

UT DALLAS

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Between the Moon and UTD

THIS SUMMER MARKS the 50th anniversary of Apollo 11 astronauts Neil Armstrong and Buzz Aldrin taking the first steps on the moon. UT Dallas' ties to space research go back to our beginnings. Scientists at the Southwest Center for Advanced Studies — the precursor to what is now UT Dallas — trained the Apollo astronauts on what to look for in moon rocks. More recently, Dr. John H.L. Hansen, associate dean for research in the Erik Jonsson School of Engineering and Computer Science, and his team developed speech-processing techniques to reconstruct and transform thousands of hours of audio from NASA's lunar missions.

This photo illustration by Rachael Drury captures the Jan. 20-21 total lunar eclipse. This Super Blood Wolf Moon is so named because it was “super” due to its proximity to Earth in its orbit and “blood” since it took on the red-orange color of sunset. Native Americans in North America bestowed unique names to each month's full moon, thus, “wolf” because in the cold of January, wolves could be heard howling outside villages.

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PHILANTHROPY



CROW
MUSEUM OF
ASIAN ART

THE UNIVERSITY
OF TEXAS AT DALLAS



Installation view, Jacob Hashimoto: *Clouds and Chaos*, September 28, 2018 – April 14, 2019

An Art Collection To Crow About

The Trammell and Margaret Crow family has donated the entire collection of the Trammell and Margaret Crow Museum of Asian Art, together with \$23 million of support funding, to UT Dallas to create the Trammell and Margaret Crow Museum of Asian Art of The University of Texas at Dallas.

THE UNIVERSITY WILL continue to operate the Crow Museum in its current space in the downtown Dallas Arts District, where it has been located for more than 20 years. The gift funding will provide for the design and construction of a second museum on the UT Dallas campus.

The Crow Museum’s growing permanent collection demonstrates the diversity of Asian art, with more than 1,000 works from Cambodia, China, India, Indonesia, Japan, Korea, Myanmar, Nepal, Pakistan, Thailand and Vietnam, spanning from the ancient



to the contemporary. The collection also includes a library of over 12,000 books, catalogs and journals.

The collection was started by Dallas residents Trammell and Margaret Crow in the 1960s. Trammell Crow was legendary in the business world, known as one of the most innovative real estate developers in the U.S. In the mid-1980s, he was the nation’s biggest developer, with more than 8,000 properties in over 100 cities. During numerous business trips to Asia, he developed an appreciation for its diverse art. Over the course of three decades, the Crows assembled a



Detail view of Tribute Gift.
China, Qing dynasty (1644-1911),
18th-19th century

vast and distinguished collection, including a 6-foot Ming dynasty seated Vairocana Buddha and one of the finest collections of later-period Chinese jades in the U.S., including such works as the 18th-century Qing dynasty sculpture titled *Jade Mountain*.

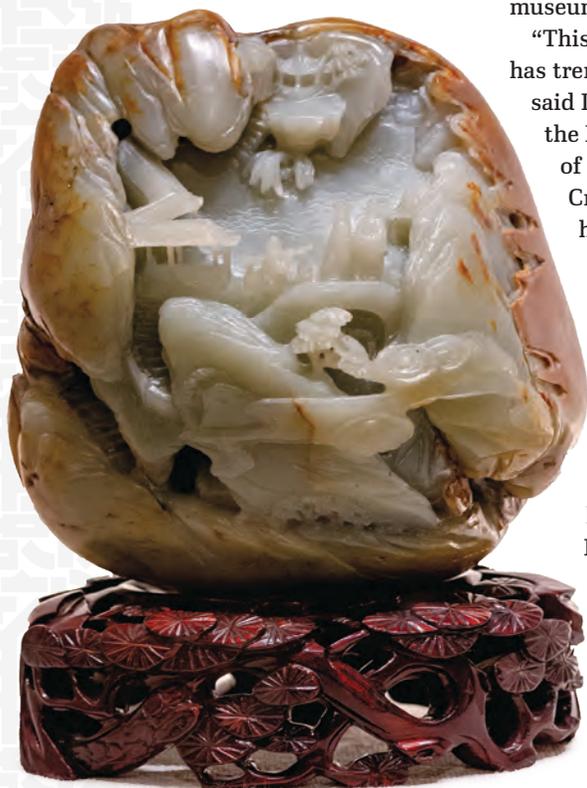
Trammell S. Crow, president of the Crow Family Foundation and son of Trammell and Margaret Crow, has overseen the development of the museum during the past 20 years as a point of connection between the U.S. and Asia.

“We are excited to see The University of Texas at Dallas bring the museum that our parents built into a new era,” Crow said. “It is our hope that the museum will continue to create global awareness and conversation through the power of the collection and its programs and reach new audiences, both among UT Dallas students and the broader North Texas community.”

Amy Lewis Hofland, who has led the Crow Museum since 2002, will continue in her leadership role for both museum sites.

“This magnificent and farsighted gift from the Crow family has tremendous significance for our University’s future,” said Dr. Richard C. Benson, president of UT Dallas and the Eugene McDermott Distinguished University Chair of Leadership. “The vision of Trammell and Margaret Crow was that the artistic and cultural treasures they had assembled would be shared as widely as possible with the public. We are immensely gratified that the Crow family has entrusted us with ensuring that this vision be enhanced and perpetuated.

“This new strategic thrust will build upon the path-breaking endowment gift five years ago that led to the creation of the Edith O’Donnell Institute of Art History. The next major step forward in the role of the arts in the life of UT Dallas occurred last year with the historic gift from Richard and Luba Barrett of their entire collection of Swiss art. This new gift of the art of the Crow Museum and the funds to create a museum on campus of Asian art will provide a spectacular complement to the museum that will house the Barrett Collection. Together these gifts will provide deep and wide resources for research and teaching in the arts.” ■



Pebble with scholars on a garden bridge.
China, Qing dynasty (1644-1911), 19th century

**The Crow Museum
of Asian Art of
The University of
Texas at Dallas**



**2010 Flora Street
Dallas, Texas**

Admission: Free
Hours: 11 a.m. – 5 p.m.,
Tues – Sun
*The museum is closed
Independence Day,
Thanksgiving Day,
Christmas Eve,
Christmas Day
and New Year’s Day.*

The Crow Museum continues to present a full exhibition schedule in the Dallas Arts District. **The current show, “Hands and Earth: Contemporary Japanese Ceramics,” will be on display through Jan. 5, 2020.** Featuring an in-depth selection of important works by master Japanese ceramic artists of the last 80 years, this exhibition offers a rare opportunity to see significant examples of avant-garde approaches to clay.

PHILANTHROPY

Barrett Collection Gift Expands Canvas for University Art

RECOGNIZED FOR ITS excellence in science, engineering and business, UT Dallas has recently placed greater emphasis on the arts. With the creation of the Edith O'Donnell Institute of Art History in 2014, the University has fostered innovative research and graduate education in the history of art. The gift of the Barrett Collection, which will be housed in a new Barrett Museum to be built on campus, will extend the vision for the O'Donnell Institute, attracting new

scholars and expanding the role of the arts across the University.

The gift made last fall to UT Dallas of the Barrett Collection, consisting of over 400 works of Swiss art, is the single-largest donation ever made to the University, as well as the largest gift of art to any school in the UT System.

The collection of paintings, sculpture, drawings and prints is the only definitive collection of Swiss art outside of Switzerland and is considered the largest and finest private collection of Swiss art ever formed. With works dating from the late 14th through the mid-20th century, the Barrett Collection includes important pieces by every major artist born in Switzerland.

"The arts are an essential facet of any great university," said Dr. Richard C. Benson, president of UT Dallas and the Eugene McDermott Distinguished University Chair of Leadership. "I am grateful to the Barretts for this generous gift, which will catalyze the development of arts programs and provide our students with direct access to an extraordinary collection."

The collection was started in the 1990s by Dallas residents Nona and Richard Barrett. Since Nona's death in 2014, Richard and his present wife, Luba, have continued to expand the collection.

The core of the collection is composed of 11 works by Caspar Wolf, 12 by **Angelika Kauffmann**, seven by Heinrich Füssli, six by Arnold Böcklin, 50 by the 19th-century Swiss landscape masters, 38 by Ferdinand Hodler, 34 by Felix Vallotton and 41 by **Cuno Amiet**.

Dr. Richard Brettell, a scholar of modern painting and founding director of the O'Donnell Institute, has known the collection since its inception.

"Bringing this collection to a major research university makes the significance of the gift even greater," said Brettell, who is the Margaret M. McDermott Distinguished Chair of Art and Aesthetic Studies, and the Edith O'Donnell Distinguished University Chair. "The focus and range of the Barrett Collection will spark many new dissertations, articles and books written by our graduate students and faculty." ■

"Bringing this collection to a major research university makes the significance of the gift even greater."

Dr. Richard Brettell



Women in the Garden



Ulysses on the Island of Circe

ON CAMPUS

New Director joins Edith O'Donnell Institute of Art History

DR. MICHAEL THOMAS is the new director of the Edith O'Donnell Institute of Art History at UT Dallas, succeeding founding director Dr. Richard Brettell. Thomas holds the Edith O'Donnell Distinguished University Chair and serves as a professor in the School of Arts and Humanities while directing the Institute's graduate studies programs.



Brettell will continue to contribute to the O'Donnell Institute as professor of art history in the School of Arts and Humanities and holder of the Margaret M. McDermott Distinguished Chair of Art and Aesthetic Studies, and the Edith O'Donnell Distinguished Chair of Art History.

The Edith O'Donnell Institute of Art History was established by a gift of \$17 million from Edith O'Donnell in 2014. This gift was supplemented with \$10 million from the Texas Research Incentive Program. The institute, housed in the Edith O'Donnell Arts and Technology Building, also maintains facilities in the Dallas Museum of Art. It is the first art history research institute founded in the digital age.

Thomas most recently served as director of the Center for the Study of Ancient Italy at UT Austin. After graduating from St. Mark's School of Texas, he pursued a bachelor's degree in art history from Duke University and a master's degree in art history from Southern Methodist University. Thomas received his PhD in art history from UT Austin in 2001. He has taught at SMU, the University of Michigan and Tufts University. He is a member of the Meadows Museum Advisory Council at SMU and a board member of the Etruscan Foundation.

Thomas has been engaged in archeological excavations in Italy for more than 25 years, where he co-directs two projects: the Oplontis Project in Torre Annunziata near Naples, and the Mugello Valley Archaeological Project & Poggio Colla Field School in Tuscany.

"Since I already work in ancient Italy, plus the fact that we already have strong Edith O'Donnell Institute of Art History faculty members who work in Italy, I believe that ancient Italian, Renaissance and Baroque will always have a good place at UT Dallas," Thomas said. ■

UT Dallas Climbs *Forbes'* List of Best Value Colleges in U.S.

UT Dallas was named the best value public university in Texas, according to rankings released in May of America's Best Value Colleges 2019 by Forbes.



THE LIST HIGHLIGHTS schools with the highest quality and best financial outcomes. UT Dallas is tied for 15th among U.S. public universities and moved up from 61st last year to tied for 31st among public and private U.S. institutions offering four-year degrees.

"While no single metric or ranking can capture the full picture of our dynamic university, this particular ranking speaks highly of our value to students and their families," UT Dallas President Richard C. Benson said.

Forbes compiled its fourth annual ranking of the 300 Best Value Colleges by comparing data on 645 colleges and universities across all 50 states. The schools were evaluated in six areas: quality, net price, net debt, alumni earnings, timely graduation and access for low-income students.

According to the *Forbes* website: Colleges and universities are assessed on net price or sticker price for tuition, fees, and room and board minus the grants, scholarships and education tax benefits that students receive. For state schools, in-state tuition is used for the rankings. *Forbes'* methodology also considers average federal debt load per

student, timely graduation rate and mid-career alumni earnings sourced from the Department of Education's College Scorecard and PayScale.

The ranking also takes into account the presence of Pell Grant students, which is considered a plus, as it tends to mean schools are focused on creating opportunities for low-income students.

The only Texas school ranked ahead of UT Dallas was Rice University (No. 21). Other institutions listed in the top 31 included Stanford University (No. 6), Harvard University (No. 7), Duke University (No. 16) and the Massachusetts Institute of Technology (No. 25).

"Our students are among the smartest and most talented in the nation," said Dr. Jessica Murphy, dean of undergraduate education at UT Dallas. "I am thrilled to learn that this ranking shows that UT Dallas is giving them the knowledge and tools they need to be successful after graduation."

In January, UT Dallas was also named on *The Princeton Review's* annual list of Best Value Colleges for the seventh consecutive year. —*Brittany Magelssen*

ON CAMPUS

Keeping an Eye on UTD Weather

A NEW WEATHER station at UT Dallas is helping administrators better monitor inclement weather and its possible impact on the campus community.

The new WeatherSTEM station provides a micro-local forecast and current weather information for the

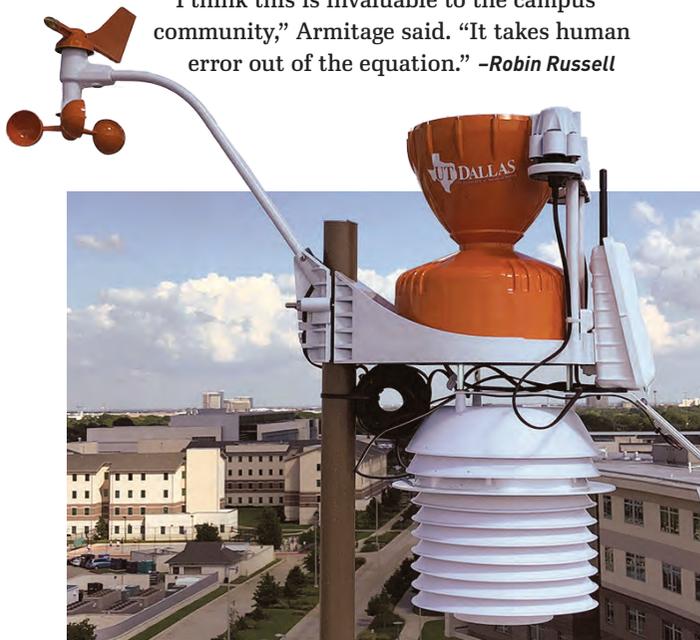
University and the surrounding area. The station, installed on top of Residence Hall West, has additional cameras facing north atop the Natural Science and Engineering Research Laboratory and south and west on a Canyon Creek Heights apartment building.

“We are now able to get an accurate forecast for the campus area instead of having to type in our 75080 ZIP code and getting the other side of North Central Expressway,” said Angela Dees, emergency management specialist.

UTD students, faculty and staff can click on the weather station’s dashboard (dallas.weatherstem.com/utdallas) to see views of the horizon and get the latest information on conditions, including the temperature, wind gust, barometer, dew point, heat index, rain total and closest lightning.

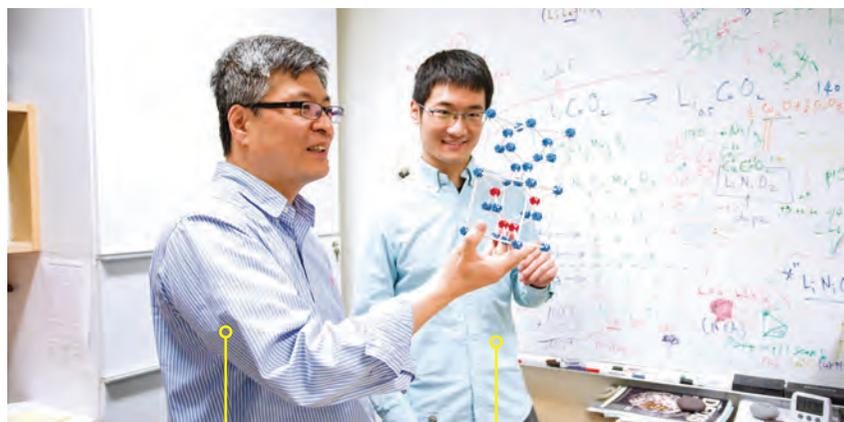
The station provides real-time data to help with decisions about such things as delaying classes, canceling an on-campus event or postponing an athletic game, said Mariah Armitage, director of emergency management and continuity planning. The station also will provide automatic alerts about severe weather to key University administrators who can then communicate to students, faculty and staff.

“I think this is invaluable to the campus community,” Armitage said. “It takes human error out of the equation.” —Robin Russell



RESEARCH

Key to Safer Batteries Lies on the Surface



LITHIUM-ION BATTERIES HAVE been the hands-down favorite for smartphones, tablets, laptops, cameras and rechargeable power tools for decades. But they also have drawbacks, such as “thermal runaway,” in which a battery fails—or catches fire—due to the buildup of too much heat.

For years, researchers have been looking for the source of the heat problem and how to fix the associated volatility. After three years of material simulation, synthesis, characterization and battery performance tests, UT Dallas researchers have discovered that the problem with lithium-ion batteries isn’t inside the battery materials.

“It turns out only the surface of the battery cathode materials is the problem,” said **Dr. Kyeongjae “K.J.” Cho**, professor of materials science and engineering. “The inside is OK. This gives us great hope we can figure out how to stabilize the surface and make really high-capacity batteries a reality.”

