2024

The University of Texas Rio Grande Valley™

Research Annual Report

2024 UTRGV Research Annual Report

The UTRGV Research Annual Report is published under the leadership of Dr. Can Saygin, Senior Vice President for Research. The writing, photography, design, and production for this publication were completed by María González and Jesús Alférez.

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Photography by Jesús Alférez

Welcome to the second edition of The University of Texas Rio Grande Valley Annual Research Report for Fiscal Year 2024 (FY24). As I reflect on the progress we have made since last year's inaugural report, I am filled with pride as I witness the continued growth and accomplishments that define our path toward research excellence.

In my third year as Senior Vice President for Research and Dean of the Graduate College, I remain deeply committed and energized by our shared mission to advance research and generate meaningful societal impact. The progress we have seen over the past year is a direct result of the dedication, collaboration, and hard work of our exceptional faculty, students, and staff.

Research expenditures and doctoral degrees are two key metrics in our journey to becoming an Emerging Research University and achieving Carnegie R1 status. Our research performance in FY24 highlights several important milestones, building on the foundation laid in previous years.

This year, we submitted 601 proposals, a significant increase from 505 in FY23 and 467 in FY22. The total value of proposals submitted reached $200.1M in FY24, up from $98.8M in FY23 and $97.2M in FY22. The number of faculty involved in proposal writing as Principal Investigators (PIs) and Co-PIs also grew, with 416 faculty participating in FY24, compared to 359 in FY23 and 343 in FY22. Our total research expenditures reached $86.9M in FY24, continuing a steady rise from $78.8M in FY23 and $60.7M in FY22. Additionally, we graduated 68 doctoral students in FY24, a significant increase from 45 in FY23 and 43 in FY22.

As of September 2024, we have surpassed the requirements to become eligible to receive the annual National Research Support Funding (NRSF). Given our overall performance, we are making significant progress toward achieving Carnegie R1 status in the 2028 Carnegie classification cycle.

These achievements reflect our ongoing commitment to continuous improvement and operational efficiency. This year, our focus on excellence in customer service was recognized with the Inaugural Bravo Vaqueros Spirit Award, highlighting our efforts to provide responsive, solution-oriented support to our research community.

Our success is the result of the hard work and collaboration of our UTRGV faculty, students, and staff. Their collective efforts are driving our mission forward, creating tangible societal impact through research and scholarly activities across our region, state, nation, and beyond.

In this report, you'll learn about UTRGV's 19 research centers and institutes, as well as feature stories that highlight the impact of our faculty, staff, and colleges. These achievements are propelling UTRGV forward, reinforcing our role as a leading community-focused research university.

I hope you enjoy reading this report, share it with others, and, most importantly, take pride in UTRGV's relentless pursuit of research excellence and the transformative impact we are making as a university.

Senior Vice President for Research
Dean of the Graduate College

Research Leadership

Can Saygin, PhD is the Senior Vice President for Research and Dean of the Graduate College. He is also a Professor of Manufacturing and Industrial Engineering at the College of Engineering and Computer Sciences at The University of Texas Rio Grande Valley (UTRGV). Previously at The University of Texas at San Antonio (UTSA), he held key administrative roles, including Senior Associate Vice President for Research and Senior Vice Provost. His career spans the University of Toledo in Ohio, Missouri S&T, and UTSA. He received prestigious awards, such as the UTSA College of Engineering 2009 Excellence in Teaching Award, the UTSA President's 2011 Distinguished Achievement Award for Teaching Excellence, and The University of Texas System Regents' Outstanding Teaching Award in 2012. Joining UTRGV in 2022, Dr. Saygin continues to shape academia and advance manufacturing initiatives in the region.

Thomas B. Spencer, PhD, MBA is the Associate Vice President for Research Operations and Associate Professor of Health Sciences in the Department of Health and Biomedical Sciences at The University of Texas Rio Grande Valley. He oversees six key areas within the Division of Research: Research Liaison, Sponsored Programs, Grants & Contracts, Grants Accounting, Contracts & Industry Agreements, and Technology Commercialization. He has worked in Academia and Research Administration for over two decades and is currently a member of the Board of Directors for the National Council of University Research Administrators (NCURA), and he teaches in the Johns Hopkins Research Administration master's degree program. His research focuses on the study and methods of research itself, including research administration, public affairs, and American healthcare.

Abby Guillory, MLIS, CRA is the Assistant Vice President for Research Enhancement at The University of Texas Rio Grande Valley (UTRGV), with two decades of experience in research and proposal development, sponsored project management, and professional development. Recognized in research administration, she is an educator, publication author, Traveling Workshop Faculty, and recipient of both the National Council of University Research Administrators (NCURA) Distinguished Educator Award and the Society of Research Administrators International (SRAI) Future of the Field award. Abby is currently serving on the Board of Directors for SRAI and pursuing a Doctor of Education, focusing on factors influencing faculty research productivity. At UTRGV, she leads efforts to expand research, scholarship, and creative activities, overseeing proposal development, large-scale submissions, limited submission opportunities, and faculty development.

Arya Singh is the Assistant Vice President for Research Analytics at The University of Texas Rio Grande Valley. He has 16 years of experience in data analytics, data engineering, data management, and data governance, focusing on technology and data service management, and has held positions at The University of Texas San Antonio, Texas State University and Dell Inc. Arya leads the development, management, and maintenance of automated solutions to capture, store and analyze data for institutional research metrics and key performance indicators. He oversees all aspects of technology for the research division, including enterprise and administrative applications, administrative and research data services, networking, servers, and desktop support.

Glorimar Colón, JD, MHEA, ECoP is the Assistant Vice President for Research Integrity at The University of Texas Rio Grande Valley. With 25 years of experience in Research Administration, Glorimar is a seasonal professional specializing in research compliance and integrity. She is also a member of the Society of Research Administrators International (SRAI), Association of University Export Control Officers (AUECO), and the Association of Research Integrity Officers (ARIO). Throughout her career Glorimar has demonstrated expertise in navigating complex regulatory frameworks, policy development, and collaborative problem solving. These strengths have established her as a trusted leader in advancing research goals while upholding trust and institutional integrity.

Angela Cook, PhD, RN, OCN, CCRP is the Associate Vice President for Clinical and Translational Research at The University of Texas Rio Grande Valley. She has worked in Academia and Clinical Research for over 20 years and is currently a member of the Oncology Nursing Society, The Society of Clinical Research Associates, Public Responsibility in Medicine & Research, and the American College of Healthcare Executives. Angela's work and research is dedicated to the improvement and innovation of clinical and translational research, driving clinical excellence. Her approach is to blend administrative and clinical activities into a supportive and collaborative environment that benefits students and professionals looking to deliver quality outcomes and patient satisfaction.

Rosalinda N. Salazar, MBA serves as the Director for Budget and Operations at the Division of Research, contributing 20 years of dedicated service to The University of Texas Rio Grande Valley and the legacy institution UT Brownsville. Her extensive experience spans effective budget management for state, municipal, and school district government entities, including an international bridge. In her current role, Rosalinda oversees general operations and administrative functions, leads strategic initiatives, facilitates communication flow, and guides senior management focus. She actively fosters teamwork, serves as a liaison with supporting areas, and ensures Division-wide budget compliance. Additionally, Rosalinda monitors internal budget reports, prepares forecasts, and audits expenditures and reconciliations, promoting fiscal responsibility within the Division of Research.

María González is the Communications Manager for the Division of Research at The University of Texas Rio Grande Valley (UTRGV), and holds a master's degree in communication. She oversees researchs communication strategy, standards, and branding to strengthen communications across the university, as well as media relations and the writing of news articles to promote research. Before joining UTRGV, María worked for six years at Telemundo NBCUniversal, where she contributed to breaking news, immigration coverage, and investigative journalism. A six-time Lone Star EMMY award-winning journalist, she worked on special coverage, including presidential elections and natural disasters such as The Impact of Hurricane Harvey and Terremoto en México, a report on the 2017 Mexico City earthquake. María is also a recipient of a Regional Overall News Excellence Edward R. Murrow Award.

Aidé Garza is the Administrative Manager with a history of working with large and complex budgets and teams for governmental, academic, and commercial entities supporting research and research administration at The University of Texas Rio Grande Valley. She is focused on results, with over 40 years of experience and impactful problem-solving while developing strategies to support decision-making at the A-suite level. Aidé is also an expert at collaborating across teams and institutions to meet complex goals across multi-year projects. Her extensive experience spans civil engineering, higher education, supporting critical offices at our legacy institution, UT Brownsville—culminating in the President's Office (1990–2005)—as well as finance and aerospace, including supporting the MPCV Orion Project and the Bioastronautics Contract for NASA (2008–2015).

Photography by Jesús Alférez

Excellence Through Service

Written by María González

The Division of Research at The University of Texas Rio Grande Valley (UTRGV) continues to set new standards in customer service excellence, reflecting consistent improvements across all service categories. This commitment has been recognized with the Inaugural Bravo Vaqueros Spirit Award, acknowledging the division's dedication to the VAQUEROS Culture of Service Excellence. The award highlights a multi-year effort by the Division of Research to enhance professionalism, responsiveness, and overall service quality, as demonstrated by the results of its annual customer satisfaction surveys.

