



RESEARCH

A Carnegie R1 Institution



*Research Report
Board of Trustees
February 2023*

▶ From the Vice President for Research

Dear Trustees,

I hope you had a restful holiday break with your loved ones and are enjoying a great start to the new year.

As we begin 2023, I would like to reflect briefly on 2022, another banner year for our research enterprise. The year began with a visit from U.S. Energy Secretary Jennifer Granholm to the Dominion Energy Innovation Center at our Lowcountry campus as she was highlighting advancements in clean energy innovation. While visiting the Clemson facility, Granholm said South Carolina had a real opportunity to be a leader in energy technology.

The same month, the chief scientist for the U.S. Army DEVCOM Ground Vehicle Systems Center, David Gorsuch, visited Clemson to help celebrate another \$22 million to support the Virtual Prototyping of autonomy-enabled Grounds Systems (VIPR) Research Center project at Clemson. Our facility and expertise made Clemson uniquely positioned for the project, he said.

Then in late November, we were afforded a distinct opportunity to showcase our facilities, our capabilities, and most importantly, our people to one of the nation's most influential scientists – National Science Foundation Director Sethuraman Panchanathan. He left our Greenville campus impressed with what we are building here, particularly with our success in collaborating with industry and community partners to advance meaningful, impactful research.

“Seeing the synergistic and symbiotic systems of students, public funding and private industry happening here, we should determine how we scale activities here and use Clemson as an example all around the country,” Dr. Panchanathan said during his visit.

Use Clemson as an example.

At Clemson, we continue to make a name for ourselves as a top research institution, and the scholarly community is taking notice. We are building a winning culture. We are thinking big and winning big and proving that we can handle large, interdisciplinary research projects. The VIPR project involves 62 faculty members and 125 graduate students spread across 10 departments.

Clemson recently received its first Energy Frontier Research Center project from the Department of Energy, a \$10.35 million grant that involves five Clemson departments and numerous partners, including two national labs.

The new USDA Partnerships for Climate-Smart Commodities project marked the largest single grant Clemson has ever received from a federal funding agency – \$70 million. The project involves 29 Clemson faculty and 20 graduate students across 11 departments, as well as an impressive state coalition of 27 community partners.

We now have four NIH Centers of Biomedical Research Excellence, the most active COBRE projects a university can have at one time. What a feat for a university without a medical school. We have EPSCoR projects from the National Science Foundation and the Department of Energy. These involve dozens of faculty members and students.

Our research on online disinformation and scams has recently received more than \$8 million in funding ([page 19](#)).



Tanju Karanfil

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▶ From the Vice President for Research

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One of our faculty members earned a prestigious “genius grant” from the MacArthur Foundation ([page 18](#)).

And, importantly, it is not just the grants. The number of Clemson-authored journal publications has increased 42 percent over the past decade, and citations of Clemson research have increased 82 percent. Clemson faculty members and students continue to earn significant national honors, fellowships and scholarships. I have included a list of some of the most recent accomplishments on [pages 20-27](#) and provided highlights of a faculty member from each college on [pages 28-35](#) to share the breadth of diverse research happening across Clemson.

These are only a few examples. There are so many shining examples of great research happening at Clemson. There are more than 1,900 research projects happening across Clemson’s footprint right now, by the way, and that’s an increase of more than 33 percent since 2016.

It is truly a great time to be a Tiger. I am excited to see what 2023 brings.

With your tenacious support of scholarship and discovery, we will continue to *Elevate* research at Clemson. Thank you.

Respectfully submitted,



Tanju Karanfil, Ph.D., PE, BCEE, IWA Fellow
Vice President for Research, 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's total R&D expenditures increased to \$237 million in 2021, the latest year for which data is available. This figure is reported in the National Science Foundation Higher Education Research and Development (HERD) Survey and used in the Carnegie Classification ([page 5](#)).
- Competitive expenditures, which include funds only from competitively bid projects, were up 12 percent in the first quarter of fiscal year 2023, compared to the same quarter the prior fiscal year ([page 6](#)).
- During the first quarter of FY2023, proposal submissions remained strong at \$263 million, up 36 percent from the prior-year quarter. ([page 7](#)).
- Research awards increased 8 percent to \$43 million in the first quarter of FY2023, continuing the strong momentum in competitive awards received ([page 8](#)).
- A list of the top 10 awards received recently are included on [pages 9-10](#).
- The research report card provides additional information, including research metrics per college, innovation cluster and business unit ([pages 11-14](#)).

Total R&D expenditures continue to increase

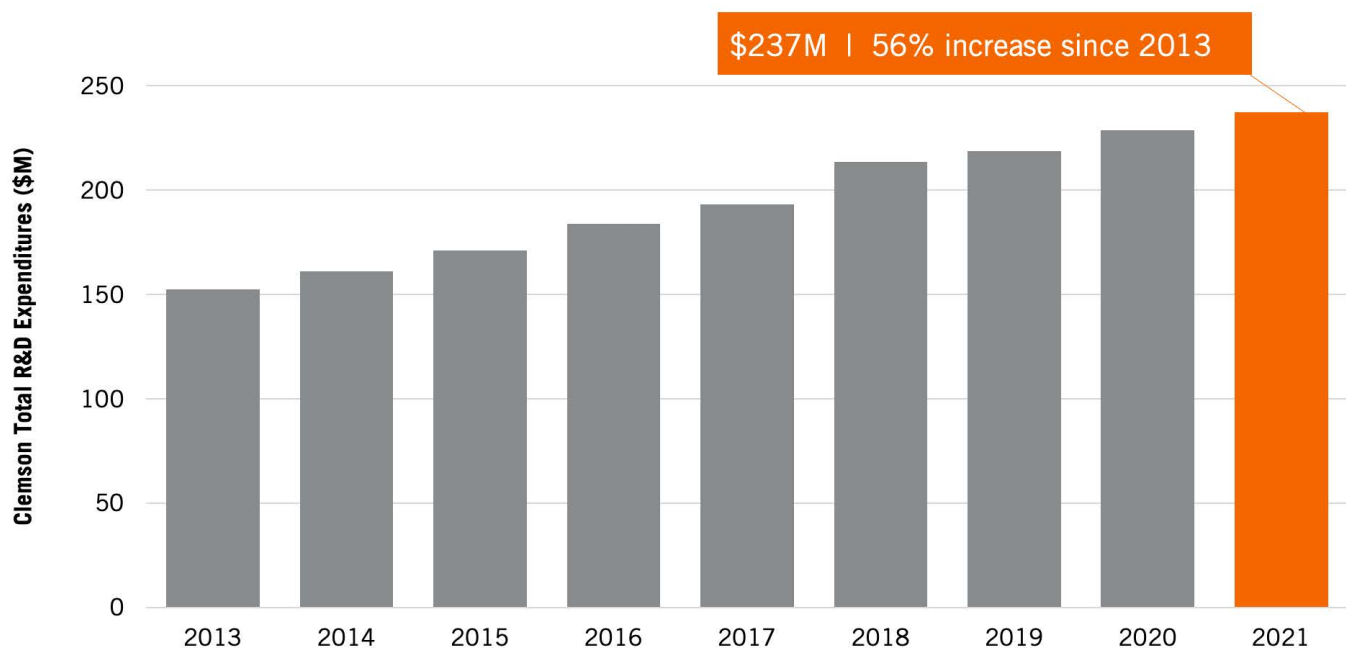
The latest National Science Foundation Higher Education Research and Development (HERD) Survey has been released, providing total R&D expenditure data for 2021.

Clemson's total R&D expenditures continued to increase in 2021, 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.

The HERD Survey is the primary source of information on research and development expenditures at U.S. colleges and universities. The survey collects information on R&D expenditures by field of research and source of funds and also gathers information on types of research, expenses, and headcounts of R&D personnel.

Total R&D expenditures from the HERD Survey are used in the Carnegie Classification and allow for an apples-to-apples comparison of research expenditures at peer Carnegie R1 institutions.

