

OFFICE OF  
RESEARCH &  
ENGAGEMENT

**ANNUAL  
REPORT  
FY2018**



THE UNIVERSITY OF  
**TENNESSEE**  
KNOXVILLE



## LETTER FROM THE INTERIM VICE CHANCELLOR FOR RESEARCH



**FISCAL YEAR 2018** saw significant increases in several research performance metrics for the University of Tennessee, Knoxville, research community.

UT reported its most impressive research year on record, with \$260 million in total research expenditures. Federal funding accounted for \$117.8 million, or 45 percent, of TREs, with the remainder coming from institutional, state and local government, business, nonprofit, and other funds. The federal agencies that invested the most in UT research were the Department of Energy with \$58.9 million, the

National Science Foundation with \$25.6 million, and the Department of Defense with \$10.8 million. Research outside of science, technology, engineering, and manufacturing fields accounted for more than \$42 million in expenditures.

UT's research community submitted 1,764 proposals with a total dollar value of \$611 million. Researchers were awarded \$158 million in external awards, a 3 percent increase over the previous five-year average.

Eight UT faculty members received NSF Faculty Early Career Development (CAREER) awards—the university's second-largest number of recipients in a fiscal year. Six of the eight FY18 CAREER recipients were from the Tickle College of Engineering and two were from the College of Arts and Sciences.

Two faculty members in the College of Arts and Sciences were awarded yearlong fellowships from the National Endowment for the Humanities to support their research. Since the start of the NEH Fellowship Program in 1967, UT faculty have been awarded 32 NEH Fellowships; 18 of those have been awarded since 2005, when the Office of Research and Engagement created a position to assist faculty in the pursuit of humanities awards. UT ranks ninth in the nation in the number of these prestigious awards received since 2005.

UT has seen continued growth in research engagement. More than 3,900 undergraduate students participated in research during the course of the year. The annual Exhibition of Undergraduate Research and Creative Achievement (EURēCA) has grown steadily since 2014, with 850 students presenting 628 posters in John C. Hodges Library. More than 500 engagement and outreach projects across the state show the impact of UT's research enterprise on Tennessee's communities and citizens.

Looking ahead, the Office of Research and Engagement continues to seek strategic opportunities for UT faculty and students and to diversify our sources of funding while growing our partnerships with industry and government agencies. We look forward to the future of research, engagement, and creative activities at the University of Tennessee!