The Division of Research conducts an Annual Survey to assess the quality and effectiveness of its services. In Fiscal Year 2023 (FY23), the division received 85 responses, while Fiscal Year 2024 (FY24) saw a significant increase to 352 responses. The results highlight substantial growth in satisfaction levels between FY22, FY23, and FY24. Figure 1.1 illustrates these improvements, showing the percentage of faculty who "Agree" or "Strongly Agree" with positive statements about the division's services.

A comparison of FY22 and FY24 over this period shows notable progress across all six service categories. Staff Professionalism increased from 68% in FY22 to 97% in FY24, representing a 29% improvement. Timely Response saw the largest growth, rising from 56% in FY22 to 96% in FY24—a 40% increase. Staff Knowledge improved by 36%, increasing from 59% in FY22 to 95% in FY24. Additionally, Clear Communication improved from 61% to 96%, reflecting a 35% increase, and Problem Resolution grew from 59% to 96%, a 37% increase. Overall Positive Experience increased from 57% to 95%, a 38% improvement. These results indicate a consistent upward trend in customer satisfaction over the three fiscal years.

Dr. Can Saygin, Senior Vice President for Research and Dean of the Graduate College, emphasized the significance of this achievement to the Division of Research staff. "This achievement is proof of the collective effort of each member of our division. Their dedication and hard work have not only contributed to this recognition but also ensure that we continue to enhance our support to UTRGV's research community. Our commitment to responsive, solution-oriented service, and continuous improvement in our operations enables us to advance UTRGV's mission."

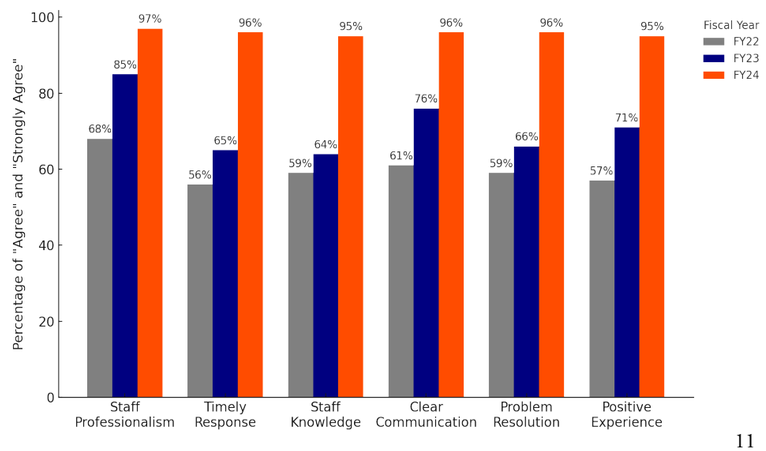
The sustained improvements across all categories reflect the division's proactive approach to addressing feedback and implementing meaningful changes. By analyzing survey responses and internal metrics, the Division of Research identified key areas for growth and acted decisively. This strategic focus on enhancing communication, reducing response times, and improving problem resolution has significantly increased satisfaction and reinforced the division's reputation for service excellence.

The Division of Research's improvements reflect a commitment to the core principles of the VAQUEROS Culture of Service Excellence: responsiveness, solution-oriented service, engagement, and quality of service. By addressing challenges proactively and implementing effective solutions, the division ensures consistent, accurate, and professional support for the research community.

Survey results indicate, the Division of Research is working to improve business processes related to account setups, billing, compliance, and communication. These efforts, focused on continuous improvement, have played a significant role in the division's recognition with the Bravo Vaqueros Spirit Award. By streamlining these processes, the division supports UTRGV's broader objective of becoming a Tier One university. This focus on efficiency and responsiveness has created an environment where challenges are promptly addressed, improving the overall experience for faculty and staff.

As the Division of Research grows, its commitment to service excellence remains strong. Collaboration and involvement are key to expanding capabilities and enhancing service quality, ensuring that UTRGV's research community receives the support necessary to thrive. This recognition reflects the division's dedication and underscores its role in supporting UTRGV's mission. ■

Figure 1.1: Customer Satisfaction Levels Across Fiscal Years



FY24 Research Performance by the Numbers

Table 1.1: Research by the Numbers	FY24	FY23
Total Research Expenditures	$86,902,473	$78,777,880
Federal Research Expenditures	$35,014,075	$25,065,324
Restricted Research Expenditures	$42,640,123	$42,412,698
Unrestricted Research Expenditures	$44,262,350	$36,365,182
Number of Proposals Submitted	601	505
Total Budget of Proposals Submitted	$773,945,042	$460,640,760
Total Awards Received	$200,130,228	$98,789,747
Total Research Awards Received	$97,809,068	$44,915,283
Total Non-research Awards Received	$102,321,159	$53,874,464

Table 1.1 shows a 10% increase in total research expenditures, from $78.8 million in FY23 to $86.9 million in FY24. Federal research expenditures rose by $10 million to $35 million. The number of proposals submitted increased from 505 to 601, with a 68% rise in the total proposal budget to $773.9 million. Total awards received more than doubled to $200.1 million, with research awards growing to $97.8 million.

Table 1.2 lists the top 10 sponsors of The University of Texas Rio Grande Valley's research funding for fiscal year (FY) 2024. The U.S. Department of Health and Human Services led with $72.3 million, followed by the U.S. Department of Education at $38.7 million. Other major contributors include the Valley Baptist Legacy Foundation ($30 million) and the U.S. National Science Foundation ($10.5 million).

Table 1.2: Sponsored Project Awards by Top 10 Sponsors	Amount
U.S. Department of Health & Human Services	$72,324,284
U.S. Department of Education	$38,685,107
The Valley Baptist Legacy Foundation	$30,000,000
U.S. National Science Foundation	$10,468,181
U.S. Department of Defense	$7,603,384
U.S. Department of Agriculture	$4,823,064
U.S. Department of Commerce	$3,274,422
Texas Division of Emergency Management	$2,709,458
National Aeronautics and Space Administration	$2,195,606
Bill & Melinda Gates Foundation	$1,499,306

Increase in Total Research Expenditures

Table 2.1 compares total research expenditures by academic unit for fiscal years (FY) 2023 and 2024. UTRGV's total research expenditures increased by 10%, from $78.8 million in FY23 to $86.9 million in FY24.

Table 2.1: Total Research Expenditures	FY24	FY23
College of Education & P-16 Integration	$2,632,798	$2,108,820
College of Engineering & Computer Science	$15,023,858	$10,682,644
College of Fine Arts	$1,814,135	$1,576,624
College of Health Professions	$3,963,360	$2,656,894
College of Liberal Arts	$7,603,384	$6,041,958
College of Sciences	$18,139,300	$16,019,083
Honors College	$127,830	-
Robert C. Vackar College of Business & Entrepreneurship	$6,093,146	$5,039,344
School of Medicine	$23,376,429	$28,065,671
School of Nursing	$419,749	$654,297
School of Podiatric Medicine	$460,868	$243,841
School of Social Work	$597,684	$863,103
Other VP Level Divisions	$6,649,933	$4,825,599
Total	**$86,902,473**	**$78,777,878**

Growth in Restricted Research Expenditures

Table 3.1 compares restricted research expenditures by academic unit for fiscal years (FY) 2023 and 2024. Total restricted research expenditures saw a slight increase, from $42.4 million in FY23 to $42.6 million in FY24.

Table 3.1: Restricted Research Expenditures	FY24	FY23
College of Education & P-16 Integration	$873,314	$509,078
College of Engineering & Computer Science	$10,644,892	$7,044,434
College of Fine Arts	$191,117	$142,291
College of Health Professions	$1,937,453	$1,410,860
College of Liberal Arts	$2,118,777	$1,257,476
College of Sciences	$9,835,994	$8,759,416
Honors College	$127,830	-
Robert C. Vackar College of Business & Entrepreneurship	$145,241	$52,284
School of Medicine	$16,334,709	$22,528,102
School of Nursing	$59,442	-
School of Podiatric Medicine	$24,634	$26,985
School of Social Work	$105,058	$353,999
Other VP Level Divisions	$241,664	$327,774
Total	**$42,640,123**	**$42,412,699**

Increase in Total Budget of Proposals Submitted

Table 4.1 compares total budget of proposals submitted across academic units for fiscal years (FY) 2023 and 2024. Total proposal funding increased significantly from $460.6 million in FY23 to $773.9 million in FY24.

