



RESEARCH

QUARTERLY RESEARCH REPORT

APRIL 2024



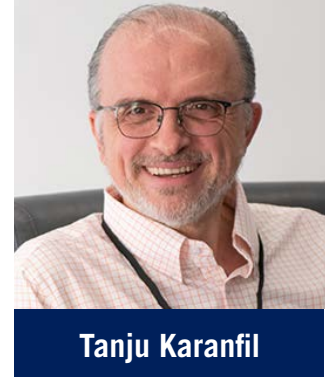
**STUDENT
RESEARCH:
A World-Class
Experience**



From the Senior Vice President for Research, Scholarship and Creative Endeavors

Unique research opportunities are creating an unmatched student experience at Clemson.

Academics, athletics and research are strongly interconnected in the Clemson brand and shape the experiences of our students. Imagine 2,000 externally funded projects being implemented across Clemson every day, and the range of opportunities that they provide to our students. Think of our high-caliber faculty leading those projects, teaching in classrooms and working side-by-side with students in different research projects. The pursuit of scholarship and discovery through research has become engrained in the culture at Clemson University. It's part of the fabric of our student experience, along with world-class academics and championship-caliber athletics. And, as the research enterprise grows, so do the opportunities for students.



Tanju Karanfil

Consider Elizabeth Caldwell, a National Scholar and junior genetics major who is pictured on the cover of this report. Caldwell is conducting research on rare immunodeficiency disease along with Michael Sehorn, an associate professor in the Department of Genetics and Biochemistry.

She wants to become a doctor. At age 14, she was diagnosed with Ehlers-Danlos syndrome, a group of disorders that affect connective tissues supporting the skin, bones, blood vessels and other organs and tissues. Her condition is incurable, and it also motivates her research and career aspirations.

Caldwell started in the lab with Sehorn during her first year at Clemson and is also a part of Clemson's Clinical Undergraduate Research Experiences in Surgery (CURES), a class also taught by Sehorn. Participating students complete 12-hour shifts in the trauma bay at Prisma Health Greenville Memorial Hospital and conduct clinical research. Last summer, Caldwell interned with St. Jude's highly competitive pediatric oncology education program.

“Clemson has been able to make me competitive for those types of internships with a high caliber that are very well established and known.”

Elizabeth Caldwell,
Junior Genetics Major



“Clemson has been able to make me competitive for those types of internships with a high caliber that are very well established and known,” she said.

Caldwell has a bright future and a wonderful [story](#) that illustrates the connection between research and education. Numerous examples of research enriching the student experience are on [pages 13-19](#).

Similarly, our young faculty are proving Clemson to be a great place to build a career. Consider the growing numbers of early-career award recipients at Clemson. So far this fiscal year, six faculty members have earned prestigious early CAREER awards from the National Science Foundation and one faculty member, Adam Melvin, left his previous institution to come to Clemson and bring his CAREER award with him.

These are highly competitive catalyst awards given to the brightest young minds in the country to help them build a research portfolio. Not only do they advance research, each awarded project has a



From the Senior Vice President for Research, Scholarship and Creative Endeavors

strong teaching component as well, further enhancing the student experience at Clemson. Notably, the current 2024 class of awardees includes a diverse mix of disciplines: computing, physics, genetics, chemistry and several engineering fields. Read more about their work on [pages 24-25](#).

Opportunities for our students and our emerging young faculty will increase along with our research enterprise, and our research enterprise has been on an impressive growth curve. Fiscal year 2023 was historic for research awards at Clemson, with awards hitting a high-water mark of \$282 million. Our momentum has continued so far in the first half of fiscal year 2024:

- Research awards were \$141 million through the second quarter ended Dec. 31, up 33 percent from the same six-month period in the prior fiscal year.
- Proposal submissions were \$366 million, and competitive expenditures were \$87 million, up 24 percent from the same period a year ago.

Finally, I would like to again note that large awards have fueled our growth. Clemson has earned 113 projects valued above \$2 million since 2015, bringing a combined \$673 million to the university. An enhanced research culture has our faculty dreaming big and winning. In turn, this contributes directly to our Clemson Elevate goal to “Deliver the No. 1 Student Experience,” particularly as it relates to experiential learning. Our students are conducting research in the labs, in the fields, in the clinics, anywhere their projects take them and, oftentimes, they are working right alongside professionals in the field, as Elizabeth Caldwell got to do at Prisma Health and at St. Jude.

What an experience and what a time to be a Tiger.

Sincerely,

Tanju Karanfil, Ph.D., PE, BCEE, IWA Fellow

Senior Vice President for Research, Scholarship and Creative Endeavors

Clemson University

TABLE OF CONTENTS

1. [Note from the Senior Vice President](#)
2. [Research Metrics](#)
3. [Research News](#)
4. [Focus on Faculty](#)

NOTE: Click the tabs at the top of each page to navigate to the executive summaries at the beginning of each section. Underlined text in Clemson orange links directly to pages within this document or to additional information posted online.



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 \$287 million for 2023 to the National Science Foundation Higher Education Research and Development (HERD) Survey. This is an increase of more than 9 percent from 2022 ([page 5](#)).
- Competitive expenditures topped \$87.2 million through the second quarter of FY2024, an increase of 24 percent from \$70.2 million during the first six months of the previous year ([pages 6-7](#)).
- Proposal submissions were nearly \$366 million through the second quarter of FY2024 ([page 8](#)).
- Research awards reached \$141 million through the second quarter of FY2024, up nearly 37 percent from the same six-month period of the prior fiscal year ([page 9](#)).
- Descriptions of the top awards received during the second quarter are on [pages 10-11](#).

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.

CAAC: College of Architecture, Art & Construction

CAH: College of Arts & Humanities

CAFLS & PSA: College of Agriculture, Forestry & Life Sciences and Public Service & Agriculture

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

Total R&D Expenditures

Clemson's total R&D expenditures continued to increase in 2023 to \$287 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.



Total R&D Expenditures (in millions)

SOURCE: National Science Foundation Higher Education Research and Development Survey



	2020	2021	2022	2023	2024 2nd Quarter
NIH R01-Equivalent Awards	1	3	1	6	1
Doctorates Awarded	249	225	242	285	186
STEM Doctorates Awarded	162	159	172	190	124
Disclosures	68	44	50	61	29
Patents	12	15	33	11	7
Licenses/Options	13	13	27	16	8
Licensing Revenue	\$315,578	\$239,074	\$380,286	\$392,162	\$61,586
Start-up Companies (based on licenses/options)	1	1	4	4	5
Supporting Workforce					
Graduate Student Enrollment	5,627	5,538	5,448	6,401	5,872
Sponsored Graduate Research Assistants	637	546	729	926	871
Postdoctoral Fellows	98	106	117	112	130
Research Faculty: Permanent 100% Non-E&G Funded	18	12	2	5	3
Research Faculty: Temporary 100% Non-E&G Funded	54	45	32	28	35

Competitive Expenditures

Competitive expenditures topped \$87 million through second quarter of FY2024, an increase of 24 percent from \$70.2 million during the first six months of the previous year. Competitive expenditures include funds only from competitively bid projects, such as federal grant awards.

Additional details on expenditures by business unit, innovation cluster, funding source, and per tenure/tenure-track faculty member are included in the table on the next two pages. The column for 2024 is data through the second quarter only; data for other years is for the full 12-month period.

The graph on the following page compares competitive expenditure data for the first two quarters of past fiscal years.

Research Expenditures (millions)	2020	2021	2022	2023	2024 2nd Quarter
By Business Unit	\$105.3	\$114.4	\$141.4	\$160.3	\$87.2M
CAAC	\$1.2	\$1.0	\$1.1	\$1.3	\$0.7
CAH	\$0.4	\$0.1	\$0.2	\$0.6	\$0.5
CAFLS & PSA	\$20.2	\$20.5	\$25.0	\$29.7	\$17.3
COB	\$0.7	\$0.7	\$0.7	\$1.0	\$0.7
CECAS	\$46.4	\$54.4	\$71.7	\$76.0	\$39.1
CBSHS	\$6.7	\$9.0	\$12.0	\$16.7	\$8.7
COE	\$2.4	\$2.3	\$3.8	\$5.6	\$3.0
COS	\$17.3	\$15.9	\$18.5	\$23.1	\$12.7
VP for Res & Interdisc Inst	\$9.5	\$9.6	\$7.0	\$6.2	\$3.8
All Other	\$0.5	\$0.8	\$1.5	\$1.6	\$0.7
By Innovation Cluster	\$105.3	\$114.4	\$141.4	\$160.3	\$87.2M
Advanced Materials	\$13.5	\$14.3	\$18.6	\$21.1	\$11.6
Cyberinfrastructure & Big Data Science	\$4.4	\$5.5	\$8.2	\$7.7	\$3.7
Energy, Trans. & Advanced Manufacturing	\$14.5	\$19.9	\$27.7	\$29.5	\$13.7
Health Innovation	\$27.1	\$27.1	\$26.3	\$30.5	\$17.2
Human Resilience	\$9.7	\$12.7	\$14.8	\$19.1	\$10.4
Sustainable Environments	\$23.9	\$21.3	\$26.8	\$33.7	\$21.0
Other	\$12.1	\$13.6	\$19.6	\$20.2	\$9.6

continued on next page ►

Competitive Expenditures



Competitive Expenditures Second Quarter (in millions)



