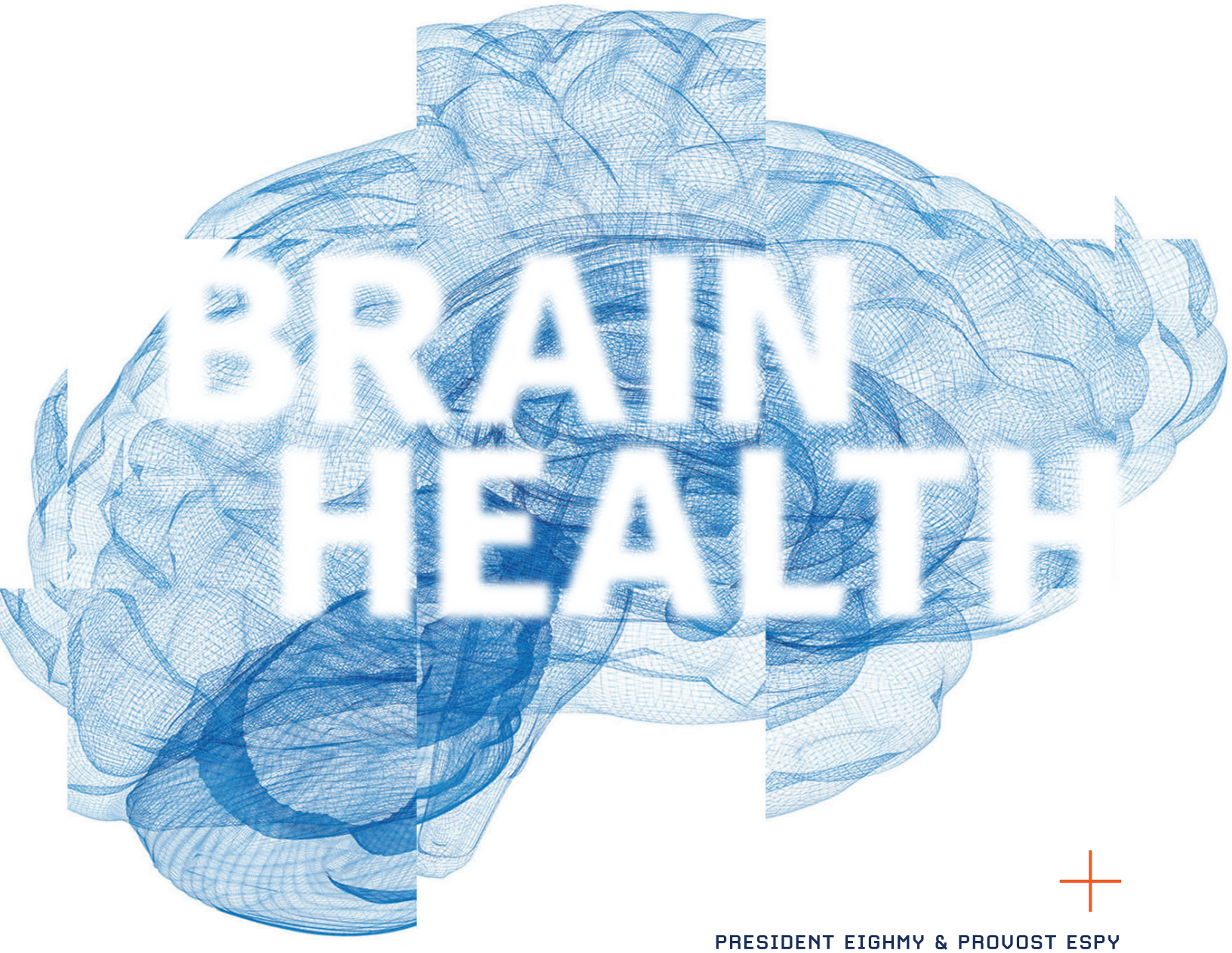
SPRING/SUMMER 2018

Discovery

RESEARCH, SCHOLARSHIP, AND CREATIVE ACHIEVEMENT
AT THE UNIVERSITY OF TEXAS AT SAN ANTONIO



UTSA Knowledge Enterprise

[CONTENTS]

SPRING / SUMMER 2018

Discovery

The University of Texas at San Antonio

PRESIDENT
Dr. Taylor Eighmy

INTERIM VICE PRESIDENT FOR RESEARCH, ECONOMIC DEVELOPMENT AND KNOWLEDGE ENTERPRISE
Dr. Bernard Arulanandam

ASSOCIATE VP FOR RESEARCH INTEGRITY
Dr. Michelle Stevenson

SENIOR ASSOCIATE VICE PRESIDENT FOR ECONOMIC DEVELOPMENT
Robert McKinley, MPA

ASSISTANT VP FOR RESEARCH FINANCE & OPERATIONS
Beth Manning

DIRECTOR OF COMMERCIALIZATION & TECHNOLOGY TRANSFER
Dr. Christine Burke

DIRECTOR OF RESEARCH SUPPORT
Jaclyn Shaw

EXECUTIVE DIRECTOR OF UNIVERSITY COMMUNICATIONS
Christi Fish

MANAGING EDITOR
Sarah Hada

CREATIVE DIRECTOR
Austin Gutierrez

CONTRIBUTORS
Joanna Carver
Kate Hunger
Jo Ann Jones
Rebecca Luther
Deborah Silliman
Michelle Skidmore
Kara Soria

PHOTOGRAPHY
Austin Gutierrez
Mark McClendon
Courtney Campbell
Lilian Cano

MAILING ADDRESS:
The University of Texas at San Antonio
Office of the Vice President for Research, Economic development and Knowledge Enterprise
One UTSA Circle, San Antonio, TX 78249

VISIT US ON THE WEB
research.UTSA.edu

FOLLOW US
@UTSAResearch

NEWS OR STORY IDEAS?
Email us at research@utsa.edu

Welcome to our annual magazine, DISCOVERY, focused on the research activities of the faculty, students, staff, and partners at the University of Texas at San Antonio (UTSA).

It has been a record year for research on campus: total research expenditures increased to $68.1 million, an increase of 19.9%, and our restricted research expenditures grew to $40.1 million in the 2017 fiscal year. This growth enables the institution to move closer towards being recognized as a research intensive (R1) university, as measured by the Carnegie Foundation for the Advancement of Teaching, and meeting eligibility for the Texas National Research University Fund (NRUF).

The institution welcomed new leadership with a new president – **Dr. Taylor Eighmy** – at the beginning of the 2017-2018 academic year, and a new provost – **Dr. Kimberly Andrews Espy** – in June 2018. Both are successful researchers in their respective fields, civil engineering and translational neuroscience. Aligning their strengths and research perspectives with ours, our office has developed key strategies in evolving and enhancing our initiatives and programs, and growing and diversifying our funding dollars and base.

One of those recently implemented strategies is the amalgamation of the Research Office with UTSA's Institute of Economic Development into a new unit called **Knowledge Enterprise.** Inspired by our academic peers, we are taking an interdisciplinary approach to everything we do. With an emphasis on entrepreneurship and innovation, we are leveraging our research and development capabilities to focus on society's greatest challenges to, in turn, benefit our community, the state of Texas, and the world beyond.

This is a defining moment in UTSA's history and we are excited about the momentum given by our new leadership. Everyone, whether it's our students or faculty or collaborators, engaged in discovery should feel empowered to seize the available opportunities and be bold in their approach in growing the knowledge enterprise on campus.

We hope you enjoy this snapshot of our current activities and welcome your feedback.

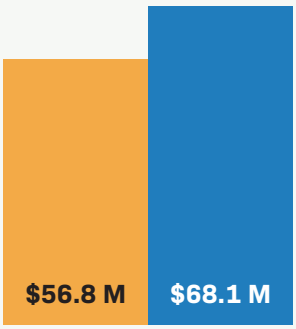
Regards,

Bernard Arulanandam
Interim Vice President for Research,
Economic Development and Knowledge Enterprise

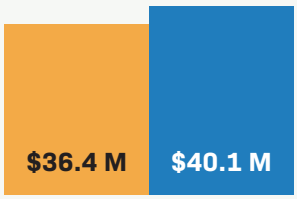
RESEARCH BY THE NUMBERS

Over the past year (FY 2017), UTSA grew its institutional research portfolio, engaged more students, and built partnerships with industry and government to expand funded research, leading UTSA research expenditures to reach an institutional record high. Total research expenditures increased from $56.8 million (FY 2016) to $68.1 million FY 2017), an increase of 19.9 percent. The university's restricted research expenditures grew from $36.4 million (FY 2016) to $40.1 million (FY 2017). This growth will help UTSA move closer toward becoming recognized as a research intensive (R1) university, as measured by the Carnegie Foundation for the Advancement of Teaching, and meeting eligibility for Texas' National Research University Fund (NRUF).

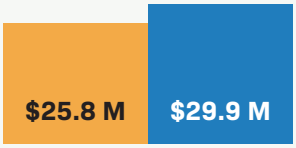
FY16 VS FY17



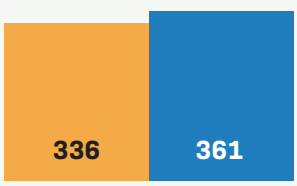
19.9% **TOTAL RESEARCH EXPENDITURES**



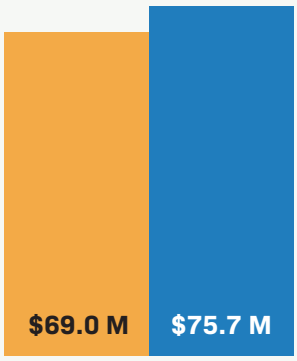
10.1% **RESTRICTED RESEARCH EXPENDITURES**



15.9% **FEDERAL RESEARCH EXPENDITURES**



25.0% **NUMBER OF AWARDS**



9.7% **AMOUNT OF AWARDS**

Proposed: The National Security Collaboration Center

The National Security Collaboration Center (NSCC) is the result of strong partnerships with both the public and private sectors.

Letters of support & commitment has been received from the following government, federal, industry and nonprofit organizations:

- **24th Air Force (Air Forces Cyber)**
- **25th Air Force**
- **Accenture**
- **Army Research Laboratory**
- **Booz Allen Hamilton**
- **BuildSec Foundry**
- **Cybersecurity San Antonio**
- **Federal Bureau of Investigations**
- **LGS Innovations**
- **National Security Agency**
- **Noblis**
- **Office of Congressman Will Hurd**
- **Office of Mayor Ron Nirenberg**
- **Parsons**
- **Peraton**
- **Raytheon**
- **San Antonio Chamber of Commerce**
- **San Antonio Economic Development Foundation**
- **US Secret Service**

Governmental agencies are calling for greater collaboration to address America's national security infrastructure protection. To encourage this, business and local government partners need direct access to the technical expertise, highly trained students, and specialized facilities that make UTSA a premier cybersecurity program. The National Security Collaboration Center (NSCC) is the result of strong partnerships with both the public and private sectors.

A presidential initiative, our goal is to grow the National Security Collaboration Center at UTSA to advance research, education, and workforce development in the areas of cybersecurity, data analytics, and cloud computing. The NSCC will build a collaborative and impactful ecosystem engaging government, industry and academia to solve the nation's greatest issues surrounding cybersecurity. This initiative includes a Cyber Laboratory/Range, Data Analytics Laboratory, Cloud Computing and Visualization technologies and an Innovation Factory to feed innovation in San Antonio. We will expand UTSA's ability to conduct applied and classified research.

Both virtual resources and a physical location are vital for government, industry, and academic partners to collaborate, conduct leading research, and to rapidly develop and prototype state of the art technologies and solutions to face the ever-increasing level of threats to national security and global defense. By partnering with the NSCC companies will have a competitive advantage for attracting customers, talent, and funding to grow their businesses. With its convenient location, partners will have expedient access to UTSA faculty, research, and students and have the benefit of competitively priced land, lab, and office space leases.

By providing office space, state-of-the-art research laboratories, and incubator capabilities to both government and industry partners, the NSCC will give Government–University–Industry (GUI) entities the ability to collaborate on scientific investigation and business enterprise. This initiative is the next major step in UTSA's path toward national recognition as a research-intensive university and serves our strategy to ensure UTSA's competitive advantage and reputation as America's premier cyber security program.

UTSA is seeking partnerships. For opportunities, please contact:

Bernard Arulanandam
Interim Vice President for Research, Economic Development, and Knowledge Enterprise
Bernard.Arulanandam@utsa.edu

Jaclyn Shaw
Director for Research Support
Jaclyn.Shaw@utsa.edu

For updates, please visit
http://www.utsa.edu/strategicplan/tactical-initiatives/nscc/index.html


UNIVERSITY
PRAESIDIUM

8 QUESTIONS WITH

PRESIDENT EIGHMY & PROVOST ESPY

Since arriving on campus last September, **President Taylor Eighmy** has outlined a bold vision for UTSA as an urban-serving, Hispanic-thriving discovery enterprise (utsa.edu/strategicplan). **Provost** and **Vice President for Academic Affairs Kimberly Andrews Espy** arrived last month and has already made an impact with her leadership and insight.

Both are senior researchers [Dr. Espy is a translational clinical neuroscientist, Dr. Eighmy is a civil and environmental engineer] and experienced research administrators from Carnegie R1 (research intensive) universities. In Espy's former role as a senior vice president for research and chief research officer at the University of Arizona, she led the university's interdisciplinary research centers and institutes, central core research facilities and four university museums in addition to research development, corporate engagement, and global research alliances. Arizona's research activity increased by $34 million under her leadership, and the innovative public-private partnership with Banner Health was established. Eighmy was formerly the vice chancellor for research and engagement at the University of Tennessee-Knoxville, and helped secure, with colleagues from Oak Ridge National Laboratory, the Institute for Advanced Composites Manufacturing Innovation, a $259 million public-private partnership supported by the U.S. Department of Energy. At Texas Tech University as senior vice president for research, he was instrumental in realizing National Research University status for his institution.

Given their depth and breadth of their research backgrounds, Drs. Eighmy and Espy graciously answered our questions as we navigate our future in growing the research and knowledge enterprise at UTSA.

1 WHY IS RESEARCH IMPORTANT TO AN ACADEMIC INSTITUTION?

Dr. Taylor Eighmy: As a former chief research officer, this question resonates with me at many levels, from foundational to specific. Foremost, one of the foundations of public higher education is the role that doctoral-granting research universities play in generating new knowledge to benefit the world, including knowledge that allows us to solve our societal grand challenges. More specifically, discovery and new knowledge is brought into the classroom to enrich learning. What really excites me is that here at UTSA, undergraduates actively participating in mentored research is growing and will become a component of our experiential learning push. Lastly, we have an important obligation to society to translate our discovery into knowledge that is available to the public, either through the stories we tell or the intellectual property we develop that is commercialized as new innovations. All of these components are part of our institutional DNA.

Dr. Kimberly Andrews Espy: I too am a former chief research officer, and research is about discovery – advancing our frontiers whether it's discovering a new technology to advance our well-being, discerning a new understanding for an age-old problem, or realizing a novel application for social benefit. This spirit of discovery is not limited only to research. As Provost, I am particularly excited how discovery permeates the student experience.

Our students come to UTSA to explore who they are and will become. They will learn inside and outside of the classroom to uncover their career path. At a research university, students are engaging in this discovery from classroom to career, guided by faculty who are on the frontiers of knowledge, learning directly what will be published in textbooks five years from now.

2 WHAT MAKES UTSA'S RESEARCH ENTERPRISE DISTINCTIVE?

TE: We are a relatively young university that is still evolving and growing. That said, our enterprise is robust and already impactful in many areas: cybersecurity, brain health, tissue engineering and biomedicine, infectious diseases, material sciences, teacher preparation, and bicultural and bilingual studies are some excellent examples. For such a young university, to have these areas of distinction speaks to the quality of our faculty and our collective efforts to become the best.

We can also focus on becoming more excellent across all our disciplines: the creative arts, social sciences, and STEM.

KAE: President Eighmy highlights some outstanding spires of excellence. What strikes me about UTSA's research enterprise – regardless of area – is the deep connection to our communities, businesses, city and state. These research strengths are grounded in, and contribute to, our economy and region in a positive feedback loop. That's what great research universities of the 21st century do. As a multicultural discovery enterprise, UTSA is equipping our students with the tools needed to thrive in this modern knowledge economy.

3 WHY IS IT IMPORTANT FOR THE INSTITUTION TO ATTAIN NRUF* ELIGIBILITY AND THE R1 CARNEGIE CLASSIFICATION?

TE: If you look forward ten years, we will be a bigger university with multiple campuses, a larger faculty, and a larger graduate student population. The growth of our research enterprise will have this same trajectory. There are way points along this trajectory: NRUF status, Carnegie R1 designation, and further specialization of our areas or focus and development of the excellence of our knowledge enterprise. We can use NRUF and Carnegie designations as way points as we chart our course forward. This course is one of continuous distinction and impact.

KAE: And for our students, these distinctive milestones drive home the quality of the academic preparation and student experience at UTSA. Cutting-edge instructional techniques, faculty engaged with students, out-of-classroom experiences in our communities, pursuing new ideas in the lab or library, involvement in innovative technology and entrepreneurship, immersion in diverse culture abroad – all these elements drive the transformation of classroom learning to career readiness.

[*National Research University Fund (NRUF) was established by the Texas Legislature "to provide a dedicated, independent, and equitable source of funding to enable emerging research universities in this state to achieve national prominence as major research universities."]
http://research.utsa.edu/nruf

WHAT IS OUR PATHWAY TO BE RECOGNIZED AS A LEADING RESEARCH INSTITUTION?

TE: The world is pretty competitive and getting more so, especially in the new ideas space, availability of transformative funding, the cost of investment talent development, and the availability of strategic partnerships. Our best ways to differentiate ourselves and to drive the density of excellence that makes us the go-to discovery enterprise is to focus on our present and future areas of strength so that we achieve the excellence density function. We can do that in many ways: how we attract students, how we develop and support our faculty, how we invest in state-of-the-art infrastructure, how we cluster hire, and how we strategically partner.