Table 4.1: Total Budget of Proposals Submitted	FY24	FY23
College of Education & P-16 Integration	$28,525,767	$31,275,582
College of Engineering & Computer Science	$146,447,280	$85,138,952
College of Fine Arts	$3,040,284	$637,427
College of Health Professions	$21,646,963	$29,445,702
College of Liberal Arts	$13,684,792	$19,275,280
College of Sciences	$95,068,644	$92,026,232
Honors College	$7,500	$9,750
Robert C. Vackar College of Business & Entrepreneurship	$81,471,197	$6,927,244
School of Medicine	$151,898,247	$142,699,714
School of Nursing	$6,056,613	$5,925,264
School of Podiatric Medicine	$3,586,297	$604,794
School of Social Work	$8,376,142	$2,636,200
Other VP Level Divisions	$214,135,316	$44,038,620
Total	**$773,945,042**	**$460,640,761**

Growth in Total Sponsored Project Awards

Table 5.1 shows the growth in total sponsored project awards across academic units at UTRGV for fiscal years (FY) 2023 and 2024. Total sponsored project awards increased from $98.8 million in FY23 to $200.1 million in FY24.

Table 5.1: Sponsored Project Awards	FY24	FY23
College of Education & P-16 Integration	$21,668,697	$25,840,289
College of Engineering & Computer Science	$14,115,672	$14,639,963
College of Fine Arts	$336,088	$866,997
College of Health Professions	$2,455,277	$603,266
College of Liberal Arts	$2,451,211	$3,683,222
College of Sciences	$19,801,684	$19,551,622
Honors College	$34,688	$9,750
Robert C. Vackar College of Business & Entrepreneurship	$846,705	$103,807
School of Medicine	$75,559,555	$21,522,136
School of Nursing	$376,983	$199,031
School of Podiatric Medicine	$249,500	-
School of Social Work	$829,170	$232,539
Other VP Level Divisions	$61,404,999	$11,537,125
Total	**$200,130,228**	**$98,789,747**

Increase in External Research Awards

Table 6.1 compares external research awards by academic unit for fiscal years (FY) 2023 and 2024. Total external research awards increased from $44.9 million in FY23 to $97.8 million in FY24, reflecting a growth of 118%.

Table 6.1: External Research Awards	FY24	FY23
College of Education & P-16 Integration	$2,161,466	$335,437
College of Engineering & Computer Science	$13,848,773	$13,665,926
College of Fine Arts	$7,500	$759,997
College of Health Professions	$1,219,527	$68,516
College of Liberal Arts	$1,262,567	$2,984,771
College of Sciences	$17,263,922	$12,996,017
Honors College	-	-
Robert C. Vackar College of Business & Entrepreneurship	$33,283	$74,807
School of Medicine	$55,770,625	$13,297,706
School of Nursing	$255,805	-
School of Podiatric Medicine	-	-
School of Social Work	$137,952	$67,539
Other VP Level Divisions	$5,847,648	$664,567
Total	**$97,809,068**	**$44,915,283**

Leading Externally Sponsored Project Expenditures

This photograph highlights faculty from The University of Texas Rio Grande Valley who have surpassed $1 million in sponsored project expenditures. Their dedication and success have significantly contributed to restricted expenditures exceeding $40 million in Fiscal Year 2024.

Dr. Hilda Medrano
Human Development and School Services
College of Education and P-16 Integration
$8,527,177

Dr. Constantine M. Tarawneh
Mechanical Engineering
College of Engineering and Computer Science
$2,740,427

Dr. Gladys E. Maestre
Neuroscience and Behavioral Health Integration and Support Unit
School of Medicine
$2,343,844

Dr. John Blangero
Primary Care Clinical Integration and Support Unit
Human Genetics and South Texas Diabetes and Obesity Institute
School of Medicine
$1,940,318

Dr. Jianzhi (James) Li
Manufacturing and Industrial Engineering
College of Engineering and Computer Science
$1,861,987

Dr. Joanne E. Curran
Primary Care Clinical Integration and Support Unit
Human Genetics and South Texas Diabetes and Obesity Institute
School of Medicine
$1,429,507

Dr. Saúl D. Rivas
Primary and Community Care Integration and Support Unit
School of Medicine
$1,336,294

Dr. Nancy Peña Razo
Human Development and School Services
College of Education and P-16 Integration
$1,284,617

Dr. Deepu Varughese George
Primary Care Clinical Integration and Support Unit
Primary and Preventive Care
School of Medicine
$1,153,748

Dr. Sarah A. Blangero
Primary Care Clinical Integration and Support Unit
Human Genetics and South Texas Diabetes and Obesity Institute
School of Medicine
$1,139,680

Dr. Christopher J. Vitek
School of Integrative Biological and Chemical Sciences
College of Sciences
$1,004,351

Research Pathways Impact

Written by María González

The research pathways at The University of Texas Rio Grande Valley (UTRGV) define the institution's strategic research directions across seven key areas: Societal Transformations, Living on the U.S.-Mexico Border, Human Health, Technology and Innovation, Environment and Sustainability, Space Sciences, and Data Sciences, Analytics, and Security. These pathways address important challenges while aligning with the university's mission to grow as a Tier One research university. Each pathway is supported by operational pillars that ensure researchers receive the necessary resources and infrastructure.

The Societal Transformations pathway focuses on innovation, exploration, and economic development. This pathway encourages collaboration between faculty, communities, industries, and partners to convert applied research into practical outcomes. Projects in this area promote job creation, community development, and the creation of equitable and sustainable environments.

Living on the U.S.-Mexico Border explores the social, economic, and health impacts of living in a bi-national region. Research focuses on the cultural identities and experiences of those who live and work in this area. With its presence across the border, UTRGV is uniquely positioned to conduct research that addresses the realities of border life.

The Human Health pathway focuses on increasing the impact of biomedical, clinical, and translational research to improve health in the Rio Grande Valley (RGV) and beyond. The RGV is home to a unique population that, historically, has had limited access to healthcare, contributing to health disparities and health outcomes below national and state norms. UTRGV is uniquely qualified to serve as a catalyst in transforming the landscape of health and medicine across the region by building a culture of health and well-being through focused research.

Technology and Innovation focuses on developing and implementing new technologies to improve quality of life. Research areas include materials science, advanced manufacturing, railway safety, biomedical devices, and clean energy. This pathway supports technological advancements that address current challenges and promote sustainable growth.

Environment and Sustainability addresses sustainable practices in agriculture, food systems, resource management, and energy. Research focuses on solutions such as renewable energy technologies and efficient resource management strategies. These efforts aim to promote environmental responsibility and create job opportunities in sustainable industries.

Space Sciences supports research in astronomy, astrophysics, planetary science, and biology. UTRGV's South Texas Space Science Institute combines the efforts of the Center for Gravitational Wave Astronomy, the Spacecraft Tracking and Astronomical Research into Gigahertz Astrophysical Transient Emission, and the Center for Advanced Radio Astronomy. This pathway aims to maximize research output and advance knowledge of space sciences.

Data Sciences, Analytics, and Security focuses on data analytics, extraction, and cybersecurity. This pathway supports the development of tools for decision-making and the protection of data systems. Research in this area aims to address the demands of the digital age and improve the reliability of data technologies.

The research pathways are supported by operational pillars: research development and enhancement, sponsored project administration, doctoral student support, postdoctoral and technical staff, research support capacity in colleges, research core facilities and shared equipment, and research productivity dashboards and visualization. These pillars provide the infrastructure needed to ensure research growth and productivity.

The goal of the Research Pathways is to achieve societal impact through research excellence. UTRGV's commitment to these pathways positions the university to address local and global challenges through focused, collaborative research efforts. ■

Faculty Research Fellows Program

Catalyzing Innovation and Growth

Written by María González

The University of Texas Rio Grande Valley (UTRGV) is advancing its mission to become a leading research university through the newly launched Faculty Research Fellows Program. Led by the Division of Research, this initiative enhances interdisciplinary collaboration, mentorship, and research innovation, aligning with UTRGV's goal of achieving Carnegie R1 status.

"This fellowship program establishes a foundation for excellence by advancing UTRGV's research capacity and fostering innovative solutions to regional and global challenges with societal impact," said Dr. Can Saygin, Senior Vice President for Research and Dean of the Graduate College. "By supporting exceptional researchers, this program creates new opportunities, elevates research leadership, and accelerates our progress toward becoming a top-tier research university."

Fellows focus on key areas such as data science, human health, technology, and societal transformations, contributing to UTRGV's research growth and impact. The program drives collaborative efforts to address regional and global challenges.

"The Faculty Research Fellows Program takes the strategy of becoming a Carnegie R1 university and gives the power to the faculty to help shape the reality of that mission and goal," said Dr. Thomas B. Spencer, Associate Vice President for Research Operations.

Each fellow strengthens UTRGV's research culture by mentoring peers, supporting proposal development, and facilitating projects that foster community and industry engagement.

The program brings together experienced researchers to lead initiatives promoting interdisciplinary collaboration across departments and colleges. By building connections, the program strengthens the university's research portfolio.

"Faculty across the university are making important contributions to the research pathways critical to our region's growth and resilience," said Abby Guillory, Assistant Vice President for Research Enhancement. "Faculty research fellows facilitate connections across departments and colleges, fostering interdisciplinary collaborations that will catapult UTRGV to becoming a regional leader in key research areas."

Fellows also mentor early career researchers, offering guidance on funding processes, participation in research events, and integration into UTRGV's research community.

