

EDUCATION

'They're there for Texas': How researchers make an impact as UT hits \$1B in expenditures

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The University of Texas spent more than \$1 billion last year in research expenditures, including money from grants in its highest annual expenditure for research yet.

The university said this is indicative of high research activity levels – up by 25% compared to fiscal year 2022. The \$1.06 billion in expenditures covers more than 4,000 research projects across every UT school and college.

"It's a real milestone. It puts us in a different category of universities," said Dan Jaffe, the vice president for research at UT. "There are not that many universities in the country that have research expenditures that are reached at this level."

Of the \$1.06 billion, 60.9% came from federal money and 22.3% from institutional money. Industry, state and local funds and nonprofits also contributed.

For President Jay Hartzell, this landmark is just the beginning of what UT is capable of.

"What's so exciting about this billion-dollar threshold now is it just speaks to the potential," Hartzell said in an interview. "For us, that billion is just scratching the surface."

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UT's growing medical campus expands its potential to obtain larger grants from the National Institute of Health, Hartzell said, further enhancing life sciences research, which has doubled in expenditure since 2013. The university also has declared 2024 the Year of Artificial Intelligence and announced an SXSW event slate largely focused on AI and tech.

Jaffe said what makes UT unique is the breadth of the research, including its ability to foster talent that can directly help the community, such as during the COVID-19 pandemic.

"It serves as kind of a what I would call an intellectual lifeboat for the rest of society," Jaffe said. "When they're needed to support an emergency, they're there for Texas."

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The Statesman interviewed researchers about three initiatives directly impacting Central Texas and Austin specifically.

Center for Psychedelic Research & Therapy

Greg Fonzo and Charles Nemeroff lead the Center for Psychedelic Research and Therapy, which opened in December 2021 at UT's Dell Medical School, to study how psychedelic medications can treat treatment-resistant mental illnesses.

The center's essential question is to discover how these medicines work with the goal of developing more effective treatments.

"People typically feel better right afterwards and that's a pretty rare thing in psychiatric treatment," Fonzo said. "Having this tool available where we can really affect a change very quickly for people is really fascinating."

The center started with observational studies looking at how surviving female family members of veterans who suffer from prolonged grief, veterans with posttraumatic stress disorder, and special operations forces veterans with combat-related mental health issues respond to psychedelic-assisted therapy.

The center also launched commercial, on-site trials at the end of 2023, generating data that may be used to secure FDA approval for psilocybin to treat treatment-resistant depression and another study looking at psilocybin for anorexia nervosa, a severe eating disorder that can be fatal.

Nemeroff said they believe that psychedelics change the way the brain processes sensory information, causing people to think about things they typically defend against. He said the treatment is influential for patients who are particularly stuck, such as those with severe substance use disorder, a history of child abuse and neglect, and severe depression.

"We think that psychedelics changes that circle of hell, and, perhaps, allows the brain to be more receptive to other treatments," he said.

More: Dell Medical School starts center to study psychedelics for mental health treatments

The center next plans to launch a study looking at how psilocybin combined with repeated targeted magnetic stimulation in the brain can rewire the brain to treat severe depression.

Fonzo said the hope is to continue expanding their talent, train other clinicians, and if FDA approval is given, eventually treat people in the community.

National Disability Center for Student Success

Stephanie Cawthon, a professor at the College of the Education, is the principal investigator, executive director and founder of the National Disability Center for Student Success. The center launched in August 2023 after a \$5 million grant from the U.S. Department of Education. It's the first post-secondary students with disabilities center funded by the department in the country, Cawthon said.

"We think of it as a whole umbrella, including two-year and four-year institutions, but anything that really helps students make that transition from their high school experience to not just a job but a career," Cawthon said. "We're filling that gap of what's needed in those education and learning spaces."

The center, housed at the Texas Center for Equity Promotion at UT, plans to complete 10 research studies in five years. Cawthon said the center collects data to then make informed recommendations for how universities can increase support for disabled students.

The first initiative, a national college accessibility survey, was piloted at UT in the fall with 500 students.

The pilot survey results found that 42.5% of students don't disclose their disability to instructors, making the importance of having accessible classrooms, Cawthon said, more important.

The center plans to create public health campaigns to expand people's knowledge of available mental health support, as well as better accessibility training for faculty. In April, it also will start holding town halls, Cawthon said.

The goal is for these conversations to uncover, or de-silo, the conversation around disability at UT, "using that as a model for how other campuses can de-silo the conversation there," she said.

A national pilot survey is planned for March. The final questions will be used by the center's data partner, the Center for Community College Student Engagement, in 2025.

The center is interdisciplinary. All researchers are those with disabilities or close connections to those with disabilities, including students, Cawthon said.

This research, she said, "gives a focus to something that is usually hidden."

"I'm really interested in how do we bring the resources that are across the country and help everyone have conversations that are meaningful, but also translate into action things that people can really grab a hold of?" Cawthon said. "There's always something everyone can do."

Electric grids

Natural disasters, cyber-attacks and high demand for power are challenges the local and national electric grids weren't built to handle, UT researcher Javad Mohammadi said.

"It's not a secret that our electric grid needs a lot of upgrades. It needs a lot of investments," he added.

Mohammadi, an assistant professor in the civil, architectural and environmental engineering department of the Cockrell School of Engineering, researches how upgrading the software tools governing power systems can help improve their ability to face these challenges.

Mohammadi said that when electric grids were built, it was like a one-way traffic system. But with modern technologies and expansions, such as installing solar panels or battery energy storage, "it is like opening up a lot of streets into the highway system," he said. This creates a need for more tools to control the flow.

"When you have a lot of like traffic, a lot of electrons coming in, you need direct control," he said. "A lot of our efforts goes into how to build these tools that are scalable, are computationally efficient, and are resilient."

For instance, he is testing how integrating artificial intelligence into grids can help with the complicated, fast decision-making in the event of climate emergencies to reroute and conserve power.

"We want to make sure supplies are equal to demand, that's the holy grail of our electric grid," Mohammadi said, adding that these protections could help reduce the impact of severe winter storms.

Mohammadi, who works with five graduate students and a postdoc student, said they are testing this software in-house. They look at both local and national power systems, but also partner with the National Science Foundation, the Department of Energy and the Department of Defense. At UT, they are also affiliated with the Center for Environmental Engineering Resources.

Mohammadi sees the power grid becoming more decentralized, giving individuals more control over producing and storing their power. He said this research has a direct impact on people's lives by reducing the impact of extreme events.

"This is a really exciting time for power system researchers to look into these issues, partner with these governmental agencies," he said. "We're seeing a lot more students being excited about these topics."