

# 2024 Annual Report





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The University of Texas at San Antonio Office of Research

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Revised 2024. Data sources include: Sponsored Projects Administration, Research Support, Research Partnerships and Strategy, Commercialization and Innovation, Research Integrity, Research Finance and Operations, and the Valdez Institute for Economic Development, All financial data has been rounded to the nearest dollar











2024 marked my second year serving as interim vice president for research, and it has truly been an honor work with our talented team to continue to build upon our achievements and grow our impact. UTSA's research and economic development enterprise flourished this year, and that is evident in both the data shared in this report as well as the individual success stories and results of our projects.

Over the course of our record-breaking year, research expenditures grew to \$167.5 million, up nearly 10% from the \$152.3 million in expenditures of the previous year, making it the fifth consecutive year expenditures

exceeded \$100 million. I believe we can attribute this growth to the talent, determination and creativity of our community members, including researchers, research administrators, inventors, economic development practitioners, as well as our partners in academia, industry, health care and the military.

This growth has been supported by several strategic initiatives, such as our Clustered and Connected Hiring program, which aims to expand our talent hubs in strategic areas including artificial intelligence, brain health, microbiome and human health, space and transdisciplinary research. These areas will be mission critical as we grow as a university and aim to address grand challenges in our rapidly changing world.

Our efforts in economic development also had a significant impact in 2024. The Valdez Institute for Economic Development reported \$1.8 billion in direct economic impact. This metric encompasses new financing, investments, sales, contracts and exports. The institute also fueled the creation of 4,345 jobs and 536 businesses. These data give us a glimpse into the tremendous scale of the positive change we are creating in Texas and beyond.

I was also proud to announce the establishment of our newest center, the Center for Space Technology and Operations Research (CSTOR). CSTOR launched in December 2024 under the leadership of David Silva, UTSA distinguished professor of physics and astronomy, to advance the engineering, technology and operations that enable space missions between the Earth and the Moon and on the lunar surface. Like our other research centers, CSTOR aims to address a pressing demand for research and workforce development in its area.

We achieved so much together in 2024, and it wouldn't have been possible without each member of our collaborative research community. This includes everyone, from Faculty Research and Development, Research Administration, and Research Partnerships and Strategy, to our Centers and Institutes, CORE Labs, the Research External Advisory Council and Deans Research Council, and especially the bold researchers and innovators we support throughout the university. Thank you, all, for your continued efforts to drive our university forward.

Thank you for another unforgettable year!

Sincerely,

6 ann Browning

JoAnn Browning, Ph.D. Interim Vice President for Research

# FY24 EXPENDITURE SUMMARY

In 2024 research expenditures grew to \$167.5 million, up nearly 10% from \$152.3 million the previous year, making it the fifth consecutive, record-breaking year that UTSA's annual research expenditures exceeded \$100 million.

These highlights reflect the accomplishments of a growing community of staff and researchers across the Office of Research, as well as UTSA's 31 specialized research centers and institutes and nine colleges.

This report captures UTSA's expanding research expenditures, outputs and awards from FY24.



# **TOP 10** LARGEST RESEARCH AWARDS

#### \$7,299,868

Mark Appleford, Tammy Wyatt, Amy Buechler University College VP Academic Affairs UTSA One: Helping First Generation Students Seize Opportunities, Navigate Transitions and Explore Possibilities Department of Education (DOED)

### \$3,420,925

Albert Salgado Office of Research TX SW SBDC Network Program Renewal CY24- San Antonio United States Small Business Administration

### \$2,800,000

Dhireesha Kudithipudi, Itamar Lerner, Fidel Santamaria, Gabriela Ciocarlie, Murtuza Jadliwala, Amina Qutub, Panagiotis Markopoulos Klesse College of Engineering and Integrated Design College for Health, Community and Policy PARTNER: Neuro-Inspired AI for the Edge at UTSA (NAIAD)

National Science Foundation (NSF)

### \$2,499,997

Nehal Abu-Lail, Eric Brey, Karina Vielma, Mehdi Shadaram Klesse College of Engineering and Integrated Design Engineering Success through Culturallyresponsive and Hands-On LeARning Program (Engineering SCHOLARs) National Science Foundation (NSF)

#### \$2,400,000

Elizabeth Sooby, Patrick Warren, Xochitl Lopez-Lozano, Mira Khair College of Sciences Experimental and Computational assessment of thermodynamic stability of fission products in advanced reactor fuels Department of Energy (DOE)