FY2013 FY2014 FY2015 FY2016 FY2017 FY2018 FY2019 FY2020 FY2021 FY2022 FY2023 FY2024

Research Expenditures (millions)	2020	2021	2022	2023	2024 2nd Quarter
By Funding Source	\$105.3	\$114.4	\$141.4	\$160.3	\$87.2M
Federal Government	\$85.2	\$95.1	\$125.1	\$141.0	\$77.9
Foundations, Societies, and Associations	\$6.9	\$6.2	\$4.6	\$5.4	\$2.5
Industry/Other	\$5.6	\$4.8	\$4.8	\$5.9	\$2.4
International	\$0.3	\$0.4	\$0.5	\$0.5	\$0.2
Local Government	\$0.5	\$0.8	\$0.9	\$0.7	\$0.2
State Government	\$6.8	\$7.3	\$6.2	\$8.2	\$3.9
Per T/TT Faculty Member					
CAAC	\$20,942	\$18,195	\$21,321	\$26,231	\$13,617
CAC	\$4,218	\$1,113	\$1,864	\$5,507	\$4,671
CAFLS & PSA	\$137,438	\$131,195	\$196,657	\$231,788	\$131,084
COB	\$6,991	\$7,132	\$6,787	\$9,865	\$6,750
CECAS	\$201,553	\$223,843	\$296,203	\$310,088	\$160,117
CBSHS	\$50,495	\$67,202	\$90,220	\$121,581	\$62,001
COE	\$47,742	\$48,805	\$80,058	\$121,114	\$57,558
COS	\$116,020	\$107,258	\$120,778	\$146,445	\$80,058
Clemson average (Total exp/Total T/TT faculty)	\$96,497	\$103,187	\$142,129	\$159,792	\$87,092

Proposal Submissions

Proposal submissions were nearly \$366 million through the second quarter of FY2024. Quarterly data for each year are shown in the graph below. Additional details on the number and value of submissions for each college, as well as college targets for FY2024, are included in the table below.



Proposal Submissions Second Quarter (in millions)



Proposal Submissions	2020	2021	2022	2023	2024 2nd Quarter	
By Count	1,728	1,581	1,492	1,680	684	
CAAC	60	49	24	20	6	
CAH	16	12	11	7	5	
CAFLS & PSA	509	426	392	451	179	
CBSHS	143	150	151	183	74	
CECAS	672	596	631	684	271	
COE	42	37	43	45	14	
COB	11	14	9	11	5	
COS	219	229	193	259	114	
VP for Res & Interdisc Inst	29	29	23	11	10	
All Other	27	39	15	9	6	
By Value (millions)	\$734	\$762.4	\$896	\$932.8	\$365.9	FY2024 Targets
CAAC	\$2.7	\$3.8	\$6.5	\$10.4	\$3.2	\$11.00
CAH	\$3.2	\$1.7	\$1.7	\$3.0	\$0.3	\$3.25
CAFLS & PSA	\$99.3	\$89.7	\$249.9	\$149.6	\$63.3	\$160.00
CBSHS	\$41.1	\$64.3	\$73.1	\$106.5	\$48.1	\$112.00
CECAS	\$405.9	\$342.9	\$380.8	\$426.0	\$168.7	\$450.00
COE	\$18.9	\$22.4	\$32.3	\$34.4	\$8.5	\$36.00
COB	\$2.9	\$4.2	\$4.8	\$6.3	\$1.3	\$6.50
COS	\$129.3	\$175.4	\$127.3	\$169.8	\$62.5	\$180.00
VP for Res & Interdisc Inst	\$19.8	\$22.3	\$11.0	\$6.7	\$3.3	
All Other	\$10.7	\$35.7	\$8.9	\$20.3	\$6.7	

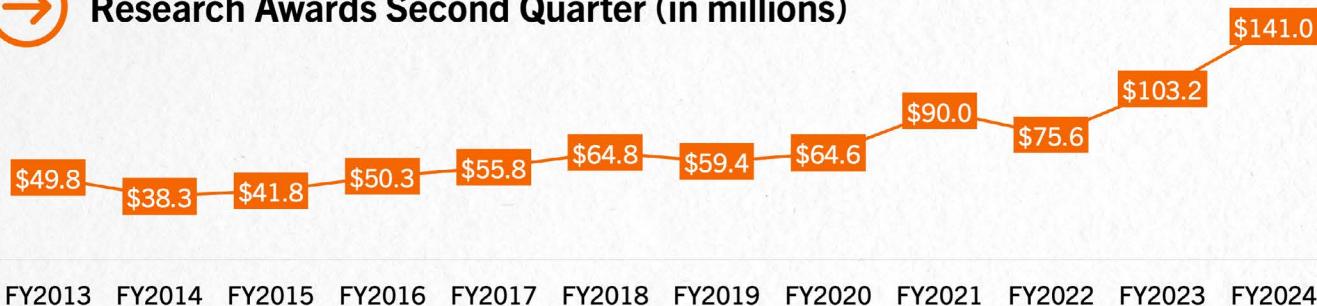
Competitive Research Awards

Research awards reached \$141 million through the second quarter of FY2024, up nearly 37 percent from the same six-month period of the prior year. The graph below compares awards received during the second quarter of each year. The table shows awards per college and the number of prestigious young investigator awards earned.

Information on the top awards received is included on [pages 10-12](#).



Research Awards Second Quarter (in millions)



Research Awards	2020	2021	2022	2023	2024 2nd Quarter
By College/Unit (millions)	\$118.3	\$162.2	\$157.6	\$282.0	\$141.0
CAAC	\$1.0	\$1.0	\$0.4	\$3.4	\$0.2
CAH	\$0.4	\$0.4	\$0.8	\$2.1	\$0.6
CAFLS & PSA	\$26.5	\$29.9	\$26.9	\$107.4	\$22.4
CBSHS	\$7.7	\$17.4	\$13.7	\$21.0	\$18.1
CECAS	\$48.0	\$75.0	\$76.4	\$102.8	\$63.7
COE	\$2.3	\$5.1	\$5.7	\$10.1	\$2.9
COB	\$1.2	\$0.2	\$0.9	\$1.1	\$1.1
COS	\$14.2	\$25.4	\$17.8	\$24.4	\$15.0
VP for Res & Interdisc Inst	\$14.6	\$5.1	\$6.6	\$7.1	\$4.6
All Other	\$2.6	\$2.6	\$8.3	\$2.6	\$12.2
Young Investigator Awards	13	9	5	8	8
NSF CAREER	9	8	4	6	8
NIH KO1	1	-	-	-	-
Air Force Young Investigator	-	-	-	1	-
Army Young Investigator	1	-	-	-	-
DARPA Young Investigator	1	-	-	-	-
EPA Early Career	-	-	-	-	-
DOE Early Career	1	1	1	-	-
Arnold & Mabel Beckman Foundation	-	-	-	1	-

Top Competitive Awards (Second Quarter FY2024)

Clemson University researchers received \$5.5 million from the National Institutes of Health to develop data-driven approaches for opioid use disorder treatment, recovery and prevention in rural communities. [The project](#) is led by Lior Rennert, associate professor of public health sciences and director of the Center for Public Health Modeling and Response, and Alain Litwin, professor of practice in the Department of Psychology and vice chair for academics in the Department of Medicine for Prisma Health-Upstate, will lead the project.

Joe Watkins, director of general engineering, received \$4 million from the U.S. Army via the University of Alabama-Huntsville to continue a project investigating advanced laser systems. This work aims to improve performance of beams of directed energy (DE) that 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.



Joe Watkins, left

Lesley Ross, SmartState/SmartLife Endowed Chair in Aging and Cognition, received \$3.3 million from the S.C. Department of Health and Human Services to support development of the S.C. Alzheimer's Disease Research Center in collaboration with the University of South Carolina and Medical University of South Carolina. The center intends to serve as a statewide initiative to advance the diagnosis, treatment and prevention of Alzheimer's disease and related dementias through research, clinical care and community and healthcare provider education.