KAE: UTSA is fortunate to be in San Antonio, a rich, vibrant city with a distinctive history, multicultural roots, economic growth mindset, and strong business and government assets. This alignment of excellence density with these community assets is an unparalleled opportunity. UTSA will employ strategies and tactics to drive these connections even deeper.

WHAT ARE THE ROLES OF THE DOWNTOWN AND MAIN CAMPUSES IN RESEARCH?

TE: Rather than being location specific, I think we need to optimize our discovery enterprise as it involves people, places, and ideation. The best knowledge generation comes when you have that excellence density function and you involve many disciplines that come together to generate that new knowledge as new disciplines. That is the leading edge of this go-to concept. Tissue regeneration is one such example of a new discipline that can be go-to for UTSA and our strategic partners here in San Antonio. As such, our campuses must be designed to foster a transdisciplinary approach. Transdisciplinarity also involves all disciplines: creative arts, social sciences, STEM. As an example, some of the hottest new transdisciplinary areas nationally involve the visual arts, digital media, data science, and information management.

KAE: So much of today's academic activity does not have boundaries – classroom instruction can be online and on-demand, or out in the field, laboratory or community. Faculty work side by side with colleagues a world away with the click of a mouse. Our campuses allow us greater opportunity and creativity in aligning our diverse academic and research programs with the needs and assets in our communities. Examples include flexible degree programs for professionals who work downtown, as well as intensive laboratory experiences for our STEM students in our renowned microscopy facilities or those of our partners, such as UT Health San Antonio, Southwest Research Institute, Texas Biomedical Research Institute, just to name a few. UTSA will leverage this diversity to benefit our students and our region.

GIVEN YOUR BACKGROUND AS A RESEARCHER AND AN EXPERIENCED RESEARCH ADMINISTRATOR, WHAT MAKES A GOOD RESEARCHER?

TE: Passion, curiosity, altruism.

KAE: Unbridled drive to understand, commitment to the work/pursuit of the answer, dedication to sharing the results with others, further driving the cycle of discovery.

HOW DID YOU START ON YOUR RESEARCH JOURNEY? WHAT WAS YOUR "AHA" MOMENT?

TE: I loved science and had the great privilege to do undergraduate research with a faculty mentor at Tufts University many years ago. That set me on my own course to where I am today.

KAE: As an undergrad at Rice, I had great faculty who were committed to discovery in a city that had so many different opportunities– it was infectious.

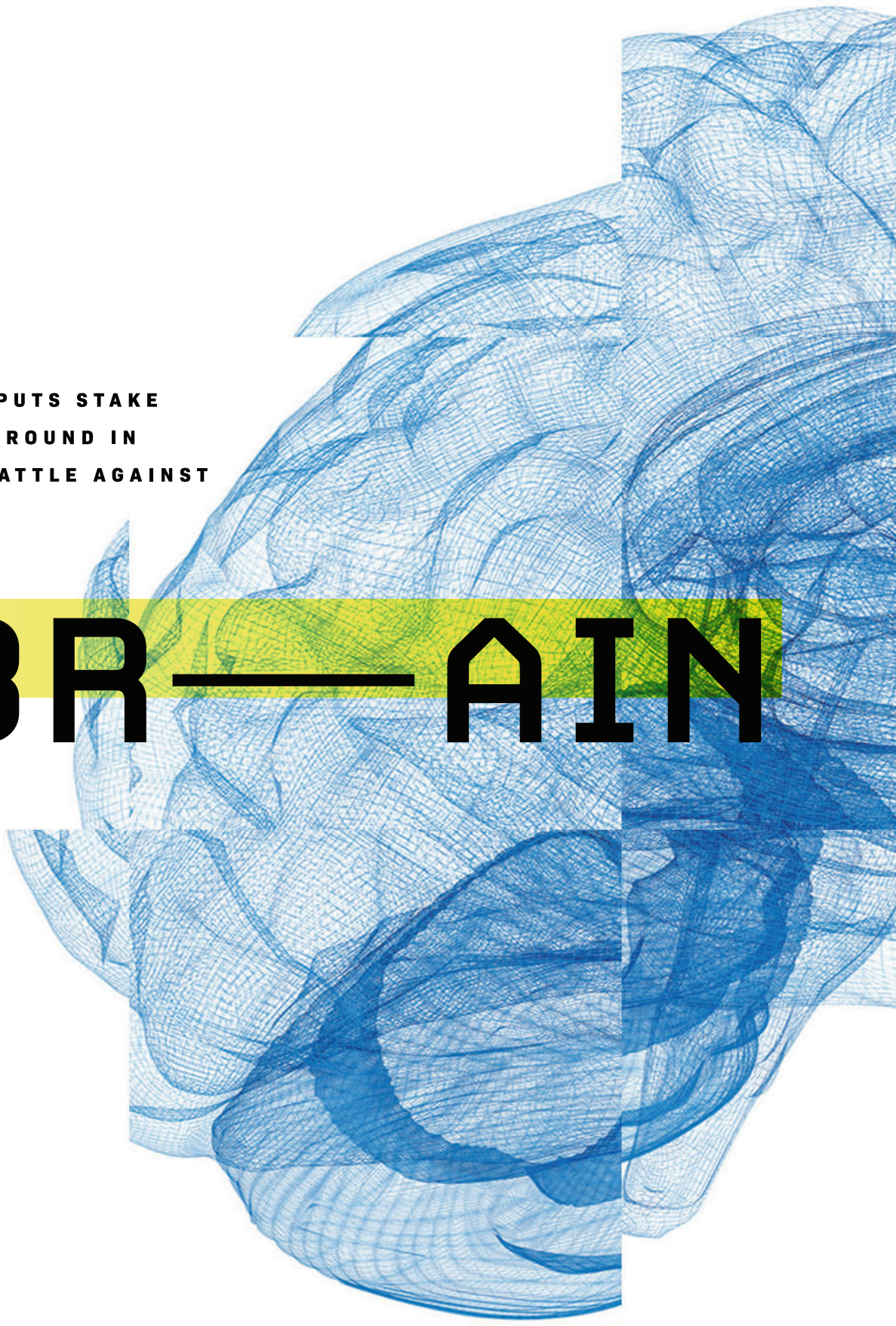
HOW DOES THE RECENT ORGANIZATIONAL CHANGE, THE CREATION OF THE "RESEARCH, ECONOMIC DEVELOPMENT, AND KNOWLEDGE ENTERPRISE" OFFICE, IMPACT AND HELP ADVANCE RESEARCH ON CAMPUS?

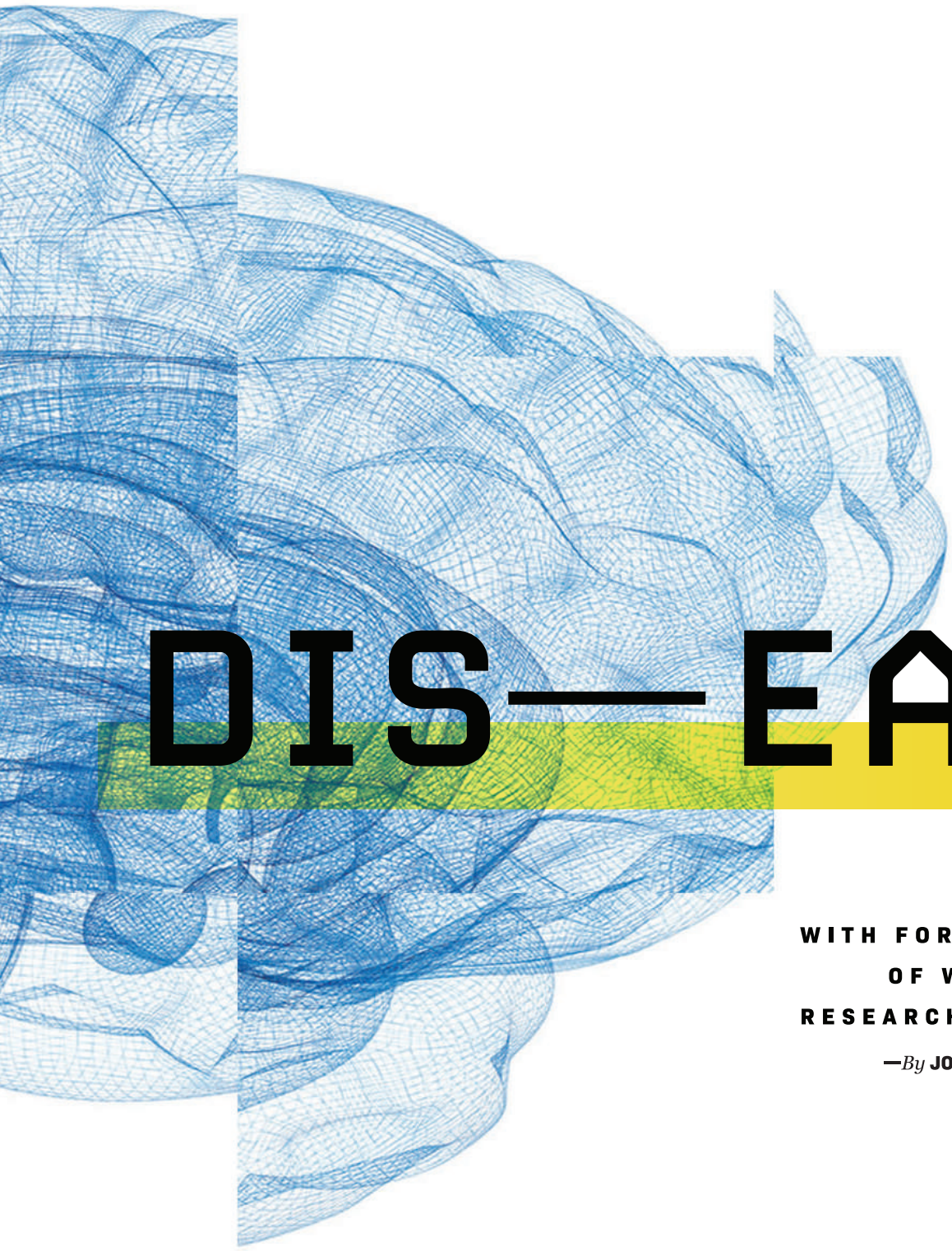
TE: This is part of our maturation of our research enterprise. We need to take our current discovery enterprise and expand its impact and benefit through leveraging its impact on economic development, social benefit, prosperity. Many of our new aspirant peers have evolved into this mode. Now is the time for us to do so too.

KAE: As Provost, I look forward to driving this discovery model deeper into our academic programs and student experience, in collaboration with San Antonio business, community, and governmental partners. UTSA is on the move!

UTSA PUTS STAKE
IN THE GROUND IN
BATTLE AGAINST

BR—AIN



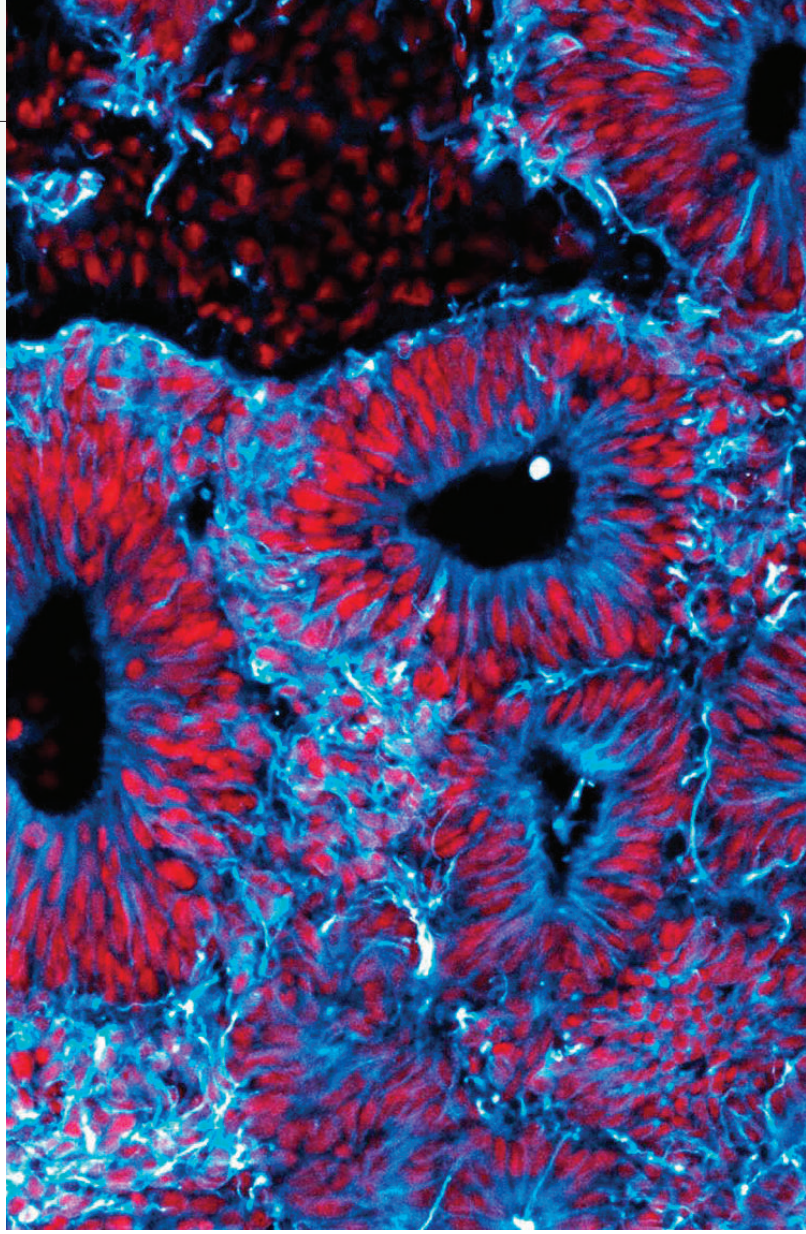


DIS—EASE

WITH FORMATION OF WORLD-CLASS RESEARCH CLUSTER

—*By* **JOANNA CARVER**

MAKING A BOLD COMMITMENT TO DEVELOP GROUNDBREAKING APPROACHES FOR TREATING BRAIN DISEASES AND INJURIES,



the University of Texas at San Antonio (UTSA) has assembled a world-class research enterprise, comprised of over 40 of the nation's leading brain health researchers, dedicated to conquering the greatest mysteries of the brain.

The researchers will leverage their expertise in neurodegenerative disease, brain circuits and electrical signaling, traumatic brain injury, regenerative medicine, stem cell therapies, medicinal chemistry, neuroinflammation, drug design and psychology to collaborate on complex, large-scale research projects that will produce a greater understanding of the brain's complexity and the factors that cause its decline.

This knowledge will be used to develop new and more effective methods for treating debilitating conditions including Alzheimer's, epilepsy, Parkinson's, addiction and traumatic brain injury.

Jenny Hsieh, a nationally recognized researcher, joined the UTSA faculty this spring to lead the UTSA Brain Health Consortium as the Semmes Foundation Chair in Cell Biology.

Hsieh's research focuses on how to make newborn neurons so a brain affected by disease or injury can replace its own damaged cells and heal. She tackles the challenge using molecular and genetic tools and is focused on understanding the factors that control the brain's stem cells so she can manipulate and stimulate new growth.

She has a doctorate in biology from John Hopkins University and completed a postdoctoral fellowship at the Salk Institute for Biological Studies.

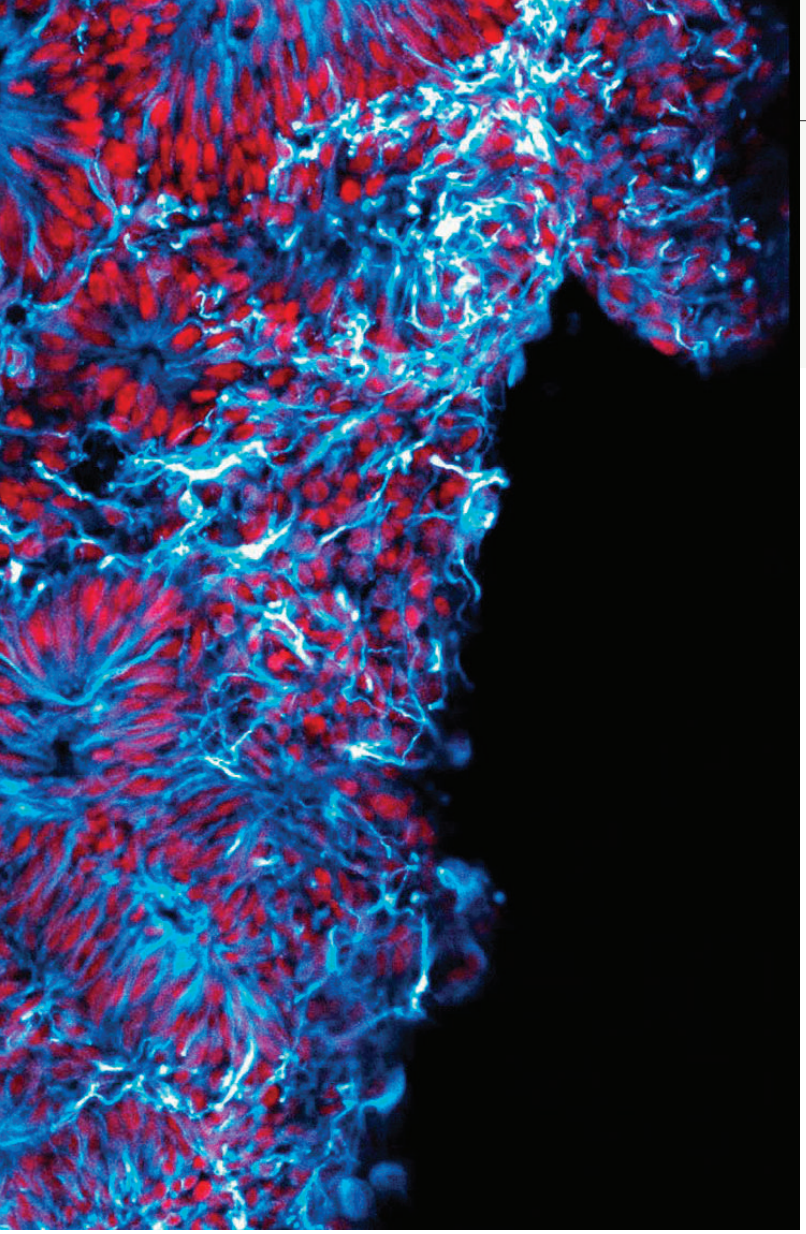
The Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation, which has supported medical and science research since 1950, will provide a $2.7 million gift to support Hsieh's research.