### \$2,283,422

Thomas Coyle, Edward Golob, Jeffrey Mock, Willie Hale College for Health, Community and Policy Executive Functions, Brain Games, and Brain Stimulation: An RCT for Mild TBI U.S. Army Medical Research Acquisition Activity

### \$2,000,000

Dhireesha Kudithipudi, Itamar Lerner Klesse College of Engineering and Integrated Design College for Health, Community and Policy EFRI BRAID: Efficient Learning of Spatiotemporal Regularities in Humans and Machines through Temporal Scaffolding National Science Foundation (NSF)

### \$2,000,000

Fidel Santamaria College of Sciences EFRI BRAID: Fractional-order neuronal dynamics for next generation memcapacitive computing networks National Science Foundation (NSF)

### \$1,839,282

Natalie Sjelin College of Sciences National Cybersecurity Preparedness Consortium (NCPC) University of Arkansas System

### \$1,775,000

Oleg Larionov College of Sciences New organosulfur-based strategies for efficient construction of carbon-carbon and carbonheteroatom bonds National Institute of General Medical Sciences (NIH)

# **EXPENDITURES BY COLLEGE**

COLLEGE	AMOUNT
Carlos Alvarez College of Business	\$13,062,333
College of Education and Human Development	\$10,270,608
College for Health, Community, and Policy	\$14,519,814
Honors College	\$93,304
College of Liberal and Fine Arts	\$10,148,452
Margie and Bill Klesse College of Engineering and Integrated Design	\$35,924,941
College of Sciences	\$53,633,433
University College	\$3,654,110
VP Academic Affairs	\$3,935,898
Office of Research	\$21,283,950
Other (Library, VP Information Management and Technology, VP Buisness Affairs)	\$968,446

## TOTAL

\$167,495.289



# **EXPENDITURES BY RESEARCH CENTERS & INSTITUES**

#### **CENTER & INSTITUTES**

Academy for Teacher Excellence Research Center Brain Health Consortium (Adding NI and BACAPPR Center for Advanced Manufacturing & Lean Syste Center for Advanced Measurements in Extreme E Center for Applied Community & Policy Research Center for Archeological Research (CAR) Center for Community Based and Applied Health Center for Cultural Sustainability (CCS) Center for Dialogue and Deliberation Center for Excellence in Engineering Education Re Center for Infrastructure Assurance and Security Center for Innovation and Drug Discovery (CIDD) Center for Public Opinion Research Center for Urban and Regional Planning Research Cyber Center for Security and Analytics Cybersecurity Manufacturing Innovation Institute Institute for Cyber Security (ICS) Institute for Demographic and Socioeconomic Res Institute for Health Disparities Research (IHDR) Institute of Regenerative Medicine (IRM) Institute for Water Research, Sustainability and Po Matrix AI Consortium for Human Well-Being UTSA Mexico Center National Security Collaboration Center Open Cloud Institute (OCI) South Texas Center for Emerging Infectious Disea Sustainable Pervasive Urban Resilience (SPUR) Texas Sustainable Energy Research Institute (TSE Urban Education Institute UTSA Arts Institute



TOTAL

	AMOUNT
r	\$867,955
RI)	\$6,934,940
ems (CAMLS)	\$1,801,905
Environments (CAMEE)	\$3,258,600
	\$377,548
	\$855,375
Research (CCBAHR)	\$934,751
	\$390,683
	\$950,099
esearch (CE3R)	\$2,438,715
(CIAS)	\$1,883,459
	\$2,119,117
	\$776,181
n (CURPR)	\$173,842
	\$1,286,028
(CyManII)	\$6,908,770
	\$929,320
search (IDSR)	\$1,368,481
	\$380,642
	\$489,257
olicy (IWRSP)	\$213,025
	\$2,107,25
	\$152,596
	\$1,773,469
	\$326,134
ases (STCEID)	\$4,971,393
	\$1,415,229
ERI)	\$4,184,965
	\$269,504
	\$38,402

