

# University Research Report

- Focus on Faculty
- Research Metrics
- Significant Awards

# Focus on 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.

# College of Agriculture, Forestry and Life Sciences



**Marzieh Motallebi, PhD**  
**Assistant Professor**  
**Department of Forestry and Environmental Conservation**

Marzieh Motallebi is a natural resource economist who works on economic and human dimensions of environmental markets. She received her PhD in Ecology from Colorado State University where she worked on economic, hydrological, behavioral, and ecological aspects of the water quality trading market in Jordan Lake, NC.

Marzieh's current projects are supported by the SC USDA NRCS and the United Sorghum Checkoff Program. She is heavily involved in applying for federal and state grants and collaborating with her colleagues. Her research lab consists of one post-doctoral fellow, one Master's student, and she is in the midst of hiring two PhD students for Jan 2018. She also serves as a search committee member for hiring new assistant professors in the Forestry and Environmental Conservation Department.

## Bulleted list of accomplishments:

- Awarded a research grant from SC NRCS for Promotion of a Sustainable Carbon Market to South Carolina Forest Landowners (total funds \$149,862 (1:1 matching funds)) (PI)
- Awarded a research grant from SC NRCS for Evaluating the Potential of Organic Farming Practices in SC. SC NRCS (total funds \$149,752 (1:1 matching funds)) (PI)
- Awarded a research grant from the United Sorghum Checkoff Program for Sorghum as a Feedstuff for Gamebirds and Broilers in the Southeast. United Sorghum Checkoff Program (requested funds \$123,415) (Co-PI)
- Awarded a research grant from SC NRCS for Design of a Framework for Payments for Ecosystem Services and Analysis of Adoption Behavior in the Santee Basin. SC USDA NRCS (requested funds \$149,730 (1:1 matching funds)) (Co-PI)
- Published four peer-reviewed journal articles, one peer-reviewed conference proceeding article, and one Clemson Cooperative Extension factsheet on "Carbon Offsets for South Carolina Family Forest Landowners."
- Planner and organizer of the 2017 Benthic Ecology Conference.
- Conducted a workshop on Carbon Markets for South Carolina.
- Co-conducted a workshop on The Business of Recycling.
- Baruch Institute representative for the South Carolina Coastal Information Network (SCCIN).
- Invited Guest Speaker- Oklahoma State University, University of Kentucky, and College of Charleston.
- Conducted a state-wide survey on consumers' and producers' perceptions about agricultural organic products.
- Conducted a state-wide survey on forest landowners' perception about willingness to participate in the carbon market.



**Angela M. Fraser, PhD**  
**Associate Professor**  
**Department of Food, Nutrition, and Packaging Sciences**

Angela Fraser is an infectious disease/food safety expert who studies interventions to prevent infectious disease. The main focus of her scholarly activities is controlling and preventing foodborne disease and acute gastroenteritis in institutional settings -- child care, long-term care, and schools. In addition to her food safety/infectious disease control work, she also works on community-based projects, such as assessing the readiness of congregate nutrition sites to implement educational interventions, exploring factors that influence participation in the South Carolina School Lunch Program, and examining barriers and challenges of institutional foodservice operations sourcing produce from small farms. All current research projects are

supported by the U.S. Department of Agriculture. Fraser also teaches two required courses in the Didactic Program for Dietetics – NUTR 2160: Evidence-based Nutrition and FDSC 3060: Institutional Foodservice Operations. Her current research group consists of one full-time project coordinator, two M.S. students and two PhD students.

Bulleted List of Accomplishments:

- Co-Project Director for the NoroCORE project, a collaboration of 19 universities/research institutions (10 major partners and 9 collaborators) and over 30 industry stakeholders. The long-term goal of NoroCORE is to reduce the burden of foodborne disease associated with viruses, particularly noroviruses using a collaborative, team science approach.
- Submitted 21 research proposals—12 as PD, five as Co-PD, and three as a Collaborator. Twelve were funded (\$4.2 million) and two are still under review, one to the National Institutes of Health.
- Corresponding author/first author on 23 articles with undergraduate/graduate students coauthoring 14 articles.
- Authored 52 proceedings/abstracts -- undergraduate/graduate students were co-authors on 20 abstracts.
- Serving as Chair of Clemson Online Faculty Advisory Board.



**Sarah A. White, PhD**  
**Associate Professor**  
**Department of Plant and Environmental Sciences**

Sarah White is an environmental toxicologist who studies the use of plant-based treatment systems to clean water. She helps both nursery and greenhouse industries adopt technologies to recycle water, preserving water resources for human and environmental purposes, while ensuring continued resources for green industry sustainability. She conducts most of her research in SC, but also collaborates extensively across the continental United States.

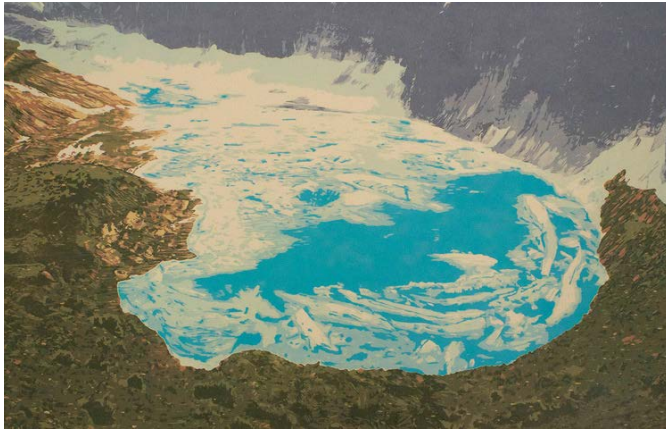
Current research projects are supported by the National Institute of Food and Agriculture-United

States Department of Agriculture – Specialty Crop Research Initiative, the SC Institute for Water Research (USGS), and the Horticulture Research Institute. She serves as faculty advisor for the Horticulture Club. Her research lab consists of one research assistant professor, two PhD students, one Master's student, and three undergraduate research interns. For the past two summers, undergraduate students from St. Francis University and Lincoln University also worked with her.

Bulleted list of accomplishments:

- Received an \$8.26M + \$1.78M cost-share (\$10.04M) research grant from NIFA-USDA, Specialty Crops Research Initiative and directed the project with 21 Co-PIs and 9 Institutions to “Clean WaterR<sup>3</sup>: Reduce, Remediate, Recycle” irrigation water at nursery operations (PD).
- Participating in the Presidents Leadership Institute and LEAD21 (Class 13)
- Received \$26,115 from USGS – Water Resources Commission (Co-PI)
- Received \$28,200 from the Horticulture Research Institute (PI)
- Gave 2 invited seminars at the University of Connecticut and the University of Georgia.
- Consulting editor for *HortTechnology*, Nursery Crops
- Released *GroZone Tracker*, a smart phone application (Co-PI)
- Education Advisor for the SC Nursery and Landscape Association and the SC Green Industry Association.
- Chair of the Plant and Environmental Sciences Department Tenure, Promotion and Reappointment Committee and Department Faculty Advisory Committee.
- Chair of the Southern Nursery Integrated Pest Management Working Group
- Chair of the Executive Committee of the from Southern Region American Society for Horticultural Science (SR-ASHS)
- Blue Ribbon Extension Publication Award from SR-ASHS

## College of Architecture, Arts and Humanities



**Todd Anderson, MFA**  
**Assistant Professor**  
**Department of Art**

Todd Anderson received his Bachelor of Fine Arts from the University of Wisconsin-Madison in 1997 and his Master of Fine Arts (with Distinction) from the University of New Mexico in 2004. Anderson worked at various Fine Art print studios over the course of seven years including Tandem Press (Madison, Wisconsin, USA), The Tamarind Institute of Lithography

(Albuquerque, New Mexico, USA) and The Artist's Press (Mpumalanga, Republic of South Africa). He is currently a researcher and professor at Clemson University and his work has been widely exhibited nationally and internationally. His artwork is in numerous notable collections including the New York Public Library Print Collection, The U.S. Library of Congress Print Collection and the Metropolitan Museum of Art.

### Bulleted List of Accomplishments:

- Professor Anderson has done extensive work documenting climate change through artistic interpretations of glacial melt in the project *The Last Glacier* (<http://www.thelastglacier.com/anderson/>). This work has gained international attention, and has been acquired by the Metropolitan Museum of Art, the New York Public Library, Yale's Haas Family Arts Library, the US Library of Congress, among others.
- Anderson will return to the gallery with a new series of works featuring the stunning vistas and unmatched beauty of Rocky Mountain National Park.
- Todd Anderson and Ian van Coller's book of original art, "Mount Kilimanjaro – The Last Glacier," was acquired by Stanford University Ute and Bill Bowes Art and Architecture Library Special Collections, and over the summer he was invited to exhibit his work at the prestigious Kai Lin Art Gallery in Atlanta.



**Stephen Fitzmaurice, MIP**  
**Assistant Professor**  
**Department of Languages and Literature**

Stephen Fitzmaurice is an Assistant Professor of Interpreting: American Sign Language (ASL), ASL Section Head, and lead faculty for the ASL-English Educational Interpreting program. Professor Fitzmaurice holds a Masters of Interpreter Pedagogy degree from Northeastern University and has earned several national interpreter certifications including: Registry of Interpreters for the Deaf Certificate of Interpretation and Certification of Transliteration; National Interpreter Certificate: Advanced; National Association of the Deaf Master Interpreter Certification;

and an Educational Interpreter Performance Assessment rating of 4.5. He is currently earning his PhD from Galludet University. Stephen is the Director of the South Carolina Educational Interpreting Center and has worked as a professional ASL-English interpreter for over twenty-five years. He is also the recipient of the National Association of the Deaf Golden Hands Award and is the current past-President of the South Carolina Registry of Interpreters for the Deaf. Professor Fitzmaurice lectures extensively on developing interpreting skills for in-service ASL-English interpreters and has scholarly interests spanning: second language acquisition; metacognitive processing of interpreters; ASL linguistics; literacy development of Deaf children; and educational access via interpreting services.