This photo supplied courtesy of Duke Energy shows the Nuclear Discussion Collaborative at Oconee Nuclear Station

Lindsay Shuller-Nickles, associate professor of environmental engineering and earth sciences, received \$2 million from the U.S. Department of Energy to support the [Nuclear Waste Dialogue \(NuWaDi\) Consortium](#) led by Clemson University and the South Carolina Universities Research and Education Foundation (SCUREF). The consortium is offering funding opportunities to a wide range of South Carolina, North Carolina and Georgia organizations as part of an effort to engage community conversations about nuclear energy and waste.

James Hollis, director of the S.C. Meat-Poultry Inspection Department, received \$1.9 million from the U.S. Department of Agriculture (USDA) to support inspection services. The S.C. Meat-Poultry Inspection Department is housed with Clemson University Livestock Poultry Health and serves by establishment of the S.C. Legislature to protect the health of consumers by providing a comprehensive inspection service to assure that meat and poultry products are safe, wholesome and accurately labeled.

continued on next page ►

Top Competitive Awards (Second Quarter FY2024)

► continued from previous page

Zhana Duren, assistant professor of genetics and biochemistry, received \$1.8 million from the National Institutes of Health (NIH) to investigate genetic variants in the human genome and how they relate to disease. The goal is to develop new statistical methods to study the mechanism of disease-causing genetic variants by gene regulatory networks. Many diseases are caused by or associated with altered gene regulation.

Anand Gramopadhye, dean of the College of Engineering, Computing and Applied Sciences, received \$1.6 million from the National Science Foundation to [develop artificial intelligence](#) that would combine with “extended reality” technologies to help technicians ensure planes are safe to fly. Researchers envision a future in which technicians work collaboratively with artificial intelligence to inspect airplanes to reduce human error, which accounts for 70% of aircraft accidents.



Marek Urban, J.E. Sitrine Foundation Endowed Chair in Advanced Polymer Fiber-Based Materials, received \$1 million from the U.S. Department of Energy for research on new advanced materials. Urban will investigate certain molecular-level processes that may give polymers unique and desirable electrical features.

Radhika Kakani, director of the Veterinary Diagnostic Center, received \$1 million from the USDA via Colorado State University to support testing related to animal disease. The Diagnostic Center assists veterinarians, animal industry, and animal owners with livestock, poultry, companion animal, and wildlife disease problems. The Center is an integral part of a disease surveillance system that helps to assure a safe and adequate food supply.



Alyssa Gamaldo-Roddy, professor of psychology, received \$990,000 from NIH via Florida State University to support work-related healthy aging. An affiliate of the Institute for Engaged Aging, Gamaldo-Roddy works to identify factors associated with cognitive functioning, particularly in populations at risk for Alzheimer’s disease and related dementias. She is also supports research that explores the utility of digital health assessments in diverse older adult populations.



RESEARCH

RESEARCH NEWS

This section highlights research news from across the university.

Executive Summary

- Research is part of the fabric of the student experience at Clemson. Students are traveling the world to pursue research and scholarship and earning highly competitive internships, fellowships and scholarships for their work. Examples for student research and scholarship are on [pages 13-19](#).
- The largest single award granted by a federal agency in Clemson history (\$70 million) involves 27 community partner organizations, 29 Clemson faculty members and 20 Clemson graduate students across 11 departments ([pages 20-21](#)).
- The Virtual Prototyping of Ground Systems (VIPR-GS) project has received positive reviews from sponsors ([pages 22-23](#)). The project involves 70 faculty members and 120 graduate students across 10 departments.
- Clemson faculty have earned six highly competitive early CAREER Awards from the National Science Foundation this year and another CAREER award recipient has left his previous institution to join Clemson ([pages 24-25](#)).

Student Experience

The following pages highlight examples of research, scholarship and creative endeavors enriching the student experience at Clemson.

‘This passion is literally woven into my DNA’: Clemson student in search of answers for rare diseases

Service, passion and research are what drive Elizabeth Caldwell, a National Scholar and junior genetics major, to be the leader she is in the Clemson community.

At 14 years old, Caldwell was diagnosed with Ehlers-Danlos syndrome, a group of disorders that affect connective tissues supporting the skin, bones, blood vessels and many other organs and tissues.

Although her condition is medically considered an incurable disease, Caldwell views her disability as a “big part of her identity” and a driving motivation for her area of study, field research, future aspirations of becoming a doctor and continued community service.

Her research with Michael Sehorn, an associate professor in the Department of Genetics and Biochemistry, concentrates on a rare immunodeficiency disease. Elizabeth started in the lab with Sehorn during her first year at Clemson.

Caldwell has focused her efforts on the role a DNA damage repair pathway plays in a relatively under-researched rare immunodeficiency disease in Sehorn’s lab.

Caldwell is also a part of Clemson’s Clinical Undergraduate Research Experiences in Surgery (CURES), a class also taught by Sehorn. Participating students complete 12-hour shifts in the trauma bay at Prisma Health Greenville Memorial Hospital and conduct clinical research.

Sehorn lauded Caldwell’s inspiring “natural curiosity” and unequivocal dedication that she brings to her work.

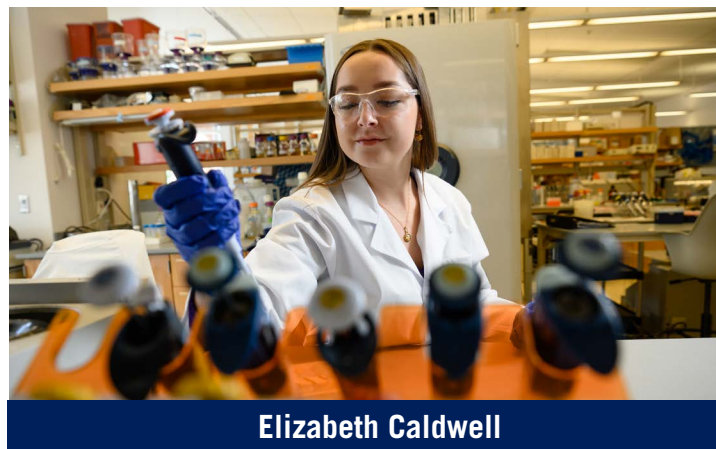
“She has shown resilience as she works through and overcomes challenges on her path to achieving success,” said Sehorn. “She is a wonderful student, and the lab would not be the same without her.”

Last summer, Caldwell was an intern with St. Jude’s pediatric oncology education program, a competitive opportunity she believes her time at Clemson helped her secure.

“Clemson has been able to make me competitive for those types of internships with a high caliber that are very well established and known,” said Caldwell.

During her time at St. Jude, Caldwell researched a rare, cancerous fusion protein related to leukemia and was able to find a drug that showed “promise for treating the disease.” She also worked on research with the largest cohort of leukemia patients and is part of a research paper that is currently pending professional review.

[READ MORE](#)



Elizabeth Caldwell

At St. Jude, Caldwell researched to find a drug with potential to treat leukemia.

[continued on next page](#) ►

Student Experience

► [continued from previous page](#)

Clemson student and alumnus work together to advance public health research

Emily Bernabe, a junior majoring in biochemistry and minoring in microbiology, spent last summer in Maryland learning to analyze samples of untreated wastewater to detect the presence of viruses and bacteria. She also designed an experiment to compare the capabilities of two polymerase chain reaction (PCR) instruments used to detect viruses and bacteria.



Emily Bernabe

Bernabe and alumnus Matthew Angel worked in neighboring labs at Clemson University's Eukaryotic Pathogens Innovation Center (EPIC) a few years ago, sharing lab equipment and sitting next to each other in meetings.

Angel, a career Army officer, was a member of Cheryl Ingram-Smith's lab and earned his Ph.D. in biochemistry and molecular biology in 2022. Currently, he leads a team of scientists at the Defense Centers for Public Health – Aberdeen at Aberdeen Proving Ground, Maryland, to develop and use molecular biology methods to advance public health initiatives.

Bernabe started working in Kerry Smith's lab the summer before she started at Clemson through the EUREKA! program. But it was a chance encounter in Washington, D.C., in fall 2022 that led to Bernabe's working in Angel's lab through an Oak Ridge Institute of Science Education (ORISE) internship. ORISE is a program designed to provide practical scientific training experiences for students who are pursuing a degree or have recently graduated.

Bernabe was on a field trip to tour the National Institutes of Health with the Biochemistry and Genetics Club during the 2022 fall break. Angel, who had previously served as president of the organization, met club members in Bethesda, Maryland, for dinner. Bernabe and Angel didn't know the other would be there.

Angel described to the students how his lab develops wastewater surveillance methods to detect the presence and prevalence of infectious diseases. He told students to let him know if they wanted to work in his lab. Bernabe jumped at the chance.

While there, she was able to work with technicians who are trying to develop a method to detect the presence of antimicrobial resistance (AMR) genes in wastewater. Antibiotic resistant bacteria are a growing problem across the United States.

