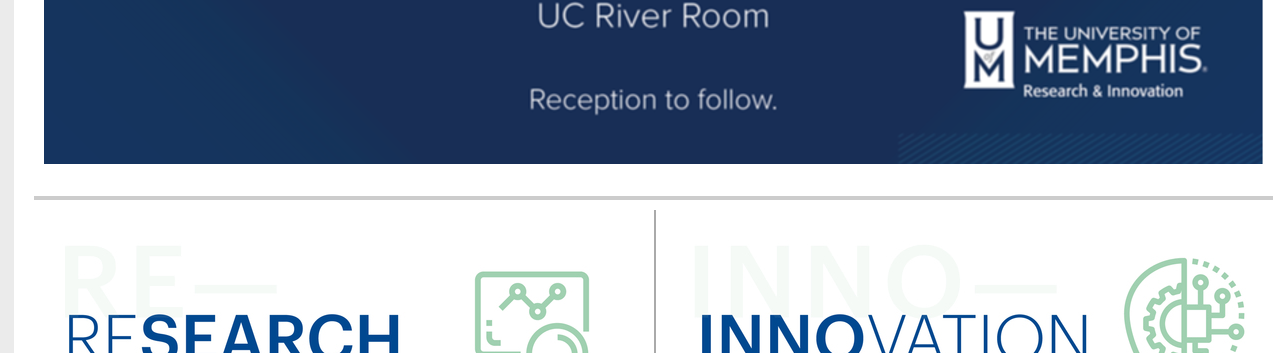




February 2020



RESEARCH CELEBRATION

From your first effort \$5 to the P1 Millions, every member of our research community is vital to the success and growth of our research institution. Join us as we recognize and celebrate these esteemed researchers.

Feb. 25 | 1:30 PM
UC River Room

Reception to follow.

RESEARCH

IIS Team Developing DataWhys, an AI-Driven Platform Training Platform

Dr. **Andrew Olney**, professor in IIS and the Department of Psychology, will advance understanding of how to optimize that learning by identifying the most effective learning supports across a range of skill levels. The work will synthesize previous work in the related fields of statistics, programming, and machine learning, each of which has been used only a few of the learning supports and techniques that will be comprehensively investigated in this project.

Through a partnership with the data science division of St. Jude Children's Research Hospital and Novartis, and through a summer internship for STEM majors from Lemoyne-Owen College, the research team will conduct longitudinal studies to provide additional evidence regarding workforce relevance via usability metrics and progress in personal learning plans. The software and training materials developed by this grant will be freely shared to help train the next generation of data scientists. Co-PIs for this grant are **Dr. Vasile Rus**, William Dunavant professor in Computer Science; **Dr. Scott Fleming**, associate professor in Computer Science; **Dr. Dale Bowman**, associate professor in Mathematical Sciences; **Dr. Andrew Tawfik**, assistant professor in Instruction and Curriculum Leadership; and **Dr. Natasha Sahr**, senior principle biostatistician at Novartis.

For more information on this research, contact Olney at adolney@memphis.edu. Read full press release.

INNOVATION

Schiro-Geist Receives \$1,974 Million Grant

To address shortages in vocational rehab

Dr. Chrisann Schiro-Geist, professor in Counseling Educational Psychology and Research (CEPR), recently received a grant to fund her project, Project FIRST (Training Innovative Rehabilitation Services). The goal of this project is to address the shortage of qualified vocational rehabilitation (VR) counselors and pre-employment transition services (Pre-ETS) specialists as results of Rehabilitation Act and Workforce Innovation and Opportunity Act (WIOA) amendments. To address this shortage, this project will develop innovative, data-driven, evidence-based and system support building training modules for inclusion in short-term in-service VR and Pre-ETS training programs by engaging other stakeholders in the project, i.e., family members, in-service educators/special educators, paraeducators/job coaches, and employers in in-demand fields and STEM) to maximize employment outcomes of youth with intellectual and developmental disabilities (IDD). This proposed project is critical given a large number of youth with IDD served by VR agencies and the growing complexity of the challenges faced by youth with IDD in finding and retaining a job. The University of Memphis Institute on Disability will work collaboratively with other stakeholders to carry out this project.

This project changes the in-service VR and Pre-ETS training paradigm from a role and function model to an outcome-based model, with an emphasis on strengthening coordinated VR team efforts. The anticipated outcomes of this project include: outcome- and evidence-based in-service VR training modules for Pre-ETS training modules tailored to meet the employment needs of youth with IDD; high quality in-service VR counselors and Pre-ETS specialists; and a coordinated VR team to serve youth with IDD, enhanced retention of in-service VR team to systematically support integrated and competitive employment outcomes for youth with IDD.