"The Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation is glad to be working with UTSA toward finding causes and cures of human brain malfunctions," said **Helen K. Groves**, president of the Kleberg Foundation.

Hsieh's work will also be supported by a $1 million gift from the Semmes Foundation.

UTSA's bold vision to become a national leader in brain health attracted Hsieh to the university. She plans to expand UTSA's work in pluripotent stem cell research and personalized medicine to develop new and innovative approaches to neurodegenerative disease. Hsieh will use CRISPR, a cutting-edge gene-editing technology, to conduct some of her research into personalized, precision medicine.

To encourage collaboration, Hsieh will also establish a new core facility at UTSA allowing researchers from around the country to study human-induced pluripotent stem cells.



Pluripotent stem cells are taken from any tissue in the human body and genetically modified to behave like embryonic stem cells that are able to develop into any adult cell type. The cells are especially beneficial in brain health treatments, since damaged neurons are unable to replicate themselves.

"Now that we can create a specific cell from any patient, every patient can have his or her own personalized stem cell line," Hsieh said. "We can differentiate a person's unique stem cells to any type of tissue we want and use that to treat their disease in a way that is personalized."

Four additional researchers, recently recruited from some of the nation's top research institutions, include **Hyoung-Gon Lee**, the John H. Doran, M.D., F.A.C.P. Distinguished Professor in Peripheral Neuropathy, **Asif Maroof**, assistant professor of biology, **Lindsey Macpherson**, assistant professor of biology, and **Edward Golob**, professor of psychology.

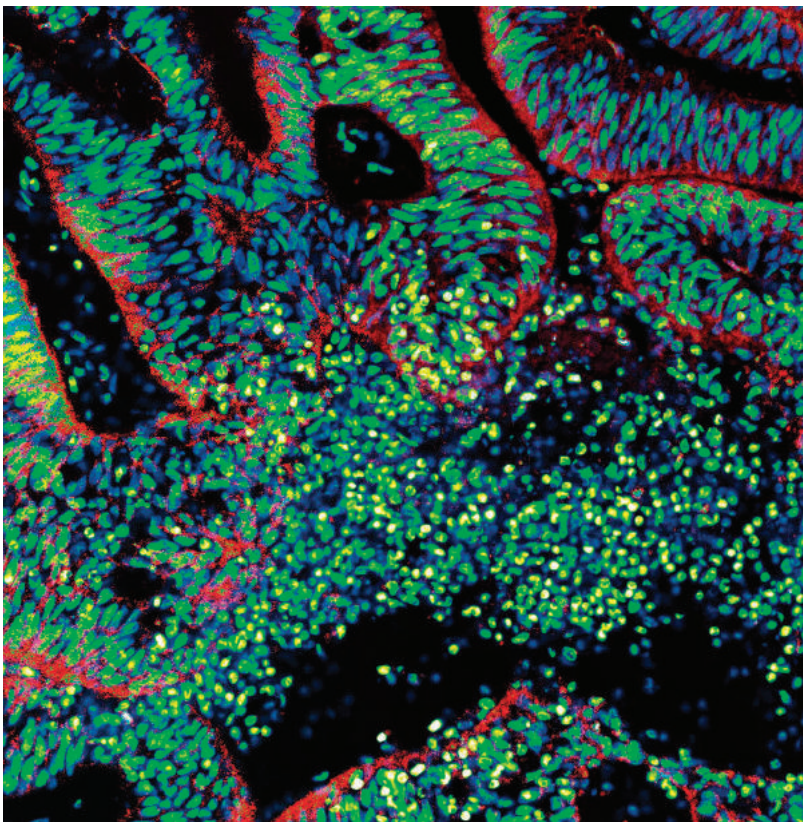
Lee's research is focused on understanding the mechanisms of the neurodegeneration related to Alzheimer's disease. In particular, he is taking a closer look at why neurons appear to be attempting to divide but then die when afflicted with Alzheimer's. He joined UTSA from Case Western Reserve University School of Medicine.

Maroof is researching how brain cells are impacted by aging, injury or disease. Using human pluripotent stem cells, he is modeling neurological diseases, such as Alzheimer's disease and Lou Gehrig's disease, to determine when the brain's cells are most susceptible or resistant to illness, and how molecular interactions in those cells affect the progression of disease. He joined UTSA from Harvard University.

Macpherson's research centers on wiring and the functional connections between cells within peripheral sensory circuits. Specifically, she is interested in understanding the sense of taste and how the molecules, cells and circuits of the chemosensory system convey information from the tongue and gut to the brain. She joined UTSA from Columbia University, where she completed her post-doctoral fellowship, and The Scripps Research Institute, where she completed her doctoral studies.

Golob's expertise is cognitive neuroscience, specifically perception, attention and memory perception in the auditory system. He studies aspects of hearing that are important to humans, such as determining where a sound is coming from, recognizing speech and music, and relating our actions to perception. Through this work, he is striving to understand the cognitive and neurobiological differences that accompany normal aging as well as neurodegenerative disease. He joined UTSA after serving on the Tulane University faculty, and completing his doctorate degree and post-doctorate fellowship at Dartmouth College and UC Irvine, respectively.

"We have amazing neuroscientists here at UTSA and we've been able to round out their great work by recruiting other well-respected researchers, people with very specific expertise," said George Perry, Semmes Foundation Distinguished University Chair in Neurobiology. "The work that they're conducting holds such great promise for society. It's an exciting time to be a neuroscientist at UTSA."



Q

HEALTH

&

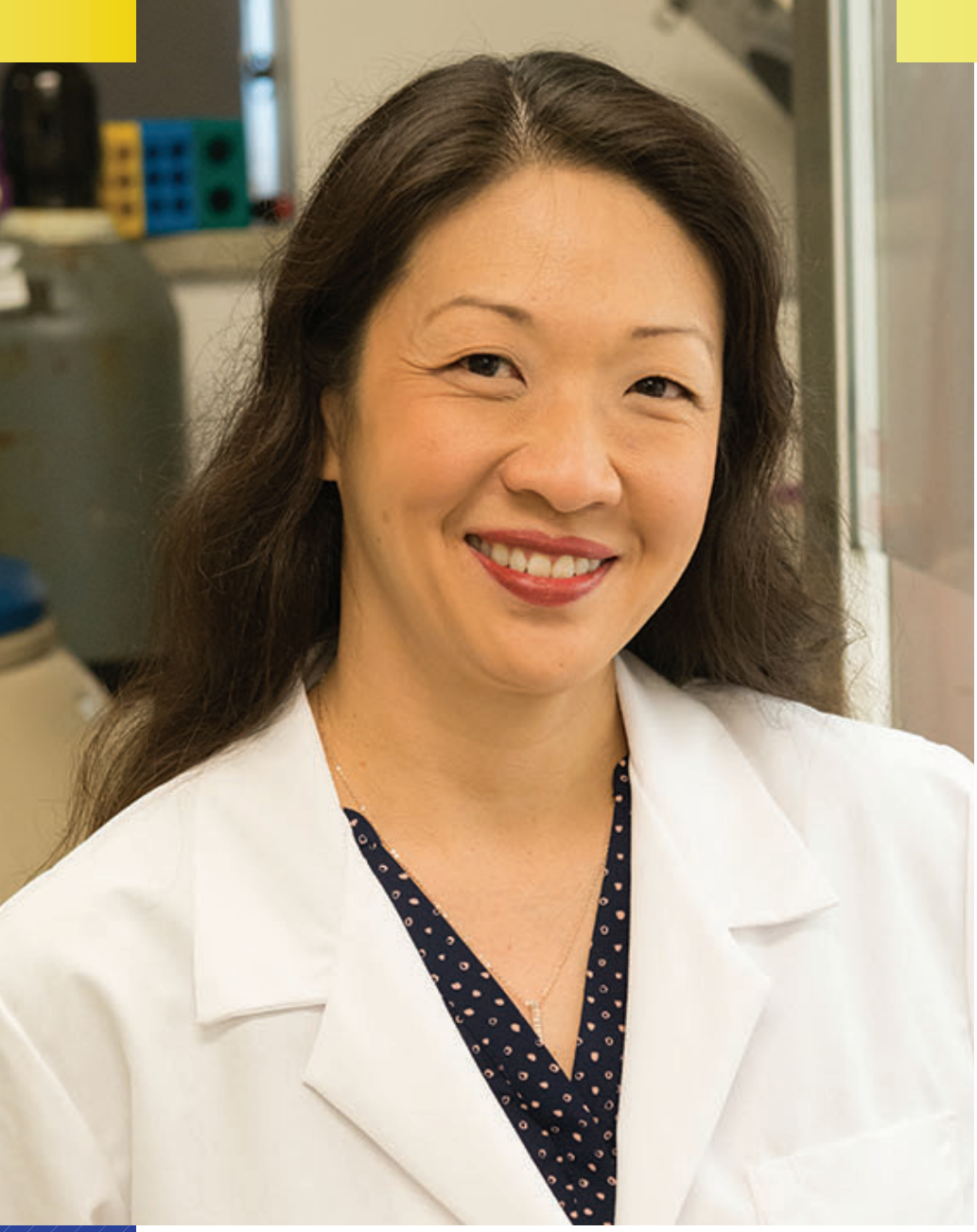
BRAIN

A

JENNY HSIEH

JENNY HSIEH IS THE SEMMES FOUNDATION CHAIR IN CELL BIOLOGY AND THE DIRECTOR OF THE UTSA BRAIN HEALTH CONSORTIUM. A NATIONALLY RECOGNIZED RESEARCHER, HSIEH'S WORK FOCUSES ON HOW TO MAKE NEWBORN NEURONS SO A BRAIN AFFECTED BY DISEASE OR INJURY CAN REPLACE ITS OWN DAMAGED CELLS AND HEAL. SHE TACKLES THE CHALLENGE USING MOLECULAR AND GENETIC TOOLS AND IS FOCUSED ON UNDERSTANDING THE FACTORS THAT CONTROL THE BRAIN'S STEM CELLS SO SHE CAN MANIPULATED AND STIMULATE NEW GROWTH.

—by **Joanna Carver**



AS DIRECTOR OF THE BRAIN HEALTH CONSORTIUM, HSIEH IS EXPANDING UTSA'S WORK IN PLURIPOTENT STEM CELL RESEARCH AND PERSONALIZED MEDICINE TO DEVELOP NEW AND INNOVATIVE APPROACHES TO NEURODEGENERATIVE DISEASE. SHE ALSO PLANS TO ESTABLISH A NEW HUMAN STEM CELL CORE FACILITY AT UTSA TO ENCOURAGE INTERDISCIPLINARY COLLABORATION, AMONG MANY OTHER EFFORTS TO SUPPORT INNOVATION IN BRAIN HEALTH RESEARCH.

WHAT IMPACT DO YOU HOPE YOUR RESEARCH WILL HAVE?

We hope our research in brain function will impact the lives of patient populations as well as the general public. Our research studies how the brain works and how the brain may change with different genetic disorders, health conditions and the basic human experience of living. Specifically, we hope to increase our understanding of the mechanisms that cause brain disorders, such as childhood epilepsy. By studying these ideas in our laboratory, we can translate basic discoveries into cures and preventative strategies to help improve the lives of people living with different disorders.

WHAT WOULD YOU SAY TO A STUDENT WHO IS INTERESTED IN ENTERING YOUR FIELD?

My best advice for someone who is entering this field is to identify the most important problem in the field and to not be afraid of taking risks. Don't do something because everything else is doing it. Do something truly new. A career in scientific discovery requires a curious, creative mind, and I would encourage new scientists to embrace and trust this creativity.

WHAT DO YOU THINK THE BIGGEST CHALLENGE RESEARCHERS IN YOUR FIELD ARE FACING?

The most talked about challenges are funding concerns, and issues with rigor and reproducibility in science. What is less talked about is that science is poorly communicated. To improve science communication, being able to explain your work to a non-scientific audience is just as important as publishing in a peer-reviewed journal. But this skill is under-rewarded in the current system. Another challenge is the incredibly stressful life of a Ph.D. or postdoc. I believe we need to focus on supporting a work/life balance to cultivate successes in the laboratory. For example, family leave policies and child care solutions can help support the next generation of researchers.

WHAT IS THE MOST IMPORTANT THING GOING ON IN YOUR FIELD THAT NO ONE IS TALKING ABOUT?

One idea that isn't discussed too often is the regulations and laws behind research with human subjects. Right now, Congress is working to change these laws in the favor of scientists to decrease administrative burdens for collecting patient information and patient samples, which I believe would increase research activity.

Specifically, the regulations for biobanks of human biospecimens is under review. If this is approved, patients would be able to donate their information and biosamples to large research systems and biobanks in a more streamlined, highly ethical way. We will see if these new regulations go into effect in January of next year.

D9

JENNY HSIEH, PH.D.

SEMMES FOUNDATION CHAIR IN CELL BIOLOGY; DIRECTOR, BRAIN HEALTH CONSORTIUM

SPECIALTY: Neurogenesis, Adult neurogenesis and epilepsy, Cancer stem cells, Epigenetic regulation, Neurogenic small molecules, Stem cell biology

Hsieh lab / Precision models of epilepsy using human induced pluripotent stem cells

Epilepsy is a debilitating neurological disorder, affecting over 3 million Americans and over 65 million people worldwide. About a third of patients live with uncontrolled seizures and suffer from memory and mood disorders.

Dr. Jenny Hsieh's research strives to understand the causes and mechanisms of epilepsy and other neurological disorders at the cellular, molecular, and circuit level. She is recruiting patients with genetic mutations in epilepsy and making individualized pluripotent stem cell lines. By creating three-dimensional brain-like structures (called organoids) from patient-derived stem cells, she is identifying the cause of their epilepsy and screening for drugs to treat their epilepsy.

EDWARD GOLOB, PH.D.

PSYCHOLOGY

SPECIALTY: Cognitive neuroscience, Partial cognition attention and working memory perception and action in the auditory system, Normal aging and age-related cognitive disorders

Dr. Edward Golob's lab studies how auditory processing is affected by attention, memory, and the relations between perception and action. He seeks to understand the cognitive and neurobiological differences that accompany normal aging, age-related neurological disorders such as Alzheimer's disease, and speech fluency disorders. In many studies, they monitor the brain's electrical activity using event-related potentials and EEG; in others, they use transcranial magnetic and electrical stimulation to transiently influence brain activity. The lab is expanding its work to include traumatic brain injury and risk of future cognitive impairments, as well as patient rehabilitation using advanced computing and brain-computer interface methods.

HYOUNG-GON LEE , PH.D.

CELL CYCLE AND NEURODEGENERATION BIOLOGY

SPECIALTY: Cell Cycle and neurodegeneration, Alzheimer's Disease, Neurobiology

Neurodegenerative diseases cause neuronal death, but how? Neurons are non-proliferative, meaning their cell-cycle is arrested; perhaps accidental activation of the cell-cycle sets them on a course to die.

Dr. Hyoung-gon Lee's research hypothesizes that cell cycle re-entry in the CNS is a key pathogenic mechanism in neurodegeneration. He is using transgenic mouse models to dissect and understand what might trigger cell cycle activation and whether this event bears any causal relationship with neurodegeneration like that observed in Alzheimer's disease.

ASIF MAROOF, PH.D.

CORTICAL INTERNEURON FATE AND FUNCTION IN DISEASE; BIOLOGY

SPECIALTY: Projection neurons transmit information between brain regions, but it's the local circuit interneurons that shape the signals being transmitted. The diversity of interneurons confers the powerful computational capacity of the CNS, and their dysfunction results in pathological states.

Dr. Asif Maroof is using cutting-edge transgenic technology and stem cells to study the differentiation of cortical interneurons. He is determining their diversity, how they connect, and serve information flow in the brain. His research is fundamental to building the next generation of cell-based therapies for a whole array of neurological disorders and diseases.

LINDSEY MACPHERSON, PH.D.

CHEMOSENSATION; BIOLOGY

SPECIALTY: Wiring and functional connections of peripheral sensory circuits

The Macpherson lab is interested in investigating the sense of taste and the molecules, cells, and circuits involved in chemosensation from the tongue and gut to the brain. Taste receptor cells on the tongue are specialized to be activated by only one of the five taste qualities, and signal that information to discrete populations of neurons in the gustatory ganglia through "labeled lines." This hard-wired, labeled line connectivity pattern is essential for our ability to correctly detect and discriminate tastes. The lab is interested in understanding how this gustatory circuit is organized at the cellular and molecular level.

Less well understood are chemosensory cells in the gut – which have many parallels to taste receptor cells – and may signal the presence of nutrients, toxins, and microbial metabolites to peripheral sensory neurons in the vagal ganglia. We aim to identify the cells and signaling mechanisms necessary for this gut-brain communication.

George Perry Named Chief Scientist, UTSA Brain Health Consortium

George Perry, a leading Alzheimer's researcher, was appointed the Chief Scientist in the newly established UTSA Brain Health Consortium, effective July 1, 2018.

Prior to joining UTSA as dean of the College of Sciences in 2006, Perry worked for more than 20 years at Case Western Reserve University, where he was professor of pathology and neurosciences and chair of the Department of Pathology. Perry earned a B.A. in zoology from the University of California, Santa Barbara and a Ph.D. in marine biology from the Scripps Institution of Oceanography. He received a postdoctoral fellowship in the Department of Cell Biology at Baylor College of Medicine.