Bulleled List of Accomplishments:

- In November 2016, Professor Fitzmaurice was awarded a grant worth just over \$1,000,000 to start an Educational Interpreting Center to benefit the entire state. He says the “grant is new but feels old” because he spent two years “convincing the S.C. State Department of Education they needed to fix the current population of [educational] interpreters”. The grant is atypical in that the SC State Department of Education didn’t send out requests for grant proposals to create the center, he approached them and convinced them this was something that would benefit the state. Schools are legally obligated to provide interpreters for Deaf students; however, there are currently no certification requirements regulating educational interpreters (legislation is currently being proposed that would require a minimum level of certification and is hoped to be passed within the year) and therefore the skills of those working in the schools as interpreters vary greatly. This project will build up the state capacity to serve its underserved population, and help Clemson meet some of its core public service roles.



**Lee Morrissey, PhD**  
**Associate Professor**  
**Department of English**

Lee Morrissey's work focuses on relationships between literature and intellectual history, political philosophy, religion, and theory, largely in the seventeenth and eighteenth centuries. His main areas of interest include: the history and theory of literary criticism, Restoration and eighteenth-century English literature, Milton, the Enlightenment and the question of modernity, early democratic political theory, the sixteenth- and seventeenth-century Anglo-Irish encounter, and relationships among the arts. At Clemson, he has served as Department Chair, Alumni Distinguished Professor, named Student

Government Teacher of Excellence, and the recipient of the Gentry Award for Teaching in the Humanities. He has been awarded a Newberry Library Short-Term Fellowship, an NEH Summer Stipend, a Fulbright Scholarship (National University of Ireland, Galway), and a Muriel McCarthy Research Fellow, at Marsh's Library, Dublin.

Bulleted List of Accomplishments:

- Morrissey has recently been awarded a prestigious National Endowment for the Humanities grant under the "Creating Humanities Communities" program (\$30,000). The award, titled "My Name: African Americans in Early Clemson University History" is an ethnographic project that seeks to explore the lived experiences of Native Americans and African Americans and their contributions to Clemson University's history. Given the nature of race and history dynamics that have been a prominent part of Research I universities over the past several years, this effort aims to manage an important and growing conversation about American higher education institutions.

## College of Behavioral, Social and Health Sciences



**Lori A. Dickes, PhD**  
**Assistant Professor**  
**Program Coordinator MPA program**  
**Department of Parks, Recreation and Tourism Management**

Lori A. Dickes is a Policy and Economic Analyst whose research focuses on economic and community development and how we create stronger more resilient communities. She is currently the program director of the Masters in Public Administration Program.

She has several streams of research focusing on regional and rural economic development, the economic and social impacts of natural resource policy and management, and the economic impacts of public health policy. Some examples of her research include the importance of broadband policy and infrastructure for rural entrepreneurship and development and a broad analysis of the cost, benefits and safety of a statewide implementation of a new Neonatal Abstinence Syndrome model of care. Through her work, she has been engaged in a range of local and applied community and economic development projects including workforce development, strategic planning, community engagement and other qualitative and quantitative analysis. She is committed to work that adds value to our local communities and enhances their short and long term sustainability as places to live, work, and play.

She has served as the committee chair of 6 Master's students Capstone projects, has served as committee chair or a committee member of 5 PhD committees and is currently serving on 7 ongoing PhD committees. Her primary teaching responsibilities include rural development, regional economic development policy and practice, organizational theory and other related coursework.

### Bulleted List of Accomplishments:

- Co-PI on the Clemson/GHS, DHEC funded MAiN 2.0- Neonatal Abstinence Syndrome: Analysis of Cost, Safety, and Efficacy of a Palliative Care Approach to Treating Narcotic-Dependent Newborns. 5 year funding for \$996,000.
- Co-PI on DHEC/DHR funded project, facilitating the Stakeholder Engagement Process for Statewide Water Planning in South Carolina. 1 year funding \$50,000.
- Invited Speaker at a Joint Federal Reserve of Cleveland/Washington Jefferson College symposium on Regional Economic Development.
- Invited Speaker at the National Council on Economic Education Meeting, St. Petersburg, Florida and New York, New York.
- Developed a successful collaboration and study abroad effort with Linnaeus University in Kalmar, Sweden centered around multidisciplinary issues of sustainability
- Nominated and participated in the ACE Women's Higher Education Leadership Conference.



**Arelis Moore de Peralta, PhD**

**Assistant Professor**

**Departments of Youth, Family and Communities  
Studies/Languages**

Arelis Moore de Peralta is a social scientist and epidemiologist of Dominican origin, who studies factors that determine health disparities for minority populations in the US and the Dominican Republic (DR), through community-engaged research methods. She also explores capacity building and community development as a means to improve low-resourced communities' health and well-being. She conducts most of her research in the upstate of South Carolina and the Dominican Republic.

Her current research projects are supported by the Center for South Carolina Clinical & Translational Research (SCTR) Institute/with an academic home at the Medical University of South Carolina, and the College of Behavioral Social and Health Sciences' IMPACT seed grant funding. Moore de Peralta currently teaches courses in Community Development, Families and Communities in the Caribbean, Health and the U.S.-Hispanic Communities, Health Administration and Medical terminology. She teaches the last three courses in Spanish for the Language and International Health Program (L&IH), housed in the College of Architecture, Arts, and Humanities. She also leads a Creative Inquiry (CI) program on Building Healthier Communities in the Dominican Republic, which involves ongoing partnerships with a Dominican university, the DR government and leaders from a low-resource community in Santo Domingo; as well as with several departments within Clemson University. She is the internal evaluation team coordinator for the NSF funded Tigers Advance project that promotes systemic change, institutional transformation, and gender equity at Clemson University.

**Bulleted List of Accomplishments:**

- Awarded the HEHD Award of Excellence in Graduate Student Advising/Mentoring
- Awarded the South Carolina Hispanic Chamber of Commerce President's Award for outstanding achievement in community development.
- Awarded the Vera Paster Award, by the American Orthopsychiatric Association in recognition of her work with Latino immigrants.
- Received a \$10,000 research grant from the South Carolina Clinical & Translational Research (SCTR) Institute with an academic home at the Medical University of South Carolina.
- Received \$11,000 in allocations from the CU's Creative Inquiry project for the CI on building healthier communities in the DR.
- Received a \$36,945 grant from Clemson University's College of Behavioral, Social and Health Sciences IMPACT seed grant.
- Serves as evaluation team coordinator for the Tigers Advance project. NSF funded grant.
- Published five peer-reviewed articles on behavioral health and community-based participatory research.
- Serves in the Board of Child Abuse and Neglect Journal, and is a reviewer of the following journals: Racial and Ethnic Health Disparities, Journal for the Poor and Undeserved, and Hispanic Health Care International.



**Steven V. Miller, PhD**  
**Assistant Professor**  
**Department of Political Science**

Steven Miller is a political scientist whose research and teaching interests focus on the causes of war, the peace between democracies, and how external threat and conflict shape political attitudes and behavior. His published research appears in prominent journals of political science like *International Studies Quarterly*, *Journal of Peace Research*, *Political Behavior*, and *Political Research Quarterly*, among many others. His current research projects focus on the evolution of coercive bargaining and demands in militarized

interstate disputes, which recently received extramural support from the National Science Foundation. Miller has also received praise for his instruction in the classroom, receiving the *40 Under 40: Professors Who Inspire* honor in 2014. He was one of just two professors under the age of 30 to receive that distinction.

Bulleted List of Accomplishments:

- Received a \$92,787 grant from the National Science Foundation, the first NSF grant in the history of the Department of Political Science and the largest award of any type.
- Selected as honorary “Professor of the Game” against Georgia Tech in October 2017.
- Published a revised version of the Correlates of War Militarized Interstate Dispute data set, correcting a 70% error rate in the most widely used data set on conflict in political science.
- Discussed research forthcoming in *Conflict Management and Peace Science* and *Political Behavior* in a feature on *The Monkey Cage*, a section of *The Washington Post*.
- Quoted in Greenville News, and MacLean’s.
- Organized Peace Science section of the 75th annual Midwest Political Science Association conference.
- Received \$3000 University Research Grant Committee Completion Grant.

## College of Business



**Howard Bodenhorn, PhD**

**Professor**

**John E. Walker Department of Economics**

Howard Bodenhorn is a Professor in the John E Walker Department of Economics. He earned a PhD from Rutgers University. Since 2001, Professor Bodenhorn has been a research associate at the National Bureau of Economic Research (NBER).

Bodenhorn classes are well received by the students. He typically teaches at least one creative inquiry class a semester. In these courses, the students are encouraged to engage in academic research. One of Bodenhorn's current NBER working papers "Blind tigers and red-tape cocktails: liquor control and homicide in late nineteenth-century South Carolina," is an outgrowth of one of his creative inquiry classes. He has two other projects that focus on the economic history of South Carolina that originated as creative inquiry classes. The titles of the papers are "Color-blind prosecution in the Prohibition-era South" and "Pleas without bargains in 1920s South Carolina."

### Bulleted List of Accomplishments:

- Howard is in the top 6 percent of all economists in Research Papers in Economics (RePEc).
- The book "The Color Factor: African-American Well-Being in the Nineteenth-Century South" was recently published by Oxford U Press in 2015.
- He has a forthcoming review chapter titled "Two centuries of finance and growth in the United States," Handbook of Finance and Growth (forthcoming). Ross Levine (ed.)
- Professor Bodenhorn has received several grants. Most recently, he received the Larry J. Hackman Residency Grant from the New York State Archives Partnership Trust for his research on corporate governance in New York banking.
- According to Google Scholar Howard's research has over 5000 citations. In the last five years, his work has been cited more than 3000 times.



**Amy Ingram, PhD**  
**Assistant Professor**  
**Department of Management**  
**College of Business**

Amy E. Ingram is an assistant professor in the College of Business at Clemson University. She received her PhD from the University of Cincinnati, College of Business. Ingram's research interests surround the investor and market influence and persuasion, the entrepreneurial ecosystem, paradox, gender and Corporate Political Activity. She is a member of the Strategic Management Society, Academy of Management, Beta Gamma Sigma, Phi Beta Kappa and The National Society of Collegiate

Scholars. Ingram received the UC College of Business Outstanding Graduate Research Award in 2010.

