



RESEARCH

A Carnegie R1 Institution

Tanju KARANFIL, vice president for research
2022 Clemson University Research Symposium

Quarterly Research Reports

[clermson.edu/research/
division-of-research/
leadership](https://clermson.edu/research/division-of-research/leadership)



RESEARCH

BOARD OF TRUSTEES REPORT

APRIL 2022



R1 Status Confirms Clemson's National Reputation

Carnegie R1 Confirmed January 2022

- **Boosts National Reputation**
- **Opens Door for Collaboration/Funding**
- **Helps Recruit Faculty, Students, Industry**

R1 Designation Reflects Performance Across Disciplines

| Metrics | Clemson 2015 | Clemson 2018 | Clemson 2021 | Δ Metric 2015-2021 |
|---|--------------|--------------|--------------|--------------------|
| Science & Engineering Expenditures | \$117M | \$145M | \$165M | ↑ \$48M |
| Non-Science & Engineering Expenditures | \$44M | \$49M | \$54M | ↑ \$10M |
| Postdoc & Non-Faculty Researchers | 65 | 111 | 162 | ↑ 97 |
| PhD Humanities | 2 | 8 | 7 | ↑ 5 |
| PhD Social Sciences | 9 | 20 | 25 | ↑ 16 |
| PhD STEM | 143 | 170 | 156 | ↑ 13 |
| PhD Other | 62 | 33 | 55 | -7 |
| Per Capita Science & Engineering Expenditures | \$180K | \$159K | \$174K | -\$6K |
| Per Capita Non-Science & Engineering Expenditures | \$52K | \$53K | \$56K | ↑ \$4K |
| Per Capita Postdoc & Non-Faculty Researchers | 0.08 | 0.122 | 0.170 | ↑ 0.00 |