AMOUNT

### \$50,577,671

# AWARDS

COLLEGE	NUMBER	DOLLAR AMOUNT
Carlos Alvarez College of Business	23	\$2,811,066
College of Education and Human Development	13	\$4,150,245
College for Health, Community, and Policy	40	\$8,400,981
Honors College	1	\$14,960
College of Liberal and Fine Arts	46	\$1,583,877
Margie and Bill Klesse College of Engineering and Integrated Design	102	\$25,474,203
College of Sciences	108	\$37,079,649
University College	3	\$4,430,875
VP Academic Affairs	7	\$584,642
Office of Research	34	\$11,296,207
Other (Library , VP Student Affairs, VP Buisness Affairs)	8	\$3,972,726

TOTAL

385 \$99,799,431



# **PROPOSALS BY COLLEGE**

COLLEGE	AMOUNT
Carlos Alvarez College of Business	57
College of Education and Human Development	43
College for Health, Community, and Policy	120
Honors College	1
College of Liberal and Fine Arts	121
Margie and Bill Klesse College of Engineering and Integrated Design	356
College of Sciences	314
University College	3
VP Academic Affairs	9
Office of Research	38
Other (VP Student Affairs, VP Information Management and Technology, VP Buisness Affairs, Library, etc.)	15

# TOTAL

# **PROPOSALS BY SOURCE**

# SOURCE

Federal GovernmentFederal Pass ThroughLocal GovernmentOther GovernmentState GovernmentPrivateTOTAL

## 1077

AMOUNT
418
191
37
2
171
258
1077

# FY24 SEED GRANTS

The UTSA Office of Research has awarded its annual seed grants to spark innovation on campus. This money, distributed through five funding mechanisms, funds new research projects or new lines of inquiry to advance this promising research through the discover process.

### BRAIN HEALTH CONSORTIUM (BHC) COLLABORATIVE SEED GRANT (CSG) PROGRAM

The Brain Health Consortium (BHC) Collaborative Seed Grant (CSG) program offers seed grants to support collaborative research at UTSA. These grants support a broad range of trans-disciplinary research projects that may yield fundamental insights into the mechanisms underlying brain disorders.

- » October 1, 2023 through July 31, 2024
- » \$60,000 awarded: \$30,000 per researcher x 2 new projects

#### **College of Science**

#### Soo Chan Lee, Ph.D.

Department of Molecular Microbiology and Immunology; *Investigation of the Association of the Commensal Fungus Candida Albicans in Alzheimer's Disease* 

#### College of Education and Human Development

#### Emily Bonner, Ph.D.

Department of Interdisciplinary Learning and Teaching; *The Brain Health Institute for Teachers* (*BRITE*)

### CONNECTING THROUGH RESEARCH PARTNERSHIPS (CONNECT)

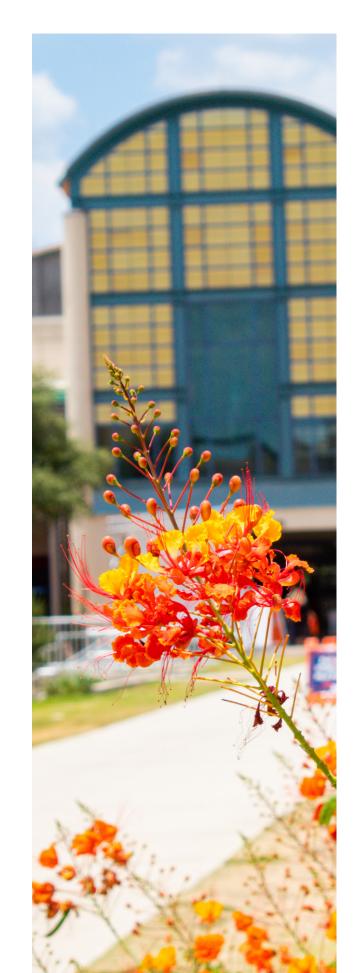
The CONNECT Program is a joint effort between UTSA and the Southwest Research Institute (SwRI). The program encourages interaction between investigators in support of the acquisitions of established extramural, peer-reviewed research funding. This agreement provides unprecedented opportunities for researchers to work together in addressing issues of mutual interest and need.