Bulleted List of Accomplishments:

- Ingram joined the Clemson family in 2011 as an Assistant Professor of Management.
- Ingram's research is recognized internationally, exploring the intersections of non-market strategy, organizational paradox and entrepreneurship.
- Her work appears in premier academic and practitioner outlets such as the Academy of Management Journal, Journal of Management, Harvard Business Review, and Entrepreneurship Theory and Practice, among others.
- She received the Clemson College of Business Emerging Scholar Research Excellence Award in 2017 for her work.
- Ingram's works has garnered attention from executive education programs, consulting firms and media outlets. For instance, her works have been featured by Fortune and executive education programs such as the Darla Moore School of Business Center for Executive Succession.
- Organizations such as National Women's Business Council and Kaufman Foundation have used Dr. Ingram's research to prompt policy change and promote new venture creation.



**Robin Radtke, PhD**  
**Assistant Professor**  
**School of Accountancy**  
**College of Business**

Robin Radtke joined the faculty at Clemson in July, 2012. She received her PhD in Accounting from the University of Florida in 1992 and to date has published 25 academic articles, with the majority focusing on accounting ethics related issues.

Bulleed List of Accomplishments:

- Radtke is a member of the editorial board of Behavioral Research in Accounting and is the Program Coordinator for this year's Accounting, Behavior and Organizations Research Conference upcoming in October in Pittsburgh.
- She was invited to author "The Ethics of Behavioral Accounting Research" chapter in the forthcoming Routledge Companion to Behavioral Accounting Research book, which according to the publisher's website should serve as a "vital introduction for Ph.D. students as well as resource book for established behavioural accounting researchers."
- She has published six articles in total (two while at Clemson) in the Journal of Business Ethics, which is included in the "Financial Times Top 50 Journals Used in Business Schools Research Rankings."

## College of Education



**Mikel W. Cole, PhD**

**Assistant Professor**

**Department of Education and Human Development**

Mikel Cole studies English language learners, including culturally sustaining pedagogy, the preparation of teachers in K-12 settings, and language policy. His scholarship has appeared in numerous journals such as *Journal of Literacy Research*, *Bilingual Research Journal*, *Language Arts*, *Journal of Early Childhood Literacy*, *Middle Grades Research Journal*, *English Teaching: Practice & Critique*, and *Social Education*.

### Bulleted List of Accomplishments:

- Chosen to represent Clemson University at OpenCon in Brussels, Belgium.
- Elected to serve as Co-Chair of the Transnational/Multilingual Innovative Community Group (ICG) of the Literacy Research Association.
- Elected to represent the College of Education as a Faculty Senator.
- Invited to serve as Co-author on a Presidential Research Report for the Literacy Research Association.
- Invited to serve as Keynote Speaker at the Annual Diversity Conference held at Benedictine University.
- Two publications have appeared in the Research in Teaching English Top 15 Articles in Second Language Literacy lists.



**Mindy Spearman, PhD**  
**Associate Professor**  
**Department of Teaching & Learning**

Mindy Spearman specializes in social studies education and the historical foundations of education. Her research interests include: the history of teacher professional development, teaching about sustainability, art/artifacts in elementary social studies pedagogy, and qualitative research methods. She is a past president of the Organization of Educational Historians.

Bulleted List of Accomplishments:

- Member of an interdisciplinary research team investigating ways to increase underrepresented populations in gifted education—with recent publications in *The Elementary School Journal* and *Action in Teacher Education*.
- Collaborating with Dr. Rhondda Thomas (English) on a NEH Public Humanities Project planning grant entitled “Black Clemson: From Enslavement to Integration, an American Story.”
- Chosen as a Provost’s Faculty Leadership Program Fellow, 2015-2016
- Designed a new course (Curriculum Theory) for the M.Ed in Teaching and Learning, ranked #10 in the nation by *U.S. News and World Report*.
- Involved with City of Clemson community organizations: chairs the city Board of Zoning Appeals and serves Board of Directors at The Arts Center of Clemson.



**Robin Phelps-Ward, EdD**

**Assistant Professor**

**Department of Education and Organizational Leadership  
Development**

Robin Phelps-Ward centers her inquiry and praxis on racial marginalization in education. More specifically she researches formal mentoring programs for students of color, pipelines to graduate school and the professoriate, Black faculty and staff belonging, and Black women and girls' experiences with their natural hair. Her scholarship has appeared most recently in the *Journal of Student Affairs Inquiry*, the *Western Journal of Black Studies*, the *Journal of Public Scholarship in Higher Education*, and *Gender & Education*.

Bulleted List of Accomplishments:

- Earned the Dissertation of the Year award from Ball State University (Muncie, IN) for her dissertation titled "Formal mentoring programs to support students of color in the academy: A phenomenological analysis of student and faculty experiences."
- Earned a fellowship with the Clemson University Graduate School and leads the Action Research Collective, a group of undergraduate and graduate students who use participatory research methods to explore the professional development needs of graduate students of color.
- Developed the Diversity Curriculum & Pedagogy Lab within the College of Education, which provides a place for Clemson University students to explore innovative and culturally relevant diversity education strategies.
- Chosen to participate in the 2016 American Educational Research Association's Division J Emerging Scholars Workshop.

## College of Engineering, Computing and Applied Sciences



**Amy Apon, PhD**  
**Professor and Chair Computer**  
**Science Division**  
**School of Computing**

Amy Apon is a computer scientist who studies all aspects of parallel and distributed systems. Her current work focuses on experimental performance studies of high performance computing and cloud computing systems. Much of her work is done in partnership with researchers from a range of disciplines, including chemical engineering, economics, physics, and Intelligent Transportation Systems. Her collaborative research helps to enable high performance solutions to science questions such as, “How does water freeze?” Or, “What is the impact

to a university’s research productivity when it acquires a high performance computing cluster such as the Clemson Palmetto cluster?” Apon’s work is supported by the National Science Foundation and by several industrial partners. Apon currently teaches a class in Cloud Computing Architecture that utilizes materials from Amazon Web Services (AWS), and is leading efforts to teach this course as an academic semester course at universities in the United States. She also is teaching a Creative Inquiry course to study methods for traffic safety alerts, a course that has been inspired by the parents of an incoming freshman student who was killed in a car accident near Charleston during a dangerous road situation. Apon is co-teaching a graduate course on Data Analytics in Intelligent Transportation Systems with Dr. Mashrur Chowdhury. Apon supervises nine Ph.D. students in addition to her leadership roles as Chair of the Computer Science Division, co-Director of the Complex Systems, Analytics and Visualization Institute (CSAVI), and co-PI of the Clemson Center for Connected Multimodal Mobility (C2M2).

### Bulleted List of Accomplishments:

- Served as Program Officer at the National Science Foundation during 2015 in the Computer Network Systems division of the Computer Information Systems and Engineering directorate. Apon managed review processes for several programs, including Computer Systems Research, Big Data, and Smart and Connected Health, and contributed to policy models for NSF engagement with industry.
- Received, with Dr. Mashrur Chowdhury, the CECAS Collaboration Award in 2017.
- Co-author of new book, “Data Analytics for Intelligent Transportation Systems” 2017.
- Author or co-author of twelve articles published or in print in journals or peer-reviewed conferences since 2015.
- PI for recommended Major Research Instrumentation award that will fund an expansion of the Palmetto computer supercomputing cluster. Dr. Apon was the PI on a similar award in 2012.
- Apon and her research team have received cash and in-kind gifts from industrial partners that total approximately \$500K since 2015.



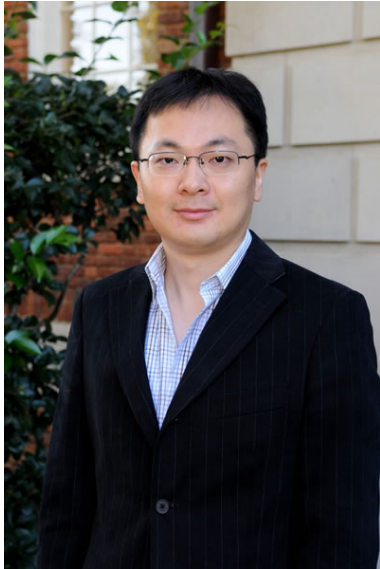
**Luiz G. Jacobsohn, DSc**  
**Assistant Professor**  
**Department of Materials Science and Engineering**

Luiz Jacobsohn obtained a B.Sc. in Physics in 1992, a Master degree in Materials and Metallurgical Engineering in 1994, and a D.Sc. in Physics in 1999, all from the Pontifical Catholic University of Rio de Janeiro, Brazil. He joined the Materials Science and Technology Division of Los Alamos National Laboratory in 2002 as a post-doctoral research associate, and in 2005 was converted to limited term technical staff member in the same Division. In 2009, he joined Clemson University's Department of Materials Science as a research faculty. Since 2014, he is a tenure track assistant professor in the Department of Materials Science and Engineering, and a researcher affiliated with the Center for Optical Materials Science and

Engineering Technologies, COMSET, and the Center for Nuclear Environmental Engineering Sciences and Radioactive Waste Management, NEESRWM. Jacobsohn's research interests are in the areas of scintillators, dosimeters, and luminescent materials and nanomaterials. He has more than 17 years of experience in materials synthesis, processing and characterization and has authored and co-authored 1 patent issued, 1 book chapter, and 104 publications that received more than 1350 citations Web of Science.