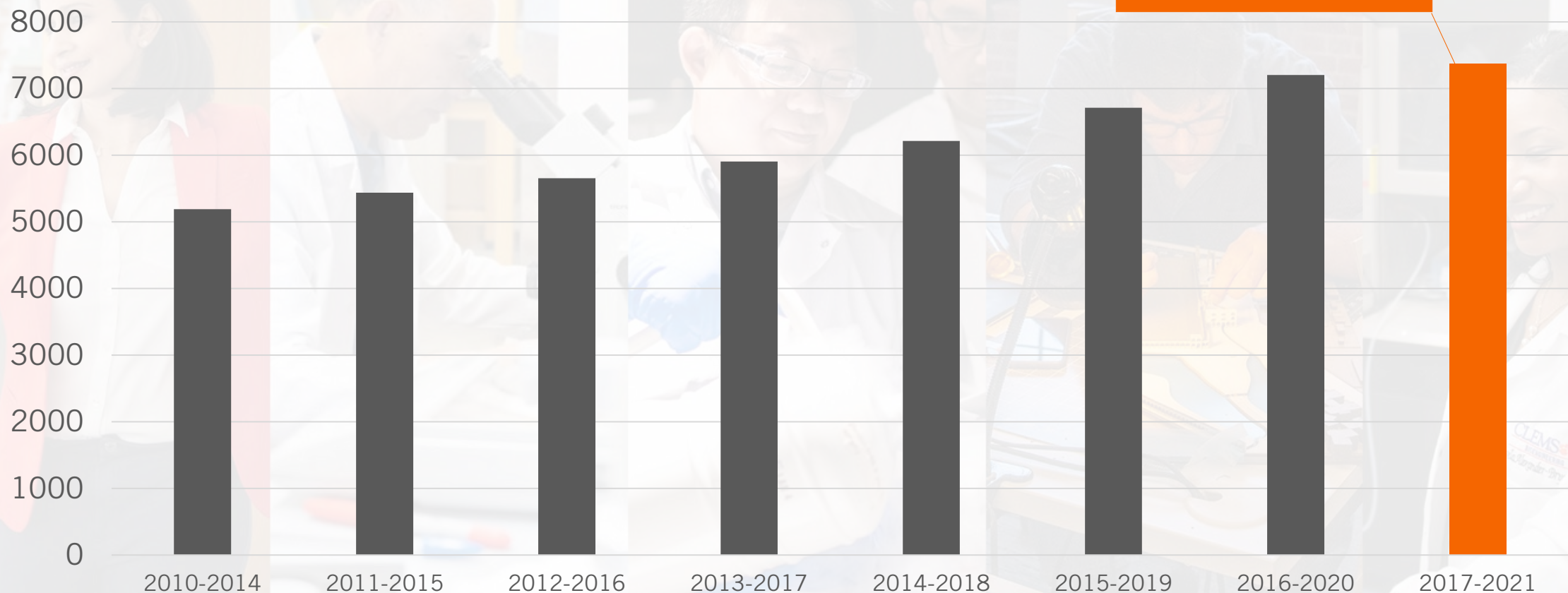
EXECUTIVE SUMMARY

- Carnegie tracks 10 metrics
- Captures performance in STEM, Social Sciences and Humanities
- Clemson metrics improving in nearly all categories

Clemson Faculty Authoring More Peer-reviewed Articles

 **Journal Articles Authored**

42% increase
over past decade



Per capita 5.91

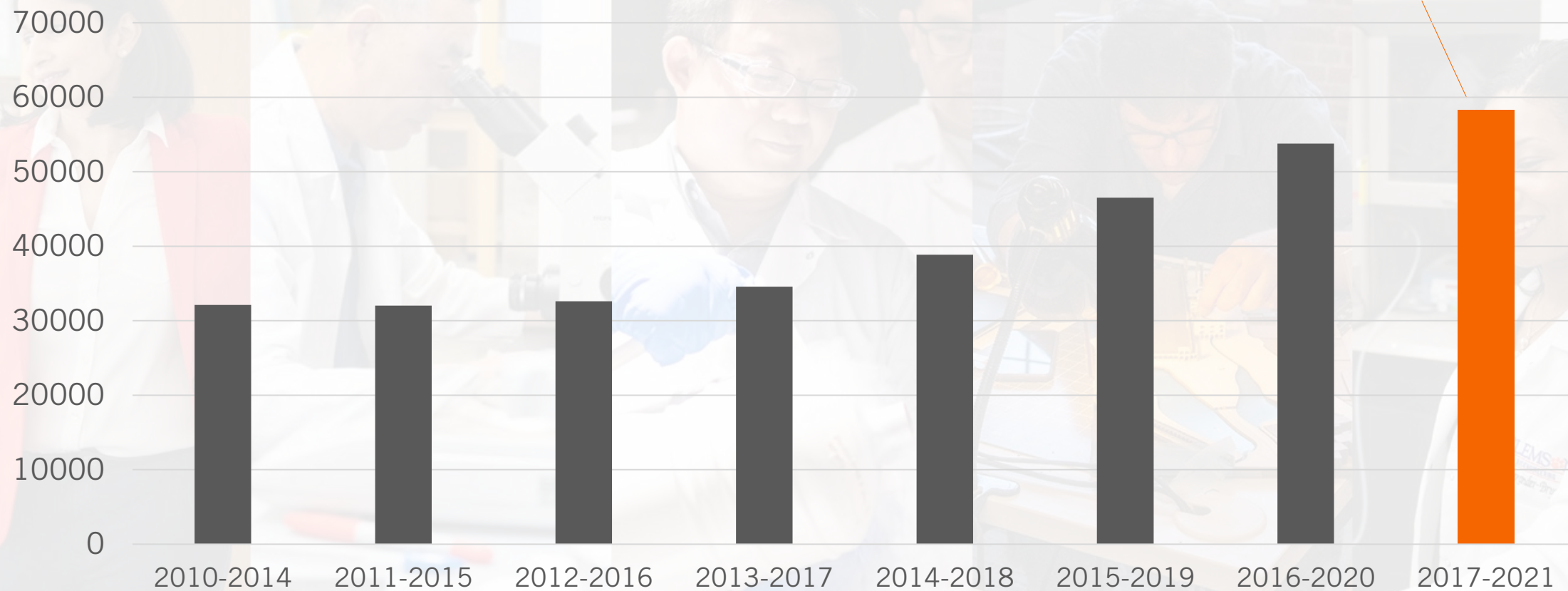
Per capita 7.71

SOURCE: Web of Science

Citations of Clemson Research Are Increasing

Citations of Research

82% increase
over past decade



Per capita 36.55

Per capita 61.02

SOURCE: Web of Science

Clemson Faculty Author Some of Most Prominent Papers in Their Fields



8 Hot Papers in 2021:

These papers have been cited enough times to place them in **the top 0.1%** when compared to papers in the same field.