The Faculty Research Fellows Program supports 13 faculty members by providing personalized coaching, group workshops, and funding for postdoctoral support and stipends. These fellows focus on critical areas aligned with UTRGV's research priorities.

Five of the fellows are part of the National Institutes of Health (NIH) Engagement and Access for Research-Active (EARA) Institutions initiative, which enhances research capacity in key disciplines. This structure strengthens research in areas critical to the Rio Grande Valley while supporting broader global impact.

The NIH EARA Fellowship connects UTRGV to NIH resources, encouraging collaboration and increasing awareness of funding opportunities in biomedical research. Meanwhile, Research Pathways fellows provide mentorship and leadership, supporting faculty initiate research projects, and pursue external funding.

A key focus of the program is to expand UTRGV's research portfolio. Faculty fellows create core research groups within their focus areas, lead discussions, and to guidance to improve research outcomes. "The program is meant to be a catalyst for expanding our interdisciplinary research portfolio and bringing external funding, doctoral students, and faculty teams together," Guillory said.

The Faculty Research Fellows Program underscores UTRGV's commitment to addressing challenges both locally and globally. By supporting community-focused research and mentorship, the program aims to develop solutions with broad and lasting impact. "This program is about more than research—it's about building a legacy of innovation and community impact," Spencer said.

Through this initiative, UTRGV is fostering a dynamic research environment that connects faculty, engages students, and creates opportunities for growth. As the program evolves, it will play a key role in positioning UTRGV as a regional leader in research excellence. ■

Alfonso Mercado
Research Pathways Fellow
Societal Transformations

Engil Isadora Pujol Pereira
Research Pathways Fellow
Environment and Sustainability

Kelsey Baker
Research Pathways Fellow
Human Health

Megan Keniry
Research Pathways Fellow
Technology and Innovation

Bin Fu
Research Pathways Fellow
Data Sciences, Analytics, and Security.

Joseph Romano
Research Pathways Fellow
Space Sciences

David Martínez Prieto
Research Pathways Fellow
Living on the U.S.-Mexico Border

Derek Abrams
Research Faculty Fellow
Technology Transfer & Commercialization

Sara Reyna
NIH EARA Fellow

Jesús Melgarejo
NIH EARA Fellow

Upal Roy
NIH EARA Fellow

Sue Anne Chew
NIH EARA Fellow

Claudia Biguetti
NIH EARA Fellow

Photography by Jesús Alférez

Photography by Jesús Alférez

Strengthening Educational Leadership Through Doctoral Growth

Written by María González

The College of Education and P-16 Integration (CEP) at The University of Texas Rio Grande Valley (UTRGV) has played a key role in advancing the university's mission to meet Carnegie R1 and Emerging Research University (ERU) criteria. With a growing number of graduates in its doctoral programs, particularly in Educational Leadership and Curriculum and Instruction, the college continues to strengthen UTRGV's research expansion.

Under the leadership of Dr. Alma Rodríguez, CEP has been central to developing future educational leaders. "The growth of our doctoral programs is a direct result of the hard work of our faculty and students," says Rodríguez. "Dr. Can Saygin's strategic leadership as Senior Vice President for Research and Dean of the Graduate College, along with his ongoing support, has been crucial in guiding this success."

CEP's doctoral programs, including the Doctor of Education (Ed.D.) in Educational Leadership and the Ed.D. in Curriculum and Instruction, support UTRGV's broader goal of improving educational outcomes. These programs have not only increased the number of graduates but also elevated the quality of research, which contributes to UTRGV's efforts to achieve Carnegie R1 status. "Our dissertation chairs, along with department chairs including Dr. Jim Jupp, Dr. Fred Guerra, and Dr. Chuey Abrego, have dedicated countless hours supporting students at each stage of the dissertation process," Rodríguez explains. "This collaborative effort, alongside the support from program coordinators Dr. Laura Jewett and Dr. Marie Simonsson, has led to the successful completion of numerous dissertations and enhanced our students' success overall."

In addition to supporting UTRGV's research goals, CEP's doctoral programs are aligned with UTRGV's broader mission as a Hispanic-Serving Institution (HSI), addressing the educational needs of the region. "Doctoral education in the College of Education provides practitioners with the tools to engage in scholarly practice that leads to meaningful improvements in education," says Rodríguez. "This is vital to UTRGV's mission, particularly as we aim to serve the needs of the Rio Grande Valley."

The research conducted by doctoral students at the college covers areas such as leadership studies, instructional leadership, bilingual studies, educational technology, and special education. "Our doctoral students learn to conduct rigorous, applied research in these fields, with a focus on solving real-world problems in their educational settings," Rodríguez says. "They have the opportunity to explore pressing issues that directly impact the communities we serve, which is a core part of our mission."

As UTRGV continues to strengthen its research profile, CEP remains committed to expanding its doctoral programs. "We have a long history of developing leaders through our Doctor of Education programs," Rodríguez explains.

The college's efforts to strengthen research capacity have been supported by strategic initiatives, including the creation of the CEP Research Hub, which supports faculty and doctoral students with research initiatives, provides additional support for their development. "Our 2024 strategic plan focuses on increasing our research output and supporting the development of our faculty and students," Rodríguez says. "This plan ensures that as UTRGV continues its journey to becoming a nationally recognized institution. We will remain at the forefront of educational research."

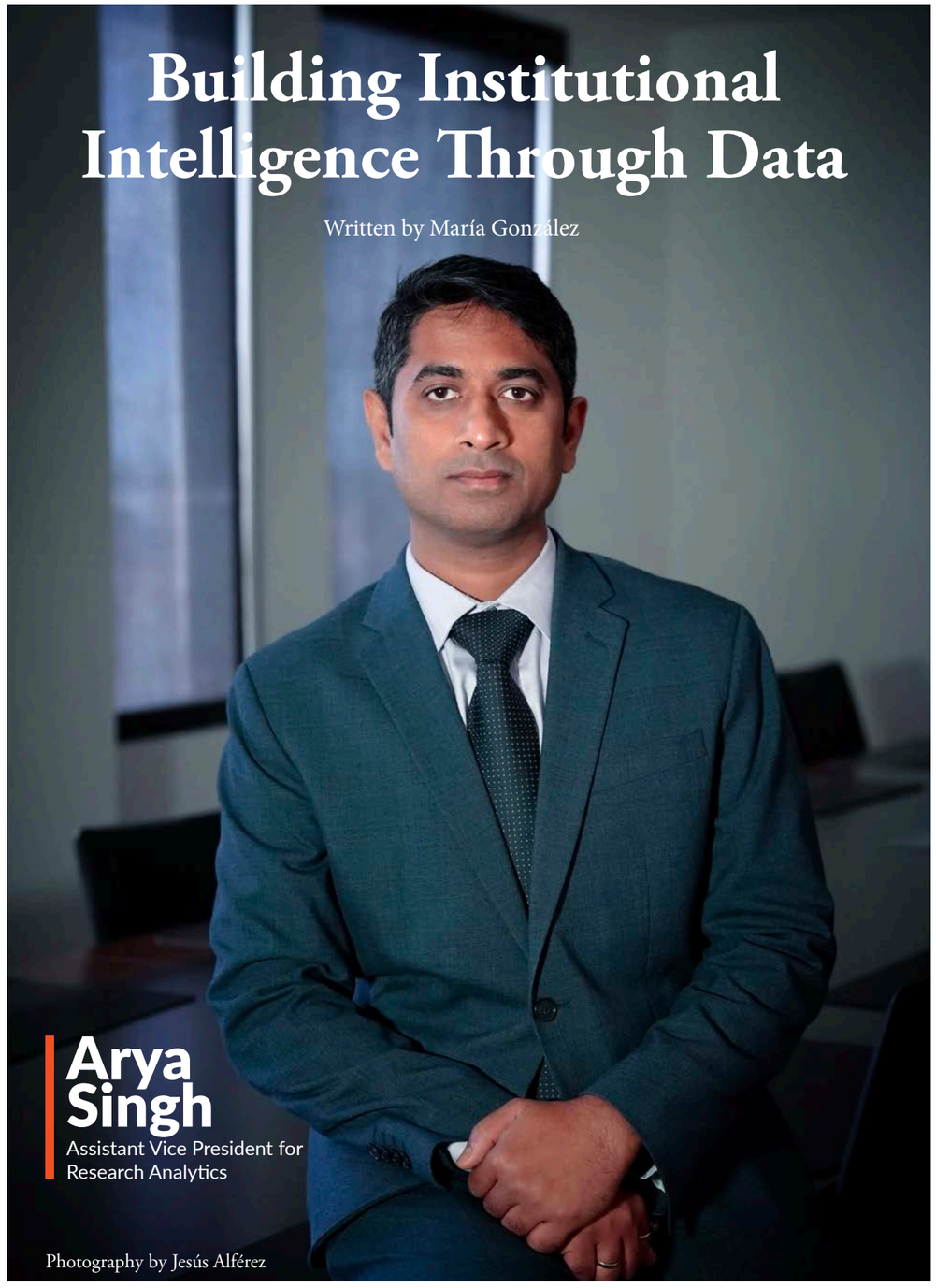
Rodríguez also highlights the importance of UTRGV's leadership in creating an environment where doctoral students can excel. "The success of our programs is largely due to the leadership and support from President Guy Bailey, Dr. Can Saygin, and Provost Luis H. Zayas. Their commitment to our college has been essential in helping us achieve the necessary doctoral degrees toward meeting the Carnegie R1," she says.