Cho and his colleagues described their findings in the Jan. 10 print edition of the journal *Advanced Energy Materials*.

“When a battery is constantly charged and recharged, the material begins to degrade. Released energy causes heating, and the battery catches fire. That’s essentially the safety problem,” he said.

During the constant cycles of

charging and recharging, oxygen gases are released from the surface of battery materials. During that process, the pathway for lithium-ion transportation from the interior to the exterior can get blocked by metallic nickel dust, which is generated along with gas releasing, Cho said.

“When there is a blockage, there’s no way to transfer lithium-ions at the surface that want to come in and out. This leads to rapid decrement of battery capacity. As the amount of heat increases, the chances of fire and explosions also increase,” he said.

Cho suggests perhaps a well-designed oxide coating could be added on the battery surface.

“Modifications could lead to maintaining a charge for a longer period of time,” Cho said. “This is the problem industry is trying to solve right now for the next generation of lithium-ion battery. It’s very exciting, and we are working on the next stage.”

Fantai Kong PhD’17, lead author of the study and Cho’s former student, is a senior engineer with Hunt Energy Enterprises in Dallas working on large-scale energy storage and material projects. He said solving the heat problem in batteries could lead to a 20% to 30% higher capacity.

“We are right at the threshold of commercial viability,” Kong said.

The work was supported primarily by the government of South Korea and L&F Co. of Korea. —Melissa Cutler

ARTS AND CULTURE



Illustrator Becomes Picture of Success

A NEW CHILDREN'S book helps demystify the Muslim headscarf and inspire young girls to be proud of their faith, thanks to the illustration work of UT Dallas animation senior **Aaliya Jaleel**.

Jaleel's lively illustrations for *Under My Hijab*, which was released earlier this year by Lee & Low Books, tell the story of a young girl inspired by the women and older girls in her life who wear the hijab in ways that reflect their personalities and styles. Written in rhyming text by Hena Khan, the book is intended to celebrate modern American Muslim women who choose to wear it.

"I hope this book helps others to understand better the diversity of women who wear the hijab, as well as give confidence to the young girls who don't see themselves represented in media yet," Jaleel said.

This is the second book—and the first with a professional publisher—that Jaleel has illustrated. She also illustrated a self-published book with her English teacher as a sophomore in high school.

Jaleel's family sparked her interest in both wearing the hijab and becoming an artist. Born in Sri Lanka, Jaleel moved with her parents to the U.S. when she was 2.

Her grandmother taught her to do crafts and painting. By fourth grade, she was taking an adult still-life class. She has been drawing seriously since she was in the seventh grade.

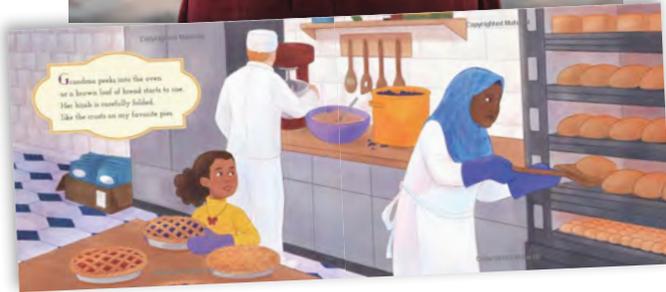
As a child, Jaleel sometimes felt self-conscious about her faith and appearance, so she could relate to the main character in *Under My Hijab*: a girl who goes through the day observing family members who wear the headscarf and gets inspired herself to also wear the hijab.

In the book, the young girl's grandmother works in a bakery and wears the hijab in public but goes without it when she bakes cookies at home. Her mother is a physician who wears the headscarf at work but gardens at home without it. Her aunt, an artist, wears the hijab turban-style.

Khan described Jaleel's illustrations in an interview as "simply stunning" and said they capture familiar elements of Muslim family life.

"She brings the characters to life on every spread, with the perfect balance of warmth and joy," Khan said.

Jaleel is now working on illustrating the book *Muslim Girls Rise* with Salaam Reads, an imprint of Simon & Schuster. The book will comprise 19 small biographies about progressive Muslim women. —Robin Russell



"She brings the characters to life on every spread, with the perfect balance of warmth and joy."

Hena Khan, author of *Under My Hijab*

ON CAMPUS



Neurologist Named New Dean of BBS

DR. STEVEN L. SMALL, formerly professor of neurology at the University of California, Irvine, and director and chief scientific officer of the Medical Innovation Institute at the UC Irvine School of Medicine, became the new dean of the School of Behavioral and Brain Sciences (BBS) on April 15.

Small, who holds a PhD in computer science from the University of Maryland in College Park and a medical degree from the University of Rochester, has conducted extensive research on the neurobiology of language and motor skills and the effects of stroke on these functions. His areas of expertise range from language processing and computational neuroscience to neuroimaging. His research involves direct investigation of human subjects, particularly in speech and language, and more recently clinical and fundamental neurobiological aspects of mild traumatic brain injuries such as concussions.

"UT Dallas has the most exciting trajectory of any university in the country," Small said. "Behavioral and Brain Sciences has a trajectory that is ascending, and my field is what BBS does: neuroscience, psychology, and speech and hearing sciences." —Stephen Fontenot

ON CAMPUS



The University Emergency Medical Response team has two golf carts to respond to medical needs on campus. From left: psychology junior Landon Wright, neuroscience senior Scott Bell, biology sophomore Brooke Wilson and healthcare studies senior Jagan Kandadai are among the 28 team members.

University Emergency Medical Response Team Expands Services

UT DALLAS STUDENT volunteers with University Emergency Medical Response (UEMR) serve as around-the-clock first responders to provide fast, direct Basic Life Support and first aid on campus.

Since fall 2017, the UEMR team has grown to 28 student volunteers with emergency medical technician (EMT) training who provide 24/7 service.

The team responds to an average of two calls a day, said Scott Bell, chief of the UEMR team.

“We found that people were not getting care for minor injuries, such as cuts or scrapes from a skateboard fall,” said Bell, who is a neuroscience senior. “Now we’re handling those, and we’re also answering life-threatening calls: seizures, breathing emergencies, chest pains, stroke, psychiatric problems and trauma.”

UEMR volunteers, who are mostly pre-med students, use golf carts to arrive within two to four minutes at any location on campus. Housed in Cecil H. Green Hall, two rotating team members are on-call each night, with others filling daytime shifts.

“Positively affecting patient outcomes is a real confidence builder for the providers, and the service is a great benefit to the campus community as well.”

Scott Bell

The team provides CPR, respiratory assistance, basic medication assistance and other noninvasive, life-support measures. They recently were approved to administer lifesaving drugs, such as epinephrine and naloxone, as well as to complete blood glucose assessments.

The UEMR team is notified whenever someone on campus with a medical emergency calls the UT Dallas Police or the city of Richardson’s 911 system. The team responds quickly, while volunteers stay in touch with the city’s emergency dispatchers who continue to monitor the situation.

While the team consists mostly of students who have EMT or paramedic experience, faculty and staff with EMT training also can volunteer.

Bell, who hopes to eventually become a physician and work in emergency medicine, said being part of the team is “an adrenaline rush.”

“I love going in and not knowing what you’ll find,” Bell said. “Getting hands-on experience is never an easy thing to do. You’re responsible for someone’s life. But positively affecting patient outcomes is a real confidence builder for the providers, and the service is a great benefit to the campus community as well.”

The group received the 2018 First Responder Award at the Texas EMS Conference in Fort Worth. Sponsored by the Texas Department of State Health Services, the award is given to a registered first-responder organization that demonstrates emergency medical services leadership in patient care, public access, medical control, disaster preparedness, public education or training. —Robin Russell

RESEARCH

Diabetes Drug Shows Promise for Chronic Pain

SCIENTISTS SEEKING an effective treatment for one type of chronic pain believe a ubiquitous, generic diabetes medication might solve both the discomfort and the mental deficits that go with the pain.

“People who are in constant pain have problems thinking straight sometimes. The longer you’re in pain, the more entrenched the impairment becomes,” said Stephanie Shiers, a cognition and neuroscience doctoral student at UT Dallas and lead author of the cover article in the **Aug. 15, 2018, issue of the *Journal of Neuroscience***. “These impairments aren’t addressed by existing therapeutics.”

In the study, UT Dallas researchers show how a type of chronic pain called neuropathic pain responds to metformin, one of the most prescribed medications worldwide, as well as to pain relievers gabapentin and clonidine.

Neuropathic pain is caused by damage to nerve cells. Examples include phantom limb syndrome, pain resulting from a stroke and the “pins and needles” sensations associated with diabetes.

Dr. Sven Kroener, associate professor, and Dr. Ted Price BS’97, a Eugene McDermott Professor, both in the School of Behavioral and Brain Sciences, are co-senior authors of the paper. Price, who is head of neuroscience, explained that pain affects a wide variety of regions of the brain.

“Metformin outperformed both clonidine and gabapentin.”

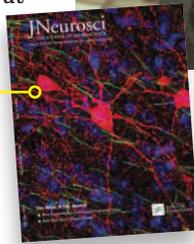
Stephanie Shiers

“The sensory input that drives pain sends electrochemical signals almost everywhere in your brain, including the prefrontal cortex,” Price said. “When neuropathic pain occurs and certain nerves become active all the time, a huge swath of your brain is now receiving this constant sensory input, and it has to adapt. It makes it go haywire.”

The study, which was conducted on mice, used a task that gauges attention and mental



Left to right: Dr. Sven Kroener, Stephanie Shiers and Dr. Ted Price BS’97



flexibility to measure how each drug helped or harmed the cognitive abilities of the rodents.

While clonidine did not change task performance and gabapentin affected it negatively, metformin reversed pain-induced impairments.

“We chose clonidine because it has a very robust effect on pain if injected into the spinal canal, and gabapentin because that’s the most widely prescribed non-narcotic pain drug,” Shiers said.

Previous studies have established that neuropathic pain patients’ cognitive deficits can persist even when the pain has been treated.

“That suggested to us that there was a long-lasting type of structural change at work in the brain,” Shiers said. “In this regard, metformin outperformed both clonidine and gabapentin.”

Kroener, whose research focuses on the function of the prefrontal cortex in animal models of schizophrenia and addiction, said the next step is to gain a better understanding of why metformin is effective in these cases.

“It’s great if a drug works. It’s even better if we know how it works,” Kroener said. “We observe the results, but we don’t know how they are achieved. That’s what we should pursue next: determining the pathways in which metformin works to correct these defects and how the physiology changes.”

Their work was supported by the National Institutes of Health and the UT System STARS (Science and Technology Acquisition and Retention) program. *—Stephen Fontenot*

ON CAMPUS

Engineer to Lead Jonsson School

DR. STEPHANIE G. ADAMS has become the fifth dean of the Erik Jonsson School of Engineering and Computer Science, effective Aug. 1.



Adams formerly was dean of the

Frank Batten College of Engineering & Technology and professor of engineering management and systems engineering at Old Dominion University. From 2011 to 2016, Adams was department head of Engineering Education at Virginia Tech, where she worked with its then dean of engineering, Dr. Richard C. Benson, now UT Dallas president.

Adams, president of the American Society for Engineering Education, holds a PhD in interdisciplinary engineering from Texas A&M University. Her research interests include interdisciplinary research, undergraduate and graduate education, leadership and service in professional organizations, teamwork and team effectiveness, and quality control. She is a leader in efforts to broaden participation of women and underrepresented minorities in engineering.

“Throughout the interview process, I found a vibrant, rapidly growing and exciting environment, which left me more and more impressed with the school and the University,” Adams said. “I look forward to working with Provost [Inga] Musselman, President Benson and the faculty, staff and students of the Jonsson School to continue the positive trajectory and growth.” *—Kim Horner*

PHILANTHROPY

Johnson Legacy Gift Endows 8 Science and Math Chairs

IN 2010 MAURINE Johnson, wife of the late **Dr. Francis “Frank” Johnson**, UT Dallas’ first acting president, became a member of the Legacy Society with a planned gift intended to create the Francis S. and Maurine G. Johnson Distinguished University Chair in the School of Natural Sciences and Mathematics. Upon her death in 2016 at the age of 97, Johnson’s gift of \$5.5 million became the largest planned gift in UTD’s history.

“These funds provide a perpetual source of support that allows for the recruitment and retention of outstanding individuals who will enhance students’ academic experiences and advance the reputation of their schools.”

Dr. Richard C. Benson



“The incredible generosity of this gift will make a tremendous impact at the University,” said Dr. Richard C. Benson, president of UT Dallas. “In addition to establishing the original distinguished chair, the bequest is allowing us to create seven additional Francis S. and Maurine G. Johnson Chairs to support the School of Natural Sciences and Mathematics.”

His leadership at UT Dallas helped to deepen the University’s connections with exciting developments in the new field of space exploration and cemented the University’s reputation as an innovative leader operating at the crossroads of academia and industry.

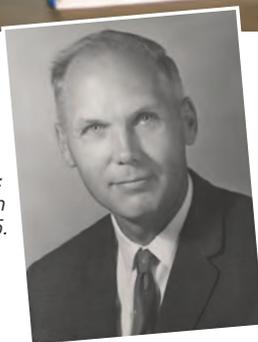
“Endowed professorships are the lifeblood of every great university,” said Benson, who holds the Eugene McDermott Distinguished University Chair of Leadership. “These funds provide a perpetual source of support that allows for the recruitment and retention of outstanding individuals who will enhance students’ academic experiences and advance the reputation of their schools.”

Dr. Hobson Wildenthal, executive vice president at UT Dallas, said: “The legacy that Maurine and Frank Johnson leave through this remarkable bequest will impact the realization of UT Dallas’ mission to become a world-class institution of teaching and research far into the future.” —*Daniel Steele*

As the original first lady of UT Dallas, Johnson occupied a unique position in the University’s history. While her husband and UT System leaders attempted to catalyze the development of the fledgling University and expand its breadth of expertise, she played a key role in helping to attract academic and industry leaders to campus and secure their commitments to join the University’s faculty. She welcomed recruits and distinguished guests in the couple’s home, hosting delegates from NASA and other space science institutions. By creating a caring and collegial environment for potential recruits and industry partners, she helped encourage many of the University’s first faculty members to come aboard.

“Maurine was Frank’s right-hand person, and together they accomplished so much,” said Penny Lesan, Johnson’s niece and executor of her estate. “They made quite the team through 66 years of marriage.”

An expert in atmospheric physics, Frank Johnson served as manager of space physics for Lockheed Missiles and Space Co., and, while working in the Naval Research Laboratory in Washington, D.C., he designed instruments to study the atmosphere using German V2 rockets captured after World War II. One of his crowning achievements was the invention of a gauge that was used to detect atmospheric pressure on the moon, a device that flew on Apollo missions 12, 14 and 15.



Above:
Dr. Frank Johnson with ionization gauge.
Right:
Johnson circa 1965.

PHILANTHROPY

\$3 Million Gift Creates Weitzman Institute for Real Estate

NORTH TEXAS REAL estate icon **Herb Weitzman** and his wife, **Donna**, believe mentorships, an entrepreneurial mindset and a customer-centric focus are the keys to building a successful real estate career. Their \$3 million gift to the Naveen Jindal School of Management at UT Dallas will help ensure that real estate students learn those lessons and put them into action in their careers.

The Weitzmans' gift will establish the Herbert D. Weitzman Institute for Real Estate at the Jindal School.

Herb Weitzman is founder and executive chairman of Weitzman, which operates full-service corporate real estate offices across Texas. Donna Weitzman, an entrepreneur, dating expert, author and podcaster, also has had an accomplished real estate career. She formerly served as Colleyville, Texas, mayor and City Council member.

The Weitzman Institute will provide scholarships for eligible undergraduate finance

and business administration students pursuing a concentration in real estate.

"The Jindal School is one of the best in the country," Donna Weitzman said. "So why wouldn't we want to be associated with winners? That's the way we looked at it."

Herb Weitzman said he is grateful for being able to build a career in Dallas and to build and maintain professional relationships with the visionaries who helped form the city. His and Donna's vision for the institute, he said, is a "phenomenal opportunity" to show real estate students and graduates how to continue building "the greatest city in the country."

"We hope that more and more people want to get into real estate as their vocation and then eventually open their own companies to be entrepreneurial," he said. "If somebody has the passion and gets a good mentor, the sky's the limit."

Weitzman's father planted



the idea in his 4-year-old son's mind of pursuing real estate as a career when they would walk the neighborhood to collect rent from tenants every month. Weitzman's mother, who operated the dry-goods store she owned with her husband, taught him about entrepreneurship and running a customer-focused business when he helped her in the shop on Saturdays.

Weitzman said his goal in establishing the institute was

to enable students from all socioeconomic backgrounds to consider real estate as a career option and to offer them the academic support and tools they need.

"A program that trains our future leaders offers the potential of reshaping the North Texas community in a positive way for decades to come," he said. "I'm honored to be able to contribute to that promise." —*Jimmie Markham*

ON CAMPUS

High-Speed Dream Fuels Student's Pursuit of Degree

A STUDENT IN the Naveen Jindal School of Management at UT Dallas is pursuing a bachelor's degree in global business with the hope that it will drive his success in a career not usually associated with that field of study.

"My one goal in life is to become a professional race car driver," said **Nicholas (Nikko) Reger**. "That's what I want to do."

