



RESEARCH

QUARTERLY RESEARCH REPORT
OCTOBER 2023

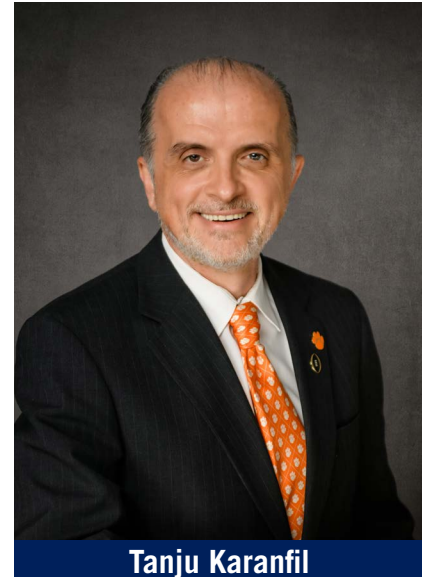


▶ From the Vice President for Research

Fiscal year 2023 was a historic one for research at Clemson University.

We have shattered records in research awards received. We are doing more than ever before. Conducting more research. Writing more scholarly articles and books. Innovating more. Impacting more lives.

In fiscal year 2023, research awards received at Clemson hit an all-time high of \$282 million, a 79 percent increase from the prior year. Clemson has earned numerous high-value, capacity-building research awards this year, including the largest grant funded by a single agency in our history – the \$70 million Climate-Smart Commodities project from USDA – as well as a \$20 million National Science Foundation grant to apply artificial intelligence to health care diagnostics and treatment; a \$20 million national transportation center; another \$16 million to advance the next generation of U.S. Army fleet vehicles; our first Energy Frontier Research Center from the DOE (\$10M); a phase 2 renewal of our Eukaryotic Pathogens Innovation Center COBRE (\$11M); and numerous other projects. I have included brief descriptions of our highest value projects for the year on [pages 10-13](#).



Tanju Karanfil

These projects involve hundreds of faculty members and students and represent a wide range of disciplines: healthcare, education, agriculture, energy, advanced materials, bioengineering, automotive engineering and others.

And, our researchers are not slowing down. In fiscal year 2023, Clemson submitted nearly \$1 billion in proposals for funding, an increase of 4 percent from 2022 and more than double the amount submitted 10 years ago.

Clemson is looking to push the boundaries of knowledge, seeking answers to the world's pressing problems and introducing new innovations to the world. Here are just a few recent examples:

- Clemson students debuted an autonomous vehicle that could support natural disaster relief efforts ([page 15](#)).
- A Clemson researcher has helped develop a digital standard that could be key to the protection of privacy in the age of quantum computing ([page 15](#)).
- A Clemson faculty member is helping to inform counterterrorism efforts ([page 17](#)).
- Clemson researchers have developed a new way of 3D-printing fuel cells ([page 17](#)).

More examples are included on [pages 15-18](#).

Additionally, our peers in the academic community are recognizing the contributions of Clemson researchers:

- Three Clemson programs received national awards for programs that use teaching and research to advance diversity in STEM careers ([page 19](#)).
- Clemson earned national recognition for its use of Geographic Information Systems (GIS) technology to understand vast amounts of data and solve complex problems ([page 20](#)).

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▶ From the Vice President for Research

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- A Clemson alumnus was named one of the most outstanding young manufacturing engineers by the nonprofit Society of Manufacturing Engineers ([page 21](#)).
- A finance professor is among just 44 individuals designated a Fellow by the Real Estate Research Institute ([page 22](#)).

Clemson has a great faculty body working to improve the world through their research, scholarship and creative endeavors. A profile of one faculty member from each college is included on [pages 23-33](#) to give a sense of the breadth of scholarship and discovery happening at Clemson. We are fortunate to have a great faculty body that has helped us grow our research exponentially in recent years. Now, we get to work to elevate Clemson even further.

I am excited to see what the future holds.



Tanju Karanfil, Ph.D., PE, BCEE, IWA Fellow
Senior Vice President for Research, Scholarship and Creative Endeavors
Clemson University

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RESEARCH

RESEARCH METRICS

This section covers institutional research productivity with data on proposal submissions, awards and expenditures.

Executive Summary

- Clemson reported total R&D expenditures of \$263 million for 2022 to the National Science Foundation Higher Education Research and Development (HERD) Survey. This is an increase of 11 percent from 2021 and marks the first time Clemson has surpassed \$250 million ([page 5](#)).
- Competitive expenditures topped \$160 million in fiscal year 2023, an increase of more than 13 percent from the previous year ([pages 6-7](#)).
- Proposal submissions increased 4 percent to \$932.8 million in fiscal year 2023 ([page 8](#)).
- In FY2023, Clemson earned \$282 million in awards, up 79 percent from the prior year ([page 9](#)).
- A list of the top awards received during the fiscal year is included on [pages 10-13](#).

The tables on the following pages provide details on proposal submissions, awards and expenditures per college/unit. Abbreviations used in the tables are listed below. This report includes data through fiscal year 2023 (July 1, 2022 — June 30, 2023); Therefore, data is still listed for the former College of Architecture, Arts & Humanities, which was reorganized into two new colleges effective July 1, 2023.

CAAH: College of Architecture, Arts & Humanities

CAFLS: College of Agriculture, Forestry & Life Sciences

CBSHS: College of Behavioral, Social & Health Sciences

CECAS: College of Engineering, Computing & Applied Sciences

COE: College of Education

COB: Wilbur O. and Ann Powers College of Business

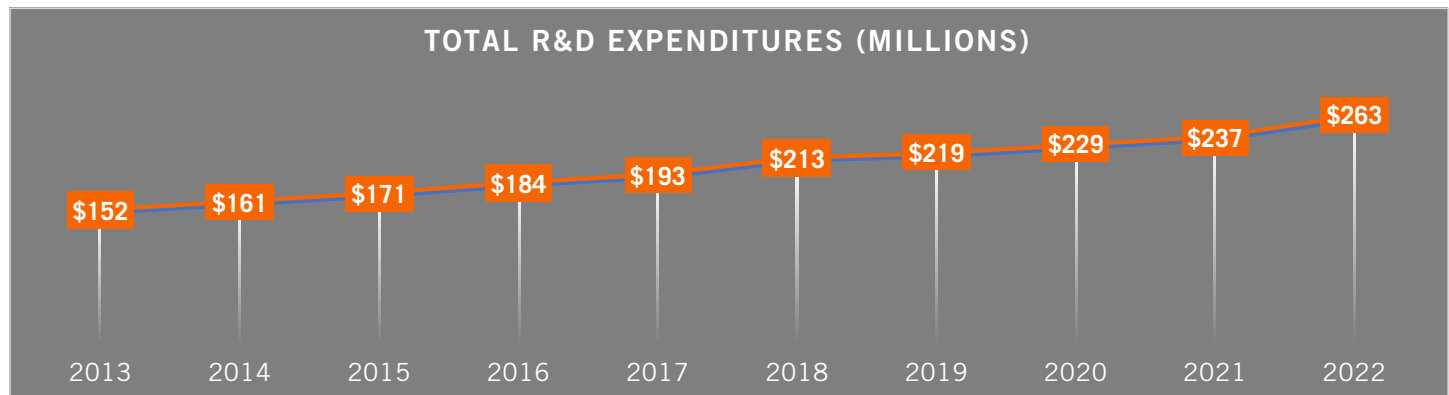
COS: College of Science

PSA: Public Service & Agriculture

Total R&D Expenditures

Clemson's total R&D expenditures continued to increase in 2022 to \$263 million, as shown in the chart below. This data includes expenditures on all research revenue, including state support, gifts, external research services, competitive awards, and other sources, as reported to the National Science Foundation Higher Education Research and Development (HERD) Survey.

The table below shows various outputs (Ph.D. productivity, licensing revenue, patents, etc.) and the size of the workforce supporting research activity at Clemson.



	2019	2020	2021	2022	2023
NIH R01-Equivalent Awards		1	3	1	6
Doctorates Awarded	301	249	225	242	285
STEM Doctorates Awarded	174	162	159	172	190
Disclosures	62	68	44	50	61
Patents	18	12	15	9	11
Licenses/Options	19	13	13	27	16
Licensing Revenue	\$398,136	\$315,578	\$239,074	\$380,286	\$392,162
Start-up Companies (based on licenses/options)	5	1	1	4	4
Supporting Workforce					
Graduate Student Enrollment	5,282	5,627	5,538	5,448	6,401
Sponsored Graduate Research Assistants	558	637	546	729	926
Postdoctoral Fellows	98	98	106	117	112
Research Faculty: Permanent 100% Non-E&G Funded	11	18	12	2	5
Research Faculty: Temporary 100% Non-E&G Funded	29	54	45	32	28

Competitive Expenditures

Competitive expenditures topped \$160 million in fiscal year 2023, an increase of more than 13 percent from the previous year. Competitive expenditures include funds only from competitively bid projects, such as federal grant awards.

Competitive expenditures have increased steadily at Clemson over the past decade and have greatly outpaced increases to the size of the faculty body, as shown in the expenditures per faculty member figures on the following page.