Looking ahead, the College of Education and P-16 Integration plans to continue expanding its impact. The vision of the college is to serve as a model HSI that leads the preparation of adept educators, education leaders, and researchers, while conducting community-focused research that will have a national impact.

"The growth of our doctoral programs is not just about numbers," Rodríguez emphasizes. "It's about ensuring that we are preparing the next generation of educational leaders who will make a difference in schools and communities across the region and beyond." ■

Building Institutional Intelligence Through Data

Written by María González



Photography by Jesús Alférez

The University of Texas Rio Grande Valley (UTRGV) is advancing institutional decision-making and strategic planning through the development of a robust data-centric suite of dashboards and analytical tools. Led by Arya Singh, Assistant Vice President for Research Analytics, the university is building "Institutional Intelligence" by transforming raw data into actionable knowledge to support operational and strategic objectives.

Under Singh's leadership, UTRGV has developed a comprehensive framework to guide data from collection to analysis in support of institutional goals. "UTRGV's structured approach to data collection, transformation, and analysis systematically converts raw data into actionable insights, enabling informed decision-making," Singh said. "Dashboards serve as critical tools in this transformation, offering real-time, interactive visualizations that simplify complex data and highlight key metrics."

A significant part of UTRGV's strategy is the development of operational intelligence through strategic dashboards. These tools provide stakeholders with real-time insights into performance metrics to support informed decisions. The dashboards are designed to achieve three goals: supporting decision-making, increasing transparency, and promoting continuous improvement. As Singh explains, the dashboards "connect data with outcomes, directly contributing to measuring and improving Institutional Mission Performance."

The dashboards support monitoring of institutional performance by tracking progress toward strategic goals. By presenting key metrics such as research expenditures, student progression, and faculty productivity, they help the university assess outcomes and align strategies with broader institutional objectives.

UTRGV integrates data from multiple sources, including operational databases, customer relationship management systems, enterprise resource planning systems, external application programming interfaces, research expenditure records, and student and faculty performance metrics. "The dashboards consolidate data from across the university, ensuring a comprehensive and unified dataset," Singh said. The information is then processed and visualized to provide clear insights into university operations.

Singh said advanced analytics, interactive tools, and contextual benchmarks "help uncover trends, diagnose challenges, and predict outcomes." This process includes data normalization, cleaning, and aggregation to structure and contextualize raw data into useful insights.

As the data moves from basic visualization to advanced analysis, the dashboards evolve to include more sophisticated capabilities. "The transformation of information into knowledge involves key processes such as data normalization and aggregation, which ensure consistency and compatibility," Singh said. "By applying advanced in-house procedures, we calculate key performance indicators and generate insights."

A key outcome of the dashboards initiative is increased data accessibility for stakeholders. "The dashboards have transformed data analysis and visualization by enabling stakeholders to easily access, discover, and utilize data through centralized, intuitive tools," Singh said. This shift has improved accuracy and integrity, ensuring decision-makers have access to high-quality, up-to-date information.

Looking ahead, UTRGV plans to expand its dashboards with advanced automation and machine learning capabilities. "We envision enhancing dashboards with advanced process orchestration to automate data collection, ensuring consistent quality across research operations," Singh said. The integration of artificial intelligence (AI) will also support predictive analytics and anomaly detection, offering more detailed insights into institutional performance. These developments align UTRGV's data efforts with strategic goals and support its mission to advance data-informed decision-making and institutional progress.

UTRGV's approach to research analytics represents a commitment to technology that positions the university as a leader in evidence-based decision-making. "By integrating AI, machine learning, and advanced automation, we are building a future where data-driven insights empower transformative decisions and drive institutional success," Singh said.

Through Research Analytics, UTRGV is expanding its capacity for data-informed strategies and establishing a model for other higher education institutions. The university's work in developing institutional intelligence shows how data can improve operational efficiency, support strategic planning, and guide long-term progress. ■

Research
Centers and Institutes

Navigating Uncertainty, Together

Written by María González

The Center for Community Resilience Research, Innovation, and Advocacy (CCRRIA) in the College of Liberal Arts at The University of Texas Rio Grande Valley (UTRGV) focuses on building resilient communities by addressing social and physical infrastructure challenges. With $220,355 in restricted research expenditures, $334,080 in externally sponsored project expenditures, and four awards totaling $322,175, CCRRIA engages in interdisciplinary research and community collaboration to develop strategies for resilience in the Rio Grande Valley. The center's efforts include fostering university-community partnerships, enhancing public health readiness, and supporting graduate education to prepare future leaders in resilience research.

College of Liberal Arts

Cecilio Ortiz-García, PhD

CCRRIA Director

Photography by Jesús Alférez

The Center for Community Resilience Research, Innovation, and Advocacy (CCRRIA) at The University of Texas Rio Grande Valley (UTRGV) is advancing a mission to build resilient communities prepared to face challenges that threaten both social and physical infrastructures. Defining resilience as "the governance of uncertainty," the center, known as CCRRIA, aims to strengthen the Rio Grande Valley's (RGV) adaptability by focusing on collaborative partnerships and establishing UTRGV as a local community resilience hub that brings together researchers, stakeholders, and community leaders.

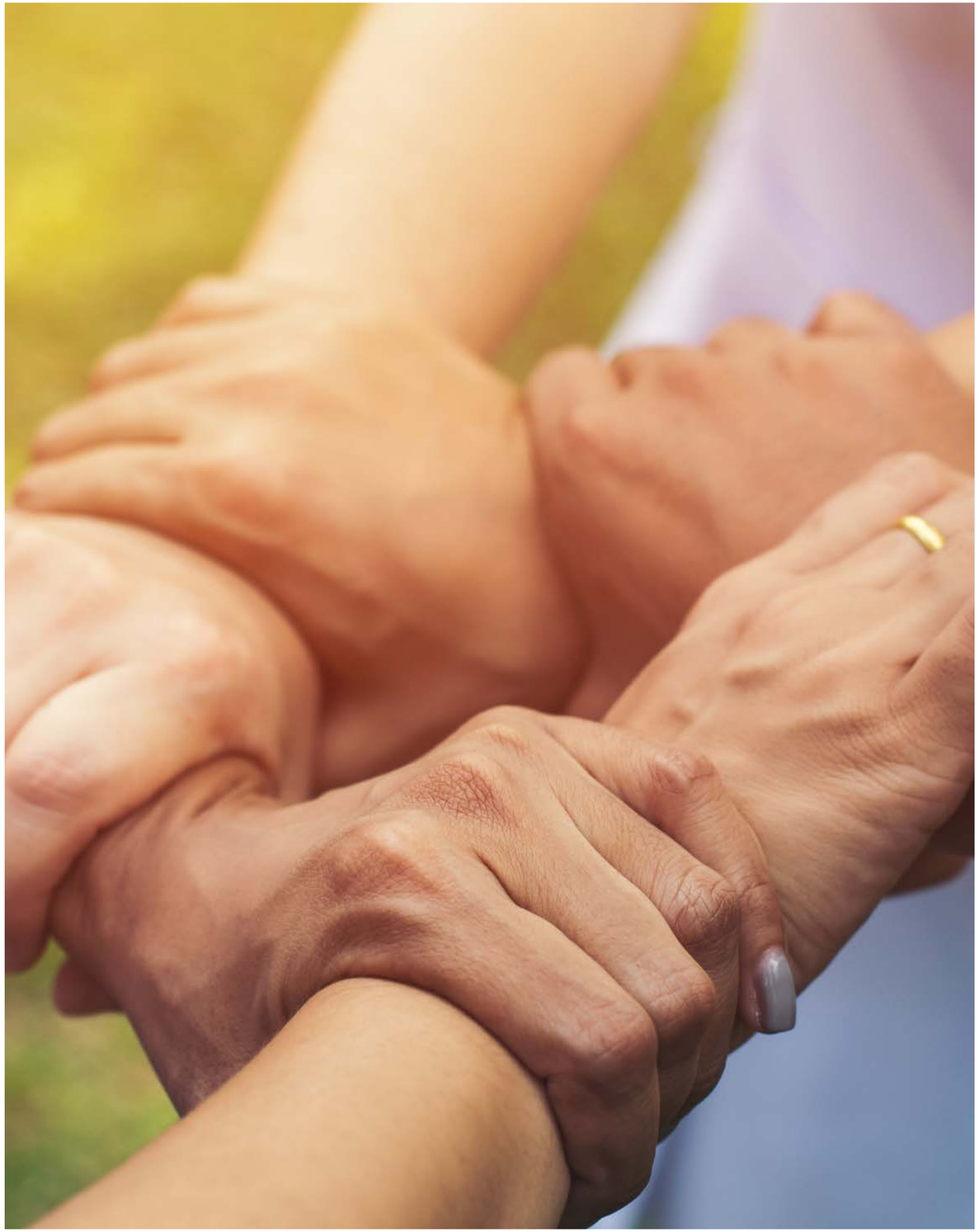
Under the leadership of Dr. Cecilio Ortiz-García, CCRRIA applies the U.S. National Science Foundation's (NSF) convergence research model, which promotes interdisciplinary collaboration to address complex, cross-cutting issues. "Our goal is to create a space where researchers, advocates, and communities work together to develop practical, community-centered solutions," Ortiz-García said. "Our research focuses on actionable outcomes that help communities prepare for and respond to the unique challenges they face by making sure they are at the center of decision-making processes."