- » October 1, 2023 through September 30, 2024
- » \$250,000 awarded: \$125,000 per team (\$50,000 UTSA; \$75,000 SwRI)

#### Klesse College of Engineering and Integrated Design

Marzieh Hajiaghamemar, Ph.D., UTSA and Mark Libardoni, Ph.D., SwRI; Pushing the Boundaries of Assessment Techniques for Traumatic Brain Injury

**Esteban López Ochoa, Ph.D.,** UTSA and **Stuart Stothoff, Ph.D.,** SwRI; *Calibrating Satellite Data with Ground Environmental Metrics: A pilot in San Antonio's Historic Westside.* 



## GRANTS FOR RESEARCH ADVANCEMENT AND TRANSFORMATION (GREAT)

The GREATprogram is offering seed grants to support new areas of research for faculty at UTSA. The primary goal of these awards is to assemble preliminary data that can be used to seek extramural funding and advance UTSA's institutional research excellence goals.

- » October 1, 2023 through July 31, 2024
- » \$ 80,000 awarded: \$20,000 per researcher x 4 new projects

#### College for Health, Community and Policy

#### Emily Nicklett, Ph.D.

Department of Social Work; *Strategies to Increase* Inclusion in Fall Prevention for Older Adults who are Blind or Vision Impaired in San Antonio, TX: A Needs Assessment

#### Klesse College of Engineering and Integrated Design

#### Bin Wang, Ph.D.

Department of Electrical and Computer Engineering; *Quantum Computing for Power System Simulation* 

#### Gongchen Sun, Ph.D.

Department of Biomedical Engineering and Chemical Engineering; Isolation and Enrichment of Live Chondrocytes for Personalized Cartilage Tissue Regeneration by Multi-phase, Multi-field, Machine Learning-assisted (3M) Microfluidics

#### **College of Sciences**

#### Lacy Barton, Ph.D.

Department of Neuroscience, Developmental and Regenerative Biology; *Decoding and Controlling Calcium flux in Primordial Germ Cell Migration* 

### INTERNAL RESEARCH AWARDS (INTRA)

The Internal Research Awards (INTRA) program is part of UTSA Research's coordinated efforts to promote research and scholarship of the highest quality. This program offers experience in identifying and submitting applications to potential funding sources, provides preliminary data to support applications for extramural funding and enhances scholarly and creative activities.

- » October 1, 2023 through July 31, 2024
- » \$75,000 awarded: \$5,000 per researcher x 15 new research projects

#### Klesse College of Engineering and Integrated Design

John Alexander, Ph.D., School of Architecture and Planning; Research on the Roman Inventory of Della Chiesa's Goods

**Wei Zhai, Ph.D.**, School of Architecture and Planning; *Using Immersive Virtual Reality Experiences of Extreme Weather Events to Communicate Climate Change Risks* 

#### **Alvarez College of Business**

**Zhongxia Ye, Ph.D.**, Department of Accounting; *Does Mixed-Ownership Reform Affect Private Firms' Demand for Audit Quality? Evidence from China* 

**K.K. Raman, Ph.D.**, Department of Accounting; *Do shared auditors facilitate strategic alliance formation/success among their audit clients?* 

Jennifer Yin, Ph.D., Department of Accounting; Internal Control Quality and Audit Fees: Does the CIO Matter?

**Yuexia Zhang, Ph.D.**, Department of Management Science and Statistics; *Exploring the Causal Relationship between Post-traumatic Stress Disorder and Alzheimer's Disease* 

#### College of Education and Human Development

**Yi-Fan Li, Ph.D.**, Department of Interdisciplinary Learning and Teaching; *Examining the Effects of an Email-Writing Intervention for Students with Cognitive Disabilities Using ChatGPT* 

#### **College of Liberal and Fine Arts**

**Eva Wikberg, Ph.D.**, Department of Anthropology; *The Relationship Between Gut Microbiome Composition and Health in a Wild Non-Human Primate (Colobus vellerosus)* 

**Rebecca Bria, Ph.D.**, Department of Anthropology; *The Rise of Civilization in Highland Peru: Reconstructing the ritual ecology of two early complex communities (3000–900 BC)* 



**Julie M. Johnson, Ph.D.**, Department of Art & Art History; *Light and Space and Air: Wit and Interdimensionality in the Aesthetics of Vienna 1900* 

**Annette Portillo, Ph.D.**, Department of English; *Representations of Indigenous People: Museums, Visual Art, Media, Literature and Culture* 

#### College of Health, Community and Policy

**Tianou Zhang, Ph.D.**, Department of Kinesiology; Velocity-based Exercise Training on Body Composition, Physical Performance, and Metabolic Biomarkers in Older Adults from Senior Communities

