Research and Economic Development Committee
Board of Trustees | July 19-21, 2018

recognizing excellence

Prepared by the Clemson University Division of Research
Dear Board of Trustees Members,

I am pleased to present you the University Research Report prepared by the Research Division in a new format. I trust you will find this new version informative, concise, and strategic. In this cover letter, I would like to address two key topics: (1) Clemson’s R1 status and (2) new awards and new proposal submissions.

(1) As the Chief Research Officer of the University, my primary responsibility is to assure Clemson is continuously achieving Carnegie R1 status, a primary goal of ClemsonForward. This lays the foundation for Clemson to become a member of the American Association of Universities (AAU), which, in my opinion, should be Clemson’s long-term aspiration. AAU membership is the highest recognition for higher education institutions in the United States, with only 62 members and membership only possible by invitation. Carnegie classification is based on 10 metrics and success in all metrics is required. I am pleased to report that we have made significant progress in the past three years with positive trends in seven out of 10 Carnegie metrics. As a result, our overall average rank among 115 R1 schools improved from 101 to 92, indicating penetration into the R1 category since 2015. We completed a six-month project in the Research Division that allows us to recreate the Carnegie model. The results confirmed our improved R1 status. With this model, we can systematically assess the impact of ClemsonForward strategies and investments. Our strategic and meticulous work on Carnegie ranking, along with significant growth in Clemson research in the past three years, is paying dividends. Recently, Carnegie unexpectedly announced that it will move from a five-year classification schedule to three years. Without our recent momentum, this unexpected change could have jeopardized Clemson’s R1 status, but as long as Carnegie’s classification methodology remains the same, I anticipate the confirmation of Clemson’s R1 status in January 2019. However, Carnegie may add professional practice doctoral degrees (e.g., JD, MD, PharmD) into its calculation methodology. Since Clemson does not have medical and law schools, this proposed change could significantly impact our R1 status. We are awaiting details on Carnegie’s proposal.

(2) We have experienced amazing growth in awards the past four years, expanding from $80M/year (end of FY 2014) to $136M/year as of May 2018. We now see softening in proposal submissions and anticipate finishing the year with about $450M in submissions, $100M lower than last year. Several factors contribute: (i) successes in obtaining grants sometimes shift faculty focus from submitting proposals to managing awards, (ii) Clemson has a relatively small faculty body and ~15% of faculty account for ~80% of awards, (ii) Due to federal budget uncertainties, federal agencies have delayed the release of calls for proposal of interest to Clemson, (iii) steady growth in student populations has created additional demand on faculty, and (iv) four new Deans have been hired in the past year. We have implemented several strategies to boost submissions: (i) Provost has set submission targets with College Deans for FY19 and beyond, (ii) Research Division invested about $2M in R-Initiatives, (iii) Research Division created the Office of Research Development to aid in the development of large proposals, (iv) CURF was reorganized to further grow industry and federally sponsored research, and (v) Research Division is working with Office of Corporate and Strategic Engagement to grow industry research.

Several remarkable accomplishments are documented throughout this report. These are exciting times for Clemson research, and I am proud of the progress we have made. We have plenty more to accomplish.

Respectfully submitted,

Tanju Karanfil, Ph.D., PE, BCEE, IWA Fellow
VP for Research, Clemson University

*Carnegie does not publish any ranking. Clemson Research Division tracks 222 R1 and R2 Universities and runs metrics to determine rankings.*
1. Carnegie Update
2. Celebrate Faculty
3. URSAAA Awards
4. Research Metrics
5. Significant Awards

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RESEARCH REPORT
1. Carnegie Update

An Analysis of Carnegie Classification Methods and a Review of Recent Metrics Data
Clemson University continues to improve in rank

- Compared to R1 and R2 universities, Clemson has increased its rank for most of the 10 Carnegie metrics in 2017 compared to 2015. (Page 2)
- Small declines in rank or in value occur in metrics where Clemson is already comparatively strong among the 222 R1 and R2 institutions (e.g., No. 18 in non-S&E Exp., No. 71 in PhD STEM, and No. 8 in Per Cap. non-S&E Exp.).
- Overall average rank, meanwhile, has improved from 101 in 2015 to 92 in 2017.
- The increase in Clemson rank in 7 of 10 metrics and the overall average rank among R1 and R2 universities is important because 2018 values and ranks will be used for the 2019 classifications.

Clemson should remain an R1 university in 2019

According to our modeling of Carnegie’s methodology, which tracks movement of R1 and R2 universities, Clemson is on track to maintain its R1 status. (Graph 2, Page 5).
- A detailed description of Clemson’s Carnegie status can be found on Page 6.
- A detailed discussion of our Carnegie model may be presented at the Board retreat.

Carnegie changes could affect Clemson

- Carnegie recently announced it will move from a 5-year to a 3-year schedule for gathering data for Carnegie Classifications.
- Carnegie also announced plans to add professional practice doctoral degrees (e.g., JD, MD PharmD). Clemson has only one new degree in this category (Ph.D. in Nursing Practice).
- Carnegie has not announced the details of the new methodology at the time this report was prepared. Clemson continuously monitors these developments.
### 2015-2018 Metrics

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<td>7 PhD Other</td>
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<td>86</td>
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<td>82</td>
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**Average Rank 2015**: 101  
**Average Rank 2017**: 92
Current Carnegie Publication Schedule 5-Year Cycle:

2015 — 2020 — 2025 — 2030 — 2035

New Carnegie Publication Schedule 3-Year Cycle:

2018 — 2021 — 2024 — 2027 — 2030

New Carnegie Data Collection Schedule:

2017 — 2020 — 2023 — 2026 — 2029

2016-2017
Doctoral completions (Submitted to DoED IPEDS, not publicly available)

FY 2017
Expenditures data (Submitted to NSF HERD, not publicly available)

Fall 2016
Faculty counts / post-docs & non-faculty researchers (NSF GSS publicly available)
Carnegie has suggested adding a new PhD classification of which Clemson currently does not have any graduates.
CLEMSON FORWARDED momentum

Graph 1

Graph 2
Clemson University continues to improve in the 10 Carnegie metrics (Page 2) used to determine universities’ basic category (i.e., Doctoral University, Highest Research also known as R1 status). Clemson’s values for each metric have been updated to include Clemson University’s 2018 data.

- Clemson continues to move in a positive direction for nine of the 10 Carnegie metrics in terms of absolute values (Page 2, column Δ Metric 2015 to 2018).
- Ranking information is only obtainable when the information from other universities is made public. 2017 is the most recent year for publically available data for tracking Clemson University’s rank compared to peers. Clemson has moved up in seven of the 10 ranking metrics. The most positive movement included the addition of postdoctoral fellows and non-faculty research staff. Clemson also gained significant ground in rankings due to increasing doctoral completions, particularly in the social sciences (psychology and economics). Despite growth in absolute values, Clemson has a small decrease in three of the rankings (i.e., non-science and engineering expenditures, doctoral STEM completions, and per-capita non-science and engineering expenditures). Clemson’s rank in these metrics is already high (No. 18 in non-S&E Exp., No. 71 in PhD STEM, and No. 8 in Per Cap. non-S&E Exp.). Some variability, sometimes small negative or positive values, in rank is to be expected.
- Clemson University has continued to climb in its average ranking (i.e., average of 10 metrics) from an average rank in 2014 of 101 to an average rank in 2017 of 92.

Carnegie has recently announced it will move to a 3-year update schedule of the Carnegie Classifications (Page 3). This update in schedule moves the next publication of institutional classifications from early 2021 to late 2018. This change in timeline also shifts the timing of data collection from 2019 to 2017. The data to be used in the next series of classifications has already been submitted to reporting agencies like the NSF and the Department of Education. Despite changes due to positive research growth patterns in the past two to three years, we are confident Clemson will remain an R1 university, unless Carnegie significantly changes its calculation methodology. (Graph 2, Page 5)

Carnegie has also announced it is shifting some of its methodology regarding which doctoral completions are counted (Page 4). In addition to the current doctoral completions counted as part of the Basic Categorization, Carnegie plans to add a fifth category of doctoral completions, Professional Practice doctoral degrees (e.g., JD, MD, PharmD, D.Div) degrees will now be added to STEM, Humanities, Social Science and Other doctoral degrees.

