TEXAS UNDERGRADUATE RESEARCH DAY 2023

Panel Participants
April 11, 2023

Welcoming Remarks

Commissioner Harrison Keller, Texas Higher Education Coordinating Board

- B.A., University of Notre Dame (Philosophy)
- M.A., Georgetown University (Philosophy)
- Ph.D., Georgetown University (Philosophy)

At the Coordinating Board, Dr. Keller has worked with higher education leaders, employers, and policymakers to develop and advance the state's strategic plan for higher education, *Building a Talent Strong Texas*. With the adoption of this plan in January 2022, Texas became the first state to condition its goals for awarding higher education credentials on the value of those credentials to students. Dr. Keller has also worked with the Governor, legislators, and higher education leaders to accelerate innovation and increase support for financial aid, transfer, workforce education, and research and development. Dr. Keller is a recognized innovator in policy and programs to improve college readiness and student success, especially for low-income and first-generation students. He is the founder of the OnRamps dual enrollment initiative that provides college-level courses to tens of thousands of high school students across Texas each year. He also founded Texas OnCourse that supports college and career advising in secondary schools across the state.

Faculty Conversation (10:00 am panel)

Moderator: Stacey Kulesza, PhD, Texas State University

Associate Professor — Ingram School of Engineering

- B.S., Texas A&M University (Civil Engineering)
- M.E., Texas A&M University (Civil Engineering)
- Ph.D., Texas Tech University (Civil Engineering) (all with a geotechnical focus)

Dr. Kulesza's research focuses on integrated site characterization, applied geophysics, and geotechnical infrastructure deterioration. She also studies asset based pathways towards creating authentic engineering identities. Her research sponsors include the National Science Foundation, Federal Railroad Administration, U.S. Department of Transportation, and various state agencies. She is the director of the new CREATE University Transportation Center. CREATE is a $10 million center sponsored by the USDOT and housed at Texas State that will focus on research and education actions for enhanced durability of coastal transportation infrastructure. She is a member of the NSF Geotechnical Extreme Events Reconnaissance (GEER) team and participated in the GEER evaluation of the city of Houston impacts from Hurricane Harvey in 2017.

Michael Sanders, Texas A&M University – Corpus Christi

Executive Director, Lone Star UAS Center of Excellence and Innovation

- B.A., University of California, Los Angeles (Liberal Arts)
- M.S., University of Central Florida (Industrial Engineering and Management Sciences)

Mr. Sanders leads Texas A&M-Corpus Christi's Lone Star Unmanned Aircraft Systems (UAS) Center of Excellence and Innovation; one of seven Federal Aviation Administration's designated UAS Test Sites. LSUASC's mission is to: advance the integration of UAS and Autonomous Aviation (AAV) technologies across educational, public, and commercial agency interests; inform governing agencies on UAS and AAV operations to better able integration into the National Airspace System; and support state-wide efforts to integrate UAS to Emergency Management and Public Safety agencies within the State of Texas. Prior to joining the university, Mike served as an Infantry Officer in the US Army in a variety of Command and Leadership positions. His assignments included combat deployments coordinating Counter-IED efforts in Afghanistan in 2011. Mike was an experimentation lead for the Army's Objective Force Task Force while serving as Deputy Director for both the Army and Defense Modeling and Simulation Offices. After retiring from the Army, Mike spent almost five years in the private sector, and was the Deputy Project Manager on a $5M Air Force modeling and simulation support services contract.

Sue Anne Chew, PhD, The University of Texas Rio Grande Valley

Associate Professor in the Depart. of Health and Biomedical Sciences in the College of Health Professions

- B.S., The University of Texas at Austin (Chemical Engineering)
- Ph.D., Rice University (Bioengineering)