Perry is recognized internationally as one of the top Alzheimer's disease researchers and has been cited over 80,000 times. He is editor for numerous journals and serves as editor-in-chief for the "Journal of Alzheimer's Disease."

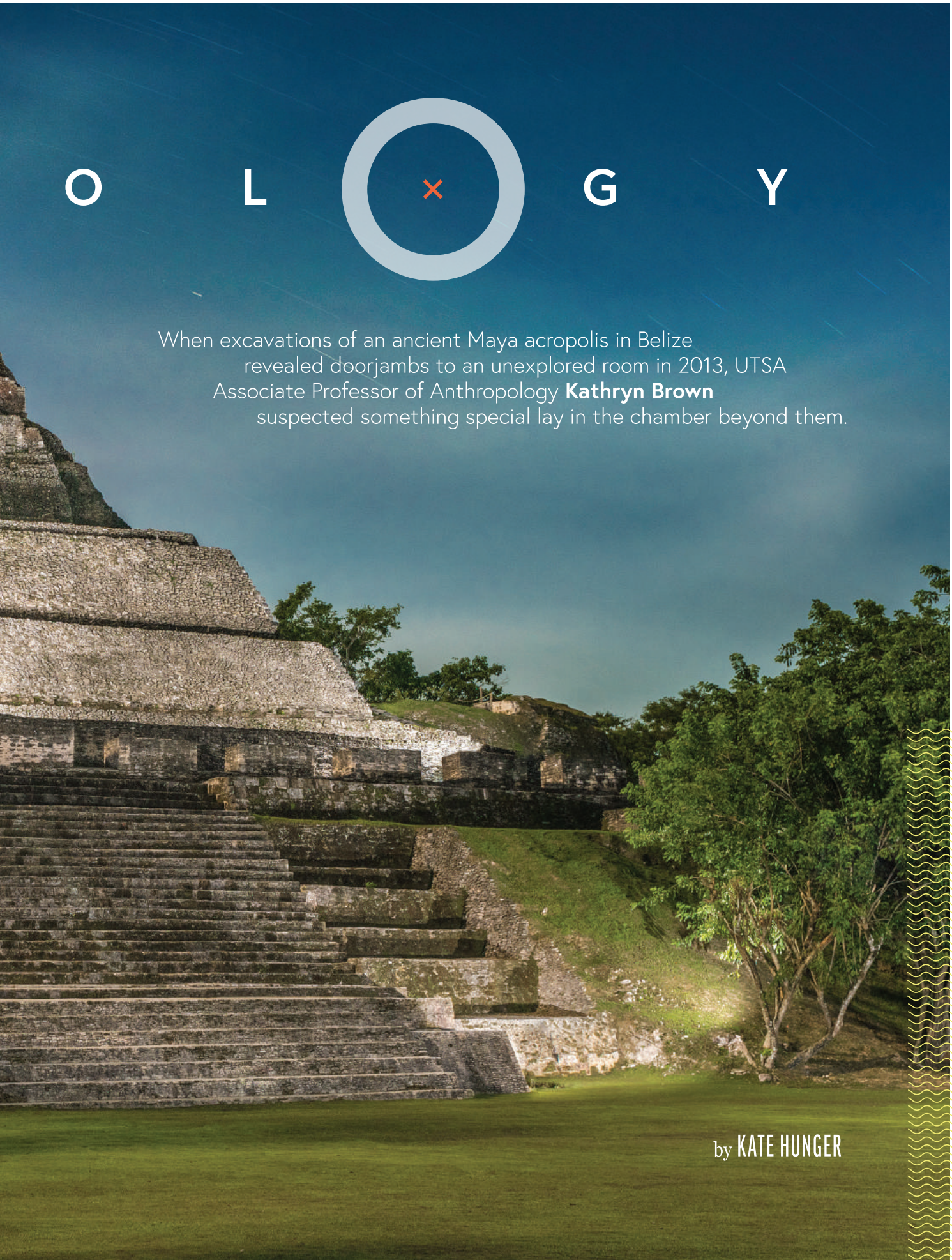
"Dr. Perry is one of the leading Alzheimer's researchers in the world, particularly in the area of oxidative damage," said Jenny Hsieh, director of the Brain Health Consortium and Semmes Foundation Chair in Cell Biology. "We are incredibly fortunate that he will be devoting himself full time to continuing this critically important work and sharing his expertise with our consortium faculty."

BELIZE

A R C H E

O L O G Y

When excavations of an ancient Maya acropolis in Belize revealed doorjambs to an unexplored room in 2013, UTSA Associate Professor of Anthropology **Kathryn Brown** suspected something special lay in the chamber beyond them.



by KATE HUNGER

She was right…

but confirming her hypothesis would have to wait: The room had been carefully filled to the ceiling with stones and sediment. However, last summer, the opportunity to excavate the room at the El Castillo acropolis at Xunantunich finally came, three years after the doorway's discovery. What Brown and her team found confirmed her belief that they had uncovered what once was an academy for young noblemen training to be scribes or sages—the first room found with such a concentration of incised markings in the Maya region of Belize.

"There are warriors, there are shamans, there are a lot of phallic symbols represented, but in bloodletting," Brown said, referring to the Maya ritual of bloodletting as auto-sacrifice. "It's a place where ritual activities were highlighted and warfare and sacred animals like snakes, jaguars, pumas. There's a depiction of a dog, toucan, some birds, and mostly snakes and felines."

The sage room is a recent discovery in more than two decades of archaeological research of Maya sites in the Mopan River Valley in west-central Belize by Brown and Professor **Jason Yaeger**, Department of Anthropology chair. They spend summers leading teams of students and local workers in excavations that have deepened their understanding of ritual, kingship, warfare and shifting capitals in the region over centuries.

The sage room's walls are covered in plaster, with some 200 incisions of symbols and images, called graffiti because they appear less formally rendered or planned. There are bits of paintings, as well, but they are faded and poorly preserved. The designs, including profiles and animal heads, are sometimes repeated and display different degrees of skill, which Brown interprets as signs of practice and revision. Some of the incisions and etchings are crossed out, others gouged. Brown believes the room dates to between 600 AD and 680 AD, with further analysis pending.

Brown's team spent last summer excavating the room and recording what they found. She hopes to excavate an adjacent room this summer, which she thinks could contain paintings or perhaps even evidence of calendar system instruction. Also planned for further study is a pair of previously excavated parallel structures not far from the scribal room.

"Our working hypothesis at this stage is that those may represent the spaces where the noble young men would live, walk around the back side of El Castillo, and up a secret staircase to the area where a scribe or sage would work with them," Brown said.

Leah McCurdy was the doctoral student on Brown's team who found the doorjambs. The inscriptions on the doorjambs were actually easier to see when they were filled with sediment from a rainstorm, she said.

"It was one of those moments when you are seeing a face come out and a turkey head and a jaguar head," recalled McCurdy, who earned her Ph.D. last summer and lectures at Texas Christian University and UT Arlington. "We just looked at this yesterday and it was just white plaster."

AN EVOLVING UNDERSTANDING OF WARFARE IN THE MAYA REGION

Warfare has emerged as a major area of interest for Brown and Yaeger and relates to a number of recent projects, from images in the sage room, to 20 projectile spear points found last summer at an elite residential group at Xunantunich, to evidence of fortifications at sites, including two burned palisades Yaeger identified at Buenavista del Cayo, another Maya archaeological site in the area. The kind of warfare the Maya engaged in apparently was more complex at an earlier time in history than previously thought, Yaeger and Brown explained.

"What we are seeing a century or two earlier is very deliberate fortification of sites suggesting that intensity of warfare was something that Maya—at least in our part of the Maya world—were living with, coping with, and surviving with for generations before the collapse," Yaeger said.

Yaeger's work at Buenavista yielded an exciting find in 2014—a royal burial that included a shell pendant bearing an inscription identifying the remains as those of the lord of Komkom, the site's original name, which had been a mystery. Efforts were under way this fall to use a 3D printer to make a replica of the shell, Yaeger said, something that could soon be common practice for other artifacts.

Brown and Yaeger's research projects are funded through a number of mechanisms including a three-year $307,500 Alphawood Foundation grant; the Termini Endowment for Maya Archaeology; three endowments from the University, the Belize Maya Program Endowment, Brown's Lutcher Brown Endowed Professorship, and the President's Endowed Professorship, which Yaeger was awarded in 2016. In 2013, another Alphawood grant supported a Light Detection and Ranging (LiDAR) survey of the landscape in the Mopan River Valley. A team of scholars collaborated on the grant for the survey, which continues to yield data.

"We are able to pinpoint large sites and even small sites we didn't know existed before because it takes decades to survey on foot through the jungle with your machete," Brown said of the LiDAR survey. "So this really moved our research forward."

"It helped us understand that the site of Xunantunich was actually two centers – a Pre-Classic center and a Classic center, and that they were separate and had different histories," Brown said.

The LiDAR survey also revealed fortification features previously undetected. While LiDAR is a sophisticated tool, Brown and Yaeger also appreciate a more basic convenience—two vehicles for their research teams' use in Belize, purchased by the University. The vehicles are the first UT System-owned vehicles to be kept in a foreign country.

Graduate students have projects of their own that fit into the overall scope of the research program, Brown said. One such student is Whitney Lytle, a doctoral student who said she chose UTSA in order to work with Brown. Lytle has been working at sites in Belize since 2008, but this past summer, she uncovered an elite burial at one of the archaeological sites at Xunantunich. She described her excitement at finding a large quantity of chipped stone objects, as well as carved shells and jade ornaments.

"I love the idea of being able to tell these people's stories and how they were incorporated into the Maya socio-political systems and how the activities that happened on these structures reflected what was happening in the overall Maya world, and how these might help us interpret patterns that we see at other sites," Lytle said.

BELIZE SUMMER FIELD SCHOOL IN ARCHAEOLOGY:

Brown and Yaeger direct the Belize Summer Field School, a four-week course that teaches students basic archaeological field methods, including mapping, surveying, excavation and artifact analysis.

"Archaeology is one those disciplines that you can read hundreds of books about but not really understand until you actually do field work," Yaeger said. "Our field school provides UTSA students an opportunity to really understand what it's like to do archeology. They are not digging in a sandbox, they are digging real sites and collecting real data that helps us answer these questions."

The opportunity to gain life experiences in a new environment—in a foreign country, in the jungle, without air conditioning and hot water—is just as important as the intellectual and academic opportunity, said McCurdy, who attended the field school in 2008 without ever having excavated.

"It also is a personal growth thing and certainly from my own experience, some of the most poignant things I remember are getting stuck in the rain and having a Frisbee and playing rain Frisbee," she said.

Miranda Martinez, a junior anthropology major at UTSA, attended the field school last summer.

"It was the most amazing experience I've had, honestly," she said.

Martinez said she wouldn't trade her time in Belize. "You pick up a ceramic piece and you look at it and you know that hundreds of years ago this was in someone else's hand and it hasn't been touched since then. That moment really hits you: I'm actually connected to these people who were an amazing civilization and did amazing things."

UTSA forms partnership with Idaho National Laboratory

Agreement will advance academics and research related to national security

To help safeguard the nation's energy sector, The University of Texas at San Antonio (UTSA) and Idaho National Laboratory (INL) have signed a three-year agreement to facilitate collaborative academic and research programs in cyber and critical infrastructure protection.

UTSA is widely recognized as the nation's academic leader in cybersecurity for its range and depth of cyber research and cyber degree programs. Drawing on San Antonio as the second largest cyber hub in the country outside of Washington, D.C., UTSA and INL will leverage their extended network of government and industry partners.

INL is renowned for its innovations in control system cybersecurity and multidisciplinary approach to Consequence-driven Cyber-informed Engineering. INL is committed to working with UTSA to conduct research and development activities to advance a broad range of innovative solutions that will have a transformational and sustainable impact on the reliability and resilience of the grid and energy infrastructure.

"These solutions will be realized through partnerships to deploy innovative technologies, implement enhanced engineering and operational processes, and develop a highly skilled and well-informed workforce," said **Zach Tudor,** INL associate laboratory director for National and Homeland Security.

The agreement will include increased internship and post-doctoral opportunities, and joint appointments of cyber-focused researchers, allowing UTSA faculty and INL staff to conduct collaborative research programs, with projects and personnel co-located on both the UTSA and INL campuses.

"The vast and deep expertise we have here at UTSA in cybersecurity combined with the reputation of Idaho National Lab will allow us to tackle some of our nation's most intractable critical infrastructure cybersecurity challenges," said UTSA President **Taylor Eighmy.** "We look forward to growing this strategic partnership."

This partnership supports the U.S. Department of Energy (DOE)'s multi-year plan to expand and enhance the energy sector's cyber security efforts across the country. The research conducted by UTSA and INL will be aligned to programs within the DOE Cybersecurity, Energy Security and Emergency Response Office to ensure efficiencies. D9

UTSA Research Welcomes ARL South Cyber to Campus

UTSA and The U.S. Army Research Laboratory (ARL) — the Army's corporate research lab — are working together to further research and innovation, to find real world applications and solutions for a myriad of challenges to safeguard our military personnel, citizens, and our nation.

Last spring, we welcomed the first two researchers from ARL who are embedded within the UTSA campus to facilitate research collaboration and discovery. Their physical presence through the ARL Open Campus initiative allows for collaboration with regional academia, governmental agencies, and industry.

Dr. Ray Bateman, ARL South Cyber on-site Lead, and **Kristin Schweitzer** have formed the nucleus of ARL South Cyber on the UTSA campus. They focus on all things cyber. In addition to the research hub at UTSA, ARL South Cyber includes three satellite research sites, located at UT Arlington, UT Dallas (position to be filled this fall) and UT El Paso.

As the Lead for ARL South at UT Austin, **Heidi Maupin** coordinates and synchronizes the research activities of all Southern ARL campuses. "There are opportunities for UTSA faculty to collaborate not only with our researchers on campus but also with other ARL researchers from other campuses on more than cyber including materials and manufacturing, biosciences, energy and power and energetic materials. We are also considering additional universities and industry partners given the concentration and depth of cyber resources and organizations in the region," said Maupin.

Added Bateman, "ARL South is a matrix organization with personnel from different directorates and different disciplines, pooling resources together. [Ed. note: Bateman is a mathematician; Schweitzer is a mechanical engineer.] We have a research plan that ties in the four universities, focused on basic cyber research to provide the tools to protect our soldiers. UTSA's cyber strength and its proximity to the 24th & 25th Air Force along with the NSA and FBI's strong presence in San Antonio, makes this an ideal placement." D 9

UTSA researchers interested in collaboration should reach out to Dr. Bateman & Ms. Schweitzer via email at ARL.South@utsa.edu.

This partnership was facilitated by the UT System Office of Federal Relations and the UTSA Office of the Vice President for Research.

A big thank you to UTSA Facilities for renovating the ARL research offices in record time!

ARL South Cyber focuses on basic research in the following areas:

UTSA (HUB)
» Cyber/Physical Systems
» Cyber Analytics and Visualization
» Machine Learning

UT ARLINGTON/DALLAS (SATELLITES)
» Human Centric Cyber Security
» Data Analytics

UT EL PASO (SATELLITE)
» Analyst-Centric Data Acquisition and Analysis
» Cyber Modeling

UTSA HOSTS

FIFTH ANNUAL

Innovation Awards

Thirty UTSA faculty members, students and community leaders are recognized for their research and discovery.

The University of Texas at San Antonio (UTSA) recognized UTSA professor Bing Dong as its 2017 Innovator of the Year at their fifth annual Innovation Awards. His selection was based on a number of factors including the launch of his startup, grant awards, I-Corps participation and licensing of his numerous technologies.

Dr. Bing Dong earned his Ph.D. at Carnegie Mellon University. Before joining UTSA in 2013, he was a senior research scientist at United Technologies Research Center. His current research interests include energy modeling, intelligent building operation, occupant behavior in buildings and buildings-to-grid integration. His lab, Built Environment Science & Technology/ BEST, is interdisciplinary, combining mechanical engineering, artificial intelli gence, electrical engineering, and social science research. In 2017, he received the UTSA Faculty Research Award for Highest Funding as Principal Investigator and a Distinguished Service Award from the International Energy Agency. He has published one book, ten book chapters, and over 50 journal and conference papers.

Additionally, UTSA recognized 29 other members of its research community. Organized by the UTSA Office of Commercialization and Innovation (OCI), these annual awards are presented in four categories, reflecting UTSA's success at commercializing new knowledge and technologies.

"Our goal is to cultivate a research-intensive environment where our faculty and students can flourish and their research contributions have meaningful impact societally," said **Dr. Bernard Arulanandam.**

The OCI works with UTSA faculty to facilitate technology transfer and commercialization, and to assist with university-industry partnerships. Through the OCI, the university provides intellectual property management and licensing, proof-of-concept development, new venture incubation, entrepreneurial training, and policies and procedures that accelerate and ease the transition of intellectual property from the university to industry.

"These awards recognize the UTSA research community's accomplishments. By inviting key stakeholders from across the larger regional research network including industry and government partners, it is an opportunity for everyone to engage and find new ways for collaboration across various fields and interests," added **Dr. Christine Burke,** Director of Commercialization and Tech Transfer.

THE FOLLOWING RESEARCHERS AND TEAMS WERE RECOGNIZED FOR THEIR ADVANCEMENTS IN THEIR FIELDS:

Recipients of Issued Patents

Issued patents represent the securing of intellectual property rights for new innovations, which grows our licensing portfolio and contributes to UTSA's state, national, and international rankings.

Dr. C. Mauli Agrawal
2013221777 | Australia
Scaffold System for Tissue Repair
An expendable scaffold that serves as a temporary template that allows damage tissue to be rebuilt.

Dr. David Akopian
9,741,256 | United States
Remote Laboratory Gateway
System used to access and control a laboratory experiment remotely.

Dr. Arturo Ayon and Dr. Cory Hallam
9,714,875 | United States
Impact Resistant Surface-Mounted Roof Sensors
A roof sensor system to measure and transmit load information to warn of roof collapse.