**Bulleted List of Accomplishments:**

- Recipient of the CAREER award in 2017, the NSF'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."
- PI of a \$290,354 grant from the Department of Energy in 2017
- Co-PI of a \$1,009,761 grant from the Defense Threat Reduction Agency in 2016
- Received \$17,615 supplemental funds from the NSF in 2016 (PI)
- Co-chaired the 6<sup>th</sup> International Workshop on Photoluminescence in Rare Earths: Photonic Materials and Devices (PRE'16) in Greenville, SC, 2016
- Member of the Steering Committee and the Scientific Committee of PRE since 2016
- Managing Guest Editor of the PRE'16 conference proceedings published as a special issue of Optical Materials in 2017
- 11 manuscripts were published in peer-reviewed journals, including the cover for Journal of Sol-Gel Science and Technology, Optical Materials, Radiation Measurements, and the Journal of the American Ceramic Society
- Invited to deliver talks at the American Ceramic Society's Glass and Optical Materials Division Annual Meeting, and at the Fall Electrochemical Society Meeting in 2017
- Interviewed for Greenville News, CU's Newstand and Idea Magazine
- Member of the Nuclear Engineering and Radiological Science Minor selection committee
- Served in the MSE Graduate and Standards Committee
- Ad Hoc committee member to develop faculty evaluation criteria for the MSE Department
- Member of the thesis committee of five Ph.D./D.Sc. and one M.Sc. students
- Chair of the examination committee of one Ph.D. candidate
- Advisor of the CU Chapter of the Society of Hispanic Professional Engineers (SHPE)
- Organizer of the Luminescence Across Borders (LAB) Summer Program at Clemson University



**Lin Zhu, PhD**  
**Associate Professor**  
**Department of Electrical and Computer Engineering**

Lin Zhu is currently an Associate Professor of Electrical and Computer Engineering Department at Clemson University and is also the program coordinator of inter-disciplinary Photonics Graduate Program. He obtained the PhD in Electrical Engineering from California Institute of Technology in 2008. Zhu's current research interests include laser beam combining, hybrid photonic integration, optomechanics, and nanophotonic devices. He has published more than eighty peer-reviewed journal and conference papers. His work has been funded by many federal and state agencies, including ARO, DARPA, HEL-JTO, NSF, USARMY SMDC, ORAU, SC Space Grant, and SC EPSCoR/IDeA. Lin Zhu was the recipient of the DARPA

Young Faculty Award, ARO Young Investigator Award, and ORAU Ralph E. Powe Junior Faculty Enhancement Award. He has served on the technical committees of many IEEE and OSA photonics conferences.

Bulleted List of Accomplishments:

- Published 13 peer-reviewed journal articles and conference papers
- Received a \$1.4 M research grant (with additional \$1M extension options) from the High Energy Laser Joint Technology Office (PI)
- Received a \$558,567 research grant from the Army Research Office (PI)
- Received a \$125,000 Defense University Research Instrumentation Program (DURIP) grant from the Department of Defense (PI)
- Received a \$240,000 research grant from the US Army SMDC (PI, award pending)
- Gave multiple invited talks at other universities, including Tsinghua University and Northwestern University.
- Served as the program coordinator of Clemson University Photonics Graduate Program.
- Served as Chair of IEEE/OSA Conference on Lasers and Electro-Optics technical subcommittee.
- Served as the member of IEEE/OSA Conference on Lasers and Electro-Optics technical subcommittee, IEEE Photonics Conference technical subcommittee, and OSA Annual Meeting technical subcommittee.
- Served as the faculty mentor of the NSF REU Program in Solid-State Devices at Clemson University.

## College of Science



**Susan C. Chapman, PhD**  
**Associate Professor**  
**Department of Biological Sciences**

Susan Chapman is a developmental biologist working on understanding the developmental mechanisms required for normal embryogenesis and the causes of congenital disorders. Her research team's primary focus is a translational medicine project involving Creatine Deficiency Syndrome, which causes severe intellectual disability and autism spectrum disorders. The lab is testing potential drug candidates to treat this disorder, which affects as many as 7 million people globally, with males being most severely affected. The IQ of these patients is usually less than 60, with 80% having

epilepsy and there is currently no treatment. These drugs would reverse some of the effects of this disorder in patients already exhibiting symptoms, but most importantly, by giving the drug to mothers or newborns with the condition, it would prevent the onset of the disease, leading to a normal life. The secondary project is to gain insight into the regulation of genetic mechanisms that pattern the embryo. 125 million years ago, avian dinosaurs underwent a number of physical adaptations that lead them down the pathway of evolution to modern birds. One of the most striking changes was the reduction of tail length, from long to short, with no intermediate lengths in the fossil record, and the development of fused sections of the spine that enabled flight. Using a number of model organisms, including alligators, anolis lizards, mouse and chicken the lab is working to identify the changes in gene regulatory mechanisms that account for these diverse morphological patterns. This study investigates fundamental mechanisms responsible for body shape and size and lends understanding into how the same genes can, for example, produce a bird's wing, a human hand or a dolphin's flipper.

The National Institutes of Health, the Self Family Foundation and Clemson's Creative Inquiry program support Chapman's work. She has attracted over \$2.3 million in funding as Principle Investigator at Clemson since 2007. She has graduated three Ph.D. students and works with six undergraduate students, about half of which are Honor's students each semester, and is currently supporting a postdoc. Over 100 undergraduate students have contributed to research in the laboratory. Chapman has initiated a number of collaborations, including the Centre for Neuroscience, Pisa, Italy; the Brain Institute, Queensland, Australia; Montana State University and Greenwood Genetics Center.

### Bulleted List of Accomplishments:

- Developed a new zebrafish model for Creatine Deficiency Syndrome to enable candidate drug testing and identified a new mechanism of creatine action as a neuromodulator of GABA A receptors, which suggests a mechanism that causes 80% of patients to exhibit epilepsy.
- Serve as an editorial board member for two journals and reviewer for several international peer reviewed journals.
- Serve on several invited NIH and NSF study panels.
- Organized and chaired the Society for Developmental Biology regional meeting at Clemson (2015).
- Published 3 peer reviewed journal articles (27 total, h-index 14, 894 citations).
- 7 Invited talks and presentations (Regional, National, International).



**Elena S. Dimitrova, PhD**  
**Associate Professor**  
**Department of Mathematical Sciences**

As a mathematical biologist, Elena Dimitrova's research is focused on using discrete mathematic tools to solve problems that stem from molecular biology. While continuous techniques are more traditional and widespread in mathematical biology, discrete models have been gaining popularity as they have proven successful in providing insights into biological processes that are inherently discrete or for which the available data are insufficient for modeling with continuous functions. Dimitrova has worked on discrete modeling of

gene regulatory networks, both purely from gene expression data and from literature, and has participated in building software packages for generating and analyzing such models. In her most recent modeling project in collaboration with a vascular biologist, she investigated the consequences of targeting various regulatory components of injury-induced TLR4 signal transduction on potential pro-inflammatory or pro-healing outcomes.

While working on modeling, Dimitrova realized that data selection and preprocessing is absolutely crucial for building quality mathematical models. She then began work in the area of algebraic design of experiments which has led to two consecutive NSF grants. In this work, she has collaborated in developing new mathematical theory that allows for planning and performing the minimum number of experiments which will produce the necessary data for unique model identification, thus saving time and money to the experimentalist. Very recently, she has found another application of our theory in mathematical neuroscience.

Dimitrova has also worked on applying chaos theory to population models and if and how chaotic behavior benefits the species in an ecological system. While this connection has long been suspected, there have not been rigorous tools for quantifying it. Her work, which is in the intersection of chaos theory, ecology, and control theory, has demonstrated that certain desirable properties of population models are more easily achieved if a chaotic orbit is present.

**Bulleted List of Accomplishments:**

- Co-authored six publications.
- Obtained two research grants from the National Science Foundation.
- Delivered an invited keynote address at the 2014 KNOWeSCAPE (Analyzing the dynamics of information and knowledge landscapes) Meeting, European Cooperation in Science and Technology, Thessaloniki, Greece.
- Presented eight invited talks at professional meetings and colloquia.
- Served on four invited review panels at the National Science Foundation.
- Advised three PhD and nine MS students since 2007.
- Taught fifteen different graduate and undergraduate classes at Clemson University.



**F. Alex Feltus, PhD**  
**Associate Professor**  
**Department of Genetics & Biochemistry**

The Feltus lab is discovering causal gene sets underlying complex trait expression ranging from the control of bioenergy feedstock traits to root nodulation to autism spectrum disorders to intersecting pathways in various tumor states. Gene sets are discovered *de novo* with high performance computing and network biology techniques. With networks, they embrace biological complexity and measure, model and interpret gene expression relationships and gene product physical interactions on a massive scale.

As genomics enters the Big Data scale, data transfer, storage and analysis will all become more difficult. The Feltus lab is at the forefront of this technology wave resulting in improvement to the Lab's core biological research mission. They are developing a national scale distributed ACI platform called SciDAS. Feltus is co-chair of the Internet2 Distributed Big Data & Analytics working group and member of the Internet2 CINO Program Advisory Board. Feltus is a key liaison between Clemson and the NSF funded South Big Data Hub and is the faculty chair of CU-CAT, a Clemson University wide research computing governance committee that reports to the CIO.

