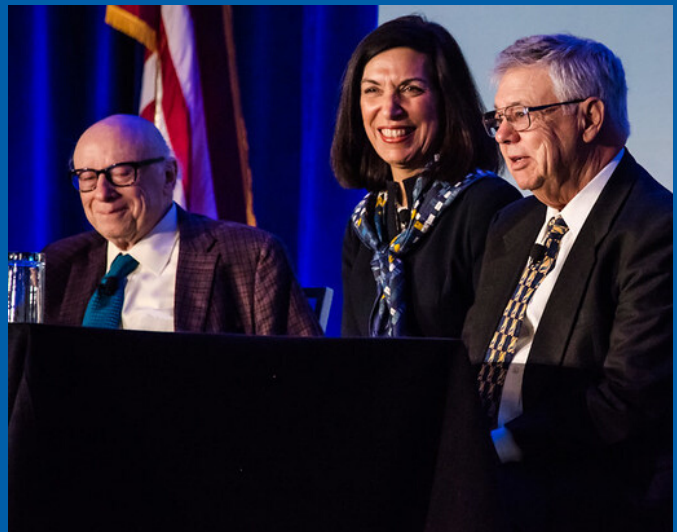


CONFERENCE SUMMARY

TAMEST 2020 ANNUAL CONFERENCE
JANUARY 7-9, 2020
FAIRMONT DALLAS HOTEL
DALLAS, TEXAS

**INNOVATING
TEXAS**
*RESEARCH TO
COMMERCIALIZATION*



INNOVATING TEXAS

TAMEST ★ 2020 Annual Conference
RESEARCH TO
COMMERCIALIZATION
January 7-9, 2020 | Fairmont Dallas

TAMEST (The Academy of Medicine, Engineering and Science of Texas) Conference Summary 2020 Annual Conference

TAMEST (The Academy of Medicine, Engineering and Science of Texas) held its annual conference, Innovating Texas, on January 7–9 in Dallas to look at research commercialization through multidisciplinary forums of state and national experts on innovation. With this gathering of the greater research community, Texan titans of industry and innovation experts, the conference aimed to work together and map out the future of Texas' success.

The conference provided participants with information and analysis on Texas innovation ranging from early innovation—the creation of MD Anderson Cancer Center as **one of three original comprehensive cancer centers** designated by the National Cancer Act of 1941, the Nobel Prize winning Texas Instruments engineer who invented the **integrated circuit in 1958**—to the **innovative horizontal drilling and hydraulic fracturing technologies** that are making Texas a driving force in the energy industry today.

The conference resulted in a broader understanding of the innovation happening across the state. Participants also networked across disciplines to foster collaborations for years to come.

More than 350 registrants representing leaders of Texas industry, medical research, academia, venture capital and more attended and contributed their experiences, perspectives and insights. The 41 different panelists and speakers discussed Texas innovation in three categories: celebrate, critique and catalyze.

Links to photos, videos and presentations can be found at tamest.org/2020.

TAMEST 2020 AT A GLANCE



350+
Registrants



41
Speakers and Panelists



30
Sponsors



40+
TAMEST Protégés

"Innovation is the most important thing that will determine our future and our prosperity."

RICHARD K. TEMPLETON
CHAIRMAN, PRESIDENT AND CEO
TEXAS INSTRUMENTS



KEY TAKEAWAYS: CELEBRATE SESSIONS

Hydraulic Fracturing: How One Innovation Changed the World:

"It was definitely incremental experimentation, project by project, and the culture that was created inside the company [Mitchell Energy] was one that allowed for those kinds of experiments to happen." - J. Todd Mitchell, President, Two Seven Ventures, interviewed by Loren Steffy, Author, Speaker and Publisher, 30 Point Press; Stoney Creek Publishing Group

Takeaways: George Mitchell is often known in the industry as the "father of fracking" despite earlier attempts dating as far back as the Civil War era. George Mitchell's son, J. Todd Mitchell, says it was his father's innovation of applying hydraulic fracturing in a massive way, in terms of the pressure and amount of fluids used, that solidified his place in the oil and gas industry. He says it came from a necessity to prevent the company's potential decline based on conventional drilling approaches and sparked a call to action to figure out how to get the gas out of the ground. At the end of his life, George Mitchell made a point to look at the difficult impacts of fracking, which would become part of the Mitchell Foundation's legacy.