**Zhiyong Lin, Ph.D.**, Department of Sociology; Social Determinants of Unmet Care Needs among Older Adults

**Bonita Sharma, Ph.D.**, Department of Social Work; Women's Entrepreneurial Involvement in Addressing the Climate Change: Intentions and Drivers for Social and Environmentally Sustainable Enterprises

**Stephen Pan, Ph.D.**, Department of Kinesiology; Healthcare Preferences and Utilization among Recent Chinese Immigrants in the United States: a Cross-Sectional Survey and Discrete Choice Experiment

### TRANSDISCIPLINARY TEAMS (T2) PROGRAM

The Transdisciplinary Teams (T2) Program, sponsored by UTSA in collaboration with the City of San Antonio (CoSA), is a grant opportunity offered to enhance greater intellectual collaboration between the two institutions and to increase the research-funding base with inter-institutional collaborative programs. The program encourages interaction between investigators in support of the acquisitions of established extramural, peer-reviewed research funding.

» October 1, 2023 through July 31, 2024

» \$25,000 awarded: 1 new research project

Mpox Vaccine Preferences among Men in Metro San Antonio, Texas

Team:

Stephen Pan, Ph.D.

College for Health, Community and Policy Department of Public Health

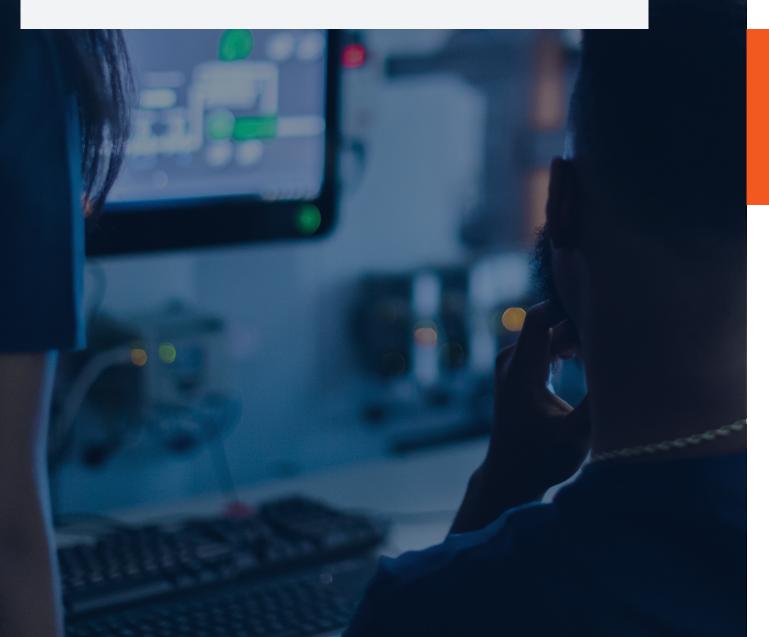
#### Shamshad Khan, Ph.D.

College of Liberal and Fine Arts Department of Communications

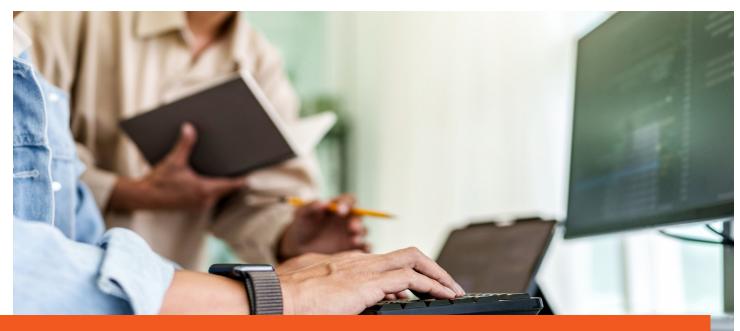


# BOLD RESEARCH

UTSA is committed to investing in research that tackles grand challenges in our world. From pursuing cures and developing new vaccines to optimizing the energy efficiency and resilience of San Antonio, UTSA researchers are working year-round to improve and extend lives.



# **BRIDGING THE EMPLOYMENT GAP FOR NEURODIVERSE ADULTS**



"THIS GRANT IS A GAME-CHANGER FOR OUR COMMUNITY. BY PROVIDING TARGETED TRAINING AND SUPPORT, WE CAN BRIDGE THE GAP BETWEEN THE SKILLS OF INDIVIDUALS WITH DISABILITIES AND THE NEEDS OF EMPLOYERS, CREATING A MORE INCLUSIVE AND EQUITABLE WORKPLACE." – SARA PATTON, DIRECTOR OF COMMUNITY AND PARTNER ENGAGEMENT FOR MORGAN'S MAC.

