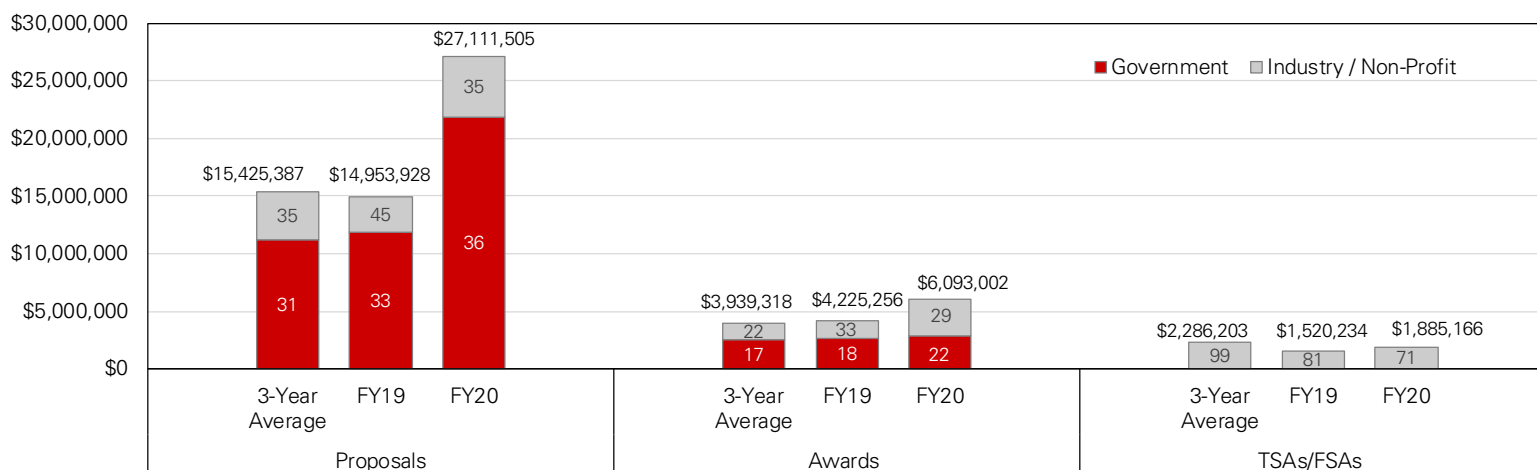


The research programs in the Wilson College of Textiles at NC State University are innovative, life-saving, creative, global and thriving. The College also provides tech service to all stakeholders and supports the economic development of the State and beyond. This newsletter gives a brief overview on the research and tech service activities of the faculty, staff and students during the third quarter of Fiscal Year 2020.

FY20 vs. FY19 vs. Three-Year Average (Q1-Q3)



NUMBERS TO DATE (FY20 Q3)

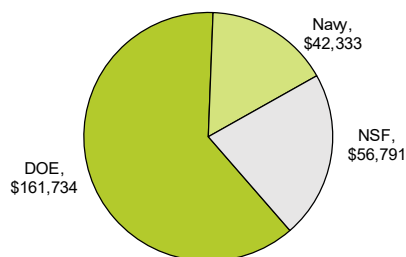
Research Awards Received (\$1,425,012)

- Federal: \$260,858 | DOE, Navy, NSF
- Industry/Non-Profit: \$1,164,154 | Center for Dielectrics and Piezoelectrics, Eastman Chemical Company, Mide Technology, P&G

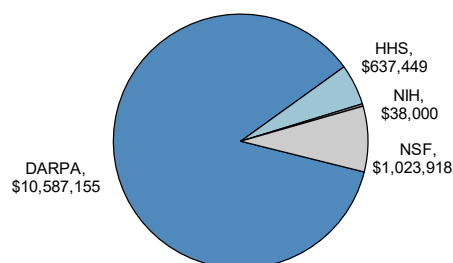
Research Proposals Submitted (\$14,881,415)

- Federal: \$12,286,522 | DARPA, HHS, NIH, NSF
- Industry/Non-Profit: \$2,594,893 | Australian Wool Innovation Ltd., AFFOA, Chancellor's Innovation Fund, Eastman, NY Stem Cell Foundation, Oak Ridge Assoc. Univ., P&G, Storgenergy Tech, Inc., TensTech, Inc., Wake Forest University

FY20 Q3 Federal Awards by Agency



FY20 Q3 Federal Proposals by Agency



NUMBERS TO DATE (FY20 Q3) Cont.