[READ MORE](#)

[continued on next page](#) ►

Student Experience

► [continued from previous page](#)

Landscape architecture students tackle environmental threats in The Bahamas

Any mention of The Bahamas evokes images of sparkling waves and white-sand beaches. Now, Clemson students are part of an effort to preserve the natural beauty of that iconic landscape.

Clemson University landscape architecture students recently worked with the local government of Tarpum Bay to create a master plan and design for the Tarpum Bay Waterfront in Eleuthera.

A studio comprised of undergraduate and graduate landscape architecture students, led by Professor Hala Nassar, used community feedback to develop a master plan and design for the Tarpum Bay Waterfront that directly reflected the needs of the Tarpum Bay area.

“Dr. Nassar and I met last year to discuss how the community and particularly the waterfront of Tarpum Bay could be developed,” explained Shawna McCartney, community relations and special events officer at One Eleuthera Foundation and a local government official. “During Dr. Nassar’s visits to Eleuthera, she always admired the Tarpum Bay Waterfront, noting the potential it had to develop as a cultural, economic and social center without losing its laid-back island charm.”

Nassar, McCartney and Professor Lane Glaze hosted a community engagement session in Tarpum Bay earlier in the year, where the community came together to conduct a mapping exercise, provide feedback on community needs and pinpoint essential locations along the Tarpum Bay Waterfront.

The feedback the community provided directly informed the work produced by Nassar’s class.

“The students were able to take this information and translate it into what they thought was best suited for the community,” explained McCartney. “The designs allow the exploration of what can potentially happen in terms of development, and it definitely opened my eyes to the possibilities; as a matter of fact, the presentations exceeded my expectations.”

[READ MORE](#)



Architecture student Jada Calwile



Orlandi

Giovanni Orlandi becomes second Clemson University student in two years to win a Churchill Scholarship

Giovanni Orlandi is the second student in Clemson University history to win the Churchill Scholarship, allowing him to pursue a master’s degree at the University of Cambridge, one of the world’s oldest and most distinguished institutions of higher learning.

As a student at Cambridge, Orlandi will be following in the footsteps of some of history’s most towering innovators and thinkers, including Sir Isaac Newton, Stephen Hawking, Alan Turing, Charles Babbage and Lord Kelvin.

[continued on next page](#) ►

Student Experience

► [continued from previous page](#)

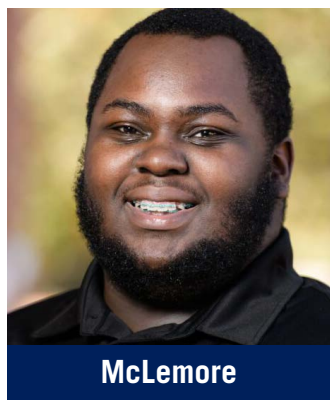
The scholarship will pay for a year of tuition and various other expenses, including travel costs and room and board. Orlandi plans to pursue a Master of Philosophy in materials science and metallurgy under Bartomeu Monserrat, a materials physics professor.

“Applying for the Churchill is one of the things I really wanted to do,” Orlandi said. “Cambridge is one of the oldest universities in the world, and so much good work is done there. Just to go would be an honor, but being able to go with funding as a Churchill Scholar, that’s really special, and I’m really excited for it.”

At Cambridge, Orlandi plans to join the quest to find a room-temperature superconductor, an innovation that if achieved could revolutionize fields ranging from energy to computing to medicine. His long-term goal is to earn a Ph.D. in materials science and engineering with a focus on theoretical and computational materials science.

Orlandi is an Honors student who is majoring in mechanical engineering and minoring in physics at Clemson. He would like to either become a university professor or lead a research team at a national lab, focusing on renewable energy production to address climate change.

[READ MORE](#)



McLemore

National scholarship recipient embarks on a life-changing exchange semester

Studying abroad opens doors to other countries, cultures, and ideas, instilling a love of learning by allowing students to collaborate with people of diverse backgrounds in an immersive environment. The Benjamin A. Gilman International Scholarship Program is a selective, federally funded program that offers financial assistance to students who want to study abroad. Gajmere McLemore, a senior Graphic Communications major at the Wilbur O. and Ann Powers College of Business, was named one of the nine national scholarship recipients.

McLemore, from Beaufort, S.C., is ecstatic to have been chosen, as the impact of the scholarship will be significant. “Being a recipient of the Benjamin A. Gilman Scholarship will not only offset the cost of studying abroad but will also make me a more competitive candidate when applying for jobs, other scholarships, and graduate admission,” McLemore says.

While applying for the scholarship, McLemore credited the Office of Major Fellowships for its extensive help. At the beginning of the application period, McLemore did not know where to start; however, he sought help from the Office and encouraged others to do the same when applying for scholarships like the Benjamin A. Gilman International Scholarship Program. “The Office of Major Fellowships is dedicated to helping students navigate the application process for nationally competitive scholarships, grants, and fellowships,” McLemore comments. “They offer a variety of resources for application support, including draft reviews and access to exemplar essays.”

As a first-generation student, the opportunity to study in Germany for the next semester is a chance McLemore did not want to miss. “My mom didn’t have the opportunity...she always pushed me to do things that she didn’t get to do...,” he shares. “I just feel like because my parents didn’t

[continued on next page](#) ►

Student Experience

► [continued from previous page](#)

have that opportunity, I want to be the person to step out of my comfort zone and take advantage of opportunities like this. So, when I have children, I can share my experience with them and be that guide for them as well". He's looking forward to attending a college specializing in art and hopes that studying abroad will open opportunities to collaborate with more artists. McLemore departed in March for Stuttgart, Germany and returns to Clemson in July to finish his remaining degree requirements.

MBA students working on new Greenville startups

The Clemson MBA program has witnessed student ideas born in the classroom evolve into fully operating South Carolina startups. The diverse list of Clemson MBA graduate businesses includes Michael D'Onofrio and Austin Clark's TestedHQ, a product-development testing firm that originated from an idea pitch at the MBAe EnterPrize Awards. It has now transformed into a rapidly scaling business with funding support from local investors.



Michael D'Onofrio and Austin Clark present their company TestedHQ at the inaugural NEXT Accelerator.

While the business idea originated in a Clemson classroom, it came to life with the assistance of community networks, experienced mentors, and programming from Greenville partners like NEXT, an organization dedicated to supporting local innovators as they develop their businesses. NEXT fortifies high-growth companies rooted in Greenville through a series of programs, services, and events. The NEXT team also acts as stewards of the broader startup ecosystem (#StartupGVL), a thriving community of founders, mentors, and support organizations, all contributing to the entrepreneurial growth of the region.

"We've got a strong foundation here in the Upstate for startups to be successful," says Eric Weissmann, Executive Director of NEXT. "And with the dramatic influx of newcomers to the region (20,000 new citizens a year), the next few years are going to be transformative. That's why coordinating with partners like Clemson is so vital. Getting founders up and running, or at least failing fast, will be critical to future success — for them and for the community."

Other Clemson students benefiting from NEXT programs include Julian Brinkley of MyUI, a digital interface adaptation company developing accessible user interfaces for those with disabilities, and Jerome McClendon, who is working on a digital health and wellness app called MAHI. "All three of these Clemson students came in with a different focus and at a different stage of development, which requires three very different types of programs," adds Weissmann. "Julian went through our accelerator program, Jerome is in VMS (Venture Mentoring Service) and the TestedHQ team has been featured at our signature annual event, NEXT Venture Summit, two years in a row."

[READ MORE](#)

[continued on next page](#) ►

Student Experience

► [continued from previous page](#)

Four electrical engineering students receive IEEE PES Scholarships

Four Clemson University students have received awards from the IEEE PES Scholarship Plus Initiative, including one who won the John W. Estey Outstanding Scholar Award.

The Estey Award, the most prestigious of the honors, went to Michael Walters, who is on track to graduate this year. In addition to Walters, the three Clemson students who received PES Scholarships are Jacob Bittinger (2024), Carson Crooke (2025) and Samuel Langenfeld (2025).

The award comes from IEEE's Power & Energy Society.

The Clemson winners are among the 82 high-achieving students, all majoring in electrical engineering, to receive scholarships through the initiative, according to IEEE.

The students will receive a financial award and one year of IEEE PES student membership and have the opportunity to be mentored by leading professionals in the power and energy industry.

[READ MORE](#)

Clemson undergrad could help with conservation of important deep-water coral

A Clemson University undergraduate student's research could help efforts to conserve an important deep-sea coral imperiled by a changing global climate and human activities like fishing and oil exploration.