Robert Nobles II  
Interim Vice Chancellor for Research

## TABLE OF CONTENTS



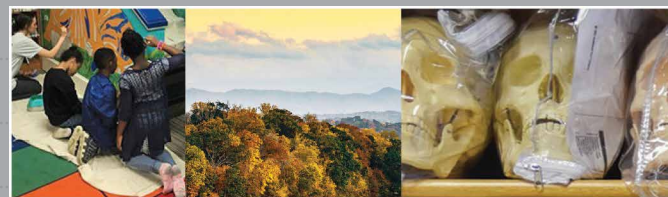
**06**  
Publications & Citations



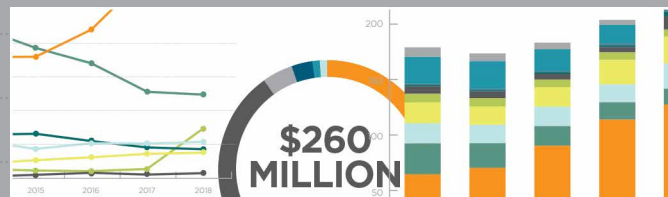
**08**  
Research Highlights & News



**10**  
Undergraduate Research Highlights



**12**  
Engagement



**14**  
Data Summary

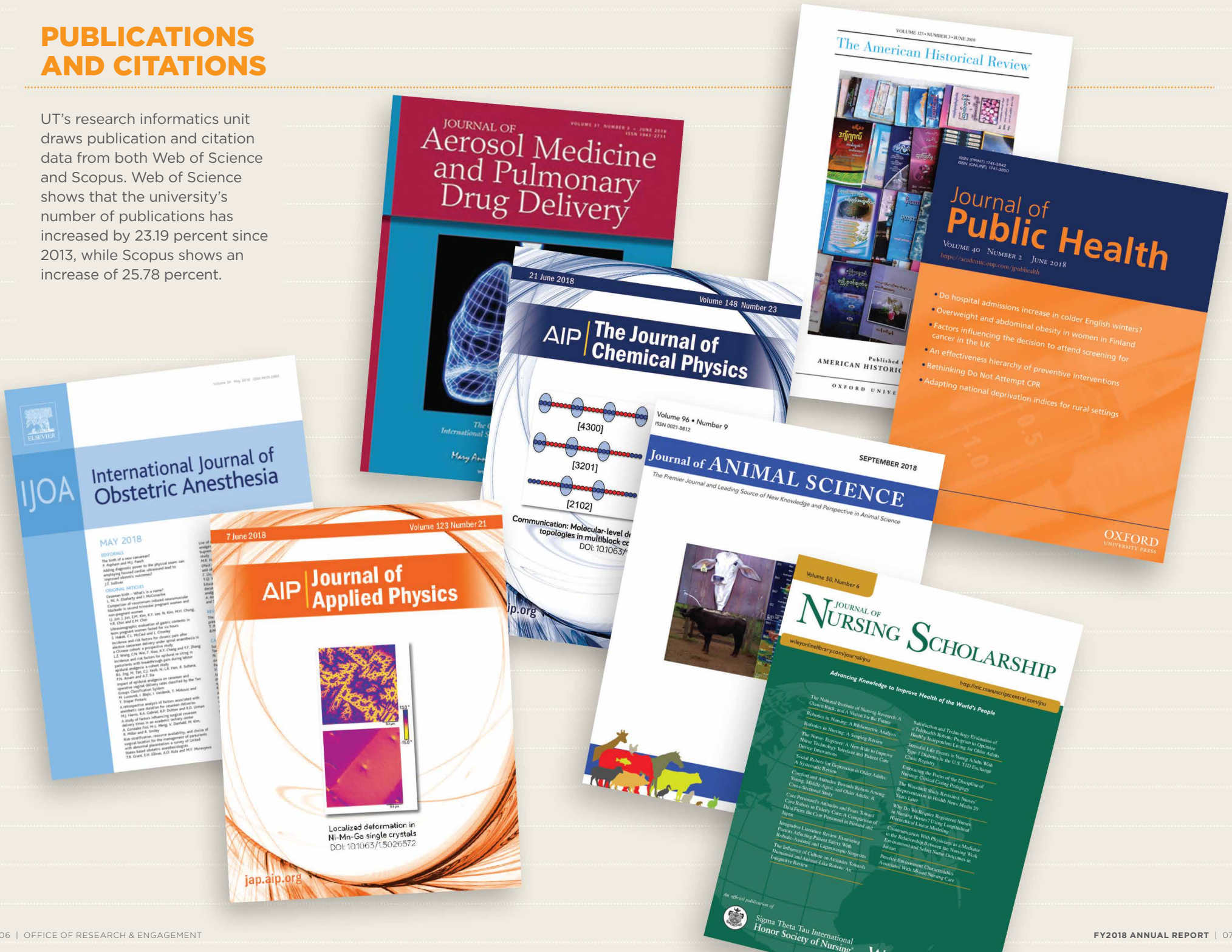


**18**  
Humanities Awards



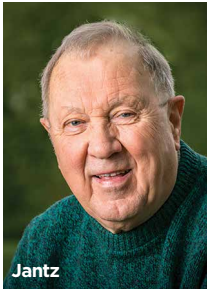
# PUBLICATIONS AND CITATIONS

UT's research informatics unit draws publication and citation data from both Web of Science and Scopus. Web of Science shows that the university's number of publications has increased by 23.19 percent since 2013, while Scopus shows an increase of 25.78 percent.