The Power of the Permian and Shale Revolution:

"The number one benefit of the U.S. Shale Revolution is energy security." - Scott D. Sheffield, President and CEO, Pioneer Natural Resources

Takeaways: Pioneer Natural Resources is a \$28 billion dollar company that has only one asset: The Permian Basin. It has recently surpassed the Ghawar oil field in Saudi Arabia to become the largest oil field in the world. Currently, Pioneer is producing 4.8 million barrels a day with the forecast of shale oil production expected to increase to 6 million barrels a day in the coming years. Despite his assurance that the oil fields will not dry up any time soon, Sheffield said we must look at hydrocarbons as a transition to natural energy in the long term and that we must keep investing in natural energy, wind, solar and electric vehicles.

MD Anderson: Advancing Science, Discovery and Therapeutics in Cancer Care:

"Thirty to fifty percent of cancers can be prevented using the science we have now. We need to anchor ourselves around an approach where science is driving policy. It is our job in the academic community to promote this thinking in the industry." - Peter WT Pisters, M.D., President, The University of Texas MD Anderson Cancer Center

Takeaways: A series of unique factors position MD Anderson Cancer Center and Texas for an unprecedented pace of discovery and innovation. Through its strategic position in talent and infrastructure, financial resources, patient volumes and industry relationships with transformational potential, MD Anderson Cancer Center continues to create practice-changing discoveries. Since 2007, MD Anderson has contributed to 72 out of 130 FDA approvals for oncology. Pisters says continued collaboration between academia and industry will be crucial for Texas innovation.

TEXAS INNOVATION AT A GLANCE



**10th Largest Economy
in the World**



**Home to 50
Fortune 500
Headquarters**



**Fast-Growing Tech
Sector**



**Most Productive
Oil Field in the
World**



**Top Cancer
Center in the
United States**

KEY TAKEAWAYS: CELEBRATE SESSIONS



"I found hundreds of definitions for 'innovation', but innovation is more than a good idea...more than solving problems...it affects the way we communicate, work, play and think."

JOHN L. ANDERSON, PH.D. (NAE)
PRESIDENT
NATIONAL ACADEMY OF ENGINEERING

The Relevance of the NAE to Innovation:

"We don't innovate in the Academies. We empower [and] convene people to promote the concept [of innovation] and move it forward." - John L. Anderson, Ph.D., President, National Academy of Engineering

Takeaways: The National Academy of Engineering's relevance to innovation lies in its ability to get out of Washington, listen to its members and advance the well-being of the nation by promoting a vibrant engineering profession and by marshaling the expertise and insights of eminent engineers to provide independent advice to the federal government on matters involving engineering and technology.

Texas Instruments: Leading Technology Innovation:

*"We knew it was important to be able to adapt and change in a world that is constantly changing. In the world of technology, that sentiment has never let us down."
- Richard K. Templeton, Chairman, President and CEO, Texas Instruments*

Takeaways: It takes time, patience and persistence to take an idea to commercialization. In 1958, Texas Instruments Engineer Jack Kilby invented the integrated circuit, which later earned him a Nobel Prize. However, it took about a decade until the world really recognized the transformative power of this invention. According to Templeton, it was TI's environment and commitment to looking forward and setting aside time and resources to work on the next challenge or problem facing the world that clinched his success. In addition to internal ideas, TI actively recruits from the outside and constantly looks for fresh ideas. Moving forward, Templeton encourages companies to invest more in K-12 STEM education, research and the world's best minds.

KEY TAKEAWAYS: CELEBRATE SESSIONS

Innovating Texas Poster Challenge:

The Innovating Texas Poster Challenge highlighted 23 participants from both academia and industry involved in an innovative project that helped create a product or technology that is being commercially pursued. The concept was to identify research with potential for positive impact from rising researchers across the state of Texas.

The winners:

- Industry: Southwest Research Institute's Michael A. Miller, Ph.D., for his poster "LotusFlo™: A Molecular Plasma Coating Process for Mitigating Deposit Adhesion on Surfaces."
- Academia: The University of Texas at Austin's Ashlee Brunaugh for her poster "CzIP-17: An Optimized, Targeted Treatment for Non-Tuberculous Mycobacterium Lung Infections."