Dr. Rajendra Boppana and Dr. Ram Tripathi
9,626,154 | United States
Verification of Pseudorandom Number Streams
A statistical test to measure the quality of random numbers provided to a computer program.

Dr. Banglin Chen
9,539,559 | United States
Metal-organic Frameworks for Selective Separations
A series of new prototype metal organic frameworks that exhibit storage capabilities for multiple gases.

Dr. Yusheng Feng
9,642,741 | United States
Surgical Cooling Device
A laparoscopic device used for cooling organs during surgery.

Dr. Brian Hermann
9,553,025 | United States
Method for Treating Chemotherapy-Induced Male Infertility
A method used to lessen or render less severe chemotherapy induced infertility.

Dr. Joo L. Ong
2,695,946 | Canada
Bi-Layered Bone-Like Scaffolds
Biomedical scaffolds used for treatment of bone diseases and bone repair.

Licensing Revenue

Licensing revenue represents income the university receives from intellectual property that has been optioned or licensed. The revenues are shared amongst the university, colleges, departments, and faculty involved in the intellectual property.

Dr. Doug Frantz
New Chiral Phosphite Ligands for Asymmetric Catalysis

Dr. Ruyan Guo and Dr. Amar Bhalla
Accurate and Repeatable Method of Measuring and Profiling Frozen Beverages

NSF I-Corps™ Recognition

In 2017, the National Science Foundation awarded six $50,000 grants to six UTSA investigators and their teams, with the goal to identify valuable product opportunities that can emerge from academic research. This grant also provides entrepreneurship training to the participants by combining experience and guidance from established entrepreneurs through a targeted curriculum.

NTV Module

Mr. Shuza Binzaid, Entrepreneurial Lead
Dr. Ruyan Guo, Principal Investigator
Mr. Neal Guentzel, Mentor

A NTV regulator module that lowers the voltage to lowest powers consumption setting, it can be drop-in the existing ICs that barely requires any additional silicon space or redesigning the core system. Demand of this NTV regulator fulfills low-power, low heat loss, long-life of ICs and longer battery life can be met very easily.

Detecting Breast Cancer Using Raman Spectroscopy

Dr. Ekatrina Vinogradova, Entrepreneurial Lead
Dr. Miguel Jose-Yacaman, Principal Investigator
Mr. Diego Capeletti, Mentor

A method for PCP and OB/GYN doctors to measure levels of a breast cancer biomarker in saliva that allows early detection (stage 0, I & II) of breast cancer in women with extremely and heterogeneously dense breast tissue (1 in 4 women), reducing mortality rate by and cancer care costs.

InfraVein System

Mr. Kreg Zimmern, Entrepreneurial Lead
Mr. Sanjiv Patel, Entrepreneurial Lead
Dr. Teja Guda, Principal Investigator
Dr. Cory Hallam, Mentor

InfraVein uses an infrared camera to make veins easier to detect, so that needle insertion is as simple and painless as possible.

Dash Messaging

Dr. Sahak Kaghyan, Entrepreneurial Lead
Dr. David Akopian, Principal Investigator
Mr. Andrei Zorilescu, Mentor

DashMessaging is a simplistic, user-friendly flexible messaging platform for fast deployment of variety of automated protocols. This platform saves time and money by reducing everyday administrative burdens.

NovoThelium

Dr. Bianca Cerqueira, Entrepreneurial Lead
Ms. Lauren Cornell, Principal Investigator
Dr. Cory Hallam, Principal Investigator
Dr. Lynda De La Viña, Mentor

NovoThelium is a biotechnology company developing a tissue based product for use in breast reconstruction that enables patients to regenerate a nipple made from their own cells that maintains projection, has natural pigmentation, and improved sensation

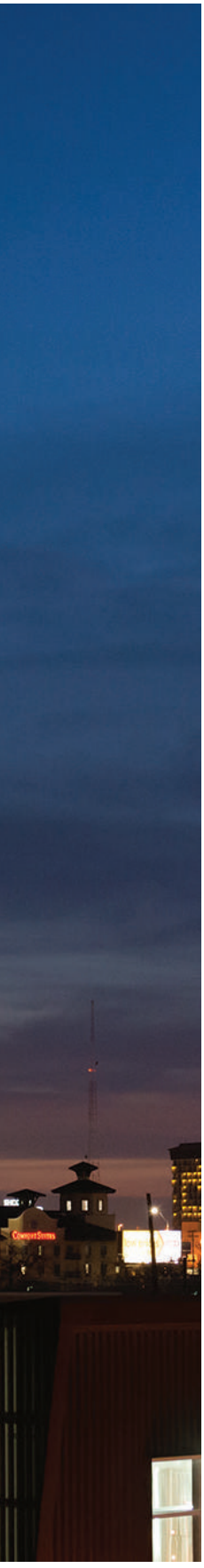
Energy and Wellness Management System

Mr. Edward Hooks, Entrepreneurial Lead
Dr. Bing Dong, Principal Investigator
Mr. Jeff Xu, Principal Investigator
Mr. Brian Veneklase, Mentor

A UTSA based start-up company, Leaptran, Inc. offers innovative energy and wellness management systems (EWMS) for buildings and communities through sensing, energy optimization, machine learning, and behavior analysis.

The UTSA Office of Commercialization and Innovation also recognized UTSA's latest inductee in to the National Academy of Inventors: **Dr. David Akopian (2016).** He joins **Dr. Taylor Eighmy (2013).**

NATIONAL ACADEMY OF INVENTORS



San Antonio's smart city innovations startup emerges: Leaptran, Inc. launches out of UTSA

A recent spinout from The University of Texas at San Antonio (UTSA), Leaptran, Inc., is bringing to market products that will optimize whole building energy use while providing room-level comfort for individuals. Using artificial-intelligence and smart building features, these integrated hardware and software products will optimize energy use among micro-grid distributed energy resources (DERs) such as solar power generation and battery energy storage systems (BESS).

Leaptran's technologies are licensed from UTSA and are based on co-founder and UTSA Assistant Professor **Bing Dong's** more than ten years of research in building energy efficiency, occupant behavior, big data analytics, intelligent building operation and optimization, measurement and verification, and buildings-to-grid integration research. Recent UTSA Entrepreneur-in-Residence and energy storage expert, **Jeff Xu,** founder of Leaptran, identified and evaluated these technologies and recognized their synergy with his skills as a great commercial opportunity.

Leaptran has launched at full speed. Through UTSA, the Leaptran team received a $50,000 award to participate in the National Science Foundation's Innovation-Corps (I-CorpsTM) program to optimize their product and market development focus. As a UTSA New Venture Incubator member, they then landed a SBIR Phase I award of $149,991, funded by the Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) through the Small Business Innovation Research (SBIR) program. In addition, Leaptran now has a contract in place with UTSA and CPS Energy to explore micro-grid-level energy optimization and the deployment of distributed energy resources intelligently.

Buildings consume more than 70% of total electricity usage in a city. 1 Leaptran's energy management with predictive control (EMPC) for buildings and micro-grid will integrate sensing, energy optimization, machine learning, and behavior analysis. Their technology aims to reduce wasted energy in a building up to 50%. This efficiency will reduce both the electric bill and greenhouse-gas emissions.

To help buildings and micro-grids incorporate more renewable and distributed energy resources, Leaptran's products will balance increased load demands and integrate building energy management. Battery energy storage unlocks the potential for battery in buildings and allows the grid to maximize renewable and distributed energy sources. With its intelligent capability, Leaptran's solution can as well be adapted to a smart micro-grid solution.

"THIS IS A GREAT EXAMPLE OF TAKING BASIC RESEARCH OUTSIDE OF THE LABORATORY AND CREATING A PRACTICAL APPLICATION TO TACKLE REAL WORLD CHALLENGES WHICH WILL BENEFIT SOCIETY. BY BRINGING TOGETHER OUR IN-HOUSE RESEARCH EXPERTISE WITH OUR REGIONAL ENTREPRENEUR NETWORK, WE CAN DEVELOP SOLUTIONS FOR THE MARKETPLACE,"

said Christine Burke, Director of Commercialization and Technology Transfer at UTSA.

D 9

2017 Technology Disclosures

JANUARY 2017

A prediction method for real-time large-scale solar Photo-voltaic energy production forecasting
Bing Dong, Zhaoxuan Li
Mechanical Engineering

Multistage therapeutic delivery system
Robert Lyle Hood, Teja Guda, Gold Hood, Forhad Akhter, Joseph Pearson
Mechanical/ Biomedical Engineering

A mechanism for drug release from an implantable drug reservoir
Ruyan Guo, Robert Lyle Hood, Amir Jafari Neda Habibi
Mechanical Engineering
Electrical & Computer

A method for propagation control of THz waves
Ruyan Guo, Amar S. Bhalla, Soutik Betal, Moumita Dutta
Electrical & Computer

Nanorobot that allows remote controlled cell targeting, permeation and transport
Ruyan Guo, Amar S. Bhalla, Soutik Betal, Moumita Dutta
Electrical & Computer

Image and video processing systems and methods
Artyom M Grigoryan, Sos Agaian
Electrical & Computer

A timing system to reduce hyperventilation
Brant Tyler Bennett, Carter Steven Baumgartner, David Miles Jackson, Rodolfo Garcia
Electrical & Computer

Electrosensitive drug delivery
Anson Joo Leng Ong, Teja Guda, Solaleh Miar
Biomedical Engineering

FEBRUARY 2017

An enzyme purification technique
Francis K Yoshimoto, Michal Siller
Chemistry

A small molecule ensymatic inhibitor as a potential therapeutic to treat obesity
Francis K Yoshimoto
Chemistry

A method to optimize building energy cost and occupancy predictions
Bing Dong, Jeff Xu, Zhaoxuan Li
Mechanical Engineering

A medical device designed to slow and prevent hemorrhaging
Hannah Mae Jones, Madaleine Marie Farrer, Brian Nathaniel Ke-Han Ruliffson, Jozse Hernandez Trevino
Biomedical Engineering

An integrated device for real time electrical property study of targeted biological cells
Ruyan Guo, Amar S Bhalla, Anand Kumar Ramasubramanian, Soutik Betal, Moumita Dutta, Amit Kumar Saha
Electrical & Computer Engineering

A device for the detection of dental cavities
Anson Joo Leng Ong, Alan William Kosub, Steven Jim DeLeon, Daniella Bojado,Frank Rodriguez DeLuna
Biomedical Engineering

MARCH 2017

Forming hierarchical representations of semi-structured data to perform analysis on applications for computer vision
Sos Agaian
Electrical & Computer
Non-UTSA Inventors: Aaron Greenblatt

The incorporation of a buffer system capable of drastically decreasing solid deposit formation in the after treatment systems of diesel engine.
Ryan Christian Hartley, Zachary John Tonzetich
Chemistry

A device that allows detecting and tracking of targets with guided aiming to hit the target.
Raafat Seif, Carmina Francia, Melvin Stubblefield, Yonggun Lee, Elizabeth Martin, Federico Berlanga
Mechanical Engineering

An EEG system is used to sense user mental states which can be fed to a VR system used to control the VR content.
Jianqiu Zhang, Yufei Huang, Zijing Mao, Lenis Mauricio Merino
Electrical & Computer

A sock that can detect foot skin integrity between sensors.
Tiffany Addyson Bunnell, Erin Pitre Pollet, Carol Ann Cordova, Kristen Joy Steinke
Biomedical Engineering

A medical device that is to be used for the purpose of treating trauma induced hypothermia.
Katie Marie Alex, Jasmine Paulette King, Travis Kotzur, Kennedi Wilson, Abbey Rhenae Vela
Biomedical Engineering

A device that uses a controlled LED source that strongly attracts selected genus of obnoxious flying insects to a trapping/ killing system.
Robert Lyle Hood, Gold Hood, Roy Matthew Ringrose, Richard Raymond Leach
Mechanical Engineering

A robotic invention that would serve to provide a physical extension to the fingers while also providing a degree of pressure sensing and movement control
Corinne Nawn, Robert Lyle Hood, Carlyn Abbott, Caroline Campbell, Sarah Robinson
Biomedical/ Mechanical Engineering

A mathematical framework to optimize power grid performance for energy consumption, power grid cost, and frequency regulation
Bing Dong, Nikolaos Gatsis, Zhaoxuan Li, Ahmad Taha, Ankur Pipri
Mechanical Engineering/Electrical & Computer

A dual purpose integrated circuit designed for efficient computation.
Eugene Britto John, Safwat Mostafa Noor
Electrical & Computer

APRIL 2017

A system designated to alert healthcare givers to the formation of pressure ulcers in sedentary and immobilized patients
Mario Hernadez, Casey Whitney, Meryem Bousfiha, U-Ter Aondo Grace Jia
Biomedical Engineering

MAY 2017

Material features that enable for high sufficient gas seperation and high capacity gas storage
Banglin Chen, Ruibiao Lin
Chemistry

JUNE 2017

An adjustable surface stiffness treadmill
Amir Jafari
Mechanical Engineering

An actuator with a wide range stiffness adjustment
Amir Jafari
Mechanical Engineering

An ExoMuscle technology that matches the flexibility and performance of human skeletal muscles
Amir Jafari
Mechanical Engineering

A social media application that assists in dating and friendships
Alan Eduardo Padilla
Business Management

JULY 2017

A method that connects indoor environment control system with human productivity based on brain signal
Bing Dong, Yufei Huang, Tapsya Nayak, Tinghe Zhang
Mechanical Engineering

A low-cost prototype to harvest thermal energy from pavement and convert into electric power
Samer Dessouky, Utpal Datta, Athanassios T. Papagiannakis
Civil & Environmental Engineering

Software to optimize the code for high performance computing
Harry Millwater, Juan Ocampo, Nathan Crosby
Mechanical Engineering

AUGUST 2017

A new memory allocator designed to improve security by protecting against common heap-based attacks
Tongping Liu, Hongyu Liu, Sam Albert Silvestro
Electrical & Computer

A microfluidic flow system whose main purpose is to assist in the study cell growth in vitro and emulate cell to cell interaction in the human body
Robert Lyle Hood, Christopher R Rathbone, Carlyn Abbott, Adrian-Joseph Macapinlac Alapag, Marcus Jorge Haraway, Victor Rene Palos, Jose Ignacio Aguilera, Brandon DeMont'e Durham
Mechanical & Biomedical Engineering

An automated system designed for cancer detection and Gleason scoring of different cancer tissue using artificial intelligence
Sos Agaian, Foram Mahendra Sanghavi
Electrical & Computer

A technique that detects certain classes of cyber attacks on the Global Positioning System (GPS)
David Akopian, Ali Khalajmehrabadi, Nikolaos Gatsis, Ahmad Taha
Electrical & Computer

Compounds that can be applied in the development of point-of-care electrochemical devices for use in doctors' offices, hospitals, rural clinics, and limited resource areas
Stanton McHardy, Waldemar Gorski, Travis Menard, Doug P Hanson
Chemistry

SEPTEMBER 2017

Implantable microcomputer with embedded sensors for the management of diseases or medical monitoring of patients
Chunjiang Qian, Joseph John Paul, Paul Morton
Electrical & Computer Engineering

A lighting fixture that dramatically changes the surface appearance between lit and unlit states
Taeg K. Nishimoto
Architecture

A bioink to enable the 3D printing of biomaterials
Joseph Pearson, Teja Guda, Jasmine Paulette King
Biomedical Engineering

OCTOBER 2017

An experiential educational program in which undergraduate students perform internships, community service, and urban engagement
Sean Kelly, Kathryn Jill Fleuriet
Honors College

An antigen useful for diagnosis and immunization against Valley fever infection
Chiung-Yu Hung, Gary R. Ostroff, Natalia Castro-Lopez
Biology

NOVEMBER 2017

A system for detecting emotion engagement streamed over the internet
Peyman Najafirad, Arun Das
COE Electrical & Computer Engineering

A device that is used to increase the performance of football blocking techniques
Michael David Erwin, Ari Andrew Richtberg, Zachary Daniel McKee, Stephanie Morgan Meier
COE Mechanical Engineering

DECEMBER 2017

A device that provides treatment to shoulder injuries through various mechanical and electrical methods
Robert Lyle Hood, Corinne Nawn, Zach Stelle Fallon, Mark Kevin Sparkman
COE Biomedical/Mechanical Engineering

Software that detects fraud anomalies in broad areas such as security, malware classification, credit cards, insurance, and health care
Daijin Ko, Nicole L Beebe
COB Information Systems & Cyber Security/ Management Science and Statistics

A method to improve AES encryption implementations
Eugene Britto John, Alekhya Muthineni
COE Electrical & Computer

A web-based tool which assists users in determining the appropriate statistical test for a given set of parameters
H. Paul LeBlanc
COLFA Communication

Software to import schedule files as baselines into an existing schedule
Yilmaz Hatipkarasulu
CACP Construction Science

Hardware that provides a high level of security by combining security features
Tongping Liu, Hongyu Liu, Sam Albert Silvestro, Tianyi Liu
COS Computer Science

UTSA
Office of Commercialization and Innovation

SBDC Technology Commercialization Finds Success with Novothelium and Infravein Corp

BY **JENNILEE GARZA**

In its first year, the SBDC Technology Commercialization Center (TCC) collaborated with partners at the university, regional, state and federal levels to help science and technology companies advance their innovations through some of the most rigorous grant competitions. The Center also earned its national accreditation, distinguishing the SWTXB SBDC Network as one of 18 "Technology Accredited" SBDC Networks nationally.

FEDERAL AND STATE TECHNOLOGY (FAST) PARTNERSHIP PROGRAM GRANT

Engaged in the Federal and State Technology (FAST) Partnership grants program, the SBDC TCC partnered with all Texas SBDC Networks and the U.S. Small Business Administration (SBA) Office of Investment & Innovation to provide outreach and technical assistance to guide tech companies through Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) grant applications. These grants, referred to as America's Seed Fund ™, provide critical early stage research and development funding to help small businesses commercialize cutting edge innovations. The rigorous review process provides recognition, validation and visibility to early stage companies. Additionally, the prestige associated with the award helps businesses attract additional funding and commercialization support from venture capital partners, larger strategic partners, and investment partners.