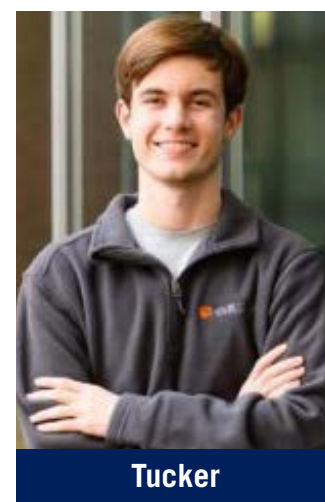
Joshua Tucker, a senior microbiology major, developed the first genomic portrait of the reef-building coral *Madracis myriaster*, known as the "fluted finger coral." *M. myriaster* is one of the most important reef-building corals in deep-water habitats of the Caribbean Sea.

"It is very important that we understand these deep-sea corals well because they are crucial to the health of their community, yet are so fragile and so slow-growing that if damage occurs due to anthropogenic activity such as fishing or oil extraction, it can lead to some serious downstream effects," said Tucker, who is a Goldwater Scholar.

At depths of 120 to 1,200 meters (about 400 to 4,000 feet), *M. myriaster* shares deep rocky seabeds with sea anemones, other corals and algae. These reefs serve as a refuge for many species of fishes and invertebrates, including crustaceans, polychaetes and echinoderms. Despite being a common species in deep habitats, *M. myriaster* is difficult to identify and it is often confused with other closely related deep-water and shallow-water corals.

Tucker created a "genomic portrait" of the deep-water azooxanthellate reef-building stony coral by characterizing its mitochondrial genome.

Tucker's research started with a Marine Conservation and Genetics Creative Inquiry course led by Associate Professor of Biological Sciences Antonio Baeza. Being able to work on a research project that would have direct impact "was enough to rope me in," Tucker said. After spending a semester learning about bioinformatic tools, Tucker was able to use that knowledge on a project that had real-world applications. [READ MORE](#)



Tucker

[continued on next page](#) ►

Student Experience

► [continued from previous page](#)

Destinee Cooper awarded STEM fellowship

A Ph.D. student in engineering and science education has added to her list of impressive credentials with another accolade.

Destinee Cooper, who is originally from Anderson, has been selected for one of 15 annual fellowships with the Community for Advancing Discovery Research in Education (CADRE). The honor comes from the National Science Foundation (NSF).

“In the coming year, the new CADRE Fellows will explore career pathways, research dissemination and use, community building and collaboration, and research funding,” according to the NSF. “They will engage in experiences such as peer mentoring and a mock DRK-12 proposal review led by an NSF program director. They will also collaborate with one another on a career-development project.”

Cooper’s credentials also include a master’s degree in chemistry education from Stanford University, experience as a Knowles teaching fellow and placement in Clemson’s Bridge to Doctorate Graduate Fellowship program.

Her research focuses on culturally relevant pedagogy in chemistry and advancing equity in STEM education. Cooper’s research advisor is Matthew Voigt, an assistant professor in the Department of Engineering and Science Education.

Cooper is currently a graduate researcher on an NSF S-STEM Hub project called Practices and Research on Student Pathways in Education from Community College and Transfer Students in STEM.

In that role, she examines how chemistry faculty understand and implement culturally relevant practices to support STEM transfer students.

[READ MORE](#)



Three Clemson University students selected as University Innovation Fellows

Three Clemson University students were selected as University Innovation Fellows, a global program that empowers student leaders to increase campus engagement through design, creativity, innovation and entrepreneurship.

The students are: Megan DeGrezia, majoring in marketing and minoring in entrepreneurship; Hayden Roof, majoring in computer science; and Brianna Sebastian-Olazabal, majoring in mechanical engineering. All three are on track to graduate in 2026.

University Innovation Fellows is run by Stanford University’s Hasso Plattner Institute of Design. This year’s crop of fellows numbers 261 from 68 higher education institutions in 15 countries.

Faculty advisors at Clemson are John DesJardins, Hambricht Distinguished Professor in Engineering Leadership, and John Hannon, director of the Brook T. Smith LaunchPad.

[READ MORE](#)

Building Partnerships for Climate-Smart Commodities in South Carolina



Clemson University and South Carolina State University, the two land-grant institutions of South Carolina, have established a statewide coalition to execute a pilot project that provides incentives to farmers to implement climate-smart production practices.

The project has received a grant with a funding ceiling of \$70 million from the U.S. Department of Agriculture, making it the largest single grant from a federal funding agency that Clemson has ever received.



Agudelo

Called “Building Partnerships for Climate-Smart Commodities in South Carolina”, the project is led by Paula Agudelo, associate dean for 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.

Climate-smart practices such as cover-cropping, reduced tillage and prescribed grazing can help improve soil nutrient retention, reduce erosion, lower agricultural inputs, and reduce greenhouse gas emissions. However, adoption of such operational practices remains low. According to the NASS Census of Agriculture, 6 percent of farmers use cover crops and 23 percent use reduced till practices. Farmers are still weighing the economic, practical, and environmental impacts of integrating these practices into their production systems. There is a compelling need to understand the barriers to adoption and to provide education and technical support to assist and promote implementation of climate-smart practices.

continued on next page ▶

By The Numbers

\$70M

USDA Funding

27

Project Partners

29

Clemson Faculty

18

Graduate Students

11

Postdoctoral Researchers

5

Academic Departments

Building Partnerships

► continued from previous page

The Climate-Smart Commodities in South Carolina project provides incentives for farmers to implement climate-smart (CS) production practices and will measure and verify the carbon and greenhouse gas (GHG) benefits associated with the practices (quantification of GHG emissions is rare in the state). Additionally, the project will support the development of markets for the resulting climate-smart commodities. This pilot project starts to develop an emission inventory by commodities and evaluates the capacity of the state to produce climate-smart commodities.

The statewide project will focus on representative agricultural production sectors of South Carolina and the Southeast, including vegetables, peanuts, beef cattle and forest products, and will ensure meaningful involvement of small and underserved producers.

South Carolina and Southeastern agriculture are challenged by highly degraded soils with organic matter content of less than 1 percent and low water-holding capacity. Climate-smart practices can overcome these challenges by helping to increase soil organic carbon, soil health, crop productivity, and climate resilience.

For historical and socioeconomic reasons, South Carolina has a large base of small and underserved farmers. The 2017 Agricultural Census (NASS, 2017) shows 92 percent of farms in South Carolina have less than \$100,000 in value of sales and are considered small (22,703 out of a total of 24,791 farms). Almost 50 percent (12,352 farms) of the farms are less than 50 acres, and over 90 percent are under 500 acres. Approximately 29 percent of South Carolina farmers are women, 7 percent are black, 13 percent have veteran status, and 29 percent identify as new and beginning farmers (NASS, 2017). Through strategic partnerships, this pilot project aims to have meaningful involvement of these small and underserved producers.

Statewide Coalition of 27 Partners

- American Peanut Council
- Aster Global Environmental Solutions
- Barry Graden, Forest Certification Consultant
- Clemson Wood Utilization Institute
- Forest Association of South Carolina
- Help for Landowners
- Mixon Seeds
- Palmetto Agribusiness Council
- Petrichor Global
- SC Cattleman's Association
- SC Peanut Board
- SC Southern SARE
- SC Timber Producers Association
- SC Forage and Grazing Lands Coalition
- SC Farmer's Markets (SCDA)
- SC Specialty Crop Association (SCDA)
- The Long Leaf Alliance
- Tidewater Lumber and Moulding, Inc.
- US Endowment for Forests & Communities
- WP Rawl
- Center for Heirs Property Preservation
- Gullah Geechee Community
- South Carolina Black Farmer's Association
- SC New & Beginning Farmers Program
- Farmer Veteran Coalition of South Carolina
- Women in Agriculture
- Women Owning Woodlands

VIPR-GS: Virtual Prototyping of Ground Systems



In 2020, Clemson announced a strategic partnership with the U.S. Army DEVCOM Ground Vehicle Systems Center (GVSC) when the University founded its Virtual Prototyping of autonomy-enabled Ground Systems (VIPR-GS) center, backed by the U.S. Department of Defense.

Just a few short years later, Clemson University students at the International Center for Automotive Research (CU-ICAR) [were debuting an off-road reconnaissance and relief vehicle](#) that can navigate on its own. The vehicle is a result of Clemson's flagship rapid vehicle prototype program, Deep Orange, housed within the University's two-year master's degree focused on systems integration in automotive engineering. To make such an ambitious project possible, two cohorts of Deep Orange students collaborated across three years to develop this autonomous, high-speed, off-road relief vehicle from the ground up.

Students worked with faculty and staff at Clemson's International Center for Automotive Research (CU-ICAR), along with the project's primary sponsor, GVSC.

The VIPR-GS center was designed to propel research breakthroughs in off-road vehicle autonomy, powertrain electrification, and digital engineering tools to more effectively support the mission of GVSC.