# RESEARCH HIGHLIGHTS AND NEWS



Jantz

## EARHART ANALYSIS

**Richard Jantz**, professor emeritus of anthropology and director emeritus of UT's Forensic Anthropology Center, made news around the world when he published a study indicating that Amelia Earhart's

remains had been found after 82 years. Jantz analyzed bone measurements taken in 1940 by physician D. W. Hoodless, who concluded that the bones belonged to a man. Based on comparison to Earhart's measurements, Jantz concluded that "until definitive evidence is presented that the remains are not those of Amelia Earhart, the most convincing argument is that they are hers."



## MULTIDISCIPLINARY UNIVERSITY RESEARCH INITIATIVE

**Suresh Babu**, the UT-Oak Ridge National Laboratory Governor's Chair for Advanced Manufacturing,



Babu

was selected to lead an Office of Naval Research Multidisciplinary University Research Initiative, the first in UT's history. Babu's team will focus on properties, defects, and instabilities in advanced manufactured alloys, an area of great interest to the Navy.

According to ONR, the award will total roughly \$1.5 million a year for three years and be extendable to five years.

## WATER LAB

**The Water Quality Core Facility**, established in spring 2018 in UT's Tickle College of Engineering, is on its way to becoming a regional leader in water quality analysis. The lab offers analytical services and expertise to several UT departments as well as clients including the



Smoky Mountains National Park, Big South Fork National River, and US national laboratories, and it hopes to expand those partnerships after attaining national accreditation.

## LAND GRANT FILMS

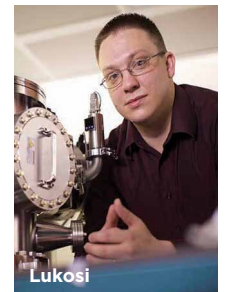
**Land Grant Films**, a documentary production program housed in UT's School of Journalism and Electronic Media, received a \$10,000

grant from East Tennessee Public Broadcast Stations to produce a series of micro-documentaries telling the stories of local post-9/11 veterans.



## LEUKEMIA TREATMENT ADVANCE

A new device devised by **Eric Lukosi**, assistant professor of nuclear engineering, and fabricated by master's student William Gerding will allow physicians to dispense accurate dosages of a drug made with actinium-225, an isotope that



Lukosi

has been shown to be effective in treating—and curing—myeloid leukemia. The device is slated for testing at Oak Ridge National Laboratory.



# UNDERGRADUATE RESEARCH HIGHLIGHTS

MORE THAN 3,900 UNDERGRADUATE STUDENTS PARTICIPATED IN RESEARCH AND CREATIVE ACTIVITIES DURING THE YEAR. THEIR WORK HAS RECEIVED NATIONAL AND INTERNATIONAL RECOGNITION AND IS A POINT OF PRIDE FOR THE UNIVERSITY.



Payne

## POSTERS ON THE HILL

**Taylor Payne**, a junior majoring in chemistry and Hispanic studies, was among 60 top students who were invited to present their undergraduate research to legislators on Capitol Hill in Washington, DC, for the Posters on the Hill Symposium. Payne's research project, Neurological Disease Detection Using Laser Technology, is part of an effort to develop a noninvasive method of detecting neurological disease using a laser light scattering technique to monitor concentrations of neurochemicals in

the brain. Payne is the fourth UT student in the past four years to have a project accepted for Posters on the Hill.

## NEW R DESIGNATION FOR RESEARCH-INTENSIVE COURSES

A new designation for research-intensive courses gives UT students another pathway for participating in undergraduate research. The 22 R-designated courses in the current

catalog have undergraduate research built into the curriculum. The new designation, along with an S designation for service-learning, was approved by the Undergraduate Council's Curriculum Committee, the Undergraduate Council, the Faculty Senate Executive Committee, and the Faculty Senate.

