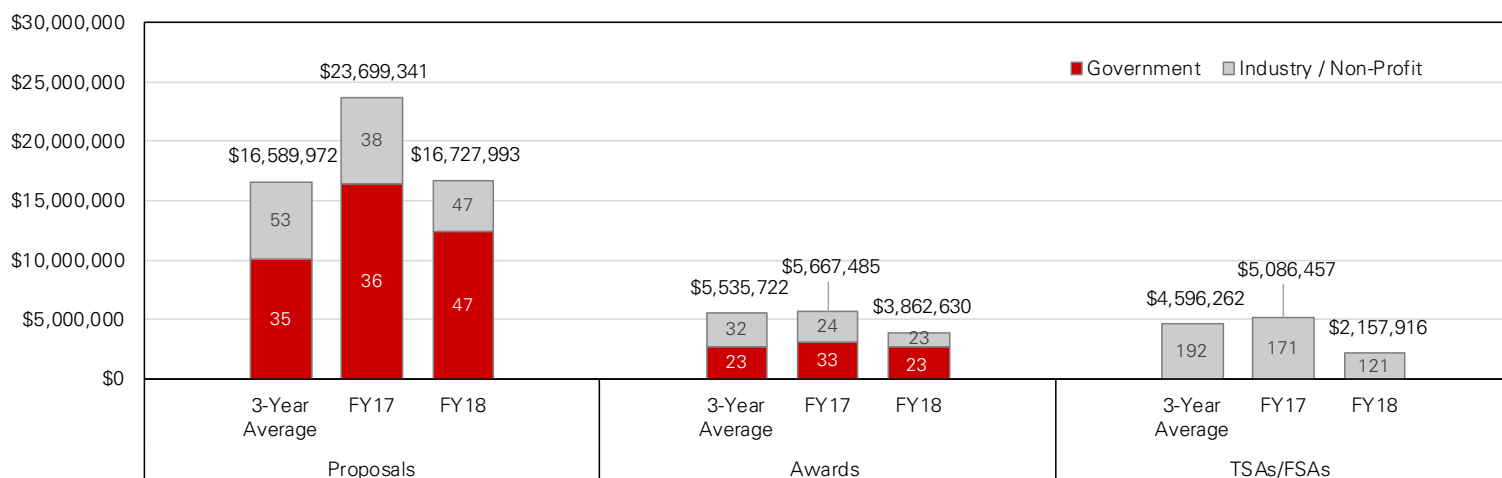


The research programs in the College of Textiles at NC State University are innovative, life-saving, creative, global and thriving. The College also provides tech service to all stakeholders and supports the economic development of the State and beyond. This newsletter gives a brief overview on the research and tech service activities of the faculty, staff and students during the fourth quarter of Fiscal Year 2018.

## FY18 vs. FY17 vs. Three-Year Average (Q1 - Q4)

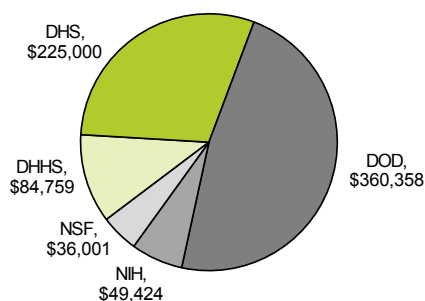


## NUMBERS TO DATE (FY18 Q4)

### Research Awards Received (\$903,947)

- Federal: \$755,542 | DHS, DHHS, NSF, NIH, DOD
- Industry: \$148,405 | Cotton Inc., Higher Dimension Materials, Kalion Inc., Luna Innovations, VF Jeanswear

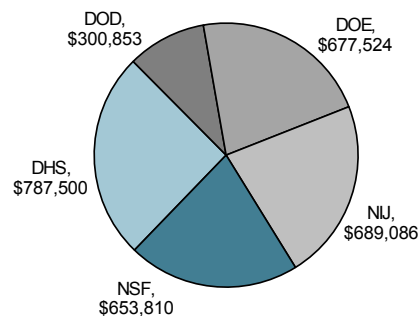
FY18 Q4 Federal Awards by Agency



### Research Proposals Submitted (\$4,071,376)

- Federal: \$3,108,773 | DHS, DOD, DOE, NIJ, NSF
- Industry: \$962,603 | CFD Research Corporation, Eastman Chemical Company, ExH Engineering, Fortified Textiles, Kalion Inc., Luna Innovations, Mermet Corporation, Nano Terra, SynTouch Inc., Vector Textiles, VF Jeanswear

FY18 Q4 Federal Proposals by Agency



## NUMBERS TO DATE (FY18 Q4) Cont.

### Inter-college Research Proposals (15)

- COT share: \$1,608,080
- With CALS, CHASS, CNR, COD, COE, COS, CVM

### Inter-college Research Awards (3)

- COT share: \$86,001
- With CALS, COE, COS, GS

### Inter-department/unit Research Proposals (1)

- \$69,798

### Inter-department/unit Research Awards (1)

- \$174,008

### Graduate Student Support

- 42 Ph.D. Student RAs (Avg Stipend: \$19,290 / year)
- 11 M.S. Student RAs (Avg Stipend: \$17,393 / year)

## RESEARCH AWARDS ABOVE \$50,000 (FY18 Q4)

1. Roger Barker, Don Thompson, Marc Mathews, Cassandra Kwon, \$225,000, Higher Dimension Materials, Inc.
2. Ericka Ford, Behnam Pourdeyhimi, \$174,088, Luna Innovations, Inc.
3. Marian McCord, Andre West, Charles Apperson, Richard Roe, Emiel Den Hartog, Quan Shi, \$150,000, Armed Forces Pest Management Board
4. A. Blanton Godfrey, \$84,759, US Dept. of Health & Human Services
5. Ericka Ford, Terrence Gardner, Mohamed Bourham, \$50,000, The Nonwoven Institute

## RESEARCH HIGHLIGHTS

The Faculty Research and Professional Development (FRPD) program is a funding partnership between the Office of Research, Innovation and Economic Development (ORIED) and the 10 academic Colleges. The program was established to assist faculty in initiating research and professional development activities. The primary objective of this program is to provide individual investigators seed funding to pursue larger awards and grants from outside agencies. The following two projects (\$8,000 each) were selected for funding in FY 2019.

**Solution Spinning of 2D Materials to Novel Fibrous Structures for Wide Applications (Wei Gao).** Novel fibers directly spun from two-dimensional materials instead of polymers can lead to a technological revolution to the state-of-the-art fiber industry. Recently two-dimensional (2D) materials such as graphene, MoS<sub>2</sub>, and MXene have demonstrated extraordinary molecular-level properties for energy storage, sensing, separation, catalysis, etc. However, their large-scale manufacturing and processing for real-world applications are still in its infancy. Professor Wei Gao's group is working on the fiber-formation technologies with this new group of 2D crystals, providing fundamental understanding of their fiber formation mechanisms. The right image shows a knitted fabric made of graphene fibers that can work as a battery to store and deliver electrical energy.



**Enhancing the Performance and Usability of Woven Conductive Textiles (Janie Woodbridge).** Few electronic textiles have penetrated the commercial market. Extensive research has gone into the development of electronic textiles but due to long term issues with durability and performance, they have had little commercial success. To overcome this challenge, Professor Janie Woodbridge is studying existing electronic textiles and working to develop a multi-layered woven conductive fabric with an integrated support system. This will provide extra durability, more comfort for the wearer, and better protection of the sensitive, often fragile, conductive fibers. Increasing performance capabilities will extend the usability of electronic textiles and make them more commercially desirable.