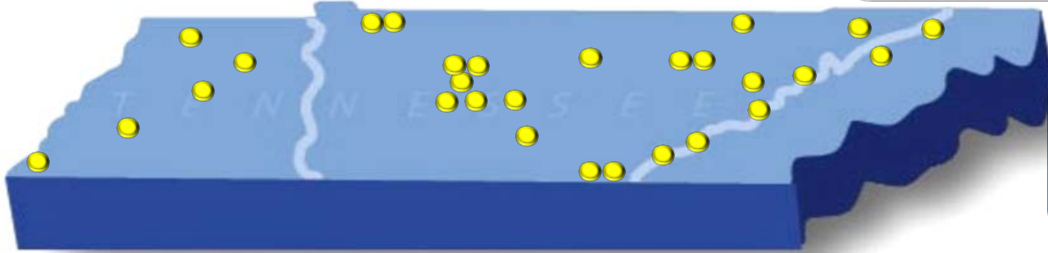


# Research, Outreach, and Economic Development Office Overview



# TN-SCORE

*National Science Foundation EPSCoR*  
Research Infrastructure Track 1  
\$24M program



299 faculty and students supported  
~49,000 K-12 students engaged

## TN-SCORE SUCCESS

239 Publications

\$20.5 M of Direct New Funding

20 Invention Disclosures

95 New Funded Projects

\$10.5 M Co-funding

2 Start-up Companies



**Tennessee Graduated from EPSCoR  
program as statewide NSF funding  
increases from \$35.1M in 2009 to  
\$51.4M in 2014!!!**

# Solar Installation Grant Program



- ✓ 156 grants
- ✓ \$11.5MM in funding
- ✓ \$27.6MM leveraged
- ✓ 6.8MW installed



Blue Cross Blue Shield, Chattanooga



Great Neck Saw Company, Memphis



Cedar Run Farms, West Tennessee



# Solar Innovation Grant Program



- ✓ 80 projects to 36 grantees
- ✓ \$12.1MM in funding
- ✓ \$7.4MM leveraged



Diversified Power International,  
Piney Flats



Shoals Technology Group, Portland



Sharp Manufacturing, Memphis



WEST TENNESSEE  
**SOLAR**  
**FARM**



# SPECTRUM

Tennessee's Solar Connection



WEST TENNESSEE  
**SOLAR**  
**FARM**

# West Tennessee Solar Farm supports electrical engineering education project!



**SOLAR  
FARM**





A valuable partnership for Tennessee!

# TENNESSEE GOVERNOR'S CHAIRS

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SURESH BABU, PH.D.

ROBERT DAVIS, PH.D.

PHILIP ENQUIST, PH.D.

HOWARD HALL, PH.D.

TERRY HAZEN, PH.D.

YILU LIU, PH.D.

FRANK LOEFFLER, PH.D.

ART RAGAUSKAS, PH.D.

JEREMY SMITH, PH.D.

ALEXEI SOKOLOV, PH.D.

UDAY VAIDYA, PH.D.

WILLIAM WEBER, PH.D.

ROB WILLIAMS, PH.D.

BRIAN WIRTH, PH.D.

TOM ZAWODZINSKI, PH.D.

STEVE ZINKLE, PH.D.