- Clemson University currently offers one doctoral degree in professional practice, Ph.D. in Nursing Practice.
- This change will likely increase the numbers of universities currently counted as “Doctoral Universities” to include institutions formerly included in the “Master’s Colleges and Universities”
2. Celebrate Faculty

College by College - Notable Faculty Achievements - Dollars alone do not give a complete indication of institutional research and scholarly productivity. National awards and quality publications also contribute to faculty and institutional reputation. Each college was requested to send a brief write-up of three top faculty with high research and scholarly productivity. This section includes the write-ups received.
Bruce Martin is a Professor of Plant Pathology in the Department of Plant and Environmental Science located at the Pee Dee Research and Education Center. Martin is the epitome of providing outstanding service and recognition through programs and activities related to the turfgrass industry. In his over 30 years of public service to the state citizens and turfgrass industry, he has obtained the utmost respect in his diagnosing and management of turfgrass diseases and nematodes. He is in constant demand throughout the country and world for his experiences in dealing with the major diseases of turfgrasses. His efforts allowed the Carolinas to retain its financial role as the second most visited golf destination in the USA, behind only the greater Fort Lauderdale/West Palm Beach area. Clemson University’s recognition of Martin coincides with his retirement June 30, 2018.

Selected Accomplishments

- Only one of two US university researchers intensively investigating biology and management of parasitic plant nematodes on turfgrasses
- Pathologist-of-the-year; Southern Regional Plant Pathology Group
- Extension Communication Award; American Society for Horticultural Sciences
- Distinguished Service Award; Carolinas Golf Course Superintendent Association’s highest award, only the second Clemson University recipient in the association’s 55 year history
- Distinguished Service Award; Golf Course Superintendent Association of America’s highest award, the first and only Clemson University recipient
- Distinguished Public Service Award; Clemson University Cooperative Extension Alumni
- Godley-Snell Award for Excellence as top agriculture researcher at Clemson University
- Fred V. Grau Turfgrass Science Award as the top national and international turfgrass science researcher; Crop Science Society of America
Nathan M. Long PhD
Assistant Professor
Animal and Veterinary Science

Nathan Long is a ruminant physiologist whose research investigates the effects of maternal and environmental factors that can alter fetal growth and development, and ultimately, how those alterations during fetal life persist into the postnatal animal and lead to alterations in growth, endocrine regulation, and body composition. His other research interests include the effects of postnatal nutrition and specific nutrients on growth and marbling of beef calves. Currently he is working on a project funded by USDA NIFA looking at the effects of increased cortisol at birth on postnatal endocrine regulation and development of the appetite control centers of the brain. He conducts most of his research at the Clemson Simpson Station REC and the Clemson Edisto REC but has also traveled to Argentina to collaborate on research with the National Agricultural Technology Institute (INTA) in Rauch, BA.

Selected Accomplishments

• Served on the Southern Section of ASAS Undergraduate Competition Committee 2015-2019
• Served on the National ASAS Beef Cattle Nutrition Symposium Committee member 2014-2016
• Published 30 peer reviewed journal articles, 32 national and international meeting abstracts and 4 popular press articles
• Received $716,500 in grant funding and $199,700 in industry gifts of money and supplies for research and teaching
• Traveled to Argentina twice to present his research and to collaborate on 4 research projects with INTA
• Hosted members of INTA during their visit to Clemson
• Mentored 7 graduate students (and served on 5 additional graduate student committees)
• Presented at multiple County Cattlemen’s meetings and events
• 15 undergraduate students have worked in his lab with one getting a first author Journal publication
Michael Vassalos, PhD
Assistant Professor
Agricultural Sciences

Michael Vassalos is an agricultural economist whose areas of specialization are agribusiness management, farm management and production economics. His research interests focus on producers’ decisions under risk and uncertainty and producers' marketing strategies. Current research projects are supported by the United State Department of Agriculture and the S.C. Department of Health and Environmental Control. Vassalos teaches courses in farm management, agricultural policy, production economics and agriculture and society. He has also been heavily involved as faculty advisor for the Agribusiness Club and the advisor to the agribusiness academic bowl team. His research team consists of several Masters and PhD students as well as undergraduate students.

Selected Accomplishments

- College of Agricultural Forestry and Life Sciences Undergraduate Excellence of Teaching Award, May 2018

- Awarded 3rd place Outstanding Undergraduate Paper competition at the 2017 Agricultural and Applied Economics Association Meeting (as advisor)

- Agribusiness academic bowl team has consistently placed either 1st or 2nd at the Southern Agricultural Economics Association Meeting (as advisor)

- Student Organization of the Month. Awarded by Clemson University’s Student Organizations and Clubs. February 2017 (as advisor)

- Clemson’s Agribusiness Association Outstanding Chapter of the Year Award. Awarded by the Agricultural and Applied Economics Association. July 2016 (as advisor)

- Received a $150,000 research grant from the United State Department of Agriculture for Evaluating the Potential of Organic Farming Practices in SC (2017-19)

- Received a $50,000 research grant from the South Carolina Department of Health and Environmental Control looking at Farm-to-Retail
Ray Huff
Associate Professor Emeritus
School of Architecture

Ray Huff graduated Clemson University with a Bachelor of Architecture in 1971. Huff teaches and is the Director of the Clemson Architecture Center housed at the Clemson Design Center in Charleston. Huff is a Fellow of the American Institute of Architects and was recently awarded the Medal of Distinction by the South Carolina Chapter of the American Institute of Architects. The Medal of Distinction is the highest honor that AIA South Carolina can bestow upon a member. Huff has lectured worldwide about his unique perspective on architecture and culture. Until 2017, he was a partner at Huff+Gooden Architects, where they approached architecture with a global perspective that aligns with proactive cultural positions.

Selected Accomplishments

• Awarded the Medal of Distinction by the South Carolina Chapter of the American Institute of Architects

• NCARB Prize - Global Climate Change and the Charleston Peninsula for Creative Integration of Practice and Education in the Academy National Council of Architectural Registration Boards (NCARB), 2008

• Ray Huff Day, Resolution of the Charleston City Council, 2008

• Clemson University School of Architecture Award of Recognition, 2008

• South Carolina Certificate of Service Award, 2007

• NCARB Prize for Creative Integration of Practice and Education in the Academy, 2003

• NCARB Prize - Upper Concord Neighborhood; Charleston, S.C., for Creative Integration of Practice and Education in the Academy National Council of Architectural Registration Boards (NCARB), 2003

• Recognition for Service to the School of Architecture, Clemson University, 2003
Jae Takeuchi, PhD
Assistant Professor
Languages

Jae Takeuchi is an Assistant Professor of Japanese in the Department of Languages at Clemson University, where she teaches courses on the Japanese language and culture. Takeuchi’s research interests include Japanese sociolinguistics, Second Language Acquisition and Japanese as a Foreign Language. She is especially interested in Japanese language learners and how they navigate the numerous speech styles of the Japanese language. At Clemson, she teaches Japanese language and linguistics courses, courses for Japanese professional communication, and courses on Japanese culture. Takeuchi received her PhD and MA from the University of Wisconsin-Madison.

Selected Accomplishments

• Awarded the Hamako Ito Chaplin Memorial Award for Excellence in Japanese language teaching at the college level. The national award, administered through the Association for Asian Studies, is given to only one or two instructors of Japanese each year.

• Presented her research “Our Language” – an autoethnographic analysis of Japanese Dialect Use in L1/L2 Interaction” at the annual American Association of Teachers of Japanese annual conference in Washington.

• Member of the American Association for Applied Linguistics, Southeastern Association of Teachers of Japanese, American Association of Teachers of Japanese, American Council on the Teaching of Foreign Languages

• Member of the 2018 Research Symposium Organizing Committee
Benjamin L. White, PhD  
Associate Professor  
Philosophy and Religion

Benjamin White is a scholar of ancient and modern interpretations of the New Testament, the reconstruction of Christian origins, and the development of early Christianities. He is particularly interested in the figure of Paul in Christian theopolitical discourse, as well as the intersection of memory, historiography, and ideology in the development of Pauline traditions. His book, *Remembering Paul: Ancient and Modern Contests over the Image of the Apostle*, was published by Oxford University Press in 2014. His research articles have appeared in the Journal for the Study of the New Testament, The Journal of Early Christian Studies, and Vigiliae christianae, among other places. At Clemson, White directs the BA in Religious Studies and leads study abroad trips to various locations in the Mediterranean region, including Turkey, Greece, and Italy.

Selected Accomplishments

- Awarded a summer stipend from the National Endowment for the Humanities (NEH). He received the $6,000 research grant that will support his project “The Authorship of the Pauline Epistles: The Promise and Limitations of Computational Methods.” White was one of 65 scholars around the country selected to receive 2018 grants through the NEH Summer Stipends program, out of a field of nearly 800 applicants.