CCRRIA's research agenda addresses challenges affecting the RGV, including natural disasters, public health emergencies, and infrastructure concerns. Recent events such as Hurricane Hanna, the COVID-19 pandemic, and Winter Storm Uri revealed vulnerabilities across social and physical systems and reinforced the importance of resilience-focused research and adaptive strategies.

The center's research focuses on understanding the capacity of university-community partnerships to reduce vulnerability in local communities, particularly underserved areas such as "colonias," which face vulnerabilities related to issues including water and infrastructure security. CCRRIA collaborates closely with stakeholders to co-imagine resilient futures as a key precursor to building communities' ability to anticipate and manage a range of crises. "We see resilience as both a social and technical challenge," Ortiz-García said. "Our research connects these areas to provide comprehensive, grounded solutions."

One of CCRRIA's primary strategies involves creating an extended peer network that includes RGV government agencies, non-governmental organizations, advocacy groups, and higher education institutions locally and across the country. This collaborative convergence network enables CCRRIA to leverage diverse expertise and perspectives that inform their research and support actionable strategies for resilience.

In its first year, CCRRIA was funded by the Texas Epidemic Public Health Institute (TEPHI), which was created to support Texas' readiness for public health challenges. The center continues to explore additional funding from state and federal agencies, as well as private foundations, to sustain and expand its initiatives. Potential supporters include the NSF, National Institutes of Health, and the Department of Energy alongside private groups and non-govermental organizations such as the Alfred P. Sloan Foundation.



By building a national network, CCRRIA enhances its capacity to submit and develop large-scale research proposals that could benefit both local and broader communities. This collaborative structure aligns with UTRGV's mission to be a leader in addressing complex societal challenges through research and engagement.

Central to CCRRIA's approach is the concept of convergence, which emphasizes the integration of multiple disciplines to address wide-ranging and interconnected challenges. CCRRIA actively collaborates with UTRGV's School of Medicine, School of Social Work, College of Liberal Arts, and College of Engineering and Computer Science, among others, to foster a strong interdisciplinary environment. More importantly, CCRRIA's convergence model integrates community knowledge as a contribution to the NSF model. This model not only allows researchers to explore resilience from varied perspectives but also creates a trusted space where communities feel comfortable engaging in citizens' research and understanding that can translate into practical solutions.

The center also prioritizes the involvement of graduate students, particularly doctoral candidates. For example, CCRRIA is engaging students from the Psychology and Educational Leadership programs and is currently working to enhance the proposed PhD in Interdisciplinary Studies. These students gain hands-on experience in resilience research, preparing them for future roles in academia, research, and community leadership. "Our doctoral students play an essential role in our research efforts," Ortiz-García explained. "They bring fresh perspectives and contribute to the ongoing development of resilience practices."

Looking ahead, CCRRIA remains committed to developing strategies that enable communities to not only respond to future crises with confidence and adaptability but also gain a seat at the decision-making table when it comes to governing their uncertainty. The center envisions expanding its research scope to encompass additional community needs and refining its model to serve as a blueprint for resilience initiatives beyond the RGV.

As part of this vision, CCRRIA plans to increase its outreach through workshops, webinars, and conferences aimed at fostering a community of practice around resilience. These events facilitate knowledge sharing and provide tools for community leaders and residents to engage in resilience planning. With a clear mission and defined objectives, CCRRIA is positioned to lead in resilience research and advocacy, fulfilling UTRGV's commitment to the communities it serves.

Through its collaborative model and focus on actionable research, CCRRIA exemplifies the impact of university-community partnerships. By leveraging local and national resources, CCRRIA addresses immediate challenges while building a strong framework for long-term community resilience. ■

Forging the Future of Manufacturing

Written by Jesús Alférez

The Center for Advanced Manufacturing Innovation and Cyber Systems (CAMICS) in the College of Engineering and Computer Science at The University of Texas Rio Grande Valley (UTRGV) is dedicated to advancing manufacturing technologies and workforce development. With $1,861,988 in restricted research expenditures, $1,861,988 in externally sponsored project expenditures, and four awards totaling $5,294,999, CAMICS focuses on additive manufacturing, robotics, and digital manufacturing systems. The center supports regional and national priorities through research, industry partnerships, and student training programs designed to enhance the future of manufacturing.

Photography by Jesús Alférez

The Center for Advanced Manufacturing Innovation and Cyber Systems (CAMICS) at The University of Texas Rio Grande Valley (UTRGV) is committed to strengthening the manufacturing sectors across the South Texas region and beyond. By integrating engineering disciplines, CAMICS is shaping the future of defense, energy, and digital manufacturing technologies through research, education, and outreach initiatives.

Under the leadership of Dr. Jianzhi (James) Li, CAMICS takes on a dual mission to advance research in manufacturing sciences and support talent preparation for the manufacturing industry. "Our mission is to bridge the gap between research and practical applications, developing technologies that have real-world impacts," Li says. "Our focus on advanced manufacturing not only benefits industries but also builds a skilled workforce prepared for the future."

CAMICS addresses multiple facets of advanced manufacturing through targeted research and technology development. Areas of focus include additive manufacturing, digital manufacturing, digital twins, robotic systems, and smart, connected systems. Research in these areas is supported by state-of-the-art equipment, such as selective laser melting additive manufacturing machines for advanced alloys and structures, laser direct energy deposition systems for large-format 3D metal printing, custom-configured femtosecond laser material processing centers, and high-resolution direct printing systems for electronics.

"Our goal is to push the boundaries of manufacturing technologies," Li explains. "We are focusing on areas that directly impact national security, energy sustainability, and economic competitiveness." CAMICS collaborates closely with industry leaders to ensure its research aligns with real-world demands. By leveraging advanced equipment and processes, the center supports innovation in defense materials, energy manufacturing, and autonomous systems—fields that are critical to both regional and national priorities.

Additionally, CAMICS places a strong emphasis on talent preparation through specialized education and workforce training funded by federal agencies, including the U.S. Department of Defense and the U.S. Department of Energy, aiming to prepare students and professionals for careers in advanced manufacturing. Doctoral students from UTRGV's Material Science and Mathematics programs play an important role in CAMICS' projects, applying their academic training to use-inspired, industry-aligned research. This hands-on experience helps students develop skills that are applicable to the advanced manufacturing sectors.