THE UNIVERSITY of TENNESSEE  
KNOXVILLE, CHATTANOOGA, MARTIN, TULLAHOMA, MEMPHIS



# UT-ORNL JOINT INSTITUTES

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Computational Sciences

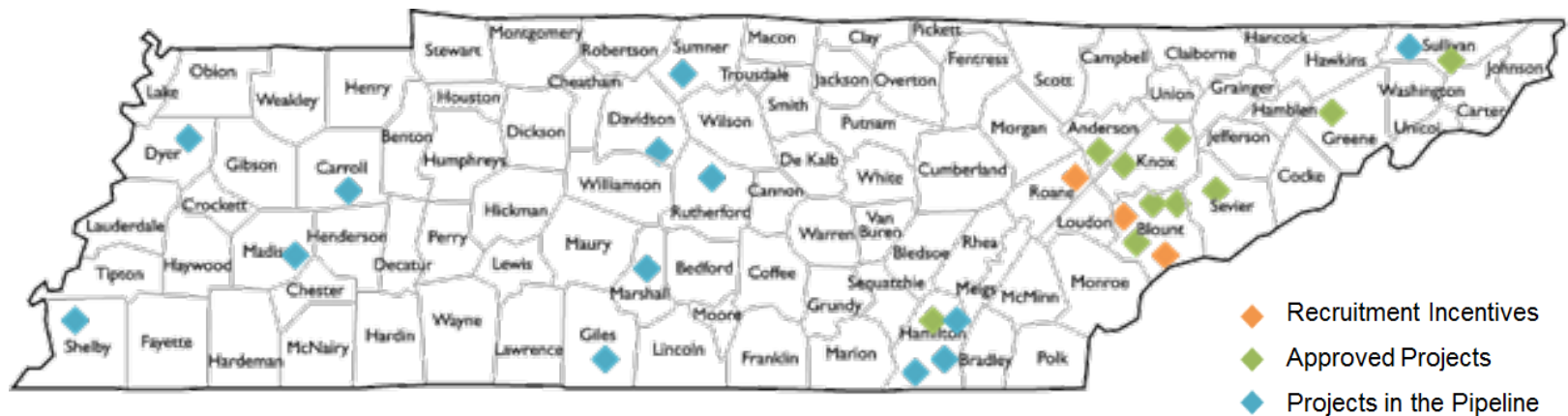


Neutron Science

Advanced Materials Science



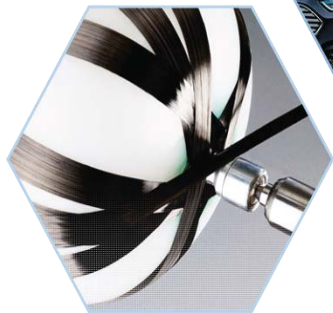
Biological Sciences



✓ \$5,000,000 in state funding for projects and recruitment



Institute for ADVANCED  
**Composites Manufacturing**  
INNOVATION



# IACMI 2017 Year in Review: Tennessee



## MEMBERS IN TENNESSEE



**MVP broke ground on 80,000 sq.-ft. manufacturing facility in Knoxville, TN** The \$12M facility will add 70 jobs, and marks MVP's 50th anniversary in East Tennessee.



**IACMI unveiled an innovative nine-meter wind turbine blade prototype. The blade was produced via pultrusion with the low cost textile PAN fiber made at ORNL's Carbon Fiber**

**Technology Facility.** This prototype has been nominated for the Combined Strength Award at CAMX, the nation's leading composites conference with more than 250 education sessions and more than 8,000 attendees.

## WORKFORCE DEVELOPMENT

### 7,000+ Training Participants in Tennessee-Based Events

- 9 internship appointments
- 17 senior executives at the National Defense University
- 155 attendees at Vanderbilt Composites One hands-on event
- 475 students at Manufacturing Day in Knoxville
- 4,000 attendees at Vanderbilt's Mini Maker Faire
- 2,700 participants in First Robotics competition
- 115 participants in Tooling U-SME



**21 Interns** accepted from hundreds of applicants, nationally. Nine interns appointed to work on projects in TN.

**TOOLING U-SME PARTNERSHIP:** IACMI-sponsored advanced composites online training for **all** IACMI members.

## TENNESSEE IACMI PROJECTS

### VOLKSWAGEN

**~\$3M Project:** Developing a sheet molding compound composite for use on exterior body panels  
**Impact:** 25% reduction in cost and weight on a production model expected to be greater than 100k units annually

### LOCAL MOTORS

IACMI's integration of large-scale additive manufacturing and composite materials for vehicle applications challenges existing designs and defines new components to meet longevity and crash performance requirements

### CRTC

**~\$1.5M Project:** Automated preform manufacturing equipment for recycling scrap pre-preg  
**IMPACT:** Improves capability toward 100% recyclability within automotive production.