SOURCE: Web of Science



Matthew Browning, assistant professor
College of Behavioral, Social and Health Sciences

Psychological impacts from COVID-19 among university students: Risk factors across seven states in the United States



Ali Shirzadibabakan, PhD student
College of Business

Urban expansion modeling using an enhanced decision tree algorithm

Clemson Faculty Author Some of Most Prominent Papers in Their Fields



8 Hot Papers in 2021:

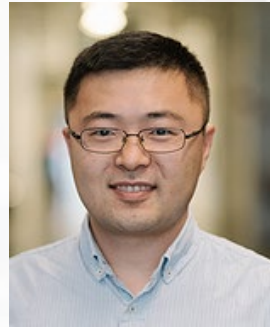
These papers have been cited enough times to place them in **the top 0.1%** when compared to papers in the same field and added to the database in the same period.

SOURCE: Web of Science



Apparao Rao, endowed professor
College of Science

*Cell-like-carbon-micro-spheres for robust potassium anode
:Large-scale low-cost synthesis methods for potassium ion
battery (PIB) anodes with long cycle life and high capacity*



Ting Zheng, postdoctoral fellow
College of Engineering, Computing & Applied Sciences

*Recent advances in cellulose and its derivatives for oilfield
applications*



Sneh Punia Bangar, graduate research assistant
College of Agriculture, Forestry & Life Sciences

*Delineating the inherent functional descriptors and
biofunctionalities of pectic polysaccharides*

Strategies for Research Growth

→ IMPROVE THE *CULTURE*

- Incentivize and incubate collaboration with R-Initiative funds and Research Symposium
- Support faculty development with CAREER Academy
- Celebrate success with faculty awards programs
- Increase faculty representation with Research Advisory Board
- Nurture the pursuit of high-value projects

→ HIRE GREAT *TALENT*

- Recruit top junior and senior faculty: Endowed chairs and professorships; Early career recipients
- Bring new leadership to the colleges: Deans and Associate Deans for Research
- Build a strong Research Division focused on customer service

→ BE *STRATEGIC*

- Aggressively pursue large projects: Centers for Biomedical Research Excellence
- Capitalize on legacy investments: International Center for Automotive Research; Dominion Energy Innovation Center; Center for Human Genetics
- Target federal priorities
- Pursue and enhance strategic partnerships: Savannah River National Lab; Prisma; Medical University of South Carolina; Industry Partnerships

→ *INVEST* IN SERVICE, EFFICIENCY, FACILITIES

- Invest in core facilities with top-notch equipment
- Improve operational efficiency: BioRAFT online lab management; Core facility management software
- Build a strong Research Division focused on customer service; operate with balanced budgets despite challenges
- Refocus Research Foundation to enhance service and create opportunity

Improve Research Efficiency



New BioRaft lab safety management software

- 60% reduction in time completing safety tasks
- 1,288 hours saved on inspections.



New iLab Core Facility Management System

- Easier, online facility scheduling and billing.