DOD COLLABORATION

In October 2017, SBDC TCC Director **Bijo Mathew** also partnered with the Kansas SBDC for its "Encountering Innovations Week" conference held at Wichita State University. The event allowed the Center to showcase Texas innovators to DoD technology scouts. The U.S. Navy also selected the SBDC TCC as the Texas host for its December 2017 Naval Sea and Air Systems Command SBIR/ STTR Innovation Summit, a premier event that provided an opportunity for technology-based businesses in Texas to connect with the U.S. Navy, which annually invests $350 million in innovative ideas.

NOVOTHELIUM

Two UTSA alumni, **Bianca Cerqueira**, Ph.D. and **Lauren Cornell**, M.S. took on the battle against breast cancer. Their biotechnology start-up company, NovoThelium, is developing a bioengineered human scaffold that allows mastectomy patients to regenerate a nipple from their own cells, maintaining projection, natural pigmentation, and improved sensation. The SBDC TCC assisted NovoThelium with their SBIR Grant applications and various competitions. NovoThelium landed among the top six contestants at the Rice Business Challenge. They also took first place at the Venture Challenge Competition and the Texas Venture Labs Investment Competition, which provided them the opportunity to ring the opening NASDAQ stock market bell in New York City in August 2017. And, they earned a spot among the top 10 national finalists at the Small Business Administration InnovateHER Challenge, which highlights products and services that have a measurable impact on the lives of women. Over 3,000 entrepreneurs competed nationally.

INFRAVEIN CORPORATION

A team of UTSA alumni are in the midst of developing a medical device that could reap benefits across multiple fields. **Kristen Hamalainen** '16, **Sanjiv Patel** '16, and **Kreg Zimmern** '16 operate InfraVein Corporation, a medical device company that provides solutions for venipuncture procedures. InfraVein's infrared medical camera could help doctors insert needles in people with small veins and aid in catheter insertion. It could also be used on babies or by people who are obese or have darker skin pigmentations. InfraVein began working with SBDC TCC Director **Bijo Mathew** in September 2017 to work on a Phase I DoD SBIR proposal for $150,000, a six-month effort. If awarded, the company plans to develop a hand held, battery powered vascular cannulation device. A successful achievement would qualify them to apply for a two-year, $1,000,000, Phase II grant. The mobile device would allow emergency medical professionals to accurately obtain arterial or central venous access under emergency conditions without external ultrasound or stationary imaging equipment.

UTSA PROFESSOR

DAVID AKOPIAN

NAMED

Fellow of the National Academy of Inventors

David Akopian, professor of electrical and computer engineering at UTSA, was named a Fellow of the National Academy of Inventors (NAI) in December 2016. He is the second NAI Fellow for UTSA. The honor places Akopian among an elite group of professionals that includes presidents and senior leaders of research universities, Nobel laureates, National Inventors Hall of Fame inductees and National Academies members.

With 32 patents to his name, Akopian's productivity as an inventor and researcher is exemplary. What is not so easily measured—and perhaps far more impactful—is Akopian's legacy as a mentor to the hundreds of students who have had the great fortune of working and studying under him. Due to his industry background, he infuses a real-world, multidisciplinary perspective into his laboratory and classroom.

Akopian's research interests are in a broad area of communication and navigation systems. He focuses on human-machine interactive mobile applications, wireless sensing, location-finding and software-defined radio technologies. His most recent research projects have focused on mobile interactive solutions for health promotion interventions.

Akopian is the founder and director of the Software Communications and Navigation Systems Laboratory at UTSA. Since 2004, his lab has trained more than 90 students who have gone on to successful careers at a variety of companies, including Apple, Google, Samsung, Cisco Systems, Amazon, Intel and Verizon.

In the course of his academic career, Akopian has acquired 25 issued and seven pending patents exploring various aspects of wireless localization systems, indoor wireless technologies and human-machine wireless concepts. Several of his patents have been used in Nokia products and UTSA testbed systems serving several federal and state projects. He has received four inventor awards from UTSA and Nokia.

His research has been supported by the National Science Foundation, National Institutes of Health (NIH), USAF, NAVSEA, ONR, Texas Higher Education Coordinating Board, CPRIT-TX, among others. Current funding comes from NIH, CPRIT-TX, San Antonio Life Sciences Institute (SALSI) and the US Air Force Academy (USAFA).

A prolific author, Akopian's research has resulted in more than 200 publications, including three book chapters, eight edited proceedings, 44 journal papers and more than 150 invited and refereed conference papers and presentations. He served as associate editor for five periodicals, and he has chaired more than 10 mobile technology conferences.

Since 2003, Akopian has served as a senior member of the Institute of Electrical and Electronics Engineers, where he also served as chair and vice-chair of the Central Texas Chapter of IEEE SMC Society for eight consecutive years. He is a member of the US Institute of Navigation (ION). In 2008 his team won the forth place (Honorable Mention) in national AT&T's "Big Mobile on Campus Challenge." In 2015, he co-supervised the students from the UTSA College of Engineering who successfully showcased their engineering skills and solutions in the Perseus III unmanned technology demonstration held at the United States Air Force Academy.

The National Academy of Inventors is a 501(c)(3) non-profit member organization comprising U.S. and international universities, and governmental and non-profit research institutes, with over 3,000 individual inventor members and Fellows spanning more than 240 institutions, and growing rapidly. It was founded in 2010 to recognize and encourage inventors with patents issued from the U.S. Patent and Trademark Office, enhance the visibility of academic technology and innovation, encourage the disclosure of intellectual property, educate and mentor innovative students, and translate the inventions of its members to benefit society.

ABOUT THE NATIONAL ACADEMY OF INVENTORS FELLOWS

The NAI Fellows Program was established to highlight academic inventors who have demonstrated a prolific spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on quality of life, economic development and the welfare of society. Election to NAI Fellow status is the highest professional distinction accorded solely to academic inventors.

The program has 912 Fellows worldwide representing more than 250 prestigious universities and governmental and non-profit research institutes. Collectively, the Fellows hold more than 32,000 issued U.S. patents, which have generated over 9,400 licensed technologies and companies, and created more than 1.3 million jobs. In addition, over $137 billion in revenue has been generated based on NAI Fellow discoveries.

With the induction of the latest class, there are now more than 100 presidents and senior leaders of research universities and non-profit research institutes, 439 members of the National Academies of Sciences, Engineering, and Medicine; 36 inductees of the National Inventors Hall of Fame, 52 recipients of the U.S. National Medal of Technology and Innovation and U.S. National Medal of Science, 29 Nobel Laureates, 3 Queen Elizabeth Prize for Engineering recipients, 261 AAAS Fellows, 168 IEEE Fellows, and 142 Fellows of the American Academy of Arts & Sciences, among other awards and distinctions.

UTSA Academy of Distinguished Researchers Welcomes Four New Members

Over the past two years, four esteemed UTSA researchers have been selected for induction into the UTSA Academy of Distinguished Researchers (ADR).

The UTSA Academy of Distinguished Researchers was established in 2015 to select and honor outstanding faculty who exemplify excellence in research; to foster the highest quality of research and scholarly activity by UTSA faculty; and to promote the university's vision as a premier public research university. The Academy is comprised of researchers across all disciplines who represent the best of research on campus.

Each year, the group decides upon the induction of new members. Candidates are nominated by peers across campus, and their body of research work is evaluated. The Academy members review each candidate, looking at all the criteria, and discusses each candidate within the group.

"The committee considers a number of factors, including: the impact and the overall quality of the research; the number of citations and publications; publication in highly recognized and leading peer-review journals; recognized works, performances and exhibitions; competitive grants, both federal and international, and funded research; patents; major scientific inventions; editorships; and research recognitions in their field," explained **Hamid Beladi**, chair of the UTSA Academy of Distinguished Researchers.

Catherine Clinton, Ph.D., Department of History | **INDUCTED IN 2018**

Clinton, the Denman Endowed Professor in American History, has been at UTSA since 2014. She is a pioneering historian of the American South and the Civil War. Clinton is the author or editor of 25 books, including The Plantation Mistress: Woman's World in the Old South; The Other Civil War: American Women in the Nineteenth Century; Southern Families at War: Loyalty and Conflict in the Civil War South; and Harriet Tubman: The Road to Freedom. Her books Divided Houses: Gender and the Civil War and Mrs. Lincoln: A Life are among several that have been History Book Club selections.

Clinton also has written history books for children, presented at numerous academic conferences, and served as a consultant to Steven Spielberg's film Lincoln. In 2015-16, she served as the president of the Southern Historical Association. In 2016, Clinton received the prestigious Guggenheim Fellowship, which funded her research on how mental illness was diagnosed and treated for Union soldiers during the Civil War. Her research brings fresh perspectives on American history, making it accessible to newer and wider audiences.

Gelu Popescu, Ph.D., Department of Mathematics | **INDUCTED IN 2018**

Popescu, professor and mathematician, is the first inductee from the Department of Mathematics. His research interests include functional analysis, operator theory and operator algebras; noncommutative multivariable operator theory; and noncommutative harmonic analysis and interpolation. He is extremely productive in terms of his research, highly recognized in his field and produces scholarly works of considerable scope and depth.

Since arriving at UTSA 24 years ago, Popescu has published on average about three research papers a year in the area of pure mathematics, which tend to run in the hundreds of pages. The majority of these papers appears in the top ranked journals in the field – Advances in Mathematics, Memoirs of the American Mathematical Society (AMS), Journal of Functional Analysis, Proceedings of the London Mathematical Society, Mathematishe Annalen, Journal fur die Reine unde Angewandte Mathematics, and Comptes Rendus de L'Academie de Science. He has published three monographs through the Memoirs of the AMS, the most prestigious U.S. society of mathematics that have cemented his reputation as one of the world's top experts in operator theory and the foremost scholar in non-commutative multivariable operatory theory. Popescu's mathematical research has broken new ground and opened entire new avenues for scholarship. Popescu's work is frequently cited by world-renowned mathematics including Fields medalists.

Joo L. Ong, Ph.D.,
Department of
Biomedical Engineering
INDUCTED IN 2017

Joo Ong is the USAA Foundation Distinguished Professor in the Department of Biomedical Engineering. He also serves as the Associate Dean of Administration and Graduate Studies, College of Engineering and the Interim Department Chair of the Department of Biomedical Engineering.

His primary research focus on modifications and characterization of implant biomaterial surfaces for dental and orthopedic applications, tissue engineered bioceramic scaffolds for bone regeneration, protein-biomaterials interactions, and bone-biomaterials interactions.

Dr. Ong is a Fellow of the American Institute for Medical and Biological Engineering. He is also the Associate Editor for the Journal of Biomedical Materials Research, Part B. His publication portfolio includes two books (one edited), 16 book chapters, and 146 peer-reviewed journal publications. He has four issued patents from his research work and one pending patent filed with the US Patent Office.

The Academy now has 17 members, representing the Colleges of Business, Education and Human Development, Engineering, Liberal and Fine Arts, Public Policy, and Sciences.

"High-quality faculty is a key component for eligibility into the National Research University Fund (NRUF). This academy serves as a way to recognize such faculty, and the high caliber of research being done at UTSA,"

—Bernard Arulanandam, interim vice president for Research, Economic Development, and Knowledge Enterprise at UTSA.

Jose L. Lopez-Ribot, Pharm.D., Ph.D.,
Department of Biology
INDUCTED IN 2017

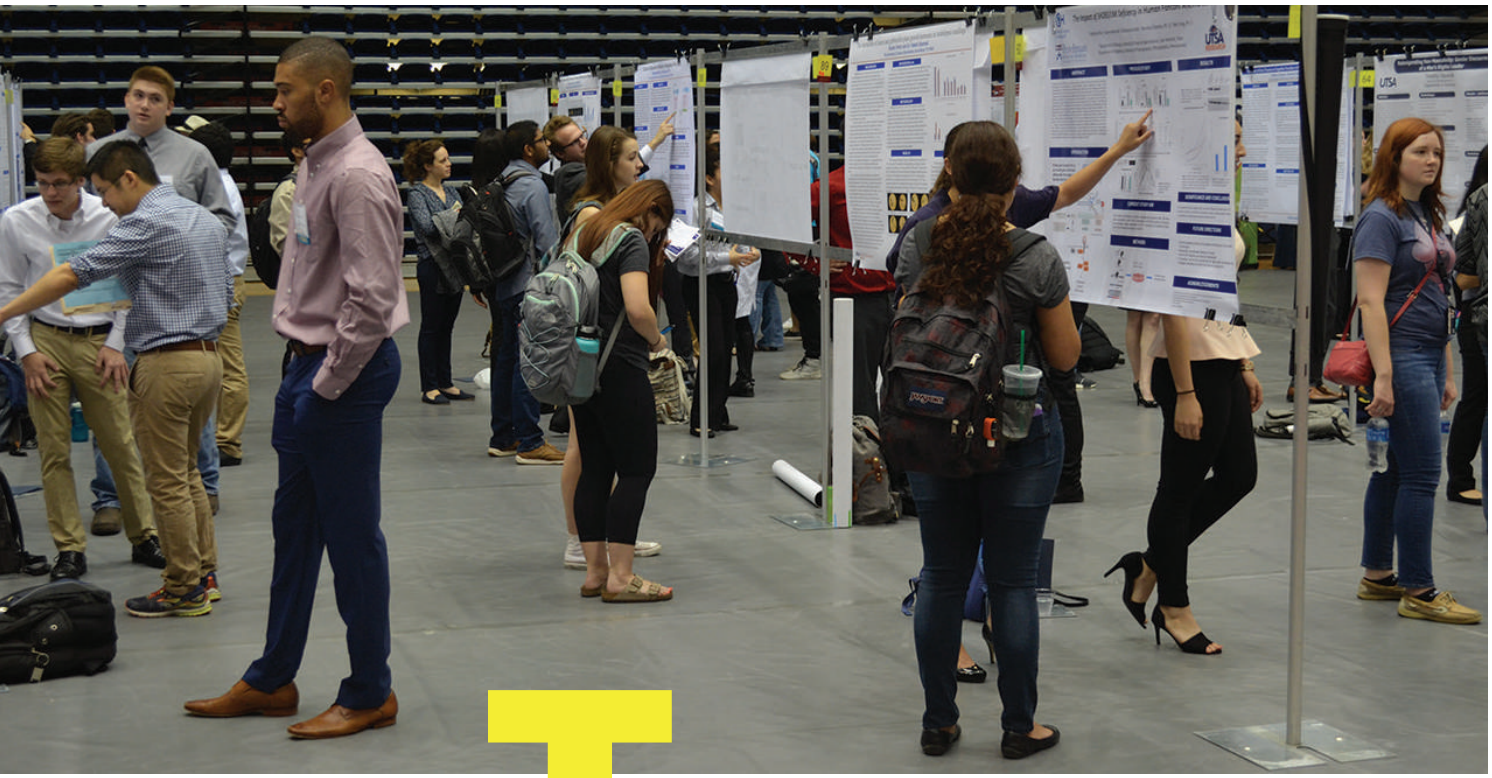
Jose L. Lopez-Ribot, Professor of Microbiology and the Margaret Batts Tobin Distinguished Chair in Biotechnology, is also the Associate Director of The South Texas Center for Emerging Infectious Diseases (STCEID).

His laboratory studies fungal infections, with an emphasis on the opportunistic pathogenic fungus Candida albicans, the main causative agent of candidiasis affecting an increasing number of immune- and medically-compromised patients. Work in his laboratory encompasses from the basic biology of the cell wall, biofilm formation, adhesion and morphogenetic conversions, to the use of animal models to better understand virulence and host responses, to the more translational and clinical aspects such as antifungal drug development, drug resistance and vaccines; with the ultimate goal of devising new strategies for the diagnosis, prevention and treatment of candidiasis.

In 2016, he was elected a Fellow of the American Academy of Microbiology. He is an author of more than 175 publications and several patents, and has received funding from the National Institutes of Health (NIH), Department of Defense, American Heart Association (AHA), different foundations and pharmaceutical companies. He has also provided extensive service to his discipline as a grant reviewer for NIH, AHA, National Science Foundation, Veteran's Administration and many other different national and international funding agencies, as well as an associate editor, editorial board member and ad-hoc reviewer for multiple Microbiology and Mycology journals.

UTSA STUDENTS FLOURISHED AT THE

Undergraduate Research and Creative Inquiry Showcase



As San Antonio's multicultural discovery enterprise, UTSA holds its largest show-and-tell event every April. Organized by the Office of Undergraduate Research (OUR), the Undergraduate Research & Creative Inquiry Showcase highlights undergraduate student research and creative endeavors from all disciplines.

The Showcase gives many undergraduate students their first opportunity to share their research in an academic setting and explain their methodology and findings to peers and faculty. Visitors are encouraged to ask questions so the presenters can practice their presentation and conversational skills. This interaction makes it a fun, dynamic event for all who participate.

"Our mission is to give all UTSA undergraduates the opportunity to engage in the research enterprise experience, whether it is a lab placement, externship, scholarship or research opportunity, ideally in their first year," said Dr. Thomas Coyle, director of the Office of Undergraduate Research (OUR). "The Showcase gives a taste of what's possible when you do get involved and we hope it inspires other students to follow suit."

Students also have the opportunity to jump-start their academic curriculum vitae (CV), and network and learn from one another. The OUR also partners with the Honors College and programs such as MARC-U*STAR, RISE and the First-Year Experience to expand the reach and breadth of the Showcase.

D9

FACULTY MENTOR AWARD FOR UNDERGRADUATE RESEARCH

Mentorship is a key element in developing a research mindset and ensuring student success. Faculty mentors play a critical role in the academic and professional development of student researchers. The following faculty members have outstanding records of enabling scholarly and creative activities with undergraduates. All of them have demonstrated a sustained commitment to undergraduate research and to their students, who have produced significant scholarly and creative works (e.g., publications, presentations, and exhibits), been accepted into graduate schools, and remain engaged in research after graduation.