Total R&D Expenditures continue to increase



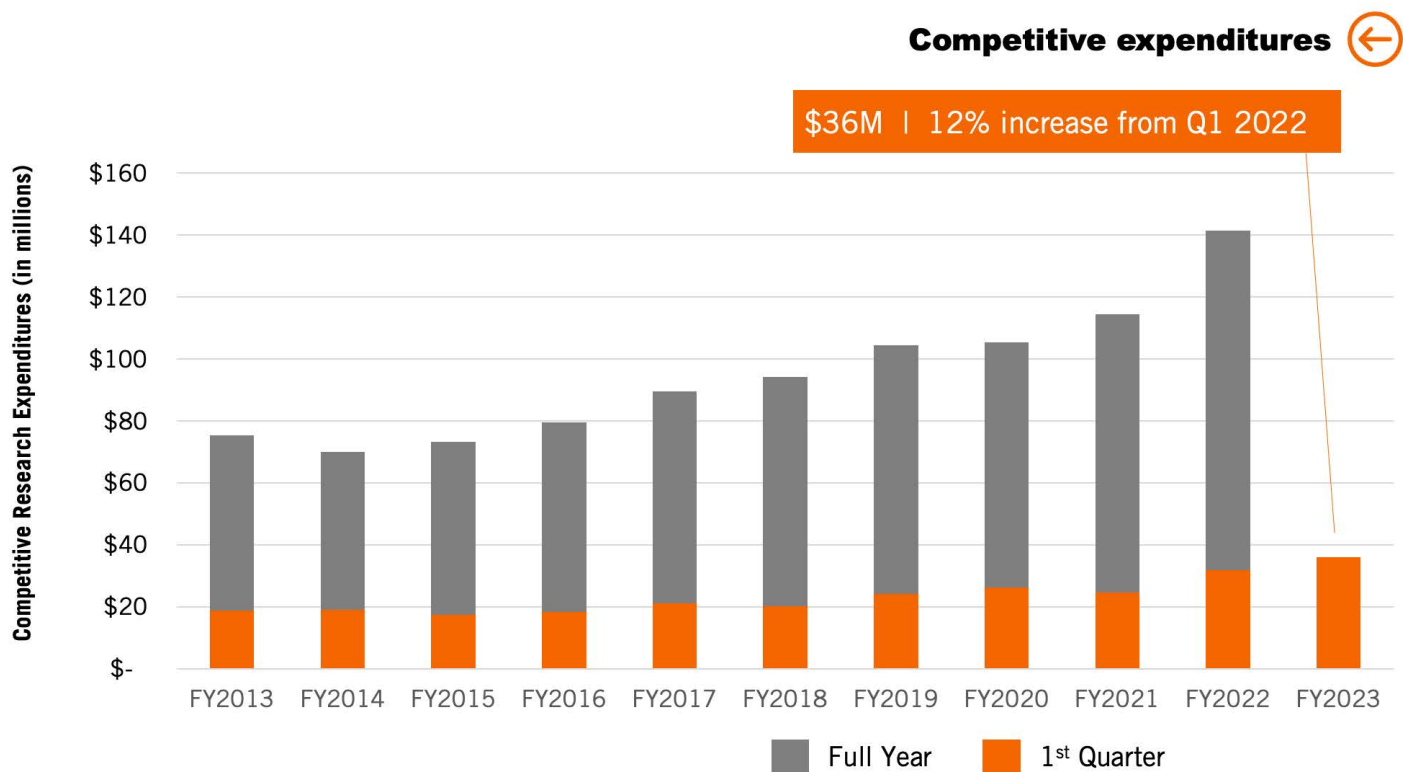
SOURCE: NSF Higher Education Research and Development (HERD) Survey

Competitive expenditures up from prior year

Competitive expenditures were \$36 million in the first quarter of FY2023, an increase of about 12 percent from FY2022, which was a banner year.

Competitive expenditures include funds only from competitively bid projects, such as highly competitive federal grant awards. Competitive expenditures have increased greatly at Clemson over the past decade, reaching a high point of \$141 million in FY2022. This is attributed to the high-quality proposals submitted by faculty, as gains in expenditures have greatly outpaced increases to the size of the faculty body.

Additional details on expenditures by business unit, innovation cluster and funding source are included in the Research Report Card on [page 13](#).

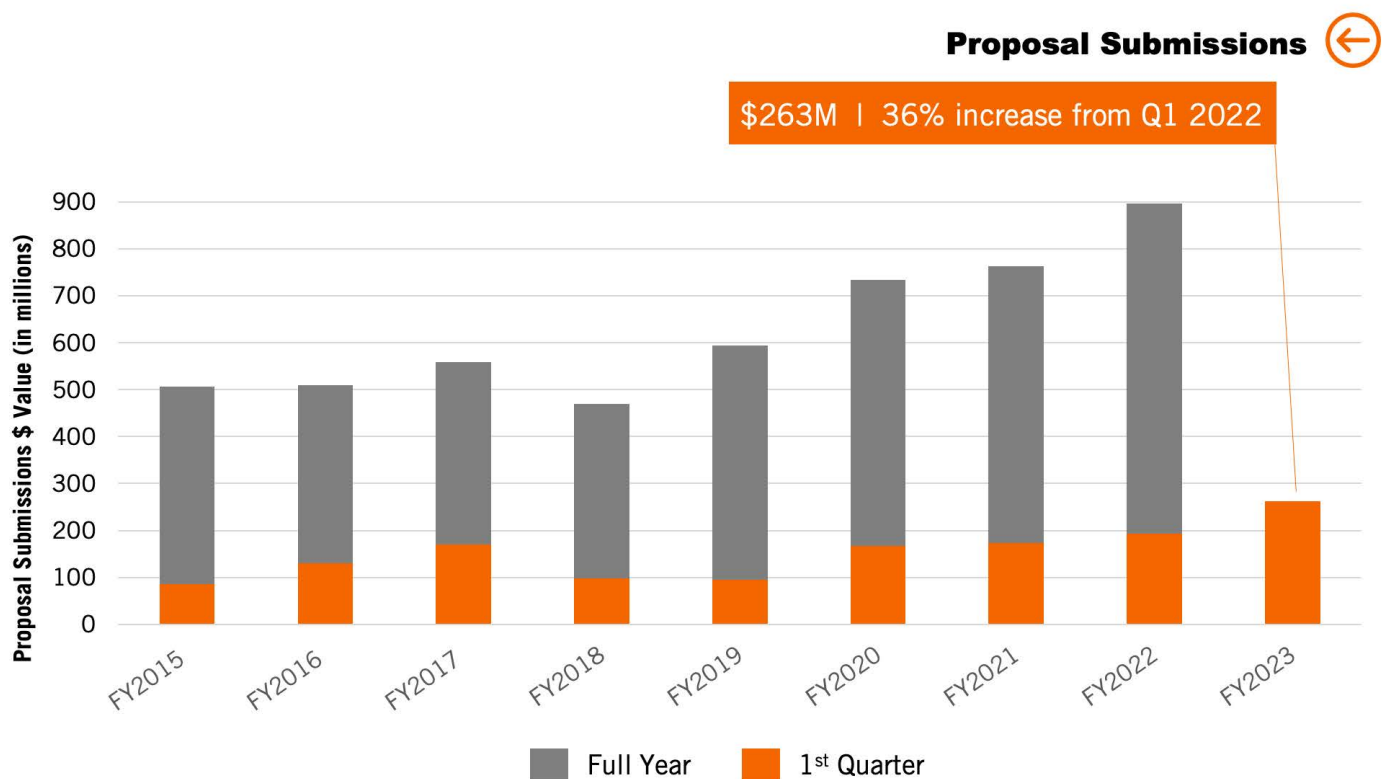


Proposal submissions

Proposal submissions have increased consistently over the past five years as Clemson faculty seek funding for scholarship and discovery. FY2022 saw submissions spike to \$896 million, an increase of nearly 18% from the prior year and more than 132% from FY2013.

During the first quarter of FY2023, proposal submissions remained strong at \$263 million, up 36 percent from the prior year quarter.

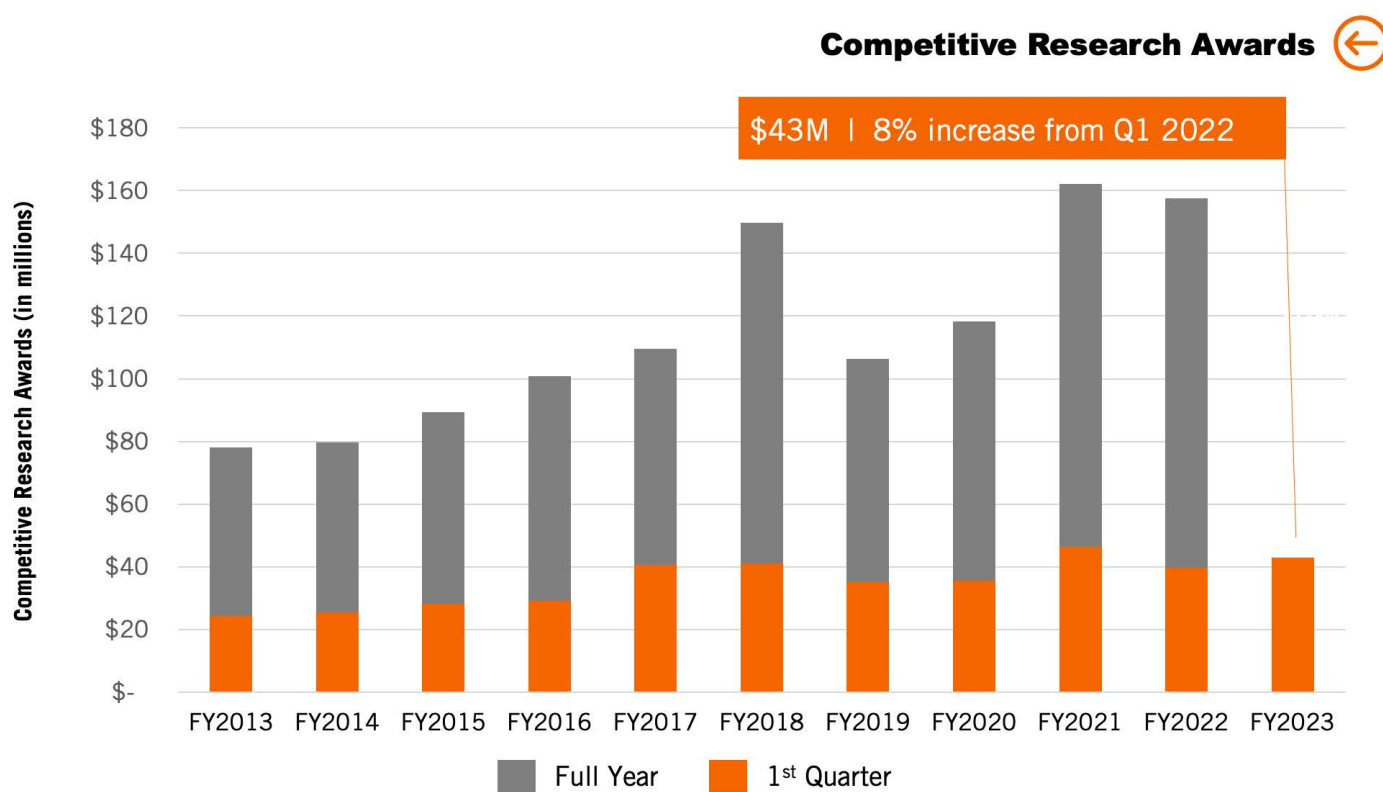
Additional details on the number and value of proposal submissions for each college are included in the Research Report Card on [page 11](#).