New Web-based Compliance Management

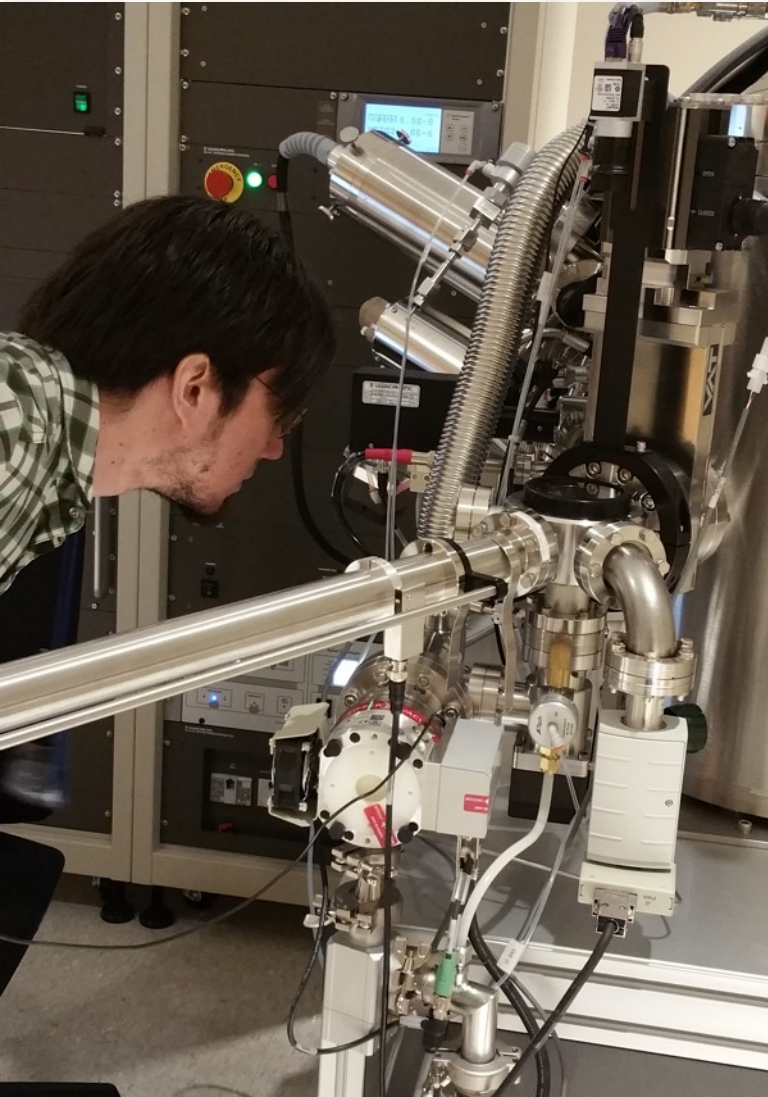
- Integrated into InfoEd for ease of use
- Institutional Review Board, Institutional Animal Care and Use Committee, and the Institutional Biosafety Committee



Searchable Research Equipment Database

- Facilitates asset sharing to maximize utilization

Investment in World-Class Facilities



Electron Microscopy Facility

- World's most advanced Scanning Electron Microscope
- Photoelectron and Auger Electron Spectroscopy



Clemson Light Imaging Facility

- New widefield imaging system



Godley-Snell Research Center

- New CT and MRI for large animals



Aquatics Animal Research Facility

- 4,000-square-foot facility with 12 individual rooms

Investing in People with the R-Initiative Funding Programs

CU SUCCEEDS

4 award programs to support project initiation or completion, interdisciplinary teams, and short-notice external funding opportunities.

CU RESEARCH FELLOWS

Funds to hire and train qualified new research faculty, research associates and postdoctoral researchers.

EXTERNAL REVIEW

External reviews to strengthen proposals before submission to funding agencies

CU CORE INCENTIVIZED ACCESS

Grants access to Clemson's core research facilities and equipment at no cost.

CU MAJOR RESEARCH INSTRUMENTATION

Funds to purchase, replace or upgrade major research equipment.

DOCTORAL DISSERTATION COMPLETION GRANTS

Funds to help students successfully earn their PhDs on time.

SPONSOR TRAVEL GRANTS

Visit agency and foundation program directors to build relationships

CURF-PRISMA MATURATION FUND

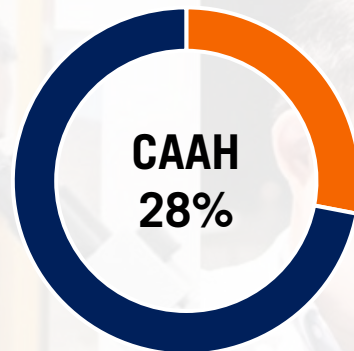
Collaborate with Prisma Health clinicians to develop and commercialize health care innovations

R-Initiative Participation by College

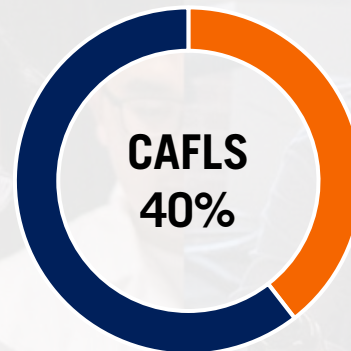
Participation Rate =
% of T/TT Faculty to
be PI or Co-PI on R-
Initiative Proposal