Bulleted List of Accomplishments:

- 68 Peer Reviewed Articles (+7 under review +6 in prep); 4 Book Chapters; 4 Conference Proceedings. Google citation count: [6173]; i10 index= 51
- Academic Editor, PLoS ONE; Chair, Clemson Computational Advisory Team Committee; co-lead, Internet2 Distributed Big Data & Analytics Working Group; Member, Internet2 CINO-PAG; Clemson Dept. Genetics & Biochemistry Graduate Committee; 25 Dissertation/Thesis committees; Active manuscript reviewer for a broad array of journals.
- "CC\*Data: National Cyberinfrastructure for Scientific Data Analysis at Scale (SciDAS)." Source: National Science Foundation [1659300] (F. Feltus PI). Total project costs: \$2,952,217
- "An HPC-backed interactive visualization instrument enabling collaborative computational genomics and virtual reality research." Source: CUSUCEEDS'17 (B. Ullmer PI). Total project costs: \$50,950
- "Tripal Gateway: Platform for Next-Generation Data Analysis and Sharing." Source: NSF-DIBBS [1443040] (S. Ficklin, PI) Total project costs to Clemson: \$214,176
- "BIGDATA: F: DKM: Collaborative Research: PXFS: ParalleX Based Transformative I/O System for Big Data." Source: National Science Foundation [1447771] (W. Ligon PI) Total project costs to Clemson: \$720,000
- "PGRP: Spatial and Temporal Resolution of mRNA Profiles During Early Nodule Development." Source: National Science Foundation [1444461]. Total project costs to Feltus: \$624,394

# Research Metrics

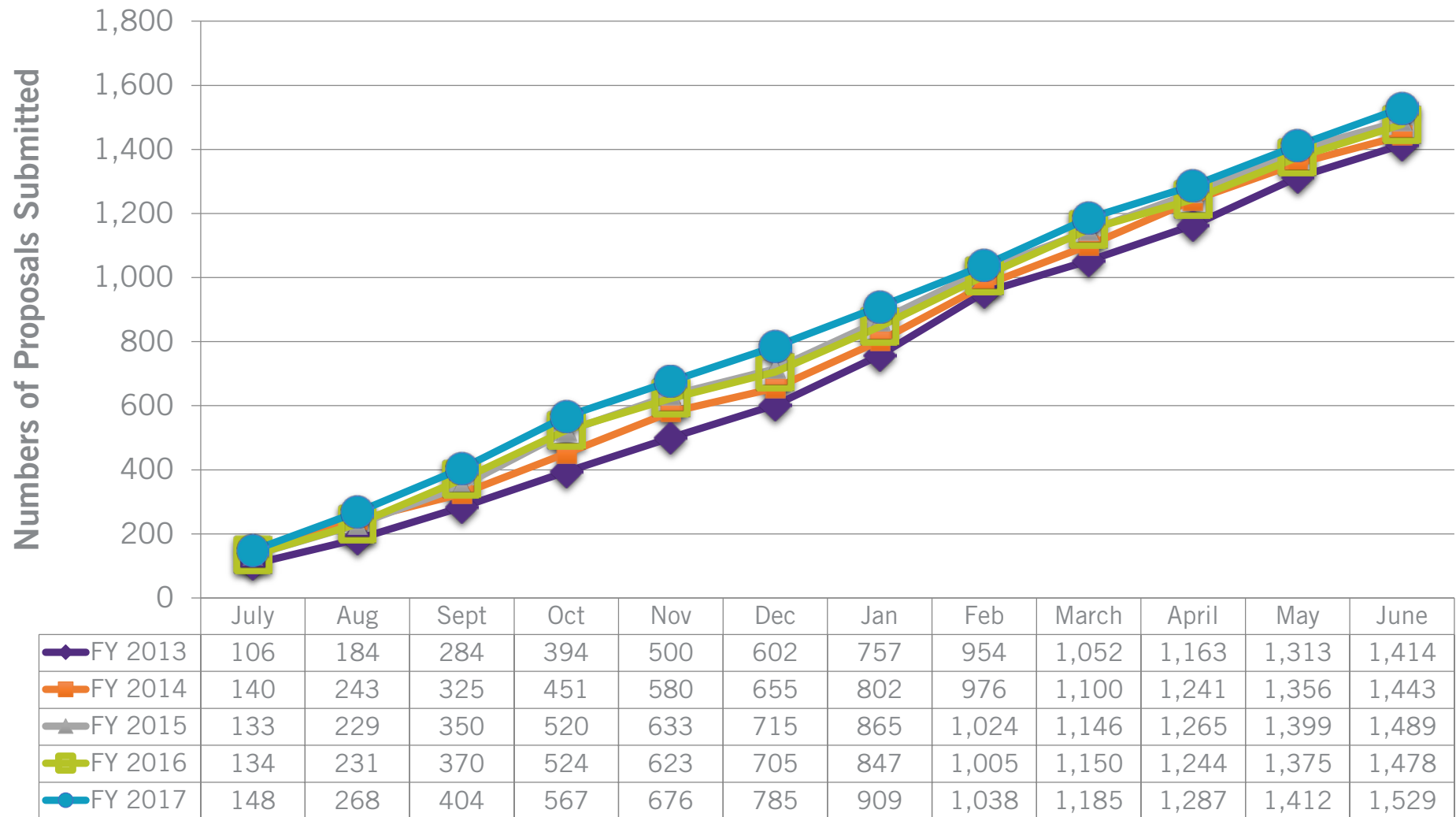
## 2017 Signature Accomplishments

- New proposal submissions reached \$561M by the end of 2017, the highest in the past five fiscal years and 45% increase as compared to June 2013 (\$386 M).
- Large proposal submissions (>\$1M) totaled 116 by the end of 2017, the highest in the past five fiscal years and 57% increase as compared to 2013 (66 submissions).
- New research awards reached \$109M by the end of 2017, the highest in the past five fiscal years and 40% increase as compared to the end of 2013 (\$78M).

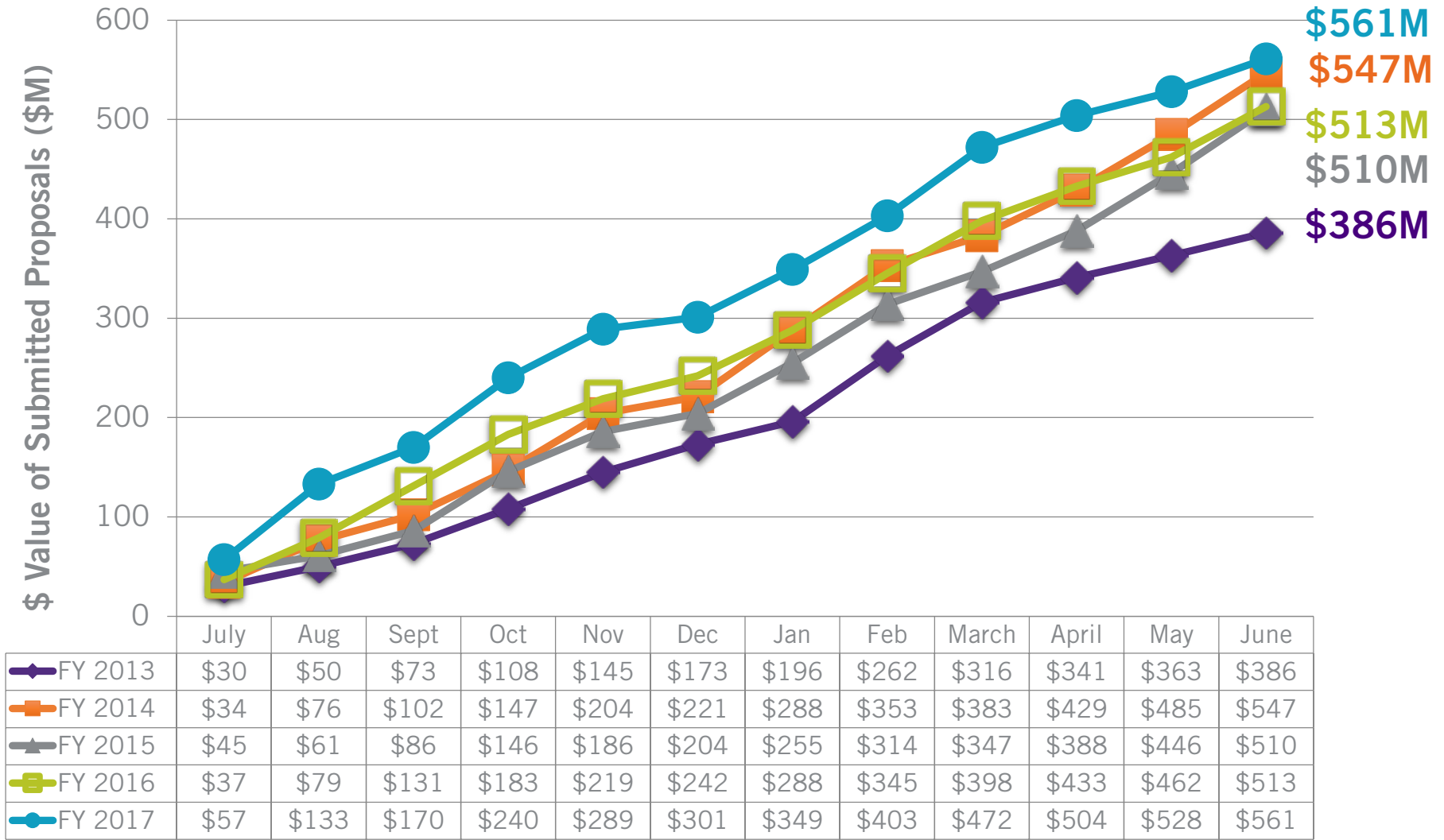
## 2017 Signature Accomplishments

- Research expenditures were \$90M by the end of 2017, the highest in the past five fiscal years and 20% increase as compared to June 2013 (\$75M).
- Junior faculty received 7 new CAREER awards in fiscal year 2017, the highest in the past five fiscal years and 75% increase as compared to May 2013 (4 awards).