- Clemson University Humanities Hub Humanities Fellowship, 2017 ($5,000)  
Faculty Research Development Program (research grant), Clemson University, 2017-2018 ($3,000)

- Wabash Center for Teaching and Learning in Theology and Religion, Departmental Grant shared with University of North Florida and Middle Tennessee State University, 2016-2017 ($30,000)

Pat Raymark, PhD  
Professor and Department Chair  
Psychology  

Pat Raymark is an Industrial-Organizational Psychologist who has served as the Chair of the Psychology Department since 2010. His area of academic expertise is in assessing the accuracy and usefulness of decisions made within organizational settings, including personnel recruitment, assessment, selection, and performance appraisal. One of his recent studies examined the various factors that influence how quickly interviewers make decisions about job applicants. In 2016, Raymark served as the chair of the academic portion of the Clemson University reorganization. During his term as department chair, Psychology has seen a 70% increase in undergraduate majors, while continuing to provide more Creative Inquiry opportunities than any department on campus.

Selected Accomplishments

- Alumnus of the Year; Illinois State University
- Teaches courses in Doctoral Seminars in Personnel Psychology, Advanced Personnel Selection, and Leadership in Organizations; Undergraduate course in Leadership in Organizations
D. Travers Scott, PhD
Associate Professor
Communication

Scott is a mixed-methods researcher whose interests include technology, health, gender, and sexuality. His training includes a BFA from the School of the Art Institute of Chicago, a Master's of Communication in Digital Media from the University of Washington, and a PhD in Communication from the Annenberg School for Communication and Journalism at the University of Southern California. Higher education is his second career, after 13 years in advertising with several high-tech clients. He has also published three book-length works of fiction. This mixture of professional and creative communication informs his teaching and research today.

Selected Accomplishments

• Pathology & Technology: Killer Apps and Sick Users (Peter Lang, 2018). This book presents a 10-year research project into associations of electric communication technologies with causing or worsening mental and/or physical illnesses. Beginning with the telegraph, it demonstrates that such concerns have occurred repeatedly with old and new technologies, from the telephone to social media.

• What Comes After Coming Out? LGBTQ Players in College Athletics: PI of three-person team conducting survey and interview research on the experiences of players, coaches, and staff on college athletic teams who have had players come out as lesbian, gay, bisexual, transgender, or queer. The aim of this project is to develop practical guidelines for what problems tend to occur, and dispel unwarranted concerns. (Brooks Sports Science Institute)

• Completed 4 years as Co-chair of LGBTQ Studies Interest Group, International Communication Association; Reviewer for Social Media and Society; Television and New Media; SAGE Handbook of Qualitative Dissertation Methodology; Communication, Culture, and Critique; International Journal of Communication; Annals of the International Communication Association, Culture and Society; Western Journal of Communication; Clemson Honors College National Scholars Program

• Associate Editor, Journal of Positive Psychology
Kathleen Valentine is Director of Clemson’s School of Nursing, Associate Dean of CBSHS, and Chief Nursing Academic Officer of Greenville Health System. Valentine is an international leader in nursing education having held positions as Dean of Nursing at the University of New Brunswick, Canada, and associate dean positions at Massachusetts General Hospital Institute for Health Professions; Florida State University’s College of Nursing; and department chair and associate professor at the University of Wisconsin, Eau Claire. Valentine has also held various clinical positions, including director for Patient Care Services at Kaiser Permanente, director of the Memory and Wellness Center and Diabetes Center at the Christine E. Lynn College of Nursing at Florida Atlantic University. Valentine’s research focuses on the economic value of human caring, nurse-managed primary care clinics, and interprofessional collaboration, particularly related to services for the aging.

Selected Accomplishments

- Clemson University School of Health Research Scholar; Board Member for the Institute for Engaged Aging; Board Member for the Anne Boykin Institute for the Advancement of Caring; Honorary Research Professor, University of New Brunswick (2016-present); American Heart Association Mission Committee member

- Co-Investigator for “Expanding the Primary Care Family Nurse Practitioner Workforce with Expertise in Diverse, Rural and/or Undeserved Populations in South Carolina, Greenville Health Authority Award. 2017-2019

- Co-Investigator for Grant Clemson University- April 14,2017- “Improving Inter-Professional Team ‘Neighborhoods’ Leads to Better Intensive Care Unit Design.”

- Principal Investigator of NBHRF (New Brunswick Health Research Foundation) Establishment “Building Capacity for Transforming Healthy Aging Care Delivery”

- President of Academy for Nursing Excellence in Design, Chairperson for the 2019 International Caring Conference and International Healthcare Design conferences sponsored by CUSON
Babur De los Santos, PhD
Associate Professor
Economics

Babur’s research intersects economics and marketing. Primarily, he focuses on online consumer searches and sales. Since joining the John. E. Walker Department of Economics in 2015, Babur has published five papers and has had another paper conditionally accepted for publication. One of his publications was published in one of the top three economic general interest journals. “Testing Models of Consumer Search Using Data on Web Browsing and Purchasing Behavior,” co-authored with Ali Hortacsu and Matthijs Wildenbeest, was published in the American Economic Review. In this paper, they use online data to assess how individuals search for specific products (books). Babur also recently had his manuscript accepted for publication in Quantitative Marketing and Economics.

Selected Accomplishments

- Has nine publications in high-quality journals. His research papers have been cited nearly 500 times according to Google Scholar
- Has been invited to present his work at more than 25 different universities and research centers. In addition, he has presented his work at more than 20 academic conferences
- Recently invited to give two seminars at the Digital Economy Unit of the Joint Research Centre of the European Commission in Seville Spain
- Invited to present at the Digital Economics Group at the University of Cologne and to give two seminars at Télécom École de Management and another at Université Paris Sud
- Has served as a referee for more than 15 different economics and marketing journals including all the top journals in his research areas of expertise
Jace Garrett is an assistant professor in the School of Accountancy whose research centers on the relationship between interpersonal trust and accounting processes within organizations. His primary focus is on the effects managerial control systems have on trust between individuals within an organization. He also studies the effect of trust on the quality of an organization’s financial reporting and internal control environment. Garrett believes that accounting is more than just a set of rules meant to be followed mindlessly. Rather, it is a tool that, when understood properly, can be used to help companies succeed.

Selected Accomplishments

- Had two acceptances in the “Top-5” accounting journals for his research on management control and trust
- Presented his paper, “Controls and Cooperation in Interactive and Non-Interactive Settings,” at the 2015 Contemporary Accounting Research Conference
- Received an AAA/Grant Thornton Doctoral Dissertation Award for Innovation in Accounting Education
- Was a 2014 AAA/Deloitte Foundation/J. Michael Cook Doctoral Consortium Fellow
- Received the 2012 Innovation in Research Award from the AAA Public Interest Section for “Trust and Financial Reporting Quality.”
T. Andrew Poehlman, PhD
Assistant Professor
Marketing

Andrew Poehlman’s research investigates influences outside of awareness affecting consumer behavior, choices and stretch into well-being. In addition, Poehlman has consistently supervised a Consumer Research Creative Inquiry the past three years and during every year of the CI a student has presented research at a national marketing academic conference. In addition, Poehlman has supervised 11 master’s projects in the departments’ M.S. program. He has advised over 20 undergraduate students through his CI, two of which have gone directly into top Ph.D. programs.

Selected Accomplishments

- Promoted to Associate Professor with Tenure effective Aug. 15, 2018
- Recently received the University Research, Scholarship, and Artistic Achievement Award for having a publication with over 1,000 citations
- College of Business Undergraduate Teaching Excellence Award for the 2016-2017 academic year
- Named Marketing Department Director of Undergraduate Honors
- Served on the program committee for the M.S. in Marketing program
- Dan Duncan Sports Marketing Research Fellow
- Interviewed by the Wall Street Journal regarding published research
- Presented work (co-authored with Danny Weathers) at the Association for Consumer Research conference (the top conference in Consumer Research)
- Presented four papers at the Society for Marketing Advancements in Fall 2017, Louisville, KY
Bea Bailey has been a professor at Clemson for 27 years as she has helped prepare English and social studies teachers at the undergraduate and graduate levels. The recipient of several national research awards for her applied work related to teacher preparation, Bailey currently studies ways teachers can help middle grade students think like budding historians. Most recently, she has partnered with the Greenville County School District for 18 months to enable teachers to help their students use multimedia technologies to produce Our History Clips, which are three-to-five minute videos that reveal students’ understandings and their growing skills as historians (while many also eagerly strive to be like Ken Burns). Bailey is in Poland this summer as a participant in the Fulbright Seminar Abroad Program.

