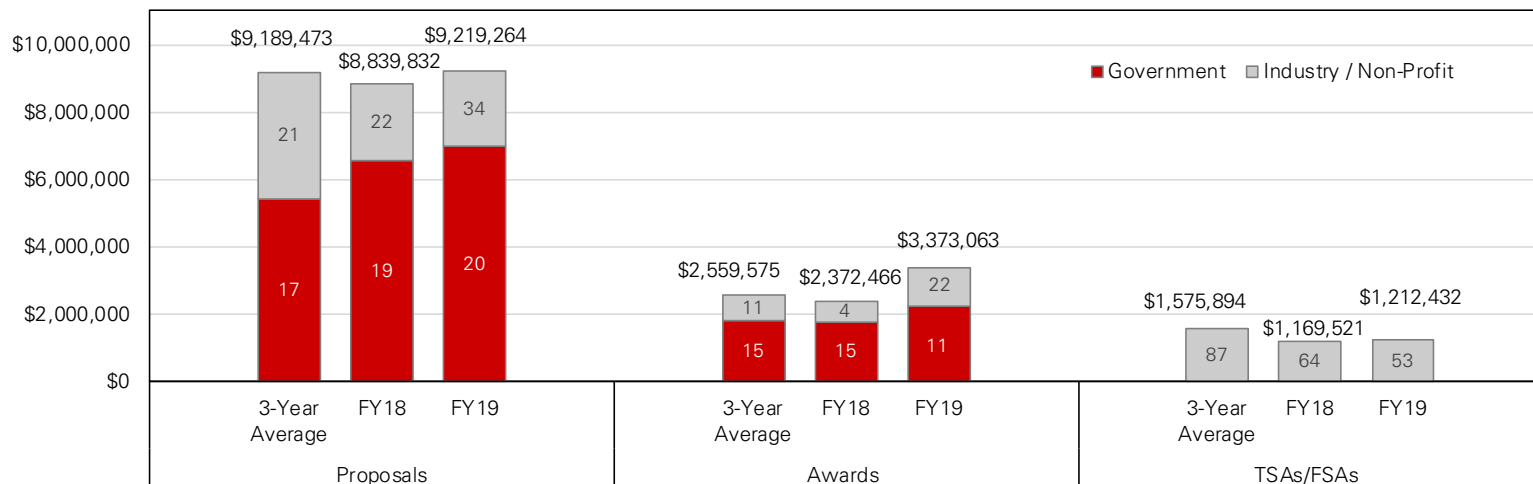


The research programs in the Wilson College of Textiles at NC State University are innovative, life-saving, creative, global and thriving. The College also provides tech service to all stakeholders and supports the economic development of the State and beyond. This newsletter gives a brief overview on the research and tech service activities of the faculty, staff and students during the second quarter of Fiscal Year 2019.

## FY19 vs. FY18 vs. Three-Year Average (Q1 + Q2)



## NUMBERS TO DATE (FY19 Q2)

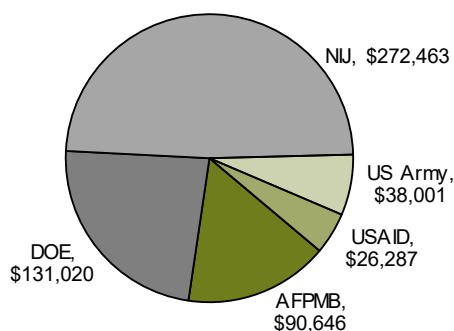
### Research Awards Received (\$1,280,302)

- Federal: \$558,417 | AFPMB, US Army, DOE, NIJ, USAID
- Industry/Non-Profit: \$721,885 | Algiknit, ASSIST, Australian Wool Innovation, Bastcore, DSM Dyneema, NWI, NC Biotech, Thermo-Flex Technologies Inc.

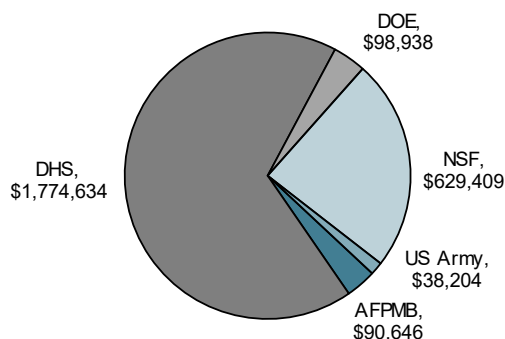
### Research Proposals Submitted (\$3,752,941)

- Federal: \$2,631,831 | AFPMB, US Army, DHS, DOE, NSF
- Industry/Non-Profit: \$1,121,110 | ACS, Algiknit, Bastcore, Cotton Inc., CRDC, Eastman Chemical Company, Everlight Chemical Industrial Corporation, Global Fund to End Modern Slavery, SCEYE SARL, Thermo-Flex Technologies Inc.