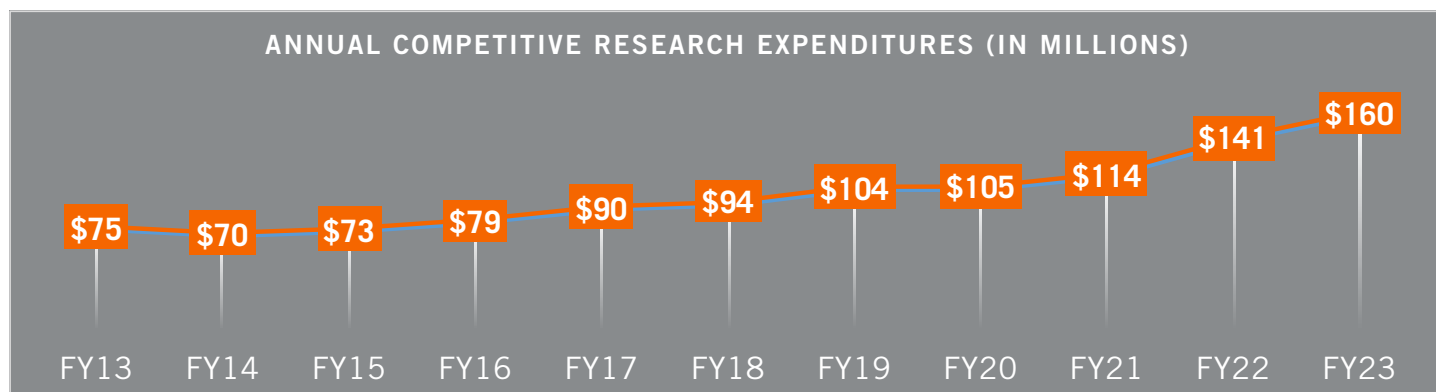
Additional details on expenditures by business unit, innovation cluster and funding source are included in the table on the next two pages.

The chart on the following page shows annual competitive expenditure data over the past decade.

Research Expenditures (millions)	2019	2020	2021	2022	2023
By Business Unit	\$104.5	\$105.3	\$114.4	\$141.4	\$160.3
CAAH	\$1.7	\$1.6	\$1.1	\$1.3	\$1.9
CAFLS	\$14.1	\$16.4	\$15.0	\$17.8	\$20.2
COB	\$0.8	\$0.7	\$0.7	\$0.7	\$1.0
CECAS	\$50.3	\$46.4	\$54.4	\$71.7	\$76.0
CBSHS	\$5.3	\$6.7	\$9.0	\$12.0	\$16.7
COE	\$2.5	\$2.4	\$2.3	\$3.8	\$5.6
COS	\$17.2	\$17.3	\$15.9	\$18.5	\$23.1
PSA	\$3.7	\$3.9	\$5.5	\$7.2	\$9.5
VP for Res & Interdisc Inst	\$7.1	\$9.5	\$9.6	\$7.0	\$6.2
All Other	\$1.5	\$0.4	\$0.7	\$1.1	\$1.6
By Innovation Cluster	\$104.5	\$105.3	\$114.4	\$141.4	\$160.3
Advanced Materials	\$15.4	\$13.5	\$14.3	\$18.6	\$21.1
Cyberinfrastructure & Big Data Science	\$6.9	\$4.4	\$5.5	\$8.2	\$7.7
Energy, Trans. & Advanced Manufacturing	\$17.1	\$14.5	\$19.9	\$27.7	\$29.5
Health Innovation	\$23.8	\$27.1	\$27.1	\$26.3	\$30.5
Human Resilience	\$9.0	\$9.7	\$12.7	\$14.8	\$19.1
Sustainable Environments	\$20.6	\$23.9	\$21.3	\$26.8	\$33.7
Other	\$11.7	\$12.1	\$13.6	\$19.6	\$20.2

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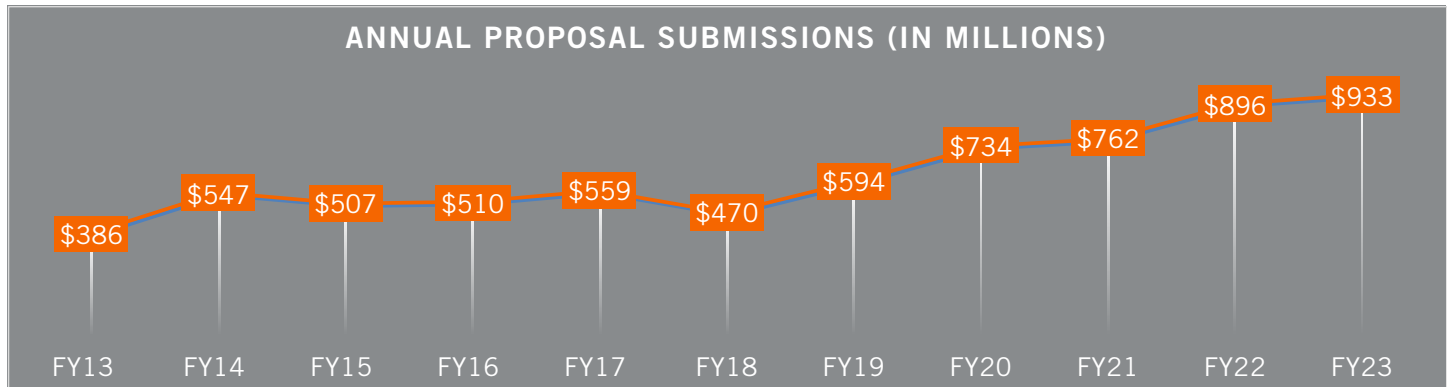
Competitive Expenditures



Research Expenditures (millions)	2019	2020	2021	2022	2023
By Funding Source	\$104.5	\$105.3	\$114.4	\$141.4	\$160.3
Federal Government	\$85.1	\$85.2	\$95.1	\$125.1	\$141.0
Foundations, Societies, and Associations	\$7.4	\$6.9	\$6.2	\$4.6	\$5.4
Industry/Other	\$5.3	\$5.5	\$4.8	\$4.8	\$5.9
International	\$0.3	\$0.3	\$0.4	\$0.5	\$0.5
Local Government	\$0.5	\$0.5	\$0.8	\$0.9	\$0.7
State Government	\$5.7	\$6.8	\$7.3	\$6.2	\$8.2
Per T/TT Faculty Member					
CAAH	\$10,159	\$10,003	\$6,912	\$8,266	\$12,192
CAFLS	\$134,555	\$137,438	\$131,195	\$139,844	\$157,860
COB	\$8,200	\$6,991	\$7,132	\$6,787	\$9,865
CECAS	\$225,620	\$201,553	\$223,843	\$296,203	\$310,088
CBSHS	\$40,301	\$50,495	\$67,202	\$90,220	\$121,581
COE	\$47,371	\$47,742	\$48,805	\$80,058	\$121,114
COS	\$118,600	\$116,020	\$107,258	\$120,778	\$146,445
Clemson average (Total exp/Total T/TT faculty)	\$99,125	\$96,497	\$103,187	\$142,129	\$159,792

Proposal Submissions

Proposal submissions increased 4 percent to \$932.8 million in fiscal year 2023. Of particular note, every college exceeded its target set at the beginning of the year for proposal submissions, as shown in the “FY2023 Targets” column in the table below. Additional details on the number and value of proposal submissions for each college are included in the table below.