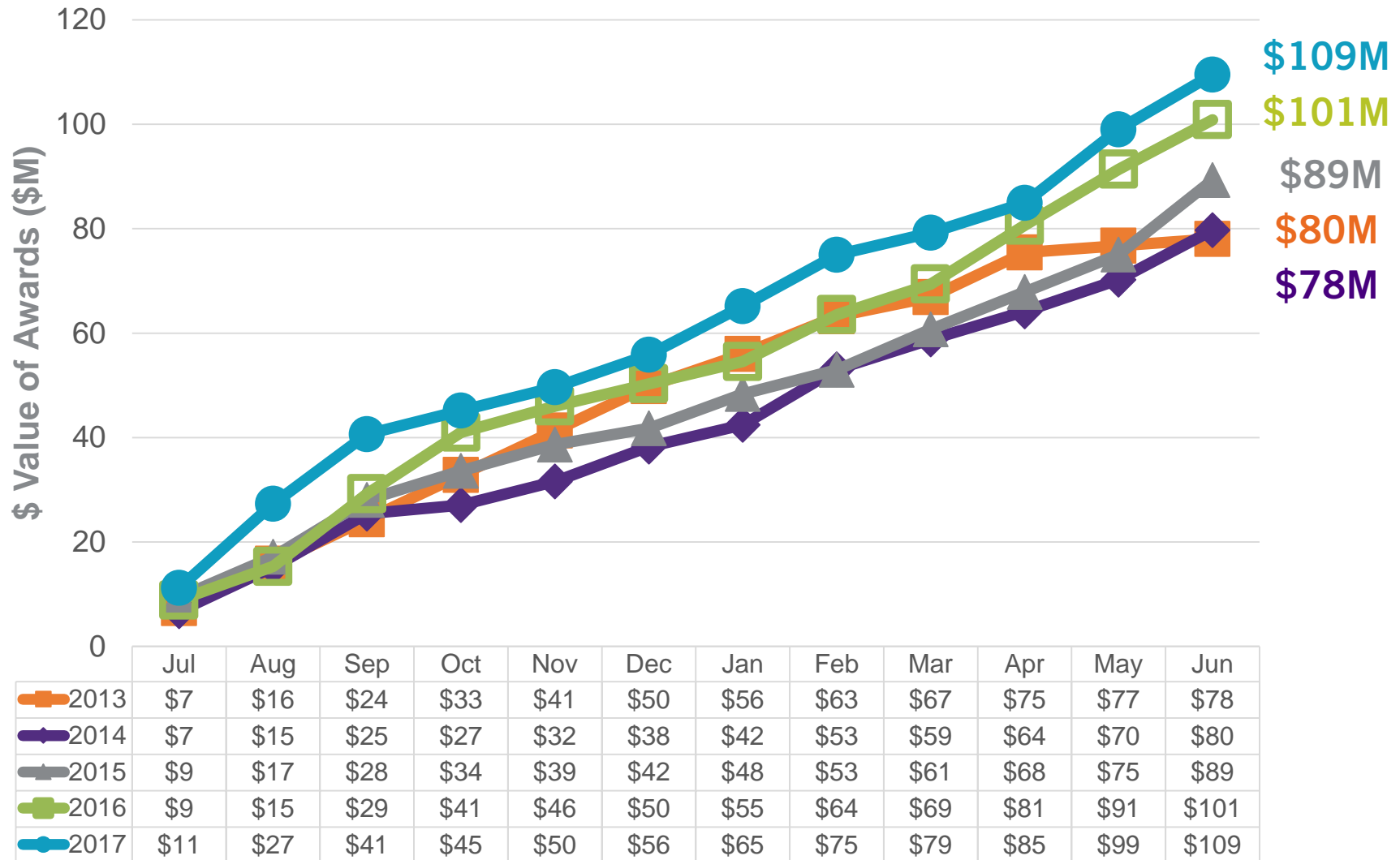
# CLEMSON CUMULATIVE SUBMISSIONS: PROPOSAL COUNTS (2013-2017)



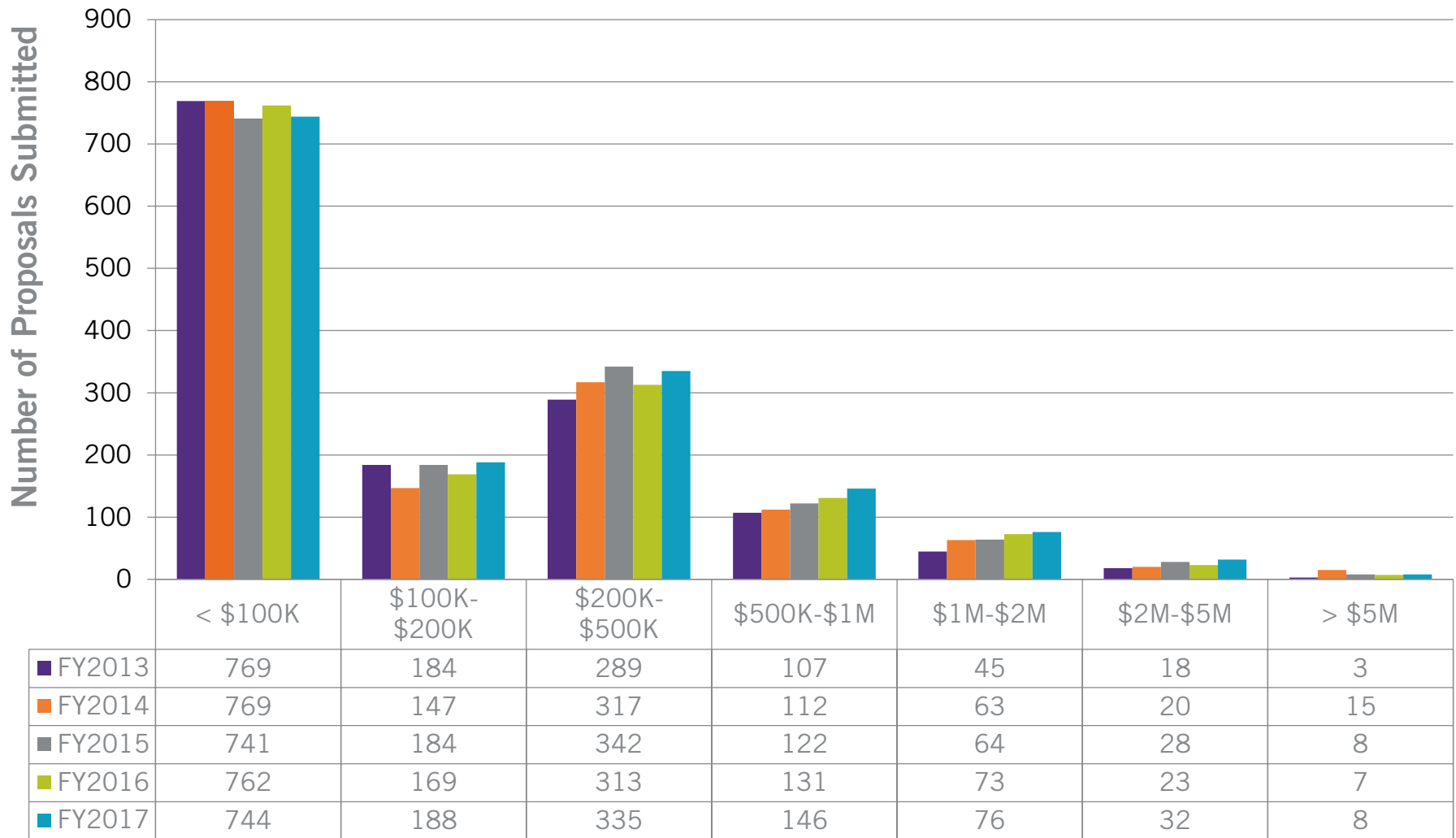
# CLEMSON CUMULATIVE SUBMISSIONS: \$ REQUESTED (2013-2017)