Competitive Research Awards

Funding agencies continue to reward high-quality proposals and ideas from Clemson faculty. In particular, Clemson faculty are earning higher value awards of \$2 million and more, as shown in the graphic at the bottom of the page. This is fueling an ongoing upward trajectory in research awards received, as shown in the chart below. FY2021 was particularly strong with awards up 37 percent from the prior year. FY2022 was another strong year with awards reaching \$158 million, topping \$150 million for the third time in the past five years. Momentum continued in the first quarter of FY2023, with awards increasing 8 percent to \$43 million.

Additional details on awards per college are included in the Research Report Card on [page 12](#).



Earning High-Dollar Awards

76 RESEARCH AWARDS OF AT LEAST \$2M WON SINCE 2015

THE TOTAL VALUE OF THESE PROJECTS IS **\$385 MILLION**

Top Competitive Awards (first quarter FY2023)



Morris

James Morris, professor of genetics and biochemistry, received \$11 million from the National Institutes of Health to support the Eukaryotic Pathogens Innovation Center (EPIC), a Center of Biomedical Research Excellence. 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.

Srikanth Pilla, Jenkins endowed professor of automotive engineering, received \$10.4 million from the U.S. Department of Energy for his “Artificially Intelligent Manufacturing Paradigm for Composites (AIM for Composites)” project. The AIM for Composites center 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.



Pilla



Long

Steven Long, assistant director for plant industry, received \$5.4 million from the U.S. Department of Agriculture 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.

Srikanth Pilla, Jenkins endowed professor of automotive engineering, received \$4 million from the U.S. Department of Energy for a project that aims to develop an efficient, composites-based, additive manufacturing-built, low-cost tooling technology for forming lightweight thin-walled metal and composite prototype structures. Collaborators on the project include Honda Development & Manufacturing of America, Ohio State University and Additive Engineering Solutions, LLC.



Pilla



Warren

Patrick Warren, associate professor of economics, received \$3.8 Million from the John S. and James L. Knight Foundation to support Clemson University’s Media Forensics Hub at the Watt Family Innovation Center. Researchers with the Hub study disinformation and inauthenticity online and create tools to educate people and stop the spread of disinformation. The Hub was launched in May 2020 and has created the Spot the Troll quiz, where people can test their own ability to spot online trolls and inauthentic social media accounts.

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Top Competitive Awards (first quarter FY2023)

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Mackay

Trudy Mackay, Self Family Endowed Chair in Human Genetics and director of the Center for Human Genetics, received \$2.5 million from the National Institutes of Health to identify the genetic underpinnings of cocaine and methamphetamine consumption to understand why some people become addicted to drugs and alcohol and other don't. The research could lay the groundwork for developing new drugs or repurposing already approved drugs to treat or prevent addiction in humans.

Rebecca Kaminski of the Department of Education and Human Development received \$2.3 million from the U.S. Department of Education for her project, "Building Capacity for Early Multilingual Learners: Bridging Literacy, Reading Recovery, and ESOL (English to Speakers of Other Languages)." Kaminski works with school districts in South Carolina to discover effective approaches that K-12 educators studying literacy and English for Speakers of Other Languages (ESOL) can use to improve their teaching practices, student outcomes and parent/caregiver involvement in student learning.



Kaminski



Ding

Feng Ding, associate professor of physics and astronomy, received \$2 million from the National Institutes of Health to continue his research on proteins linked to human diseases. The Ding research lab focuses on understanding the structure, dynamics and function relationship of biomolecules and molecular complexes using multiscale modeling approaches. Feng's research can support the design of therapeutic strategies in a cost-effective manner.

Lukasz Kozubowski, associate professor of genetics and biochemistry, received \$1.9 million from the National Institutes of Health for research into finding safer and more effective drugs that target fungal infections, which can be dangerous and even deadly, especially for immunocompromised people such as transplant recipients and those with HIV/AIDS. Kozubowski is examining how fungus adapts and survives in the environment of the human body, specifically the temperature.



Kozubowski



Morgante

Fabio Morgante, assistant professor of genetics and biochemistry, received \$1.9 million from the National Institutes of Health for his research on the genetic architecture of complex traits, which are traits controlled by numerous genetic and environmental factors. The work will advance personalized medicine by helping scientists better predict an individual's susceptibility to disease and providing specific targeted treatment plans for medical patients.

Research Report Card (FY2023 First Quarter)

INDEX

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: College of Business

COS: College of Science

CCIT: Clemson Computing & Information Technology

PSA: Public Service & Agriculture

		2018	2019	2020	2021	2022	2023 First Quarter	
a. Proposal Submissions by Number		1,451	1,417	1,729	1,583	1,492	406	
1	CAAH	64	69	76	61	35	10	
2	CAFLS	229	377	473	401	366	93	
3	CBSHS	101	105	143	151	151	38	
4	CECAS	587	562	672	596	631	164	
5	COE	37	39	42	37	43	12	
6	COB	10	5	11	14	9	5	
7	COS	227	186	219	229	193	58	
8	CCIT	1	1	1	-	-	-	
9	PSA	163	33	37	26	26	17	
10	VP for Res & Interdisc Inst	12	25	29	29	23	4	
11	All Other	20	15	26	39	15	5	
b. Proposal Submissions by Dollar Value (in millions)		\$470M	\$594M *	\$734M	\$762.4M	\$896M	\$262.5M	FY2023 Targets
12	CAAH	\$5.7	\$4.4	\$5.9	\$5.6	\$8.3	\$4.2	\$9.0M
13	CAFLS	\$37.1	\$68.4	\$92.9	\$84.1	\$242.1	\$46.8	\$90.0M
14	CBSHS	\$25.9	\$87.5	\$41.1	\$64.3	\$73.1	\$21.8	\$75.0M
15	CECAS	\$235.5	\$255.3	\$405.9	\$342.9	\$380.8	\$119.7	\$390.0M
16	COE	\$19.1	\$10.1	\$18.9	\$22.4	\$32.3	\$14.6	\$26.3M
17	COB	\$1.8	\$2.1	\$2.9	\$4.2	\$4.8	\$3.0	\$5.6M
18	COS	\$100.4	\$73.8	\$129.3	\$175.4	\$127.3	\$36.3	\$142.5M
19	CCIT	\$0.9	\$4.6	\$3.0	\$0.02	\$0.7	\$0.01	-
20	PSA	\$25.8	\$11.4	\$6.4	\$5.6	\$7.8	\$11.3	\$11.3M
21	VP for Res & Interdisc Inst	\$12.7	\$68.5	\$19.8	\$22.3	\$11.0	\$1.7	
22	All Other	\$5.0	\$7.4	\$7.7	\$35.7	\$8.3	\$3.2	

*This figure includes a large \$107M proposal

Research Report Card (FY2023 First Quarter)

		2018	2019	2020	2021	2022	2023 First Quarter
c. Research Awards (in millions)		\$149.8M	\$106.3M	\$118.3M	\$162.2M	\$157.6M	\$42.9M
23	CAAH	\$1.9	\$2.0	\$1.4	\$1.4	\$1.3	\$0.9
24	CAFLS	\$13.9	\$14.2	\$22.3	\$24.2	\$19.9	\$5.6
25	CBSHS	\$8.1	\$5.9	\$7.7	\$17.4	\$13.7	\$2.9
26	CECAS	\$80.8	\$50.4	\$48.0	\$75.0	\$76.4	\$16.2
27	COE	\$4.5	\$3.3	\$2.3	\$5.1	\$5.7	\$2.3
28	COB	\$1.1	\$0.8	\$1.2	\$0.2	\$0.9	\$0.05
29	COS	\$14.7	\$18.7	\$14.2	\$25.4	\$17.8	\$8.7
30	CCIT	\$1.3	\$0.1	\$0.3	\$0.7	\$0.2	-
31	PSA	\$6.6	\$4.0	\$4.1	\$5.8	\$6.9	\$5.8
32	VP for Res & Interdisc Inst	\$15.1	\$6.2	\$14.6	\$5.1	\$6.6	\$0.5
33	All Other	\$1.7	\$0.7	\$2.2	\$1.9	\$8.2	-
d. National Young Investigator Awards		8	6	10	10	1	1
34	NSF CAREER Awards (by start date)	7	4	6	9	1	4
35	NIH KO1	1	-	1	-	-	-
36	Air Force Young Investigator Awards	-	1	-	-	-	-
37	Army Young Investigator Awards	-	-	1	-	-	-
38	DARPA Young Investigators Awards	-	-	1	-	-	-
39	EPA Early Career Awards	-	1	-	-	-	-
40	DOE Early Career Awards	-	-	-	1	-	-
41	Department of Homeland Security	-	-	-	-	-	-
42	Dept. of Ed. Inst. of Educational Sciences	-	-	1	-	-	-
e. Supporting Workforce							
43	Graduate Student Enrollment	4,985	5,282	5,627	5,538	5,448	5,900
44	Sponsored Graduate Research Assistants	761	558	637	546	729	738
45	Postdoctoral Fellows	97	98	98	106	117	116
46	Research Faculty: Permanent 100% Non-E&G Funded	14	11	18	12	2	3
47	Research Faculty: Temporary 100% Non-E&G Funded	27	29	54	45	32	29

Research Report Card (FY2023 First Quarter)