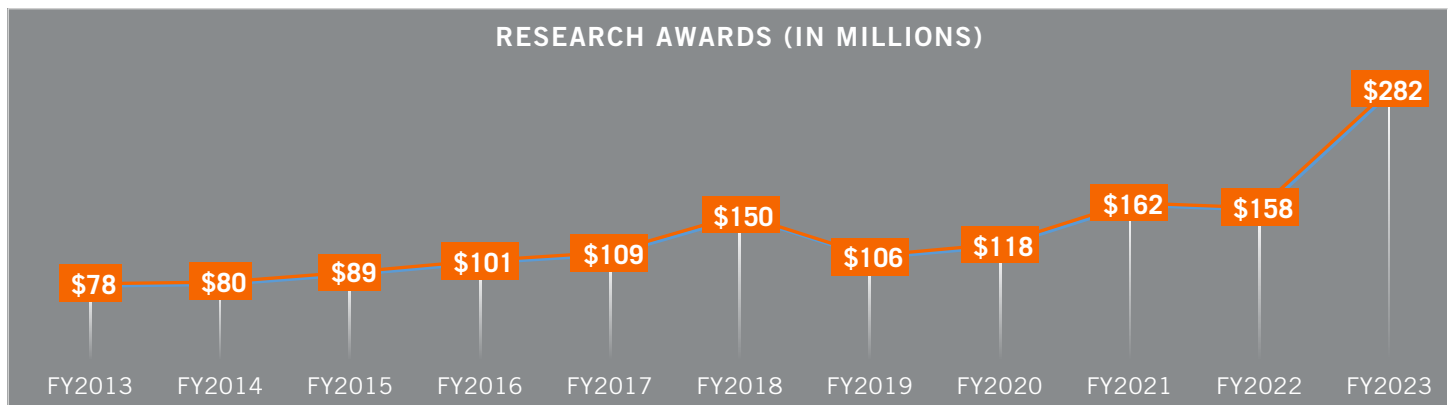


Proposal Submissions	2019	2020	2021	2022	2023	
By Count	1,417	1,729	1,583	1,492	1,680	
CAAH	69	76	61	35	27	
CAFLS	377	473	401	366	411	
CBSHS	105	143	151	151	183	
CECAS	562	672	596	631	684	
COE	39	42	37	43	45	
COB	5	11	14	9	11	
COS	186	219	229	193	259	
PSA	33	37	26	26	40	
VP for Res & Interdisc Inst	25	29	29	23	11	
All Other	15	26	39	15	9	
By Value (millions)	\$594	\$734	\$762.4	\$896	\$932.8	FY2023 Targets
CAAH	\$4.4	\$5.9	\$5.6	\$8.3	\$13.4	\$9.0
CAFLS	\$68.4	\$92.9	\$84.1	\$242.1	\$136.1	\$90.0
CBSHS	\$87.5	\$41.1	\$64.3	\$73.1	\$106.5	\$75.0
CECAS	\$255.3	\$405.9	\$342.9	\$380.8	\$426.0	\$390.0
COE	\$10.1	\$18.9	\$22.4	\$32.3	\$34.4	\$26.3
COB	\$2.1	\$2.9	\$4.2	\$4.8	\$6.3	\$5.6
COS	\$73.8	\$129.3	\$175.4	\$127.3	\$169.8	\$142.5
PSA	\$11.4	\$6.4	\$5.6	\$7.8	\$13.5	\$11.3
VP for Res & Interdisc Inst	\$68.5	\$19.8	\$22.3	\$11.0	\$6.7	
All Other	\$7.4	\$7.7	\$35.7	\$8.3	\$20.3	

Competitive Research Awards

Clemson faculty continue to successfully earn competitive research awards, particularly high-value awards of \$2 million and more, earning 100 such awards since 2015 for a total of \$588 million. This has fueled a big jump in awards. In FY2023, Clemson earned \$282 million in awards, up 79 percent from the prior year.

The table shows awards per college and the number of prestigious young investigator awards earned.



Research Awards	2019	2020	2021	2022	2023
By College/Unit (millions)	\$106.3	\$118.3	\$162.2	\$157.6	\$282.0
CAAH	\$2.0	\$1.4	\$1.4	\$1.3	\$5.6
CAFLS	\$14.2	\$22.3	\$24.2	\$19.9	\$97.3
CBSHS	\$5.9	\$7.7	\$17.4	\$13.7	\$21.0
CECAS	\$50.4	\$48.0	\$75.0	\$76.4	\$102.8
COE	\$3.3	\$2.3	\$5.1	\$5.7	\$10.1
COB	\$0.8	\$1.2	\$0.2	\$0.9	\$1.1
COS	\$18.7	\$14.2	\$25.4	\$17.8	\$24.4
PSA	\$4.0	\$4.1	\$5.8	\$6.9	\$10.1
VP for Res & Interdisc Inst	\$6.2	\$14.6	\$5.1	\$6.6	\$7.1
All Other	\$0.7	\$2.2	\$1.9	\$8.2	\$2.6
Young Investigator Awards	6	10	10	1	8
NSF CAREER	4	6	9	1	6
NIH KO1	-	1	-	-	-
Air Force Young Investigator	1	-	-	-	1
Army Young Investigator	-	1	-	-	-
DARPA Young Investigator	-	1	-	-	-
EPA Early Career	1	-	-	-	-
DOE Early Career	-	-	1	-	-
Arnold & Mabel Beckman Foundation	-	-	-	-	1
Dept. of Education Inst. of Educational Sciences	-	1	-	-	-

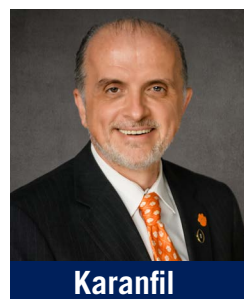
Top Competitive Awards (Year End FY2023)

The U.S. Department of Agriculture (USDA) awarded \$70 million to a collaboration between Clemson and South Carolina State University, marking the largest single award from a federal agency in Clemson's history. The two land-grant institutions have established a statewide coalition to implement climate-smart agricultural production practices. Called "Building Partnerships for Climate-Smart Commodities in South Carolina," the project is led by Paula Agudelo, associate dean of research in the College of Agriculture, Forestry and Life Sciences, and director of the Clemson Experiment Station, a collection of research and education centers stretching across South Carolina. [READ MORE](#)



Representatives from South Carolina, U.S. Congress and the USDA announced a \$70 million investment into Clemson and South Carolina State universities to support Partnerships for Climate-Smart Commodities.

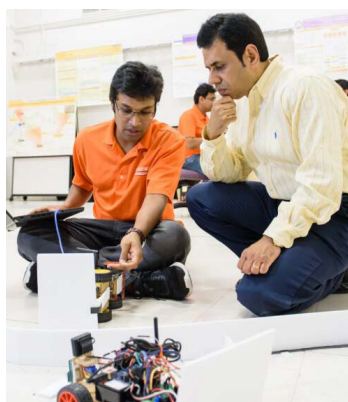
The National Science Foundation awarded a \$20 million, five-year grant to a Clemson-led project that aims to modernize health care diagnostics and treatment in South Carolina with the use of AI. The project, called Artificial Intelligence-Enabled Devices for the Advancement of Personalized and Transformative Health Care in South Carolina or ADAPT-SC, includes a statewide team of researchers from 11 institutions that will work closely with industry to advance AI-enabled medical devices and to train an AI-ready workforce. The project is lead by Tanju Karanfil, senior vice president of research, scholarship and creative endeavors. Bruce Gao, South Carolina SmartState Endowed Chair of biofabrication engineering, is the ADAPT scientific lead. [READ MORE](#)



Karanfil



Gao



Chowdhury, right

The U.S. Department of Transportation awarded Clemson \$20 million to establish the new National Center for Transportation Cybersecurity and Resiliency (TraCR). Led by Mashrur "Ronnie" Chowdhury, the Eugene Douglas Mays Chair of Transportation at Clemson, TraCR will devise new ways of hardening the transportation system against cyberattacks as a growing number of vehicles and more of the world's infrastructure rely on the internet to move people and goods safely and efficiently. Wirelessly connecting vehicles to each other and to the roadway infrastructure holds the promise of reducing gridlock, crashes, fuel use, emissions and social inequities. However, it also opens the transportation system to a host of cyber threats from individual hackers, criminal gangs, terrorists and other bad actors. Researchers expect to develop software and hardware that will be designed as an ironclad defense against cyberattacks. [READ MORE](#)

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Top Competitive Awards (Year End FY2023)

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Officials tour the Virtual Prototyping of autonomy-enabled Ground Systems (VIPR-GS) Center at the Clemson University International Center for Automotive Research.

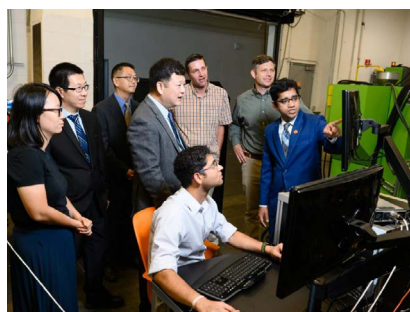
The U.S. Army awarded Clemson \$16.4 million to advance the Virtual Prototyping of autonomy-enabled Ground Systems (VIPR-GS) Center project initially announced in 2020. VIPR-GS consists of 70 faculty, 120 graduate researchers, 30 active translational research projects and 10 supporting departments. The team is working to develop innovative digital engineering tools for rapid exploration and design of the next generation of on- and off-road vehicles. These tools aim to support of GVSC's ambitious goals for rapid modernization of U.S. Army fleets.

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The National Institutes of Health awarded an \$11 million, phase 2 Center of Biomedical Research Excellence grant to support Clemson's Eukaryotic Pathogens Innovation Center (EPIC). EPIC researches novel therapeutic treatments for tropical diseases caused by eukaryotic pathogens. Eukaryotic pathogens cause some of the most devastating and intractable diseases in humans, including malaria, amoebic dysentery, sleeping sickness, Chagas disease and fungal meningitis. This phase 2 COBRE is led by James Morris, professor of genetics and biochemistry. [READ MORE](#)



Professor Kerry Smith in the Department of Genetics and Biochemistry conducts research at the Eukaryotic Pathogens Innovation Center.



The AIM for Composites research team.