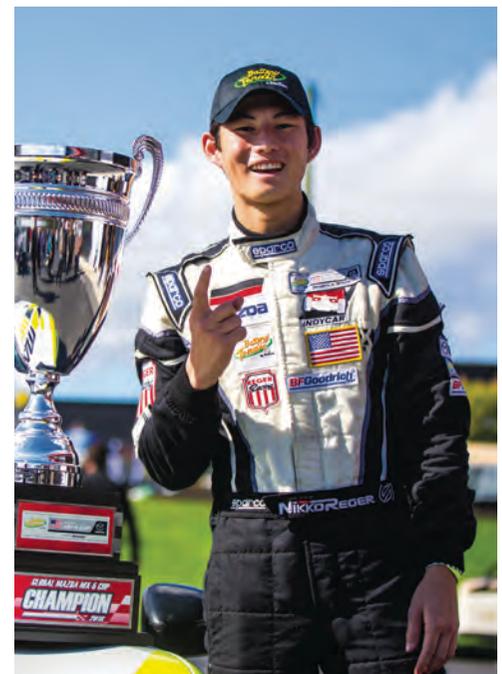
Reger started go-kart racing when he was 9. By age 13 he was in a full-size car—but only on racetracks whose governing bodies allowed it. He was the Texas Teen Mazda Challenge winner in 2014. In September 2018 he won the Global Mazda MX-5 Cup Championship and \$200,000, which he will invest in the next stage of his career.

Recently, he and his brother Timo climbed the next rung of the ladder by signing a contract to race in the 2019 IMSA Prototype

Challenge, a six-race series that runs through mid-October.

Reger said the global business program is a good fit for him because of the international nature of the racing business, which includes manufacturers across the globe. He frequently speaks with engineers from Germany and Japan. He is under contract with Mazda Motorsports, the North American auto racing division of Mazda Motor Corp.

"A huge part of a race car driving career is business," Reger said. "There's a million different business meetings with so many different companies. Racing is such a unique way of doing business because you're not necessarily selling a product. I have to be creative and sell my own personal brand instead." —*Jimmie Markham*



RESEARCH

Lab Helps Create Virtual Impaired Driver for Identifying DUIs

A UT DALLAS professor has teamed up with researchers at Sam Houston State University and EyeT Plus to create a virtual impaired driver — nicknamed “Brian” — that is helping to train police officers to identify one of the strongest clues to driving under the influence: twitchy eyes.

Brian is the star performer of a project called Individual Nystagmus Simulated Training Experience (INSITE), which helps identify horizontal gaze nystagmus (HGN). This condition — evaluated in a standard field sobriety test — is the involuntary jerking or twitching of a driver’s eyes as they follow an officer’s finger as it moves from side to side in front of the driver’s face. How soon the eyes begin to twitch as the officer conducts the horizontal gaze nystagmus test indicates the driver’s impairment level.

“HGN is subtle, and sometimes hard to recognize,” said Dr. Marjorie Zielke PhD’07, director of the Center for Modeling and Simulation/Virtual Humans and Synthetic Societies Lab at UT Dallas. “Simply put: The eyes don’t lie.”

The presence of HGN allows an officer to determine whether a driver is under the influence, said Sgt. Matthew Dusek, a drug recognition expert in the Northeast Police Department near Denton, Texas.

“HGN is an important indicator and one of the best clues that a drunken-driving arrest may be the appropriate action. Using Brian, a virtual trainer, is sure to boost officer confidence,” Dusek said.

Zielke’s team developed Brian in partnership with Sam Houston State University, which received a grant from the Texas Department of Transportation, and EyeT Plus, a group of police training subject-matter experts. INSITE is used throughout Texas as part of the Advanced Roadside Impaired Driving Enforcement (ARIDE) training program directed by SHSU.



“HGN [horizontal gaze nystagmus] is an important indicator and one of the best clues that a drunken-driving arrest may be the appropriate action. Using Brian, a virtual trainer, is sure to boost officer confidence.”

Sgt. Matthew Dusek

Consisting of the head and shoulders of an adult male, Brian combines 3D modeling, programming and animation to create a lifelike appearance. Mathematical algorithms map Brian’s physical features and eyes, which follow and twitch when an officer moves his finger horizontally in front of the screen, which is topped by a camera. The system is equipped with analytical algorithms to give feedback on the officer’s performance and technique.

Brian can be programmed to represent various levels of blood alcohol content

(BAC). Instructors can customize the BAC level, plus create a number of scenarios using different settings for eye redness, wetness, pupil size and pupil dissimilarity.

“The research team would like to get Brian into more police training programs,” Zielke said. “But the question is additional funding. At the moment, INSITE is positioned to help educate up to 500 officers in 2019.”

The UT Dallas team also is researching how to use Brian for identifying impairment due to use of marijuana and other drugs. —Melissa Cutler

PHILANTHROPY

Graves Charitable Foundation Gift Expands Jindal School's International Efforts

THE NAVEEN JINDAL School of Management will benefit from two new endowments designed to expand the school's study abroad programs and forge new partnerships with academic and economic institutions in developing countries.

Established with a \$1 million gift from the Ann and Jack Graves Charitable Foundation and supplemented with matching funds from the Jindal School, both endowments promise to enrich students' experiences at UT Dallas through increased opportunities for intercultural collaboration.

"We are very grateful for the foundation's generous support of these important programs at the Jindal School," said Dr. Hasan Pirkul, Caruth Chair and Jindal School dean. "Ensuring that our students are empowered to broaden their horizons and understand the impact that their talents can make in the world is a part of our school's mission."

The new Ann and Jack Graves Foundation Global Business

Scholars Fund will provide scholarship support for international student travel and study abroad experiences, with a particular focus on travel to Africa. Jindal School students studying global business are required to complete one study abroad experience, which may be fulfilled through a semester-long exchange program, an international fellowship or by taking two global experience courses at UT Dallas.

Mike Redeker MBA'97, MA'01, who helps administer his family foundation, was inspired by his own experiences as a student to support study abroad efforts at the Jindal School.

"The first semester of my MBA program, my professor announced a trip to Vietnam, Singapore, Indonesia and Hong Kong. Having never been outside the United States, I signed up for the adventure," Redeker said.

"When we arrived, we met with high-ranking government leaders and multinational



business executives. The experience opened my eyes not only to the unique opportunities of emerging markets but also to an appreciation for efficient markets. Most of all, it helped me to see people not as 'other' but as fellow human beings who want the best for their children."

The foundation's second endowment will help leverage Jindal School expertise in order to promote economic advancement in developing countries, specifically targeting African economies. The Ann and Jack Graves Foundation Society of Emerging Economies' Development Fund will support a wide

range of initiatives, including academic conferences, new partnerships between UT Dallas and international universities, and research projects by faculty and students.

"The reason we directed funding to UT Dallas is to employ the tools available in the Jindal School to address how we can best help the world's poor," Redeker said. "I believe that UTD can partner with universities in developing economies to listen to the needs of communities, help them develop sustainable business solutions and help measure the results so we can constantly improve the model." —*Daniel Steele*

IN MEMORIAM



Remembering BBS Professor James C. Bartlett

Dr. James C. Bartlett, Ashbel Smith Professor of Psychology and a faculty member for 44 years in the School of Behavioral and Brain Sciences (BBS) at UT Dallas, died on June 1 at the age of 70.

BARTLETT, WHOSE SCHOLARLY specialties ranged broadly over cognitive neuroscience and cognitive psychology, made many significant contributions to the research and teaching missions of the University and provided leadership in a variety of important

capacities. He served as associate dean of the School of Human Development (the prior name of BBS) from 1989 to 1992; as dean of graduate studies and research from 1992 to 1994; as chair of the UT System Faculty Advisory Council from 2004 to 2005; and as head of the PhD program in cognition and neuroscience from 2004 to 2015. Most recently, Bartlett served as the interim dean of BBS from 2015 to 2018.

Bartlett received his bachelor's degree from UT Austin in 1970 and his PhD from Yale University in 1975 — the same year he took his faculty appointment at UT Dallas and the first year that the school admitted undergraduates.

Bartlett's research focused on how people receive and retain nonverbal information — from melodies to faces and places. He also was among the first to research holistic memory processing — producing pioneering behavioral evidence that the brain processes faces as a unit, and not by their individual components.

"I want my research to help people, but at the same time, I've always had an instinctive desire to discover things," he said in 2015. "I tell my students it's like Christmas morning when they come in with new data from a completed experiment. I don't know where that comes from. It's the kind of thing that brings me joy." —*Stephen Fontenot*

RESEARCH

Team's Peace Project Focuses on Ending Deadliest Type of War

A NEW FEDERALLY funded research project at UT Dallas aims to identify the most effective strategies for ending



the deadliest type of war: civil conflicts that involve other countries.

Dr. Paul Diehl,

Ashbel Smith Professor of political science in the School

of Economic, Political and Policy Sciences, recently received a grant from the U.S. Institute of Peace to study methods for reducing violence in internationalized civil wars, such as those in Yemen, Syria and Ukraine.

Interventions in these conflicts often focus on either the civil or the international aspects of conflict, Diehl said. He added that research rarely addresses the dual challenges of internationalized civil wars. The new project, which also involves researchers from the University of Notre Dame and the University of Georgia, aims to understand how to manage both at the same time.

"We'd like to identify pathways to transform hostile relations into peaceful ones," said Diehl, who is also associate provost and director of the Center for Teaching and Learning.

Internationalized civil conflicts have the most fatalities, last the longest and are the most difficult to resolve because of the challenges involved in reducing violence within a nation as well as between rival states, Diehl said. Civil conflicts often spill over into other states with refugees flowing across borders and other countries taking sides. Diehl said only 13% of efforts to reach compromises are successful.

The U.S. Institute of Peace, created by Congress in 1984, is dedicated to the proposition that a world without violent conflict is possible, practical and essential for global security. *-Kim Horner*

ON CAMPUS

Service Learning Classes Build Community Connections

IN SOME OF the newest UT Dallas classes, students help immigrant high schoolers with English. Another class talks to fifth- and sixth-grade girls about social media and bullying. And still another works with homeless teens in Dallas.

These classes are part of the University's growing community-based service learning program, which gives students the opportunity to explore new topics while serving as teachers and mentors in the community.

The University received a three-year, \$1 million grant in 2017 from the UT System for "Engagement through Collaboration, Mentorship, and Service Learning." The funds were part of a broader \$10 million initiative that provided for campus-based programs in support of former Chancellor William H. McRaven's Student Success Quantum Leap.

The goal of community-based service learning is to increase students' sense of belonging, one of three pillars that the UT System has identified as critical for student success. (The other pillars are finances and advising.)

The weekly, small-group classes have been a success, with many students saying the experiences were meaningful and gave them a greater sense of purpose, said Dr. Joanna Gentsch MS'96, PhD'06, director of student and community engagement, who designed and expanded the program across campus.

"Our students are gaining a sense of belonging by connecting with each other and people in the community," said Gentsch, a senior lecturer in the School of Behavioral and Brain Sciences.

The program has expanded from one class initially to 10. One of the most popular is #GOALS, in which UT Dallas students help immigrant students in the Richardson Independent School District (RISD).

Ashlea Campbell, program specialist for Student Assistance in RISD, said the classes have helped students from other countries better adjust to their new schools. As a result, the district expanded the program, now at four campuses, and asked UT Dallas to create a class to address bullying for upper-elementary girls.



In addition to the classes in the Richardson schools, the University offers a variety of community-based service learning courses, including Hidden in Plain Sight, which involves working with teens at a Dallas ISD drop-in center for homeless students.

Another course, **Juega Conmigo (Play With Me)**, facilitated by the UT Dallas Center for Children and Families, offers free weekly parent-child playtimes for children through age 3 (see related story on page 22).

Other courses address topics such as Women in STEAM (science, technology, engineering, art and math), LGBT issues, and pregnancy and parenting challenges. *-Kim Horner*

STUDENT SUCCESS

Sense of Belonging

Finances

Advising

The goal of community-based service learning is to increase students' sense of belonging, one of three pillars that the UT System has identified as critical for student success.

ON CAMPUS



Increasing Mathematics
Potential across Texas:

IMPacT

UTD/UTRGV Program Creates Equation for Stronger Math Impact

A NEW INITIATIVE involving two sister institutions in The University of Texas System aims to prepare students better for graduate studies and careers in mathematics while enhancing diversity among applicants.

UT Dallas received a grant from the National Science Foundation to develop a program with UT Rio Grande Valley (UTRGV) to encourage more students from underrepresented groups to pursue PhDs in math.

The partnership created Increasing Mathematics Potential across Texas (IMPacT), which combines innovative educational practices with industry connections.

“If we want to increase the pool of applicants for graduate school, we first need to enhance upper-level undergraduate classes so students are better prepared to pursue graduate studies,” said Dr. Vladimir Dragovic, professor and head of the Department of Mathematical Sciences at UT Dallas who leads the collaboration with Dr. Timothy Huber, director of the School of Mathematical and Statistical Sciences at UTRGV.

With six locations across the Rio Grande Valley, UTRGV is classified as a minority-serving institution, with more than 87% of its student body being Hispanic. While

“Mathematics is a vibrant profession, with many diverse opportunities, but that knowledge has not reached the wider community, even among university students, so we want to showcase the many career possibilities.”

Dr. Vladimir Dragovic

UT Dallas has a PhD program in mathematics, UTRGV does not.

As part of IMPacT, Dragovic and his colleagues developed hybrid versions of five of the most advanced undergraduate math courses — Abstract Algebra 2, Mathematical Analysis 2, numerical analysis, problem solving and mathematical statistics — blending online instruction with in-person interaction. Good performance in these courses indicates to PhD admission committees that a student is well-prepared for the rigors of a doctoral program, Dragovic said.

In January both campuses began teaching the first two classes — Abstract Algebra 2

and Mathematical Analysis 2 — with 65 students at UT Dallas and 12 at UTRGV. The format involves synchronous teaching, where students at each institution — some 550 miles apart — attend at the same time and are linked via videoconferencing.

Another component of IMPacT involves leveraging UT Dallas’ ties with companies and government agencies in North Texas to identify opportunities for students of both universities to get involved in industry-related research.

“Mathematics is a vibrant profession, with many diverse opportunities, but that knowledge has not reached the wider community, even among university students, so we want to showcase the many career possibilities,” Dragovic said.

In addition, UT Dallas will offer students from both universities summer boot camps to enhance problem-solving and communication skills, cultivate research aptitude and assist in navigating the application process to a PhD program.

“We have built this joint infrastructure between two geographically distant universities with distinct student populations and resources, and we hope it will serve as a national model,” Dragovic said. —*Amanda Siegfried*

UT Dallas Gets in New Game With

esports

By Brittany Magelssen

IF YOUR CONCEPT of a collegiate video-game player elicits the image of a student alone in his dorm room surrounded by empty snack wrappers and energy drinks, think again.

Esports, the competitive side of video games, is taking off at universities across the country.

The University of Texas at Dallas launched its own esports program in fall 2018, making it one of the few universities in Texas to offer esports under the umbrella of the athletics department, along with more traditional sports like basketball, volleyball and track.

“It does seem fitting that esports is the newest addition for the athletic programs,” said Dr. Gene Fitch Jr., vice president for student affairs. “To say that this was the perfect match is probably an understatement.

“Video gaming and UTD go together like peanut butter and jelly, or hot sauce and chicken wings. It was just a matter of time before the vision was realized, and now, here we are. This phenomenon known as esports has found its home at UT Dallas.”

Esports team members are held to the same standard as their Comet sports peers. They must maintain a minimum 2.0 GPA while also upholding a code of conduct when representing the University. Students also serve in support roles as analysts and assistant coaches.

“It’s nice to have esports at a collegiate level because it allows students to not only get the competitive experience, but also the education they want,” said coach Greg Adler.

According to ESPN, varsity collegiate esports began in 2014 when Robert Morris University in Illinois announced a scholarship-sponsored “League of Legends” team. By 2019 the scene included around 145 colleges and universities and a national governing body known as the National Association of Collegiate Esports.

\$1.1B

esports revenues

**453
million**

esports audience

2019



Dreams of eVictory

LAST FALL, GREG ADLER scored his dream job.

"Greg will be part of history as UTD's first esports coach," said UT Dallas athletics director Bill Petitt. "He brings a passion and knowledge of both games we initially launched, and I feel he will be a great ambassador of our university and will help us become a program that will be recognized globally."

A native of Holland, Pennsylvania, Adler earned his bachelor's degree in music education from Kutztown University in 2015. As a student, Adler maintained an active esports schedule and competed at a high level in both "League of Legends" and "Overwatch."

Upon graduation, Adler formed the PMA League of Legends Championship Series, creating and running a 10-team, 10-week "League of Legends" tournament. He also is a past representative with the New York Excelsior team in the "Overwatch" League.

"I am extremely excited to help develop the esports program within UTD," Adler said. "The potential for success and growth is limitless, and, with the support the administration has shown, this program will become the premier example of collegiate esports in the country." ■





In March, a UT Dallas "Overwatch" team won first place at Planet Comicon in Kansas City, Missouri.

esports *continued*

The first games UT Dallas teammates played competitively were "League of Legends" and "Overwatch" — two popular, multiplayer online games.

