manipulation. His ultimate goal is to one day operate his own lab, developing intelligent devices that assist humans. He counts the time he spent as a pod leader for the MIT Summer Research Program (MSRP) as his most rewarding graduate school experience. There, he helped minority scientists realize their research potential and better prepare them for graduate school. Michael also has served as the treasurer for both the Black Graduate Student Association and the Academy of Courageous Minority Engineers at MIT. As vice president of Yale's chapter of the National Society of Black Engineers, he founded a tutoring service at a local public school for students at risk of failing ninth-grade algebra. So far in 2023, he has participated in Stanford University's Postdoctoral Recruitment Initiative in Sciences and Medicine and Georgia Tech's Focus Fellows Program. It is his goal to become a professor who inspires Black students to pursue careers in engineering and impacts lives through education and mentorship.



**Juan Camilo Velasquez**

[juancamilo.velasquezgonzalez@my.utsa.edu](mailto:juancamilo.velasquezgonzalez@my.utsa.edu) | Mechanical Engineering | The University of Texas at San Antonio (UTSA)

Research Interests: Sensor Placement Optimization for Structural Health Monitoring

Poster Number: **#37**

Poster title: **Complex Variable Methods to Optimize Bio-inspired Phononic Metamaterials**

Juan Camilo Velasquez earned his bachelor's degree in mechanical engineering in 2020 from Universidad EAFIT, Colombia. Currently, he is a PhD student in mechanical engineering at the University of Texas at San Antonio (UTSA), where he is funded through a Department of Defense project focused on enhancing the capabilities of sensor systems used for nondestructive testing and structural health monitoring. His work centers around the development of a robust gradient-based optimization framework for systems whose behavior resembles a highly non-linear dynamical response. He aspires to contribute to the field of design, analysis, and testing of hierarchical multifunctional materials, with applications mainly on the microscale. His approach will be equal parts computational and experimental components. At UTSA, he has volunteered at the Annual Technical Meeting of the Society of Engineering Science and at the STEM Day for Educators, in which he introduced computational topics to high school teachers from minority-serving institutions. As a professor, Velasquez hopes to: teach a mixed-level course on design, analysis, and fabrication of materials with exceptional properties; promote an inclusive research task force that does not discriminate by race, religion, national origin, disability, or gender; use technological tools that enhance the learning experience; and encourage and promote female access to the STEM fields.



**Isaiah M. Spencer-Williams**

[ims17@pitt.edu](mailto:ims17@pitt.edu) | Civil and Environmental Engineering | University of Pittsburgh

Research Interests: Urban Water Treatment & Microbiology

Poster Number: **#38**

Poster title: **Understanding how Changes in Operation and Design of Urban Water Infrastructure may Impact Connected Aquatic Microbiomes and Public Health**

Isaiah M. Spencer-Williams received his bachelor's degree (2019) and master's degree (2022) in civil engineering from the University of Pittsburgh (Pitt), where he currently is a PhD student in civil and environmental engineering. For his dissertation, he is evaluating how design and operational changes in the urban water cycle impact microbial quality and, in turn, human and environmental health. His future lab will explore how to best utilize plant-microbiome interactions to improve urban food production. Spencer-Williams is a student liaison for the Pitt EXCEL Alumni Council, in which he supports student programming, mentors EXCEL scholars, and develops opportunities for students and alumni to engage. In May 2023, he participated in Pitt's Race @Work Summer Retreat for underrepresented faculty development. As a spoken word artist, poet, and curator, he searches for ways to utilize art to connect scientific concepts and real-life experiences to make the STEM journey for historically underrepresented scholars more visible. He co-founded the Increasing Natural "N-tellect" already Trickling Eternally (INNATE) Project and now serves as an executive board member for the Coloured Section Black Artists' Collective. His education plan entails not only equipping his students with the technical prowess and engineering knowledge to be formidable, but also the core values of empathy, compassion, and servant leadership.