 T/TT R-Initiative Participants

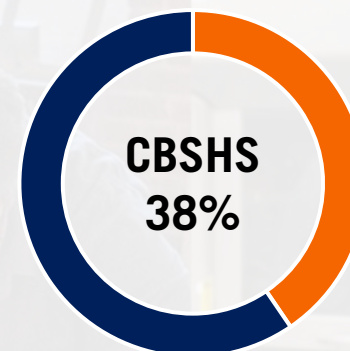
 Nonparticipants



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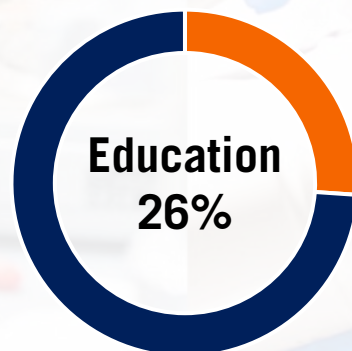
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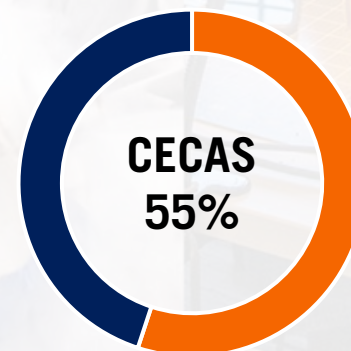
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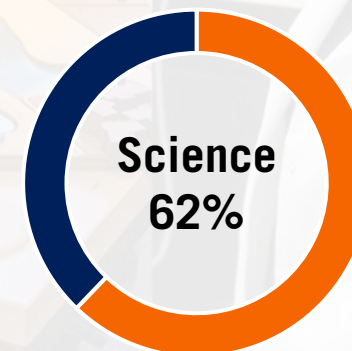
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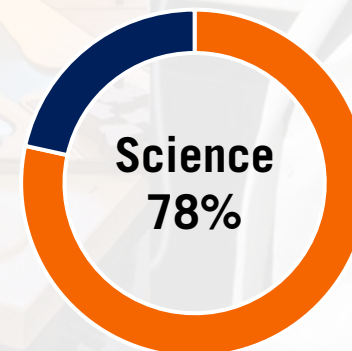
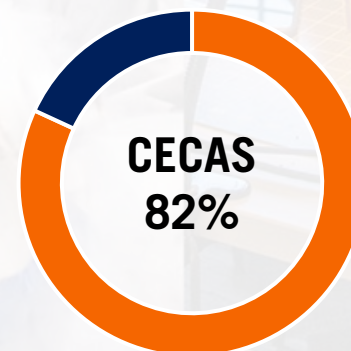
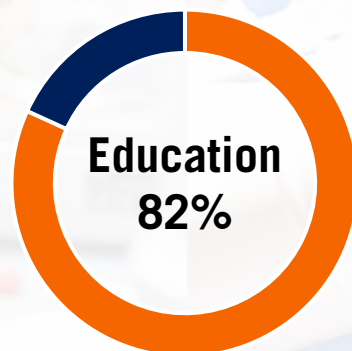
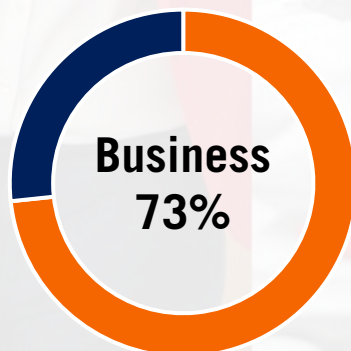
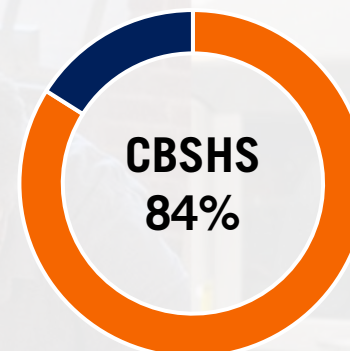
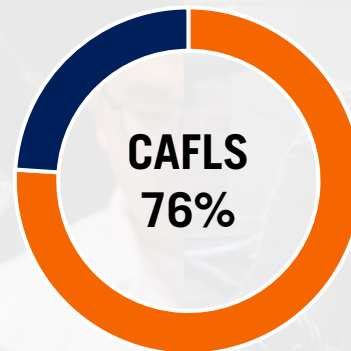
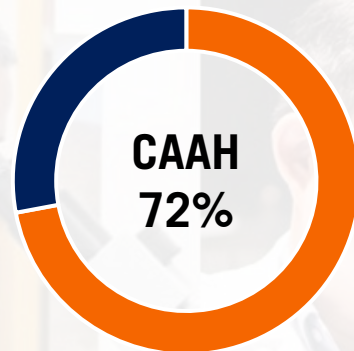
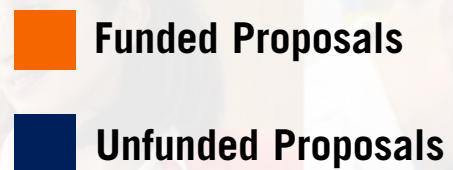


