

MAJOR WIND ENERGY FUNDING

Texas Tech included in millions of dollars of research funds.

MICROZAP

MicroZAP, developed through cutting-edge food sterilization research, was awarded up to \$1.5 million.

NEW DINOSAUR FOUND

Researchers discovered first complete skeleton of an early sauropod.

SUSTAINABLE ARCHITECTURAL CONCEPTS

Texas Tech's Sustainable Cabin gains recognition in architectural publications.

Pushing Limits With Research

Texas Tech researchers and scholars consider the globe — and the moon — their laboratory. From discovering new dinosaurs to chasing — and harnessing — the wind, from pop music's influence on academia to finding ways to make our food safer, our scientists and scholars will continue to find the answers that matter.

- Texas Tech is included in a \$5.2 million grant from the U.S. Department of Energy to advance two areas of **wind power research**. One project will improve short-term wind forecasting, which will accelerate the use of wind power in electricity transmission networks by allowing utilities and grid operators to more accurately forecast when and where electricity will be generated from wind power. Another project aims to boost the speed and scale of mid-size wind turbine technology development and deployment.
- A \$500,000 gift enabling the use of emerging technology in the **neuroimaging field** puts Texas Tech on the cutting edge of autism research. The gift, from the Autumn's Foundation, supports the Autumn's Dawn Neuroimaging, Cognition and Engineering (NICE) Laboratory.
- David Richman was hired to fill the endowed \$1.5 million Jere Lynn **Burkhart Chair** in Autism Research in the Burkhart Center for Autism Education and Research. Richman's research focuses on the effects of early intervention and prevention treatment for birth-to-five children with disabilities exhibiting emerging behavior disorders.
- Dimitri Pappas, assistant professor of chemistry, received a \$520,000 grant to find better methods of **studying cell death** that could lead to more useful medications for ailments such as heart disease and cancer.
- Researchers at Texas Tech University associated with a Compact Muon Solenoid (CMS) experiment at CERN's Large Hadron Collider (LHC) continue to seek the elusive **new particles**, which, if found, could answer some of the most profound questions about the structure of matter and the evolution of the early universe.
- Researchers, including Texas Tech biologist Shan Bilimoria, have made a breakthrough that explains the sudden death of **bee colonies** since late 2006




Texas Tech established the National Wind Resource Center (**NWRC**), a research collaboration with many of the nation's leading research universities, each utilizing its unique areas of expertise within the renewable energy sector. The consortium also includes several nationally recognized workforce development leaders.

The university is a collaborator with the National Institute for Renewable Energy (**NIRE**), a non-profit, public/private collaboration that will address key scientific and technology issues facing the wind power industry.



A \$7.5 million contribution from Bayer CropScience to the Department of Plant and Soil Sciences will support facilities development and **new research** initiatives focused on developing cotton with improved fiber properties.


across North America.

- Researchers in Texas Tech's Center for **Pulsed Power** and Power Electronics have been instrumental in the United States Department of Defense's efforts to combat improvised explosive devices (IEDs). The center's research was recently referenced in a Popular Mechanics story on the Navy's research in defeating IEDs.
- **Fibertect®**, a decontamination technology developed by Seshadri Ramkumar and his team at the Institute of Environmental and Human Health (TIEHH), was one of seven new innovations selected by Cotton Incorporated to show the versatility of the fiber. A Fibertect® wipe can absorb and neutralize gases and liquids that might be used in chemical warfare.
- Texas Tech **food safety** researchers are part of a \$2 million grant from the USDA aimed at improving food safety by managing antibiotic resistance in beef and dairy cattle systems in the United States and Canada.
- James C. Cokendolpher, assistant curator of invertebrates at The Museum of Texas Tech University and a colleague in Austin recently documented a **new arachnid**, *Parobisium yosemite*. The pseudoscorpion is found in granite caves in Yosemite National Park. It might be the second discovered cave-dwelling pseudoscorpion that lives in these granite talus caves in the world, he said.
- A Texas Tech **whale researcher**, working with other universities, found evidence of exposure to polycyclic aromatic hydrocarbons (PAHs) and persistent organic pollutants, including the pesticide DDT, in Pacific Ocean-dwelling sperm whales. Surprisingly, the whales living in or around waters near the Galapagos Islands — a UNESCO marine reserve and considered pristine — showed higher levels of a contamination biomarker than whales from other areas of the world's largest ocean. The study provides a unique baseline for global assessment of pollution exposures and sensitivity in the sperm whale, a globally distributed and threatened species
- A new bibliographic guide to **academic literature** compiled by Texas Tech librarians Susan Hidalgo and Rob Weiner shows that Michael Jackson's influence stretched well beyond music and pop culture to academia. Their list of scholarly papers and peer-reviewed articles, culled from more than 100 databases for a special issue of The Journal of Pan African Studies, found the King of Pop referenced in psychology, medical, chemistry, mass communications and even engineering journals.
- Work by Lou Densmore, interim chairman of the Department of Biology, found that *Crocodylus anthropophagu*, an early form of **crocodile**, fed on humans as far back as 2 million years in the Cradle of Mankind in Africa's Olduvai Gorge.
-  Texas Tech researchers in the Department of Plant and Social Sciences are evaluating which **wine grapes** that flourish in certain parts of Europe might excel in West Texas. The hope is to grow grape varieties on the South Plains that can make exceptional wines, which would make the grapes in high demand in other parts of the state. Winemakers throughout Texas commonly purchase grapes from the South Plains where they can obtain large quantities of high-quality fruit to produce many different wine types.



Geoscience researcher Seiichi Nagihara has a grant from NASA to look at geophysical data collected on the moon from 1969 to 1972 but never analyzed. With a \$45,000 grant from the Goddard Space Flight Center, Nagihara hopes to restore the full records of the Apollo **heat flow experiments** and use modern computers to reanalyze the data to better understand the moon's internal structure.



 For a second year, Texas Tech participated in the Verification of the Origins of Rotation in Tornadoes Experiment 2 (**VORTEX2**), an \$11.9 million project funded by the National Science Foundation and the National Oceanic and Atmospheric Administration. The purpose is to discover the origins of tornadoes in order to better predict when and where storms will develop, determine how severe they will be, and in turn, improve alert systems by increasing warning times. The project fits into Texas Tech's 40-plus years of tornado research.



A worldwide license agreement for a chemical additive called an aptamer that makes certain existing antibiotics viable against **antibiotic-resistant bacteria** was granted. The agreement is with RI Scientific LLC for the development and commercialization of metal-beta-lactamase inhibitors, short chains of nucleic acid that have demonstrated the ability to eliminate bacterial resistance to antibiotics. The patented technology was developed by Robert W. Shaw, acting chairman of the Department of Chemistry and Biochemistry at Texas Tech, and Sung-Kun Kim,



Record Research Year Texas Tech set a record in 2010 with \$125.8 million in total research expenditures, up from about \$50 million in 2008. Texas Tech researchers also set records in the number of research proposals submitted, awards received and the value of the awards received. The number of patents filed increased to 17, up from six the previous year. Patents granted jumped from three in 2008–2009 to 10 this year. Five companies were created this year as the result of work done by Texas Tech researchers

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