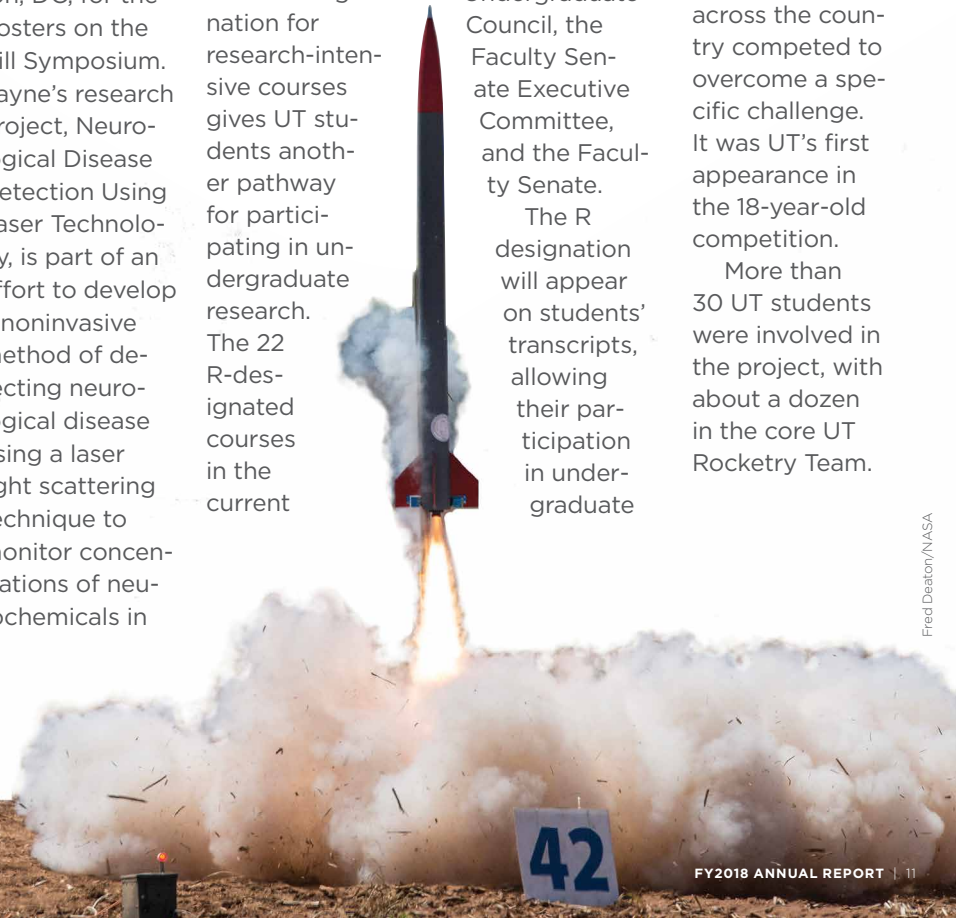
The R designation will appear on students' transcripts, allowing their participation in undergraduate

research to be confirmed by graduate schools and employers.

## NASA ROCKETRY COMPETITION

A group of UT engineering students took part in NASA's Student Launch project, in which 45 teams from across the country competed to overcome a specific challenge. It was UT's first appearance in the 18-year-old competition.

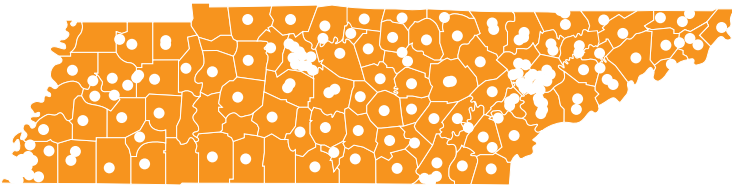
More than 30 UT students were involved in the project, with about a dozen in the core UT Rocketry Team.