Adults who are neurodiverse — people with a range of conditions and disorders including autism, attention deficit hyperactivity disorder, and intellectual or developmental disabilities — are disproportionately unemployed or underemployed. UTSA researchers John Davis and Leslie Neely are collaborating with the Brain Health Consortium, Morgan's MAC and Southern Methodist University to address this issue through a groundbreaking program called Employ210.

With a \$9 million grant from the U.S. Department of Education, the initiative aims to empower neurodiverse individuals to enter and thrive in the workforce by providing comprehensive training incorporating both technical and interpersonal skills.

Participants in the program will engage in several steps, including exploring job options, shadowing professionals and developing personalized "employee blueprints." The program will also explore unspoken agreements between employers and employees, helping to set clear expectations on both sides and enabling smoother working relationships. Participants will use AI simulations to prepare for specific job interactions.

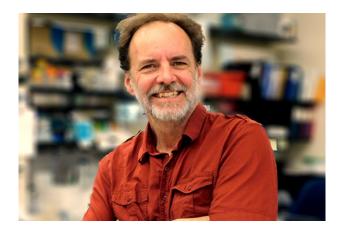
The program is informed by extensive analysis of employers' needs, tasks and expectations, with the aim of striking better matches between employee skills and employer requirements.

# INTRODUCING UTSA'S NEWEST NAI SENIOR MEMBERS: KARL KLOSE AND TEJA GUDA

In February 2024, faculty members Karl Klose and Teja Guda joined the Class of 2024 Senior Members, a prestigious recognition from the National Academy of Inventors (NAI).The NAI's Senior Members program recognizes academic innovators deemed to have "growing success in patents, licensing, and commercialization, while educating and mentoring the next generation of inventors."

Karl Klose is a renowned leader in biomedical research and serves as the director of The South Texas Center for Emerging Infectious Diseases (STCEID). He manages a laboratory dedicated to the study of bacterial pathogenesis aiming to develop effective vaccines and therapeutics.

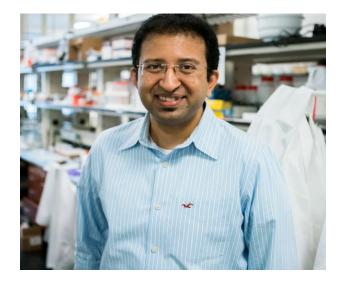
Klose's recent studies on Vibrio cholerae, the bacteria that causes cholera, led to the identification of a therapeutic intervention that could inhibit the bacteria from colonizing in the intestine, and from persisting in the environment.



"Our vaccine development efforts are getting us closer to having a vaccine that will protect people from the illicit use of biothreat agents, so this is very exciting for me and all the other scientists who have contributed to this effort." — Karl Klose Teja Guda is a biomedical engineer and an associate professor of mechanical engineering in the Margie and Bill Klesse College of Engineering and Integrated Design.

Guda manages the Regenerative Medicine and Device Innovation (ReMeDI) Lab, which develops biomaterials for tissue engineering and medical devices that help with the detection, maintenance, restoration and rehabilitation of the upper airway in people who are finding it hard to breathe for a variety of reasons.

Guda's recent research seeks to improve the design of endotracheal tubes to alleviate the fibrotic scarring often suffered by hospital patients who have been on ventilators for a long time.



"Health care is an ever-moving goalpost, so we believe in constantly moving the chains. Currently, we have developed therapeutic platforms to prevent injuries from worsening, speeding up healing and restoring some function after burn or abrasion damage in the airway." — Teja Guda

# MAKING STRIDES IN NUCLEAR SECURITY AND NONPROLIFERATION

In July 2024, UTSA joined the newly established Enabling Capabilities in Technology Consortium, a network of universities and national laboratories dedicated to advancing nuclear security and nonproliferation.

It is one of two consortia that were awarded \$50 million in cooperative agreements by the Office of Defense Nuclear Nonproliferation in the U.S. Department of Energy's National Nuclear Security Administration (DOE NNSA).