In January, UT Dallas appeared in the inaugural ESPN Top 25 College League of Legends Coaches Poll. The Comets ended the season ranked 20th in the nation.

The season ended for one of two "League of Legends" teams in the quarterfinals of their playoffs after a loss to UT Austin. One of two "Overwatch" teams made it to the Sweet 16 in their tournament, but lost to Missouri's Maryville University, the No. 1 team in the country.

UT Dallas was the only school in the country to have two "Overwatch" teams make it to the Top 64.

Garrett Porter, an "Overwatch" team member, said esports can be as competitive as traditional sports.

"The level of skill involved can be just as much as any other sport," said Porter, a junior in the School of Arts, Technology, and Emerging Communication (ATEC). "It is serious; there are people who put a lot of time into it and can get really good at it."

In February, the program announced its third official team with the addition of "Super Smash Bros. Ultimate." The 2018 crossover fighting game is a competitive favorite in which players battle to be the last one standing on a stage. It features more than 70 different characters, including Mario, Donkey Kong, Pikachu, Zelda, Link and Pac-Man.

"Super Smash Bros.' is a game series that has existed at a highly competitive level since its debut in 1999, so we're confident that the game will have longevity," Adler said. "With 'Ultimate,' the latest installment in the series, we saw how successful our students were and knew this would be the perfect addition to our program."

The "Super Smash Bros. Ultimate" team won first place in the Collegiate Starleague Southern Division Conference in May, ranking UT Dallas No. 1 in the South. The team will travel to Massachusetts in August to compete in nationals at Shine 2019, one of the largest "Smash" tournaments in the world.

A love of gaming isn't new to UT Dallas, known for its "nerd" culture. ATEC's game design programs have been ranked among the nation's best. The Student Services Building Addition, which opened in January 2017, features a gaming wall where students play games like "FIFA 17" and "Star Wars Battlefront." The University is also home to many video game-related research projects, lectures and events.

"Overwatch" analyst Lindsay Caudill, a junior marketing major, said UT Dallas is the perfect environment for an esports team.

"We have a bunch of bright, intelligent students that come here, and a lot of them do like to spend their time gaming," she said. "There's a big passion for it, and no one is shy when they talk about gaming."

Esports is the 14th varsity sport at UT Dallas. ■

Alum Energizes Esports With Gift To Name Arena

DANIEL SHEN BS'10 remembers when his older brother brought home the family's first computer.

It was a foreign object. A big box that their parents did not understand. He looked on in awe while his brother played games like "Tetris" and "Pong."

Shen went on to enjoy games such as "StarCraft," "Counter-Strike" and "League of Legends," and even played "World of Warcraft" competitively full-time from 2006 to 2008.

As a gamer himself, the alumnus wants to help develop esports at UT Dallas. His \$100,000 gift has named the new Sector 7 Energy UT Dallas Esports Gaming Arena, a facility in the Student Union where the esports teams train and play.

"Watching it evolve into what it is today is very fascinating, considering a decade ago when I attended UTD, you couldn't fathom any university adopting esports as part of its athletics program, let alone even recognizing it as something good for students or athletes," said Shen, who earned a bachelor's degree in psychology from the School of Behavioral and Brain Sciences. He founded the Plano-based energy consulting firm Sector 7 Energy in 2015.

Shen said he is proud that UT Dallas is at the forefront of the development of this industry. He hopes his first gift to the University will help propel the program's expansion and the teams' successes in league matches.

The 24-seat arena has four 80-inch TVs for match viewing, a cubicle for the coach, Alienware Gaming PCs and custom chairs.

"The space is incredible," Shen said. "I expected it to be simpler, but they've made an actual arena on campus with professional equipment."



Daniel Shen's \$100,000 gift has named the new Sector 7 Energy Esports Gaming Arena, where members of the UT Dallas esports teams train and play. Shen's passion for video games is reflected in the name of his energy consulting firm, named after a sector in the video game "Final Fantasy VII." His company's corporate facility features an esports room and an arcade for its employees.

In his remarks during a dedication and ribbon cutting for the esports training room, UT Dallas President Richard C. Benson shared Shen's enthusiasm.

"It is hard not to be utterly astounded by the level of excitement that esports generates," said Benson, who is also the Eugene McDermott Distinguished University Chair of Leadership. "I'm really pleased that we are part of this trend." ■





CENTER FOR CHILDREN AND FAMILIES

THE PLAY'S THE THING

By Stephen Fontenot

THE SOUND OF young children's voices and their parents' singing, interspersed with enthusiastic, rhythmic clapping, distinguishes one classroom from the others. Inside, seated in a circle, are a dozen babies and toddlers, each sitting with a parent and all fixated on a singular message.

The lesson is simple: playful learning.

And that lesson, together with parenting conversations that promote nurturing parent-child relationships, has been taught for eight years by Adriana Villa Baird, program director for *Juega Conmigo* — Spanish for “Play With Me.”

Juega Conmigo is a central component of the outreach programming from The University of Texas at Dallas' Center for Children and Families (CCF). Now in its 10th year, CCF is celebrating a decade of accomplishments while making plans for its future growth.

Founded in the fall of 2008 by developmental psychologists in the School of Behavioral and Brain Sciences — and with support from a three-year, \$350,000 matching grant from the Meadows Foundation — CCF's mission is to enhance the community's understanding and application of child development via research, outreach and service.

“We set out to become a recognized, impactful resource for children and families in the community around us,” said Dr. Margaret T. Owen, Robinson Family Professor and CCF director. “We're doing that by sharing results of our research on children's development and applying lessons shaped by the research into services for children and their families.”

PLAY AND GROW

THE CENTER'S INITIAL outreach activities included a spring lecture series, fall forum, a resources and referrals phone line, and developmental screenings for young children — programming that has continued to be offered throughout the past decade. The screenings for developmental delays, provided in English and Spanish, were initially provided when parents sought a screening because they were concerned about their infant's or toddler's development. These assessments chart cognitive, language and social-emotional abilities as well as motor skills. They also identify needs for developmental guidance and intervention services.

CCF staff were surprised to uncover an even larger need than they had expected.

"In this first decade, we've conducted more than 1,300 developmental screenings," Owen said. "Nearly 40 percent of the screenings have identified developmental delays or concerns in the children. In turn, we referred one-quarter of the children for intervention services."

With an initial grant in 2011 from The Dallas Foundation, CCF began providing screenings in both English and Spanish in the activity room at the Bachman Lake branch of the Dallas Public Library. In an effort to attract more parents and spread the word about the value of having a developmental screening for their child, the center decided to have a drop-in playtime for children ages 0 to 3 and their parents or caregivers in the activity room, with attractive toys and fun routines. This sparked the creation of *Juega Conmigo*.

"We quickly recognized that having all of these children and parents in one room together was a great opportunity to show parents the benefit of playing with their kids," Baird said.

Using toys, music and movement, Play With Me has grown to include eight sessions each week in five locations for bilingual, Spanish-speaking and English-speaking families.

"We evolved quickly, developing the program's structure, curriculum and routines, and we provided a safe space for parents to learn from us and one another," Baird explained. "We now serve over 550 children and parents annually with this program. It's been shown to help bring about more positive parenting practices, increase parenting confidence and reduce parenting stress — all leading to children's healthy development and readiness for school."

Betania Calles is one of those parents. She brings her 17-month-old twins, Bruno and Fernanda, to Play With Me sessions at a Richardson Independent School District elementary school.

"I bring my children here to interact with other children in a new environment," Calles said. "They are encouraged to explore, and it helps me understand how they learn."

Maria Reyes brings her 3-year-old son, Axel, to the same class, where about 10 pairs of parents and children play and learn for 75 minutes every Tuesday.

On a recent visit, Axel, who smiles easily, seemed to relish playing with trucks and bubbles and was delighted to learn with his mom how to make a pinwheel spin.

"He's learning to follow instructions and play with children his age — his siblings are 7 and 5," Reyes said. "He's always happy here."



Adriana Villa Baird teaches playful learning to preschoolers and their parents at Juega Conmigo.

“The first three years of school provide the foundation for virtually all learning that comes after.”

-Dr. Margaret Owen



CHARTING NEW PATHWAYS

THE SUCCESS OF the center’s services rests upon the research of affiliated faculty members, whose developmental expertise funnels into the outreach programs. UT Dallas students also gain academic and hands-on experience assisting in the program.

“Our faculty affiliates provide translational research results that we communicate to the community in ways that inform policymakers, guide the work of service providers and educators, and enhance families’ lives,” Owen said.

Owen’s current long-term research project is the Dallas Project on Education Pathways. It has yielded findings that show how various child and family factors influence the development of school readiness and school success of urban minority children.

The study began in 2009 with an initial \$1.2 million grant from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, part of the National Institutes of Health. The Dallas Preschool Readiness Project, as it was called then, is one of the nation’s first and longest studies of childhood self-regulation development and its implications among African American and

Hispanic children. It is co-led by Owen and Dr. Margaret Caughy, the Georgia Athletic Association Professor in Family Health Disparities at the University of Georgia.

The researchers have been following 407 low-income children in the Dallas area since they were 2½ years old. They are studying the factors that contribute to disparities in their acquisition of self-regulation skills, such as the ability to listen, sit quietly, and remember and follow instructions.

The researchers also are tracking how the development of self-regulation skills affects a child’s future academic achievement in reading and math.

“The first three years of school provide the foundation for virtually all learning that comes after,” Owen said. “Entering school with less-well-developed skills can have a lasting impact on academic achievement if a child misses out on these foundational skills.”

In 2017 the researchers received a five-year, \$2.8 million renewal grant from the NIH to study the students’ transition into middle school.

“We have seen delays in the development of these skills in many of the children we’ve studied, but we’ve also observed strengths and resilience in a number of the children and their families. These findings hold promise for the development of new programs of support for children at risk in our community,” Owen said.

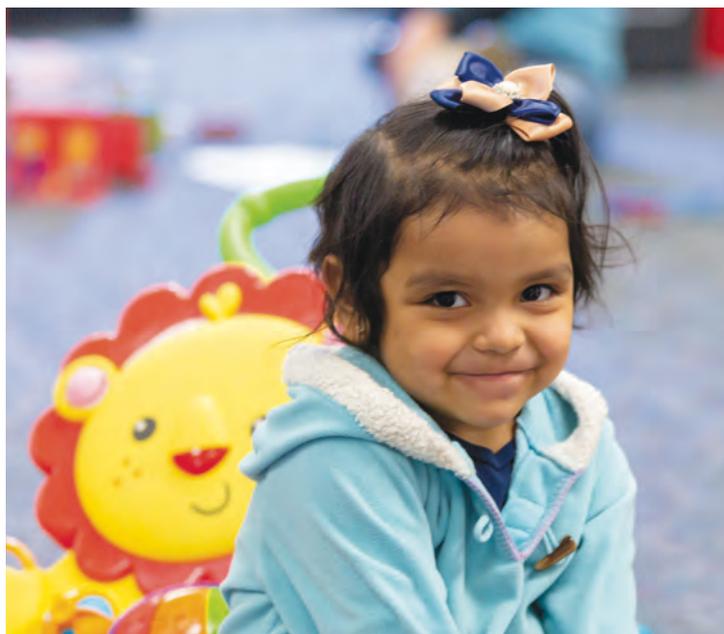
FOOD FOR THOUGHT

CCF-AFFILIATED FACULTY RESEARCHERS examine a wide range of biological, cognitive, language, social-emotional and cultural areas of development and their implications for families. An essential element of early childhood development is nutrition.

Dr. Shayla Holub, associate professor of psychological sciences, is affiliated with the CCF. Her research focuses on the role parents play in forming children’s eating habits and how dietary patterns evolve in early childhood.

“It’s during the preschool period that children learn to use food to respond to both happy and sad emotions,” Holub said.

She and her colleagues published a study in 2018 in the journal *Appetite* that demonstrated that children from 4 to 9 years old chose chocolate candy over goldfish crackers more frequently in response to both happiness and sadness.





Their study showed that, when presented with four snacking options, children who were shown sad video clips from Disney's *The Lion King* ate more chocolates than children who were shown happy video clips, who in turn ate more chocolates than children who watched neutral video clips.

The study's results also show that these tendencies increase as children progress in their early school years.

"The developmental differences we saw in our sample suggest that eating in response to emotions is likely socialized by parents and others," Holub said. "Understanding the role that parents and caregivers play is key to developing interventions to promote children's health."

REAL-WORLD SOLUTIONS

RESULTS OF UT Dallas research and that of child development experts at other institutions are disseminated through two annual avenues: the fall forum and spring lecture series, both of which have been mainstays of CCF's programming from its early days.

"Since 2012 our annual forum has offered speakers that promote greater understanding of how children thrive," Owen said. "We bring together widely renowned psychologists, developmental and educational experts, and local perspectives to engage with the community on issues critical to children's healthy development."

CCF also collaborates with UT Dallas' Callier Center for Communication Disorders at six screening fairs at various high-need community sites, where children are evaluated and, if needed, referred for developmental, vision, hearing and language delays.

"Being able to work with the specialized experts at Callier to provide hearing and language screenings has allowed us to provide screenings that address a fuller array of needs of the children and their families. We've also brought in vision screening services for the families attending the fairs," said Maria Maese, program

director of *Crece Conmigo*, or "Grow With Me," a program that offers comprehensive developmental screenings for children from birth to age 5.

"It takes a village," may be a cliché, but for CCF, it is a fact. Funding for the center is provided by a growing number of individuals, corporations and foundations, in addition to considerable support from the School of Behavioral and Brain Sciences. All of the center's outreach programming is provided at no cost to families, with costs offset by gifts like a recent \$50,000 contribution from The Dallas Foundation. All told, nearly one-third of CCF's budget comes from donations by foundations and individuals.

With a healthy, successful decade behind it, CCF is poised to thrive as it moves into its next stage, with a continued focus on the well-being of the next generation.

"Drawing on the wealth of interdisciplinary child-development research conducted by our faculty and students, and with the visionary leadership of BBS's former dean, Dr. Bert Moore, we set forth to promote optimal family and child development through research, practice and outreach," Owen said. "Now, we're charting our course with a dedication to solving real-world challenges and bringing science-based solutions to families and communities." ■

"It's during the preschool period that children learn to use food to respond to both happy and sad emotions."

-Dr. Shayla Holub

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Winds of Change

by Amanda Siegfried

IT'S CLEAN; it's sustainable; and it's abundant from the Gulf of Mexico to the West Texas plains. UT Dallas engineers are riding a tailwind as their work propels innovations that will help increase wind's role as a power player in the Lone Star State.

Take a spring drive along Interstate 20 near Sweetwater in West Texas, and you'll see them, towering above the bluebonnet-strewn landscape like pinwheels in a giant's garden.

The Roscoe Wind Farm in Nolan County is one of the world's largest-capacity wind farms, with more than 600 wind turbines generating enough electricity to power over 250,000 Texas homes.

For a state nearly synonymous with oil and natural gas production, Texas leads the nation in the number of wind turbines — more than 13,000 — and in its capacity to generate electricity from wind. In 2018 that was enough to power more than 7 million homes.

Wind not only generates power, but it also fuels jobs and economic development in the Lone Star State. According to the American Wind Energy Association, Texas leads the nation with more

than 25,000 people employed in the wind industry, and it has 46 manufacturing facilities that produce products and supply raw components.

As the wind business booms — not only in Texas but across the country and worldwide — engineers at The University of Texas at Dallas are driving innovation in wind-turbine design and efficiency, propelled by new research facilities and a state-of-the-art building that provide opportunities for students to learn and for industry partners to boost their bottom lines.

WindSTAR

TEXAS' WIND-FRIENDLY terrain sits at the south end of a blustery corridor that stretches from the Great Plains into Canada, an ideal environment for the huge, three-bladed whirligigs.

Likewise, UT Dallas' Department of Mechanical Engineering is well-positioned both geographically and with the right blend of faculty expertise to meet the challenges facing the wind industry.

Much of the University's wind-energy-related research falls under the umbrella of the Wind Energy Science, Technology, and Research Industry/University Cooperative Research Center, or WindSTAR. Established in 2014 in collaboration with the University of Massachusetts Lowell, WindSTAR is one of 91 such cooperative centers funded by the National Science Foundation and the only one devoted to wind energy.



WindSTAR currently has 13 fee-paying industry members who work closely with academic researchers to identify projects and problems of interest.

“We are doing user-inspired research driven by a need, as opposed to fundamental research driven by curiosity,” said Dr. Mario Rotea, head of mechanical engineering at UT Dallas and co-director of WindSTAR. “The potential for wind energy is tremendous. But realizing this potential requires a coherent industry-relevant research and development program that involves industry, academia and government.”

Threefold Approach

WITHIN WINDSTAR, UT Dallas engineers and their students work collaboratively in three broad areas of research that intersect and inform one another: data gathering and analysis, computational fluid dynamics, and design of the control systems that operate turbines.

Combined, these efforts reveal ways to improve efficiency, performance and reliability, from the single turbine level to the scale of large wind farms.

Wind turbines are designed in the absence of detailed information about their ultimate installation location or configuration. So within each machine, sophisticated control systems and software adjust the pitch, yaw and speed of the blades and rotors in order to optimize performance for a given situation or environment.

Rotea’s research focuses on developing control systems that can automatically adapt the movement and orientation of turbines to their home conditions.