		2018	2019	2020	2021	2022	2023 First Quarter
f. Sponsored Research Expenditures by Business Unit (in millions)		\$94.2M	\$104.5M	\$105.3M	\$114.4M	\$141.4M	\$36M
48	CAAH	\$1.4	\$1.7	\$1.6	\$1.1	\$1.3	\$0.3
49	CAFLS	\$11.0	\$14.1	\$16.4	\$15.0	\$17.8	\$4.1
50	COB	\$0.8	\$0.8	\$0.7	\$0.7	\$0.7	\$0.2
51	CECAS	\$45.1	\$50.3	\$46.4	\$54.4	\$71.7	\$18.2
52	CBSHS	\$4.9	\$5.3	\$6.7	\$9.0	\$12.0	\$3.8
53	COE	\$2.2	\$2.5	\$2.4	\$2.3	\$3.8	\$1.1
54	COS	\$16.7	\$17.2	\$17.3	\$15.9	\$18.5	\$5.2
55	CCIT	\$0.6	\$0.2	\$0.1	\$0.2	\$0.4	\$0.1
56	PSA	\$5.9	\$3.7	\$3.9	\$5.5	\$7.2	\$2.5
57	VP for Res & Interdisc Inst	\$3.9	\$7.1	\$9.5	\$9.6	\$7.0	\$1.6
58	All Other	\$1.6	\$1.5	\$0.4	\$0.7	\$1.1	\$0.3
g. Sponsored Research Expenditures by Innovation Cluster (in millions)		\$94.2M	\$104.5M	\$105.3M	\$114.4M	\$141.4M	\$36M
59	Advanced Materials	\$12.1	\$15.4	\$13.5	\$14.3	\$18.6	\$4.9
60	Cyberinfrastructure & Big Data Science	\$9.6	\$6.9	\$4.4	\$5.5	\$8.2	\$2.0
61	Energy, Trans. & Advanced Manufacturing	\$16.8	\$17.1	\$14.5	\$19.9	\$27.7	\$7.0
62	Health Innovation	\$17.8	\$23.8	\$27.1	\$27.1	\$26.3	\$7.2
63	Human Resilience	\$8.6	\$9.0	\$9.7	\$12.7	\$14.8	\$4.3
64	Sustainable Environments	\$19.5	\$20.6	\$23.9	\$21.3	\$26.8	\$7.4
65	Other	\$9.6	\$11.7	\$12.1	\$13.6	\$19.6	\$4.6
h. Sponsored Research Expenditures by Funding Source (in millions)		\$94.2M	\$104.5M	\$105.3M	\$114.4M	\$141.4M	\$36M
66	Federal Government	\$78.2	\$85.1	\$85.2	\$95.1	\$125.1	\$32.8
67	Foundations, Societies, and Associations	\$5.1	\$7.4	\$6.9	\$6.2	\$4.6	\$1.3
68	Industry/Other	\$6.3	\$5.3	\$5.5	\$4.8	\$4.8	\$1.5
69	International	\$0.4	\$0.3	\$0.3	\$0.4	\$0.5	\$0.1
70	Local Government	\$0.5	\$0.5	\$0.5	\$0.8	\$0.9	\$0.2
71	State Government	\$3.7	\$5.7	\$6.8	\$7.3	\$6.2	\$1.5

Research Report Card (FY2023 First Quarter)

		2018	2019	2020	2021	2022	2023 First Quarter
i. Sponsored Research Expenditures per T/TT Faculty by College							
72	CAAH	\$8,945	\$10,159	\$10,003	\$6,912	\$8,266	\$2,171
73	CAFLS	\$103,814	\$134,555	\$137,438	\$131,195	\$139,844	\$31,987
74	COB	\$8,269	\$8,200	\$6,991	\$7,132	\$6,787	\$2,185
75	CECAS	\$214,280	\$225,620	\$201,553	\$223,843	\$296,203	\$74,428
76	CBSHS	\$39,532	\$40,301	\$50,495	\$67,202	\$90,220	\$27,486
77	COE	\$40,197	\$47,371	\$47,742	\$48,805	\$80,058	\$23,061
78	COS	\$110,206	\$118,600	\$116,020	\$107,258	\$120,778	\$32,8026
79	Clemson Average	\$103,706	\$99,125	\$96,497	\$103,187	\$142,129	\$35,711
j. Additional information							
80	NIH R01-Equivalent Awards (by start date)	3	6	1	3	1	4
81	Doctorates Awarded (August)	234	301	249	225	242	102
82	STEM Doctorates Awarded (August)	171	174	162	159	172	3
83	Disclosures	51	62	68	44	50	14
84	Patents	11	18	12	15	9	4
85	Licenses/Options	11	19	13	13	27	5
86	Licensing Revenue	\$461,755	\$398,136	\$315,578	\$239,074	\$380,286	\$62,559
87	Start-up Companies (based on licenses/options)	3	5	1	1	4	2



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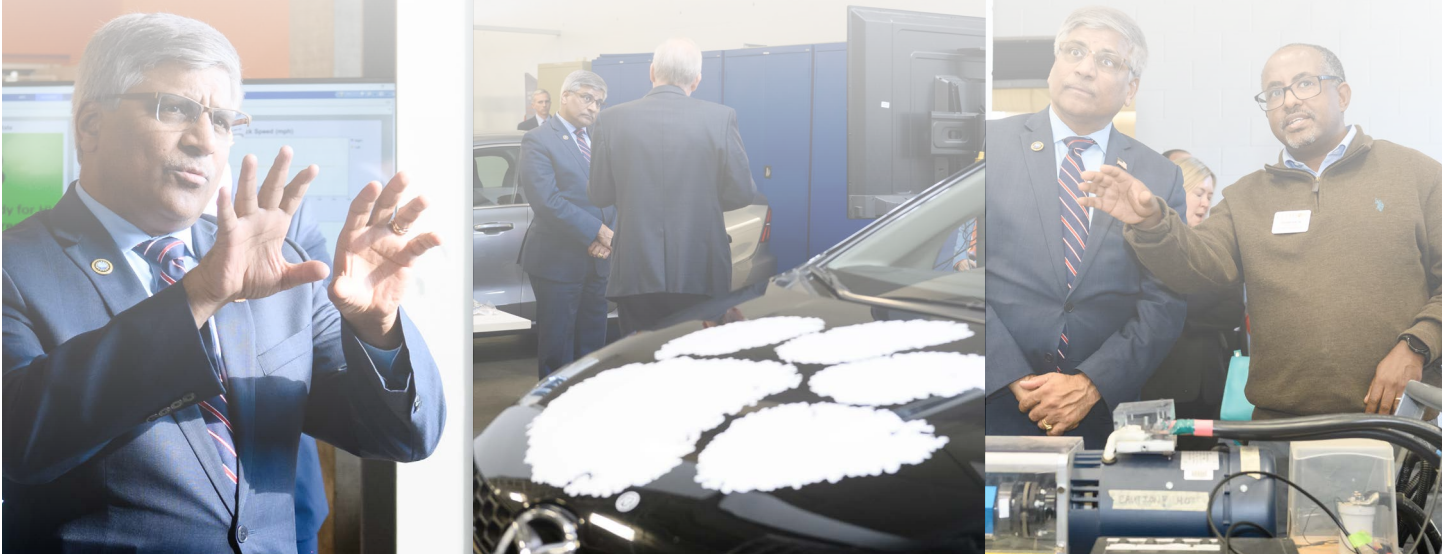
RESEARCH NEWS

This section highlights research news from across the university.

Executive Summary

- National Science Foundation Director Sethuraman Panchanathan visited Clemson in November, saying the university could be a national example ([pages 16-17](#)).
- Clemson professor Drew Lanham received a prestigious and rare “genius grant” from the MacArthur Foundation ([page 18](#)).
- Clemson researchers have received two major grants totaling \$8.8 million to support their effort to curb online scams and disinformation ([page 19](#)).
- Brian Powell, a professor of nuclear environmental engineering, was named senior Researcher of the Year at Clemson University in 2022 and received the Class of ‘39 Award of Excellence. He will discuss his research at the upcoming Research and Economic Development Committee meeting ([page 20](#)).
- Clemson students and faculty members have earned considerable national and international recognition for their work ([pages 21-27](#)).

NSF Director visits CU-ICAR, looks to Clemson as a National Model



Sethuraman Panchanathan, director of the United States National Science Foundation (NSF), visited Clemson's International Center for Automotive Research (CU-ICAR) to discuss the agency's vision and priorities while meeting with University leaders, faculty and students. Director Panchanathan was joined by U.S. Senator Lindsey Graham for a portion of the visit as the University highlighted ongoing NSF-funded projects and Clemson research impacts.

"It was awesome to be here with my good friend, Jim Clements, and visit this outstanding CU-ICAR Campus," Panchanathan said. "Institutions like Clemson are a vanguard of global competitiveness, and ICAR is an exemplar of the outstanding ecosystem of excellence and collaboration between private companies like BMW. NSF is a catalyst and an enabler for the type of work being done here, and the most important part of what we do is developing talent for the future. Seeing the synergistic and symbiotic systems of students, public funding and private industry happening here, we should determine how we scale activities here and use Clemson as an example all around the country."

Director Panchanathan kicked off his visit with an overview of Clemson's research prowess and initiatives, the CU-ICAR campus and future opportunities for collaboration among Clemson, the NSF and industry partners. Led by President Jim Clements and Provost Bob Jones, the briefing included Senior Vice President for External Affairs Angie Leidinger; Vice President for Research Tanju Karanfil; Dean of the College of Engineering, Computing and Applied Sciences (CECAS) Anand Gramopadhye; Associate Vice President and CU-ICAR Executive Director David Clayton; and CECAS Associate Dean for Research Dan Noneaker.