Dr. Sue Anne Chew research focuses on the development of biomaterial-based strategies encompassing cells and/or bioactive factors for tissue engineering and the treatment of cancer. Her research is funded by a NIH SC3 grant and she is a recipient of the 2022 American Association of Cancer Research (AACR) Minority and Minority-Serving Institution Faculty Scholar in Cancer Research Award. Passionate about getting students involved in research starting at the high school and undergraduate level, she is the Program Director of the Biomedical Freshman Research Initiative Program (BFRI) that provides UTRGV freshmen the opportunity to be exposed to research. As the Program Director of the NIH T34 funded Rio Grande Valley Bridges to Baccalaureate in Biomedical Sciences Program (B2BMED), Chew supports the bridging of students from South Texas College (STC) and Texas Southmost College (STC) into the BS in Biomedical Sciences program. Her continuous goal is to become a successful investigator in the development of biomaterials for cancer and bone tissue engineering field that is able to contribute high quality and impactful findings to the scientific community. She also aims to become a researcher that is an influential mentor to future scientists and investigators. Besides conducting research, she enjoys teaching and was a 2019 Regent's Outstanding Teaching Award recipient.

Krishna Jagadish, PhD, Texas Tech University

Professor, Thornton Distinguished Chair of Plant & Soil Science; Director, Davis College Water Center; Director, Texas Coalition for Sustainable Integrated Systems Research and Coordinator for Texas Alliance for Water Conservation

- B.S., University of Agriculture Science, Bangalore, India (Agriculture)
- M.S., University of Agricultural Sciences, Dharward, India (Agronomy)
- Ph.D., University of Reading, UK (Agriculture, Crop Physiology)

Dr. Jagadish's research program at Texas Tech focuses on optimizing forage-based cropping systems, developing new tools to enhance water conservation and improve soil health. The goal of his program is to effectively integrate forage-crop-livestock components to enhance economic benefits and environmental sustainability in the Southern High Plains. His research has resulted in 168 international peer-reviewed publications with more than 11223 citations and a H index of 58. He has generated more than 17 million USD in grant funding as PI, mentored more than 25 graduate students and served as an associate editor for Field Crops Research and other journals. A recent grant with which Dr. Jagadish is involved is with Love, Tito's, the philanthropic branch of Austin-based Tito's Handmade Vodka. The $1.2 million gift will support research in sustainable solutions related to water on local and global scales.

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Pre-Panel Presentation

Texas Research and The Texas CHIPS Act

Mr. Garza will provide an overview of proposed legislation referred to as the "Texas Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act" that would create the Texas Semiconductor Innovation Consortium and Fund. The consortium would build on the expertise of institutions of higher education, industry and nonprofit stakeholders to address semiconductor innovation, advance Texas as a leader in advanced semiconductor research, design and manufacturing, encourage investments in related programs across the state (including research, commercialization and manufacturing of semiconductors). The legislation also provides for the creation of the Texas Semiconductor Innovation Fund as a means of financing projects, grants and economic development-related initiatives.

Related links: HB 5174, SB 2288, CHIPS Act press release, semiconductor news coverage.

Norman Roy Garza, Jr., Texas A&M University

Vice President of Government Relations

- B.S., St. Edward's University (Political Science)
- Graduate coursework: Universidad de Belgrano (Buenos Aires, Argentina), international relations

Mr. Garza leads implementation of congressional and legislative initiatives through coordination with The Texas A&M University System federal and state relations offices – respectively, located in Washington, D.C. and Austin, TX. Prior to this role, Mr. Garza was Assistant Vice Chancellor of Government Relations for Texas A&M Engineering and Associate Legislative Director for Texas Farm Bureau, as well as deputy chief of staff for a state senator.

Additional legislation advancing the state economy through university research, community support, business/industry participation and federal programming is the proposal to create the Texas Space Commission and the Texas Aerospace Research and Space Economy Consortium (SB 1652 and the identical companion, HB 3447; overview provided here).

Faculty and Graduate Student Conversation (11:15 am)

Moderator: Stacey Kulesza, PhD, Texas State University

Associate Professor — Ingram School of Engineering

Mark V. Albert, PhD, University of North Texas

Associate Chair for Graduate Studies, Assistant Professor, Computer Science and Engineering

• B.S., Pittsburg State University (Computer Science, Chemistry, Physics, Mathematics)
• Graduate coursework: Carnegie Mellon University, University of Pittsburgh, University of Vienna (Austria)
• Ph.D., Cornell University (Computational Biology)

As the director for the Biomedical Artificial Intelligence Lab, Dr. Albert's professional goal in life is to leverage machine learning to automate the collection and inference of clinically useful health information to improve patient outcomes. His projects in wearable sensor analytics have improved the measurement of health outcomes for individuals with Parkinson's disease, stroke, and transfemoral amputations. He has currently funded projects improving fall prediction for hip-worn airbags with the Shirley Ryan AbilityLab, performing toddler activity recognition with Lurie Children's Hospital, and predicting surgical outcomes in Cerebral Palsy with the Shriners Hospitals for Children network. He also manages over 2,000 current graduate students in Computer Science and Engineering as the Associate Chair for Graduate Studies with a variety of initiatives to engage them in industry and academic research.