The U.S. Department of Energy awarded a \$10.4 million Energy Frontier Research Center grant for the "Artificially Intelligent Manufacturing Paradigm for Composites (AIM for Composites)" project. The AIM for Composites center based at the Clemson University International Center for Automotive Research will develop AI-enabled, cloud-based, inverse design tools that can accelerate the discovery and manufacturing of new high-performance composite materials. Collaborators include the Pacific Northwest National Laboratory, the Savannah River National Laboratory, University of Florida, The Ohio State University, Brown University and South Carolina State University. [READ MORE](#)

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Top Competitive Awards (Year End FY2023)

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Karthikeyan

The U.S. Department of Agriculture awarded \$10 million to Clemson to study development of a controlled environment agriculture (CEA) platform for growing salt-tolerant crops – mustard greens, cucumbers and tomatoes – using saline water for irrigation. This research could provide a solution for the limited amount of freshwater available for agricultural production. CEA covers a variety of systems, including greenhouses and modular containers, that take a technology-based approach to farming. The project is led by Raghupathy Karthikeyan, Charles Carter Newman Endowed Chair Professor of Natural Resources Engineering. [READ MORE](#)

The Defense Advanced Research Projects Agency awarded \$6.9 million for a project to develop communities of marine microbes that form smooth, stable biofilms to reduce drag and fouling (the accumulation of marine organisms on underwater surfaces) on unmanned underwater vehicles. This framework for engineering protective, stable and resilient biofilms could be extended to address an array of challenges caused by fouling in oil production, water treatment, fuel tanks, the food and beverage industry, and nuclear power plants. The project is led by David Karig, associate professor of bioengineering.



Karig



The U.S. Department of Education awarded Clemson \$5.8 million for an effort to increase the number of school counselors at K-12 schools.

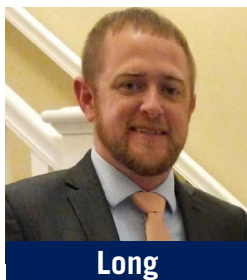
The project is led by Amanda Rumsey, assistant professor of education and human development. Rumsey will work with Greenville County Schools to identify and educate employees who seek to become school counselors. School districts strive to keep the ratio of students to counselors to a manageable number, as a high ratio leads to overburdened counselors and teachers pulled away from teaching to address more mental health and behavioral needs.

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Top Competitive Awards (Year End FY2023)

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Long

The U.S. Department of Agriculture awarded Clemson \$5.4 million for a program to help eradicate the Asian longhorned beetle in and around Charleston and Dorchester counties. The non-native pest causes extensive loss to ornamental and commercial tree species and forested areas, along with the associate industries that utilize these products or depend on forest-related tourism. The project is led by Steven Long, assistant director for plant industry.

The U.S. Army awarded \$5.4 million to a collaborative project Clemson has with the University of Alabama-Huntsville for research on advanced laser systems. Beams of directed energy (DE) can address threats at the speed-of-light and are especially critical to counter future hypersonic weapons. This project utilizes cutting-edge optical materials and structured light engineering capabilities within Clemson University's Center for Optical Materials Science and Engineering Technologies. The project is led by Joe Watkins, chair of general engineering.



Joe Watkins, director of general engineering, left, works in his lab with Eric Johnson, PalmettoNet Endowed Chair in Optoelectronics, right, and a student, center.

The S.C. Department of Education awarded Clemson \$4.6 million to develop the Behavior Alliance of South Carolina (BASC). BASC, a collaborative between Clemson and the University of South Carolina, will work directly with the state to help districts and schools across South Carolina build capacity for supporting students with social, emotional and behavioral needs. The project is led by Shanna Hirsch, associate professor of education and human development.

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Hirsch speaks in a classroom.



RESEARCH

RESEARCH NEWS

This section highlights research news from across the university.

Executive Summary

- Clemson researchers are working to innovate and to seek answers to the world's pressing problems. This section includes examples of Clemson researchers making an impact through their research, scholarship and creative endeavors ([pages 15-18](#)).
 - » Clemson students debuted an autonomous vehicle that could support natural disaster relief efforts ([page 15](#)).
 - » A Clemson researcher has helped develop a digital standard that could be key to the protection of privacy in the age of quantum computing ([page 15](#)).
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 - » Clemson researchers have developed a new way of 3D-printing fuel cells ([page 17](#)).
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 - » A Clemson alumnus was named one of the most outstanding young manufacturing engineers by the nonprofit Society of Manufacturing Engineers ([page 21](#)).
 - » A finance professor is among just 44 individuals designated a Fellow by the Real Estate Research Institute ([page 22](#)).

Research Impact

Clemson researchers are constantly seeking answers to the world's pressing problems. The goal of any research project is to generate new knowledge that will contribute to the effort to make the world a better place. The following pages provide examples of the many ways Clemson faculty members and students are making an impact through their research, scholarship and creative endeavors.

Clemson University students debut autonomous off-road vehicle with far-reaching impact for natural disaster relief

Each year, natural disasters cause significant damage and disruption to the nation's transportation infrastructure, destroying delivery routes to affected populations and complicating efforts to assess the situation.

In 2022 alone, natural disasters caused an estimated \$165.1 billion in damages in the United States, according to the U.S. National Oceanic and Atmospheric Administration (NOAA).

To expedite the delivery of supplies and to gather real-time data for emergency responders, Clemson University students at the International Center for Automotive Research (CU-ICAR) developed an off-road reconnaissance and relief vehicle that can navigate all on its own.

Equipped with lidars, cameras and high-accuracy GPS (GNSS), the autonomous vehicle can sense and navigate on unknown terrain. The vehicle can reach 45 mph, scale 18-inch high obstacles, maneuver 60% grade surfaces and pivot 360 degrees in place in two seconds.

Its adaptable series-hybrid powertrain allows for powerful maneuverability and improved fuel economy as well as silent travel in electric-only mode. When the vehicle arrives at its destination, it can deliver emergency supplies and act as a mobile generator in case of electricity disruptions without putting humans in harm's way.

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Clemson mathematicians' collaborative digital signature is a candidate to become a national standard

A digital signature developed by researchers from Clemson University and three universities in Europe could become part of the national standard for encryption tools designed to protect the privacy of digital information against quantum computers in the future.

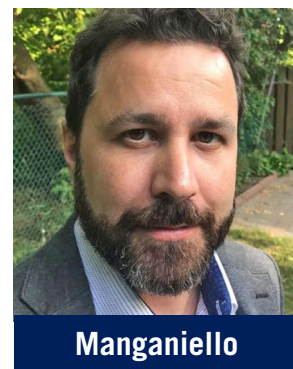
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Research Impact

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The U.S. National Institute of Standards and Technology (NIST) is holding a competition to select standard post-quantum digital signature algorithms that would securely authenticate email, credit card and bank transactions, and digital documents from unwanted third parties' tampering.

The researchers' CROSS (Codes and Restricted Objects Signature Scheme) proposal was named a candidate for standardization. Felice Manganiello, an associate professor in the Clemson School of Mathematical and Statistical Sciences, is one of the developers of CROSS.



Manganiello

[READ MORE](#)



Konkel

Fully sequenced human Y chromosomes could lead to better understanding of men's health

A team of scientists — including researchers from the Clemson University Center for Human Genetics and the Department of Genetics and Biochemistry — has fully sequenced multiple Y chromosomes from populations around the world. The research provides an important foundation for future studies on how the Y chromosome may contribute to certain disorders and diseases. The Y chromosome's contributions to human health are largely unknown.

“The ability to effectively assemble the complete human Y chromosome has been a long-awaited, yet crucial milestone toward understanding the full extent of human genetic variation,” said Miriam Konkell, a member of the Clemson Center for Human Genetics and an assistant professor in the Department of Genetics and Biochemistry. “It also provides the starting point to associate Y-chromosomal sequences to specific human traits, evolution and disease,” she said.

[READ MORE](#)

Burying carbon could help fight climate change

Clemson University researchers are proposing a new way to deliver a double-punch to climate change by burying massive amounts of carbon to keep it out of the atmosphere while raising the earth's surface to protect low-lying areas from encroaching seas.

The carbon would come from wood that is turned into a slurry of particles and injected into the subsurface. The injection process opens new space to store the wood while gradually lifting the ground.

Trees are about 50% carbon, and burying wood prevents it from releasing that carbon back into the atmosphere as it degrades, researchers found. The higher elevation would protect sensitive areas, such as farm fields and wetlands, from saltwater intrusion and help prevent flooding on roads and other infrastructure, researchers said. Researchers are calling their technique Carbon SIRGE. The acronym stands for “Solid Injection to Raise Ground Elevation,” and was coined in an earlier paper. The new twist is using SIRGE to store carbon. [READ MORE](#)

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Research Impact

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Jadoon

Clemson faculty member's research could inform counterterrorism efforts

In her latest book, “Islamic State in Afghanistan and Pakistan: Strategic Alliances and Rivalries,” political science assistant professor Amira Jadoon explores the Islamic State Khorasan (ISK) and its rise to power since 2015.

From 2015-2018, ISK waged a deadly campaign across Pakistan and Afghanistan, establishing itself in Nangarhar, Afghanistan and becoming one of the world's deadliest terrorist groups by 2018. ISK's initial successes provoked intense counterterrorism efforts against the group, including United States airstrikes, Afghan government operations as well as clashes with the Taliban.

These took a major toll; however, despite this pressure, ISK rebounded and was named one of the world's deadliest groups again last year.

“Understanding the group's strategy and tactics, and its potential sources of strength and weaknesses was critical to inform current and future counterterrorism and stabilization efforts,” Jadoon said. “Today, ISK is a growing threat for all dimensions of human security, and the longer it persists with its extremist ideology and tactics, the more likely it is to exacerbate political violence and instability across South and Central Asia.”