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By The Numbers

\$26M

in NSF Expenditures at Clemson in 2022.

9% increase

in NSF expenditures at Clemson in past five years.

No. 1

Clemson has earned more new NSF awards than any other university in S.C., according to the NSF.

NSF Director Visit



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Following a discussion with President Clements, Senator Graham and Director Panchanathan, the director was the featured speaker at a lunch with Clemson deans and NSF Career Award recipients.

“The National Science Foundation is the premier government agency working to see America win on many fronts – artificial intelligence, manufacturing, energy independence – and ICAR is one of the premier research facilities in the world,” Senator Graham said. “It says a lot about Clemson that the NSF director would visit to see the capabilities here, and I’m here to help Clemson tell the story.”

The afternoon featured a comprehensive tour alongside faculty and student researchers of ongoing work taking place on the CU-ICAR campus including an overview of the automotive engineering department, the Deep Orange project, VIPR-GS, human factors in automotive research, advanced composites research, innovation in sustainable materials, smart manufacturing, and autonomous driving. Each stop highlighted the value of public-private partnerships and the key contributions of federal, state and industry funding to advance mobility technology.

Director Panchanathan’s visit concluded with a meeting of several Clemson leaders and senior leaders from BMW including Robert Engelhorn, President and CEO, BMW Manufacturing Co., who discussed Clemson’s capabilities and opportunities on a regional, national and international level.

“ Seeing the synergistic and symbiotic systems of students, public funding and private industry happening here, we should determine how we scale activities here and use Clemson as an example all around the country.



Sethuraman Panchanathan,
Director, National Science Foundation

Clemson's Lanham garners 'genius grant' from MacArthur Foundation to 'fund dreams'



Clemson Alumni Distinguished Professor of Wildlife Ecology J. Drew Lanham was announced by the John D. and Catherine T. MacArthur Foundation as one of its 2022 MacArthur Fellows, which have come to be known by their own descriptive title: "genius grants."

The Fellowship is awarded to talented individuals in a variety of fields who have shown exceptional originality in and dedication to their creative pursuits. Fellows receive \$800,000 stipends bestowed, quarterly over five years, with no conditions; recipients may use the money as they see fit.

Nominated anonymously by leaders in their respective fields and considered by an anonymous

selection committee, recipients learn of their selection only when they receive a call from the MacArthur Foundation just before the public announcement.

"When I got the congratulatory call, I was both speechless and, I think, a babbling idiot," Lanham joked. "But it's a great honor. For a while I thought of it almost as an intellectual lottery, but really what it is, is creative liberation. It allows me to continue the work that I've been doing, but now without so much explanation as to why that I do the work that I do."

Although nominees are reviewed for their achievements, the fellowship is not a lifetime achievement award, but rather an investment in a person's originality, insight and potential. Indeed, the purpose of the MacArthur Fellows Program is to enable recipients to exercise their own creative instincts for the benefit of human society.

"In addition to recognizing and supporting exceptional creativity, we hope that the Fellowship will inspire people to pursue their own creative interests," said Kristen Mack, Vice President, Communications, Fellows, and Partnerships.

Lanham is an ornithologist, naturalist, writer and poet combining conservation science with personal, historical and cultural narratives of nature. His research and teaching focuses on the impacts of forest management on birds and other wildlife.

The Poet Laureate of Edgefield County, from where he hails, Lanham brings his ecological knowledge as well as his perspective as a Black man living in the South to bear on his work as a storyteller, poet and passionate advocate for birdwatching, outdoor recreation and environmental conservation and stewardship.

Lanham believes that the combination of scientific facts and emotional connections to nature can more effectively encourage conservation action. A critical component of the head to heart connection is understanding people's historical and cultural associations with land, a point he illustrates through an affecting account of the painful legacy of slavery attached to the farm.

[READ MORE](#)

Clemson researchers boost their fight against online disinformation with two grants

Clemson University researchers have received two grants to support their effort to curb online scams and disinformation.

The John S. and James L. Knight Foundation provided a \$3.8 million grant to support Clemson University's Media Forensics Hub at the Watt Family Innovation Center.

Researchers with the Hub study disinformation and inauthenticity online and create tools to educate people and stop the spread of disinformation. Clemson University is matching the grant, making the total investment in the Hub \$7.6 million over the next four years. This funding will allow the Hub to hire four more faculty in different disciplines — psychology, communication, marketing and computer science — to each bring their unique perspectives and expertise to the issue. The grant will also fund technology infrastructure for the Hub, as well as graduate assistants and postdoctoral researchers.

The Media Forensics Hub is an interdisciplinary team of researchers working not only to study disinformation online but also to develop tools and educate people to recognize it and to stop it from spreading. The team began as a partnership in 2017 between Darren Linvill, associate professor of communication, and Patrick Warren, associate professor of economics, who worked together to uncover and expose more than 3 million tweets by Russian trolls. The Media Forensics Hub was launched in May 2020 with the support of the Watt Family Innovation Center and sponsorship from the South Carolina Research Authority. Since then, the Hub has created the Spot the Troll quiz, where people can test their own ability to spot online trolls and inauthentic social media accounts.

The Knight Foundation grant will more than double the size of the Hub's research team. [READ MORE](#)

Additionally, the National Science Foundation has awarded a two-year, \$5 million Convergence Accelerator phase 2 cooperative agreement to support an effort to create digital tools that help older adults better recognize and protect themselves from online deceptions and other forms of disinformation.

The project, Deception Awareness and Resilience Training (DART), is led by University at Buffalo's (UB) Center for Information Integrity.

Clemson's researchers are led by Linvill. He will work with researchers from the University at Buffalo, Cornell University, Lehigh University, and the University of Illinois Urbana-Champaign. They will also be working with Clemson's CBSHS Institute for Engaged Aging, Clemson Downs, and Clemson's Media Forensics Hub.

Cybercrime is an epidemic among the older US population, and last year, more than 92,000 U.S. adults aged 60 and over reported being victims of online scams, according to the FBI's Internet Crime Complaint Center. These victims lost roughly \$1.7 billion.

[READ MORE](#)



Patrick Warren, left, and Darren Linvill



***PRESENTER
SPOTLIGHT***



Brian Powell

Fjeld Professor in Nuclear Environmental Engineering and Science

Powell was named senior Researcher of the Year at Clemson University in 2022 and received the Class of '39 Award of Excellence.

His research focuses on the understanding and prediction of the physical, chemical and biological processes which govern the mobility of radionuclides in natural and engineered systems.

Powell has conducted sponsored research in a wide range of projects dealing with topics of nuclear forensics; evaluation of nanoparticle behavior; sorption and environmental transport of plutonium; development of radiation detection and radiation detection laboratory courses; iodine, radium, strontium geochemistry in wetland and subsurface sediments; radionuclide geochemistry of saltstone and solid waste performance assessments at the Savannah River Site; measurement of thermodynamic parameters supporting advanced fuel cycle chemistry; and related topics.

Powell is not only a professor at Clemson, he is an alumnus who earned his Master of Science in 2001 and Ph.D. in 2004, both in environmental engineering and science. He returned to Clemson in 2008, this time as a faculty member.

Powell's research on radionuclides is helping form the technical basis for designing repositories to store spent fuel from nuclear power plants and to clean up sites contaminated by nuclear-weapons production. His work at Savannah River Site has helped the U.S. Department of Energy save millions of dollars in remediation costs.

Powell has graduated 10 master's students and nine Ph.D. students since the 2017-18 academic year. In those five years, Powell has authored or co-authored 51 publications and has received nearly \$5.6 million in new awards to fund research.

Powell will discuss his research at the upcoming Board of Trustees Research and Economic Development Committee meeting.



Impacts, Honors and Achievements

Clemson veterinarian receives international award for support of ethical research

Clemson University veterinarian John Parrish has received the Jeff Cohen PRIM&R Service Award for his career-long commitment to ethical research.

PRIM&R (Public Responsibility in Medicine and Research) is an international nonprofit that promotes ethics and integrity in research involving animals and human subjects. The organization's Service Award honors individuals who have provided significant timely or timeless service to the PRIM&R community in areas including teaching, mentorship, innovation, leadership, engagement, program improvement and research. The award is named for Jeff Cohen, considered a pillar in the research ethics community, a longtime university professor and administrator who also served with the Office for Human Research Protections at the National Institutes of Health and an active PRIM&R advocate before his death in 2021.

Parrish is director of the Godley-Snell Research Center and the Office of Animal Resources, which provides high-quality veterinary care programs, professional and technical support, education and training, and technologically advanced facilities and equipment for animal research and teaching activities. Parrish has more than 30 years of experience supporting infectious disease, toxicology, vaccine, trauma, vascular and other areas of medical research and teaching important to the military, contract research and academia. After a distinguished 20-year career in the U.S. Army, he led programs of animal care and use at the National Institutes of Health and two contract research organizations before joining Clemson in 2006. [READ MORE](#)



John Parrish, right, with PRIM&R executive director Elisa Hurley



Eva Murphy

Mathematics Ph.D. student Eva Murphy receives Dr. Kenyon Fairey Annual Doctoral Fellowship

Eva Murphy, a fifth-year doctoral candidate in the Clemson University School of Mathematical and Statistical Sciences, has received the Dr. Kenyon Fairey Annual Doctoral Fellowship for her dissertation research on wind.

In her dissertation, Murphy aims to develop a modeling framework for studying the variation of wind speed and direction in space and time. She has three main goals: to develop statistical models and methods to accurately model wind speed and wind direction, to extend the modeling of the wind data to the space-time field by incorporating factors like seasonality and long-term trends, and to include machine learning methods to predict future wind speed and wind direction.