For example, turbines that end up in uneven or rough terrain will face wind patterns that are different from those in a flat, open area. In addition, a turbine’s placement within hundreds on a large wind farm can dictate how it will need to move: The rotating blades of a “lead” turbine produce ripples, waves and other disturbances in the air that can affect and interfere with air around turbines downstream, much like the wake of one boat can affect a boat behind it.

“The control system on each machine is automated and designed to respond in real time to changing conditions,” said Rotea, who is the Erik Jonsson Chair in the Erik Jonsson School of Engineering and Computer Science. “The system must adjust each turbine’s

orientation in order to extract maximum power from the wind while not putting too much strain on any individual turbine.”

Rotea’s work is informed by that of his colleagues who combine field data with expertise in computational fluid dynamics. (From a mathematics and engineering standpoint, moving air and moving liquid are both treated as fluids.)

Dr. Giacomo Valerio Iungo, assistant professor of mechanical engineering, takes students and mobile equipment to a wind farm in North Texas to collect data. Measurement-taking involves light detection and ranging equipment, or LiDAR, which is similar to radar but uses light instead of radio waves. The technology directs pulsed laser beams toward a moving wind

turbine and then picks up the reflection off of particles moving in the turbulent air.

“As the laser scans and bounces off of the moving air particles, we get information that can then be processed to give us wind speeds and direction,” Iungo said.

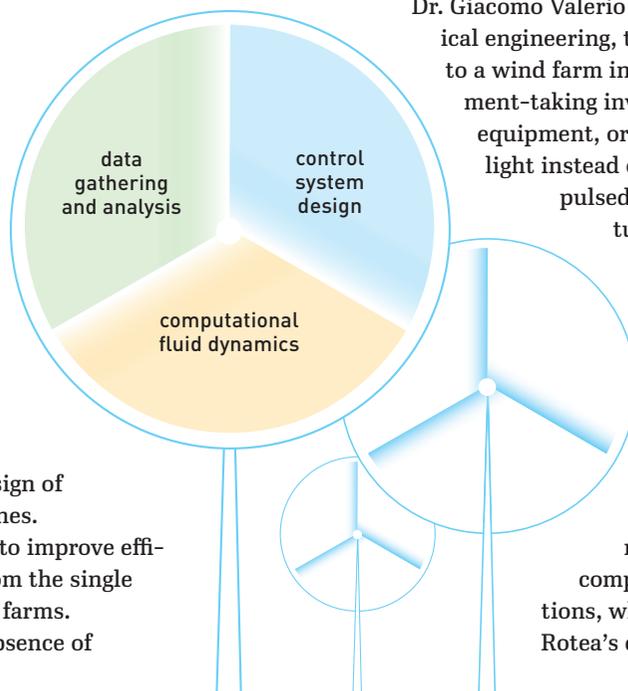
Data from such measurement campaigns is used by Dr. Stefano Leonardi, associate professor of mechanical engineering, in his complex computer models and high-fidelity simulations, which also incorporate information from Rotea’s control system work.

For example, Leonardi is investigating how much power is lost per turbine when the wake from one wind turbine interacts with another. Wind-farm configurations can cause up to 20% of lost production every year, according to the U.S. Department of Energy.

To measure the power production of each turbine and find potentially more efficient configurations, Leonardi’s research group runs their data-intensive simulations on high-performance computers at the

Texas Advanced Computing Center at UT Austin. Information from such research could affect future wind-farm layouts and provide more accurate predictions of how much power is generated every year from a wind power plant.

“This collaboration is very fruitful,” Rotea said. “Dr. Iungo collects and analyzes field data; Dr. Leonardi uses some of that data to validate his computer models; and I inject the control systems. All of this combined can tell us what works in terms of improving the performance of a wind farm.”



“The time is right to leverage our investments in this field, to make Texas an even greater state for wind power in particular and wind engineering in general.”

-Dr. Richard C. Benson

Industry Benefits

COMPANIES INVOLVED IN WindSTAR gain access to UT Dallas research and advanced facilities, as well as student projects focused on industry-driven needs. Industry partners range from turbine manufacturers to owner/operators to component and service providers.

Results from UT Dallas projects have provided valuable preliminary data to WindSTAR partners who then use that information to apply for federal grants. A recent WindSTAR collaboration with center member Aquanis resulted in just such an award.

Aquanis is a Rhode Island-based company that makes plasma actuators, which modify the air flow over the turbine blades, enabling them to instantly react to changes in the wind. This advanced control system reduces the cost of wind energy by making wind turbines more durable and eventually allowing blades to be built with less material.

UT Dallas engineers worked on a project with Aquanis to gather data on using plasma to reduce mechanical loads on blades at high wind speeds. The company used that data in a funding proposal, and in 2018 won a grant from the Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) to increase the power output of wind turbines without increasing the mechanical loads.

"For an investment of about \$30,000, Aquanis received \$3.5 million, and UT Dallas got about \$1.4 million to continue our research efforts," Rotea said. "That's a phenomenal return on investment for this company."

"This industry/university cooperative research center is an example of how UT Dallas has become part of an effort that has tremendous value to the innovation engine in this country. The end result will be new technologies for wind-power diagnostics, new control systems for improved reliability and energy capture, and graduates who are ready to take the lead in the field."

In 2018 power generated from wind in Texas avoided 54 million metric tons of carbon dioxide emissions.

American Wind Energy Association



Award-Winning Building Offers Inside View of Engineering at Work

Four-stories high with 200,000 square feet of labs, classrooms and office space, the new Engineering and Computer Science West (ECSW) building at UT Dallas is inspired by student learning and advanced research. Designed by faculty and staff, the all-glass, modern exterior is sure to turn heads, but it is what's inside that makes it a tangible lesson in engineering.

The \$110 million facility, which opened in fall 2018, was supported by bonds and funding from various sources and primarily houses the Department of Mechanical Engineering. It includes a 300-seat auditorium, a retail food grab-and-go, a third-floor student lounge with a balcony and a landscaped courtyard with seating for study groups.

Special attention was paid to the building's framework. All the piping and heating systems are visible, as are I-beams that support the load of the building, pipes for the sprinkler systems, even water chillers in the stairwells. Glass-windowed labs allow passers-by to see research, which includes energy, robotics and nanotechnology.

This year the building was awarded LEED Gold status by the U.S. Green Building Council, becoming the seventh building on the UT Dallas campus to earn LEED certification. LEED, or Leadership in Energy and Environmental Design, recognizes environmentally conscious construction.

Also, *R&D Magazine* presented ECSW with a 2019 Lab of the Year Award-Special Mention for Engineering Labs. This prestigious international competition recognizes innovative designs, materials and construction for laboratory and health care facilities.



A subsonic wind tunnel in ECSW is used to study aerodynamics.

"What distinguishes ECSW is that it is a student-centric building with plenty of space for students as well as exposed mechanicals to help educate mechanical engineers in 21st century building technologies," said Dr. Mario Rotea, head of mechanical engineering. ■



Dr. Todd Griffith contributed to the design of a prototype blade that was tested in October in Colorado.



Everything's Bigger in Texas

AN INDUSTRIAL WIND turbine can reach over 300 feet high, from the ground to the tip of an upstretched blade. That's taller than the Statue of Liberty. Laid sideways, it would be approximately the length of a football field.

Dr. Todd Griffith, associate professor of mechanical engineering, has even grander designs in mind for the growing industry. He and his collaborators are developing the world's biggest wind-turbine blades, inspired by an unusual source: palm trees.

"Our design is inspired by palm trees — how resilient they are when powerful winds blow," Griffith said. "The fronds are flexible; they fold up in hurricane-force winds for protection. When they unfold, they're fine. I wondered whether we could use that concept in a wind turbine."

Before joining the faculty of the Jonsson School in 2017, Griffith was a principal member of the technical staff and offshore wind technical lead at Sandia National Laboratories' Wind Energy Technologies Department. He has been a key member of a multi-institutional collaboration, led by the University of Virginia, to design and build a 50-megawatt offshore wind turbine roughly six times more powerful than the biggest one on record off the coast of Scotland.

Funded by a grant from ARPA-E, the collaboration also includes researchers at the University of Illinois at Urbana-Champaign, University of Colorado Boulder, Colorado School of Mines and the National Renewable Energy Laboratory (NREL).

Since arriving at UT Dallas, Griffith has continued his role on the project, working on the designs of next-generation blades over 750 feet long. Typical blades are about one-quarter that size.

"We're designing the world's largest wind turbine," Griffith said. "Where else would you do it but Texas? Everything is bigger in Texas."

Gale-Force Strength

THE MASSIVE TURBINE marks an about-face from conventional designs. The standard wind turbine is a three-bladed machine positioned with the blades facing incoming winds. The blades for the new concept, called a Segmented Ultralight Morphing Rotor (SUMR), would face downwind and would be tailored for offshore wind farms.

"If you build a wind turbine offshore, whether it's in the Atlantic Ocean or the Gulf of Mexico, you're going to have to deal with a hurricane event," Griffith said. "Wind speeds can reach over 200 mph. That's why we designed the turbine to perform the way palm trees perform and ride out a hurricane. They bend but don't break."

A hinge near the central hub of the turbine allows the blades to fully fold and collapse in hurricane-force winds. Each blade is built in four to five segments and assembled at the project site, eliminating the considerable challenge of transporting a single massive blade the length of two football fields on a truck.

"The cost of electricity dictates the success of a wind turbine design. Our approach to reducing electricity cost for the consumer is a significantly longer blade providing a much greater amount of energy extracted from the wind," Griffith said. "Our UTD team is aiming for engineering a solution to make extreme-scale blades and low-cost offshore wind energy a reality."

In October, Griffith's research team began field testing a smaller prototype version of his team's blade design on a 12-story turbine

"We're designing the world's largest wind turbine. Where else would you do it but Texas?"

-Dr. Todd Griffith

tower at NREL's National Wind Technology Center in Golden, Colorado. Now, he's planning to assess the prototype inside UT Dallas' new subsonic wind tunnel and in his lab in the new Engineering and Computer Science West building, which opened in 2018 and contains high-ceilinged mechanical engineering labs that allow for testing of very large structures.

BLAST Off

IN AUGUST 2018 UT Dallas unveiled the newest investment in its wind-research portfolio. The Boundary Layer and Subsonic Tunnel, or BLAST, is an experimental testing facility that enhances the University's existing wind-engineering capabilities, providing research and educational opportunities for faculty, students and industry partners.

The wind tunnel, shaped like an oblong doughnut, boasts a 26,000-pound fan that can create wind conditions similar to those in the atmosphere. Inside the tunnel, air flows around an anchored test object. The tunnel's contraction cone takes a large volume of low-velocity air and reduces it to a small volume of high-velocity air without creating turbulence. A glass-paneled observing area allows 100 feet of visibility of the test area.

Researchers use the tunnel's two test sections to study the effects of a range of wind speeds and turbulence levels.

The Boundary Layer Test Section, where winds can reach 80 mph, is ideal for analyzing challenges in the automotive industry, such as drag reduction, noise prevention and windshield reliability. In BLAST's Subsonic Test Section, winds can reach 115 mph, similar to a Category 3 hurricane or an EF2 tornado. In this range, for example, Griffith can examine his palm-frond prototype, or aircraft designers could test wind effects on airplanes using scale models.

BLAST is being integrated into curriculum and will be a key asset for students' wind-related senior design projects. BLAST's features are also likely to lead to new partnerships with national laboratories and other universities.

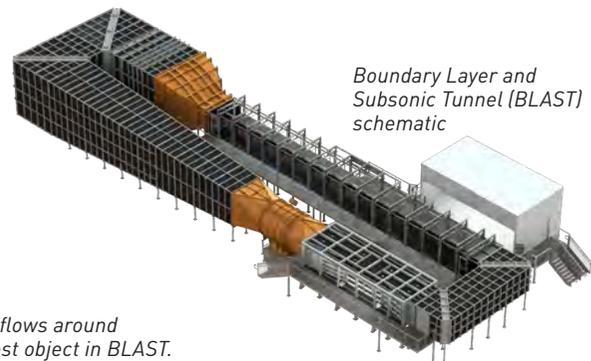
"With the experimental capabilities made possible by the BLAST wind tunnel, coupled with UT Dallas' extensive capabilities in high-performance computing, we have that ideal blend of theory, experiment and simulation to take us to the next level of wind engineering," said Dr. Richard C. Benson, president of UT Dallas and the Eugene McDermott Distinguished University Chair of Leadership.

"With our industry partners, we intend to build a progressively larger R&D program on the effects of wind on the natural and built environment," he said.

It's clear UT Dallas knows which way the wind is blowing.

"The time is right to leverage our investments in this field, to make Texas an even greater state for wind power in particular and wind engineering in general," Benson said. ■

-Reporting by Melissa Cutler



Air flows around a test object in BLAST.



BACTER BATTLE



ISA

UT Dallas microbiologists are on the front lines of an arms race that threatens the entire human race.

BY AMANDA SIEGFRIED

UPON ACCEPTING HIS Nobel Prize in 1945, the scientist who discovered penicillin warned of the dangers of infectious bacteria becoming resistant to antibiotics. By the late 1940s, the penicillin-resistant bacterium *Staphylococcus aureus*, which causes pneumonia, sepsis and skin infections, had become a global pandemic.

Dr. Alexander Fleming's dire predictions have been amplified in modern times: Frontline antibiotics have become nearly obsolete as disease-causing bacteria quickly evolve and adapt for survival. It's an arms race the human race might lose, unless researchers can develop strategies to stay more than one step ahead of marauding microbes.

Microbiologists at The University of Texas at Dallas are in the fray, discovering the tricks bacteria play to evade antibiotics and developing new approaches to fight infectious diseases.



Dr. Kelli Palmer and members of her UT Dallas laboratory, including research scientist Dr. Yahan Wei, are investigating how bacteria develop resistance to antibiotics.

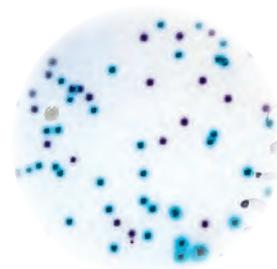
BACTERIA 101

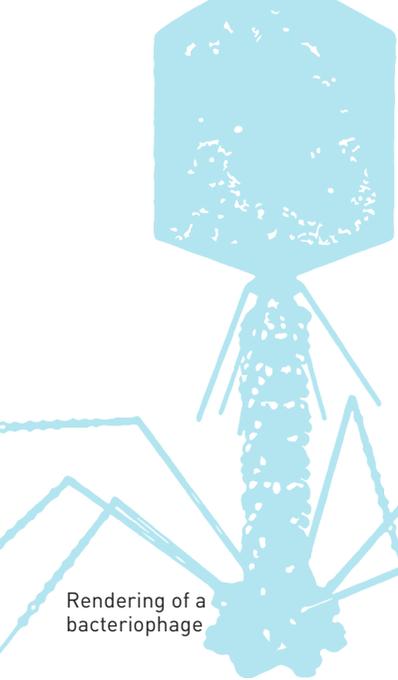
BACTERIA ARE SINGLE-CELLED organisms that live nearly everywhere on the planet — in the air, water and earth. They break down soil and provide nutrients for plants to grow. They live on the human body, causing body odor, and inside it, digesting food. There are as many bacterial cells as human cells in and on a human body, resulting in a healthy symbiosis.

In the human gastrointestinal (GI) tract, a conglomeration of helpful bacteria, called the gut microbiome, is thought to be unique among individuals.

Wherever they live, bacterial species battle one another for food, and they have evolved defenses to keep their rivals at bay. Scientists have discovered many of the chemical weapons bacteria produce to kill their competitors, and the pharmaceutical industry has subsequently exploited those discoveries to produce lifesaving drugs — antibiotics — that kill bacteria that cause human diseases.

But nearly every antibiotic in use today is based on discoveries made more than 30 years ago, according to the Pew Charitable Trusts' Antibiotic Resistance Project. Bacteria constantly mutate, and some have developed





Rendering of a bacteriophage

ways to survive not just one antibiotic, but many, earning the moniker “superbug” for their multi-drug resistance. Such antibiotic resistance is accelerated in part by the overuse and inappropriate use of the drugs, for example taking an antibiotic for an infection caused by a virus. (Antibiotics do not kill viruses.)

RESEARCH GOES VIRAL

HOW EXACTLY DO bacteria develop antibiotic resistance? Dr. Kelli Palmer, an associate professor of biological sciences who joined the School of Natural Sciences and Mathematics faculty in 2012, is investigating the underlying mechanisms by which bacteria acquire antibiotic resistance genes from one another. Her work is funded primarily by the National Institutes of Health.

For example, in a study published in the *Journal of Bacteriology*, Palmer, her students and her colleagues shed light on a gene-swapping process called conjugation, which, she tells her students, is like bacterial sex.

“Bacteria of different species can exchange antibiotic resistance genes through conjugation, which requires them to meet up and come into physical contact in close quarters, such as in human wounds or on hospital surfaces,” said Palmer, Fellow, Cecil H. and Ida Green Chair in Systems Biology Science.

Research in Palmer’s lab—which she is quick to note is driven and carried out by talented students—also examines how viruses might be used to combat antibiotic resistance.