For more information on this project, contact Schiro-Geist at cschirg@memphis.edu.

Grants Awarded as Part of the UoM's Collaboration with Czech Republic

Will partner UoM faculty with Czech faculty

Three University of Memphis faculty members were recently awarded grants through the Mobility Plus Project program, as part of the UoM's partnership with the Czech Academy of Sciences (CAS). The partnership with CAS was finalized in 2018 with a signing ceremony between CAS President Eva Zazulova and UoM President Dr. M. David Rudd. Comprised of 64 research institutions, the CAS is considered for leading research in the Czech Republic across a range of natural, technical, social sciences and humanities topics.

The recipients were:

- Dr. Chuck Langston**, UoM professor and director of the Center for Earthquake Research and Information (along with Dr. Jiri Malek, Institute of Rock Structure and Mechanics of the Czech Academy of Sciences of Rotational Seismology for Earthquake Early Warning and Monitoring.
- Dr. Joel Bumgardner**, UoM professor in Biomedical Engineering (along with Dr. Lucie Bacakova, Institute of Physiology). His project "Novel Nano-fibrous Scaffolds for Skin Tissue Engineering."
- Dr. Ebrahim Asadi**, UoM assistant professor in Mechanic Engineering (along with Dr. Daniela Rostohar, Czech Institute) for the project "Hybrid Additive Manufacturing and Laser Shot Peening Process for Quality Improvement of 3D metal printed objects."

For more information on this collaboration, contact the Division of Research and Innovation at research@memphis.edu.

Political Science Faculty Awarded International Fellowship in Germany

inequality issues; perceptions and responses

Dr. Kris-Stella Trump, assistant professor in the department of Political Science, has been awarded a senior fellow position at the University of Konstanz (Germany) in their Cluster of Excellence "The Politics of Inequality." This position is part of the Excellence Strategy of the German federal and state governments. The cluster's researchers investigate inequality in areas such as social mobility, employment and political rights. They study how people perceive these inequalities, how they lead to social and economic inequalities, and how political actors respond to them. As a senior fellow, Trump will become a member of the cluster and will actively participate in its activities during fall 2020. While at the University of Konstanz, Trump will work on her book project that examines perceptions of deservings and attitudes toward redistribution and reactions to growing income inequality.

For more information on this appointment, contact Trump at ktump@memphis.edu.

UoM Lead Participant in Major Genomic Research Study

Research featured

The evolutionary innovations of insects and other arthropods – the most diverse group of animals on Earth – are as numerous as they are fascinating, from fangs, silk and stingers to exquisitely colored wings and ingenious feats of bioengineering. Some insects control vital ecosystem services, including pollination and decomposition, while others are pests of agriculture or cause human diseases. DNA sequencing allows us to study the genomic blueprints underlying this extraordinary diversity. An international team of scientists, including researchers from the University of Memphis, is part of a project designed to look at the sequencing of genomes from thousands of arthropod species (the Insect 5,000 Genomes Project, I5G).

Adding the 28 genomes they sequenced to previously sequenced ones enabled a uniquely large-scale comparative analysis involving genomes from 76 arthropod species. Their results have wide-ranging implications for our understanding of the evolution and genomic basis of arthropod biology, including insect form and function. Moreover, they support a diversity of new research at the interface between insects and humans, and involving the roles and management of insects in agriculture, forestry and natural ecosystems.

Learn more about McKenna's work. Read the full press release. Read paper in [Genome Biology](#). [Gene content evolution in the arthropods](#).

Dr. Christine Bertz and CREP Partner with Smithsonian Science Education Center

Will lead evaluation efforts on grant

The Center for Research in Educational Policy (CREP) in the College of Education is serving as a sub-awardee to the Smithsonian Science Education Center (SSEC) on a new \$4.4 million, five-year grant awarded to SSEC by the U.S. Department of Education's Education Innovation and Research program. The evaluation for the grant will be performed by CREP with **Dr. Christine Bertz** serving as the principal investigator, and will assess the impact on student achievement. **Dr. Don Zoblotsky** and **Dan Strahl**, CREP associate director, will serve as co-PIs. Bertz coordinates research in the U.S. Department of Education involvement in projects with SSEC.

SSEC will bring "Smithsonian Science for North and South Carolina classrooms" to more than 11,250 students in grades 3-5 in rural North Carolina and South Carolina as part of a partnership with two external partners – the North Carolina Science, Math and Technology Center and the South Carolina Coalition for Mathematics & Science. In addition to the curriculum modules, SSEC will develop and implement differentiated science and engineering professional development to support the content and pedagogy within the curriculum modules.