# CLEMSON CUMULATIVE AWARDS (2013-2017)



# CLEMSON CUMULATIVE SUBMISSIONS: \$ REQUESTED (2013-2017)



Clemson University  
Research Report Card  
Fiscal Year 2017

	2013	2014	2015	2016	2017	Data Trends 2013-2017
<b>RESEARCH INPUTS</b>						
<b>a. Proposal Submissions (Count)</b>	<b>1,414</b>	<b>1,443</b>	<b>1,489</b>	<b>1,478</b>	<b>1,529</b>	
1 AAH	38	51	65	62	69	
2 CAFLS	235	230	224	222	241	
3 CBSHS	81	93	102	104	112	
4 CECAS	549	555	582	617	618	
5 COE	51	54	39	45	46	
6 COB	7	15	13	15	7	
7 COS	242	247	263	239	230	
8 CCIT	12	12	6	3	5	
9 PSA	88	90	118	97	170	
10 VP for Res & Interdisc Inst	31	17	7	17	14	
11 All Other	80	79	70	57	17	
<b>b. Proposal Submissions (Value)</b>	<b>\$ 386,106,648</b>	<b>\$ 547,095,092</b>	<b>\$ 510,484,443</b>	<b>\$ 513,180,239</b>	<b>\$ 561,148,836</b>	
12 AAH	\$ 3,580,723	\$ 14,849,844	\$ 12,839,717	\$ 10,263,562	\$ 1,732,701	
13 CAFLS	\$ 34,372,635	\$ 43,999,698	\$ 36,519,514	\$ 23,617,486	\$ 35,593,389	
14 CBSHS	\$ 13,290,053	\$ 21,511,560	\$ 26,844,900	\$ 33,953,358	\$ 42,973,134	
15 CECAS	\$ 188,119,992	\$ 283,220,894	\$ 278,574,540	\$ 298,715,448	\$ 332,003,069	
16 COE	\$ 13,990,537	\$ 14,850,254	\$ 11,982,507	\$ 15,246,312	\$ 19,874,910	
17 COB	\$ 975,025	\$ 2,209,136	\$ 4,025,430	\$ 2,035,401	\$ 921,817	
18 COS	\$ 75,761,887	\$ 118,510,356	\$ 100,001,493	\$ 106,950,376	\$ 88,889,567	
19 CCIT	\$ 37,911,464	\$ 12,473,160	\$ 2,116,258	\$ 2,219,976	\$ 1,285,424	
20 PSA	\$ 8,554,512	\$ 16,989,642	\$ 26,480,496	\$ 5,530,132	\$ 27,052,907	
21 VP for Res & Interdisc Inst	\$ 4,191,314	\$ 5,660,278	\$ 5,861,000	\$ 6,131,772	\$ 6,079,004	
22 All Other	\$ 5,358,506	\$ 12,820,270	\$ 5,238,588	\$ 8,516,416	\$ 4,742,914	
<b>c. Research Awards</b>	<b>\$ 78,013,996</b>	<b>\$ 79,728,290</b>	<b>\$ 89,313,594</b>	<b>\$ 100,861,140</b>	<b>\$ 109,488,152</b>	
23 AAH	\$ 224,473	\$ 590,154	\$ 656,030	\$ 1,400,972	\$ 1,519,688	
24 CAFLS	\$ 7,284,564	\$ 6,659,619	\$ 14,149,829	\$ 8,619,438	\$ 10,898,288	
25 CBSHS	\$ 2,737,876	\$ 3,385,989	\$ 4,776,199	\$ 5,065,880	\$ 4,564,531	
26 CECAS	\$ 34,201,429	\$ 37,723,081	\$ 43,231,494	\$ 45,535,064	\$ 54,000,082	
27 COE	\$ 2,629,505	\$ 4,089,157	\$ 3,203,419	\$ 2,945,717	\$ 2,774,422	
28 COB	\$ 2,023,722	\$ 1,114,979	\$ 1,312,998	\$ 783,916	\$ 1,179,733	
29 COS	\$ 10,344,423	\$ 7,780,394	\$ 9,938,990	\$ 15,605,625	\$ 19,899,415	
30 CCIT	\$ 1,617,466	\$ 5,675,854	\$ 668,873	\$ 819,396	\$ 477,594	
31 PSA	\$ 14,827,292	\$ 12,284,142	\$ 9,588,294	\$ 12,965,629	\$ 7,908,591	
32 VP for Res & Interdisc Inst	\$ 1,790,060	\$ 268,882	\$ 573,565	\$ 5,139,315	\$ 5,030,743	
33 All Other	\$ 333,188	\$ 156,039	\$ 1,213,903	\$ 1,980,188	\$ 1,235,065	
<b>d. Notable Awards</b>						
34 NSF CAREER Awards (by start date)	4	1	3	5	7	
35 NIH R01-Equivalent Awards (by start date)	-	-	2	2	2	
36 NIH Career Awards (by start date)	1	-	-	-	-	
37 Air Force Young Investigator Awards	-	-	1	2	-	
38 DOE Early Career Awards	1	-	-	-	-	
<b>e. Supporting Workforce</b>						
39 Graduate Student Enrollment	4,206	4,372	4,670	4,664	4,425	
40 Sponsored Graduate Research Assistants	822	745	707	693	696	
41 Postdoctoral Fellows	48	64	83	85	90	
42 Research Faculty: Permanent 100% Non-E&G Funded	6	6	6	11	17	
43 Research Faculty: Temporary 100% Non-E&G Funded	18	18	15	14	24	
<b>RESEARCH PROCESS</b>						
<b>f. Sponsored Research Expenditures by Business Unit **</b>	<b>\$ 75,388,679</b>	<b>\$ 69,907,663</b>	<b>\$ 73,307,908</b>	<b>79,493,329</b>	<b>89,547,288</b>	
44 AAH	\$ 504,683	\$ 378,112	\$ 419,440	\$ 1,104,015	\$ 1,324,634	
45 CAFLS	\$ 8,768,472	\$ 7,706,442	\$ 6,752,344	\$ 8,631,050	\$ 11,066,587	
46 COB	\$ 1,239,726	\$ 1,200,289	\$ 1,081,898	\$ 958,613	\$ 867,778	
47 CECAS	\$ 34,969,267	\$ 34,550,052	\$ 34,968,963	\$ 37,483,798	\$ 42,945,440	
48 CBSHS	\$ 3,050,080	\$ 2,817,714	\$ 3,680,307	\$ 4,068,139	\$ 4,413,360	
49 COE	\$ 3,286,747	\$ 3,256,328	\$ 3,793,915	\$ 2,510,444	\$ 2,580,041	
50 COS	\$ 13,209,952	\$ 10,501,024	\$ 9,286,770	\$ 11,327,997	\$ 14,777,229	
51 CCIT	\$ 1,996,620	\$ 1,631,199	\$ 3,400,258	\$ 2,775,609	\$ 426,836	
52 PSA	\$ 4,746,123	\$ 4,858,414	\$ 5,847,737	\$ 5,588,699	\$ 5,749,370	
53 VP for Res & Interdisc Inst	\$ 1,878,676	\$ 1,302,734	\$ 1,892,429	\$ 3,531,216	\$ 3,930,146	
54 All Other	\$ 1,738,332	\$ 1,705,355	\$ 2,183,847	\$ 1,513,750	\$ 1,465,867	

Clemson University  
Research Report Card  
Fiscal Year 2017

		2013	2014	2015	2016	2017	Data Trends
							2013-2017
<b>g. Sponsored Research Expenditures by Innovation Cluster</b>		<b>\$ 75,388,679</b>	<b>\$ 69,907,663</b>	<b>\$ 73,307,908</b>	<b>79,493,329</b>	<b>89,547,288</b>	
55	Advanced Materials	\$ 14,258,840	\$ 11,288,090	\$ 10,713,746	\$ 10,385,364	\$ 10,704,111	
56	Cyberinfrastructure and Big Data Science	\$ 10,277,111	\$ 10,513,388	\$ 10,137,409	\$ 8,874,268	\$ 8,125,965	
57	Energy, Transportation and Advanced Manufacturing	\$ 4,687,300	\$ 5,680,684	\$ 7,236,983	\$ 7,645,169	\$ 17,716,377	
58	Health Innovation	\$ 13,115,231	\$ 10,248,431	\$ 10,188,088	\$ 12,470,389	\$ 16,312,927	
59	Human Resilience	\$ 8,200,415	\$ 7,708,375	\$ 9,700,880	\$ 9,762,842	\$ 7,780,667	
60	Sustainable Environments	\$ 18,331,776	\$ 16,877,332	\$ 17,926,296	\$ 21,723,962	\$ 18,984,797	
61	Other	\$ 6,518,006	\$ 7,591,364	\$ 7,404,505	\$ 8,631,335	\$ 9,922,444	
<b>h. Sponsored Research Expenditures by Funding Source</b>		<b>\$ 75,388,679</b>	<b>\$ 69,907,663</b>	<b>\$ 73,307,908</b>	<b>\$ 79,493,329</b>	<b>\$ 89,547,288</b>	
62	Federal Gov	\$ 62,890,679	\$ 56,872,229	\$ 58,457,288	\$ 65,135,890	\$ 74,571,410	
63	Foundations, Societies, and Associations	\$ 4,221,409	\$ 4,294,121	\$ 4,741,795	\$ 4,137,246	\$ 4,696,551	
64	Industry/Other	\$ 4,930,465	\$ 5,641,543	\$ 6,071,417	\$ 6,870,782	\$ 6,793,645	
65	International	\$ 813,542	\$ 577,879	\$ 765,179	\$ 778,835	\$ 517,558	
66	Local Gov	\$ 597,732	\$ 614,527	\$ 578,235	\$ 530,909	\$ 523,786	
67	State Gov	\$ 1,934,852	\$ 1,907,364	\$ 2,693,993	\$ 2,039,667	\$ 2,444,338	
<b>i. Sponsored Research Expenditures per T/TT</b>							
68	AAH	\$ 3,299	\$ 2,264	\$ 2,343	\$ 5,841	\$ 8,177	
69	CAFLS	\$ 88,570	\$ 81,120	\$ 69,612	\$ 84,618	\$ 105,396	
70	COB	\$ 14,415	\$ 13,047	\$ 11,510	\$ 9,683	\$ 8,855	
71	CECAS	\$ 169,754	\$ 160,698	\$ 163,406	\$ 163,685	\$ 194,323	
72	CBSHS	\$ 27,982	\$ 26,853	\$ 33,764	\$ 42,376	\$ 34,751	
73	COE	\$ 54,779	\$ 51,688	\$ 62,195	\$ 38,037	\$ 44,483	
74	COS	\$ 95,724	\$ 72,421	\$ 61,912	\$ 77,589	\$ 95,956	
75	CU average (Total exp/Total T/TT faculty)	\$ 83,858	\$ 75,089	\$ 78,826	\$ 85,753	\$ 84,297	
<b>RESEARCH OUTPUTS/OUTCOMES</b>							
76	Doctorates Awarded (Aug, Dec, May)	187	217	237	233	252	
77	STEM Doctorates Awarded (Aug, Dec, May)	118	153	165	138	185	
78	Disclosures	102	129	70	60	65	
79	Patents	16	15	15	14	18	
80	Licenses/Options	9	7	7	5	10	
81	Licensing Revenue	\$ 1,134,289	\$ 762,811	\$ 360,131	\$ 354,827	\$ 539,490	
82	Start-up Companies (based on licenses/options above)	1	4	4	2	3	
<b>THE BOTTOM LINE</b>		<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	
	Research Awards	\$ 78,013,996	\$ 79,728,290	\$ 89,313,594	\$ 100,861,140	\$ 109,488,152	
	Other Sponsored Program Awards (CCIT Medicaid)	\$ 24,009,167	\$ 28,567,490	\$ 32,532,784	\$ 58,187,130	\$ -	
<b>* Awards Total</b>		<b>\$ 102,023,163</b>	<b>\$ 108,295,780</b>	<b>\$ 121,846,378</b>	<b>\$ 159,048,270</b>	<b>\$ 109,488,152</b>	
<b>** Research Expenditures</b>		<b>\$ 75,388,679</b>	<b>\$ 69,907,663</b>	<b>\$ 73,307,908</b>	<b>\$ 79,493,329</b>	<b>\$ 89,547,288</b>	
	Other Sponsored Programs Expenditures	\$ 24,009,167	\$ 28,567,490	\$ 32,532,784	\$ 58,187,130	\$ -	
	Less CURF Indirect Expenditures	\$ 1,303,354	\$ 743,951	\$ 684,695	\$ 574,081	\$ 255,982	
<b>Sponsored Research and Programs Expenditures</b>		<b>\$ 98,094,492</b>	<b>\$ 97,731,202</b>	<b>\$ 105,155,997</b>	<b>\$ 137,106,378</b>	<b>\$ 89,291,306</b>	
* See section c. above							
** See section f. above							

## Research Report Card Trends

This brief report addresses areas of decline outlined in the Research Report Card for years 2013 through 2017 for units demonstrating a persistent decline.