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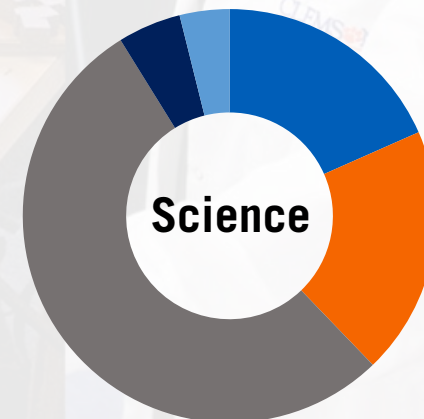
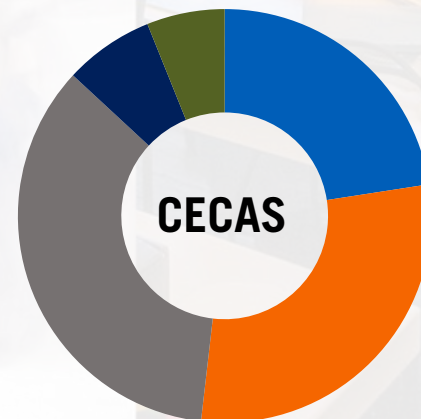
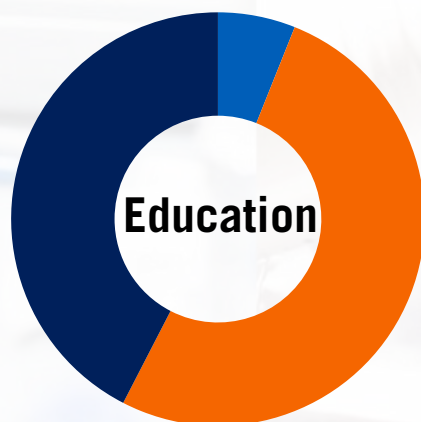
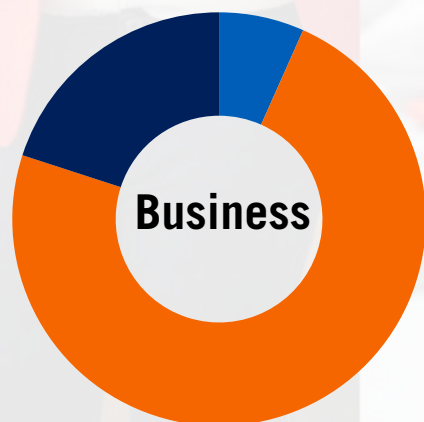
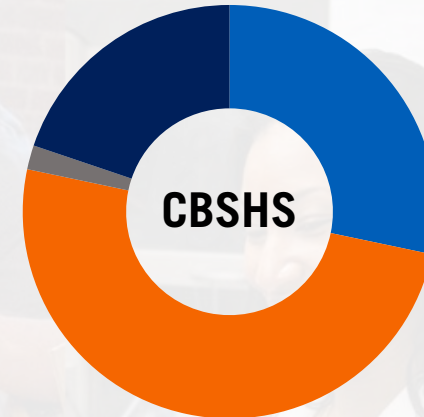
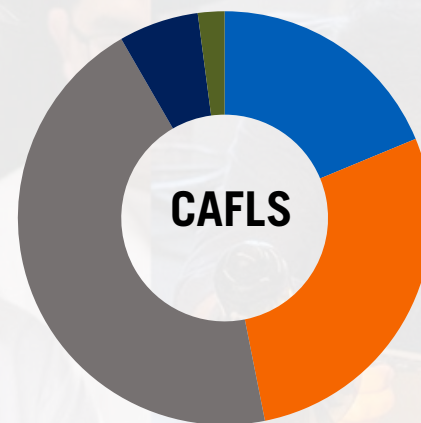
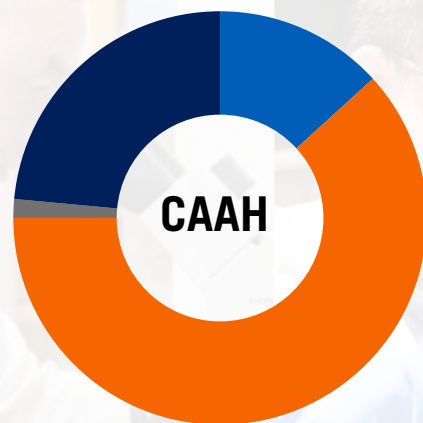