[READ MORE](#)



The research team included (from left): Jiawei Zhang, Jianhua “Joshua” Tong, Bridget Sheridan, Kyle S. Brinkman, Minda Zou, Fei Peng and Jacob Conrad.

New way of 3D-printing fuel cells could support renewable energy

Clemson University researchers have devised a novel way of 3D-printing protonic ceramic fuel cells, a renewable energy device that shows promise for generating electricity more sustainably than burning fossil fuels.

Instead of using coal or petroleum, protonic ceramic fuel cells run on renewable fuels, such as hydrogen, ammonia, hydrocarbons and alcohols. The challenge has been to move them from the lab to the real world because of how difficult they are to manufacture on a large scale.

To solve this problem, a team working at Clemson's Advanced Materials Research Laboratory turned to their expertise in 3D printing, a technology that can create complex, customizable objects with high precision.

[READ MORE](#)

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Research Impact

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Researchers demonstrate cure for Hepatitis C

Hepatitis C is rampant among people who inject drugs, and a team of Clemson University and Prisma Health researchers led a nationwide study, funded by the Patient-Centered Outcomes Research Institute, that proved the success of two models of treatment to cure the disease.

Hepatitis C is a liver infection and is spread through contact with blood from an infected person. Most people become infected with the virus by sharing needles or other drug-use equipment. While there is no vaccine for hepatitis C, it can be cured through medicine. Since 2013, the number of new cases of hepatitis C infections has increased each year in the U.S. In 2020, the latest reported year from the Centers for Disease Control and Prevention, 4,798 new short-term infections and 107,300 new chronic cases were reported.

The two models of care in the study – patient navigation and modified directly observed therapy – are most commonly used at outpatient treatment centers and community treatment centers; however, the effectiveness of these models had not yet been directly observed in people injecting drugs, until now.

[READ MORE](#)

Research sets stage for controlling entanglement in quantum materials

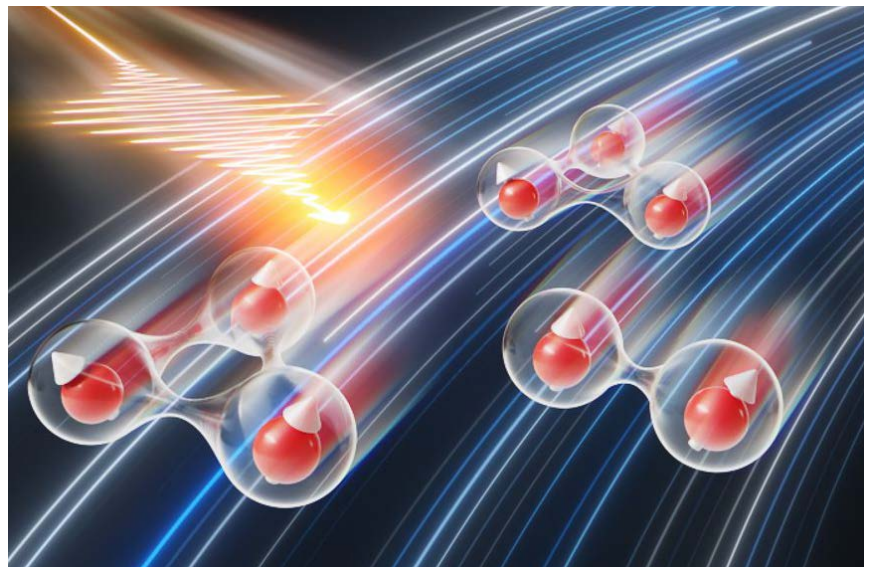
Characterizing and controlling entanglement in quantum materials is crucial for the development of next-generation quantum technologies.

While entanglement can be measured in quantum optics, defining a quantifiable figure of merit for entanglement in macroscopic solids is theoretically and experimentally challenging.

Through research funded by the Early Career Award of the U.S. Department of Energy, Clemson University scientists and their collaborators have found a novel approach to detect the quantum entanglement in quantum materials out of equilibrium and artificially induced entanglement by an intense laser pulse.

The discovery could enable researchers to control quantum devices at ultrafast timescales, leading the way for the design of material-based state of matter for quantum applications.

[READ MORE](#)



Honors and Recognitions

Our peers in the academic community are recognizing the contributions made by Clemson faculty and staff to scholarship and discovery. The following pages highlight recent honors and recognitions given to members of the Clemson family.



Keinath

Clemson plant pathologist named APS Fellow

Anthony “Tony” Keinath is the first Clemson University Research and Extension plant pathologist to be named a fellow by The American Phytopathological Society (APS).

This award is one of the highest levels of professional recognition conferred by APS in recognition of outstanding contributions to the profession of plant pathology.

Keinath is a plant pathologist in the Clemson University Department of Plant and Environmental Sciences. He is known for his studies of cucurbit diseases, most notably for his work with *Stagonosporopsis*, the fungi responsible for gummy stem blight, a disease feared by watermelon growers in the southeastern United States. Keinath demonstrated that the disease could be managed and yields could be increased if growers practiced weekly fungicide applications.

[READ MORE](#)

Clemson receives Inspiring Programs in STEM awards

Three Clemson University programs received the 2023 Inspiring Programs in STEM Award from INSIGHT Into Diversity magazine, the largest and oldest diversity and inclusion publication in higher education. It is the third consecutive year PEER & WISE and COSMIC have won the honor and the first award from the magazine for STEM ALL-In.

The Inspiring Programs in STEM Award honors colleges and universities that encourage and assist students from underrepresented groups to enter the fields of science, technology, engineering, and mathematics (STEM).

Inspiring Programs in STEM Award winners were selected by INSIGHT Into Diversity based on efforts to inspire and encourage a new generation of young people to consider careers in STEM through mentoring, teaching, research, and successful programs and initiatives.

[READ MORE](#)



Among the programs organized by PEER & WISE are summer camps, such as Next Engineers, supported by GE.

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Honors and Recognitions

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Stenbeck

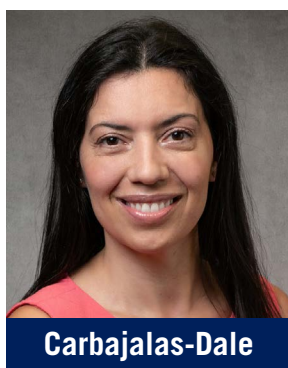
Clemson MBA students recognized for innovation

Each year, capstone students in the Clemson University MBA in Entrepreneurship & Innovation program participate in one of two competitions designed to showcase the real-world skills they've learned to launch their own businesses or innovate their current workplaces. The EnterPrize Awards and Innovation at Work competitions represent the culmination of student work on the program's entrepreneurial and innovation tracks. The respective 2023 winners are Bill Murphy and Jonathan Stenbeck.

Murphy won first place and a \$15,000 cash prize in the EnterPrize Awards on June 1, 2023, with his pitch for Autistic Innovations, a tax-incentive staffing solution to secure job placements for people on the Autism spectrum.

Stenbeck won first place and a \$3,000 cash prize in the Innovation at Work Competition on June 2, 2023, for his idea to change healthcare department staffing methods during labor shortages. His concept will help his organization, Prisma Health, increase capacity during low application periods by converting clinical departments into educational ones.

[READ MORE](#)



Carbajales-Dale

Geospatial Technologies center receives national award

Clemson's Center for Geospatial Technologies (CCGT) won an Esri SAG Award for Special Achievement in Geographic Information Systems (GIS) at this year's national convention in San Diego, California.

Esri is the global market leader in GIS software, location intelligence, and mapping. The SAG Award demonstrates an appreciation for member organizations around the world using GIS technology to understand vast amounts of data and solve complex problems.

At Clemson, Patricia Carbajales-Dale and her team use Esri's GIS technology in conjunction with Research Computing and Data's (RCD) high-performance computing to help faculty, students, and community partners map important research data such as health disparities across the state of South Carolina, statewide large-scale solar radiation analysis, or student research in traffic flow data sets so large they would ordinarily crash GIS technology on its own.

[READ MORE](#)

Clemson graduate one of six students nationwide to receive prestigious Phi Kappa Phi award

Clemson University alumnus Gabe Cutter ('23) is one of only six recent graduates nationwide to be named Marcus L. Urann Fellows by Phi Kappa Phi, America's oldest and most selective multidisciplinary collegiate honor society.

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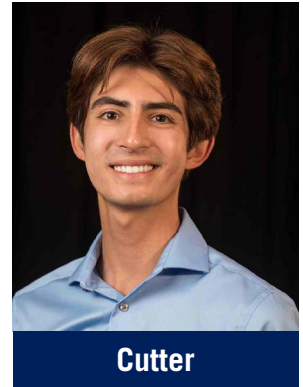
Honors and Recognitions

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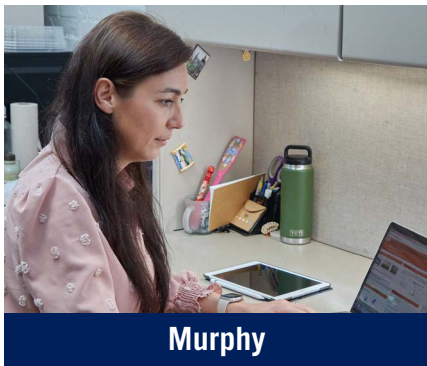
The fellowship, which provides \$20,000 for expenses related to graduate school, recognizes Cutter's exceptional research, leadership initiative and commitment to service throughout his four years on Clemson campus.