# UTRF MISSION

## TECHNOLOGY TRANSFER

- The mission is to encourage innovation, enhance research, and facilitate economic development by commercializing intellectual property created within the University of Tennessee system.



Research  
Growth



Intellectual Property  
Commercialization



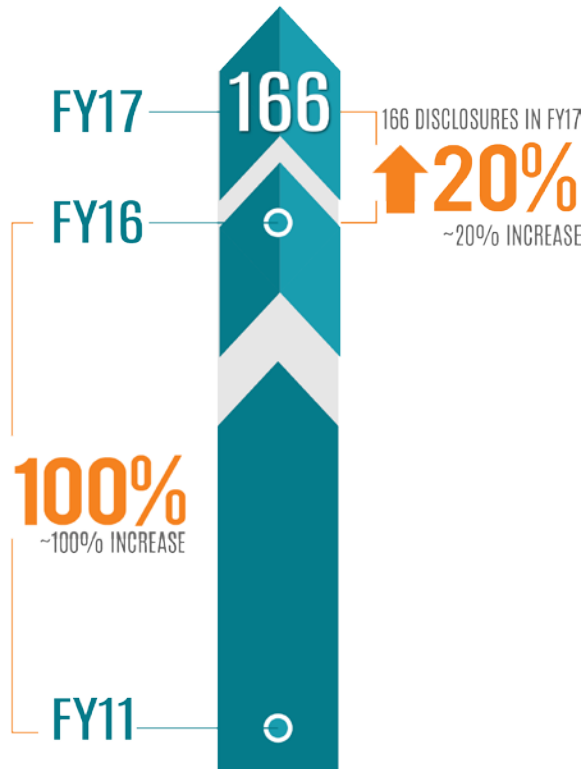
Entrepreneurial  
Culture



Economic  
Development

# UTRF BY THE NUMBERS

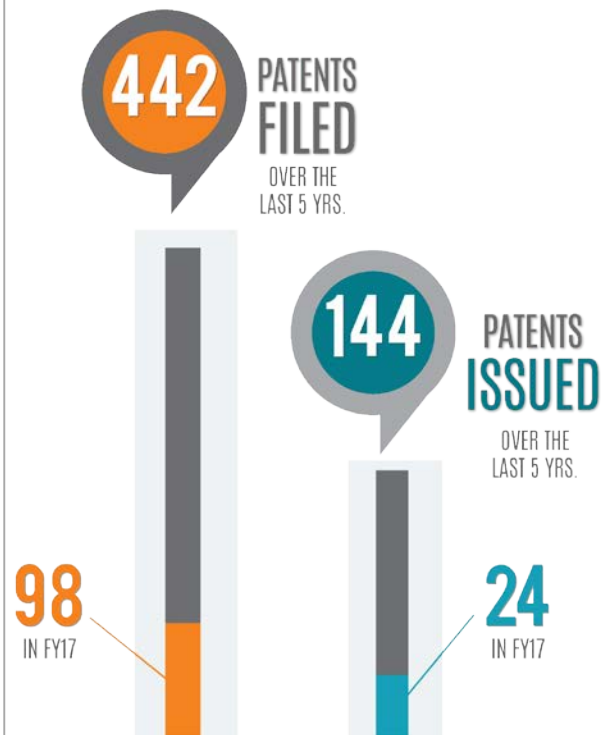
## INVENTION DISCLOSURES



FY 2017

- 166 Invention Disclosures
- ~ 20% increase from FY16
- ~ 100% increase from 2011