College	Observations	Action
CAFLS	<ul style="list-style-type: none"> <li><b>Line 2 – Submission Counts:</b> The difference in submissions is approximately 6% over four years or a difference of 13 proposals. From 2016 to 2017, CAFLS has regained strength in this area with 241 submissions – 9% growth.</li> <li><b>Line 13 – Submission Value:</b> CAFLS has been trying to increase submissions of large multi-disciplinary and multi institutional proposals. Announced RFPs applicable to CAFLS vary from year to year. With the goal of submitting larger proposals, CAFLS's submissions total has improved by 51% in 2017 compared to 2016.</li> <li><b>Line 24 – Awards:</b> There was a \$4M award (2010682) to CAFLS in 2015 to James Frederick came as a single lump, which made increased the 2015 value relative to other years. CAFLS awards are usually in the range of \$7-9M. CAFLS has completed FY2017 with awards totaling \$11M representing 26% growth over 2016.</li> </ul>	<p>Currently, the university is planning to add faculty members in CAFLS to address teaching demand, which will allow more time for research by faculty.</p> <p>Further, CAFLS is completing its strategic planning and will identify specific areas of strategic importance for each department. These actions will help to reverse the pattern in the positive direction.</p>
CAAH	<ul style="list-style-type: none"> <li><b>Line 12 – Submission Value:</b> There is a downward trend in proposal submission values beginning in 2014 and continuing through 2017. In 2015, there were several large submissions including a \$4M proposal and three proposals greater than \$1M. In 2016, there were four proposals with values between \$1M and \$2M. There were no large proposals (&gt;\$1M) submitted by CAAH in 2017.</li> </ul>	<p>With the implementation of the new large grants (see line 23 research expenditures increasing), it is expected that faculty will submit new submissions.</p>
CCIT	<ul style="list-style-type: none"> <li><b>Line 8 – Submission Counts:</b> Research has not been the primary mission of CCIT. However, a small number of research proposals, in the range of 10-15 proposals/year, are submitted annually by CCIT due to the research interests of previous CIO, Jim Bottum. With his retirement as well as the recent emphasis on the cybersecurity challenges in the University, the attention on the research proposal submission has become less critical. This trend has remained unchanged in 2017.</li> <li><b>Line 19 – Submission Value:</b> In 2013, CCIT submitted a proposal worth \$36M to the NSF. In 2014, CCIT submitted a proposal worth \$10M to the NSF. These large proposals caused the submission totals for 2013 and 2014 to be significantly higher than average. As indicated above, CCIT annual research proposal submission has been historically a small number. This trend has remained unchanged in 2017.</li> <li><b>Line 30 – Awards:</b> In 2014, CCIT was awarded \$5M for James Bottum's NSF project. This award is significant enough to disrupt the funding trends for CCIT. This trend has remained unchanged in 2017.</li> </ul>	<p>The new CIO will began in July 2017. The focus of CCIT on research proposal submissions will be evaluated and re-assessed.</p>

All Other	<ul style="list-style-type: none"> <li>• <b>Line 11 and Line 22 – Submission counts &amp; values:</b> All other category consists of Economic Development, Libraries, Facilities, Student Affairs, and Cooperative Extension, where research grants are not first priority. As a result, a high degree of variability occurs in this category. The trends observed in 2016 remained largely unchanged in 2017.</li> </ul>	No action is needed
COB	<ul style="list-style-type: none"> <li>• <b>Line 17 - Submission values:</b> The peak submissions occurred in 2015 was a result of several large proposal submissions in the same year. Otherwise, College of Business maintains an average of \$1M - \$2M/year proposal submission. Colleges of Business nationwide have low rates of extramural funding; these trends are not unique to Clemson. There has been little change in submission values for 2017; the trend remains largely unchanged.</li> <li>• <b>Line 28 – Awards:</b> The research program for COB is comparatively small (\$1-2M range) while this College serves a very large student population. Although there has been a decrease during 2013-2016 period, there has been recovery of awards in 2017 with awards totals for the COB rebounding by 51% to \$1.2M.</li> </ul>	Action will be taken if sign of weakness is detected.
Advanced Materials	<ul style="list-style-type: none"> <li>• <b>Line 55 – Expenditures:</b> Annual expenditures of this cluster was \$14M in 2013 and since then has averaged about \$10-11 M. Thus, there seemed to be a slowing of expenditures for projects in this Innovation Cluster. However, with the significant recent awards (e.g., \$6M EPSCoR Track-1, \$6M EPSCoR Track-2, and \$3.2M DARPA), this trend reversed in 2017 with 3% growth over 2016 totals.</li> </ul>	Action will be taken if sign of weakness is detected.
Local Govt.	<ul style="list-style-type: none"> <li>• <b>Line 66 – Expenditures:</b> Totals for local government have been historically low (~\$500K/year) but appear exaggerated in the sparklines plot showing the trend. There has been a slight decline in local government expenditures since 2014. These awards are small and tend to be annual -- so small shifts in awards will be apparent in expenditures. For example, the difference between 2016 and 2017 expenditures from local government sources is 2%.</li> </ul>	Action will be taken if sign of weakness is detected.
CURF	<ul style="list-style-type: none"> <li>• <b>Line 78 – Disclosures:</b> The numbers of disclosures per year is highly variable. In 2013 and 2014, CURF was processing all the BIOE senior design disclosures; after 2014, CURF no longer supported this process. In addition, Johnell Brooks with AuE submitted a significant number (between 10-15) of disclosures in 2014 for driving scenarios. Launch of the technology maturation fund in 2014 was accompanied by a caveat that applicants demonstrate at least one disclosure. There has been an increase in disclosures of 8% from 2016 to 2017.</li> <li>• <b>Line 81 – Licensing revenue:</b> An overpayment by a software company in 2013 led to an artificial inflation of licensing revenue. Repayment of that sum took place over 2014-2016. In 2014, royalty downturn was mitigated by a one-time \$300K payout on a biomedical device license by a company beginning the IPO process. Following the conclusion of the repayment, there has been a 52% increase in licensing revenue from FY 2016 to FY 2017.</li> </ul>	We are currently working on a new plan for CURF.

# Significant Awards

**Clemson University's Top Ten Awards**  
Received Between June 15, 2017 and September 9, 2017

PI	Award	(Sponsor)Project Title	Abstract
<b>Rajendra Bordia</b>	\$6.0M	(NSF) NSF EPSCoR Track 1 RII: South Carolina Materials Assembly and Design (SC MADE): South Carolina Material Genome Initiative	Eight institutions across the state to South Carolina will collaborate with the state's two research universities to develop and characterize advanced materials designed with optical or magnetic behavior, stimuli-responsive polymeric materials and interactive biomaterials. This work is designed around the focus of building a highly trained workforce as well as building economic opportunity around the state's strengths in the aerospace, automotive, biomaterials and biotech sectors.
<b>Sarah Harcum</b>	\$6.0M	(NSF) RII Track-2 FEC: Advanced Biomanufacturing: Catalyzing Improved Host Development and High Quality Medicines through Genome to Phenome Predictions	This project will strive to develop new approaches to better understand how genes impact organisms' development and health with an emphasis on improving manufacture and availability of biopharmaceuticals like those used to treat Crohn's disease or severe anemia.
<b>James R. Martin II</b>	\$2.0M	(NSF) IUSE/PFE:RED: Clemson University: Learning Teams and Innovation Ventures for Adaptable Training in Engineering	This project brings to bear Clemson University's expertise in teaching, particularly the teaching of engineering. Researchers aim to transform the curriculum in Civil Engineering with the aims of improving student preparation and building a new departmental structure to support this collaborative educational approach.
<b>Celeste Bates</b>	\$1.7M	(SC Department of Education) Reading Recovery and Early Literacy Training Center for South Carolina – 3 Yr	Reading Recovery -- an early intervention strategy aimed at 1 <sup>st</sup> grade students struggling readers with the goal of diverting students from special education -- is a cost-effective approach to successfully getting struggling readers back on track and grade level in 20 weeks. This grant will support the expansion of the Reading Recovery program to classrooms across South Carolina.

<b>Ying Mei</b>	\$1.5M	(NIH) Nanowired human cardiac spheroids for heart repair	Repair of the heart muscle after an adverse event like a heart attack presents a challenge. Potential therapies include the use of stem cell transplantation to repair damaged cardiac tissues. Difficulty with the delivery and integration of cells to the injury site has slowed the implementation of this therapy. Researchers have developed a method using electrically conductive silicon nanowires to facilitate the self-assembly of cells to form nanowired cardiac spheroids.
<b>Megan Che</b>	\$1.0M	(NSF) A Scalable RPP for Preparing and Supporting Teachers to Teach Culturally Responsive and Rigorous CS Courses in SC	This project, borne out of a collaboration between the School of Computer Science and the College of Education, will prepare teachers in South Carolina to teach computer science in grades K-12. By equipping students with the skills needed for the 21 <sup>st</sup> century workplace, the South Carolina will be prepared to meet the technological challenges of the future.
<b>Yongqiang Wang</b>	\$1.0M	(NSF) CICI: RSARC: Secure Time for Cyberinfrastructure Security	Computer systems, especially those forming the core of cyberinfrastructure, must have access to reliable time synchronization to function. Time synchronization is essential for cyberinfrastructure security because it underpins security in the form of authentication and encryption, among other crucial measures. Current methods of time synchronization are highly vulnerable to attacks. This project will develop novel time synchronization approaches to ensure secure computing function.
<b>Rachel Mayo</b>	\$1.0M	(GHS/SC DHHS) Managing Abstinence in Newborns (MAiN) 2.0 Expansion	This project expands the reach of the MAiN program, an intervention and care protocol for babies born to opioid-dependent mothers.
<b>Kyle Brinkman</b>	\$640K	(DOE) Nanostructured Ceramic Membranes for Enhanced Tritium Management	This project will support the development of and improvement of novel ceramics that are stable at high temperatures and at thicknesses of between 50-100 microns while retaining conductivity. These materials can be used in clean energy applications like novel Li-ion batteries and energy storage devices.
<b>Liang Dong</b>	\$600K	(US Army) Power Scaling of Combinable Fiber Lasers to Beyond 5kW	This project focuses on developing a reliable and scalable electricity source to power the next generation of laser weaponry.
<b>Richard Watkins</b>	\$600K	(US Navy) HOBBIT Control System Development for Higher Order Bessel Beams Integrated in Time (HOBBIT)	Bessel beams are lasers that do not function like lasers; unlike typical lasers, Bessel beams do not refract. Bessel beams can move very small objects, leading to their use as “optical tweezers,” permitting scientists to work on a micro-scale. Scaling up Bessel beams would present the possibility of moving distant objects with specially focused light.