Cutter will pursue a Ph.D. in quantum engineering at the Massachusetts Institute of Technology (MIT) this fall.

Cutter said his experience at Clemson helped him discover his purpose in serving others. A computer engineering and economics double major, he spent the summer before his first year on campus in the Honors College's EUREKA! program, which helps incoming first-year students dive into research before they start their degree.



[READ MORE](#)



Mathematics Ph.D. student wins award to present at international conference

Eva Murphy, a graduate student in the Clemson University School of Mathematical and Statistical Sciences, will present her research at the largest gathering of statisticians held in North America.

Murphy recently received a prestigious American Statistical Association Student Paper Award for her research that uses statistics to help investigate and address environmental problems. She will present her paper on the joint modeling of wind speed and direction at the Joint Statistical Meetings session sponsored by the environmental

statistics chapter of the ASA. The ASA's Section on Statistics and the Environment (ENVR) awarded five papers.

[READ MORE](#)

Clemson alumnus named among most outstanding young engineers

Wesley Salandro, who holds a doctorate in automotive engineering from Clemson, was recently recognized as one of the most outstanding young manufacturing engineers by the nonprofit Society of Manufacturing Engineers (SME).

Salandro launched his engineering career at BMW while still a Clemson University Ph.D. student, held leadership positions at two startups in two different industries and now helps build rockets as director of Falcon stage integration and composites production for SpaceX.

[READ MORE](#)



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Honors and Recognitions

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Worzala

Finance professor recognized for real estate research

Elaine Worzala, visiting professor of finance at Clemson University's Wilbur O. and Ann Powers College of Business, was awarded the designation of Fellow by the Real Estate Research Institute (RERI). Worzala is among just 44 RERI Fellows who have earned this distinction.

She joins some of the top real estate researchers in the world, both in academia and industry, in earning this honorary designation to recognize her commitment to an ongoing connection between academic and industry researchers.

Her research focuses on pension funds and their research priorities, investment in executive office suites and business centers and investment in senior housing for institutional real estate investors.

[READ MORE](#)

García appointed as faculty research fellow at the National Bureau of Economics Research

Clemson University assistant professor Jorge Luis García has earned a prestigious appointment as a faculty research fellow with the National Bureau of Economics (NBER), making him one of just two members of the NBER in the John E. Walker Department of Economics at the Wilbur O. and Ann Powers College of Business.

García's research on early childhood education, fertility and labor force participation will pertain to the NBER's Program on Children, which studies the determinants of children's well-being by leveraging economic tools and considering the roles of education, public and private health insurance and transfer programs.

[READ MORE](#)



Garcia

Ryan receives Centennial Professorship in 2023

Joseph B. Ryan earned the Clemson University Centennial Professorship in 2023. This honor is bestowed by University faculty upon an outstanding colleague who is tenured or has a tenure-track appointment with demonstrated excellence in teaching, research, service or librarianship.

Ryan is the Sue Stanzione Distinguished Professor of ClemsonLIFE and faculty in the College of Education. He is the founder and Executive Director of the LIFE (Learning is for Everyone) program, a nationally recognized post-secondary education program for young adults with intellectual disabilities. He has more than 100 publications and has served as editor of the journal *Beyond Behavior* for the past decade. His research interests focus on behavioral interventions and enhancing post-school outcomes for individuals with disabilities. He has been interviewed by multiple national publications including CNN, Headline News, New York Times, USA Today, Wall Street Journal and given several U.S. Congressional briefings on crisis interventions in schools.



RESEARCH

FOCUS ON FACULTY

This section features faculty members at Clemson University. Each College submits a profile of one faculty member.

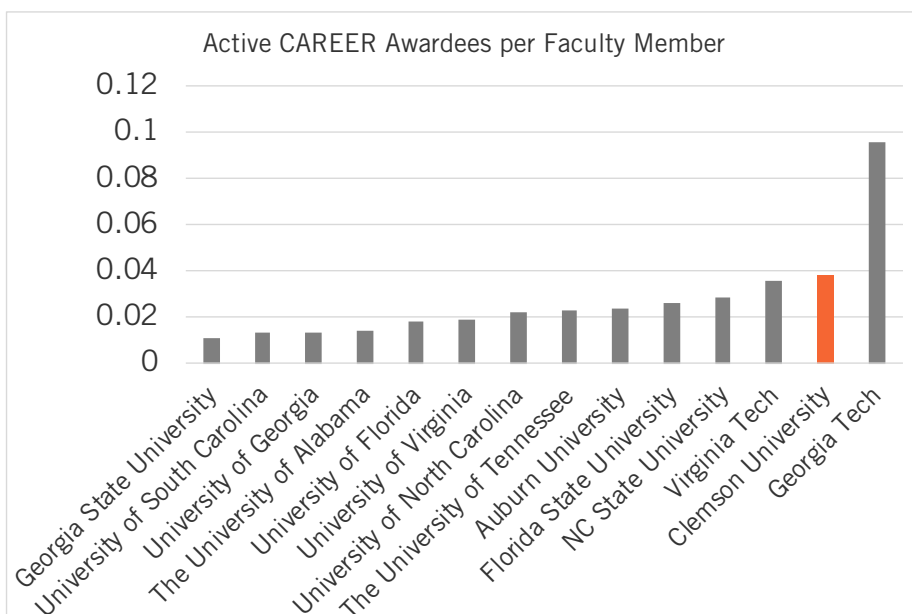
Executive Summary

- Six Clemson faculty have earned NSF CAREER Awards, one Clemson faculty member has earned the Young Investigator Research Program Award from the Air Force Office of Scientific Research, and for the first time, a Clemson faculty member has earned a prestigious Beckman Young Investigator Award ([pages 24-25](#)).
- Each college provided a brief introduction to a select faculty member. Click the links below to read about faculty from the respective college.
 - » [College of Agriculture, Forestry and Life Sciences](#)
 - » [College of Architecture, Art and Construction](#)
 - » [College of Arts and Humanities](#)
 - » [College of Behavioral, Social and Health Sciences](#)
 - » [Wilbur O. and Ann Powers College of Business](#)
 - » [College of Education](#)
 - » [College of Engineering, Computing and Applied Sciences](#)
 - » [College of Science](#)

Junior faculty are earning the nation's most prestigious awards for early career researchers

Numerous funding agencies offer grant programs available to early-career faculty. These highly competitive programs serve as catalysts to jumpstart the careers of the nation's most promising young faculty.

An increasing number of Clemson faculty are earning these awards each year, and in fact, Clemson has among the highest rates of NSF CAREER awardees among its faculty body when compared to peer institutions (see chart at right). A list of current and past CAREER awardees at Clemson is posted [online](#).



Six Clemson faculty have earned NSF CAREER Awards this year. Additionally, one Clemson faculty member has earned the Young Investigator Research Program Award from the Air Force Office of Scientific Research, and for the first time, a Clemson faculty member has earned a prestigious Beckman Young Investigator Award.



Tran

Thao Tran, assistant professor of chemistry, received a \$600,000 Beckman Young Investigator Award from the Arnold and Mabel Beckman Foundation, which created the award program to support the “most promising young faculty members in the early stages of their academic careers in the chemical and life sciences particularly to foster the invention of methods, instruments and materials that will open up new avenues of research in science.” Tran’s research aims to unlock quantum technologies by using new chemical approaches to tune their structure and behavior, helping to unleash the unparalleled power of quantum computing.



Wang

Yao Wang, assistant professor of physics and astronomy, received a \$450,000 Young Investigator Research Program Award from the Air Force Office of Scientific Research to support his research on superconductivity. Superconductors are one of the most attractive materials for modern science and are at the cornerstone of the next technological revolution. They have been applied to power transmission, quantum computing, controlled fusion, medical imaging and high-speed transportation. And they hold promise for other applications in industry and the military.



Price

Samantha Price, assistant professor of biological sciences, received a \$1.3 million NSF CAREER Award to advance her research on the repeating themes and general principles governing the evolution of biodiversity. In addition, Price plans to increase research opportunities for underrepresented students through the creation of the Classroom-based Undergraduate Research Experience (CURE) lab. The CURE lab will increase

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Early Career Awards

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the number of students experiencing research in the Department of Biological Sciences by 50 percent, with at least 250 students participating over five years.



Suseela

Vidya Suseela, assistant professor of plant and environmental sciences, received a \$1.2 million NSF CAREER Award for her research on soil organic carbon. Suseela investigates the effect of plant functional types on the quantity, composition and stabilization of soil carbon and the associated nutrient cycling for improving the soil health and productivity of agroecosystems. Her work aims to enhance soil health, thus improving agricultural productivity, food security and human health while reducing environmental pollution and mitigating climate change.