## PATENTS



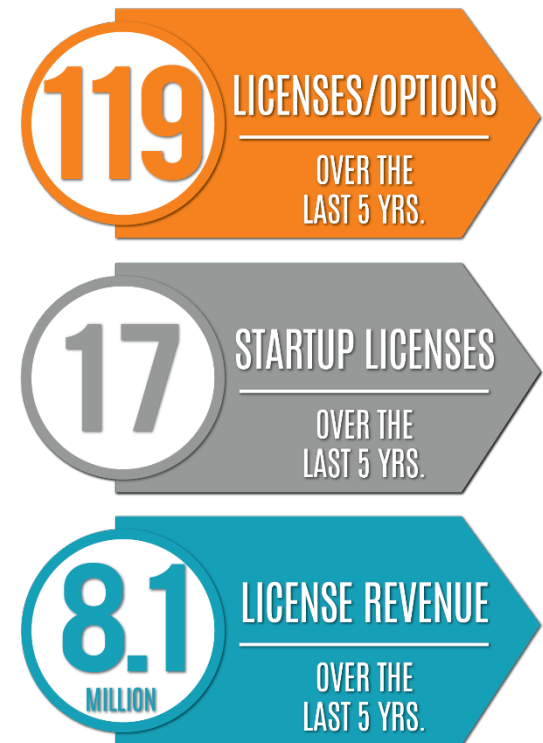
FY 2017

- 98 Patents Filed
- 24 Patents Issued

Over last 5 years

- 442 Patents Filed
- 141 Patents Issued

## LICENSING



Over last 5 years

- Licenses/Options – 119
- Startup Licenses – 17
- License Revenue - \$8.1M

# UTRF FIVE YEAR IMPACT

UTRF PROVIDES THE TECH TRANSFER SERVICES TO FACULTY, STAFF,  
AND STUDENTS SYSTEM-WIDE.