Karina Chantal Canaba, PhD, The University of Texas at El Paso

Associate Director, Campus Office of Undergraduate Research Initiatives, Research Assistant Professor, Educational Leadership and Foundations

- B.A., The University of Texas at El Paso, (Communication)
- M.Ed., The University of Texas at El Paso, (Higher Education)
- Ed.D., The University of Texas at El Paso, (Educational Leadership)

Dr. Canaba is the Associate Director of the Campus Office of Undergraduate Research Initiatives (COURI) and a Research Assistant Professor in the Department of Educational Leadership and Foundations. Her scholarship seeks to better understand equity issues in K-12 and higher education by incorporating subaltern research methodologies to identify best practices for student development and support of non-traditional and minority students. She has successfully overseen and served as co-Principal Investigator on several undergraduate research programs funded by agencies such as the National Science Foundation, the Department of Energy, and the National Institutes of Health, including BUILDing Scholars- a multi-institution consortium in the southwest that seeks to train the next generation of biomedical researchers.

Priya Arunachalam, Texas A&M University

EnMed Graduate Student (a tripartite collaboration between Texas A&M's College of Engineering, School of Medicine and the state's top-ranked Houston Methodist Hospital)

- B.S., Johns Hopkins University (Biomedical Engineering)
- M.B.A., Johns Hopkins University (Entrepreneurship & Healthcare Administration)
- M.D./M.Eng, Texas A&M University (2023) (future general surgery resident)

Ms. Arunachalam is a process-oriented innovator at the intersection of medicine, engineering and business. Her experience in these areas includes business development, disruptive product design, and market entry strategies for companies including Alcon, Pfizer, Gemstone Biotherapeutics, and Bayer. She is interested in process improvement, low-cost innovations, and enhanced patient outcomes. Arunachalam serves on the Board of Directors of a non-profit that connects medical students and professionals to service projects and provides them a space to promote their own initiatives. She is also the co-founder of a company that provides cold storage solutions for health and nutrition delivery in Sub-Saharan Africa. Arunachalam's interest in research started in high school participating at UT Austin in a wet lab combined with computational engineering, followed by several lab opportunities at Hopkins ranging from bench work to clinical research to organizational culture research; primarily clinical research and technology development at A&M. Her goal is to conduct research that results in clinical impact / change in guidelines and early adoption of new technologies

The EnMed program features a revolutionary medical education where students receive medical doctorates and master of engineering degrees focused on the design and implementation of medical technologies in the same four years.

Bridget Ford, PhD, University of the Incarnate Word

Associate Professor, Department of Biology

- B.A., St. Mary's University (Biological Sciences)
- Ph.D., The University of Texas Health Science Center at San Antonio (Molecular Medicine)

Dr. Ford is an Associate Professor in the Department of Biology at UIW. She obtained her bachelor's degree at St. Mary's University in Biological Sciences with a minor in Chemistry. She then went on to earn her Ph.D. in Molecular Medicine at UT Health San Antonio. She completed her postdoctoral fellowship training at the United States Army Institute of Surgical Research in the Extremity Trauma and Regenerative Medicine task area and at UT Health at San Antonio between the Magnetic Resonance Imaging Division and the Department of Medicine. Dr. Ford is dedicated to mentoring undergraduates in the research laboratory where her research focuses on understanding the molecular mechanisms involved in renal cell injury in diabetic kidney disease with a particular emphasis on oxidative stress pathways. The overall goal Dr. Ford has for all her trainees is to apply what they learn in the classroom to ask scientific questions in the quest to become independent and creative thinkers."