Automotive autonomy technology is changing economies and global industries – and is also a driving force behind military modernization. Bringing these self-driving vehicles to life on- and off-road requires new concepts and algorithms to be tested expeditiously and cost-effectively – all of which happen through virtual prototyping. This is the focus at VIPR-GS, which

“ They're taking Army requirements and building advanced vehicle prototypes within two years – it's truly impressive. Whether they end up working in the private sector or in our labs as an Army civilian scientist, these students are the next generation of innovators and the experts our Army and our Nation need now and into the future.



- **Major General Edmond 'Miles' Brown,**
after visiting VIPR-GS in May 2023

[continued on next page](#) ▶

VIPR-GS

► continued from previous page

already has received nearly \$76 million, with the U.S. government committing up to \$100 million to the project.

Led by Clemson professor and Timken Chair in Vehicle System Design Zoran Filipi, VIPR-GS consists of 70 faculty, 120 graduate researchers, 30 active translational research projects and 10 supporting departments.

The research is focused on autonomy-enabled ground vehicles, including digital engineering, next-generation propulsion and energy systems, and manned and unmanned teaming in unknown off-road environments. Researchers will build and validate various virtual models and simulations for off-road vehicles with advanced electrified propulsion, situational intelligence, AI-enabled autonomy and team-routing algorithms. The Center will support one of the Army Big Six Modernization Priorities – developing next-generation combat vehicles – by providing tools for technology roadmaps and hardware demonstrations.

Three themes characterize the research efforts: Off-road autonomy for multi-scale vehicle fleets; propulsion systems and smart energy; and virtual prototyping and digital engineering for autonomy-enabled off-road vehicles. Models, algorithms, analytical capabilities and decision-making tools resulting from the research will be evaluated by building a physical mock-up of an optionally manned, non-combat, off-road ground vehicle. As the project's final phase, discoveries and breakthrough innovations from the Center will be fabricated and validated via Deep Orange, the University's long-running educational prototyping program.

GVSC leadership visits VIPR-GS annually to review latest developments, innovations, and research accomplishments to support the center's mission. They have come away impressed.

"The updates, progress, and demonstrations we reviewed last week at CU-ICAR are exactly the type of insights we were looking for when we partnered with Clemson. The students coming out of the center are top-notch and highly sought after," David Gorsich, U.S. Army Chief Scientist at GVSC, said after touring the center in 2023. "I was impressed during the review to see so many of the army's industry partners there seeking to collaborate and even learned one of our industry partners has just opened an office next to CU-ICAR with over a dozen of their employees to help serve the Army's needs and draw from Clemson's expertise and students."

By The Numbers

80

faculty members

120

graduate students

10

Clemson departments

44

active projects

“

The students coming out of the center are top notch and highly sought after.

- **U.S. Army Chief Scientist David Gorsuch**

after visiting VIPR-GS in 2023



Early Career Awards

Young faculty members are proving Clemson to be a great place to build a career.

Consider the growing numbers of early-career award recipients at Clemson. So far this fiscal year, seven faculty members have earned prestigious early CAREER awards from the National Science Foundation (NSF) and one faculty member, Adam Melvin, left his previous institution to come to Clemson and bring his CAREER award with him.

These are highly competitive catalyst awards given to the brightest young minds in the country to help them build a research portfolio. Notably, the current 2024 class of awardees

includes a diverse mix of disciplines: computing, physics, genetics, chemistry and several engineering fields. In recent years, Clemson has had awardees from education, plant and environmental sciences, biological sciences, psychology and numerous other fields. The full list of early career award recipients, including past winners, is posted [online here](#). Brief descriptions of this year's NSF CAREER Award recipients are included below and on the next page.

Long Cheng, assistant professor in the School of Computing, received a \$502,505 NSF CAREER Award to evaluate privacy protections, inclusiveness and policy compliance of “voice personal assistants” like Amazon Alexa or Google Assistant, which are commonly used for ordering items online or managing bank transactions, among other uses. Cheng aims to design a new accessible and inclusive privacy notice mechanism for users; propose a dynamic analysis framework to evaluate how existing skills conform to various policy requirements and measure potential social bias issues in mainstream VPA platforms.

Jordon Gilmore, associate professor of bioengineering, received a \$550,000 NSF CAREER Award for a project to improve diagnostics and treatment of infected chronic wounds. Gilmore's research combines artificial intelligence, advanced medical textiles and electrochemical biosensing to support real-time healthcare diagnostics. For his CAREER project, Gilmore hopes to better understand the formation and progression of bacterial biofilms prevalent in chronic wounds. The work could help to develop a real-time system for monitoring and treating infections that often lead to amputation.

Stephen Kaepler, assistant professor of physics and astronomy, received a \$360,000 NSF CAREER Award for a project to understand fundamental physical processes associated with a commonly occurring auroral type called pulsating aurora, specifically on the electrical circuit associated with the “on-off” modulations that are pulsating aurora. As part of the workforce development, Kaepler will

[continued on next page](#) ►

NSF CAREER Awardees 2024



Long Cheng
Assistant Professor
School of Computing



Dan Li
Assistant Professor
Industrial Engineering



Jordon Gilmore
Associate Professor
Bioengineering



Ge Lv
Assistant Professor
Mechanical Engineering



Stephen Kaepler
Assistant Professor
Physics & Astronomy



Adam Melvin
Associate Professor
Chemical Engineering



James Lewis
Assistant Professor
Genetics & Biochemistry



Thao Tran
Assistant Professor
Chemistry

Early CAREER Awards

► continued from previous page

continue to train undergraduates in space mission design and for some of those undergraduate students to participate in a NASA sounding rocket program for students (ROCKSAT-X).

James Lewis, assistant professor of genetics and biochemistry, received a \$1.3 million NSF CAREER Award to better understand the genomic architecture that controls trait differences between sexes. The Lewis Lab studies butterfly evolution as a model for trait adaptation and diversification. For his CAREER project, he will map the genetic architecture of male-specific wing color in a neotropical butterfly and test the contribution of these genes to population differentiation. This work will test longstanding models for trait evolution and diversification.

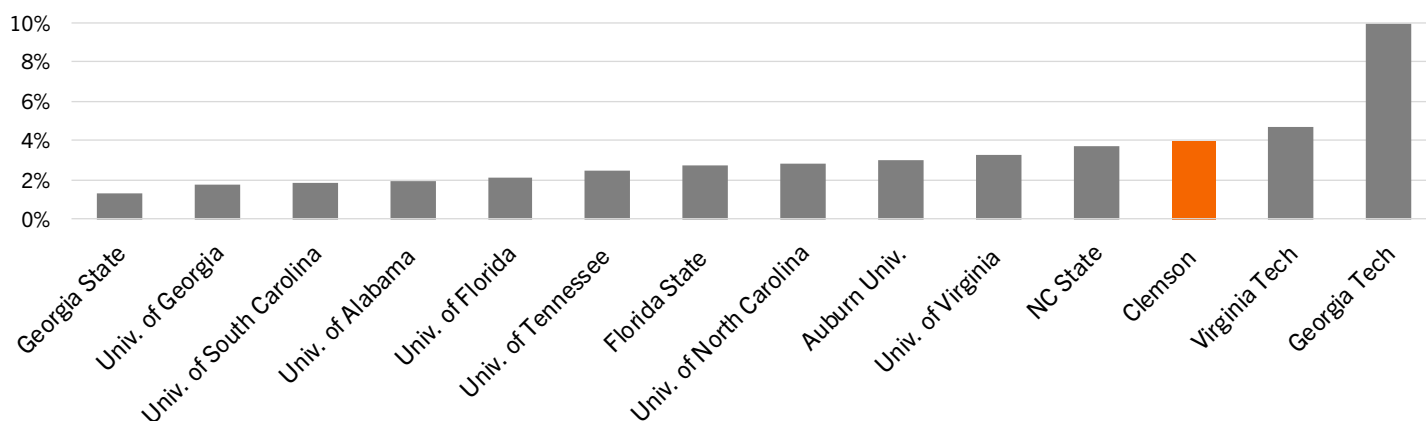
Dan Li, assistant professor of industrial engineering, received a \$555,504 NSF CAREER Award to help develop system-wide cyber-physical resilience of continuous manufacturing operations. She will investigate the interplay between the industrial internet-of-things (IIoT) and physical equipment to uncover previously unseen system-level risks induced by interconnectivity. Li aims to collaborate with industry stakeholders and extend this work to other critical infrastructures to enhance national cyber-physical resilience.

Ge Lv, assistant professor of mechanical engineering, received a \$570,938 NSF CAREER Award to advance knowledge in the control and optimization of powered lower-limb exoskeletons by investigating a novel human-in-the-loop framework to rapidly customize task-invariant assistance for volitional human motion across locomotor tasks.