Since 2010, CREP's partnership with the Smithsonian Science Education Center has brought in almost \$7 million dollars to the University of Memphis through eight grants and contracts. Projects have been conducted in North Carolina, Houston, New Mexico and Denton and surrounding areas in Colorado. Although CREP has frequently collaborated as the third-party evaluator, it is the prime recipient of the grant. CREP focuses on the areas where the SSEC serves as a sub-award partner.

For more information on this initiative, contact Bertz at gabertz@memphis.edu.

Fighting the Opioid Crisis in Tennessee

UoM faculty partners to address access to treatment

In 2017, Tennessee had the third highest opioid prescription rate in the country, and 1.5 times greater than average U.S. rate. Despite successful attempts to reduce these rates (2017 Tennessee Prescription Opioid Report), the treatment of opioid addicted individuals in the state remains a major cause for concern and the opioid abuse crisis continues to have a heavy, especially in the Appalachian counties of Tennessee. Despite the acute need for opioid use disorder treatment in this mountainous region, over 80% of those needing treatment do not receive it. **Dr. Satish Kedia**, professor in the School of Public Health Division of Social Behavioral Sciences, has spent much of the last decade addressing this critical challenge within the context of his research in alcohol and drug abuse treatment and prevention; sexuality and HIV/AIDS; caregiving and adherence; and program evaluation and impact assessment.

His most recent work, a partnership with Buffalo Valley Rehabilitation Centers, will utilize a novel outreach strategy to expand access to medication-assisted treatment and psychosocial services along with transitional housing for OUD clients. This project, part of a \$500,000 award in collaboration with the University of Baltimore, will assist with implementing a multi-faceted approach to person-centered outreach, treatment, housing, and evaluation in the target population.

For more information on this project, contact Kedia at skkedia@memphis.edu.

Geofoam Expert Continues Pioneering Research with UoM

UoM's Arellano receives grant to continue work

If you've ever driven down the interstate, you have likely noticed the foam that is used without even realizing it. Geofoam is an expanded or extruded polystyrene whose primary use is filling large voids under roadways, parking lots, and bridge construction. **Dr. David Arellano**, associate professor in Civil Engineering, has been pioneering research in this important construction material for more than a decade at the University of Memphis and was awarded \$5,000 in research funding by the Tennessee Department of Transportation to continue this work. Specifically, Arellano will be exploring the performance of geofoam in being constructed along Poplar Avenue in Memphis. He will also be developing a geofoam design manual and special provision for the use of geofoam in Tennessee, based on the field instrumentation results.

For more information on this project, contact Arellano at darellano@memphis.edu.

Moving Tennessee Forward in Research

Boosting research to provide the foundation for a modern Tennessee

According to latest data from the National Science Foundation's Higher Education Research & Development (HEDR) survey, the University of Memphis single-handedly outperformed the combined research efforts of the next 100 largest U.S. universities in Tennessee. The University of Tennessee Chattanooga, Middle Tennessee State University, Tennessee State University, East Tennessee State University, Tennessee Tech and Austin Peay had combined research expenditures of \$6 million compared to the University of Memphis' \$64,297,000. The UoM continues to grow as a research powerhouse in the State of Tennessee as well as the national pursuit of the top tier Carnegie R1 status. Kudos to UoM faculty and researchers whose efforts are driving this success.

Research Awards

December 2019

Dr. Chrisann Schiro-Geist, professor of the Counseling Educational Psychology & Research, was awarded \$1,974,264 from the U.S. Department of Education for her project "Topic Area 6: Project FIRST Training Innovative Rehabilitation Services Training."

Dr. Nathan DeVonker, assistant professor in the Department of Chemistry, was awarded \$742,139 from the National Science Foundation for his project "CAREER: A Model-Building Platform for Rational, Reproducible, and Rigorous Computational Enzymology."

Dr. Brian Waldron, associate professor of the Department of Civil Engineering and director of the Center for Applied Earth Science and Engineering, was awarded \$400,000 from the Tennessee Department of Agriculture for his project "Department of Ag West TN."

Dr. Keri Brondo, professor and chair of the Department of Anthropology and affiliated faculty in the Department of Interdisciplinary Studies, was awarded \$238,245 from the Tennessee Department of Education for her project "Governor's School for International Studies, 2020."

Dr. Amy Curry, associate professor of the Department of Biomedical Engineering, was awarded \$116,432 from the National Institutes of Health in collaboration with the University of Tennessee Health Science Center for her project "Investigations into the Etiology of Phantom Limb Sensations and Phantom Limb Pain."

Dr. Thomas Goebel, assistant professor of the Center for Earthquake Research and Information, was awarded \$41,485 from the U.S. Department of Energy in collaboration with the Regents of the University of California, Santa Cruz for his project "Assessing crustal stresses and induced seismicity distributions in light of active fluid injection and extraction operations."