Winners of the Innovating Texas Poster Challenge accept their award from two members of the 2020 TAMEST Conference Program Committee. (Left to right) Ann Beal Salamone (NAE), Michael A. Miller, Ph.D., Ashlee Brunaugh, M. Cynthia Hipwell, Ph.D. (NAE)

Army Futures Command: Bringing the Military into the Digital Age:



"[Army Futures Command chose Texas] for many reasons, but one is because of the talents, skills and willingness to work with the United States Armed Forces. There is no lack of people [and] institutions that are willing to reach out and help."

-John M. Murray, Commanding General, Army Futures Command

Out of a list of 150 potential cities across the nation, Austin, Texas became home to the headquarters of Army Futures Command in July 2018. This newly established command is designed to lead the Army through a modernization of technologies, capabilities and concepts in order to better position the military of tomorrow in operations beyond land, air and sea.

ARMY FUTURES COMMAND BY THE NUMBERS



2018
Established in
Austin, TX



\$38 Billion in the
Army's
Modernization
Budget



26,000
Employees



\$10 Billion
Dedicated to Public-
Private Partnership
Investments

Texas' Rising Star Researchers 2020 O'Donnell Awards Recipients

Changing the future of Alzheimer's Disease. Utilizing crystals to produce drugs for kidney stones and malaria. Understanding previously unobserved phenomena of our universe. And pioneering the evolution of wound care. These are the discoveries by Texas' rising stars in research being honored with the 2020 Edith and Peter O'Donnell Awards by TAMEST.

The Edith and Peter O'Donnell Awards showcase the best and brightest in Texas research, whose creative work could have a lasting impact on our lives. Their work meets the highest standards of science, and the paths to their discoveries show immense ingenuity and imagination. The awards are named in honor of Edith and Peter O'Donnell, who are among Texas' staunchest advocates for excellence in scientific advancement and STEM education.



MEDICINE

Bess Frost, Ph.D.

Assistant Professor
Sam and Ann Barshop Institute
for Longevity and Aging Studies
Department of Cell Systems
and Anatomy
UT Health San Antonio

ENGINEERING

Jeffery D. Rimer, Ph.D.

Abraham E. Dukler
Professor of Chemical Engineering
University of Houston

SCIENCE

Alessandra Corsi, Ph.D.