A virus that only infects and kills bacteria is called a bacteriophage, or phage for short. Phages don’t infect human, animal or plant cells.

Just as bacteria can acquire resistance to antibiotics, they also can quickly evolve resistance to

phage infection. In a recent study, led by former biology student Khang Ho BS’18, who is now a graduate student at UT Austin, Palmer’s team observed this happening in a population of *Enterococcus faecalis* bacterial cells. Like some other species of bacteria normally found in the gut, *E. faecalis* can cause dangerous infections if it spreads to other areas of the body, like the bloodstream. Some *E. faecalis* strains have become highly antibiotic resistant.

“The only thing we did was introduce the phage and these bacteria to each other,” Palmer said. “Then, at low frequency, bacterial mutants arose that were resistant to that phage. It took one day.”

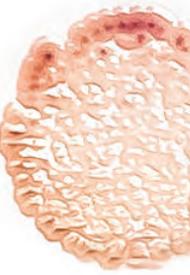
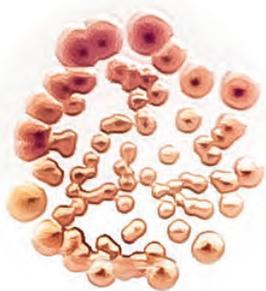
The mutated bacterial cells altered their surfaces to block the docking site where phage would normally attack. But that adaptation came at a price.

“When this strain became resistant to the phage, meaning it could no longer be killed by the phage, it simultaneously became more susceptible to antibiotics,” Palmer said. “That’s fantastic. What this means is, you might be able to develop a combination therapy using phages to kill off disease-causing bacteria and, if any happen to evolve resistance, come in with an antibiotic.”

WASTE NOT, WANT NOT

IN ADDITION TO phage therapy, another wave of the future might be fecal microbiota transplantation, Palmer said.

Admittedly, a fecal transplant sounds disgusting, but it’s actually becoming a more mainstream approach to treating certain hard-to-cure bacterial infections, especially infection with *Clostridium difficile*. When a patient takes a broad-spectrum antibiotic, this opportunistic bacterium often survives in spore form



Dylan McNutt, a senior in neuroscience, and Nhi Nguyen, a senior in biochemistry, learned the techniques scientists use to discover new antibiotics.

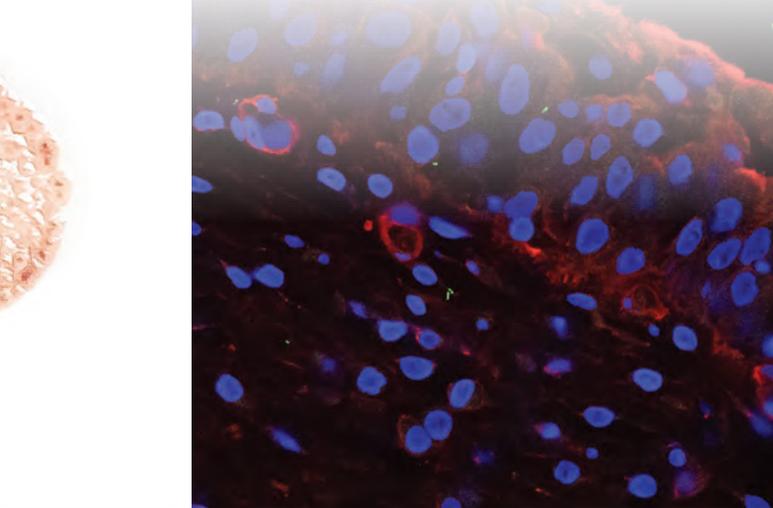
Antibiotic Discovery in the Classroom

A REVAMPED MICROBIOLOGY lab course at UT Dallas is teaching undergraduates the investigative skills that might just lead to the next new antibiotic.

The learning process starts with a handful of dirt.

“In the first week, I ask each student to bring a soil sample to class,” said Dr. Iti Mehta, a senior lecturer in biological sciences who leads the course. “From those samples and others I provide, they isolate different bacterial species and see whether they are producing any chemicals that act as antibiotic agents.”

The class, taught for the first time in spring 2019, differs from standard microbiology courses because it takes a project-based



This microscope image shows bacteria, in green, within the bladder wall tissue of a patient with recurring urinary tract infections.

Dr. Nicole De Nisco conducts research aimed at understanding the basis for recurring urinary tract infections in postmenopausal women. In her lab, students monitor the growth of various bacteria on cell-culture dishes.



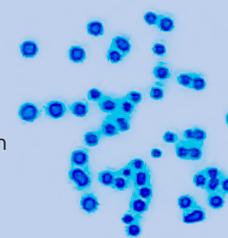
approach to teaching microbiology research techniques. The concept was inspired by curricula developed by Dr. Jo Handelsman, director of the Wisconsin Institute for Discovery at the University of Wisconsin-Madison. Her program, called Tiny Earth, encourages college students worldwide to conduct research and essentially to crowdsource antibiotic discovery.

"We took the opportunity to reimagine this class and transform it from a traditional cookbook-style lab class into a true research course," said Dr. Stephen Spiro, UT Dallas associate provost and the C.L. and Amelia A. Lundell Distinguished Professor of Life Sciences. "In its new format, the class is an open-ended investigative project in which students participate in original research and hopefully make new discoveries. They are also learning important skills in teamwork, critical thinking and communication."

The students, who work in pairs, begin by isolating bacteria from soil and identifying species using DNA sequencing technology, an advanced technique not typically taught in undergraduate labs. Next, they test whether their bacteria produce any chemicals that can kill clinically relevant bacteria. They also test those chemicals to see whether they have any adverse effects on plant cells.

To increase the chances of discovering novel compounds, a long-term goal is to extend the approach to other environments in addition to soil.

"Students compare what they find to a database of known antimicrobial agents," said Mehta, who earned her PhD in molecular and cell biology from UT Dallas in 2018. "Even if they don't find anything novel, they are learning the techniques and hopefully getting excited about the discovery process and possible careers in research." ■





in the gut, emerging after most of the other helpful bacteria have been killed off. Without any competition, *C. diff* thrives and can result in chronic diarrhea. The Centers for Disease Control and Prevention considers it “a major health threat” that infects 500,000 people every year in the U.S. and kills 15,000. For patients who experience recurring *C. diff* infections, fecal microbiota transplants have been shown in published research to be 80% to 90% effective, although the medical procedure is still considered investigational. It essentially restores a patient’s healthy gut microbiome by infusing the GI tract with feces from a healthy donor.

“Fecal transplantation is cheap. It’s just poo,” Palmer said.

“I think that understanding how organisms naturally compete with each other—which they do—in their native environment, and using that to our advantage to out-compete drug-resistant strains is a viable option,” she said.

CASE STUDY: URINARY TRACT INFECTIONS

URINARY TRACT INFECTIONS (UTIs) are irritating and painful, sometimes debilitatingly so. The majority of UTIs are caused by *Escherichia coli*, which normally lives in human intestines but sometimes gets into the urinary tract, where it is not welcome.

Roughly 10% of women in the U.S. experience a UTI each year. For most—and these infections predominantly occur in women—they are a temporary condition that can be effectively treated with available antibiotics.

But for some postmenopausal women, UTIs recur so frequently that they become a chronic condition, requiring daily doses of increasingly powerful antibiotics as the infection-causing bacteria gradually become resistant to each new drug.

“For older women, these infections can go on for tens of years,” said Dr. Nicole De Nisco, assistant professor of biological sciences at UT Dallas. “Eventually, a patient’s last resort might be removing the bladder.”

Most of the epidemiological research on UTIs has been done with women in their 20s and 30s, a much earlier age range than the typical onset of menopause. Likewise, the disease has been primarily investigated in juvenile animal models, so knowledge of it in postmenopausal women is severely limited, De Nisco said.

“One of the reasons urinary tract infections have been overlooked is because they affect women, an understudied group in general when it comes to disease, and older women in particular, who are even more understudied,” De Nisco said.

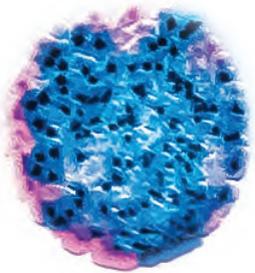
“UTIs are not going to kill you, but the effect on a patient’s life can be profound,” she said. “Many women will withdraw from society and activities, because if you have to use an external bag as your bladder, your quality of life is greatly affected.

“I think it’s a crime that this is the best we can do.”

TWO-PRONGED TREATMENT

PRIOR TO JOINING the UT Dallas faculty in 2018, De Nisco was a Howard Hughes Medical Institute post-doctoral fellow at UT Southwestern Medical Center. A graduate of the Massachusetts Institute of Technology, De Nisco has an ongoing clinical collaboration to study recurring UTIs with Dr. Philippe Zimmern, professor of urology and the Felecia and John Cain Chair in Women’s Health at UT Southwestern.

De Nisco believes that long-term antibiotic therapy to manage recurring UTIs is not only ineffective at permanently clearing the infection, but might exacerbate the problem in postmenopausal women.





“It’s a little controversial. You don’t want to tell a patient, ‘I’m not going to give you antibiotics,’ but it’s becoming more widely accepted that long-term prophylactic treatment with antibiotics, whether you have an infection or not, is not the best way to handle recurring infections,” she said. “While low-dose antibiotics are generally tolerated by patients, microbiologists know that if you grow bacteria in such subinhibitory concentrations of a drug, they will quickly develop resistance to that drug. This disconnect between scientists and clinicians is a gap my colleagues and I hope to bridge.”

De Nisco’s goal is to identify targets for adjunct, or combination, therapies that more effectively halt UTI recurrence. Her approach is to examine both the behavior of the pathogenic bacteria as well as the host tissue they infect. Host inflammation seems to be a focal point.

She explained that infectious bacteria usually significantly change the host environment. In the case of UTI, invading bacteria like *E. coli* trigger production of a cyclooxygenase-II enzyme (COX-2) in host cells. This enzyme produces a chemical called prostaglandin E2 (PGE2), which attracts immune cells to the area, resulting in inflammation. This product of COX-2 can be easily detected in urine.

If not resolved, the inflammation can cause permanent damage to the host tissue.

“We’re investigating whether COX-2 levels are elevated in the tissue samples from our patient population. We also can see if the COX-2 product is elevated in their urine,” De Nisco said. “Preliminary results from these patients show that if you have a history of recurring UTIs, levels of PGE2 in your urine are higher than if you don’t have a history.”

These findings suggest that COX-2 inhibitors—a type of nonsteroidal anti-inflammatory drug (such as Celebrex) that blocks the activity of COX-2—might be an effective therapy to reduce inflammation, giving the tissue a chance to heal and making it less hospitable to *E. coli* bacteria.

“This is one inflammatory pathway that we would like to target with a clinical trial,” De Nisco said. “If we could attack the cycle of infection at two points—both with antibiotics and selective anti-inflammatories—maybe we’ll have a better chance of actually breaking the cycle of recurrence and curing the disease instead of just managing it.”

Another important target for recurring UTIs might be the microbiome.

“We’re also beginning to understand that there are bacteria that normally reside in the urinary tract—a urinary microbiome. An imbalance in this microbiome, often brought on by antibiotic use, likely has a role in recurrence,” De Nisco said.

De Nisco and Palmer are working together to characterize precisely the urinary microbiome in postmenopausal women. They use an advanced technique called whole genome metagenomic sequencing to identify bacterial species in urine by their DNA. The goal is to determine whether there are particular microbiome profiles that are either protective or predisposing to recurrent UTIs.

“By sequencing the entire genomes present, we can begin to get a better understanding of how different microbial species might be working together or against each other to create a healthy versus unhealthy microbiome,” De Nisco said.

“For the science that I want to do and the collaborations I’m involved with, UT Dallas is the perfect place to be,” she said. ■

From Curious Kids to Serious Scientists

A SELF-DESCRIBED “Girl Scout at heart,” microbiologist **Dr. Nicole De Nisco** (right) has always loved solving problems.

“I was one of those kids who never had to be told to do their homework,” she said. “I have always enjoyed learning, and, as a scientist, you never stop learning and finding new problems to solve.”

“It sounds corny, but I want to leave the world better than I found it. This is a core value instilled in me by my parents. Because of this, I strive to always keep a strong connection between my research and the end goal of improving human health.”



When microbiologist **Dr. Kelli Palmer** (left) entered college, she defaulted to pre-med because “that’s what smart kids who are interested in science were told to do,” she said. The only scientist in her family, Palmer started her research career washing dishes in a microbiology lab.

“I loved the lab so much that I transitioned to research and never left,” she said. “As an undergraduate, I volunteered to do research in a chemistry lab, but I was just analyzing data, and I hated it. The professor could tell and suggested that I needed to be in a biology lab. She was right; I enjoy hands-on research, growing things. I just like the messiness of biology.” ■



The Winding Path to Success

Dr. Shalini Prasad

DR. SHALINI PRASAD is a rising bioengineering star at The University of Texas at Dallas.

In her research she strives to create diagnostic tools and point-of-need devices affordable enough to impact worldwide health. As interim department head of bioengineering and the Cecil H. and Ida Green Professor in Systems Biology Science, she leads one of the most dynamic and fastest-growing research and academic areas at the University.

The director of the Biomedical Microdevices and Nanotechnology Lab, and an electrical engineer by training, Prasad is also a problem-solver, taking on the core elements of cellular and molecular diagnostics for a wide range of applications.

The road to her success, though, like that of most accomplished individuals, has been strewn with its share of setbacks. These struggles along the way, she believes, have made her achievements that much sweeter and serve as a reminder of the value of resolve.

“Our failures are as important to our development as — if not more important than — our successes,” Prasad said. “They help us reflect on what we want most. Without persistence, I would not be in academia.”

She considers her job “the fulcrum that holds and guides me” and beams about the successes of her students. But she could easily have entered another field.

“When I got my bachelor’s degree in engineering in India, I hadn’t applied to any American universities for graduate studies. I envisioned getting a business administration degree and staying

there,” she said. “Unfortunately, I didn’t score well on the entrance exam, so I got into a second-tier school. My grandfather put up the money for my first semester, but two weeks before starting, I decided it wasn’t for me.”

Pressure from her family to choose a path — further academics or starting a family — “provoked me in the right way,” Prasad said.

“South India is very traditional. Being asked, ‘Is your daughter well-settled?’ means is she married with successful children,” she said. “At age 20, I had other things in mind.”

Prasad traveled to the U.S. to attend the University of California, Riverside, on a full scholarship and earned her PhD in three years.

“Two months of my graduate stipend was enough to pay back my grandfather,” she said, still relishing her accomplishment. “It was a check he never cashed.”

After three years at Portland State University, her first faculty appointment, she was hired by Arizona State University — a move partly motivated by the location of the acquaintance who would become her husband.

In another two years, a different sort of hurdle appeared.

“My green card was denied on a technicality, and I had to find a new employer to file a petition to extend my work visa,” she said. “I had to leave my job and my home. We moved a thousand miles away, upending the lives of my husband and infant son while an 18-month residency process played out.”

Moving from ASU to Wichita State University to UT Dallas in quick succession — a “red flag” of instability, Prasad explained —



Dr. Shalini Prasad with her husband, Sriram Muthukumar, and sons Eshaan Sriram (left) and Adi Sriram (right).

“The power of persistence and positivity is a story people from all walks need to know. I am very privileged to be able to work on something I am passionate about.” - Dr. Shalini Prasad

carried significant disadvantages: “It’s hard to get established as a researcher in academia when you’re moving constantly.”

Prasad admitted she considered leaving academia as the odds stacked against her.

“I was soul-searching: ‘Is this what I want to do? It’s getting harder and harder,’” she said. “I was in survival mode, just trying to stay afloat.”

Prasad fixated on what she could control — her lab. Her first full year at UT Dallas was one of her most fruitful years in terms of scientific publications, a key measure of academic success.

“I focused on my research and keeping negative thoughts at bay,” she said. “Eight years later, when you observe the successes we’re having, it’s due to all the work done in the interim.”

Having emerged from her obstacle course, Prasad hopes her message resonates with a generation of scientists for whom succeeding in academia is as tough as ever.

“For a young researcher, getting through the tenure process is increasingly difficult,” she said. “And during that stage of life, many of us are young parents. Academia can leave us without very good support systems — emotionally or physically.”

Her message is to build up that support, which may evolve over time, and to try to keep failures in perspective.

“We push it under the rug sometimes, but the power of persistence and positivity is a story people from all walks need to know,” she said. “I am very privileged to be able to work on something I am passionate about. How many people can say that?”

—Stephen Fontenot

QUICK CV

The University of
Texas at Dallas



Wichita State University



Arizona State University



Oregon Health &
Science University



Portland State University

CAREER LANDMARKS

2004: Received Graduate Research Award from University of California, Riverside for work on microfabrication techniques.

