OCAST board funds research projects

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The Oklahoma Center for the Advancement of Science and Technology (OCAST) has awarded $1,934,795 to support 33 research and development projects across the state that promise to advance sensor technologies, digital security, water treatment techniques, pecan production, new uses for native switchgrass and a host of other innovations.

The Fiscal Year 2020 awards were made across three OCAST programs: 12 Oklahoma Applied Research Support projects from 63 eligible applications, 11 Plant Science Research projects from 21 eligible applications and 10 Intern Partnership projects from 17 eligible applications.

The number of approved projects and total awards are slightly above the $1 million awarded for 16 research projects in fiscal 2020, but far below the annual average annual award number of 65 funded projects.

OCAST is a legislatively funded state agency with a mission to expand and diversify Oklahoma's economy by supporting research and development of new projects, processes and industries. The number of projects and amount of awards it supports are dependent on annual legislative appropriations.

OCAST has a documented cumulative 22:1 return on investment of state-appropriated dollars across its 33-year history. That means for every dollar of public funds invested in OCAST, the agency returns $22 to Oklahoma's economy and, in an average year, supports the creation of more than 1,500 high-tech, high-wage jobs.

"OCAST is proud to support these amazing, highly competitive science and technology projects from Oklahoma's scientific community," said OCAST executive director Michael Carolina. "I should note that due to funding limitations, we were not able to fund an additional 69 qualified projects – projects that could have led to even more innovations and, ultimately, the creation of new jobs and businesses across our state."

OCAST is the central organization of what has become known nationally as the Oklahoma Innovation Model, which supports R&D, inventors, entrepreneurs and new ventures across the state.

Each OCAST program was created with a goal of supporting science and technology R&D by facilitating collaboration between government, industry and academia to launch startups and support existing businesses to build and grow a culture of innovation and entrepreneurship in Oklahoma.

Successful applicants, organizations and projects titles are:

Oklahoma Applied Research Support

Justin Presley, Ram Jack Systems Distribution	Accelerating the development and commercialization of a novel helical sign post
Do Young Kim, Oklahoma State University with Ghost Display Technologies	OLED-based infrared image sensor

Stephen Fransen, Retinal Care	Analytics-based platform for diabetic retinopathy care management
Michael Teicheira, XploSafe	Commercialization of inorganic sorbents for the recovery of excess plant nutrients from water and their reuse as fertilizer
Hitesh Vora, Oklahoma State University with Casey Corp Defense	Next generation smart heatsinks
Clint P. Aichele, Oklahoma State University with D&B Oilfield Services	Produced water treatment fueled by high value product extraction
Ram S. Mohan, University of Tulsa with multiple industry partners	Produced water polishing utilizing integrated compact separator system
Hamidreza Shabgard, University of Oklahoma with Baker Hughes	High efficiency dry cooling method with passive cold storage
Richard D. Kopke, Hough Ear Institute	Advancement of a novel therapeutic for reversing clinical indicators of cochlear synaptopathy and tinnitus
Prem Bikkina, Oklahoma State University with Nitro-Lift Technologies	Screening reservoirs in Oklahoma and beyond for enhanced oil & gas recovery using novel nitrogen-assisted nanofluid systems
Jerald Dawkins, True Digital Security	CMMC truespeed supply chain cyber security management
Li Song, University of Oklahoma with OG&E & Maverick Technologies	Smart networked home energy management system for homes (home-EMS)

Intern Partnership

Laura P. Ford, University of Tulsa with XRG Technologies	Fired heaters internship (2 interns)
Kaveh Ashenayi, University of Tulsa with Enovation Controls	Object detection and surface modeling in marine and off-road displays (4 interns)
Chris Utz, NextThought LLC	NextThought – OU CS intern program (8 interns)
Surendra Singh, University of Tulsa with Gastech Engineering LLC	Design and development of process plant components (4 interns)
Peter J. Hawrylak, University of Tulsa with Momentum3	Development of Homi software application (2 interns)
Musharraf Zaman, University of Oklahoma with Engineering Services and Testing (EST) Inc.	An improved approach to estimate bearing capacity of soil using laboratory and field data and artificial intelligence-based models (4 interns)
William D. Paiva, Oklahoma Life Science Fund	Venture capital professional development program (4 interns)
Steven Anderson, True Digital Security	Jupyter notebook to support cyber security analysis (4 interns)
Craig Bradshaw, Oklahoma State University with OSU's CIBS	Support for the Center for Integrated Building Systems at Oklahoma State University (20 interns)
Timothy J. Bowser, Oklahoma State University	Internship for Development of Healthy Snacks

Plant Science Research

Carolyn Young, Noble Research Institute	Understanding a newly discovered pecan scab-like pathogen using population genomics
MIllion Tadege, Oklahoma State University	Understanding the molecular mechanism of copper transport and detoxification during vegetative growth and

	grain filling
Mark Buchheim, University of Tulsa	Bioprospecting Oklahoma's algal diversity for high value products
Malay C. Saha, Noble Research Institute	Can nitrogen use efficient switchgrass genotypes preferentially recruit microbiomes for sustainable biomass production?
Chris Zou, Oklahoma State University	Comparing switchgrass vs. native prairie as alternatives following redcedar removal
Kirankumar Mysore, Noble Research Institute	Genome wide identification and characterization of small signaling peptides (SSPs) involved in plant defense responses against pathogens
Hamed Gholizadeh, Oklahoma State University	Mapping invasive Lespedeza cuneata using airborne imaging to detect its spread and determine its ecological and economic impacts
Andrew Doust, Oklahoma State University	Dissecting the effect of photoperiod on architecture and flowering time in locally adapted populations of the C4 model grass, Setaria viridis
Michael Trammell, Noble Research Institute	Deciphering the soft leaf trait to improve tall fescue forage nutritive value and palatability
Jennifer Messick, University of Central Oklahoma	Identification of candidate loci associated with gypsum soil adaptation in two species of nama and phacelia using next- generation sequencing
Henry Adams, Oklahoma State University	The effect of drought on wildfire in Oklahoma: an improved quantification of the role of vegetation for forecasting wildfire risk.