Mark T. Leung
College of Business
Recognized in 2018

A tenured professor and department chair of the Department of Management Science and Statistics, Leung has mentored numerous student teams over the years who have participated and been recognized at the Showcase. Many of his students have moved on to graduate programs such as the M.S. in Data Analytics, Statistics and Data Science, M.B.A. and others. He has also collaborated with faculty members to develop an array of predictive models for UTSA student attrition, providing meaningful data and insights to address this issue and potentially shape future policy.

Pranav A. Bhounsule
College of Engineering
Recognized in 2018

A robotic specialist and assistant professor in the Department of Mechanical Engineering, Bhounsule has mentored 45 undergraduate students in diverse research experiences over the past three and half years. He has been active in recruiting and mentoring underrepresented students, with many pursuing graduate studies. His students have found numerous placements in military and industry laboratories and success in juried competitions, grant awards and scholarships.

Astrid Cardona,
College of Sciences
Recognized in 2017

An associate professor of biology, Cardona specializes in microbiology and immunology and has a sustained record of funding undergraduate research. She has mentored nearly 20 undergraduate thesis projects. In 2017, she mentored three undergraduate honors projects and co-authored three publications with RISE and MARC trainees. Many of her students have continued doing research after being accepted into Ph.D. programs.

Ian Caine
College of Architecture, Construction and Planning
Recognized in 2017

An assistant professor of architecture, Caine serves as a faculty advisor for the American Institute of Architecture Students (AIAS). He uses his studio to give constructive critiques of student architectural projects and has mentored students in architectural design and installation. He was one of three architecture faculty nationally recognized by the ACSA/AIAS.

Teja Guda
College of Engineering
Recognized in 2017

An assistant professor of biomedical engineering, Guda has developed the undergraduate curriculum and manages the internship program for his college. He has also mentored two winning student-led CITE teams (2016 and 2015), an NSF I-Corps student-led team and supervised nearly 30 undergraduates, many of them winning scholarships.

Ovidio Giberga
College of Liberal and Fine Arts
Recognized in 2017

An associate professor of art, Giberga heads the Ceramics program at UTSA. Giberga connects his students with outside artists and creates innovative creative activities such as building kilns and replacing obsolete ceramic light sconces for the UTSA Paseo. He also mentors students at ceramics research conferences and serves as faculty advisor for student groups engaged in ceramics research.

Best-in-Show Winners

"The undergraduate research award winners exemplify the best in experiential learning, with guidance from their faculty mentors. We applaud the commitment and persistence of these students and their mentors in creating new knowledge, advancing the UTSA research enterprise and pursuing excellence in undergraduate scholarly achievement,"
said Dr. Thomas Coyle, director of the UTSA Office of Undergraduate Research.

2018 BEST-IN-SHOW

COLLEGE OF ARCHITECTURE, CONSTRUCTION AND PLANNING (CACP)

Omar Aguirre
Multireligious Center
Faculty Mentor: Neda Norouzi

Desiree Igho-Orere
Stephanie Jalomo
Designing A Modern Mental Health Facility in Texas
Faculty Mentor: Neda Norouzi

Andrea Poore
Christie Thompson-Pellicier
Architecturally Re-Designed healthcare
Faculty Mentor: Neda Norouzi

COLLEGE OF BUSINESS (COB)

Luis Atkinson
Carlos Cruzportillo
Nancy Hernandez
Jacontance Williams
Designing Effective Distribution Network for a New Product Line
Faculty Mentor: Mark Leung

Ivan Arreola
Improvements and Analysis for Gene Set Enrichment Analysis
Faculty Mentor: David Han

Erica Perez
Justin Pons
Managing Predictable Variability and Planned Promotion of Nintendo Switch Supply Chain
Faculty Mentor: Mark Leung

COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT (COEHD)

Morgan Butler
Gabrielle Cortez
Joaquinita Johnson
Children Transitioning from Oral to Written Argumentation: Signaling Meaning through Punctuation in Writing: PART II
Faculty Mentor: Rosalind Horowitz

Christopher Terrazas
An Investigation of Middle School English Language Arts Classroom Libraries
Faculty Mentor: Janis Harmon

Ana Trevino
UTSA DACA Students and the Resources Provided to Them
Faculty Mentor: Cassandra Allen

COLLEGE OF ENGINEERING (COE)

Drishya Dahal
Tic Tac Toe Playing Robotic Arm
Faculty Mentor: Pranav Bhounsule

Joseph Galloway
Gerardo Aaron Rios
Mechanics and Control of Pumping a Playground Swing and Robotic Implementation
Faculty Mentor: Pranav Bhounsule

Joel Gomez
Understanding the Uncertainty in Nature's Design of Trabecular Bone
Faculty Mentor: Xiaodu Wang

COLLEGE OF LIBERAL AND FINE ARTS (COLFA)

Emily Corley
Engagement-based single stimulus preference assessment
Faculty Mentor: Bryant Silbaugh

Mollianne Flood
Math and Music: A Study of Intonation
Faculty Mentor: Kasandra Keeling

Sydnee Garcia
Equal, Not Equitable: Bexar County Education
Faculty Mentor: Sofia Bahena

COLLEGE OF PUBLIC POLICY (COPP)

Joshua Barrera
Sanctuary Cities in the United States
Faculty Mentor: Megan Augustyn

Ayesha Meghani
Amanda Mosley
Sexual Assault on College Campuses – A Comparative Case Study
Faculty Mentor: Patricia Jaramillo

COLLEGE OF SCIENCES (COS)

Joshua Anderson
Functional Analysis of Homologs of Intermediate Metabolism and DNA uptake in Borrelia burgdorferi
Faculty Mentor: Janakiram Seshu

Arturo Galindo
Study of Self Ordered Nanoporous Anodic Aluminum Oxide Membranes by Annealing
Faculty Mentor: Carlos Monton

Javier Valencia
The Role of the Vacuolar type ATPase in the Pathophysiology of Borrelia Burgdorferi
Faculty Mentor: Janakiram Seshu

HONORS COLLEGE: COLLEGE OF LIBERAL AND FINE ARTS (COLFA)

Emma Copisarow
Effects of HEXECO & VARK on College Student Metacognition & Success Practices
Faculty Mentor: Fred Previc

HONORS COLLEGE: COLLEGE OF LIBERAL AND FINE ARTS (COLFA)

Raven Douglas
Before and After the "Texas Voter ID Law": How Did SB 14 (82 R Impact Voter Turnout Among Communities of Color During the 2014 Midterm Election?
Faculty Mentor: Walter Wilson

HONORS COLLEGE: COLLEGE OF SCIENCES (COS)

Stephen Hernandez
mTOR promotes BBB breakdown and regulates tight junction proteins in an Alzheimer's disease mouse model
Faculty Mentor: Veronica Galvan, UT Health SA

2017 BEST-IN-SHOW

Shannon Roberts
"Faunal Analysis of the 2016 Archaeological Field School"
Anthropology

Monica Martinez
"Municipal Annexation as a Mechanism for Suburban Expansion in San Antonio, Texas 1939-2014"
Architecture/Construction Science & Management

Amanda Martinez
"Determining Putative Enhanced Microglia Responses Against Pulmonary Cryptococcosis"
Biology

Sandra Ramos
"Targeting Virulence for Antifungal Drug Development: Characterization of a Small Molecule Inhibitor of Candida albicans Filamentation and Biofilm Formation"
Biology

Grecia Gonzalez
"Synthesis of Silk Scaffold for Biomaterial Application"
Biomedical Engineering

Tyler Nelson
"The effect of jasmonic acid on anthocyanin pigment accumulation in wildtype and mutant Arabidopsis seedlings"
Chemistry

Kara Thompson
"Where Are We? A Critique on the Inclusion of Biracial-Black Characters in the Coretta Scott-King Book Awards for Authors from 2007-2016"
Communication

Bilal Siddiqui
"Recovering From Microprocessor Transient Faults"
Computer Science

Elizabeth Hatch
"An examination of the influence of procedural justice on inmate behavior"
Criminal Justice

Aires Ngunza
"Polymer Infiltration Toughened Hydroxyapatite Biomaterial Hybrids by Bio-inspired Materials Design"
Electrical and Computer Engineering

Sophia DiGonis
"Common Ground: How Language is Connected to Music"
English

Allison Saenz
"Puestos Aparte: Legal Segregation in San Antonio, 1920s-1940s"
History

Cynthia DeMunbrun
"Preparation of Pre-Service Teachers to Work in Inclusive Environment"
Interdisciplinary Learning & Teaching

Audrey Ramirez
"Shoulder Elevation in Manual Wheelchair Users and Able-bodied Individuals"
Kinesiology, Health, & Nutrition

Tarun Palpati
Chelsea Taylor
Kimberly Van
Christopher Weiss
Josephine West
"Strategic Analysis of Evolving Dynamics in E-Commerce Retailing"
Management Science & Statistics

Briggitt Blanco
William Cerda
Mujtaba Mohammad
"Performance Drivers and Efficiency-Responsiveness Tradeoffs in an Integrated Supply Network"
Marketing

Adam Burrows
"Neural Networks"
Mathematics

Stephanie Meier
"Characterizing Entrainment and Mixing in Density Currents using Flow Visualization"
Mechanical Engineering

Maria Macedonio
"Language and Attitudes: A Study of Attitudes Towards the Spanish Language at The University of Texas in San Antonio"
Multidisciplinary Studies

Linda McNulty
"Blood, Pollution, and Purity in the Homeric Epics"
Philosophy & Classics

Geronimo Robles
"Metal hydride composites as hydrogen fuel sponges"
Physics & Astronomy

Monica Pepping
"Aging in Mexico: A Case Study of U.S. Senior Citizens and the quality of Life in San Miguel de Allende"
Political Science & Geography

Yesenia Yanez
"Identity Conflict on Facebook"
Psychology

Annie Ma
"Cross-National Analysis of Socioeconomic Factors for Suicide"
Sociology

Richard Giddens, Jr.
"(Re)viewing & (Re)membering Violence: Testimonios of Queer & Trans Tejan@x Sexual Assault Experiences"
Women's Studies

Research Scholarships

Experiential learning such as undergraduate research can give students a transformational educational experience. Our research scholarship program supports this engagement, whereby undergraduates who perform research with a faculty mentor can receive $1,000 (fall or spring) or $2,000 (summer) upon completion of their research project. In the 2017-2018 academic year, 31 students were funded by the Office of Undergraduate Research, led by **Dr. Thomas Coyle.**

SPRING 2018

Estefania Barajas
Architecture
The City of San Antonio Climate Action and Adaptation Plan
Mentor: Hazem Rashed-Ali

Jetty Crittenden
Actuarial Science
Daily Temperatures (high and low) in San Antonio since March 1885
Mentor: Jerome Keating

Kassandra Gonzalez
Kinesiology
The effects of maternal obesity and exercise on pregnancy outcomes, fetal development, and offspring health
Mentor: Eunhee Chung

Joshua Guerra
Public Health
Examination of the Intraprofessional Stigma Towards Treatment Modalities of Substance Use Disorders
Mentor: Erin Madden

Kristine Harrigan
Economics
Better Investment Strategies for Retirees
Mentor: Don Lien

Ayesha Meghani
Public Administration
Sexual Assault on College Campuses & Analysis of University Policies
Mentor: Patricia Jaramillo

Andrea Mertins
Civil/Environmental Engineering
The role of quorum sensing in the development of M. aeruginosa blooms
Mentor: Heather Shipley

Farrin Moreno
Communication
Exclusive Human Milk Diets Post-NICU-Understanding Preemie Parents' Choices
Mentor: Stacey Passalacqua

Amanda Mosley
Public Administration
Sexual Assault
Mentor: Patricia Jaramillo

Tiffany Nguyen
Biology
Regulation of gene expression in B. burgdorferi
Mentor: Janakiram Seshu

Emmanuel Nyong
Microbiology & Immunology
Recovery of Shiga Toxin Bacteriophage positive Lysogens in the human pathogen Escherichia coli O157:H7
Mentor: Mark Eppinger

Victor Palos
Mechanical Engineering
Correlation of surface oxide film and cracking for supermartensitic 13 Cr for downhole conditions
Mentor: Brendy Rincon Troconis

Alejandra Teran
Chemical Engineering
Production of Chemical Feedstocks from Biomass Using Heterogeneous Catalysis
Mentor: Gary Jacobs

Luis Victoria
Architecture
Learning the history of San Antonio Missions through 3D built models: How the church of San Antonio de Valero changed to the Alamo
Mentor: Angela Lombardi

Yesenia Yanez
Psychology & Statistics
Fear of Negative Evaluation on Facebook: A Predicting Variable of the Perception of Identity Conflict
Mentor: David Pillow

FALL 2017

Sarah Altman
Chemistry
Structure Based Drug Design, Synthesis and Evaluation of New Antischistosomal Agents
Mentor: Stanton McHardy

Salvatore Campise
Kinesiology
Effects of Obesity on Skeletal Muscle Fiber Type
Mentor: Eunhee Chung

Andrew Deregla
Psychology
Mindfulness in the Workplace
Mentor: Meghan Thornton-Lugo

Joseph Galloway
Mechanical Engineering
Mechanics and Control of Pumping a Playground Swing and Robotic Implementation
Mentor: Pranav Bhounsule

Ray Hagimoto
Physics
An analysis of spectral properties of crystalline atomic clusters
Mentor: Kathryn Mayer

Herta Montoya
Civil Engineering
Cyber Attacks on Water Systems: Identification, Detection, and Mitigation
Mentor: Marcio Giacomoni

Sarah Rodgers
Civil Engineering
Acceptable Elongations and Low Cycle Fatigue Performance for High Strength Reinforcing Bars
Mentor: Wassim Ghannoum

The Office of Undergraduate Research received a record number of applications from a variety of disciplines and colleges for the program this year. Congratulations Roadrunners!

SUMMER 2018

Jessica Guadalupe Alonso
Biology
Osteopointin and its role in chlamydial infections
Mentor: Rishein Gupta

Brittany Haywood
Education
Expressing Imagination and Creativity Through Writing
Mentor: Misty Sailors

Peggy Wall
Anthropology
House orientation at the Sanchez site in Southeastern Arizona, AD 200-550
Mentor: Robert Hard

Jack Duncan
Economics
A Study of Cyber Insurance Markets
Mentor: Donald Lien

Victoria Gudkova
Economics
Tax Exempt for Hospitals
Mentor: Donald Lien

Amanda Flores
Physics
Magnetic Nanostructures with unique spin configurations for innovative diagnostics techniques
Mentor: Carlos Monton

Gabriela Martinez
Biomedical Engineering
Production of ECM in the Absence of Laminin a4
Mentor: Eric Brey

Tiffany Vargas
Architecture
Edge Cities Redux
Mentor: Ian Caine

John Saldana
English
Visual Rhetoric as Network: Using Wearable Devices to Produce Visual Displays of Numerical Data on Pollution That Are More Interactive and Persuasive
Mentor: Sue Hum

UTSA First-Ever Research External Advisory Council Convenes

Leveraging best practices from research-intensive universities across the country, the newly-created Office of the Vice President for Research, Economic Development and Knowledge Enterprise (VPREDKE), has created its first Research External Advisory Council (REAC). The group, comprised of accomplished professionals in their fields – industry, military, nonprofit, cybersecurity, biosciences, and research institutions, both locally and nationally – convened in April 2018 to kick off an exploration of UTSA's research enterprise, find new avenues to expand research funding and partnerships, and raise our profile beyond the region.

The VPREDKE executive team presented the structure and activities of the offices that comprise the new division: **Dr. Michelle Stevenson,** Research Integrity; **Beth Manning,** Research Operations and Finance; **Jaclyn Shaw,** Research Support; **Dr. Christine Burke,** Commercialization and Innovation; and **Robert McKinley,** Institute for Economic Development (IED). Key research strategic initiatives, such as the National Security Collaboration Center, NRUF and Carnegie Classification, were discussed and the day concluded with campus and research laboratory tours.

"We carefully selected council members who could not only assess our research enterprise objectively, but who could also bring new approaches beyond the academic perspective we possess. The REAC will evaluate our programs and output, and in the coming year, advise us on ways to best expand our research, relationships and funding dollars, particularly as we align our operations with the Institute of Economic Development, given our new structure. Collectively, we will define the knowledge enterprise at UTSA and how best to engage to benefit our students, faculty, staff and partners,"

—Dr. Bernard Arulanandam, Jane and Roland Blumberg Professor in Biosciences and Interim Vice President for Research, Economic Development and Knowledge Enterprise.

The members of the UTSA Research External Advisory Council are:

Yvonne K. Addison, PMP
Program Manager
StandardAero

Gregory Neal Akers
Senior Vice President of
Advanced Security Initiatives
Cisco

Walt Downing
Executive Vice President and
Chief Operating Officer
Southwest Research Institute

Yvonne Fernandez
Vice President of
Commercial Operations
Security Service Federal
Credit Union

Renee Forney
Senior Director of
Cyber Assurance
Capital One

Andrea Giuffrida
Vice President for Research
University of Texas Health
Science Center San Antonio

Martin Landon
CEO
BioBridge Global

Lieutenant General
James K. McLaughlin
Former 24th AF Commander
Deputy Commander for
USCYPERCOMM (retired)

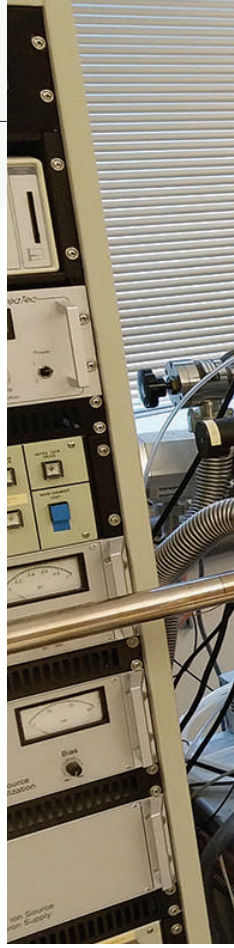
Richard Perez
President and CEO
San Antonio Chamber of
Commerce

James Reed
President
San Antonio Medical Foundation

GP Singh
Vice Chairman
Santikos

Joanne Turner
Vice President for Research
Texas Biomedical Research
Institute

James J. Valdes, Ph.D.
Defense Technology Directorate,
Principal CB Defense Engineer
MITRE Corporation



UTSA NANOTECHNOLOGY RESEARCHER

Carlos Monton Awarded NSF Grant to Fabricate, Control and Test 1-Dimensional Systems

BY **SARAH HADA**

Carlos Monton, assistant professor with the Department of Physics and Astronomy, was awarded a three-year National Science Foundation (NSF) award worth $279,976 for an innovative project to fabricate and control one-dimensional (1-D) systems.

