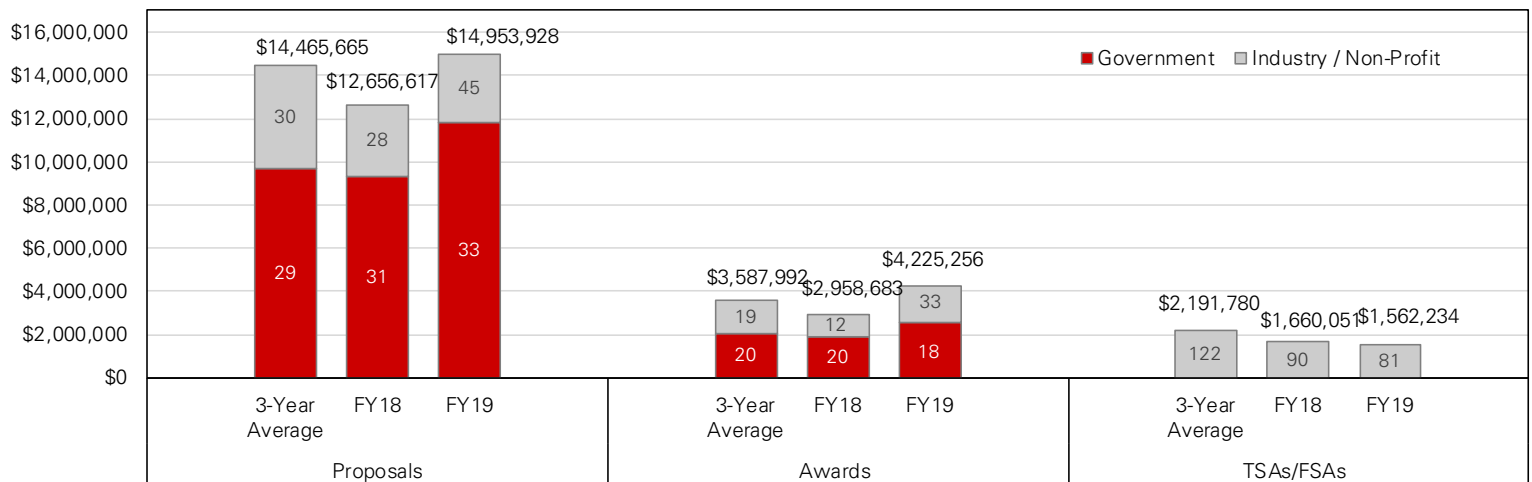


The research programs in the Wilson College of Textiles at NC State University are innovative, life-saving, creative, global and thriving. The College also provides tech service to all stakeholders and supports the economic development of the State and beyond. This newsletter gives a brief overview on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

## FY19 vs. FY18 vs. Three-Year Average (Q1 - Q3)

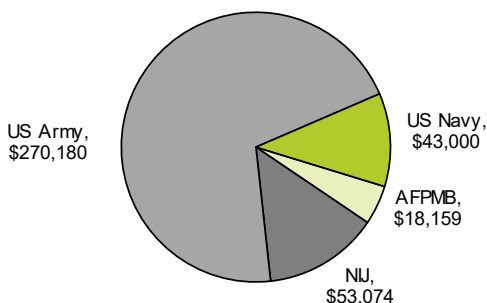


## NUMBERS TO DATE (FY19 Q3)

### Research Awards Received (\$852,193)

- Federal: \$384,413 | AFPMB, NIJ, US Army, US Navy
- Industry/Non-Profit: \$467,780 | Cotton Inc., Cotton Research and Dev't Corp., Everlight Chemical Industrial Corp., Global Fund to End Modern Slavery, Hanesbrands, NC State Center for Dielectrics and Piezoelectrics, Technology Holding LLC