Fred Deaton/NASA



# ENGAGEMENT



WE HAVE IDENTIFIED MORE THAN 500 PROJECTS ACROSS THE STATE SHOWING THE IMPACT OF UT'S RESEARCH ENTERPRISE ON TENNESSEE'S COMMUNITIES AND CITIZENS.

## MAYNARD ELEMENTARY MURAL

Six undergraduate students from UT's School of Art worked with third through fifth graders at Maynard Elementary School in Knoxville to create a mural in the school's library. Art projects like this, developed in collaboration with members of

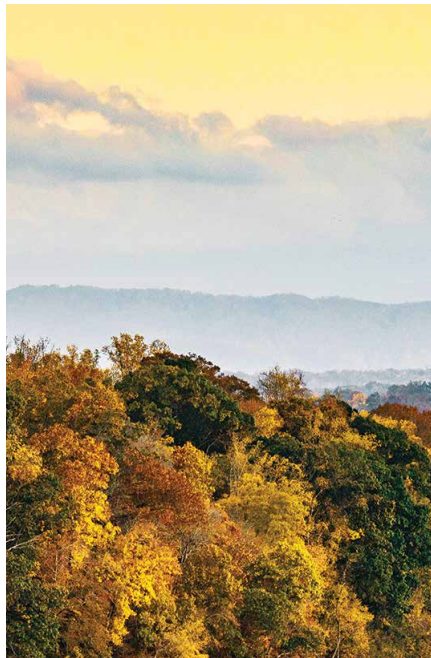


the community, establish and reinforce bonds between people and place and act as conduits for dialogue, connection, and education.

## BLACK IN APPALACHIA

After researching her family history, **Juniper Starr** realized how much information is lost because people often don't believe their stories are worth telling. Starr, a master's student in information sciences, now helps preserve the history of African Amer-

icans in Appalachia. Starr scans materials and categorizes the artifacts, images, and stories shared by



people from the region.

Her work is part of the East Tennessee PBS digital series *Black in Appalachia*, which highlights the history of African Americans in the development of the mountain South and its culture by collecting materials and narratives, engaging with the public, and holding exhibitions.

## BIOLOGY IN A BOX

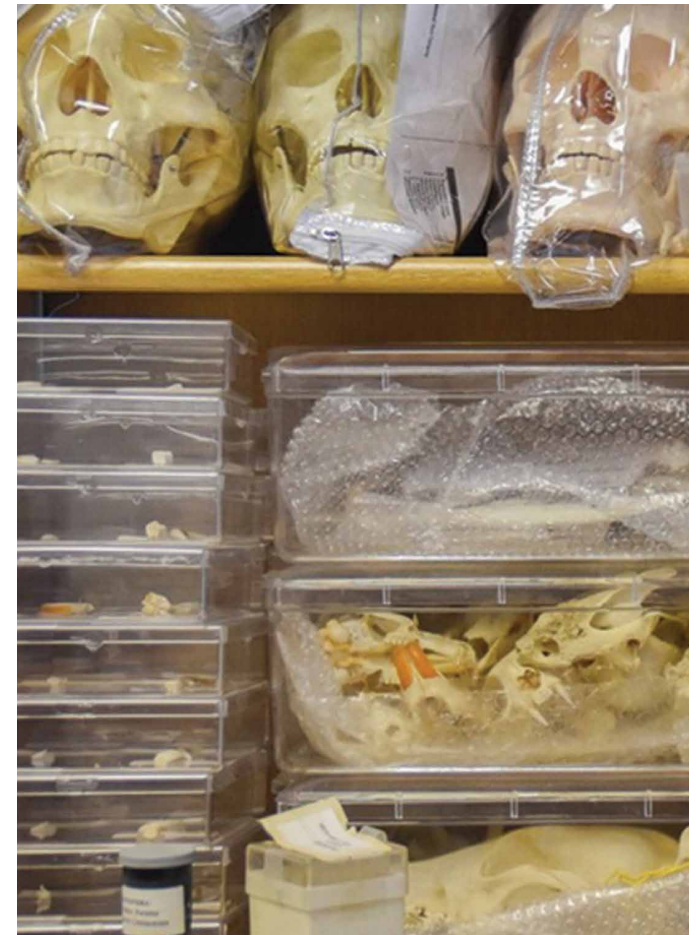
Boxes of bones, seeds, chunks of wood, seashells, measuring tape, and even turtle poop have been showing up at schools across Tennessee for more than 25 years courtesy of **Susan Riechert**, Distinguished Service Professor and Chancel-