Inter-college Research Proposals (5)

- Wilson College share: \$1,419,217
- With CALS, CHASS, CNR, COE, COS

Inter-college Research Awards (2)

- Wilson College share: \$42,923 | With COE, COS

Inter-department/unit Research Proposals (4)

- \$11,074,774

Graduate Student Support

- 89 Ph.D. Student RAs (Avg Stipend: \$15,941 / year)
- 21 M.S. Student RAs (Avg Stipend: \$14,671 / year)

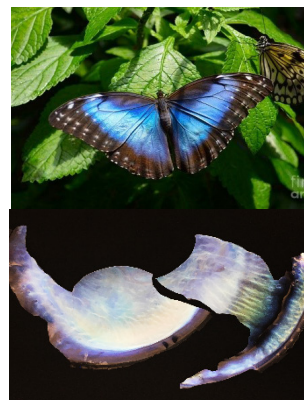
RESEARCH AWARDS ABOVE \$50,000 (FY20 Q3)

1. Abdelfattah Seyam, EAGER; Virginia Tech (NSF), \$56,791.
2. Philip Bradford, Jesse Jur, US Dept. of Energy – (ARPA-E), \$161,734.
3. Harold Freeman, Ahmed El-Shafei, Eastman Chemical Company, \$188,740.
4. Jesse Jur, Amanda Myers, Center for Dielectrics and Piezoelectrics, \$55,000.
5. Renzo Shamey, Eastman Chemical Company, \$381,321.
6. Roger Barker, Anthoney Deaton, Mide Technology Corp. (US Army), \$496,170.

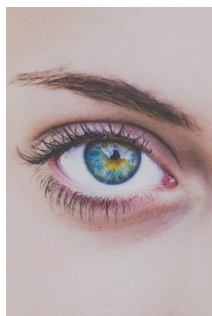
RESEARCH HIGHLIGHTS

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 2020.

Bio-inspired structural color for textiles using wood based nanomaterials can offer a greener alternative to traditional textile coloration (Kavita Mathur, Nathalie Lavoine, and Traci Lamar). In nature, generation of structural colors is realized by living organisms (e.g. butterflies). These natural colors result from the selective reflectance of incident light originating from micro- and nano-structure variation. In this project, we combine textile material, a microstructure, with wood-extracted cellulose nanocrystals, as nanostructure, to generate naturally colored fabrics. This interdisciplinary project involves a collaborative team of experts in textile structure and design, coloration technologies and cellulose nanomaterials, from the Wilson College of Textiles (Drs. Traci Lamar and Kavita Mathur) and the College of Natural Resources (Dr. Nathalie Lavoine), respectively. This innovative project aims at reducing the use of synthetic dyes and pigments in textile color applications, but also proposes a new sustainable pathway to textile coloration using renewable and biodegradable materials.



**Structural Color:
From butterfly to
wood nanomaterials**



Developing sensor-integrated polymeric scaffolds and investigating their biocompatibility for ocular tissue engineering (Januka Budhathoki-Uprety and Jessica M. Gluck). The World Health Organization estimates that at least 2.2 billion people worldwide have a vision impairment or blindness. Frequently, vision impairment has been related to damage to the cornea within the eye. The most common restorative treatment option for corneal damage is transplantation. The ocular tissue engineering approach for corneal transplantation relies on stem cells from a donor to develop corneal tissue before transplanting it to the patient. Optimal biomaterial scaffolds for tissue development as well as monitoring the tissue function are essential for successful tissue engineering. Drs. Januka Budhathoki-Uprety and Jessica M. Gluck are collaborating on developing sensor-integrated polymer scaffolds for ocular tissue engineering and in situ monitoring of tissue function. The inclusion of the biosensor in scaffolds will enable real-time monitoring of tissue health during culture and optimization strategies for corneal transplantation, as well as developing stem cell-derived epithelium to negate the need for donor tissue in the future.