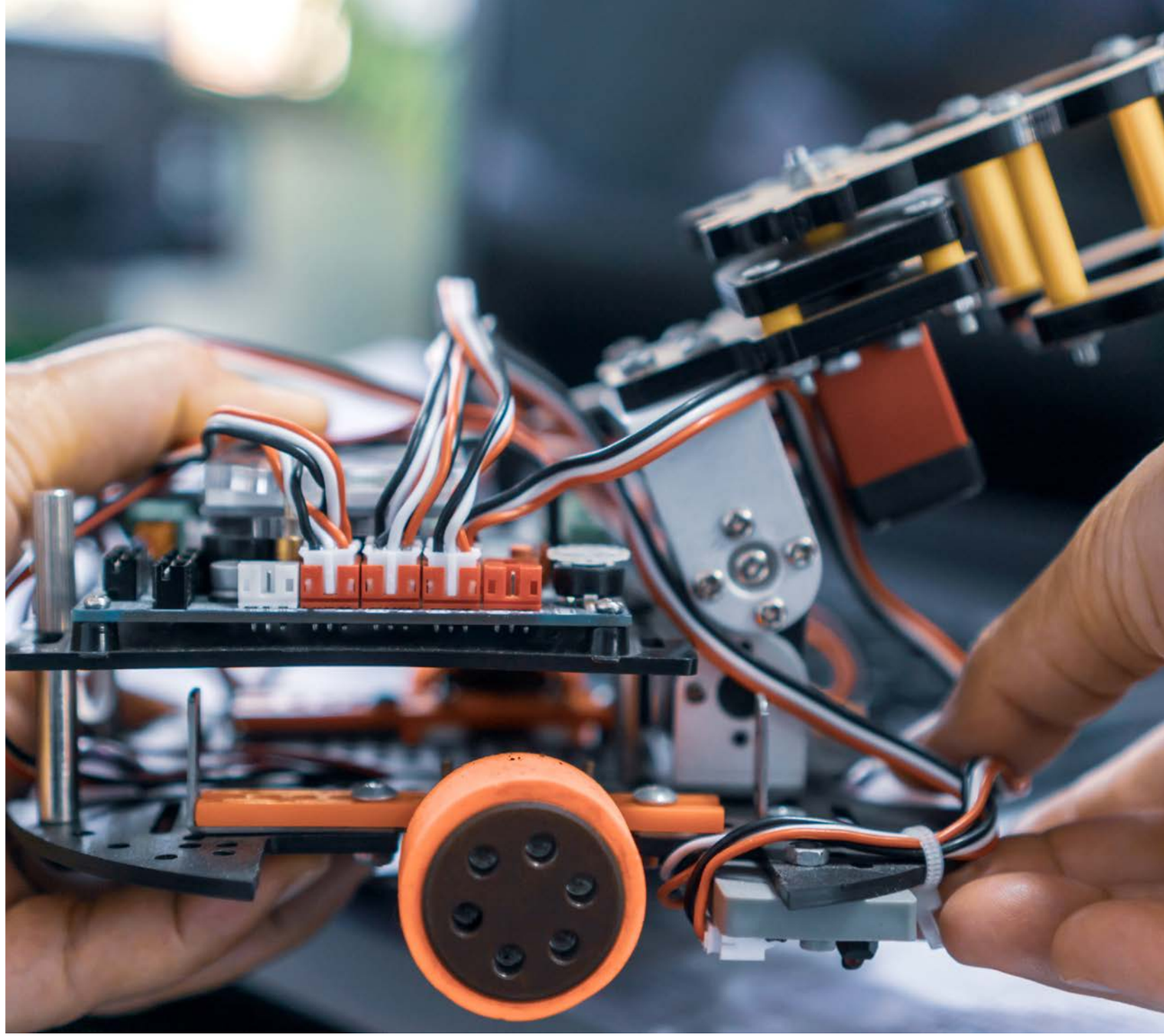
To further its educational mission, CAMICS organizes outreach initiatives, offering workshops and training programs that introduce students and community members to advanced manufacturing concepts. These programs are designed to inspire a new generation of engineers and technology leaders who can support and lead future manufacturing initiatives. "Education is integral to our mission," Li says. "By building a robust pipeline of talent, we are not only strengthening our local workforce but also contributing to national goals of creating a world-class U.S. domestic manufacturing."

CAMICS has established partnerships with key players in the manufacturing industry and academic institutions across the country. Research partners include organizations such as Oak Ridge National Laboratory, Los Alamos National Laboratory, and the Army Research Laboratory. Collaborations with corporations such as Honeywell, Raytheon, Corpus Christi Army Depot, and Boeing Global Services and Support further enhance the center's capabilities and broaden the scope of its projects. Through these partnerships, CAMICS leads high-impact research that supports national priorities and fosters technology transfer between academia and industry.

These partnerships play a crucial role in CAMICS' mission by facilitating knowledge exchange and advancing technology transfer. Through funded research projects, CAMICS collaborates with partners to address challenges in areas including autonomous systems, energy sustainability, and defense manufacturing. "Our partnerships are essential to our research," Li notes. "They enable us to scale our efforts and drive innovation that has a tangible impact."

Innovation is at the core of CAMICS' mission, and the center places an emphasis on emerging fields such as additive manufacturing, robotics, artificial intelligence (AI) and autonomy, and digitalization of advanced manufacturing. By investing in these areas, CAMICS is helping to advance technology that not only enhances productivity but also drives economic growth and job creation.

Photography by Jesús Alférez



The center's projects focus on developing solutions that address current and future manufacturing needs, positioning CAMICS as a critical contributor to the national manufacturing field.

The center's commitment to innovation also includes support for technology-driven business development. Through federally funded incubation initiatives such as America's Additive Foundry Consortium (www.americasadditivefoundry.org), CAMICS supports the growth of emerging companies, particularly those focusing on advanced manufacturing technologies. CAMICS helps to establish a strong manufacturing sector in South Texas.

Through its commitment to cutting-edge research, workforce development, and collaboration, the Center for Advanced Manufacturing Innovation and Cyber Systems at UTRGV is building a future where advanced manufacturing technologies drive positive change for all communities UTRGV serves. By fostering innovation and preparing a skilled workforce, CAMICS is contributing to a sustainable and competitive manufacturing industry that benefits the region and the nation. ■

Powering Innovation for a Sustainable Future

Written by María González

The Industrial Training and Assessment Center (ITAC) in the College of Engineering and Computer Science at The University of Texas Rio Grande Valley (UTRGV) is dedicated to enhancing energy efficiency and sustainability for small and medium-sized manufacturers. With $80,717 in restricted research expenditures, the center provides comprehensive energy assessments that help businesses reduce costs and improve operational efficiency. ITAC focuses on identifying opportunities for energy savings, optimizing production processes, and promoting sustainable practices. Through hands-on student involvement and collaboration with industry partners, the center supports workforce development and strengthens the region's manufacturing sector.

Photography by Jesús Alférez

The Industrial Training and Assessment Center (ITAC) at The University of Texas Rio Grande Valley (UTRGV) advances energy innovation, education, and implementation for the manufacturing and water sectors. Focused on enhancing energy efficiency and sustainability, the center plays an important role in supporting energy infrastructure across South Texas. Through comprehensive energy assessments and workforce training, ITAC provides actionable solutions that benefit industries and communities.

Under the leadership of Dr. Alexander Domijan, ITAC addresses complex energy challenges through cutting-edge research and collaboration. “Our center is uniquely positioned to address the energy challenges facing regional and national industries,” Domijan said. “We are committed to helping businesses reduce costs and resource consumption while advancing a sustainable energy future.”

Funded by the U.S. Department of Energy’s (DOE) Office of Manufacturing and Energy Supply Chains (MESC), ITAC has secured more than $3.4 million to support its initiatives. As part of a national network of 37 universities, the center collaborates with institutions across the country to develop advanced solutions tailored to modern energy infrastructure needs. This network strengthens ITAC’s capacity to address energy issues by combining local insights with cutting-edge research from across the United States.

ITAC’s research focuses on improving energy use and efficiency in areas such as reliability, power generation, and smart grid systems. These efforts are essential for helping industries reduce operational costs and environmental impacts. “We see our research as directly tied to economic growth,” Domijan said. “By advancing technologies and methodologies, we aim to increase energy efficiency and productivity for our partners.”

Education and workforce training are central to ITAC’s mission. The center has trained more than 100 students, providing them with hands-on experience in energy assessments and federally recognized certifications from the DOE. Students are involved in projects that require them to apply theoretical knowledge to real-world problems, preparing them for future roles in the energy sector. “Education is a cornerstone of our center,” Domijan said. “We’re not just conducting research; we’re preparing the next generation of energy leaders.”

ITAC collaborates with UTRGV’s Computer Science, Materials Science, and Engineering departments, creating a multidisciplinary platform for energy studies. This collaborative environment improves the educational experience and ensures students gain a comprehensive understanding of energy technologies. Through these partnerships, students are exposed to a range of perspectives and challenges, allowing them to develop innovative solutions that align with industry needs.

The center partners with organizations including utility companies, manufacturing firms, and water treatment plants. Collaborations with institutions such as the Polytechnic University of Valencia and the Cybersecurity Manufacturing Innovation Institute expand ITAC’s research capabilities and support the implementation of energy-efficient solutions. These partnerships allow ITAC to conduct studies and assessments that yield measurable outcomes for its collaborators. Through 61 energy studies conducted in Texas, ITAC has identified recommendations that provide an average annual savings of $137,329 per study.

In addition to its partnerships, ITAC supports regional economic development by working with local governments and economic development corporations. The center has helped manufacturers in the Rio Grande Valley secure grants to implement advanced energy technologies, compressors, and chillers at their facilities. These efforts not only benefit individual industries but also contribute to the growth of the region by increasing job creation and investment in energy infrastructure.

ITAC also aligns with federal initiatives, such as the Infrastructure Investment and Jobs Act, which directs significant funding toward energy efficiency projects. This alignment allows the center to contribute to national energy goals while expanding its impact on local communities. By connecting its work with broader federal objectives, ITAC ensures its efforts have a lasting impact, supporting both local industries and the nation’s energy priorities.

By connecting academia and industry, ITAC ensures its research translates into practical applications. The center provides energy efficiency assessments, technical support for on-site energy infrastructure, and cybersecurity readiness evaluations. These services help industries to adopt innovative practices and technologies that improve operational efficiency and sustainability. ITAC also acts as a resource for industries navigating complex energy transitions, offering guidance and support that helps businesses remain competitive in a rapidly evolving energy landscape.