Selected Accomplishments


- Clemson University College of Education, Award of Excellence in Teaching, Clemson University, 2017

- Invited speaker on First Amendment rights and student protest: Clemson University Law Enforcement Summit, 2018

- 2016 ACUHO-I Grant Recipient (PI), The Cultivation of Support Networks by Student of Color in a Residence Hall Setting at a Predominantly White Institution

- Associate Editor, College Student Affairs Journal, the journal of the Southeastern Association for College Student Affairs

- Graduate Preparation Program Chair, South Carolina College Personnel Association, 2017-current

- Title IX Hearing Board Member for the Clemson University Office of Community and Ethical Standards, 2015-current

- E. Heyward Humanitarian Award from the South Carolina College Personnel Association
Frederick C. Buskey specializes in educational leadership development, working to prepare practicing teachers for school principalship and other administrative positions. Shortly after arriving at Clemson five years ago, he assumed coordination duties for Clemson’s programs in building- and district-level administrative licensure. He teaches a range of courses in the program, including school and community relations, law and ethics. He has helped develop leadership skills in about 200 school leaders since coming to Clemson, many of whom have moved into building- and district-level leadership roles. Buskey has led a revision of the MEd and EdS programs in building level licensure to focus on meeting the needs of diverse learners in rural, high-poverty schools.

Selected Accomplishments

• MEDS Program Coordinator, 2014-2018

• Ongoing collaboration with the Western Piedmont Educational Consortium of 12 rural school districts, representing Clemson University at monthly superintendent meetings establishing a steering committee to inform program improvements and to develop innovative collaborations

• Co-Led the Leadership Learning Community initiative, developing coaching skills in experienced rural school leaders to accelerate growth of high-potential novice leaders

• Engaged in outreach with local school districts

• Served on multiple searches and committees at Clemson University

• Has authored and co-authored several book chapters and journal articles in the past two years
David A. Scott, PhD, LPC
Associate Professor
Education and Human Development

David Scott’s research focuses on at-risk youth, identity development and clinical mental health counseling. Before coming to Clemson, he worked in a variety of clinical and administrative settings, including an inpatient psychiatric hospital, outpatient counseling center, adolescent residential programs and private practice. He is also a Licensed Professional Counselor. His research agenda continues to align with the College of Education’s mission statement in the area of serving underserved communities by his research with at-risk youth. Scott teaches courses in crisis counseling, career counseling and advanced counseling techniques. He continues to be an advocate for the field of counseling by recently serving as the president of the South Carolina Counseling Association and working with his program’s graduate students to publish and present at the national level.

Selected Accomplishments

• Invited to provide testimony concerning trauma-informed care in South Carolina schools to the South Carolina Joint Citizens & Legislative Committee on Children

• Served as research consultant on a grant with a local non-profit agency working with at-risk youth

• Served as president of the South Carolina Counseling Association

• Published two books with nationally recognized publishers

• Serve as a Disaster Mental Health professional with the American Red Cross

• Co-presented with 16 master’s level students at national, peer-reviewed conferences (eight different conferences)

• Served as co-creator and co-editor of the South Carolina Counseling Journal

• Co-created an Identity Development Model, the Key Model, which is still being cited in current textbooks and journal articles
Beshah Ayalew, PhD
Professor
Automotive and Mechanical Engineering

Beshah Ayalew's expertise is in dynamical systems and control with applications in vehicle systems, energy and manufacturing processes. He is a founding faculty member of the Automotive Engineering graduate program at Clemson. He has personally developed/taught six new graduate courses and contributed to several more. He has had several successful collaborations with industry, chiefly Michelin, Toyota, Honda, Harris Corp. and BMW. He has also received multiple federal grants, including the NSF CAREER Award and a grant for the DOE GATE Center of Excellence in Sustainable Vehicle Systems, for which served as director 2015-17. He received the SAE Ralph R. Teetor Educational Award in 2014. He currently serves as the Graduate Program coordinator for the Automotive Engineering program.

Selected Accomplishments

- Elected Fellow of the American Society of Mechanical Engineers (March 2018) (honor for top 3.1% of society with 112,647 members)

- Graduated 10 Ph.D. and 16 MS students in mechanical and automotive engineering in 11 years. Graduates placed at top companies in R&D positions: Tesla, Michelin, Mereceds-Benz, Delphi/Aptive, Ford, Fiat Chrysler and TT faculty at UC-Denver

- Consistently excellent teaching evaluations on the main courses he teaches; above same level and departmental averages in nearly all questions on teaching effectiveness surveys. (>4.5/5)

- Total grants exceed $5.6m with his share at $3.24m

- Over 130 peer-reviewed journal and conference papers; over 20 journal papers published/accepted since 2016

- Chair, ASME Vehicle Design Committee; Associate Editor for ASME JDS-MC. Active in IEEE Control Systems Society
While still an undergraduate at Rutgers University, John Ballato and his mentor, Elias Snitzer, the “father of the glass laser,” invented a new process for manufacturing optical fibers. Their Molten Core Method enables a greater number of chemical compounds to be used to create new optical fibers. The molten core approach is now employed in over 40 countries to realize a very wide variety of novel and useful optical fibers, leading to countless technologies and practical uses. Ballato earned 14 patents from his dissertation work. Since joining Clemson in 1997, he has added 20 U.S. and foreign patents. As an entrepreneur, Ballato has founded two technology companies that have employed more than 70 people. As a principal investigator at Clemson, he has received more than $60 million in grants, contracts and gifts.

**Selected Accomplishments**

- Member, National Academy of Inventors
- Member, World Academy of Ceramics
- Fellow, Institute of Electrical and Electronics Engineers (IEEE)
- Traveling Lecturer, Optical Society of America (OSA)
- Principal Investigator (PI) on $1.7M Department of Defense High Energy Laser Program
- Clemson PI on $1.1M Department of Defense Multidisciplinary University Research Initiative (MURI) on Fiber Lasers
Celebrate Faculty

Nicole Martinez, PhD
Assistant Professor
Environmental Engineering and Earth Sciences

Nicole Martinez joined Clemson University as an Assistant Professor in 2014, as part of a program in the Department of Environmental Engineering and Earth Sciences designed to address broad environmental issues associated with anthropogenic and natural radioactivity. Martinez received her M.S. and Ph.D. in Radiological Health Sciences from Colorado State University. Prior to attending graduate school she served in the United States Navy as a nuclear power instructor and radiation health officer. Martinez's recent research has focused on the behavior and effects of radiological contaminants in the environment, to include radiation transport modelling, improved dosimetric methods, chronic low dose effects to and multi-contaminant response in non-human biota, and mechanisms of competitive uptake in plants.

Selected Accomplishments

• Selected to receive the Bo Lindell Medal for 2018, awarded by the Main Commission of the International Commission on Radiological Protection (ICRP). This is a new ICRP award and Dr. Martinez is the inaugural recipient of the medal, which recognizes early-to-mid career professionals who are making a significant contribution to the promotion of radiological protection. She will receive her medal in October 2018 at the celebration of the 90th anniversary of ICRP, to be held in Stockholm.

• Awarded a three-year, $800,000 grant from the Defense Threat Reduction Agency (DTRA) for research on Discriminatory Transcriptional Response of Environmental Microorganisms and Microbial Communities to Low-Dose Ionizing Radiation. There is an option for a two-year extension, totaling $1.5 million. Her co-principal investigator is Mark Blenner in the Department of Chemical and Biomolecular Engineering.

• First professor at Clemson University to partake of the Master Joint Faculty Agreement between Clemson University and the Oak Ridge National Laboratory. This has the potential to create a major opportunity for faculty throughout Clemson University.

• Nominated by the president of the Environmental/Radon section of the Health Physics Society for the Elda E. Anderson award, which is presented to a young member (under 40) of the Society for excellence in: research or development, discovery or invention, devotion to health physics, and/or significant contributions to the profession.
Daniel C. Whitehead, PhD
Assistant Professor
Chemistry

Dan Whitehead is an assistant professor of organic chemistry. His research is in organic synthetic methodologies and is focused on three areas: New reaction methodologies - Development of novel peptide based iodoarene catalysts for enantioselective synthesis; Materials chemistry - Preparation of biodegradable, functional nanoparticles capable of capturing volatile organic pollutants, and the synthesis of X-ray opaque polymers for medical imaging; and Bio-organic chemistry - Development of novel synthetic strategies for therapeutic agents for treatment of African sleeping sickness, diabetes, and various intestinal diseases. His research is funded by the National Science Foundation, the Juvenile Diabetes Research Foundation, and the Clemson University Animal Co-Products Research and Education Center.