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Impacts, Honors and Achievements

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The Dr. Kenyon Fairey Annual Doctoral Fellowship Award was established by Nancy Kenyon Fairey '71 in 2019 to provide graduate fellowships for doctoral students whose scholarship or applied research focuses on resource management, conservation, outdoor education, or health and wellness.

[READ MORE](#)

Clemson University bioengineers win two national titles at Collegiate Inventors competition

A team of Clemson University bioengineering students that has been winning accolades for its novel medical device triumphed in its biggest national test so far, taking first place in the undergraduate category and receiving the Arrow Electronics People's Choice Award at the Collegiate Inventors Competition.

The all-woman team is composed of Jordan Suzanna Cole, Kathleen Fallon, Karly Faith Ripple and Allison Reichart. They created the CatheSure, a device designed to prevent unnecessary surgery in hydrocephalus patients.

The Clemson bioengineers traveled to the U.S. Patent and Trademark Office in Alexandria, Virginia from Oct. 10-13 to face off against undergraduate teams from four other universities that have created inventions of their own.

The team's innovative solution, which involves remote pressure monitoring, had previously won or placed highly in several local and regional contests, including second place in last spring's Atlantic Coast Conference InVenture Prize competition.

When the students began the project in fall 2021, they were seniors majoring in bioengineering. Cole, Fallon, Ripple and Reichart stayed at Clemson after graduation and are now pursuing master's degrees in the same discipline. Sarah Anne Stevens, who also helped create the CatheSure as an undergraduate, is now a medical student at the Medical University of South Carolina.

The CatheSure is designed to wirelessly detect shunt malfunctions in hydrocephalus patients in less than five minutes. Hydrocephalus patients, often children, suffer from a build-up of cerebrospinal fluid in their brains, and a shunt is surgically placed in the body to help drain the fluid.

When the shunt malfunctions, it can result in symptoms, such as nausea, that could be linked to a wide range of maladies and are difficult to diagnose. The CatheSure is designed to make diagnosis faster and less invasive, helping prevent unnecessary exploratory brain surgeries, prolonged hospital stays and repeated radiation exposure.

The Clemson team is advised by John DesJardins, the Hambricht Distinguished Professor in Engineering Leadership, and Tyler Harvey, a lecturer, both in the Department of Bioengineering.

[READ MORE](#)



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Impacts, Honors and Achievements

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Political science professor receives national scholar award

Laura Olson, Thurmond professor of political science and director of the Ph.D. program in policy studies, received the Susanne Hoeber Rudolph Outstanding Scholar in Religion and Politics Award from the American Political Science Association.

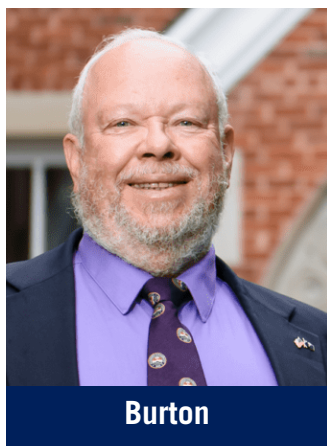
The Susanne Hoeber Rudolph Outstanding Scholar Award recognizes a scholar who has made an excellent and widely influential impact on scholarship, policy, public engagement, service, teaching and mentorship.

Olson's research focuses on contemporary religion, civic engagement, and American politics, and has placed special emphasis on the political attitudes and behaviors of clergy. Among other projects, she has worked on the progressive community-organizing work of urban clergy and congregations, the public role of mainline Protestantism, and other progressive manifestations of the relationship between religion and politics.

Her work has appeared in leading scholarly journals, including Political Research Quarterly, Social Science Quarterly, and the Journal for the Scientific Study of Religion. She is the author, coauthor, or coeditor of nine books, most recently Religion and Politics in America: Faith, Culture, and Strategic Choices.



Olson



Burton

Burton earns Lifetime Achievement Award from Southern Historical Association

The Southern Historical Association has presented the 2022 John Hope Franklin Award for Lifetime Achievement in Southern History to Vernon Burton, Clemson University's Judge Matthew J. Perry Distinguished Professor of History.

The John Hope Franklin Award is made every five years in recognition of an individual who has not only made outstanding contributions to scholarship on the American South but also exhibited the qualities of citizenship embodied by the award's namesake.

In making its determination, the prize committee pointed specifically to Burton's tireless contributions to "vital questions of public policy as an expert witness on redistricting, civil rights, and voting rights." At the award ceremony in Baltimore, SHA President Steven Hahn of New York University added a personal note when handing Burton the award: "I first became acquainted with the awardee when I was still in graduate school and he was barely past it," Hahn said, "owing to his pioneering scholarship in social history and quantitative analysis, and his generosity in helping those of us along who shared his interests. Over the years he has been an inspirational model not only of scholarly excellence but also for his remarkable teaching at the undergraduate and graduate levels, and, especially, for his deep commitment to social justice. I can think of no one who is more deserving of what is the SHA's most coveted award."

[READ MORE](#)

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Impacts, Honors and Achievements

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Davis

Clemson professor to be inducted as a fellow of the American Academy of Nursing

Stephanie Davis, Ph.D., APRN, FNP-BC, a professor in the Clemson University School of Nursing, has been selected to be a Fellow of the American Academy of Nursing. Induction into the Academy is a significant milestone in a nurse leader's career in which their accomplishments are honored by their colleagues within and outside the profession. Fellows are selected based on their contributions and impact to advance the public's health.

The Academy is an honorific society that recognizes nursing's most accomplished leaders in policy, research, practice, administration, and academia, and Fellows contribute their collective expertise to the Academy, engaging with health leaders nationally and globally to improve health and achieve health equity by impacting policy through nursing leadership, innovation, and science.

"It is such an honor to be among the cohort of 250 professionals inducted into the Academy," Davis said. "I look forward to being able to collaborate with some of the most renowned nursing leaders and researchers in the world as we strive for health equity globally."

Davis is a certified family nurse practitioner with a certificate in women's studies. She maintains a clinical practice in a weight management clinic. Her research interests include women's health (quality of life with breast cancer, body image, sexuality, and social support), international health, the health of rural and underserved populations, educational pedagogy, and weight management.

[READ MORE](#)



Clemson teacher residency program wins award for statewide impact

The Clemson University College of Education's teacher residency program received the 12th annual Dick and Tunky Riley WhatWorksSC Award for Excellence during a recent celebration of South Carolina public education. The award was presented by Furman University's Riley Institute on Oct. 25 in Columbia. The award includes a

\$10,000 prize to be used to further the program's work.

Former United States Secretary of Education and former South Carolina Governor Dick Riley presented the award, which is given annually to a program that positively impacts public education in South Carolina. The award is named for Riley and his late wife, Ann "Tunky" Riley, a devoted teacher and passionate advocate for quality public education for all children.

The teacher residency program replaces student teaching in a student's final undergraduate semester with graduate education classes, and the following year is comprised of a year-round teacher

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Impacts, Honors and Achievements

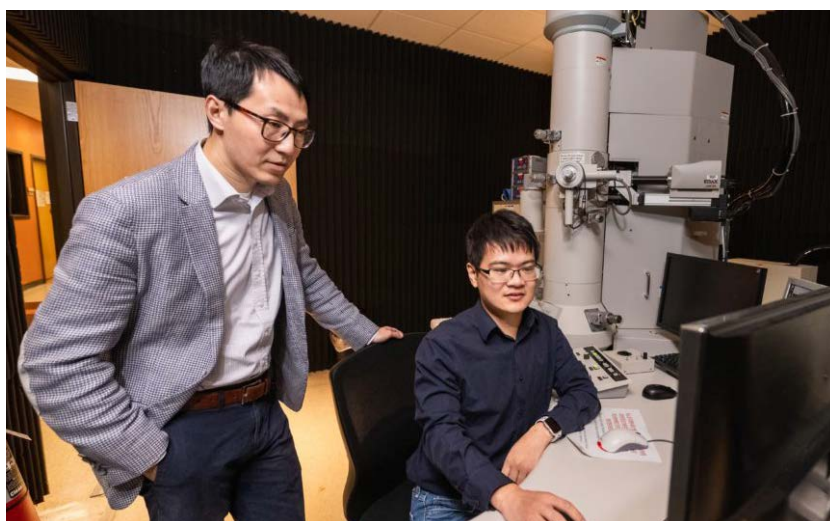
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residency with an experienced teacher who continuously gathers data about a resident's progress.

Residents spend the year-round residency in a district school, moving from a collaborative, co-teaching role in the classroom to an increasingly demanding, lead-teaching role. Using a variety of instructional coaching strategies, mentor teachers provide valuable insight into effective teaching methodologies, helping residents develop the knowledge and skills that come from years of experience.

Residents emerge after five years with this extended experience as well as a bachelor's and master's degree in education.

[READ MORE](#)



Zehua Jin, right, and Ming Yang

Clemson Ph.D. student receives Hitachi Fellowship

Clemson University Ph.D. student Zehua Jin has received the 2022-2023 Hitachi High-Tech Electron Microscopy Fellowship to further his research on the development of advanced catalytic materials to convert carbon dioxide into value-added chemicals.

The research aims to support the mitigation of greenhouse gas emissions and production of renewable fuel.

The \$25,000 Hitachi Fellowship supports Jin's use of highly

advanced equipment at the Clemson University Electron Microscopy Facility, where he is studying electrocatalytic carbon dioxide reduction. Electrocatalytic reduction is a process by which catalysts are added to solids or liquids to induce beneficial chemical reactions. In this case, Jin would selectively disperse platinum-group metals (PGM) as isolated atoms on copper nanoparticles.