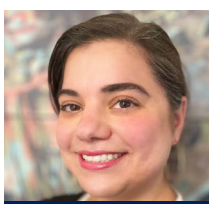
Koski

Matthew Koski, assistant professor of biological sciences, received a \$1 million NSF CAREER Award for his study of the ecological and evolutionary processes that generate color diversity in flowering plants. As part of his CAREER project, Koski will mentor at least 10 undergraduates from Clemson's biological sciences and education programs through two newly formed Creative Inquiry (CI) courses. One group will use plots established in the Clemson Experimental Forest to conduct research and outreach with 4-H Junior Naturalists (K-12 students). The other student group will manage a Citizen Science project fueled by members of native-plant societies in seven states.



Afghah

Fatemeh Afghah, associate professor of electrical and computer engineering, received a \$541,949 NSF CAREER Award for research on the use of Unmanned Aerial Vehicles (UAVs) in disaster management operations to collect data and imagery to inform rescue teams. Current operations often involve a single UAV remotely controlled by a commander or pilots in a manned aircraft relatively close to the danger-zone. Afghah will work to develop frameworks for a network of fully autonomous multi-agent systems with minimum human interventions.



Arastoopour
Irgens

Golnaz Arastoopour Irgens, assistant professor of education and human development, received a \$1.4 million NSF CAREER Award for a project to develop critical computing curriculum in elementary schools called CritComp Pop-ups, in which upper elementary students evaluate and develop AI technologies. The project will involve 500 students, teachers, school administrators and researchers in the design and implementation of the curriculum. The research will take place in an area with schools with a high percentage of African Americans and youth in poverty.



Liu

Shunyu Liu, assistant professor of automotive engineering, received a \$503,613 NSF CAREER Award for research on a novel hybrid in-situ rolled additive manufacturing (HI-RAM) technique to fabricate high-performance structural parts that could be used as critical components for many industries. This project will build partnerships with colleges, high schools, local manufacturers and manufacturing organizations to deliver professional training related to HI-RAM, aimed at motivating and preparing a high-quality manufacturing workforce. The project involves multiple disciplines, including advanced manufacturing, materials science, structural mechanics, and applied mathematics, and expects to broaden the participation of women and underrepresented minorities in STEM.



College of
**AGRICULTURE, FORESTRY
AND LIFE SCIENCES**

Eric S. McLamore, Ph.D.

Associate Professor

Department of Agricultural Sciences



McLamore is an environmental engineer who develops sensors and decision support systems applied to the nexus of food-energy-water-sanitation systems. He joined Clemson University in 2020 and teaches courses/labs on electrical systems (undergraduate) as well as proposal/fellowship writing (graduate).

McLamore is co-director of broadening participation in the NSF Science and Technology Center focused on sustainable phosphorus (STEPS). This role entails national leadership in the areas of recruiting, retention, and lifelong learning related to underprivileged persons in STEM. He is the founding director of the NIFA SmartPath Center of Excellence, which focuses on smart systems for rapid detection of pathogens in agricultural waters. This work is a platform upon which the McLamore lab works in South Carolina, North Carolina, Florida, and Iowa. McLamore holds adjunct positions at North Carolina State University and also the University of Florida. In addition, he has an international research program that includes the Bahamas, China, and Colombia (where he was a Fullbright Scholar in 2017).

Since 2010, his research has produced at least 95 peer reviewed manuscripts and more than 200 presentations, and garnered more than \$10 million in funded grants, contracts, and contributions (more than \$2 million at Clemson). His program has supported a total of four postdoctoral fellows, 11 Ph.D. candidates, eight MS students, and 65 undergraduate research assistants. These students have earned more than 23 honors/awards (e.g., poster contests, spotlight articles in peer reviewed journals).

Select Accomplishments

- Associate Editor-*SPIE Journal: Smart Biomedical & Physiological Sensors*, 2010-present;
- Editorial Board-*Biosensors*, 2018-present;
- Invited keynote speaker-Gordon Research Conference on Impactful Nano-Applications for Sustainable Food Production, Manchester, NH, 2022;
- Invited speaker-PittCon Analytical Chemistry Conference and Exposition, virtual 2021;
- Numerous national and international awards prior to joining Clemson in 2020.



College of
**ARCHITECTURE, ART
AND CONSTRUCTION**

Dustin Albright, Ph.D.

Assistant Director

School of Architecture



As an associate professor of architecture and founding member of the Wood Utilization + Design Institute, Albright looks at different applications of prefabricated light-framing systems and mass timber systems, including cross-laminated timber (CLT). This work draws on the positive environmental benefits of wood, including its renewability and minimal carbon footprint. His research recognizes that these building systems represent a wider and diversified product stream for South Carolina's \$21 billion forest products industry.

Albright's research and design work on prefabricated panelized light-framing systems led to the development of the Sim[PLY] building framing system. Developed in collaboration with other Clemson faculty and students, Sim[PLY] is designed to balance high-tech production technologies with low-tech material and assembly solutions. Utilizing interlocking plywood components fabricated using CNC machines and digital cut files, building assembly follows pictographic instructions and requires only manual tools, making the construction site simpler, safer and less energy-intensive. Receiving a patent in December 2018, uses for the system are plentiful, from affordable housing to disaster relief shelters and pop-up healthcare facilities to workforce housing.

Albright joined the University in Fall 2012 as a lecturer in the College of Architecture, Arts and Humanities while also working for an architecture firm in Greenville. He moved into his role as a full-time professor in August 2014. In addition to teaching and research, Albright is a licensed architect.

Select Accomplishments

- Becker, B. Ross, D. Albright, "Evaluating the Weighted-Sum Approach for Measuring Buildings' Adaptability," *Journal of Green Building*, volume 15, issue 3 (2020): 37-54.
- D. Albright, D. Harding, D. Pastre, U. Heine, V. Blouin, "Assembling the Digital House by Hand: Lessons from Deep Engagement and Guiding the Experimental Impulse," *Journal of Technology | Architecture + Design (TAD)*, volume 1, issue 1 (2017): 92-106. ISSN _ 2475-1448.
- D. Albright, V. Blouin, D. Harding, U. Heine, D. Pastre, "Indigo Pine: Net Zero Performance in a Unique Package," *Procedia Environmental Sciences*, volume 38 (2017): 60-67. ISSN _ 1878-0296.



College of
**ARTS AND
HUMANITIES**

Arelis Moore de Peralta, Ph.D.

Associate Professor

Department of Languages



Moore de Peralta is a medical epidemiologist and social scientist with experience in quantitative, qualitative, and mixed-methods research, particularly on health disparities among Hispanics in the United States and Latin America and the Caribbean. She has an interdisciplinary joint appointment between the Department of Languages and Department of Youth, Family and Community Studies (YFCS) at Clemson University. Moore is also the Internal Evaluation Team Coordinator for the NSF-funded Tigers Advance project.

Current interdisciplinary research includes community-engaged research and partnership to build healthier communities in the Dominican Republic, as well as addressing U.S. Hispanics health disparities through development of a culturally and linguistically appropriate measurement tool to assess partnership trust as an outcome of community-based participatory health research and interventions. Prior, she was the director of the Center for Community Services (CCS), an activity of CU/IFNL located in Simpsonville, and the Hispanic family outreach and support program Caffe Cultura. Moore de Peralta published on behavioral health and community-based participatory research in peer-review journals, including *Hispanic Health Care International*, *Journal of Immigrant and Minority Health*, *GHS Proceedings*, *Revista Panamericana de Salud Publica*, *American Journal of Infection Control*, and *South Carolina Nurse*.

She received the Vera Paster Award in October 2009 from the American Orthopsychiatric Association in recognition of her work with Latino immigrants, and she received the Kimbrough-Melton Parents Award in April 2010. She also received a Graduate Student Advising and Mentoring Award from the College of Behavioral, Social and Health Sciences in 2015, and Bradley Mentoring Award on Creative Inquiry in 2018.

Select Accomplishments

- Moore Peralta, A., Criss, S., Fair, M., Rivera, R., Alvarado, D. (2022). Latinx Community members' perspectives on barriers and facilitators to healthy eating and active living: A CBPR approach to combat childhood obesity. *Journal of Community Medicine & Public Health*, 6(3), 1-13. Credit AY22.
- Moore de Peralta, A., Cepeda, J., Abreu, G. (2022). Knowledge, perceptions, needs and challenges of Dominican adolescents with type 1 diabetes mellitus. *Ciencia y Salud*, 6(2), 23-33. Credit AY22.



College of
**BEHAVIORAL, SOCIAL
AND HEALTH SCIENCES**

Kyle McLean, Ph.D.

Assistant Professor

Sociology, Anthropology and Criminal Justice



McLean graduated from the University of South Carolina with a Ph.D. in Criminology and Criminal Justice in 2018 and was named a National Institute of Justice (NIJ) Law Enforcement Advancing Data and Sciences (LEADS) Academic in 2019. McLean works with law enforcement officers across the country to assess and recommend evidence-based practices for police departments. His research interests focus on understanding police-community relations and evaluating efforts to reform the police to better reflect community demands of policing. Accordingly, McLean has conducted research in the areas of police legitimacy, police training, police culture, police use of force, and body-worn cameras.