Selected Accomplishments

• Current Research Funding of $550,000

• 33 publications, 18 from work at Clemson University

• 40 conference presentations

• Multi-year panelist, American Chemical Society Postdoc-to-Faculty workshop

• Founder of C3H - Clemson Chemistry Connection for Homeschoolers

• Developed Science Summer Camp at Clemson Montessori School
Saara J. DeWalt, PhD
Professor
Biological Sciences

Saara DeWalt is a plant population and community ecologist who studies exotic, invasive plants in their native and introduced ranges; woody vines species diversity and distributions; rare plant dynamics; tropical forest succession; and forest dynamics. She conducts most of her research in temperate and tropical forests, including on the island of Dominica in the Caribbean and central Panama. She is part of several regional and global networks that examine carbon dynamics, patterns of tree and woody vine diversity and composition, and changes over time. She has worked extensively in Costa Rica and Hawaii. Current research projects are supported by the U.S. Department of Agriculture National Institute of Food and Agriculture, the U.S. Forest Service, and the Clemson Caribbean Initiative. DeWalt teaches courses in biology of plants, community ecology, and current readings in ecology.

Selected Accomplishments

- Received a Clemson University Board of Trustees Award
- Published peer-reviewed journal articles in Nature (1), Science Advances (2), Proceedings of the National Academy of Sciences (2), and Annals of Botany
- Received a four-year $500,000 research grant from USDA NIFA (PI)
- Received over $100,000 in research grants and cost-sharing agreements from the U.S. Forest Service Southern Research Station (PI)
- Received a $10,000 seed grant from the Clemson Caribbean Initiative research grant from the National Park Service (PI)
- Quoted in articles on the Huffington Post “Regrowing Rain Forests May Help Curb Climate Change More Than We Thought” and Environmental Monitor “Secondary Forests Key To Mitigating Climate Change”
- Served as a Councilor for the Association for Tropical Biology and Conservation (2014-2017)
- Serves as Subject Editor for the academic journal for tropical biology, Biotropica
- Selected for the Trailblazers program, the Provost’s Mentoring Initiative for Faculty
Ramakrishna Podila, PhD  
Assistant Professor  
Physics and Astronomy

Ramakrishna Podila's research is focused on elucidating fundamental properties of materials at the nanoscale and using them for energy and biomedical applications. His group at the Clemson Nanomaterials Institute synergistically integrates the principles of condensed matter physics, materials science, physiological chemistry, and toxicology to develop efficient batteries, supercapacitors, triboelectric generators, biosensors, imaging probes, unique photonic devices, and drug delivery vehicles. His work thus far has led to >70 peer-reviewed articles (Citations: 2700; H-index: 30) in high-impact peer-reviewed journals including Nature, Advanced Materials, Advanced Energy Materials, ACS Nano, Nano Letters, two patents, and several invited talks at internationally reputed conferences such as MRS Fall meeting, ACS Spring meeting, an industrial sub-contract through Haworth, Inc.

Selected Accomplishments

- Published ~10 peer-reviewed articles in high-impact journals such as Advanced Materials in 2017
- Invited to present work on “defect-engineering in nanomaterials” at the reputed Materials Research Society 2017 Fall Meeting attended by ~10k scientist from 55 countries
- Received a U.S. patent for large scale manufacturing of nanomaterials-based energy storage devices in Fall 2017
- Filed a new provisional patent on “wireless triboelectric nanogenerators” in November 2017 based on a breakthrough published in Advanced Energy Materials, which attracted media attention from national and international news outlets (e.g., Fox Carolina news and The Hindu, a daily newspaper with 12 million readership)
- Awarded NASA grant ($750k, ~35% effort) for developing next-generation energy storage and thermal materials for Mars rovers and extra-vehicular activity suits in Spring 2018
- Awarded SC-EPSCoR/Idea stimulus funding ($300K, ~35% effort) for Li-S batteries for electric vehicles in Spring 2018
The university recognized its most accomplished faculty members with URSAAA awards during the 2018 Research Symposium. WATCH THE VIDEO HERE

The section includes a list of 2018 URSAAA recipients, the inaugural class.
University Research, Scholarship and Artistic Achievement Awards

MARCO AJELLO
Assistant Professor
Physics and Astronomy

Publication exceeding 1,000 citations

TODD ANDERSON
Assistant Professor
Art

Exhibit at the Metropolitan Museum of Art, New York

JEFFREY N. ANKER
Associate Professor
Chemistry

Publication exceeding 1,000 citations

SCOTT BAIER
Chair
Economics

Publication exceeding 1,000 citations

JOHN BALLATO
Endowed Chair
Materials Science & Eng.

Fellow of The American Ceramic Society; International Society of Optical Engineering; Optical Society of America; Academician in the World Academy of Ceramics; National Academy of Inventors

CELESTE BATES
Associate Professor
Education and Human Development

Annual expenditures exceeding $1 million
University Research, Scholarship and Artistic Achievement Awards

DONALD BEASLEY
Professor
Mechanical Engineering
Publication exceeding 1,000 citations

STAN BIRCHFIELD
Adjunct Associate Professor
Electrical and Computer Engineering
Publication exceeding 1,000 citations

DAVID BLAKESLEY
Professor and Campbell Chair in Technical Comm. English
Fellow of the Rhetoric Society of America

HOWARD BODENHORN
Professor
Economics
John Simon Guggenheim Fellowship in 2008-09

RAJENDRA K. BORDIA
Chair
Materials Science & Eng.
Fellow of the American Ceramic Society; Indian Institute of Metals; and World Academy of Ceramics; and Humboldt Senior Scientist Research Award recipient from the Alexander von Humboldt Foundation

JAMES BOTTUM
Research Professor
Electrical and Computer Engineering
Annual expenditures exceeding $1 million
University Research, Scholarship and Artistic Achievement Awards

VERNON BURTON
Professor
History
Pew National Fellow; Carnegie Scholar (2000-01)

MURRAY S. DAW
R.A. Bowen Professor
Physics and Astronomy
Publication exceeding 1,000 citations

LIANG DONG
Professor
Electrical and Computer Engineering
Annual expenditures exceeding $1 million

ANDREW DUCHOWSKI
Professor
School of Computing
Publication exceeding 1,000 citations

GERALD P. DWYER
Professor and BB&T Scholar
Economics
Publication exceeding 1,000 citations

F. ALEX FELTUS
Associate Professor
Genetics and Biochemistry
Publication exceeding 1,000 citations
ANAND GRAMOPADHYE
Dean
College of Engineering, Computing and Applied Sciences
Annual expenditures exceeding $1 million

WILLIAM HALLER
Associate Professor
Sociology, Anthropology and Criminal Justice
Publication exceeding 1,000 citations

DIETER HARTMANN
Professor
Physics and Astronomy
Publication exceeding 1,000 citations

CYNTHIA HAYNES
Professor
English
Rhetoric Society of America 2017 Annual Book Award

SANDRA HEDETNIEMI
Professor
School of Computing
Publication exceeding 1,000 citations

STEPHEN HEDETNIEMI
Professor Emeritus
School of Computing
Publication exceeding 1,000 citations
LARRY HODGES
Professor
School of Computing
Publication exceeding 1,000 citations

ADAM HOOVER
Professor, Electrical and Computer Engineering
Publication exceeding 1,000 citations

BRUCE KING
Professor
Psychology
Fellow of Association for Psychological Science, American Psychological Association, International Behavioral Neuroscience Society

MURIAM KONKEL
Assistant Professor
Genetics and Biochemistry
Publication exceeding 1,000 citations

ROBIN KOWALSKI
Professor
Psychology
Publication exceeding 1,000 citations

STEPHEN KRESOVICH
Coker Trustees Endowed Chair of Genetics
Genetics and Biochemistry; Plant and Environmental Sciences
Annual expenditures exceeding $1 million and publication exceeding 1,000 citations
THOMAS KUEHN
Professor
History
National Endowment for the Humanities Fellowship, 2003-04

MICHAEL LEMAHIEU
Associate Professor
English
American Council of Learned Societies (ACLS) Fellowship for 2018-2019

SUSAN LIMBER
Distinguished Professor
Youth, Family and Community Studies
Publication exceeding 1,000 citations

HAIBO LIU
Professor
Plant and Environmental Sciences
Publication exceeding 1,000 citations

GORDON (JEFF) LOVE
Research Professor
Languages
National Humanities Center Fellow.