The idea is like adding sugar to coffee, said Ming Yang, assistant professor of chemical and biomolecular engineering and Jin's faculty advisor. PGM is the sugar. The copper is the coffee.

"Sugar easily dissolves to sweeten our coffee, but the exercise is challenging for the design and development of catalytic materials that enable net-zero carbon emissions," he said.

Too much PGM could lead to the formation of extended PGM crystal surfaces, just like sugar crystals, Yang said. Such structures will adversely suppress the targeted carbon dioxide reduction but catalyze side reactions to produce hydrogen instead. Jin's research focuses on engineering the PGM as atomically dispersed species on shape-controlled copper surfaces to accelerate the formation of methane or ethylene from carbon dioxide.

Electron microscopy allows Jin to analyze these interactions and fine-tune the catalysts to achieve the desired results.

[READ MORE](#)

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Impacts, Honors and Achievements

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LaRochelle

Historic preservation student wins King Medal for architectural research

Nicole LaRochelle, who graduated in 2022 with a Master of Science in Historic Preservation from Clemson University, is a recipient of the King Medal from the Architectural Research Centers Consortium.

The award, which LaRochelle earned for research she completed for her master's thesis, is given to one student per ARCC member school, and is awarded based on criteria that acknowledge "innovation, integrity, and scholarship in architectural and/or environmental design research."

LaRochelle said she was stunned when she learned of the award.

"I was not expecting such a huge honor for my thesis," she said. "I am quite grateful for the support of my committee and also for the fact that my program believed my work was worth nominating."

Her research consists of a comparative analysis of the environmental and economic impact of original clapboard siding on historic buildings versus three possible replacements: similar modern wood, fiber cement or vinyl siding.

[READ MORE](#)



Powell

Powell recognized with North American research award

The North American Association for Environmental Education (NAAEE) is awarded Robert Powell of Clemson University and Marc Stern of Virginia Tech with the 2022 Outstanding Contributions to Environmental Education Research Award. Established in 1987, this award recognizes exemplary researchers who study, report on, and promote effective environmental education.

Powell is the George B. Hartzog, Jr. Endowed Professor in Philosophy, Parks, and Environmental Ethics. He is also the Director of the Institute for Parks, which is an interdisciplinary institute focused on providing research, training, and outreach to support park and protected area management. With graduate degrees from Yale University, his research and outreach program has taken him to over 40 countries and 6 continents and focuses on environmental education/interpretation, ecotourism, protected areas, and the

human dimensions of biodiversity conservation.

For nearly two decades, Professors Powell and Stern have collaborated on actionable research that addresses key questions in environmental education (EE), especially focused on measurement, teaching and interpretation approaches, and culturally responsive evaluation. They aim to improve development and implementation of high-quality EE programs through assessing participants' attitudes, knowledge, skills, and behaviors, as well as programmatic aspects that influence those elements. Their partnerships with nonprofits and government agencies ensure that this theoretically grounded work is taken up in practice.

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Clemson engineering and business students tasked with finding solutions for commercial aviation

In September, a Clemson multidisciplinary team of engineering and business students traveled to Everett, WA, to visit Boeing and other aerospace manufacturers to gather information for their Boeing CATTs project. CATTs is an acronym that stands for Cougars and Tigers Together. The Clemson Tigers team is working with a Washington State University-Everett Cougars Team to provide a

solution that will improve water quality on commercial airplanes.

This is part of a combined Engineering Senior Design Course and a Management Creative Inquiry class that began in 2021. Students get the opportunity to work on a real issue with a multidisciplinary group of people in addition to working with students from another university in another time zone.

The Clemson team is made up of students: Reilly Boros (Materials Science and Engineering), Tori Malvoso (Computer Engineering), Logan Shay (Mechanical Engineering), Emma Gaugler (Marketing) and Taylor Stamos (Management). The class is being led by Thompson Mefford (Associate Dean for Undergraduate Studies) and Jim Liddle (Management).

Research discovery could influence future missions into space

Violent explosions that ripped through our galaxy before the sun was born are thought to be responsible for the wealth of elements — particularly heavy metals such as gold and platinum — that are part of the makeup of our planet. Three Clemson University scientists are looking into exactly how these elements were produced and distributed throughout the Milky Way.

The trio — Benjamin Amend, Jonathan Zrake and Dieter H. Hartmann — have authored a paper titled “R-process Rain from Binary Neutron Star Mergers in the Galactic Halo,” which was recently published in *The Astrophysical Journal*.

The rapid neutron-capture process, or “r-process” referred to in the title, creates many of the heavy elements.

“Here on Earth we have a lot of heavy chemical elements like gold and platinum. The question is where did they come from. How were they produced?” explained Amend, lead author and a fourth-year Ph.D. student in the Department of Physics and Astronomy. “Where in the galaxy were they produced, and how were they transported here?”

Scientists know that when stars explode and die, they produce heavy metals. But not all stars’ deaths are equal, and typical supernova explosions do not synthesize significant quantities of r-process elements. However, a different type of explosion, produced following the collision of two neutron stars (ultra-dense remains of massive dead stars), might have the right conditions. [READ MORE](#)



RESEARCH

FOCUS ON FACULTY

This section highlights achievements of one faculty member from each college. Entries were submitted by the colleges.

Executive Summary

- Click the links below to read about faculty from the respective college.
 - » [College of Agriculture, Forestry and Life Sciences](#)
 - » [College of Architecture, 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**

Bhupinder S. Farmaha, PhD

Assistant Professor

Plant and Environmental Sciences



Farmaha is the state extension soil fertility specialist. His ‘farmer-centric’ integrated Extension and Research program promotes and advances scientific knowledge of nutrient management practices and precision agriculture technologies for major crops, maximizing economic returns and reducing the potential of nutrient losses to the environment. He accomplishes this aim using a combination of on-station field studies, farmers’ interviews and surveys, on-farm tests and demonstrations, peer-to-peer networking, and various education delivery approaches.

Farmaha also developed virtual extension programming that included using Twitter, developing and maintaining a program-dedicated website, posting YouTube videos, and publishing Land-Grant Press articles. He served as an expert source for national and international media (BBC) related to high fertilizer prices in 2022 and mitigating strategies to deal with increased costs. On Earth Day 2022, the National Academies of Sciences’ U.S. National Committee for Soil Science invited him to represent Extension for the Southeast on the panel discussing soil health.

Select Accomplishments

- Received the CAFLS & PSA 2022 Outstanding Junior Faculty in Extension Award.
- Serves as implementation team leader on the recently funded USDA-NRCS Climate Smart Collaborative Grant (\$70 million).
- Has acquired 43 grants as PI or co-PI from federal and state agencies and commodity boards totaling ~\$3.8 million with ~\$3.5 million going directly to his program.
- Secured ~\$138,000 in fee-for-service from several agencies to support his on-farm tests and demonstrations in nutrient management and soil health.
- Authored 14 peer-reviewed research and five peer-reviewed extension publications.
- Has given 56 scientific and 62 extension presentations.
- Serves as a mentor for the Golden Opportunity (GO) Scholar program.
- Has served as a review panel member on several USDA-NIFA grant competitions.
- Serves as CAFLS’ representative to the University’s Graduate Advisory Committee.
- Serves as member of Soil Science Society of America’s Sustainability CCA Exam Committee.



College of
**ARCHITECTURE, ARTS
AND HUMANITIES**

H. Roger Grant, PhD

Kathryn and Calhoun Lemon Professor

History and Geography



Grant came to Clemson in 1996 from The University of Akron, where he had been teaching since 1970. A specialist in U.S. history and especially the Populist-Progressive era, he is recognized as one of the world's leading authorities on transportation history and American railroads. He has written or edited 37 academic books. His most recent are *Railroads and the American People* (2012); *The Louisville, Cincinnati & Charleston Railroad: Dreams of Linking North and South* (2014); *Railroaders without Borders: A History of the Railroad Development Corporation* (2015); *Electric Interurbans and the American People* (2016); *Rails to the Front: The Role of Railroads in Wartime* (with A.J. Veenendaal Jr.) (2017); *John W. Barringer III: Railroad Legend* (2018); *Transportation and the American People* (2019); and *A Mighty Fine Road: A History of the Chicago, Rock Island & Pacific Railroad Company* (2020).

Twice recognized by Clemson with awards for excellence in research, and more recently as the University's Centennial Professor, Grant was awarded the Doctor of Humane Letters by his undergraduate alma mater, Simpson College, in 2002. During spring semester 2005, Grant served as the Maxwell C. Weiner Distinguished Professor of Humanities at the University of Missouri–Rolla, today's Missouri University of Science and Technology. He was awarded the Kathryn and Calhoun Lemon Professorship in 2006. His book, "Sunset Cluster: A Shortline Railroad Saga," will be published by Indiana University Press in summer of 2023. He is under contract with Indiana University Press for another book, "A History of Railroads in the Midwest." Grant serves on the board of directors of the Lexington Group in Transportation History, the Center for Railroad Photography and Art in Madison, Wisconsin, and the John W. Barringer III National Railroad Library in St. Louis, Missouri.

Select Accomplishments

- *The Station Agent and the American Railroad Experience*, Indiana University Press (2022).
- *A Mighty Fine Road: A History of the Chicago, Rock Island & Pacific Railroad Company*, Indiana University Press (2020).
- *Transportation and the American People*. Indiana University Press (2019).
- To celebrate its 75th anniversary, *Trains Magazine* in its November 2015 issue named 75 people of the past 75 years that are worthy of recognition, including Professor Grant: "If there's a chapter of railroad history that this scholar hasn't researched, we don't know what it is."