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R-Initiative Award Rate



R-Initiative Award Breakdown per College



R-Initiative Deliverables

→ *With the R-Initiatives, Clemson has invested more than \$9 million in research involving 594 faculty*

THE FIRST GRANTS WERE AWARDED IN 2017. HERE ARE THE DELIVERABLES SO FAR:



11
ART EXHIBITIONS
AND
RESIDENCIES



8
BOOKS
AUTHORED

83
ARTICLES
AND
PRESENTATIONS



\$14 MILLION IN
ADDITIONAL
EXTERNAL FUNDING
SECURED



97 STUDENTS HAVE
EARNED PhDs



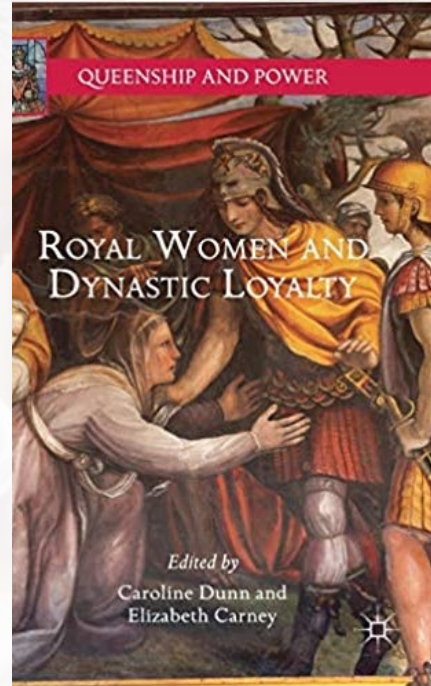
20
NEW PIECES OF
EQUIPMENT
ACQUIRED

23
POSTDOCS and
RESEARCH
ASSOCIATES
HIRED

Examples of Work Supported by R-Initiatives



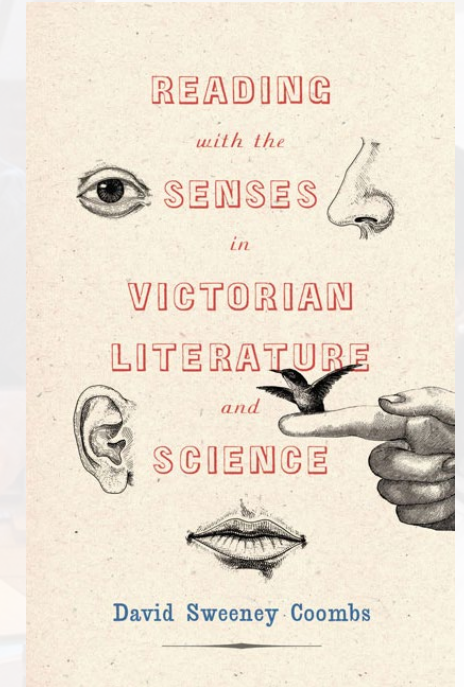
Todd McDonald,
associate professor
of art, presented at
the Waterloo Arts
Juried Exhibition



Carolina Dunn,
associate professor of
history, published a
book



Valerie Zimany, chair
of the Department of
Art, had work on
display at the New
Taipei Yingge
Ceramic Museum,
Taiwan