IGOR LUZINOW
Professor
Materials Science & Engineering
Publication exceeding 1,000 citations
KEN MARCUS
Professor
Chemistry

Fellow of the Royal Society of Chemistry (London), the American Association for the Advancement of Science, the Society for Applied Spectroscopy, and the National Academy of Inventors.

RUSS MARION
Professor
Educational & Organizational Leadership Development
Publication exceeding 1,000 citations

JOSEPH P. MAZER
Associate Professor, Associate Department Chair Communication
Publication exceeding 1,000 citations

BERT MCCARTY
Professor
Plant and Environ. Sciences’ Fellowships with Crop Science Society of America and American Society of Agronomy

JAMES MCCUBBIN
Assistant Professor
Civil Engineering
Publication exceeding 1,000 citations. Fellow of the American Psychological Association, the Academy of Behavioral Medicine Research, and the Society for Behavioral Medicine

ASHOK MIRSHA
Assistant Professor
Civil Engineering
Publication exceeding 1,000 citations
University Research, Scholarship and Artistic Achievement Awards

MARIBEL MOREY
Assistant Professor
History
Andrew Carnegie Fellowship from the Carnegie Corporation of New York (2016-2018)

LEE MORRISSEY
Professor
English
Fulbright Scholar at the National University of Ireland-Galway in the 2010-2011 academic year.

ANGELA NIAMOU
Associate Professor
English
2016 Association for the Study of the Arts of the Present (ASAP) Book Prize

JASON OSBORNE
Dean
Graduate School
Publication exceeding 1,000 citations

JUNE J. PILCHER
Alumni Distinguished Professor
Psychology
Publication exceeding 1,000 citations and Fulbright-Freud Visiting Scholar Award and Fulbright Specialist in Public/Global Health

T. ANDREW POEHLMAN
Assistant Professor
Marketing
Publication exceeding 1,000 citations
University Research, Scholarship and Artistic Achievement Awards

**BRIAN A. POWELL**
Professor
Environmental Engineering & Earth Sciences

Annual expenditures exceeding $1 million

**SAMANTHA A. PRICE**
Assistant Professor
Biological Sciences

Publication exceeding 1,000 citations

**APPARAO RAO**
Associate Dean for Discovery
College of Science

Publication exceeding 1,000 citations

**ALEDA ROTH**
Burlington Industries
Distinguished Professor Management

Publication exceeding 1,000 citations

**LAXMIKANT SARAF**
Director
Electron Microscopy Lab

Publication exceeding 1,000 citations

**MARK SMALL**
Chair
Youth, Family and Community Studies

Fulbright awards in 2004 as a traditional scholar in the Czech Republic; in 2006 as a senior specialist in the Czech Republic; and as a core scholar in Albania from 2015-2017, and publication exceeding 1,000 citations
University Research, Scholarship and Artistic Achievement Awards

KERRY SMITH
Professor
Genetics and Biochemistry

Annual expenditures exceeding $1 million

CHAD SOSLIK
Professor
Physics and Astronomy

Annual expenditures exceeding $1 million

STEVEN J. STUART
Professor
Chemistry

Publication exceeding 1,000 citations

ROBERT TAMURA
Professor
Economics

Publication exceeding 1,000 citations

LESLY TEMESVARI
Alumni Distinguished Professor
Biological Sciences

Annual expenditures exceeding $1 million

JERRY TESSENDORF
Professor
School of Computing

Received a Technical Achievement Award from the Academy of Motion Picture Arts and Sciences and is a Fellow of the Hagler Institute for Advanced Study
University Research, Scholarship and Artistic Achievement Awards

SUMANTA TEWARI
Associate Professor
Physics and Astronomy
Publication exceeding 1,000 citations

TERRY TRITT
Professor and Chair
Physics and Astronomy
Publication exceeding 1,000 citations

BRYGG ULLMER
Professor
School of Computing
Publication exceeding 1,000 citations

MAREK URBAN
J.E. Sirrine Foundation
Endowed Chair
Materials Science & Engineering
Publication exceeding 1,000 citations and fellowship in the Chemical Heritage Foundation, The Royal Society of Chemistry, and The American Chemical Society (Polymeric Materials Science and Engineering Division)

VICTOR J. VITANZA
Professor
English
Fellows of the Rhetoric Society of America and awarded the George E. Yoos Distinguished Service Award

NERNDRA R. VYAVAHARE
Hunter Endowed Chair
Bioengineering
Annual expenditures exceeding $1 million
When scientists are recognized nationally and internationally at the highest levels, as our URSAAA recipients have been, it confirms impact. Institutional recognition like this reminds them that their work is important, that it is appreciated, and that their accomplishments are something for other faculty to aspire to. It is in this spirit that we created URSAAA.”

- Tanju Karanfil
Vice President for Research
4. Research Metrics
EXECUTIVE SUMMARY

1. Clemson continues to secure competitive awards
   - Clemson has been successful in winning large awards (>$2M), winning 27 major awards since 2015 valued at a total of $154 million.
   - Clemson continues to succeed in obtaining awards, reaching record growth to $136M by May of FY2018. (Chart, Page 5)
   - Clemson’s research expenditures continue to strengthen. FY2018 will see an estimated total of $90-95M by fiscal year end.

2. Proposal submissions have softened
   - Successes in obtaining large awards since 2015 are shifting faculty focus from submitting proposals to managing awards.
   - Due to federal budget constraints, federal agencies have delayed the release of calls for proposals of interest.
   - Steady growth of Clemson University’s student population has created additional teaching demands on faculty.
   - Leadership changes in four colleges (four new deans) have been taking place in the past years.

3. We are working to boost proposal submissions
   - Provost has set goals with college deans, establishing submission targets in order to reach ClemsonForward goals.
   - Continuing support for R-Initiatives to provide funding for faculty in pursuit of large grant applications and for hiring research faculty.
   - Offering support via the Office of Research Development to aid in the development of large, complex proposals.
   - Reorganizing CURF to further grow industry/privately funded sponsored research.
   - The Office of External Affairs is developing strategic initiatives to attract new research funding to Clemson.
PROPOSAL SUBMISSIONS  
CUMULATIVE NO. 2013-2018

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<th></th>
<th>Jul</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
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<td>325</td>
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<td>229</td>
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<td>715</td>
<td>865</td>
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<td>623</td>
<td>705</td>
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PROPOSAL SUBMISSIONS
REQUESTED $: 2013-2018

Proposition Submissions ($): Ranges

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<th>Year</th>
<th>&lt; $100K</th>
<th>$100K-$200K</th>
<th>$200K-$500K</th>
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<td>317</td>
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<td>313</td>
<td>131</td>
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<td>FY2017</td>
<td>744</td>
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<td>335</td>
<td>146</td>
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<td>b. Proposal Submissions (Key Personnel Allocation, Value)</td>
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<td>2015</td>
<td>2016</td>
<td>2017</td>
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### RESEARCH INPUTS (continued)

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</table>
c. Research Awards | $78,013,996    | $79,728,290   | $89,313,594   | $100,861,140  | $109,488,152  | $136,451,485  |
| 23 AAH     | $224,473      | $590,154      | $656,030      | $1,400,972    | $1,519,688    | $1,813,385    |
| 24 CAFLS   | $7,284,564    | $6,659,619    | $14,149,829   | $8,619,438    | $10,898,288   | $10,797,786   |
| 25 CBSHS   | $2,737,876    | $3,385,989    | $4,776,199    | $5,065,880    | $4,564,531    | $6,840,928    |
| 26 CECAS   | $34,201,429   | $37,723,081   | $43,231,494   | $45,535,064   | $54,000,082   | $75,246,348   |
| 27 COE     | $2,629,505    | $4,089,157    | $3,203,419    | $2,945,717    | $2,774,422    | $3,866,135    |
| 28 COB     | $2,023,722    | $1,114,979    | $1,312,998    | $783,916      | $1,179,733    | $1,113,107    |
| 29 COS     | $10,344,423   | $7,780,394    | $9,938,990    | $15,605,625   | $19,899,415   | $13,505,312   |
| 30 CCIT    | $1,617,466    | $5,675,854    | $668,873      | $819,396      | $477,594      | $1,340,010    |
| 31 PSA     | $14,827,292   | $12,284,142   | $9,588,294    | $12,965,629   | $7,908,591    | $6,244,773    |
| 32 VP for Res & Interdisc Inst | $1,790,060 | $268,882 | $573,565 | $5,139,315 | $5,030,743 | $14,075,729 |
| 33 All Other | $333,188 | $156,039 | $1,213,903 | $1,980,188 | $1,235,065 | $1,607,972 |
d. Notable Awards
|   |               |               |               |               |               |               |
| 34 NSF CAREER Awards (by start date) | 4 | 1 | 3 | 5 | 7 | 6 |
| 35 NIH R01-Equivalent Awards (by start date) | - | - | 2 | 2 | 2 | 3 |
| 36 NIH Career Awards (by start date) | 1 | - | - | - | - | - |
| 37 Air Force Young Investigator Awards | - | - | 1 | 2 | - | - |
| 38 DOE Early Career Awards | 1 | - | - | - | - | - |
e. Supporting Workforce
|   |               |               |               |               |               |               |
| 39 Graduate Student Enrollment | 4,206 | 4,372 | 4,670 | 4,664 | 4,425 | 4,985 |
| 40 Sponsored Graduate Research Assistants | 822 | 745 | 707 | 693 | 696 | 761 |
| 41 Postdoctoral Fellows | 48 | 64 | 83 | 85 | 90 | 97 |
| 42 Research Faculty: Permanent 100% Non-E&G Funded | 6 | 6 | 6 | 11 | 17 | 14 |
| 43 Research Faculty: Temporary 100% Non-E&G Funded | 18 | 18 | 15 | 14 | 24 | 27 |
## RESEARCH PROCESS