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

Sarah Floyd, PhD

Assistant Professor

Public Health Sciences



Floyd is a health services researcher with research expertise in comparative effectiveness research methods. Her current research is focused on the use of administrative claims data and secondary use of electronic health record data to assess treatment variation and the quality of care for common musculoskeletal conditions. Her long-term research goal is to develop a real-time clinical decision support tool capable of delivering personalized treatment evidence during the clinical encounter to increase shared decision-making and data-informed treatment decision-making. Her research has been funded by the Agency for Health Research and Quality (AHRQ), and she has ongoing research partnerships with Prisma Health, the Medical University of South Carolina, the University of South Carolina, and Shriners Hospital for Children.

Floyd teaches Clinical and Translational Science offered in the Applied Health Research & Evaluation M.S. and Clinical and Translational Research Graduate Certificate programs. She also teaches Overview of Health Care Systems in the Health Science Preprofessional Health Studies BS program.

Select Accomplishments

- Published nine peer-reviewed manuscripts (2021-2022).
- Received the 2022 “Outstanding Journal Publication” Award from the College of Behavioral, Social and Health Sciences, Clemson University.
- Selected as 1 of 4 Research Project Leaders in South Carolina Translational Research Improving Musculoskeletal Health (SC TRIMH), a National Institutes of Health Center of Biomedical Research Excellence (COBRE) funded by NIH/NIGMS (P20GM121342) at Clemson University.
- Serves as principal investigator (PI) or co-investigator on four federally funded projects totaling \$4.6 million.
- Invited to serve as a Grant Mentor in the Early NIH Accelerator Program hosted by the Vice Chair of Academic Affairs and Research, Prisma Health.
- Invited Webinar Panelist hosted by the American Alliance of Orthopaedic Executives.
- Presented at five regional and national research conferences (2021-2022).
- Completed 5 peer-reviews for top journals including *Medical Care*, *BMJ Open*, *Journal of Shoulder and Elbow Surgery*, etc.



Wilbur O. and Ann Powers College of

BUSINESS**Robin Radke***Associate Professor***School of Accountancy**

Radtké's research focuses on behavioral and ethical issues in accounting. She examines how ethics interacts with many different areas of accounting, including tax, auditing, and management control. Her research results provide practical guidance to inform businesses on how to deal with a variety of ethical issues in accounting.

Radtké has taught the graduate accounting ethics class, where she prepares her students for the ethical dilemmas they will face in their future careers as accounting professionals. She also teaches management control systems, along with cost and managerial accounting classes at the undergraduate level, wherein students are prepared to work within companies in strategic cost decision analysis.

Select Accomplishments

- Serves as faculty advisor to both the Clemson Institute of Management Accountants Student Chapter and the Clemson accounting student team that participates in the Templeton Business Ethics Case Competition held annually at Stetson University in DeLand, Fla.
- Co-authored "An Experiential Investigation of Tax Professionals' Contentious Interactions with Clients," in the *Journal of the American Taxation Association*, a section-level journal of the American Accounting Association in 2019.
- Served as president of the Accounting, Behavior and Organizations Section of the American Accounting Association for the 2019 – 2020 term.
- Serves as a member of the editorial board at *Behavioral Research in Accounting*, a section-level journal of the American Accounting Association.
- Is a member of the editorial board at *Journal of Business Ethics*, which is included in the *Financial Times* Top 50 Journals.
- Served as the 2017 coordinator of the Accounting Behavior and Organizations meeting.
- Lectured on the topic of "International Business Ethics: When in Rome, should we do as the Romans do?" at Oxford University during the Clemson Business in Europe: Oxford Programme during the summer of 2019.



Cynthia M. Sims, PhD

Associate Professor

**Educational & Organizational Leadership
Development**



Sims is a human resource development scholar practitioner who focuses on how gender impacts how leadership is enacted, received and developed in the workplace and critical HRD. Through research, she seeks to improve the lives of individuals, organizations, and society in practical and actionable ways. Her research is informed from many years of leadership experience in human resource/development in a Fortune 100, premier international consulting organization. Selected peer-reviewed publications of Sims include: “Linking leader and gender identities to authentic leadership in small businesses”; “Are women business owner’s authentic servant leaders?” (recipient of An Emerald Literati Award); “Do servant, transformational, transactional, and passive avoidant leadership styles influence mentoring competencies for faculty? A study of a gender equity leadership development program”; “Advancing Gender Equity Through Mentoring and leadership Development: A Human Performance Technology Case Study.” She also was co-editor of the special issue titled *Expanding Our Voices? A Review of Human Resource Development Literature on Women of Color Leaders Over the Last Decade*. Sims has published in the leading HRD journals, including *Human Resource Development Quarterly*, *Advances in Developing Human Resources*, and *Performance Improvement Quarterly* and a book chapter with legendary HRD scholar Darlene Van Tiem. She is an elected board member of the Academy of Human Resource Development.

Select Accomplishments

- Promoted with tenure to associate professor, 2021.
- Established the Post-Master Leadership Certificate within the field of Human Resource Development.
- Served as Graduate Program Coordinator, Human Resource Development, 2015-2021.
- Served as Board Member, Academy of Human Resource Development, 2020.
- Emerald Literati Award, Highly Commended, 2019.
- College of Education, 2019-20 ADR. Seed Grant Proposal Awarded, September 2019.
- Founder director and co-lead: NSF Grant, Clemson University TIGERS ADVANCE Institutional Transformation at Clemson University, 2016 to present. Total award of \$1,355,893, Responsible for Goal 4, now known as Trailblazers: Provost’s Leadership Development and Mentoring Initiative for Faculty, 2015 to 2021.



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

Eric G. Johnson, PhD

Professor

Electrical and Computer Engineering



Johnson is the Palmetto-Net Endowed Chair in Optoelectronics. He also serves as the head of the South Carolina Smart-State Center of Economic Excellence in Optoelectronics at Clemson University.

Johnson has a PhD in Electrical Engineering from the University of Alabama at Huntsville, MS in Electrical Sciences from the University of Central Florida, and BS Physics from Purdue University. Prior to joining Clemson, Johnson held a joint appointment as a professor of physics and optical science, as well as electrical and computer engineering at the University of North Carolina at Charlotte (2006-2011), where he also served as the director of the Center for Optoelectronics and Optical Communications. Johnson has also served two rotations (2008-2010, 2018-2019) as a program director in photonics within the Electrical, Communications and Cyber Systems (ECCS) Division of the National Science Foundation.

Johnson is a Fellow of Optica/OSA, SPIE, and a senior member of IEEE. He currently serves as a commission member for the ABET Engineering Accreditation Committee (EAC), and has served on the Board of Directors for SPIE. Johnson was also an Editor for *IEEE Transactions on Electron Devices*, and Optica/OSA's *Applied Optics*, and numerous other editorial and committee chair positions for IEEE, Optica/OSA, and SPIE.

Johnson's research spans the area of optics and photonics, with applications ranging from free space optical communications, optical imaging and sensing, and beam control applications in directed energy. His recent work on structured light for imaging and sensing was the catalyst for the MURI program he leads with other major research partners. Johnson's research efforts have received more than \$20 million in his career, with over \$10 million in external grants while at Clemson. His research has also led to approximately 300 publications and 14 patents in the field of optics and photonics.

Select Accomplishments

- Is the lead principal investigator on a ONR MURI: High Photon Density Spatiotemporal (OAM+SAM) Vector Beams for Maritime Environments, which includes five university partners and received approximately \$7 million in funding.
- Member of the ABET Engineering Accreditation Committee (EAC) Commission.
- Recipient of the 2022 University Research, Scholarship and Artistic Achievement Award.
- Recipient of the 2021 McQueen Quattlebaum Faculty Achievement Award.



Yao Wang, PhD

Assistant Professor

Physics and Astronomy



Wang is a leading condensed matter and quantum science physicist at Clemson University. His research group has significantly impacted the design and discovery of quantum materials. By developing new algorithms, his group has successfully predicted multiple unconventional phenomena in quantum systems, most of which have been verified in experiments. These discoveries have enabled ground-breaking discoveries in the field of ultrafast dynamics, superconductivity, high-order entanglement, and advanced spectroscopies.

Wang received the U.S. Department of Energy Early Career Award (\$750,000), which funds his project to investigate quantum techniques for simulating quantum material's spectroscopies. Through this award, Wang is bridging the recent efforts of advanced spectroscopies and analog quantum simulations. He also received the Air Force Office of Scientific Research Young Investigator Award (\$450,000), a three-year project to design and control an unconventional superconductor, a complicated class of quantum materials. Wang also received two National Science Foundation grants in 2021 and has been involved in four multi-institution and multi-disciplinary grants, which would strengthen Clemson's engagement in the research frontier of quantum science and technology.

In 2021 and 2022, Wang was recognized (twice) as one of the 58 and 49 national scientists to receive the prestigious LRAC leadership award from the NSF-funded Texas Advanced Computing Center. He has taught undergraduate core physics classes and co-led the design of a new collaborative quantum computing course with the civil engineering department. Wang was also active in outreach activities, such as serving as a judge for the South Carolina Junior Academy of Science annual meeting. He has mentored a high-school student through the SC Governor School for Science and Mathematics, who has become a successful undergraduate student at Princeton University.

Select Accomplishments

- Recipient of DOE Early Career award.
- Recipient of Air Force Office of Scientific Research Young Investigator award.
- Led and participated in four projects funded by NSF, DOE, and Air Force.
- Has received \$1.8 million in extramural research funding (~\$1.6 million for personal share).
- Published more than 50 peer-reviewed papers in prestigious journals and presented more than 30 invited talks at international conferences and colloquiums of major institutions.
- Currently Advising five graduate students and three undergraduate students.



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