McLean is a strong advocate for evidence-based policing and applied research. He considers his greatest successes to be the projects that work with police officers to provide tangible results for improving policing. For example, McLean worked with the recruiting unit for the Charleston Police Department on a study of police recruiting that resulted in a publication co-authored with Senior Police Officer Terry Cherry and a strategy for the development of a [new recruiting video](#) for Charleston PD. Similarly, McLean worked with the Columbia Police Department, the Richland County Sheriff's Department, and the Clemson University Police Department on a grant-funded study of police decision-making using a use-of-force simulator. The presentation of results back to these three agencies provided tangible recommendations for improving training that could increase both officer and citizen safety in contentious encounters.

Select Accomplishments

- Principal investigator (PI) on a \$892,000 grant evaluating the effectiveness of de-escalation training program.
- Co-PI on a \$549,000 grant to develop a mental health co-responder model with the Clemson University Police Department.
- Co-PI on a \$94,000 planning grant to set up an evaluation of artificial intelligence review of police body-camera video.
- Investigator on \$846,000 grant to assess police decision-making in officer-citizen encounters.
- Named to the inaugural cohort of National Institute of Justice (NIJ) Law Enforcement Advancing Data and Sciences (LEADS) Academic.
- Co-authored a report to the National Academies of Sciences, Engineering, and Medicine on the evidence-base for understanding police use of force.



Wilbur O. and Ann Powers College of

BUSINESS

Danny Weathers, Ph.D.

Professor

Department of Marketing



Weathers, professor in the Department of Marketing, conducts research on consumer behavior and decision-making. He has published articles in top marketing journals, including the *Journal of Marketing Research*, *Journal of the Academy of Marketing Science*, and *Journal of Retailing*, and his research has been cited more than 1,800 times. One of his recent publications in the *Journal of the Academy of Marketing Science* examined the appeal of activity streaks and how organizations can utilize streaks to encourage behavior. To illustrate, Clemson's Office of Development seeks to encourage donations by providing special recognition to those who have streaks of annual donations. A recent publication in the *Journal of Advertising* focused on how underdog brands and companies maintain authenticity after achieving success. To illustrate, consider this recent headline: "Dabo Swinney Was an Underdog for Decades: That's Done Now."

Weathers also received two recent grants to support the agricultural industry in South Carolina. One grant involves research on consumer perceptions of poultry farming practices. Insight from this research will help the state's poultry industry better communicate and connect with consumers. Another grant from the SC Sea Grand Consortium involves research that will support the state's shellfish industry, as it examines ways by which shellfish farmers can more effectively market directly to consumers.

Weathers teaches undergraduate and graduate courses in marketing research, and he leads an annual study-abroad program for undergraduates to London and Paris. He has served as the president of the Faculty Senate, currently serves as the MS Marketing Graduate Program Director for the Department of Marketing, President of the Wilbur O. and Ann Powers College of Business Faculty Advisory Council, and chairs the university's Grievance Board.

Select Accomplishments

- Weathers, Danny and Andy Poehlman (forthcoming), "Defining, and Understanding Commitment to, Activity Streaks," *Journal of the Academy of Marketing Science*.
- Tseng, Allen, Shuya Lu, Danny Weathers, and Varun Grover (forthcoming), "How Product Review Voting is Influenced by Existing Votes, Consumer Involvement, Review Valence, and Review Diagnosticity," *Decision Support Systems*.
- Ferrand, Yann, Lawrence D. Fredendall, Jennifer D. Siemens, Danny Weathers, Ronald G. Pirrallo, Matthew D. Bitner (2022), "Assessing Patient Satisfaction with Emergency Department Care Delivery Using a Patient Experience Framework," *Quality Management Journal*, 29 (3), 160-182.



College of

EDUCATION

Tony W. Cawthon, Ph.D.

Alumni Distinguished Professor

**Educational and Organizational Leadership
Development**



Cawthon is an alumni distinguished professor in the masters counselor education/student affairs and doctoral program in educational leadership/higher education. His 40-year-plus career in higher education has been as a housing administrator, department chair, and graduate preparation program faculty. His research interest includes diversity, equity and inclusion and entry-level staff career development and socialization issues. Starting his 27th year at Clemson, he has chaired 28 dissertations, been a member of 87 additional dissertations, and graduated more than 800 master's students.

He has written numerous edited books, book chapters and articles in scholarly journals. He is the co-editor of three *New Directions for Student Services* publications, co-editor of *ACUHO-I Core Competencies: The Body of Knowledge for Campus Housing Professional* and co-editor of *Theory of College Student Development: Integration of Knowledge, Skills, and Application*.

He has a strong history of professional association service: ACUHO-I (Knowledge Enhancement, director, program chair, and editor of the *Journal of College and University Student Housing*); ACPA (director of research and scholarship, senior scholar, and on the editorial board for *The Journal of College Student Development*); NASPA (chair of Dissertation of the Year committee, and editorial board member for the *Journal of Student Affairs Research and Practice*); and SACSA (president and editor of *The College Student Affairs Journal*). He is an ACUHO-I Parthenon recipient, ACPA Diamond Honoree, and NASPA Pillar of the Profession.

Select Accomplishments

- Invited as inaugural member of Gavel and Gravel Society, Southern Association for College Student Affairs.
- Serves as executive director for The Southern Association for College Student Affairs.
- Chaired the search committee for interim dean of the College of Education and co-led the search for dean of the College of Education.
- Selected to serve as trustee for the American College Personnel Association Foundation.
- Invited to serve on the Future of the Profession Task Force-Creating Inclusive Communities Work Group for the Association of College and University Housing Officers International.
- Elected Co-Chair of the Clemson University LGBTQ Commission.



College of
**ENGINEERING, COMPUTING
AND APPLIED SCIENCES**

Divya Srinivasan, Ph.D.

McQueen Quattlebaum Professor

Industrial Engineering



Srinivasan is the McQueen Quattlebaum Professor in Industrial Engineering, with a joint appointment in Bioengineering. She is also a faculty scholar at the Clemson University School of Health Research (CUSHR).

Her research in human factors and biomechanics is focused on enhancing human physical performance, health and safety. A major thrust of her research is on the design and evaluation of human-augmentation systems, such as exoskeletons for healthy worker augmentation in an industrial context, as well as for mobility assistance and rehabilitation. Spanning the breadth of applications across industrial domains such as construction, manufacturing, agriculture, and healthcare, her research has been funded by several grants from the National Science Foundation, National Institute of Occupational Safety and Health, and the National Institutes of Health, as well as by industry sponsors in manufacturing and healthcare (\$22 million, with share of \$9.1 million as principal investigator). Her work has resulted in more than 60 publications in top-tier journals, and more than 120 conference papers/presentations in national and international conferences and has been widely cited in the occupational and clinical domains.

Select Accomplishments

- Since 2018, she has served as the principal investigator (PI) on two large NSF projects and an interdisciplinary research convergence network from the Future of Work at the Human Technology Frontier program, on the topic of exoskeletons, totaling \$7.5 million.
- In the last three years, she has served as co-PI on three large NSF initiatives: the NSF Convergence Accelerator, the National Robotics Initiative (NRI), and Leading Engineering for America's Prosperity, Health and Infrastructure (LEAP-HI).
- Recipient of the McQueen Quattlebaum Professorship at Clemson University (2021).
- Recognized as Faculty Fellow at the Virginia Tech College of Engineering (2021).
- Recipient of the William C. Howell Young Investigator Award (2019) from the Human Factors and Ergonomics Society (HFES).
- Dean's Award for Outstanding New Assistant Professor, College of Engineering, Virginia Tech (2019).



Thao T. Tran, Ph.D.

Assistant Professor

Department of Chemistry



Tran's research team applies chemical logic and tunability innate to quantum materials to address current fundamental challenges in energy and information technologies. Harnessing the potential of quantum materials by tuning their structure and behavior could revolutionize quantum information science and transform the world. A major goal of research on quantum technologies is developing an approach to creatively control nonequilibrium properties of materials, driven by magnetic fields or light-matter interactions, to generate, process, and transmit coherent information. Quantum materials are poised to offer the tunability and precision vital to meeting these requirements. They can be chemically modified, assembled into large-scale frameworks, and integrated into diverse device architectures.

While this cross-disciplinary research is critical in enabling pathways to foreseeable quantum technologies, a significant challenge in the field has been poor control over structural and electronic modification under the strict constraints required for manipulating spin dynamics by external stimuli such as magnetic fields and intense light pulses. To address this challenge, the central goal of Tran's research program is to develop a deep understanding of how chemical bonding and electronic structure result in new materials with targeted properties that can be modulated by applied fields or optical excitations relevant to important advances in integrating spins and photons in quantum technologies.

Select Accomplishments

- Authored 60 peer-reviewed publications (~2,700 citations) and one book chapter.
- Earned more than \$1 million in funding since joining Clemson in 2019.
- Has given 30 invited presentations (nationally and internationally).
- 11 awards and honors received by her undergraduate and graduate students.
- Serves as editor of the *Journal of Physics and Chemistry of Solids*, Early Career Editorial Board.
- Nominated for Provost Tenure-Track Outstanding Teaching Award.
- Named a National Science Foundation EPSCOR Research Fellow (2023 – 2024).
- Received the prestigious Beckman Young Investigator Award (2023 – 2028), the first time the award has been given in the State of South Carolina.



Division of

RESEARCH

Quarterly Research Report

October 2023