### f. Sponsored Research Expenditures by Business Unit **

<table>
<thead>
<tr>
<th>Business Unit</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAH</td>
<td>$504,683</td>
<td>$378,112</td>
<td>$419,440</td>
<td>$1,104,015</td>
<td>$1,324,634</td>
<td>$1,167,205</td>
</tr>
<tr>
<td>CAFLS</td>
<td>$8,768,472</td>
<td>$7,706,442</td>
<td>$6,752,344</td>
<td>$8,631,050</td>
<td>$11,066,587</td>
<td>$9,297,482</td>
</tr>
<tr>
<td>COB</td>
<td>$1,239,726</td>
<td>$1,200,289</td>
<td>$1,081,898</td>
<td>$958,613</td>
<td>$867,778</td>
<td>$691,261</td>
</tr>
<tr>
<td>CECAS</td>
<td>$34,969,267</td>
<td>$34,550,052</td>
<td>$34,968,963</td>
<td>$37,483,798</td>
<td>$42,945,440</td>
<td>$36,584,218</td>
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<tr>
<td>CBSHS</td>
<td>$3,050,080</td>
<td>$2,817,714</td>
<td>$3,680,307</td>
<td>$4,068,139</td>
<td>$4,413,360</td>
<td>$4,162,438</td>
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<tr>
<td>COE</td>
<td>$3,286,747</td>
<td>$3,256,328</td>
<td>$3,793,915</td>
<td>$2,510,444</td>
<td>$2,800,041</td>
<td>$1,893,362</td>
</tr>
<tr>
<td>COS</td>
<td>$13,209,952</td>
<td>$10,501,024</td>
<td>$9,286,770</td>
<td>$11,327,997</td>
<td>$14,777,229</td>
<td>$13,499,377</td>
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<tr>
<td>CCIT</td>
<td>$1,996,620</td>
<td>$1,631,199</td>
<td>$3,400,258</td>
<td>$2,775,609</td>
<td>$426,836</td>
<td>$412,488</td>
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<tr>
<td>PSA</td>
<td>$4,746,123</td>
<td>$4,858,414</td>
<td>$5,847,737</td>
<td>$5,588,699</td>
<td>$5,749,370</td>
<td>$5,275,174</td>
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<tr>
<td>VP for Res &amp; Interdisc Inst</td>
<td>$1,878,676</td>
<td>$1,302,734</td>
<td>$1,892,429</td>
<td>$3,531,216</td>
<td>$3,930,146</td>
<td>$3,353,794</td>
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<tr>
<td>All Other</td>
<td>$1,738,332</td>
<td>$1,705,355</td>
<td>$2,183,847</td>
<td>$1,513,750</td>
<td>$1,465,867</td>
<td>$1,319,128</td>
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</table>

### g. Sponsored Research Expenditures by Innovation Cluster

<table>
<thead>
<tr>
<th>Innovation Cluster</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Materials</td>
<td>$14,258,840</td>
<td>$11,288,090</td>
<td>$10,713,746</td>
<td>$10,385,364</td>
<td>$10,704,113</td>
<td>$9,280,317</td>
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<tr>
<td>Cyberinfrastructure and Big Data Science</td>
<td>$10,277,111</td>
<td>$10,513,388</td>
<td>$10,137,409</td>
<td>$8,874,268</td>
<td>$8,125,965</td>
<td>$7,166,974</td>
</tr>
<tr>
<td>Energy, Transportation and Advanced Manufacturing</td>
<td>$4,687,300</td>
<td>$5,680,684</td>
<td>$7,236,983</td>
<td>$7,645,169</td>
<td>$17,772,810</td>
<td>$14,278,788</td>
</tr>
<tr>
<td>Human Resilience</td>
<td>$8,200,415</td>
<td>$7,708,375</td>
<td>$9,700,880</td>
<td>$9,762,842</td>
<td>$7,800,667</td>
<td>$7,395,527</td>
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<tr>
<td>Sustainable Environments</td>
<td>$18,331,776</td>
<td>$16,877,332</td>
<td>$17,926,296</td>
<td>$21,723,962</td>
<td>$18,924,983</td>
<td>$16,611,181</td>
</tr>
<tr>
<td>Other</td>
<td>$6,518,006</td>
<td>$7,591,364</td>
<td>$7,404,505</td>
<td>$8,631,335</td>
<td>$9,922,442</td>
<td>$8,243,503</td>
</tr>
</tbody>
</table>

### h. Sponsored Research Expenditures by Funding Source

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Gov</td>
<td>$62,890,679</td>
<td>$56,872,229</td>
<td>$58,457,288</td>
<td>$65,135,890</td>
<td>$74,571,410</td>
<td>$64,195,989</td>
</tr>
<tr>
<td>Foundations, Societies, and Associations</td>
<td>$4,221,409</td>
<td>$4,294,121</td>
<td>$4,741,795</td>
<td>$4,137,246</td>
<td>$4,696,551</td>
<td>$4,402,256</td>
</tr>
<tr>
<td>Industry/Other</td>
<td>$4,930,465</td>
<td>$5,641,543</td>
<td>$6,071,417</td>
<td>$6,870,782</td>
<td>$6,793,645</td>
<td>$5,106,953</td>
</tr>
<tr>
<td>International</td>
<td>$813,542</td>
<td>$577,879</td>
<td>$765,179</td>
<td>$778,835</td>
<td>$517,558</td>
<td>$378,506</td>
</tr>
<tr>
<td>Local Gov</td>
<td>$597,732</td>
<td>$614,527</td>
<td>$578,235</td>
<td>$530,909</td>
<td>$523,786</td>
<td>$467,523</td>
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<tr>
<td>State Gov</td>
<td>$1,934,852</td>
<td>$1,907,364</td>
<td>$2,693,993</td>
<td>$2,039,667</td>
<td>$2,444,338</td>
<td>$3,104,703</td>
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</table>
### RESEARCH PROCESS continued

#### i. Sponsored Research Expenditures per T/TT Faculty by College

<table>
<thead>
<tr>
<th>College</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAH</td>
<td>$3,299</td>
<td>$2,264</td>
<td>$2,343</td>
<td>$5,841</td>
<td>$8,177</td>
<td>$7,205</td>
</tr>
<tr>
<td>CAFLS</td>
<td>$88,570</td>
<td>$81,120</td>
<td>$69,612</td>
<td>$84,618</td>
<td>$105,396</td>
<td>$87,712</td>
</tr>
<tr>
<td>COB</td>
<td>$14,415</td>
<td>$13,047</td>
<td>$11,510</td>
<td>$9,683</td>
<td>$8,855</td>
<td>$6,913</td>
</tr>
<tr>
<td>CECAS</td>
<td>$169,754</td>
<td>$160,698</td>
<td>$163,406</td>
<td>$163,685</td>
<td>$194,323</td>
<td>$174,211</td>
</tr>
<tr>
<td>CBHS</td>
<td>$27,982</td>
<td>$26,853</td>
<td>$33,764</td>
<td>$42,376</td>
<td>$34,751</td>
<td>$34,118</td>
</tr>
<tr>
<td>COE</td>
<td>$54,779</td>
<td>$51,688</td>
<td>$62,195</td>
<td>$38,037</td>
<td>$44,483</td>
<td>$35,062</td>
</tr>
<tr>
<td>COS</td>
<td>$95,724</td>
<td>$72,421</td>
<td>$61,912</td>
<td>$77,589</td>
<td>$95,956</td>
<td>$88,812</td>
</tr>
<tr>
<td>CU average (Total exp/Total T/TT faculty)</td>
<td>$83,858</td>
<td>$75,089</td>
<td>$78,826</td>
<td>$85,753</td>
<td>$84,297</td>
<td>$74,277</td>
</tr>
</tbody>
</table>