Thao Tran, assistant professor of Chemistry, received a \$718,100 NSF CAREER Award to advance her research on the use of materials chemistry in technological advances related to energy and quantum information science. Thao will combine chemical principles, appropriate synthetic techniques and advanced structural and physical properties characterization to develop new, more functional materials. The work will help to advance quantum technologies that can process information to solve complex problems much faster than classical computers.

Lastly, Adam Melvin recently joined Clemson as an associate professor of chemical engineering, bringing his \$500,000 NSF CAREER award with him from Louisiana State University. Melvin is working to develop peptides to control protein degradation, which can be used in diagnosing cancer and diabetes.

Notably, we see Clemson employs a high number of CAREER awardees compared to other institutions. The chart below shows the percentage of active NSF CAREER awardees per ladder rank faculty at Southeastern institutions. Clemson ranks third.





RESEARCH

FOCUS ON FACULTY

This section highlights junior faculty members at Clemson University. Each College submitted a profile of one junior faculty member.

Executive Summary

- 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 and Public Service and Agriculture](#)
 - » [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](#)



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

Liliane S. Silva, Ph.D.

Assistant Professor

Animal and Veterinary Sciences



Silva, a forage specialist, earned her Ph.D. from the University of Florida in 2019, after receiving her bachelor's and master's degrees from the University of Sao Paulo in Brazil. She came to Clemson University in 2021, specifically to the Edisto Research and Education Center, after working as a postdoctoral researcher at Auburn University. Her research focuses on developing improved management practices to enhance production, sustainability, profitability and resilience of forage-livestock systems. She is working with grazing summer and winter cover crops, measuring greenhouse gases from livestock systems, determining soil carbon and nitrogen accumulation, among other interdisciplinary statewide and multi-state research and Extension efforts. Silva has implemented 75 Extension programming activities and reached more than 3,000 people through in-person training activities in South Carolina. She currently participates in two multi-state research grants and several initiatives related to Extension. Silva is motivated to involve young people in agricultural efforts and train the next generation of researchers and agricultural professionals.

Select Accomplishments

- Received the 2023 Outstanding Extension Specialist Award from the South Carolina Agricultural Agents Association (SCACAA).
- Received \$74,868 from the Southern Extension Risk Management Education for a multi-disciplinary online course development.
- Received \$1.3 million as co-principal investigator (Co-PI) for Clemson sub-award on a federal grant to develop livestock feed additives to reduce methane emissions from beef cattle.
- Received \$461,927 as Co-PI on the USDA-Climate Smart “Climate Smart Grasslands – the Root of Agricultural Carbon Markets” led by University of Tennessee.
- Received \$461,083 as Co-PI on the “Building Ecosystem Resiliency Through Innovative Silvopasture Systems on South Carolina Farms” USDA grant.
- Received \$75,099 as Co-PI from Green Planet Platform Inc. to study kenaf production.
- Is senior personnel on Clemson's largest grant award, the \$70 million “Building Partnerships for Climate-Smart Commodities in South Carolina” from the USDA NRCS – responsible for measurement and Extension efforts on “forages for beef” cattle commodity.
- Published 24 peer-reviewed articles and more than 50 technical management articles/blog pieces.
- Developed seven Extension manuals/booklets and three online forage-livestock courses.



College of
**ARCHITECTURE, ART
AND CONSTRUCTION**

Lyndsey Deaton, Ph.D.

Assistant Professor

School of Architecture



Deaton is a licensed architect and certified planner with projects across the United States, the Middle East, Asia and Africa. She is an assistant professor in the School of Architecture at Clemson University, where she teaches and conducts research in the Architecture + Health Graduate Program. She is a Faculty Scholar at the Clemson University School of Health Research (CUSHR). Her work investigates and challenges health concepts across a wide range of venues, from the design of healthcare facilities to the role of equitable planning participation in community health. She is currently working on two original studies: a Post Occupancy Evaluation Toolkit for Milieu Space in Children's Behavioral Health Facilities with the University of Cincinnati Children's Hospital and the study Gentrification's Effects on Children's Active Mobility in Greenville, S.C. In the past 15 years, she has worked on more than 30 architecture projects and 80 master/urban planning projects. Her designs have been featured in *Architect Magazine* (2011) and received 23 awards, including the American Planning Association Federal Planning Division Honor Award for Collaborative Planning on NASA Kennedy Space Center Vision Plan and Programmatic Environmental Assessment (2022), the Lafarge Holcim Award for Sustainable Construction (2012), the American Planning Association's Outstanding Collaborative Planning Project (2016), the Mayor's Choice Award, City of Eugene (2017).

Select Accomplishments

- Environmental Design Research Association (EDRA) 23rd Annual Great Places Award.
- Creativity Professorship 2023-25 College of Architecture, Art and Construction.
- Deaton, Lyndsey. "Freedmen's Town versus Frenchtown: A Spatial History of Black Settlements in Houston, TX," in *Traditional Dwellings and Settlements Review*, Spring 2020.
- Deaton, Lyndsey. "The Rise of the Humanitarian Planning Committee," in *Interplan* Spring 2020.
- Murphey, J. & Deaton, L. "Historic Preservation with the Mission Through Installation Master Planning," in *Public Works Digest* JAN/FEB/MAR 2018 Vol XXX, No. 1.
- Gillem, Mark and Lyndsey Deaton. "New Traditions of Placemaking in Central-West Africa," in *Whose Tradition?* Ed. AlSayyad, Nezar, Mark Gillem, and David Moffat. London: Routledge, 2017.
- Gillem, Mark and Lyndsey Pruitt. "Security, Surveillance and the New Landscapes of Migration," in *Ethno-Architecture and the Politics of Migration*. Ed. Mirjana Lozanovska. London: Routledge, 2016.



College of
**ARTS AND
HUMANITIES**

Maziyar Faridi, Ph.D.

Assistant Professor

English



Faridi's research lies at the intersection of aesthetics and political philosophy. Specifically, he explores how works of art across media can call into question and expand our contemporary ways of understanding political relationality. In his current book project, Maziyar writes about how modernist Persian poetry and avant-garde cinema in the twentieth-century Middle East can complicate the modern logics of sovereignty.

Maziyar Faridi joined Clemson in 2020 and is an assistant professor in the Departments of English and Interdisciplinary Studies. He holds a Ph.D. in Comparative Literary Studies from Northwestern University (2020). His research has received major national recognition. In 2021, his dissertation, "On an Aporetic Poetics of Relation," won the prestigious Charles Bernheimer Award for the best dissertation from the American Comparative Literature Association.

His ongoing book project, *Rhythms of Relation*, is the recipient of a National Endowment for the Humanities Faculty Fellowship (2024-2025). Maziyar's most recent peer-reviewed article, "Deceleratory Encounters with Measures of Colonial Modernity: A Still Life," is forthcoming in *Diacritics: A Review of Contemporary Criticism*.

Select Accomplishments

- Humanities Hub Lightsey Fellowship, Clemson University (2022).
- Charles Bernheimer Prize (Best Dissertation), American Comparative Literature Association (2021).
- Weinberg College of Arts and Sciences/The Graduate School Teaching Fellowship, Northwestern University (2019).
- Ferdowsi Tusi Award for the Best Graduate-Student Research in Persian Literature and Culture, Ferdowsi Tusi Millennium Memorial Endowment for Persian Literature and Culture, University of North Carolina at Chapel Hill (2018).



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

Irene Pericot-Valverde, Ph.D.

Assistant Professor

Psychology



Pericot-Valverde is a clinical psychologist graduating summa cum laude from the University of Oviedo (Spain). She completed research internships at various centers in the U.S., including the Medical University of South Carolina, the University of Houston and the State University of New York at Buffalo. Finally, she culminated formal training with a two-year postdoctoral fellowship in the field of Tobacco Regulatory Science. She draws from a comprehensive training background in clinical psychology, clinical trials research, psychopharmacology and experimental psychology to develop a strong and cohesive research program focused on addiction and other unhealthy behaviors at Clemson University. Her research has primarily focused on tobacco use, opioid use and unhealthy sex behaviors. Pericot-Valverde's research has been funded by the National Institute of Drug Abuse (NIDA), South Carolina Opioid Recovery Funds, Clemson University and Prisma Health. She has ongoing research partnerships with researchers and clinicians within the college, including the departments of Psychology and Public Health, but also with clinicians and researchers from Prisma Health, the University of South Carolina and the University of Texas Health Science Center

Pericot-Valverde teaches Health Psychology in the undergraduate program of psychology, and she is working as a part of the Health Psychology Graduate Program Committee to develop a Health Psychology Graduate and Ph.D. program at Clemson University. She also leads two undergraduate Creative Inquiry teams focused on health disparities and addiction research.