Associate Professor
Department of Physics and
Astronomy
Texas Tech University

TECHNOLOGY INNOVATION

**Kristine Kieswetter,
Ph.D., M.B.A.**

Senior Director,
Device Sciences Center of
Excellence, KCI

**Deepak V. Kilpadi,
Ph.D., M.B.A.**

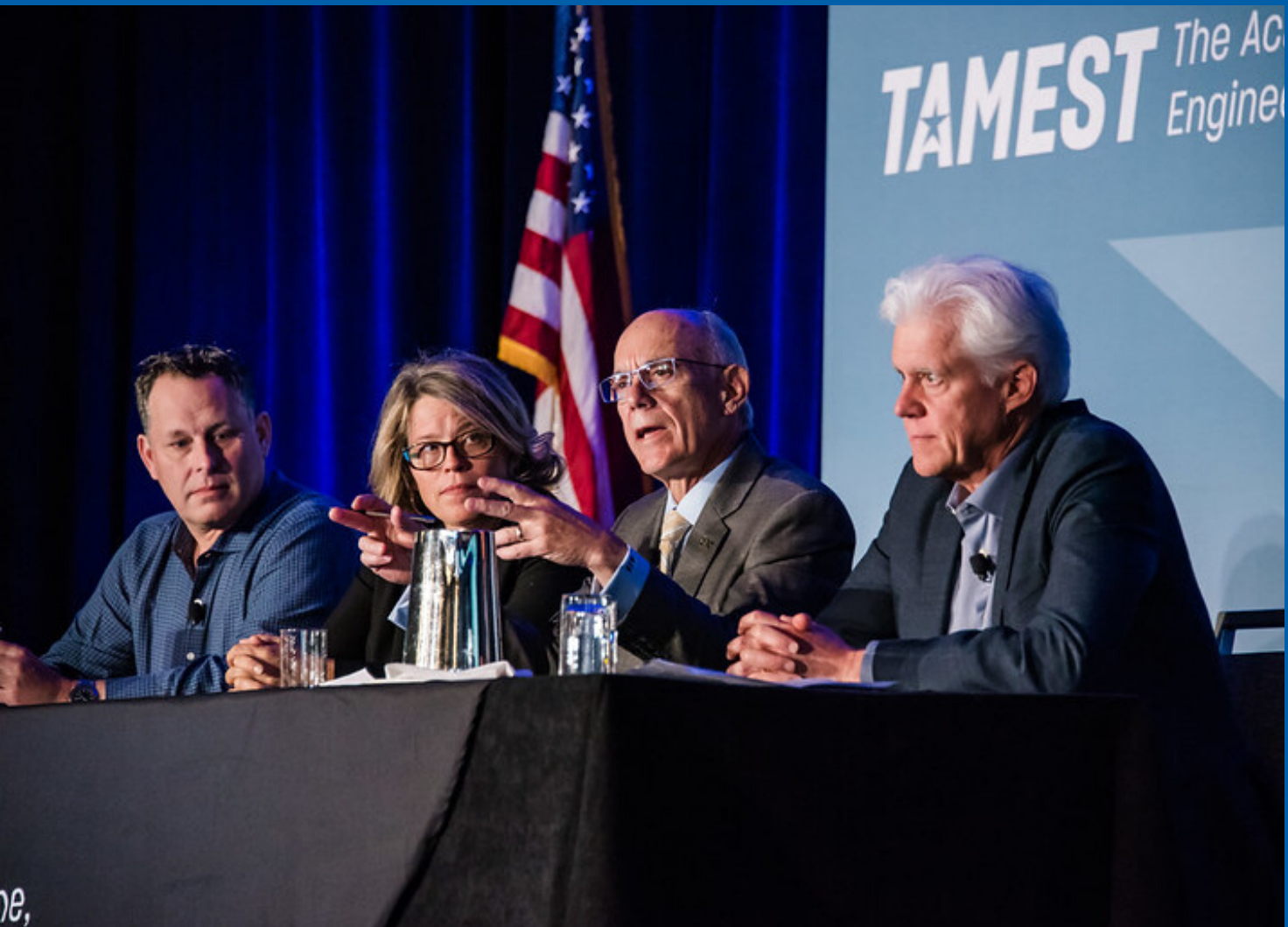
Medical Science Liaison
KCI



"Willingness to take risks is absolutely essential."

RAFAEL L. BRAS, Sc.D.

PROVOST AND EXECUTIVE VICE PRESIDENT FOR ACADEMIC AFFAIRS
GEORGIA INSTITUTE OF TECHNOLOGY



KEY TAKEAWAYS: CRITIQUE SESSIONS

Improving the Path to Research Commercialization in Texas:

"Sometimes, the right thing to look for are people who are living in the future, notice what's missing and become obsessed with solving the problem." - Mike Maples Jr., Co-Founder and Partner, Floodgate Fund

- Adam L. Hamilton, P.E. (Southwest Research Institute), Rafael L. Bras, Sc.D. (Georgia Institute of Technology), Mike Maples Jr. (Floodgate Fund), Eric Olson, Ph.D., NAM, NAS (UT Southwestern Medical Center), Katie Rae (The Engine)

Takeaways: *Three innovation experts hailing from different high-powered innovation ecosystems all agree that the key to improving Texas' path to commercialization rests in its people. Ensuring that students, startups and inventors not only have the tools to be successful but the courage to take educated risks is crucial to innovation.*

Why does Texas Underperform in VC Funding and What Can We Do About It?:

"Just like we teach...understand[ing] the market from a customer point of view, you have to know your investor...[you must find] an investor who understands your industry and cares about the technology."
- Kerry Rupp, General Partner, True Wealth Ventures

- Andrew Strong, J.D. (Pillsbury Winthrop Shaw Pittman, LLP), Jim Breyer (Breyer Capital), Clay Heighten, M.D. (GPG Ventures; Caddis Partners; Health Wildcatters), Kerry Rupp (True Wealth Ventures), Gerald Sewack, Ph.D. (RA Capital Management, LP)

Takeaways: *Austin is not the only Texas city bringing in venture dollars, but it does receive the most. Austin startups brought in 61 percent of the \$3 billion raised in Texas last year. Dallas-Fort Worth came in second, with Houston not far behind it. Though Texas is certainly on the rise for future funding, the panel spoke about what firms are looking for and how to move the needle in the rest of the state. VC firms are looking for technology that can translate into a successful business. Proper matchmaking, being able to say no when it isn't a good fit, and continued awareness of the innovation and pro-business scene in Texas will put entrepreneurs on the road to success.*

Examining CPRIT's Role in Advancing Commercialization and Innovation:

"High-risk, high-impact projects are what CPRIT allows you to work on...with their funding I've been able to hire my students full time, working on research related to cancer and diagnostics."
- Livia Schiavinato Eberlin, Ph.D., Assistant Professor, The University of Texas at Austin

- Tom Kowalski (Texas Healthcare & Bioscience Institute), Keith Argenbright, M.D. (UT Southwestern Medical Center), Livia Schiavinato Eberlin, Ph.D. (The University of Texas at Austin), James Willson, M.D. (Cancer Prevention & Research Institute of Texas)

Takeaways: *The Cancer Prevention & Research Institute of Texas' (CPRIT) prevention grant awards make it possible for prevention interventions and services to reach more Texans to decrease the burden of cancer. As a direct result of CPRIT's funding, research, such as Dr. Eberlin's MasSpec Pen, has successfully commercialized into technology that is currently being implemented. The amount of prevention programs, services and research that has been borne from CPRIT funding is a perfect example of a successful match between investor and innovator.*

TEXAS INNOVATION AT A GLANCE



**Over \$2 Billion
CPRIT Grants
Awarded Since 2010**



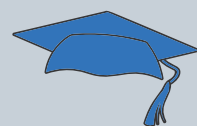
**Home to
300+ VC Firm
Headquarters**



**Five of the Top 20
Largest Cities in
the United States**



**Low Cost of Living
and Business
Friendly**



**Highly Skilled
Workforce**

"We are seeing more of team science...this is something we should capitalize on in Texas because we do have strength in [medicine], engineering [and science]."

HUDA ZOGHBI, M.D. (NAM, NAS)

PROFESSOR, BAYLOR COLLEGE OF MEDICINE

DIRECTOR, JAN AND DAN DUNCAN NEUROLOGICAL RESEARCH INSTITUTE

INVESTIGATOR, HOWARD HUGHES MEDICAL INSTITUTE



KEY TAKEAWAYS: CATALYZE SESSIONS

Creating a Disruptive Innovation Culture Within Large Organizations:

"This is the single most important aspect of change...you have to start with the people."
-Mamie Jones, Senior Vice President of Product Development, Intuit ProConnect Group

Takeaways: Innovation comes from change. Change the mindset, change the expectations, change the work culture into one that is agile and courageous enough to combat the status quo. Through emulating this strategy, Texas' innovation ecosystem can transform into a more competitive environment on a national scale.

Invention to Impact:

"Intellectual property creates a significant multiplier in economic output."
- Andrea Belz, Division Director, Industrial Innovation and Partnerships, National Science Foundation (NSF)

Takeaways: Data shows that there is a great need to support the commercialization of deep technologies. Through financial support, training programs and specialized divisions, the NSF is poised to actively and substantially impact the path from research to commercialization.

Nobel Laureates Panel: Turning Basic Research into New Therapies:

"There is no lack of ideas being generated here; it's a matter of the commercial investment."
- Nobel Laureate Michael S. Brown, M.D., Regental Professor, UT Southwestern Medical Center

- Huda Zoghbi, M.D., NAM, NAS (Baylor College of Medicine), Nobel Laureate Michael S. Brown, M.D., NAM, NAS (UT Southwestern Medical Center), Nobel Laureate Joseph L. Goldstein, M.D., NAM, NAS (UT Southwestern Medical Center)

Takeaways: Texas is a pioneering state. From heart surgery to cancer research, the work that has been done in Texas has saved thousands of lives. To continue the state's impactful trajectory, an eye for the future, an appetite for failure and the ability to integrate both clinical and research work are crucial.

Driving Innovation Through Research:

"We built this team to maximize our ability to help companies."
-Matt McMahon, Director, SEED Office, National Institutes of Health (NIH)

Takeaways: The goal of academic innovation is to get the science out of the laboratory. The NIH helps researchers execute this transition by providing multiple programs focused on understanding the path to commercialization and consultations with experts on intellectual property and investors. Due to an expansive network of NIH Centers for Accelerated Innovation and Research Evaluation & Commercialization Hubs across 34 states, more than 250 research and development projects have been supported while more than 2,000 innovators have been trained on successfully commercializing their research.