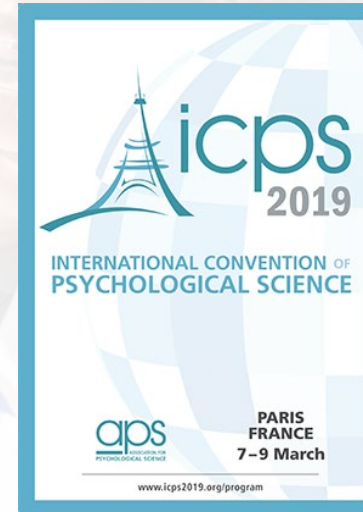


David Coombs,
associate professor of
English, published a
book

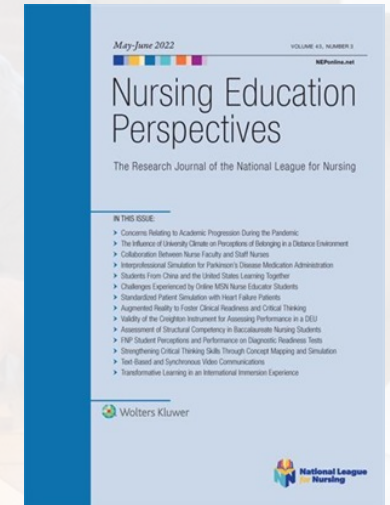
Examples of Work Supported by R-Initiatives



Travers Scott, associate professor of communication, published a book



Oriana Aragon, assistant professor of marketing, presented at the International Convention of Psychological Science



Roxanne Calabria, professor in the School of Nursing, published an article in Nursing Education Perspectives

Examples of Work Supported by R-Initiatives



Shanna Hirsch, associate professor of education and human development, presented at the Council for Exceptional Children Conference.



Sandra Linder, professor of teaching and learning, presented at the annual conference of the National Association for the Education of Young Children

Office of Research Development



Faculty Support

- CAREER Academy
- Proposal Development Support/Training
- Nominations for Prestigious Honors/Awards
- Workshops/Informational Sessions



Team Building

- Building interdisciplinary teams for large grant proposals
- TigerSphere – a program to build interdisciplinary teams around a central theme chosen by faculty
 - Environmental Justice
 - Linking Clemson's Interdisciplinary Resilience Researchers



Explore New Opportunities

- Monitor agency programs
- Private Foundations
- Limited Submissions
- Young Investigator Awards

CAREER Academy

- ✓ Extensive, 6-month CAREER Academy presented by the Office of Research Development
- ✓ Workshops and peer group meetings
- ✓ Grant-editing support to help faculty compete for NSF CAREER Awards.
- ✓ Valuable insights from CAREER awardees, former NSF program officers, and external consultants.



clemons.edu/research/development



Behind the Numbers: Faculty & Student Achievement



Valerie Zimany (CAAH)

One of 10 U.S. artists named to the International Academy of Ceramics



Abby Allen (Education)

Received early career award from the Institute of Education Sciences



Sruthi Narayanan (CAFLS)

Received Early Career Award from Crop Science Society of America in recognition of research



Chikezie Isiguzo (CBSHS)

Earned global fellowship from Association of Certified Anti-Money Laundering Specialists



Lauren Davis (Science)

Named Beckman Scholar and Goldwater Scholar and received Astronaut Scholarship



Hala Nassar (CAAH)

One of four named 2020 Fellow by the Council of Educators in Landscape Architecture



Aleda Roth (Business)

Research award created in her name by Production & Operations Mgt. journal



William Haller (CBSHS)

Received prestigious Fulbright Scholar Award



Richard Brooks (CECAS)

Selected as a Distinguished Member of the Association for Computing Machinery

Researchers of the Year



Lior Rennert

*Assistant Professor
Public Health
Sciences*

**College of Behavioral,
Social and Health
Sciences**



Rhondda Thomas

*Calhoun Lemon Professor
Literature*

**College of Architecture, Arts and
Humanities**



**2022 Researchers of
the Year to be
announced at 12:45
in the Auditorium**

University Research, Scholarship & Artistic Achievement Awards



Amy Apon
*Professor, C. Tycho
Howle Director*
School of Computing



Julia Brumaghim
Professor
Chemistry



Kai He
Assistant Professor
Materials Science &
Engineering



Anjali Joseph
*Spartanburg Regional Health
System Endowed Chair*
Architecture + Health Design



Linda Li-Bleuel
Professor
Performing Arts



Jacob Sorber
Associate Professor
School of Computing



Hai Xiao
*Samuel Lewis Bell
Distinguished Professor*
Electrical & Computer
Engineering



**2022 URSAAA
winners to be
announced at 12:45
in the auditorium**

The background is a collage of four images: a woman in a red blazer on the left, a man in a lab coat looking at a microscope in the top center, a man in a lab coat working with equipment in the bottom center, and a woman in a lab coat on the right. A large circular graphic with a dark blue outer ring and an orange inner ring is centered over the collage.

2022 Clemson University

RESEARCH
symposium

May 10, 2022