Select Accomplishments

- Published 18 peer-reviewed articles with Clemson affiliation since joining the faculty in the fall of 2022.
- Presented 20 posters and papers at National and International conferences.
- Co-investigator on a one-year state-funded (South Carolina Opioid Recovery Funds) award totaling \$241,955.
- Multi-principal investigator on a three-year federally funded (National Institute on Drug Abuse) R23 award totaling \$897,484.
- Co-investigator on a five-year federally funded (National Institute on Alcohol Abuse and Alcoholism) R01 award totaling \$3,595,375.
- Editorial Fellow for the peer-reviewed journal *Drug and Alcohol Dependence*.
- Serves as a member of the Editorial Board of the *Journal of Substance and Addiction Treatment*.



Wilbur O. and Ann Powers College of

BUSINESS**Lily Shen, Ph.D.***Associate Professor***Finance**

Shen is an associate professor of finance and a visiting scholar at Cambridge University and the research department of the Federal Reserve Bank of Atlanta. Her research focuses on the intersection of finance, machine learning and real estate. Driven by her expertise, she specializes in utilizing machine learning techniques to analyze and interpret textual data in the realms of finance and real estate. Her work extends to the application of Artificial Intelligence and Large Language Models, shedding light on how technological innovation can enhance investment strategies.

Her research papers have been published in esteemed journals, including *Management Science*, the *Journal of Financial and Quantitative Analysis*, the *Journal of Urban Economics* and the *Journal of Real Estate Finance and Economics*. Her work on COVID-19 and Airbnb has been featured in *The Economist*, while her research on real estate agent value has been showcased in the *Washington Post*. Her research on income support and mortgage default motivated the nationwide COVID-19 Mortgage Relief program.

She has received seven research awards and has presented her work 56 times at esteemed national and international conferences and universities during her tenure at Clemson. She is actively involved in student mentoring and promoting Clemson's standing in the field of business education. Leading two Creative Inquiry (CI) projects, she empowers students to utilize AI in research projects, making Clemson the first university to offer machine learning courses to business undergraduates. Additionally, Shen's research has captured the attention of Clemson alumni. She facilitates connections between current undergraduate students and successful alumni from organizations like SunTrust, CoStar and Amazon, helping students expand their professional networks and gain industry exposure.

Select Accomplishments

- Information in Financial Contracts: Evidence from CMBS Pooling and Servicing Agreements with Ambrose, Han, and Korgaonkar 2022 (*The Journal of Financial and Quantitative Analysis*).
- Double Trigger for Mortgage Default: the Fracking Boom, with Chris Cunningham and Kristopher Gerardi, 2021 (*Management Science*).
- Information Value of Property Descriptions: A Machine Learning Approach, with Stephen Ross, 2021 (*Journal of Urban Economics*).
- Cleanliness is Next to Income: The Impact of COVID-19 on Short-Term Rentals with Sean Wilkoff, 2022 (*Journal of Regional Science*).
- Featured by *The Economist*, December 2020.



College of

EDUCATION**Kristin Frady, Ph.D.***Assistant Professor***Educational and Organizational Leadership**

Engaging in research focused on accessible, inclusive and innovative educational pathways for all South Carolinians is a passion fueled by Frady's local, lived experiences as a third-generation Clemson graduate (2003) and South Carolinian living in rural areas. Her career experiences, ranging from corporate America to two-year college and high school technical education to directing a workforce development center, have shaped her research agenda. Her research focuses on education and career transitions improving human capital development. The context of her research focuses on technological (two-year and certificate level) STEM education, two-year college transfer students and the middle skills workforce. Her 110 research publications include a book, a chapter in the 2024 Handbook of Human Resource Development (the go-to reference book for the field), refereed journal articles spanning a variety of fields, book chapters, refereed conference publications, and many others. An important note about her commitment to developing the next generation of researchers is that nearly a quarter of those publications have been co-authored with Clemson students. Additionally, while Frady has been the recipient of many grant awards, the most significant is the National Science Foundation CAREER Award, which is the most prestigious award in support of early-career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their organization. Frady has also translated this important research into real impact for the university and the state of South Carolina by leading the development of a new undergraduate degree, a Bachelor of Science in Human Capital Education and Development. This degree, specifically designed to support transfer students from technical colleges, extends her research into new collaborations with statewide partners. This research and work has the potential to transform the state of South Carolina by increasing statewide educational attainment by making baccalaureate education more accessible and available to all.

Select Accomplishments

- Awarded 24 funded foundation and grant awards totaling \$17.7 million; seven as principal investigator (PI), 11 as Co-PI, and six as senior personnel.
- Received the 2022 Clemson University College of Education Insight Award of Excellence for B.S. Human Capital Education and Development.
- Received College of Education awards for 2022 Honorary Distinction, PI on a Single Grant; 2019 Distinction, Total Citation Achievement; and 2019 Cumulative Grant Achievement, Honorary Distinction over \$5 million in grants.



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

Ming Yang, Ph.D.

Assistant Professor

Chemical and Biomolecular Engineering



Yang has been an assistant professor in the Department of Chemical and Biomolecular Engineering at Clemson University since fall 2020. Before joining Clemson, Yang worked at General Motors Research & Development for four years, bridging fundamental catalysis science with industrial implementations. Yang received bachelor's degrees in both chemistry and chemical engineering, and he earned a Ph.D. in chemical engineering from Tufts University in 2016.

In this exciting era of transitioning to renewable resources and clean energy, Yang's research focuses on catalytic reaction engineering to invent new catalysts and discover new reaction pathways to accelerate carbon valorization and hydrogen production in environmentally benign and economically viable ways. His research group works on thermal, electro and magnetic reactions to prepare the future industry requiring diverse energy input and distributed manufacturing. At Clemson, Yang collaborates with talented researchers across the campus from chemical engineering, materials science and engineering, civil engineering, mechanical engineering and electrical and computer engineering. Yang maintains regular access to national lab facilities through collaborations with Argonne and Oak Ridge National Laboratories researchers. Yang serves as an inaugural Early Career Editor of *Applied Catalysis B: Environment & Energy*.

Select Accomplishments

- Received the 2022 Doctoral New Investigator Award from the ACS Petroleum Research Fund and the 2023 NSF EPSCoR Research Fellow Award.
- Recognized as the 2024 Emerging Investigator by the Royal Society of Chemistry and 2020 Movers & Shakers by Catalyst Review.
- Students have received more than 20 research awards/scholarships since his lab launched in the Fall of 2020 at Clemson.
- Work related to development of single-atom alloy catalysts for electrochemical carbon capture and utilization published in *Nature Communications* and featured by the U.S. Department of Energy.
- Work related to sustainable and efficient thermal catalytic reactions enhanced dynamic magnetic field to be featured on the cover of *ACS Catalysis* and by the featured news of the American Chemical Society (ACS).
- Authored 34 peer-reviewed journal articles and 18 U.S. patents, with a total citation of 3,849.



James Lewis, Ph.D.

Assistant Professor

Genetics and Biochemistry



Lewis received his bachelor's degree in philosophy from the University of Evansville, a master's in philosophy from Virginia Tech, and his Ph.D. in evolutionary biology from Cornell University. He held two postdoctoral positions, first at Cornell University, then at the University of British Columbia, prior to moving to the Department of Genetics and Biochemistry at Clemson University in August 2022.

Research agenda: It is well-known that a large majority of the trait differences observed in humans and other species are complex, being controlled by tens, hundreds or even thousands of different genes acting in concert. Yet despite this observation and the importance of complex traits, we still know relatively little about how the genetic architectures that underlie complex traits arise and spread within and between populations. The Lewis lab seeks to discover the molecular mechanisms that facilitate evolution of the genotype-to-phenotype map in complex traits and to explicitly connect these mechanisms to the evolutionary processes that drive adaptation.

Research in the Lewis lab employs an integrative strategy that combines trait genetics, functional genomics, gene editing technology and population genetics to identify the genes that underlie novel complex traits and how these traits have evolved. The lab uses Lepidoptera (butterflies and moths) as a primary laboratory research model, with ongoing research projects focusing on: 1) The genes and gene regulatory mechanisms that optimize population-level innate immune responses to fungal pathogens, 2) The genetic loci that control sex-specific trait adaptations, and 3) How complex traits can vary between populations.

Select Accomplishments

- Authored 24 publications with more than 2,300 citations.
- Published in high-profile journals, including *Nature*, *Science*, *Nature Genetics*, *Nature Ecology and Evolution*, and *The Proceedings of the National Academy of Sciences*.
- Received more than \$1.3 million in federal grant funding while at Clemson University, including the Faculty Early Career Development Program (NSF CAREER) grant.
- Conducted 14 research presentations (national and international conferences, symposia, and departmental seminars).
- Led or developed training modules for two international training workshops on functional genomics, held in Gamboa, Panama and San Juan, Puerto Rico.



Division of

RESEARCH

Quarterly Research Report

April 2024