lor's Professor of Ecology and Evolutionary Biology.

Her Biology in a Box outreach program has provided hands-on sci-

ence lessons in nearly 1,200 schools across the state. With physical materials as well as fun games and exercises, Riechert's boxes capture

the attention of students who may not have previously had an interest in science, technology, engineering, or math.



## DATA SUMMARY

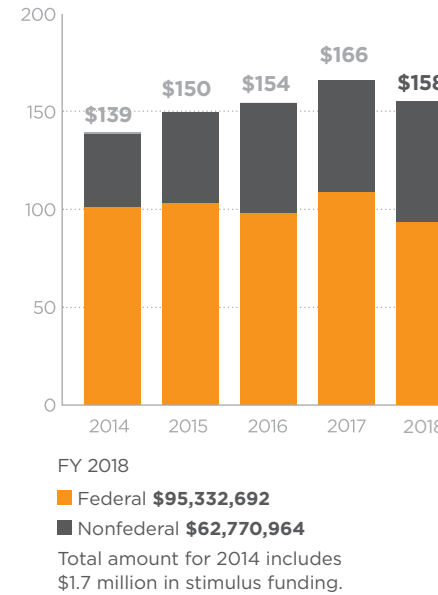
The data for this report was run on September 25, 2018. It includes research expenditures from the University of Tennessee, Knoxville, and UT Space Institute during fiscal year 2018 as reported to the National Science Foundation. Comparison data from previous years is drawn from NSF sources.

All colleges reported an increase in total research expenditures, resulting in an overall increase of 30 percent over

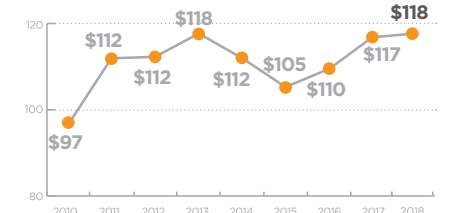
FY17, including a 4 percent increase in federal research expenditures.

Several technology transfer metrics also marked significant increases. UT and UTSI faculty contributed to a 490 percent increase in revenue over FY17. Also on the rise was the number of invention disclosures, with a 40 percent increase over FY17.

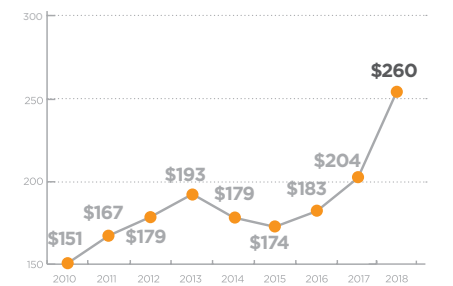
### Sponsored Research Funding by Sponsor Type (IN MILLIONS)