### RESEARCH OUTPUTS/OUTCOMES

<table>
<thead>
<tr>
<th>Metric</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctorates Awarded (Aug, Dec, May)</td>
<td>187</td>
<td>217</td>
<td>237</td>
<td>233</td>
<td>231</td>
<td>234</td>
</tr>
<tr>
<td>STEM Doctorates Awarded (Aug, Dec, May)</td>
<td>118</td>
<td>153</td>
<td>165</td>
<td>138</td>
<td>156</td>
<td>171</td>
</tr>
<tr>
<td>Disclosures</td>
<td>102</td>
<td>129</td>
<td>70</td>
<td>60</td>
<td>65</td>
<td>48</td>
</tr>
<tr>
<td>Patents</td>
<td>16</td>
<td>15</td>
<td>15</td>
<td>14</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>Licenses/Options</td>
<td>9</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Licensing Revenue</td>
<td>$1,134,289</td>
<td>$762,811</td>
<td>$360,131</td>
<td>$354,827</td>
<td>$539,490</td>
<td>$388,751</td>
</tr>
<tr>
<td>Start-up Companies (based on licenses/options above)</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

### THE BOTTOM LINE

<table>
<thead>
<tr>
<th>Metric</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Awards</td>
<td>$78,013,996</td>
<td>$79,728,290</td>
<td>$89,313,594</td>
<td>$100,861,140</td>
<td>$109,488,152</td>
<td>$136,451,485</td>
</tr>
<tr>
<td>Other Sponsored Program Awards (CCIT Medicaid)</td>
<td>$24,009,167</td>
<td>$28,567,490</td>
<td>$32,532,784</td>
<td>$58,187,130</td>
<td>$354,827</td>
<td>$77,665,928</td>
</tr>
<tr>
<td>** Awards Total</td>
<td>$102,023,163</td>
<td>$108,295,780</td>
<td>$121,846,378</td>
<td>$159,048,270</td>
<td>$109,488,152</td>
<td>$136,451,485</td>
</tr>
<tr>
<td>Research Expenditures</td>
<td>$75,388,679</td>
<td>$69,907,663</td>
<td>$73,307,908</td>
<td>$79,493,329</td>
<td>$89,547,288</td>
<td>$77,655,928</td>
</tr>
<tr>
<td>Other Sponsored Programs Expenditures</td>
<td>$24,009,167</td>
<td>$28,567,490</td>
<td>$32,532,784</td>
<td>$58,187,130</td>
<td>$354,827</td>
<td>$77,665,928</td>
</tr>
<tr>
<td>Less CURF Indirect Expenditures</td>
<td>$1,303,354</td>
<td>$743,951</td>
<td>$684,695</td>
<td>$574,081</td>
<td>$255,982</td>
<td>$106,634</td>
</tr>
<tr>
<td>Sponsored Research and Programs Expenditures</td>
<td>$98,094,492</td>
<td>$97,731,202</td>
<td>$105,155,997</td>
<td>$137,106,378</td>
<td>$89,291,306</td>
<td>$77,549,294</td>
</tr>
</tbody>
</table>

* FY15-18 Submissions are by faculty % allocation. There was insufficient data to attribute FY13 and FY14 similarly.

** See section c. above

*** See section f. above

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**Research Metrics**

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9
5. Significant Awards
1 Sandra Eksioglu - $1.2 million  “Integrated Process Optimization for Biochemical Conversion”  
USDA/DOE – NATIONAL INSTITUTE OF FOOD AND AGRICULTURE/ENERGY EFFICIENCY AND RENEWABLE ENERGY  
Clemson University, joined by the Idaho National Lab, University of Texas at San Antonio and industry partners, will develop processes to make biofuels a sustainable energy source, reducing dependence on petroleum as the primary energy stock in the United States.

2 David Jachowski - $1 million  “Doe and Fawn Movement and Survival in the Piedmont of S.C.”  
S.C. DEPARTMENT OF NATURAL RESOURCES  
Clemson University researchers will study populations of white-tailed deer does and fawns across the state to determine factors which might be limiting deer populations, particularly in Upstate South Carolina. By fitting animals with GPS collars, researchers hope to track movements of doe-fawn pairs to learn what factors most contribute to fawn mortality.

National Science Foundation  
Genomics research has been powered by advances in computing capabilities and by rapidly improving sequencing technologies. Clemson researchers will develop state-of-the-art computing algorithms to efficiently decode genetic information, saving time and computing resources.
## 4. Roy Jones - $700,000
**“Call Me MISTER”**

**SUNSHINE LADY FOUNDATION, INC**

This award provides funding through 2021 for the Call Me MISTER (Mentors Instructing Students Toward Effective Role Models) initiative at Clemson. Call Me MISTER aims to increase the pool of available teachers from a broader, more diverse background, particularly for South Carolina’s lower-performing elementary schools. The program provides tuition assistance to Clemson students who are pursuing degrees in education.

## 5. Zoran Filipi - $600,000
**“Thermal Barrier Coatings for Improving Thermal Efficiency of a Heavy Duty Engine”**

**Department of Energy/Industry Partners**

Working with Oak Ridge National Labs and industry partners, Clemson University researchers will develop specialized thermal coatings to be applied to engine parts in order to reduce heat loss during combustion. Retaining energy by reducing heat loss during combustion will improve engine efficiency.

## 6. Stephen Moysey - $600,000
**“IUSE:EHR: Assessing Virtual Reality Field Experiences for Enhanced Learning in the GeoSciences”**

**National Science Foundation**

Clemson University researchers will partner with other institutions and industry to develop best practices for the integration of virtual reality technologies into geosciences pedagogy to translate real-world field experiences to virtual reality field experiences.

## 7. Lu Shi - $600,000
**“Mindfulness Interventions to Address Depression, Substance Misuse and Physical Inactivity”**

**GREENVILLE HEALTH AUTHORITY**

Clemson will partner with the Greenville Hospital System and other community partners to provide mindfulness training programs for priority populations in Greenville County. The interventions will prevent depression relapse, enhance recovery from alcohol and opioid misuse and increase physical activity while training local professionals.
Calmodulin (or calcium-modulated protein) is a fundamental calcium-binding molecule and essential to processes like inflammation, metabolism, smooth muscle contraction and memory by interacting with hundreds of target molecules. The researcher will guide students as they characterize and model this flexible and dynamic molecule.

**Leah Casabianca - $600,000**

**“Characterizing Nanoparticle Surface Interactions Using Dissolution Dynamic Nuclear Polarization-Enhanced Nuclear Magnetic Resonance”**

**National Science Foundation CAREER**

The use of nanotechnology in medicine and consumer products is accelerating. However, very little is known about how molecules bind to or are absorbed onto the surface of nanoparticles. Determining the mechanisms of interaction of small molecules, peptides and proteins bound to a nanoparticle’s surface can lead to a fuller understanding of nanoparticle’s helpful or harmful impacts on the body.

**Ethan Kung - $500,000**

**“Hybrid Experimental-Computational Modeling Framework for Transformative Research and Multidisciplinary Education in Cardiovascular Biomechanics”**

**National Science Foundation CAREER**

Development of new medical devices and treatment protocols, particularly those designed to prolong the lives of cardiac patients, is costly and complex. Testing for safety, first in animals and later in clinical trials, slows development of these protocols and devices. The researcher will use an integrated approach to develop a physiological/biomechanical model of cardiovascular function, permitting testing of novel cardiac devices without the use of animal or human testing. This will reduce cost of device development, while improving patient safety.
The Faculty Early Career Development (CAREER) Program is the National Science Foundation’s most prestigious awards 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 department or organization.

**NSF CAREER Award Winners for 2018**

Joshua Bostwick  
Mechanical Engineering

Leah Casabianca  
Chemistry

Ethan Kung  
Mechanical Engineering

Suyi Li  
Mechanical Engineering

Sara Riggs  
Industrial Engineering

Hugo Sanabria  
Physics