FY19 Q2 Federal Awards by Agency



FY19 Q2 Federal Proposals by Agency



## NUMBERS TO DATE (FY19 Q2) Cont.

### Inter-college Research Proposals (5)

- Wilson College share: \$366,224
- With CALS, CNR, COE

### Inter-college Research Awards (6)

- Wilson College share: \$413,109
- With CALS, CNR, COE

### Inter-department/unit Research Proposals (3)

- \$1,660,102

### Graduate Student Support

- 55 Ph.D. Student RAs (Avg Stipend: \$15,689 / year)
- 20 M.S. Student RAs (Avg Stipend: \$14,441 / year)

## RESEARCH AWARDS ABOVE \$50,000 (FY19 Q2)

1. Stephen Michielsen, \$272,463, National Institute of Justice
2. Emiel Den Hartog, \$258,653, Australian Wool Innovation Limited
3. Jesse Jur, \$135,001, ASSIST Center
4. Xiangwu Zhang, \$131,020, West Virginia University (US Dept. of Energy (DOE))
5. Jesse Jur, \$110,000, Thermo-Flex Technologies, Inc. (Polo Ralph Lauren)
6. Marian McCord, Andre West, Charles Apperson, Richard Roe, Emiel Den Hartog, Quan Shi, \$90,646, Armed Forces Pest Management Board (US Dept. of Defense (DOD))
7. Philip Bradford, Mark Pankow, \$50,000, The Nonwovens Institute

## RESEARCH HIGHLIGHTS

The Wilson College Research Opportunity Seed Fund (ROSF) was launched in 2017 to promote interdisciplinary, faculty-initiated research projects with potential for extramural support. The following three projects (\$10,000 each) were selected by the College Research Committee for funding in Spring 2019.

**Creation of three-dimensional (3D) avatars for people with disabilities to be used in 3D apparel simulation (Anne Porterfield, Kate Annett-Hitchcock, and Tim Buie).** New 3D apparel simulation enables a product developer to virtually sew, view, and fit garments in a 3D environment. The primary goal of this study is to discover and define best practices for creation of custom avatars, for use in apparel simulation, from body scans of people with disabilities. Custom avatars will then be used to virtually try on garments to determine fit problems and potential solutions. This study will employ an interdisciplinary approach through combining expertise in apparel product development and 3D graphic design to come up with a solution. Graduate students from the Wilson College of Textiles and the College of Design will partner together, led by faculty from both colleges, to learn from each other about the methods and software in their respective disciplines and to test, record, and evaluate the process of achieving an effective avatar.

**Inherent thermoresponsive fabrics (Kavita Mathur and Nathalie Lavoine).** Sleep has become an increasing public health issue. One solution to improve sleep performance consists in improving thermal comfort by regulating the skin temperature within the physiological range. During the nocturnal sleep phase, our core body temperature commonly decreases, while it increases back during the waking phase, and this, repeatedly in a 24h circadian rhythm. The mechanisms regulating our sleep are thus heavily correlated to thermoregulation. Our strategy is centered on the development of woven textiles, which can undergo inherent physical and structural changes triggered by variations of the skin temperature during sleeping. This project aims at investigating the inherent thermoresponsive behavior of composite fibers made of a thermoresponsive polymer and a biocompatible cellulose matrix, when subjected to temperature stimuli, by varying the fibers morphology, composition and surface chemistry, for the elaboration of smart woven textiles.

**The impact of Laundering Variables on Microfiber Release and Capture (Karen K. Leonas, Melissa Pasquinnelli, and Richard A. Venditti).** This project aims to systematically study fiber release from textiles during home laundering and methods of trapping the released fibers before they enter waterways. Plastic pollution of many types in our oceans is significant. One subcategory of this pollution is fibrous in nature. Home laundering has been identified as a source of fiber release. The impact of specific yarn characteristics and laundering conditions on fiber release and capture will be studied. The results from this study will be compiled into a database that will be available for others to access to contribute to. The results of this project will be the foundation for future studies and provide critical information to those in the global textile complex, legislators and consumers.