TEXAS INNOVATION AT A GLANCE



11 Nobel Laureates



**Over \$400 Million
in NSF Grants
in 2018**



**3 Texas Metros
among America's Top
10 Cities of the Future**



**Best State for
Business for 15th
Year in a Row**



**Home to 5,000+
Life Science Firms**

KEY TAKEAWAYS: CATALYZE SESSIONS

The Role of Patents in Innovation:

"In the past eight years, patent filings have gone up 37 percent in Texas." - The Honorable Andrei Iancu, Undersecretary of Commerce for Intellectual Property and Director, United States Patent and Trademark Office

Takeaways: Perseverance and grit are the two qualities essential to the identity of an inventor. A patent solidifies the product of this spirit—innovation. Throughout the history of the American patent system, American inventors have been at the forefront of breakthrough discoveries and world-changing inventions. This is both the story of the nation and the story of Texas.

Ross Perot's Legacy of Innovation and Impact on the State of Texas:

*"The most critical part about our state is an attitude. We're a very optimistic, pro-business, pro-growth state."
-H. Ross Perot Jr., Chairman, The Perot Group, interviewed by Tom Luce, J.D., Board Chairman, Texas 2036*

Takeaways: Texas has changed from an agriculture and resource-based economy to one that is based on human capital. The competition in the world is now based on talent, and Ross Perot helped create the foundation for Texas' present success. The biggest challenge to continuing this success is managing the growth of the state while preserving the talent of the Texas workforce. Finding this balance is essential to the growing opportunities that Texas is being afforded thanks to the state's rich history in advancing technology.



"My father loved to help the community, the state and the country. He loved to help recruit really great scientists into Dallas-Fort Worth to build human capital and continue to build great research universities."

H. ROSS PEROT JR.
CHAIRMAN
THE PEROT GROUP

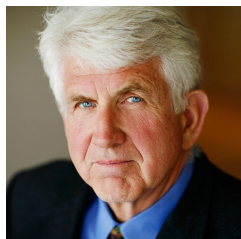
"TAMEST is an excellent example of the work that needs to be done on both local and national scales."

THE HONORABLE ANDREI IANCU
UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR, UNITED STATES PATENT AND TRADEMARK OFFICE



NEXT STEPS

The TAMEST 2020 Annual Conference showcased the best work being done and the work that still needs to be done in our great state. Research alone is not enough to solve our state's challenges. Through better illuminating the path to commercialization, understanding our state's rich history of impactful innovation and continually convening the greater research community, Texas can further strengthen its identity as a pioneering state with a guaranteed future of success.



*"Conferences like Innovating Texas can help **catalyze research commercialization** by creating **multidisciplinary forums of state experts** on innovation to work together and **map out the future of Texas' success.**"*

-Bob Metcalfe, 2020 Conference Program Chair

2020 Annual Conference Program Committee

Conference Program Chair

Bob Metcalfe, Ph.D. (NAE)
The University of Texas at Austin

Honorary Chair

The Honorable Gordon R. England (NAE)
Dyno-Tech

Claire Aldridge, Ph.D.
UT Southwestern Medical Center

David E. Daniel, Ph.D. (NAE)
The University of Texas at Dallas

M. Cynthia Hipwell, Ph.D. (NAE)
Texas A&M University

Larry Peterson, M.B.A.
Texas Foundation for Innovative Communities

Ann Beal Salamone (NAE)
Rochal Industries

Next for TAMEST

Join TAMEST as we continue to convene Texas' greater research community to tackle our state's largest challenges:

Natural Hazards Summit Part 1: Wind, Tornado and Drought Impacts

Texas Tech University | Lubbock, Texas | June 2, 2020

Natural Hazards Summit Part 2: Hurricane, Flood and Wildfire Impacts

University of Houston | Houston, Texas | October 20, 2020

TAMEST 2021 Annual Conference: Forward Texas-Community Health and Well-Being

The Westin Riverwalk | San Antonio, Texas | January 12-14, 2021

For more information, visit tamest.org



CONFERENCE SPONSORS

Innovating Texas was made possible through the generous contributions of our sponsors. We value and appreciate their support.

PLATINUM

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DIAMOND



LYDA HILL
PHILANTHROPIES



TEXAS A&M
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TEXAS
INSTRUMENTS

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Medical Center

&



Southwestern
Medical
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3M + KCI
United by purpose.



RICE UNIVERSITY



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TEXAS
The University of Texas at Austin

UNT COLLEGE OF
ENGINEERING



THE UNIVERSITY OF TEXAS AT DALLAS



Advancing Chemistry. Improving Life.

SILVER



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THE UNIVERSITY OF TEXAS
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Cancer Center
Making Cancer History™



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& Innovation



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The University of Texas at Austin
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Engineering & Science of Texas*

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