### Federal Research Expenditures (IN MILLIONS)



### Total Research Expenditures (IN MILLIONS)



### Total Research Expenditures by Source of Funds

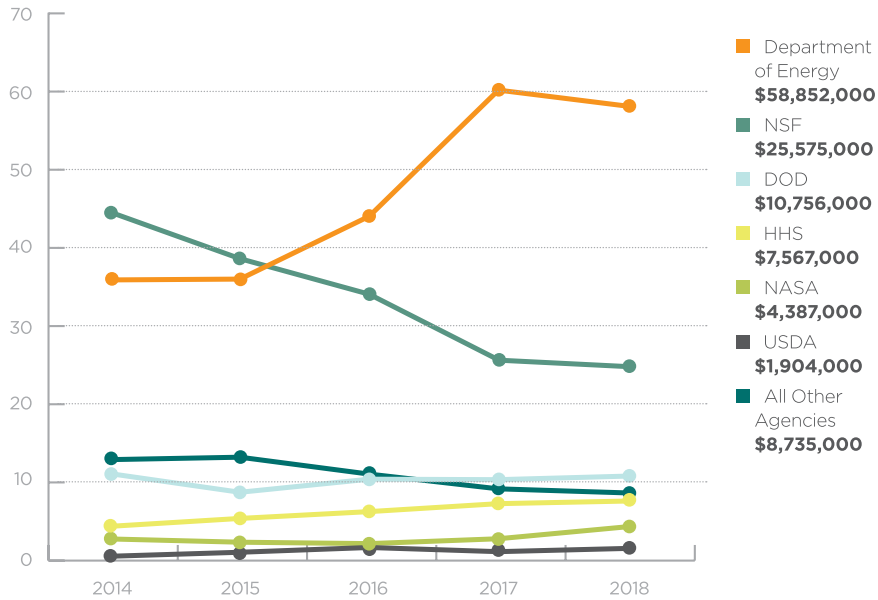


- Federal (FREs) **\$117,776,000**
- Institutional funds **\$115,857,000**
- State and local government **\$14,370,000**
- Business **\$6,219,000**
- Nonprofit organizations **\$2,669,000**
- Other sources **\$2,716,000**



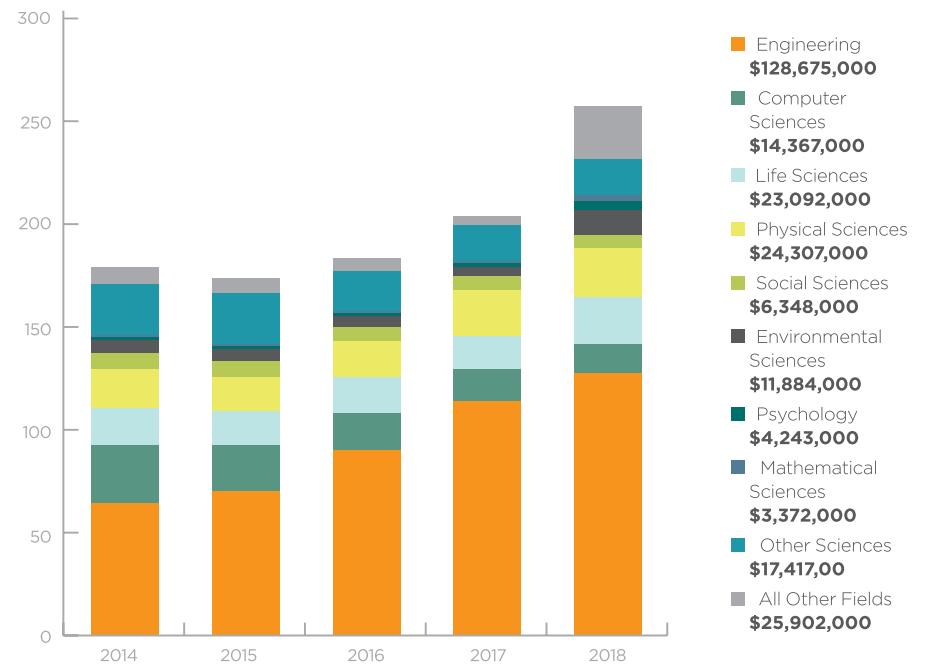
## Federal Research Expenditures by Agency

(IN MILLIONS)