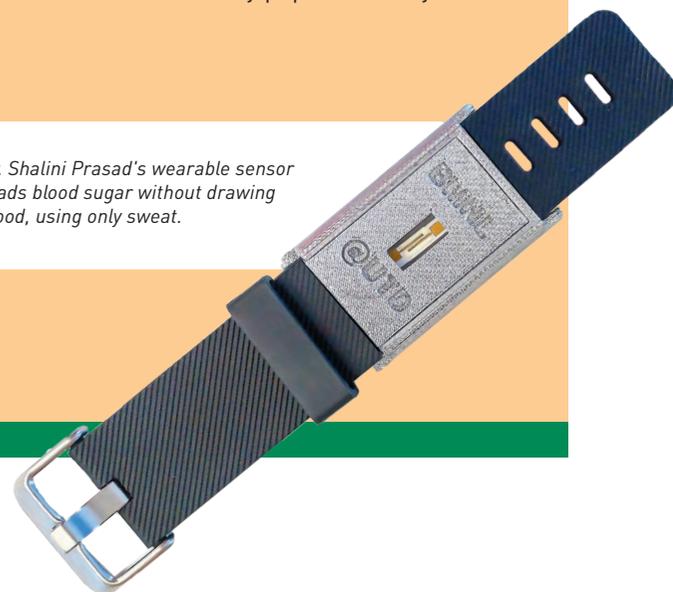
2006: Portland State University Lab2Market entrepreneur program selects her technology for sensing elements that trap specific biochemical agents.

2007: Finalist for Association for Laboratory Automation Innovation Award.

2016: Named Fellow of Society for Laboratory Automation and Screening.

2017: Study on sweat-based diagnostics published in *Nature Scientific Reports* among 10 most-read chemistry papers of the year.

Dr. Shalini Prasad’s wearable sensor reads blood sugar without drawing blood, using only sweat.





A Plan to Stop Cancer's Spread

Dr. Maria Castaneda

DR. MARIA CASTANEDA remembers struggling in an undergraduate chemistry class at the University of Tulsa when a professor invited her to work in his lab. As she gained hands-on research experience, the course material began to make sense.

"I quickly fell in love with it. My grades went from one end of the spectrum to the other," Castaneda said. "If it wasn't for him asking me to do research, I don't believe that I would have continued."

Castaneda completed her chemistry degree and came to UT Dallas for graduate school. She thrived academically in the research lab of Dr. Jiyong Lee, assistant professor of chemistry, where she investigated cancer therapeutics that target metastasis and relapse.

Backed by several research grants, Castaneda's research has already netted results and a potential patent. She identified a synthetic molecule called MC-1-F2 that blocks cancer cells in a primary tumor from transforming into cells that metastasize. The transcription factor Forkhead Box Protein C2 (FOXC2) is needed for cancer cells to transform from epithelial cells, which don't move, into mesenchymal cells, which are mobile. MC-1-F2 essentially puts up a roadblock to prevent cancer from spreading.

After earning her PhD from UT Dallas in May, Castaneda is continuing her research on FOXC2 as a postdoctoral fellow at UT MD Anderson Cancer Center in the lab of Dr. Sendurai Mani, co-director of the Center for Stem Cell & Developmental Biology and the Metastasis Research Center.

Mani's group discovered that FOXC2 is a mediator of the epithelial-mesenchymal transition.

"That's been the emphasis of my research: how to target that specific transition," Castaneda said.

"Our group focuses on finding drugs that will inhibit the transition. His group works on identifying the pathways and where you can block the pathways. It's really a continuation of what I did at UT Dallas."

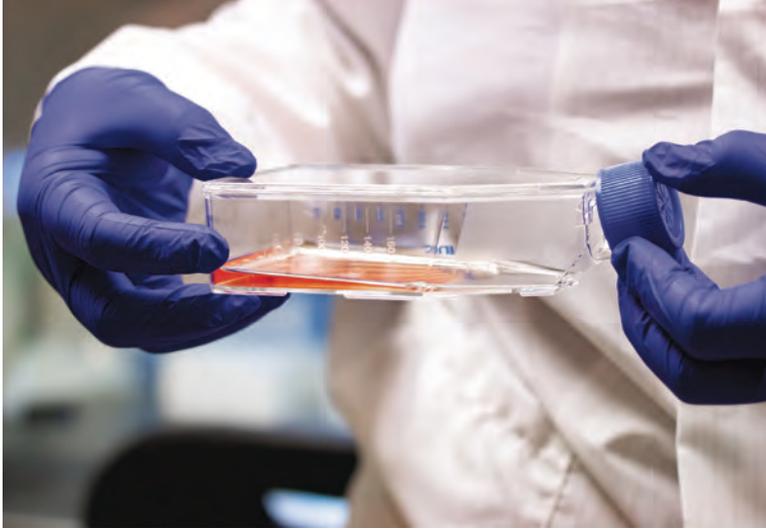
Castaneda's interest in cancer research is personal. In her last year of high school, her grandfather in rural Mexico became very sick and was diagnosed with pancreatic cancer.

"The cancer had already metastasized to his bones. There was absolutely nothing that could be done, even less so in a country where you don't have the infrastructure for hospitals. He passed three to four weeks after being diagnosed," Castaneda recalled.

When she was about to graduate from Garland High School, Castaneda thought about pursuing cancer research, but didn't know how to begin.

"My only concept of college was that it existed," Castaneda said. "A guidance counselor sat me down and explained everything. We talked about my grandfather's death. That's when I realized there's not a lot of new cancer treatments out there. There are chemotherapeutic drugs, but they have a lot of side effects that are almost worse than the cancers."

She chose to study chemistry because she wanted to focus on how drugs are made. In the lab, fellow students would be frustrated when a chemical reaction didn't work; Castaneda wanted to know why.



“We’re getting a lot better at treating cancer that’s localized because it behaves in a way that we know. But once it’s spread, we don’t know why.” -Maria Castaneda PhD’19

“You learn something from every failure. To me, sitting there for five or six hours purifying a compound, listening to music, it was OK. I liked it,” she said.

As an undergraduate, she worked three jobs until a scholarship enabled her to focus on her research. In her graduate work at UT Dallas, Castaneda expanded her research to understand how drugs are discovered.

In July 2015 Lee’s research group was awarded a grant from the Cancer Prevention and Research Institute of Texas to continue investigations on breast cancer stem cells. Castaneda also received a National Science Foundation Graduate Research Fellowship in 2016 and soon after was named a Eugene McDermott Graduate Fellow at UT Dallas.

Those opportunities provided her with a stipend and funding for research and supplies, and gave her opportunities to network with other scientists, attend conferences and write papers.

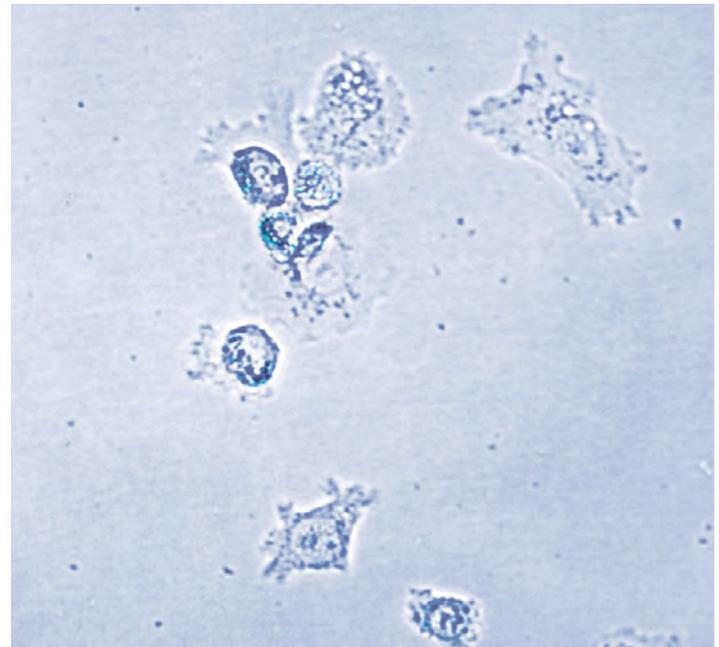
She focuses on breast cancer metastasis because of its high incidence rate — one in eight women will get breast cancer in their lifetimes — and low survival rates once the cancer metastasizes.

“We’re getting a lot better at treating cancer that’s localized because it behaves in a way that we know. But once it’s spread, we don’t know why, or why it’s spread faster in one person versus another, or why certain cancers like breast cancer are usually going to metastasize to the lungs. There’s still a lot to learn,” she said.

As a first-generation student, Castaneda said her biggest challenge has been dealing with her family and culture. Her parents grew up in small, rural Mexican towns and met when each had emigrated to the U.S. Neither of them understand Castaneda’s need for postgraduate research.

“My family thought, ‘OK, you go to university for four years, and then you get a job.’ Now my mom asks, ‘Why are you still going to school?’ They didn’t understand what graduate school was. They still don’t,” Castaneda said. “They’ve just accepted that I’m going to be in school forever.

“My mom wants to know, ‘Haven’t you learned everything already?’ I told her that if I had, we would have already cured cancer.” *-Robin Russell*



Dr. Maria Castaneda with research scientist Stefanie Boyd and research assistant professor Dr. Li Liu, both in biological sciences. Bottom: Breast cancer cells are the focus of Castaneda’s research.



Young Women in Science and Engineering

Connecting Bright Stars to Their Futures

BEFORE SHE EVEN began her freshman year, Maria Valdez already had a support system on campus at The University of Texas at Dallas.

Now a senior in mechanical engineering, Valdez said the connections she made through the University's Young Women in Science and Engineering (YWISE) Investigators program during high school helped her transition to college.

Students in the program work with mentors — UT Dallas students and faculty members, industry professionals and high school science teachers — throughout the year to design, develop and implement solutions to science and engineering problems. Students on the winning teams receive scholarships. Since the program began in 2012, 244 students have participated, with many choosing to study at UT Dallas.

"I really enjoyed my relationship with my mentors, and it led me to have closer ties with my teachers and friends. My teammates are my two best friends to this day," Valdez said.

Now that they attend UT Dallas, Valdez and some of her fellow YWISE Investigators have created an alumni group to expand their network on and off campus and support other students who participated in the program. The YWISE

Investigators alumni group became an official student organization in the fall, and Valdez and fellow officers are working to recruit more members. The alumni group aims to connect former participants, organize community service projects, build relationships with mentors and raise funds to assist students with professional development opportunities like attending conferences.

The YWISE Investigators program, sponsored by the Department of Community Engagement, was created by Dr. Magaly Spector, former assistant to the provost for strategic initiatives, to inspire young women from underprivileged backgrounds in Dallas-area high schools and community colleges to pursue careers in science, technology, engineering or mathematics. The program is funded by the University, the Texas Instruments Foundation and Ericsson.

Valdez said the program was instrumental in her decision to come to UT Dallas, where she is in a fast-track program to earn a master's degree in systems engineering and management. She said the YWISE Investigators program also led to a student job helping coordinate the program and a research opportunity in the lab of Dr. Hongbing

Samantha Montoya, Amira Zakrya, Maria Valdez and Adriana Alva formed an alumni group for students who participated in UT Dallas' YWISE Investigators program.

“The Young WISE Investigators program has created a great pipeline of students who have an interest in STEM and research.”

– Raul Hinojosa Jr.

Lu, professor of mechanical engineering, associate department head and Louis Beecherl Jr. Chair.

Samantha Montoya, a math senior in the UTeach Dallas program, serves as the alumni group’s officer for student affairs. She participated with Valdez on the same team from Dallas Independent School District’s Yvonne A. Ewell Townview Center. Their team won first place for its solution to their school’s uneven Wi-Fi access. Montoya said she looks forward to working with new YWISE Investigators.

“I wanted to help others because they’re probably first-generation college students or they don’t have siblings that went through college,” Montoya said. “We’re helping freshmen know what’s going on at UT Dallas. They can get advice from us about what we wish we knew.”

In addition to Montoya and Valdez, the group’s officers include Amira Zakrya, a healthcare studies junior, and Adriana Alva, an electrical engineering and computer engineering junior.

Raul Hinojosa Jr., director of community engagement, said it has been exciting to see how YWISE Investigators have formed a community of scholars based on the connections they built working on projects together in high school.

“The Young WISE Investigators program has created a great pipeline of students who have an interest in STEM and research,” Hinojosa said. “They are thriving at UT Dallas and have formed a great bond through their alumni chapter to help support each other on their path to graduation.” *–Kim Horner*

WISE ALUMS

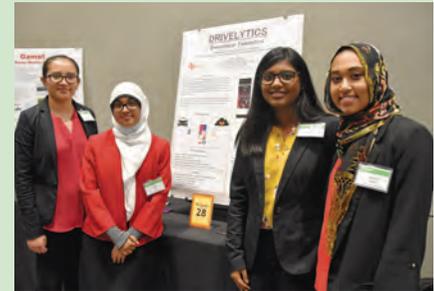
Jocelyn Linares celebrated several firsts when she earned a Bachelor of Science in electrical engineering from UT Dallas in May. She was the first engineer — and the first college graduate — in her family.

In addition, Linares and **Sonia Torres** were the first two participants from the **Young Women in Science and Engineering (YWISE)** Investigators program to graduate from UT Dallas. Torres received a Bachelor of Science in computer science.

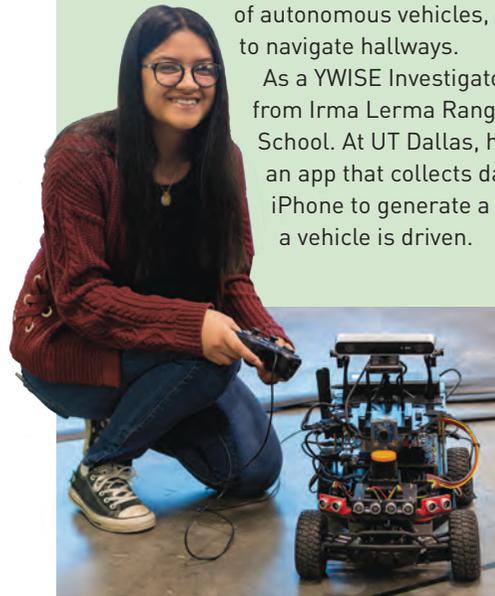
Participating in YWISE Investigators and other STEM programs in high school influenced Linares’ decision to study engineering at UT Dallas, she said. “Young WISE Investigators was a great experience,” Linares said. “When we did our presentation here, I really liked the school. Everyone was nice; the campus was beautiful; and I thought, ‘I want to go to school here.’”

Linares said she became interested in STEM while taking robotics at Hillcrest High School in the Dallas Independent School District, and a teacher told her about YWISE Investigators. For her UT Dallas senior design project, Linares worked with a team of classmates on a fleet of autonomous vehicles, which they programmed to navigate hallways.

As a YWISE Investigator, Torres was part of a team from Irma Lerma Rangel Young Women’s Leadership School. At UT Dallas, her senior design team developed an app that collects data using sensors found on an iPhone to generate a report that shows how well a vehicle is driven.



Sonia Torres (left) and her teammates Fariha Islam, Teena Jagan and Maliha Haque captured first place at the UTDesign Computer Science Expo last fall for their project, which helps show how a vehicle is driven.



Jocelyn Linares demonstrates a vehicle that she and her teammates worked on in the UTDesign program.



The UTD chess team finished third in the Final Four of College Chess, behind Harvard, Webster and No. 1 UT Rio Grande Valley.

CHESS TEAM CREATES WINNERS

THE UNIVERSITY OF Texas at Dallas chess team is known for winning. In addition to securing four national collegiate championships and going to the “Final Four” chess tournament 16 times, some former team members are now coaching other college chess programs, while others are making their mark in the business and tech worlds.

With an eye on sharing its cultural richness and academic excellence, UT Dallas in 1996 was one of the first universities in the country to create a competitive, scholarship chess program. That soon resulted in national championships and some of the best chess players in the world working in campus laboratories and earning their degrees.

“The UT Dallas chess team is a model for intercollegiate competition,” said Dr. Hobson Wildenthal,

executive vice president at UT Dallas. “Its team members are serious students, admitted to the University under the same rigorous academic standards as the rest of the student body. Upon graduation, they obtain gainful employment in high-tech fields, including engineering, business, economics, and arts and technology.”

Recently, chess team alumnus Julio Catalino Sadorra BS’13 was named coach of the team, filling the shoes of Rade Milovanovic, who retired after 20 years.

Just six weeks into Sadorra’s tenure, in April the team finished third at the President’s Cup, informally known as the Final Four of College Chess, which determines the U.S. college chess champion. Coming in as the third seed, UT Dallas beat Harvard University, played Webster University to a draw and lost to the eventual champion, UT Rio Grande Valley.



Julio Catalino Sadorra BS'13 is the new coach of the UTD chess team.

When he was a student, Sadorra played in the Final Four twice as a member of the UT Dallas team. After graduating with a degree in business administration, he began teaching chess while also playing professionally. He represented his home country of the Philippines at the World Cup Chess Championship and the international Chess Olympiad, where he played against some of the best players in the world.

In 2016 Sadorra played Magnus Carlsen, the top-ranked player in the world, to a draw.

“I was able to prove that anyone who is willing to consistently work hard and to compete with the proper mindset has a chance to equal the world champion,” Sadorra said.

Impact Beyond UT Dallas

IN THE PAST 10 years, as additional colleges began offering scholarships and stepping up their recruiting, UT Dallas chess alumni have been significantly involved in the growing competitiveness of collegiate chess.

Of the relatively small number of U.S. chess programs that offer scholarships, three of them (including UT Dallas) are coached by UT Dallas alumni. Besides Sadorra, Alejandro Ramirez BA'09, MA'11 is the coach at Saint Louis University, and Cristian Chirila BA'14 is the inaugural coach of the new competitive chess program at the University of Missouri. All three are Grandmasters, which is the highest level a chess player can attain.