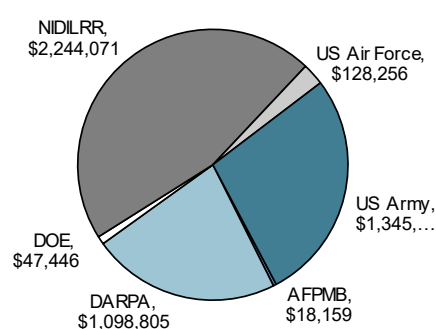
FY19 Q3 Federal Awards by Agency



### Research Proposals Submitted (\$5,734,664)

- Federal: \$4,882,212 | AFPMB, DARPA, DOE, NIDILRR, US Air Force, US Army
- Industry/Non-Profit: \$852,452 | Cotton Inc., Cotton Research and Dev't Corp., Eastman, Egyptian Cultural & Educational Bureau, Global Fund to End Modern Slavery, KITECH, Pusan National University, NC Biotechnology Center, Technology Holding LLC

FY19 Q3 Federal Proposals by Agency



## NUMBERS TO DATE (FY19 Q3) Cont.

### Inter-college Research Proposals (8)

- Wilson College share: \$4,451,838
- With CALS, CNR, COD, COE, COS, CVM, PCOM

### Inter-college Research Awards (3)

- Wilson College share: \$70,676
- With CALS, COE, PCOM

### Inter-department/unit Research Proposals (2)

- \$882,789

### Inter-department/unit Research Awards (2)

- \$83,218

### Graduate Student Support

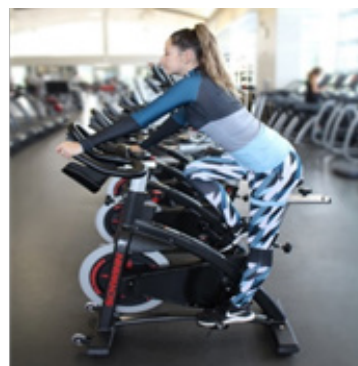
- 55 Ph.D. Student RAs (Avg Stipend: \$15,689 / year)
- 20 M.S. Student RAs (Avg Stipend: \$14,441 / year)

## RESEARCH AWARDS ABOVE \$50,000 (FY19 Q3)

1. Wei Gao, Xiangwu Zhang, \$215,620, Storagenergy Technologies, Inc. (US Army).
2. Lisa Chapman, Harold Freeman, Stephen Michielsen, Kristin Thoney-Barletta, \$65,059, Everlight Chemical Industrial Corporation.
3. Jesse Jur, Amanda Myers, \$55,000, NCSU Center for Dielectrics and Piezoelectrics (CDP).
4. Nelson Vinueza Benitez, \$53,074, Washington State University (National Institute of Justice).
5. Robert Handfield, Marguerite Moore, \$52,517, Global Fund to End Modern Slavery.
6. Emiel DenHartog, \$50,000, US Army - Soldier Systems Center (Natick).

## RESEARCH HIGHLIGHTS

**The 2D image body measuring system** developed by Professors Cynthia Istook, Andre West, and their PrimeFit research team is able to measure human body base on photos captured by smart phones. Users could put on a set of measuring garments and use their smart phones to take a front and a side view photo of them wearing the garments to get their body measurements. This measuring system offers a simple and affordable method for people to measure their bodies for daily use and could potentially solve the problem of online shopping returning caused by garment fit problem.



**Inkjet Printing Electronic Materials on Textile Platforms** is being researched to impart high electrical functionalities while maintaining inherent properties of textiles. Ink-jet printing has been demonstrated as a means of rapid production of versatile patterns, minimizing materials waste and eliminating incorporation of electronic materials in fiber and yarn production. In order to overcome challenges in heavy-metal nanoparticle inks, particle-free reactive silver inks based on silver carboxylates and ammonia ligands are processed in inkjet system to fabricate e-textiles on knit, woven and nonwoven structures. Using these strategies, the NEXT research team, led by Dr. Jesse Jur, a low sheet resistance of  $0.09 \Omega/\text{sq}$  was achieved by controlling the number of print passes, annealing process and textile structures. Their studies highlight the use of inkjet process of various electronic inks to fabricate textile-based electrodes, strain sensors, capacitors, pressure sensors and organic thin film transistors (OTFT) in wearable electronics system.