Over the last 30 years or more, the focus in nanotechnology has been on the study and development of two-dimensional (2-D) materials such as thin films. Dr. Monton and his team are going even lower, looking at one-dimensional (1-D) systems, essentially chains of atoms, to understand their physical properties.

There are different ways to fabricate these atomic chains. Monton is not only proposing a new way to assemble these chains, but also a way that allows full control of the length, and to make these chains the same length which overcomes the limitations of other known techniques.

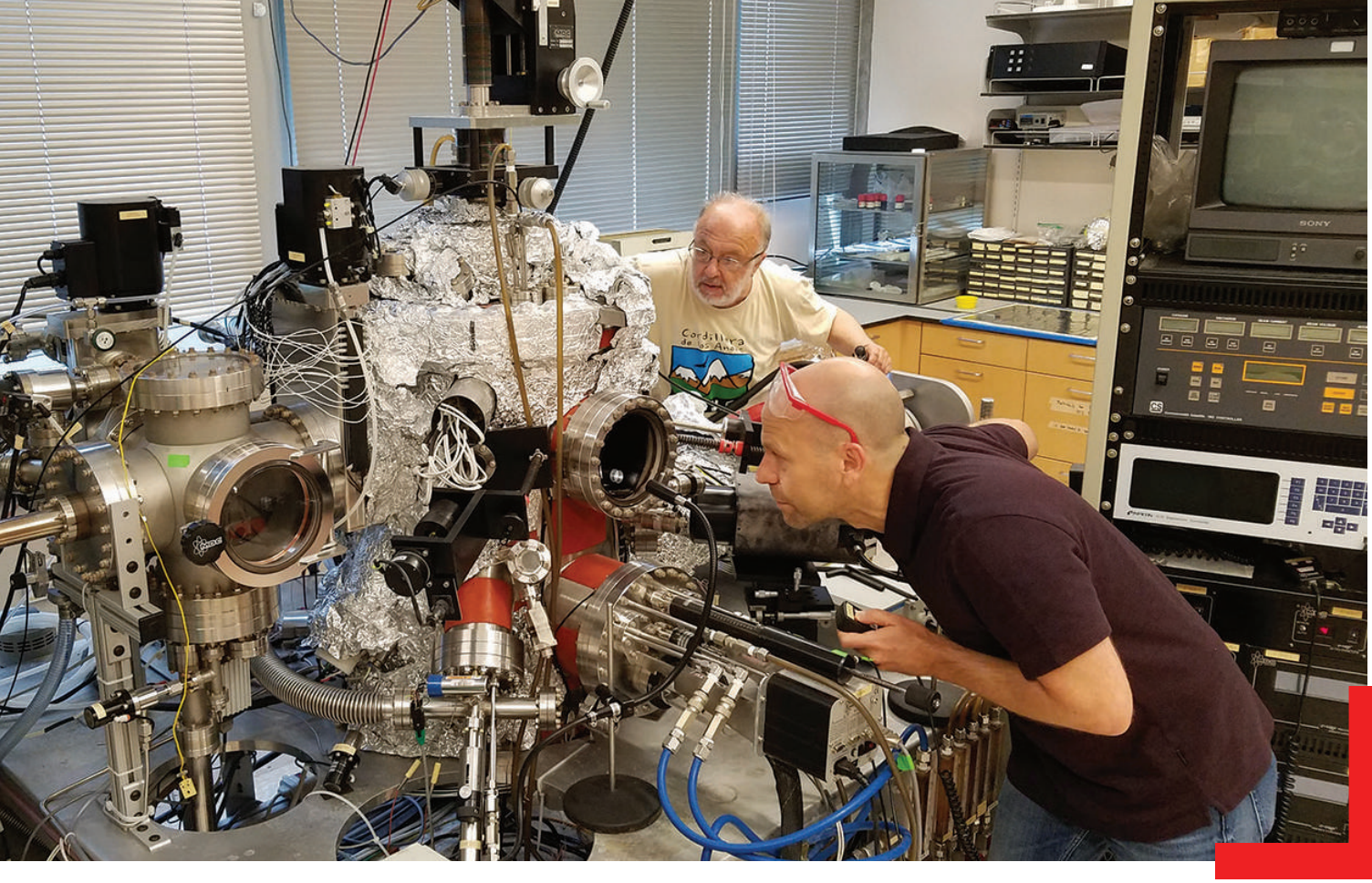
With this project, he and his team seek to understand the magnetic properties of these ultra-short atomic chains, to see whether the magnetic properties are affected by the length. At this juncture, they can control the size from seven atoms to 400 atoms or more.

It is very much a collaborative proposal. The idea came up two years with **Ivan Schuller**, Monton's collaborator, at UC-San Diego. Schuller has the technology and the machines that allow the fabrication and Monton knows how to fabricate these chains, having run Schuller's Organic Thin Film Fabrication Laboratory back when he was a postdoc. At UC-San Diego, the team fabricates the chains and performs the preliminary magnetic characterizations. Then at UTSA, they process and analyze the magnetic data and conduct an in-depth structural characterization using X-ray diffraction and electron microscopy on campus.

The possibility of fabricating these systems allows the researchers to explore fundamental physics, and see what happens with the electronic and magnetic properties of these chains. The results of this project will have a broad effect, allowing for a deeper understanding of the magnetic behavior of low-dimensional systems and may have a direct impact on a new generation of electronic devices. As the frame that supports the very short chains is organic and has interaction with light, the team foresees some applications in which they integrate these chains into other organic materials, which in time, could be used for biomedical applications and sensors. In the same way, they would like to investigate if the magnetism of these atomic chains can be controlled by light.

Another theory in which they would like to investigate is whether the spin [an intrinsic electronic property of atoms] can be controlled along the chains. "Since atoms present different spins and we can vary the atomic species along the chains, We hypothesize that we may be able to modulate the spin along the chains," explained Monton.

A year ago, Monton met **Duncan Haldane,** one of the three Nobel prize winners in 2016. Haldane's theory on the importance of spin in one-dimension systems has spun many other researchers to prove, or disprove, his argument. Monton told Haldane he might have a way of growing the system to test Haldane's theory, to which Haldane replied that the idea of modulating the spin using this approach sounded promising. This project will provide a physical system to



test Haldane's conjecture, perhaps also confirm it and find a way to modulate spin along the chain. It may even lead to other properties yet undiscovered. This research is adding to the body of knowledge in this field.

Monton and Schuller are also working with researcher **Michael Fitzsimmons** from Oak Ridge National Laboratory (ORNL). The team plans to use ORNL's neutron scattering facility to test directly and measure the occurrence of Haldane's phases on the chains. They already produced preliminary results, which was included in the award proposal to the NSF. They demonstrate they could grow these organic chains, control their length, and modulate their composition. By doing so, they can perhaps control the spin which is what they will be testing. This was a strong point in the proposal.

There are also educational and community impact to this research, which was cited by the NSF. The funding will support two graduate students working on their Ph.D. thesis, and at least two undergraduate students per semester working on this research project for the next three years. Monton's commitment to this proposal is to give priority to underrepresented students.

For community impact, the team will establish a partnership with a local San Antonio high school to expose them to research and to consider a STEM career. With Dr. Schuller being a five-time regional Emmy winner, the team plans to produce a series of short videos using a comical approach to explain nanotechnology. It will be shared on public platforms to be used educators to engage junior and high school students.

The collaboration with Schuller dates back eight years. When inspiration struck, they started working on it two years ago. Dr. Monton has been traveling every 15 days for a year and a half to run the lab at UCSD and get preliminary data to apply for the funding. Moving forward, students from both institutions will work together. With UCSD classified as a R1 institution, UTSA students will be exposed to a Tier One lab, researchers, new equipment and train in new techniques, receiving high-level training.

Looking ahead, Monton and Schuller are also collaborating with Trevor Willey and Alexander Baker at Lawrence Livermore National Lab to seek DOE funding to support additional applications of their research. Along with Fitzsimmons at Oak Ridge, ultimately, they envision the four labs collaborating which will benefit all students involved in this research.

Monton concluded, "This project started as a dream; what separates dreams from reality is a decision. We had this vision which led to a conversation. We decided to commit to this, started fabricating the samples, writing the proposal, and building the team. And now this dream it's a reality." D9

UTSA hosted more than 250 linguists from around the world

Professor **Bridget Drinka,** UTSA Department of English, organized the 23rd International Conference on Historical Linguistics which took place last summer in San Antonio. It was one of the first official events commemorating San Antonio's 300th anniversary. UTSA was one of the handful of American universities to host this conference since it began more than forty years ago.

"It was an immense honor for our institution as this conference is only hosted by Tier One universities and is the most important gathering of historical linguists in the world," said Drinka. "The conference focused on historical linguistics and attempts to answer the essential questions of how and why languages change."

"The conference gave UTSA students a unique opportunity to network with top researchers, from more than 40 countries, in the linguistics field. Attendees discovered San Antonio's history by exploring our linguistic roots," said Drinka.

Linguistics at UTSA is a growing discipline, with its new Interdisciplinary Graduate Certificate and its 16 linguists located across campus, in three colleges. Administered by the Department of Modern Languages and Literatures, UTSA's linguistics offerings provide a multi-disciplinary approach, and include the following specializations: historical linguistics; sociolinguistics; applied linguistics (Dept. of Bicultural-Bilingual Studies); and neurolinguistics (Dept. of Biology).

Drinka is the president of the International Society for Historical Linguistics. Her research focuses on Indo-European and historical linguistics. Her recently published book, Language Contact in Europe: The periphrastic perfect through history, makes a case for language contact as a major force in language change.

A $20,000 grant from the National Science Foundation was awarded to organize the conference. Additional support was provided by Humanities Texas, Casa de España San Antonio, and the Japan Society for the Promotion of Science and ORAU.

D 9

One important component was a series of panels celebrating the rich cultural history of our city entitled, "Las lenguas de San Antonio a 300 años: Reconstructing the Linguistic Roots of a Multicultural City". It included:

- SPANISH SOCIO-HISTORICAL LINGUISTICS: ISOLATION AND CONTACT
- AFRICAN AMERICAN VERNACULAR ENGLISH AND THE ECOLOGY OF LANGUAGE EVOLUTION
- THE HISTORY OF TEXAS GERMAN
- ENDANGERED LANGUAGES AND HISTORICAL LINGUISTICS

INTERNATIONAL RESEARCH COLLABORATIONS

Working with the Office of International Programs, we are expanding research opportunities for faculty and students through strategic connections with key international institutions. In November 2017, UTSA and Monterrey Institute of Technology and Higher Education (ITESM) signed a Memorandum of Understanding (MOU), establishing collaboration activities to facilitate long-term academic and economic cooperation between both institutions. In October 2017, UTSA signed a MOU with Technical University-Darmstadt in Germany, a key component of a greater cultural mission between the City of San Antonio and the City of Darmstadt to build cultural and educational bridges through a sister cities agreement.

OFFICE OF RESEARCH SUPPORT

The Office of Research Support (ORS) continued to deliver a robust slate of research support and faculty development activities. In collaboration with UTSA Teaching and Learning Services, the New Faculty Institute was launched to provide new faculty introduction to UTSA's teaching and research culture, share institutional resources and best practices and promote collaboration. In FY 17, ORS gave 46 research awards to UTSA faculty and their collaborators, totaling $712,392 to support research on campus.

NEW RESEARCH CENTERS

UTSA researchers received substantial federal grants in many fields including a $5 million grant award from the National Science Foundation (NSF), establishing the CREST Center for Security and Privacy Enhanced Cloud Computing (C-SPECC), led by **Dr. Ravi Sandhu.** Two new research centers were created: the Autism Research Center (ARC), dedicated to autism analysis, assessment and treatment and, more recently, the Center for Community Based and Applied Health Research, both housed in the College of Education and Human Development.

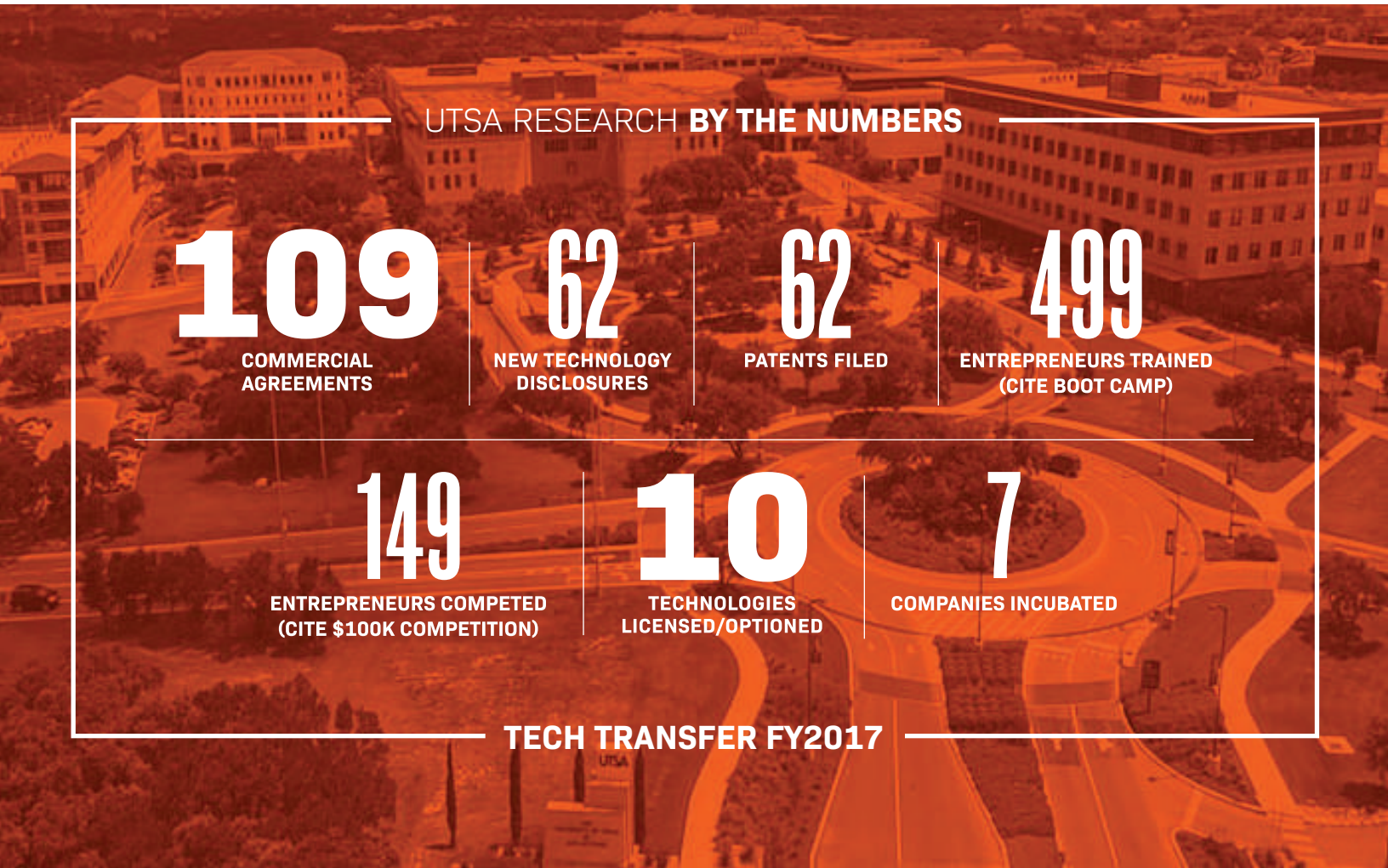
SAN ANTONIO MILITARY HEALTH SYSTEM

With funding provided by the San Antonio Life Sciences Institute (SALSI), military health research and training were supported by UTSA and UT Health SA working with the San Antonio Military Health System (SAMHS) and the Uniformed Services University Health Sciences Center (USUHSC). This partnership resulted in collaborative seed programs, extramural grant applications/awards, conferences and joint professional development opportunities. With additional support from the National Institutes of Health in 2018 (award number R13TR002409), the fourth annual San Antonio Military Health System & Universities Research Forum (SURF) conference brought more than 450 academicians, students, and other health professionals to the UTSA campus to share research, network and build new partnerships. This represented a 38.5 percent increase in attendance from year one. Of the 137 abstracts submitted for consideration, 40 were selected for podium presentations. The forum also featured a poster session where 103 projects were showcased. http://research.utsa.edu/surf #SATXSURF

UTSA
The University of Texas at San Antonio
Office of the Vice President for
Research, Economic Development,
and Knowledge Enterprise

THE UNIVERSITY OF TEXAS AT SAN ANTONIO
ONE UTSA CIRCLE
SAN ANTONIO, TEXAS 78249

Non-Profit Org.
U.S. Postage
PAID
San Antonio,
Texas
PERMIT NO. 2474



UTSA RESEARCH **BY THE NUMBERS**

109 COMMERCIAL AGREEMENTS

62 NEW TECHNOLOGY DISCLOSURES

62 PATENTS FILED

499 ENTREPRENEURS TRAINED (CITE BOOT CAMP)

149 ENTREPRENEURS COMPETED (CITE $100K COMPETITION)

10 TECHNOLOGIES LICENSED/OPTIONED

7 COMPANIES INCUBATED

TECH TRANSFER FY2017