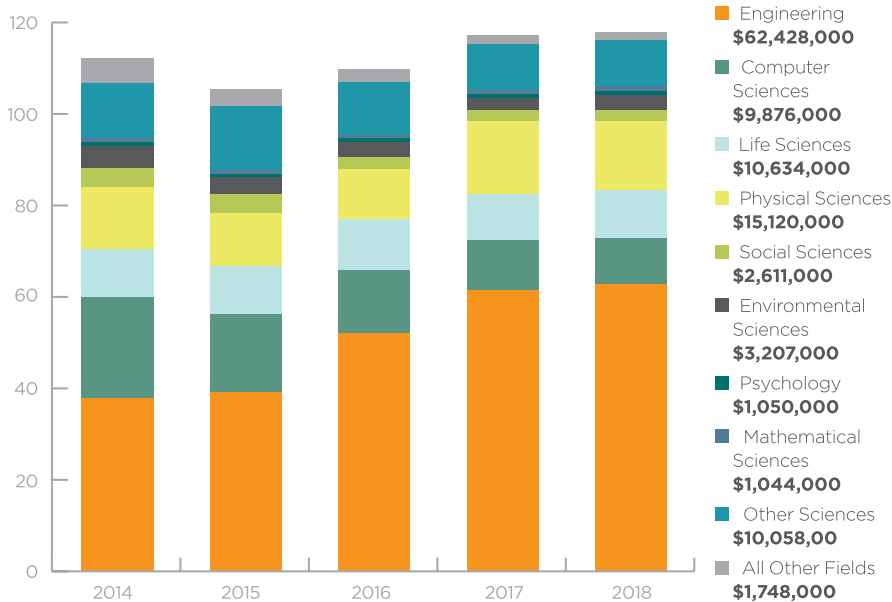
## Total Research Expenditures by R&D Field

(IN MILLIONS)



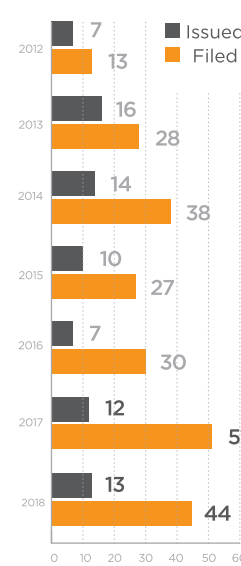
## Federal Research Expenditures by R&D Field

(IN MILLIONS)

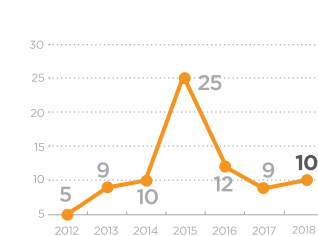


## Technology Transfer

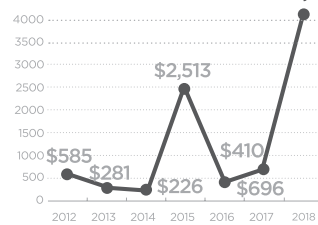
### PATENTS



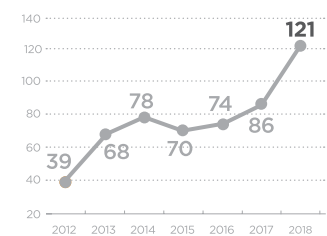
### LICENSES AND OPTIONS



### REVENUE (in millions)



### INVENTION DISCLOSURES



Since 2012, UT has launched seven student and faculty startups.

## HUMANITIES AWARDS

### Fulbright Scholars Program

Seong-Hoon Cho, Agricultural and Resource Economics

Denita Hadziabdic Guerry, Entomology and Plant Pathology

Steven Oberman, Law

Loneka Wilkinson-Battiste, Music

### Huntington Library

#### Long-Term Fellowship

Kristen Block, History

### John Carter Brown Library

#### Long-Term Fellowship

Kristen Block, History

### American Philosophical Society Franklin Award

Margaret Andersen, History

### National Endowment for the Humanities Fellowship

Anne-Hélène Miller, French

Sara Ritchey, History





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