~\$2,776,000

Paid to UT  
Inventors

~\$6,014,000

UT Research  
Contracts Due to  
Licensed IP

~\$18,100,100

Industry Research  
Agreements

~\$3,187,000

Investment in  
Patent Protection

~\$1,285,000

Paid to UT  
Colleges and  
Departments

~\$31,505,000

Impact of UTRF's  
Wholly-Owned  
Subsidiaries

~\$111,075,000

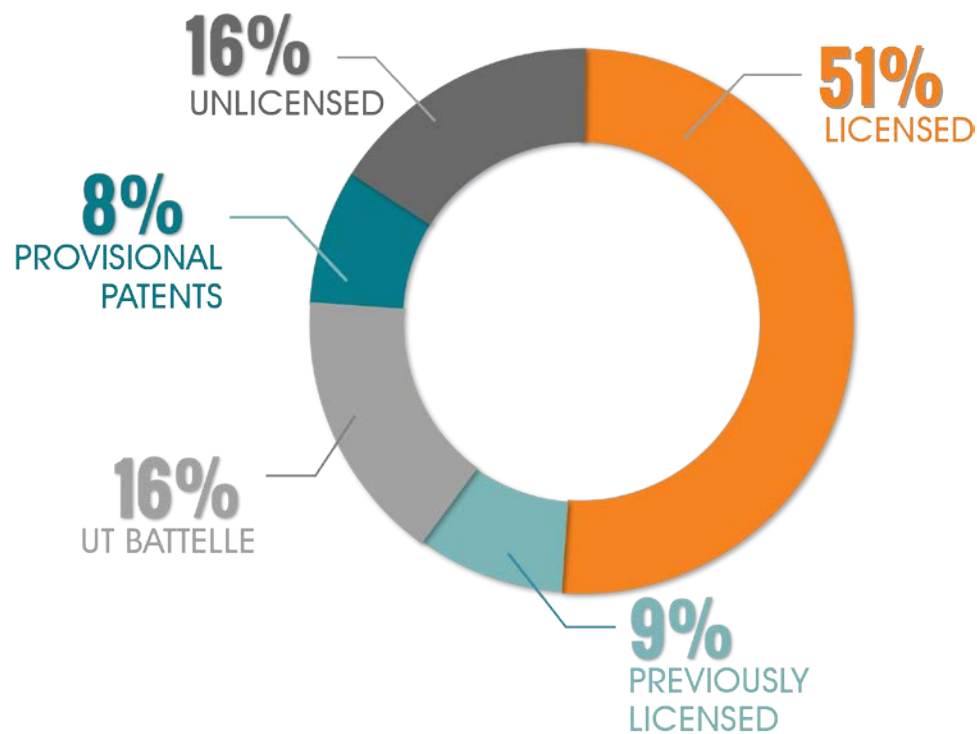
Capital Raised by  
UTRF Companies

**TOTAL**

**>\$173M**

# UTRF'S US PATENT PORTFOLIO

470 Total Patents and Patent Applications



## ENABLING PARTNERSHIPS



UTRF and HITS (a joint venture by College of Nursing and Tickle College of Engineering) are working together to bring state-of-the-art technology and expertise to healthcare-related companies and organizations.



Established an official partnership with East Tennessee Children's Hospital to collaborate on developing an innovation hub.

## What's Your Challenge?

A HITS LAB PARTNERSHIP CAN PUT YOU ON A PATH TO HEALTHCARE INNOVATION!

### HITS Partners/Collaborators

Y-12 NATIONAL SECURITY COMPLEX  
CHILDREN'S HOSPITAL OF MICHIGAN  
BELMONT UNIVERSITY  
KENNESAW STATE UNIVERSITY  
UNIVERSITY OF MEMPHIS  
EAST TENNESSEE CHILDREN'S HOSPITAL



### CONNECT WITH UT INNOVATORS

HITS, UTRF, UT COLLEGE OF NURSING,  
UT COLLEGE OF ARTS & SCIENCES, AND  
UT TICKLE COLLEGE OF ENGINEERING



### PARTNER TOGETHER - FIND SOLUTIONS

Lippincott  
DocuCare



Simulated  
Electronic  
Fetal Monitoring  
HITS



### CREATE YOUR SOLUTION



LifeCareSim



42 technology startups in the last 10 years



UT Based Companies have raised nearly \$70M since 2015!



Lippincott

UTRF owns equity in more than 50 for profit companies commercializing technology

BIOSELECT  
TECHNOLOGY, INC.



arGentis  
Pharmaceuticals, LLC



# SUMMARY OF ENTREPRENEURIAL SUPPORT



# Innovation North



Civil & Environmental  
Consultants, Inc.



# Compliance and Reporting

- Responsible conduct of Research
- Export Control License
- iEdison on inventions
- NSF HERD (with Controller's office)
- THEC
- Ad hoc reporting

# Partnerships

- Corporate and Foundation Relations Office
  - Eastman
  - Mars Corp.
- NOAA-ATDD
- TNSmart Consortium
- State relations support
  - \$20M grant match for NSF computing proposal (proposal not successful)
  - \$5M RevV funds
  - ~\$5.5M annually for GCs
  - \$6.2M Bredesen Center start up
  - \$6.6M Data Science Track of BC

# 2018 Preview

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- ❑ Hire an Assistant Vice President for Research
- ❑ Quantitative Research Strength Mapping
  - Contract in conjunction with College of Business – Analytics group
    - Cluster map of publications/citation index/funding
- ❑ Chief Research Officers workshop
  - Define metrics that promote cultural shifts
  - Develop a research “report card”
  - Develop programs to promote intercampus collaboration
- ❑ UT/ORNL joint program review
  - Joint faculty program
  - GCs
  - Joint Institutes
  - Large program initiatives
  - Public/Private Partnerships
- ❑ Cherokee Farm Innovation Campus
  - Revisit the master plan & development guidelines
  - Reimagine the marketing plan
  - Set specific performance goals