“While there are still a fair number of alumni who play chess, it’s not easy to make a living with chess. So it’s great that these three coaches all graduated from UT Dallas and are able to work in chess,” said Jim Stallings, UT Dallas Chess Program director.

UT Dallas ensures that chess team members balance their chess play with academics, which allows players to go on to successful careers in various fields.

International Master Dmitri Shneider BS'07 has worked for JPMorgan Chase & Co. for 11 years, first in New York and now in Hong Kong. He said chess players possess certain qualities that lead to success in their careers.

“There definitely are attributes, such as analytical thinking and sizing up the opponent, that help chess players make good decisions. It’s a hard game, and it takes a lot of preparation,” said Shneider, who was captain of the chess team and president of the chess club while earning his finance degree at UT Dallas.

In addition to persistence and analytics, Stallings said chess builds character.

“Chess builds strong ego. In chess, you’ve got to be able to absorb losses and keep on going. It’s not easy,” he said.

Ramirez, now at Saint Louis University, said UT Dallas’ chess success has come about because it is doing things the right way, from the natural support system that players have with each other to the intentional recruiting of the best players in the world.

“The UTD chess program was a pioneer in everything that is scholarship-related,” said Ramirez. “They established the baseline on how to do it—how to attract players and how to have a competitive chess team. They really believe in their program.

“In the last six, seven years, many other collegiate programs have popped up, basically trying to take those lessons that UTD has given us. As somebody who was part of the chess team, I know firsthand how a chess program can attract great minds that benefit the university and also benefit the world of chess.”

Shneider said that beyond career success, team members build strong personal relationships that last for years and also help in recruiting future team members.

“Before we attended UT Dallas, we all knew at least one person who previously attended and played chess here. So those relationships can be helpful in attracting good chess talent,” he said. “The fact that the school recognizes chess and provides the resources for players to succeed as students is what I think ultimately leads to success outside of the university and outside of chess.”

—Phil Roth



Former team members are now coaching other college chess programs, while others are making their mark in the business and tech worlds.



Alumnus Brings Personal Touch to Community Policing

WITH HIS OUTGOING personality and penchant for problem-solving, **Kanvin Ravin MPA'08** has built a successful 20-year career in the Plano Police Department.

Recognized in 2017 with the department's Officer of the Year award, he takes pride in mentoring new recruits and tackling new challenges. He currently serves on the department's bomb squad and is one of two Problem-Oriented Police Officers for the Dallas metro area.

"The overall mission of our department is to provide outstanding policing service in partnership with the community and to maintain a safe environment that contributes to quality of life," Ravin said. "We excel at what we do through communication."

Ravin's recognition in 2017 came after he played several key roles across the professional standards division and served as an instructor at the department's training academy. Among his many accomplishments was facilitating effective training for officer interactions with the deaf community.

Underlying this philosophy is Ravin's graduate education at UT Dallas. During his first years in Plano, Ravin

was encouraged by human resources director Greg Carpenter MPA'05 to pursue UT Dallas' Graduate Certificate in Local Government Management.

"I went to a couple of classes and loved it," Ravin said. "I was around other adult learners like myself, all from different branches of government and other local entities. I really made a lot of friends there."

After finishing the certificate, Ravin transferred his credits to UTD's Master of Public Affairs program, completing the degree in two years. During this time, Ravin learned about the importance of fostering connections between branches of government and how an interpersonal approach to problem-solving can lead to better outcomes.

Since graduating, Ravin has maintained close ties to UT Dallas. His son, a student at Heritage High School in Frisco, comes to campus one Saturday each month for the Future Comets Program, which provides college preparation and enrichment courses in STEM disciplines.

"He loves it," Ravin said. "He tells me, 'Dad, I want to go here.'" -*Daniel Steele*

Friendship Sustains Comets Pursuing Legal Careers

DURING AN INTRODUCTORY course in 2009, freshmen were asked to lead presentations on topics in which they considered themselves experts. **Aisha Noor BA'12, MPA'13** decided to demonstrate her method for wrapping a hijab and chose **Monica Niewiarowski BA'13** to be her model.

This moment launched a friendship that has allowed Noor and Niewiarowski to push each other to excel along parallel life paths, including a move from UT Dallas to Washington, D.C., to law school and back to Dallas.

Now serving as associate attorneys — Niewiarowski works in product liability and toxic tort litigation with Gordon Rees Scully Mansukhani LLP, while Noor focuses on commercial finance transactions for McGuireWoods LLP — the two found their love of the law at UT Dallas.

Both Niewiarowski and Noor graduated with degrees in political science and served as Student Ambassadors during their time on campus. Niewiarowski was also a Eugene McDermott Scholar. Noor was too young to be selected for the program — having entered UT Dallas at 16 years old — but ran in the same circles as the other scholars and considered herself an “honorary McDermott.”

As pre-law students, Noor and Niewiarowski took their first major steps toward their eventual careers through the Bill Archer Fellowship Program for Undergraduates, which sends students from the UT System to Washington, D.C., for semester-long internships.

After their acceptance, Noor and Niewiarowski had to decide which internships they would seek, eventually taking positions with the Supreme Court. Although they performed different roles during their internships and were housed in separate apartments, they were inseparable during their time there.

“We walked to our first day together, went to monuments and museums together, and had desks right next to each other,” Noor said.

After completing her Juris Doctor at the University of Virginia School of Law, Niewiarowski returned to Dallas, partly motivated by her relationship with the late Margaret McDermott.

“Mrs. McDermott wanted us students to help build a world-class city here in Dallas,” she said. “This city has experienced a renaissance, and I really want to be a part of it, contributing to the arts, social life and political environment.”

Noor returned to Dallas after attending the University of Chicago Law School, where she discovered a passion for negotiating through the written word, which has inspired her practice representing large financial institutions.

“UT Dallas is the best thing that ever happened to me,” Noor said. “It has a small-family feel but big-school resources. I loved being surrounded by smart people who constantly push you to be better, with professors who give so much attention to the individual success of each student. We left UTD as better, more well-rounded humans ready to approach the world.” —*Daniel Steele*

1970s



Teresa Moore BA'76 is the executive director of Seattle CityClub, a nonprofit organization that informs and inspires civic engagement in Seattle, Washington. She earned a degree in political science.



Deborah Hankinson MS'77, a distinguished alumna, was selected as Arbitration Lawyer of the Year for Dallas in the 2019 edition of *The Best Lawyers in America*. She is the founder and sole attorney at Hankinson PLLC, a practice focused on comprehensive conflict resolution. Hankinson graduated with a degree in special education.

1980s



Thomas J. Uhler BA'80 is an online editor at the *Fort Worth Star-Telegram*. He graduated with a degree in English literature.



Aisha Noor and Monica Niewiarowski



Alumna Follows Familiar Script to Comedy Fame by Joining Groundlings

EMILY JOYCE BA'15 has taken her penchant for comedy and improvisation to Los Angeles, where she is honing her craft through classes at The Groundlings Theatre & School.

Along with The Second City and a few others, The Groundlings is known for the development of some of the best comedy talent in the country. Alumni of the program include well-known comedians and actors such as Will Ferrell, Kristen Wiig, Melissa McCarthy, Phil Hartman, Maya Rudolph, Lisa Kudrow and Laraine Newman.

"I am an entirely silly person; I just have a knack for making people laugh," she said. "I like being able to do really silly characters and to do voices. I know it's weird, but I like making other people feel good.

"A person who wants a career in comedy has to look at places such as The Groundlings, Second City or Upright Citizens Brigade. 'Saturday Night Live' pulls from these places, so if you want to be a writer or performer with 'SNL', then you have to look into these places."

While Joyce had learned a lot about theater before she attended UT Dallas, it was at UTD where she discovered her love for improv, said her mentor Kathy Lingo, clinical associate professor in the School of Arts and Humanities.

"Emily told me after she had taken her first improv course that this is what she wanted to do for a living. And I knew she would do it," said Lingo. "She's got the smarts; she's got the drive; she'll make it."

Joyce, who has been involved in the program for a number of years, said she sees The Groundlings as a graduate school where she can develop her craft.

The competitive program, with admission by audition, consists of five levels: basic, intermediate, advanced improv, writing lab and advanced lab. The ultimate level is the Main Company — performing as The Groundlings — which is composed of no more than 30 members at any time.

The goal of most participants is to get paid for doing what they love.

"Getting through these classes, you're learning a ton. It's a quick pace, but they want to make sure people are ready to handle that kind of work," she said. -Phil Roth

1990s



Karla Jacobs BA'92, Teacher Certification'94, MBA'95 was reappointed to the Georgia Commission on Women by Georgia Gov. Nathan Deal. Jacobs is also a member of the Georgia Statewide Human Trafficking Task Force.



Avi Saxena MS'92 is chief technology officer, direct-to-consumer for Discovery. He previously served as vice president of technology for Amazon Marketplace. Saxena earned a degree in computer science.



Lisa Greenwald MS'97, PhD'07 is CEO of Washington-based Kindinger Center, which serves children with diverse abilities and their families through early intervention, family support, private therapy, and outreach and consultation. Greenwald holds degrees in communication sciences and disorders.



Scott Hackl EMBA'98 is executive vice president of North America sales for Irving, Texas-based ATM provider Hyosung.



Rahul D. Yodh BA'99 is the founder of Link Legal Search Group, a Texas-based legal executive search firm. Link Legal Search Group was recently acquired by JURISolutions (JSL) and will now operate as a division of JSL. Yodh is the senior managing director of Link Legal Search Group and will lead the firm's Dallas office. He graduated with a degree in government.

2000s



John Olajide BSTE'04, a distinguished alumnus, will serve as chair of the Dallas Regional Chamber's Board of Directors in 2020. Olajide is the founder and CEO of Axxess, a home health care technology company.



Jim Ducker MS'05 is the internal auditor at South Dakota State University. He earned a degree in accounting and information management.

84-Year-Old Undergrad Becomes Master in Perseverance

WHEN JANET FEIN BA'18 could no longer drive herself to UT Dallas, she used public transportation. When she could no longer use a walker to get to class, she switched to a wheelchair. And when her health declined and she had to move to an assisted living center, Fein took independent study classes from home.

The 84-year-old refused to let anything keep her from completing her bachelor's degree in sociology, which she earned from the School of Economic, Political and Policy Sciences, thanks to hard work and heroic levels of perseverance.

"You're never too old to keep on learning," the grandmother of eight said.

Graduating from college had been a longtime dream for Fein. She married and raised five children after finishing high school in 1951. Her late husband, Howard, was in the Army during the Korean War. Afterward, the family moved several times for his job. Fein enrolled in a few community college courses in the 1970s and finished her associate's degree in arts and sciences from Richland College in 1995.

In 2012 Fein transferred to UTD after receiving a scholarship. She also was granted a state tuition waiver that allows people 65 and older to take up to six hours each semester with no tuition costs.

The new student was 78 and had just retired from her job as a secretary at Texas Scottish Rite Hospital for Children.

"I didn't know if I could do it," Fein said. "The standards at UTD are high. I didn't know if I could meet them or not, but I found that I could."

Fein took classes in religion, immigration and political science. She maintained a 3.2 GPA despite juggling school with doctor's appointments and a hospitalization. She

said her professors were understanding, and the Office of Student AccessAbility provided accommodations, even moving classes to more accessible locations when necessary.

Through it all, Fein said she always felt welcome on campus. One of her professors and her classmates even threw her a birthday party last year.

"I was accepted, and the younger people were very friendly to me," she said. "They never felt that I was too old."

Fein's health problems came close to forcing her to stop just a couple of semesters short of a degree.

"I couldn't drive anymore, and I couldn't go to school and thought I'd have to give it up," she said.

Fein learned that she could get rides from her assisted living center to campus through a DART service for people with disabilities. Wearing oxygen tubes and a portable oxygen system, she used a walker to get to her classroom until she needed a wheelchair.

"I'm so impressed with her hard work and determination," said Meryl Fein, her daughter-in-law. "She has made it happen any way she can." —*Kim Horner*





Nicole Tucker (right) with Lailani Garcia, first recipient of the Diane Milot Tucker Scholarship.

Mom's Determination Inspires Creation of Scholarship

FIVE YEARS AGO, **Nicole Tucker BA'04** never imagined she could establish a scholarship at her alma mater.

"I thought I had to have my name on a building," said Tucker, a real estate agent in the Dallas-Fort Worth area.

But when she learned that she could give back on a smaller — yet still impactful — scale, Tucker took the opportunity to change the lives of future students.

She established the Diane Milot Tucker Scholarship, named for her late mother, at UT Dallas in 2014. This past fall, Lailani Garcia BS'18, a first-generation college graduate and mother of two, was the inaugural recipient of the scholarship, which helped pay for a final class. Garcia completed her degree in speech pathology in December.

Tucker and Garcia have more in common than just the scholarship. Garcia became a single mom at 16, and Tucker was raised by a single mom. Tucker's mom earned her associate's degree by taking classes one at a time over the course of a decade. That emphasis on the value of education inspired Tucker to honor her legacy by creating the scholarship fund.

"There are so many different ways to give," Tucker said. "Whatever your interest is, you can give toward that and be a small part of not just one person's future, but also the entire University community."

Garcia said: "I want to be able to do that in the future. It inspired me to think about what I can do later on to give back." —*Melissa Graham*



Wade Fagen-Ulmschneider BS'05, MSCS'06 is a teaching assistant professor of computer science at the University of Illinois at Urbana-Champaign. He specializes in data and works with students on data visualizations. Fagen-Ulmschneider earned degrees in software engineering and computer science.



Dr. J. Chase Findley BA'05 is an assistant professor and director of medical student education in the UT Health Science Center at Houston's Department of Psychiatry and Behavioral Sciences. In May 2018, he received the Herbert L. and Margaret W. DuPont Master Clinical Teaching Award. Findley graduated with a degree in interdisciplinary studies.



Jacob Jones-Martinez BA'05, JD is chief of staff for Iconico Campaigns, a consultancy and resource for advocacy groups and organizations that are leading the fight for social change. Jacob graduated with a degree in government.



Dr. Jonathan Fickenschner BS'06 is an associate research scholar in the Department of Mathematics at Princeton University. He focuses on ergodic theory and dynamical systems. Fickenschner earned a degree in computer science.



Dr. John Sneed BS'07 is an assistant professor in the McGovern Medical School of the UT Health Science Center at Houston. He provides inpatient psychiatric services and teaches students and residents. Sneed holds a degree in molecular biology.

2010s



Ashley Huntsberry BA'10 is an assistant professor of clinical pharmacy at the University of Colorado's Skaggs School of Pharmacy and Pharmaceutical Sciences. She serves as a clinical pharmacy specialist for the CU Denver Internal Medicine Group. She holds a degree in biology.



Dina Abdelrazik MS'15 is a senior analyst at Parks Associates in Addison, Texas. She studies market trends and consumer behavior in emerging technology products and services. Abdelrazik earned a degree in marketing.



Alex Luna BS'15 was named the head coach of Stephen F. Austin University's beach volleyball team. Before joining SFA, Luna spent two years at San Jose State University as an assistant beach and indoor volleyball coach. Luna graduated with a degree in psychology.



Miguel Perez BS'15 is an assistant producer at KERA, where he produces local content for "Morning Edition" and KERA News. Perez is also a music writer for NPR and earned a degree in economics.



Fallon D. Wallace MS'15, MBA'15 is an associate site administrator for Parkland Health & Hospital System. She previously worked at Raytheon as a process engineer, analytical chemist and management assistant.

UT Dallas Research

BY THE NUMBERS

\$113 million

Total FY 2018 Research Expenditures

556 tenured/
tenure-track
faculty

\$40 million FEDERAL

\$33.3 million INSTITUTIONAL RESOURCES
(e.g., state matching funds, designated tuition, other)

\$16 million GIFTS AND ENDOWMENTS

\$9.3 million PRIVATE NONPROFIT

\$9.1 million STATE APPROPRIATIONS

\$3.1 million STATE CONTRACTS AND GRANTS

\$2.4 million PRIVATE FOR-PROFIT

awards by sponsor

\$13.6 million Nat'l Institutes of Health

\$12.6 million Nat'l Science Foundation

\$9.8 million Dept. of Defense

\$1.6 million Dept. of Energy

\$1.1 million NASA

\$1.2 million OTHER

U.S. Census Bureau

Dept. of Education

Dept. of Justice

Dept. of Transportation

Dept. of Agriculture

Dept. of Homeland Security

Entrepreneurship

27 companies in the
Venture Development Center

352 ideas submitted
in startup competitions

UT Dallas entrepreneurship
programs rank in the **Top 25**
in the world, according to 2019
rankings by *The Princeton Review*

#11
Best Graduate
Programs for
Entrepreneurs

#23
Best Undergraduate
Programs for
Entrepreneurs

Technology Commercialization

178 currently active patents

167 patents pending

36 active licenses/options

In FY 2018

patents issued **26**

11 licenses/options executed

\$3.6 million
license revenue



THE UNIVERSITY
OF TEXAS AT DALLAS

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Permit 3641



We've done a lot
of growing since we
were established
in 1969.