Dr. Brian Waldron, associate professor of the Department of Civil Engineering and director of the Center for Applied Earth Science and Engineering was awarded \$36,515 (STTR) from Conch Technologies, Inc. for his project "MLGW street lights phase 1."

Dr. Christina Bertz, assistant professor of the Center for Research in Educational Policy, was awarded \$25,000 from the Women's Foundation for a WGFEM Vision 2020 Initiative FY2020.

Dr. Mohd Ali, associate professor in the Department of Electrical and Computer Engineering, was awarded \$20,000 from the Electric Power Research Institute for his project "Design and Operation of Utility Integrated Photovoltaic (PV) System as Supercapacitor Energy Storage."

Dr. Hironori Nishi, assistant professor in the Department of East Asian Languages and Literatures, was awarded \$15,000 from the Association for Asian Studies, Inc., for his project "2020 Annual Conference of the Japanese Association of Teachers of Japanese (SEATJ)."

January 2020

Dr. Mohamed Laradi, professor in the Department of Physics and Materials Science, was awarded \$309,367 from the National Science Foundation for his project "Membrane-Induced Self-Assembly of Anisotropic Nanomaterials."

Dr. Robin Poston, professor of the Department of Business Information and Technology and dean of the Graduate School, was awarded \$100,000 from the Air Force Institute of Technology (AFIT) in collaboration with MacCauley-Brown, Inc. for her project "Testing & Evaluation for Autonomous Cyber-Physical Systems: Research in the United States Best Practices."

Dr. John Sabatini, professor in the Department of Intelligent Systems, was awarded \$60,352 from the U.S. Department of Education in collaboration with Georgia State University for his project "Identifying Risk Factors and Predictors of Literacy Skills for Adults Performing at the Lowest Levels of PIAAC in the United States."

Dr. Marie van der Merwe, associate professor of the School of Health Sciences, was awarded \$36,037 from Kaneka Corp. for her project "Safety and efficacy of a probiotic supplement: focus on lessening GI distress in endurance athletes."

Dr. Daniel Larsen, professor and chair of the Department of Earth Sciences, was awarded \$32,000 from the City of Collierville for his project "Collierville GW Quality Research."

Dr. Lily Afshar, professor in the Rudi E. Scheidt School of Music was awarded \$7932 from the Augustine Foundation for her eighth Memphis International Guitar Festival.

* Data is reported on the 18th of each month. Any award information after the 18th of each month will be reported in the following month's report.

RESEARCH CLUSTERS

ADDITIVE MANUFACTURING

AGRICULTURE & FOOD TECHNOLOGIES

BIOLOGISTICS

CAST

DATA SCIENCE

DRONES

SMART CITIES

QUICK GUIDE

TO RESEARCH AND SPONSORED PROGRAMS

Reviewing, Submitting and Accepting Funded Research

Resource for faculty and staff

Research Development and Sponsored Programs are the central research support teams responsible for the review and submission of proposals (grants, contracts, cooperative agreements, non-monetary) to external sponsors and for the review and acceptance of any sponsored project funds. The team includes Pre-Award Services, Contract and Award Services, Electronic Research Administration and Research Development. They are located in 315 Administration Building.

Quick Guide available [here](#).

NEWS TO FEATURE IN THE RESEARCH + INNOVATION NEWSLETTER?

We welcome the opportunity to highlight the research infrastructure and innovation capabilities at the University of Memphis. Email your award notifications, references to be held at the UoM, honors, publications, research impact stories, initiatives, etc., for inclusion in an upcoming issue of the UoM newsletter. We look forward to sharing the world-class accomplishments taking place at the University of Memphis.

CONTACT US

Visit the [website for the latest news and happenings at the research park](#)

Redefining the University District and strengthening Memphis's economic impact

View website [here](#)

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FEEDBACK WITH

RFID Experimentation on Tiny Hawk MicroDrones

Ongoing research at the University of Memphis

When the weather gets chilly, the members of 901 EFPY bring their high-speed races indoors. Earlier this month, these drone racers participated in an experiment with **Dr. Kevin Berisso** to determine if lightweight RFID tags could be used to detect when the rapidly-moving Tiny Hawk drones passed near a sensor array. If so, a future drone racing event could be held indoors. The experiment was designed to test the ability of the racers, to introduce moving obstacles and surprise events, changing the difficulty of the race track in real time.

The experiment's result: It worked! Don't miss out on upcoming events like these. Follow the FedEx Institute of Technology today.

University of Memphis Research + Innovation Magazine

Leading Through Innovation

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