The consortia were established to facilitate collaboration between institutions to advance science and technology that furthers NNSA's nuclear security and nonproliferation



g missions and prepares the next generation of experts for careers at DOE national laboratories. Each consortium will receive up to \$5 million per year for five years to further these objectives. In in Led by UTSA faculty researcher Miltos Alamaniotis, an expert in applied artificial intelligence within nuclear engineering, UTSA's engagement in the consortium will contribute to cutting-edge research and development in this critical field. Alamaniotis will lead a project that uses AI to detect hidden radiological threats in metropolitan areas while preserving privacy.

> "UTSA IS HOME TO WORLD-CLASS RESEARCHERS AND INNOVATORS IN THE NUCLEAR FIELDS. CONNECTING WITH OUR PEER INSTITUTIONS AND NATIONAL LABS WILL CATALYZE OUR SCIENTIFIC ADVANCEMENTS AND ENHANCE OUR STUDENTS' EXPERIENCE IN THIS FIELD."

- ERIC BREY, DEAN OF THE MARGIE AND BILL THE KLESSE COLLEGE OF ENGINEERING AND INTEGRATED DESIGN

# FUELING ADVANCEMENTS IN SPACE TECHNOLOGY AND OPERATIONS UTSA'S NEWEST RESEARCH CENTER

Research and innovation in space technology and operations was a growing area of focus in FY 2023, with UTSA joining the prestigious Universities Space Research Association (USRA) in May 2024.

To further catalyze this growth, UTSA recently announced the launch of the Center for Space Technology and Operations Research (CSTOR), a new research center dedicated to advancing engineering, technology and operations that will support space missions between the Earth and the Moon, an area referred to as cislunar space, as well as the lunar surface.

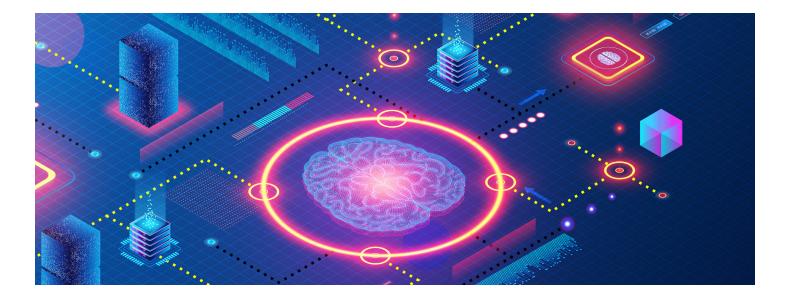
The center will address the growing demand for research and workforce development by civil, commercial and national security space agencies and companies. David Silva, distinguished professor of physics and astronomy, will serve as the center's inaugural director.

The new center will grow UTSA in-space technology and operations research expertise, support commercial and national security agency partners and train the next generation of space industry scientists and engineers.

"UTSA has intentionally expanded its capacity, facilities and expertise in space technology to meet the rapidly growing demand for innovation and enable stronger comprehensive partnerships with key organizations like Southwest Research Institute and Department of Energy National Labs. The launch of this new center positions UTSA as a destination for innovation, knowledge creation and talent development for the space economy."

— UTSA President Taylor Eighmy





# PAVING THE WAY IN NEUROMORPHIC COMPUTING: THE FIRST NEUROMORPHIC COMPUTING HUB IN THE NATION

UTSA recently received \$4 million from the National Science Foundation to lead The Neuromorphic Commons (THOR) to establish a specialized computing system that is the first of its kind in the United States.

This initiative will create a new and unparalleled large-scale neuromorphic computing resource, working in close collaboration with leading AI industries and university partners such as UC San Diego, University of Tennessee, Knoxville and Harvard University.

THOR will provide community researchers with open access to rapidly test ideas, as well as a flexible option for conducting various AI and high-performance computing experiments to solve complex problems on the fly using relatively little energy.

Leading the project is Dhireesha Kudithipudi, Robert F. McDermott Endowed Chair in Electrical and Computer Engineering and founding director MATRIX: The AI Consortium for Human Well-Being.



"THE FIELD IS AT A PIVOTAL MOMENT, AND ENSURING ACCESS TO A BROADER GROUP OF RESEARCHERS IS CRITICAL AT THIS STAGE. THIS INITIATIVE REFLECTS A COMMUNITY-DRIVEN APPROACH, SHAPING A FRAMEWORK DESIGNED BY AND FOR THE COMMUNITY. " — DHIREESHA KUDITHIPUDI

# The University of Texas at San Antonio Office of Research