The Industrial Training and Assessment Center at UTRGV works to advance the future of energy use through research, education, and collaboration. By solving critical energy challenges and providing students with the tools they need for success, ITAC continues to support innovation and foster economic growth across South Texas and beyond. ■

Nanotechnology Breakthroughs that Matter

Written by Jesús Alférez

The Nanotechnology Center of Excellence (NCE) in the College of Engineering and Computer Science at The University of Texas Rio Grande Valley (UTRGV) focuses on advancing research in nanotechnology and facilitating innovation in materials science and engineering. With $847,956 in restricted research expenditures, $949,486 in externally sponsored project expenditures, and three awards totaling $334,492, NCE addresses challenges in nanoreinforced polymer composites and nanofiber systems. The center promotes mentorship, research, and education to prepare underserved students for successful careers in STEM, while fostering collaborations with institutions to enhance research outcomes and professional growth.

College of Engineering and Computer Science

Karen Lozano, PhD

NCE Director

Photography by Paul Chouy

The Nanotechnology Center of Excellence (NCE) at The University of Texas Rio Grande Valley (UTRGV) focuses on advancing nanotechnology research while expanding opportunities in Materials Science and Engineering. The center increases awareness of nanotechnology efforts, supports junior faculty in building research careers, and promotes collaboration to enhance research productivity within UTRGV.

Under the leadership of Dr. Karen Lozano, NCE emphasizes an inclusive approach by supporting underserved students in STEM. "Our mission is to create opportunities for students from diverse backgrounds, helping them excel in science and engineering," Lozano said. "Through research and mentorship, we aim to foster a supportive environment that promotes long-term success."

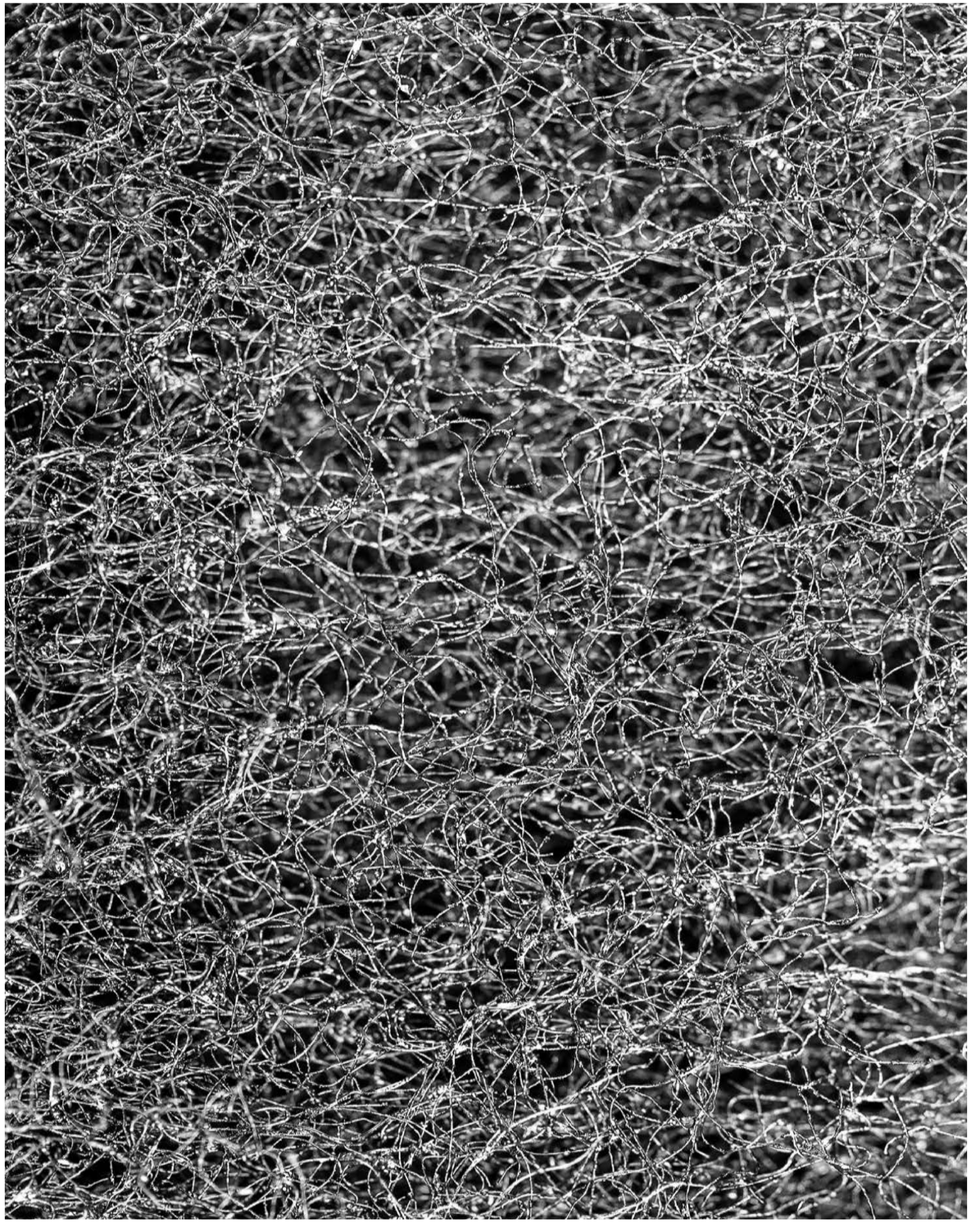
NCE's primary research areas include nanoreinforced polymer composites and the processing-structure-property relationships of nanofiber systems. These focus areas contribute to advancements in electrical, biomedical, structural, and other applications where nanotechnology can provide tangible solutions. Supported primarily by the U.S. National Science Foundation (NSF), NCE is also pursuing funding opportunities with other agencies such as the National Institutes of Health (NIH) to broaden its impact.

"Our work explores the capabilities of nanotechnology to address real-world challenges," Lozano said. "We focus on areas that have significant potential to improve products and systems." This research aims to produce practical outcomes in materials science that can be applied across various fields.

One of NCE's goals is to support students and faculty through education and mentorship. Since its founding, the center has achieved a 100% retention and graduation rate for over 500 students who have been involved in its programs. Additionally, NCE has set the pathway for more than 50 former members for doctoral degrees at Tier One institutions.

The center also contributed to the establishment of the first PhD program in the College of Engineering and Computer Science (CECS) at UTRGV, a PhD in Materials Science and Engineering. "Our role is to prepare students for advanced careers in materials science," Lozano said. "The achievements of our students are a direct result of our commitment to supporting their education."

NCE's work has earned numerous awards and recognitions. The center's faculty and students have been honored with distinctions such as the U.S. Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM) in 2019 and the "Great Immigrants, Great Americans" award from the Carnegie Corporation. Lozano has also received numerous honors, including induction into the National Academy of Engineering, the Texas Academy of Medicine, Engineering, Science, and Technology (TAMEST), and the National Academy of Inventors (NAI).



"These honors reflect our commitment to excellence and our role in developing future scientists and engineers," Lozano remarks. "We're proud that our work resonates within the scientific community, elevating UTRGV's contributions to research and innovation." These recognitions highlight the impact of NCE's work in nanotechnology. By maintaining research standards and achieving measurable results, NCE continues to strengthen UTRGV's reputation in science and engineering.

While NCE primarily engages in internal collaborations to support UTRGV faculty in establishing and strengthening their research programs, the center also partners with external institutions, such as the University of Minnesota, through the Partnerships for Research and Education in Materials (PREM) grant. This collaboration allows faculty and students to engage with peers in the field and gain insights from different perspectives. Partnerships like these support NCE's mission to promote professional growth and expand its research network.

The center's goals include building new relationships with research partners and securing additional funding sources. These efforts aim to increase NCE's impact in materials science and open new avenues for collaboration.

Looking ahead, NCE is committed to growing its programs and expanding its research scope. By prioritizing the recruitment and retention of students, the center seeks to make STEM fields more accessible. NCE's dedication to advancing nanotechnology research and facilitating innovation aligns with UTRGV's broader goals in education and community development.

Through its contributions to research, education, and training, the Nanotechnology Center of Excellence at UTRGV is creating a lasting impact on the field of materials science. The center's focus on developing practical applications and supporting talent highlights its role as an important resource to the university and the broader scientific community. ■

Empowering the Rails with Safety and Innovation

Written by María González

The University Transportation Center for Railway Safety (UTCRS) in the College of Engineering and Computer Science at The University of Texas Rio Grande Valley (UTRGV) is dedicated to enhancing the safety of the nation's rail systems. With $3,902,570 in restricted research expenditures, $4,114,582 in externally sponsored project expenditures, and 27 awards totaling $2,638,615, UTCRS addresses critical safety challenges through research on mechanical systems, operations, and infrastructure. The center's efforts include developing innovative technologies, fostering workforce development, and engaging in K-12 STEM outreach programs to build future transportation leaders.

Photography by Jesús Alférez

The University Transportation Center for Railway Safety (UTCRS) at The University of Texas Rio Grande Valley (UTRGV) is leading efforts to enhance the safety of the nation's rail transportation systems. By conducting research, developing a broad talent pool, and advancing critical technologies, UTCRS is making significant progress in support of the U.S. rail industry's strategic safety goals.

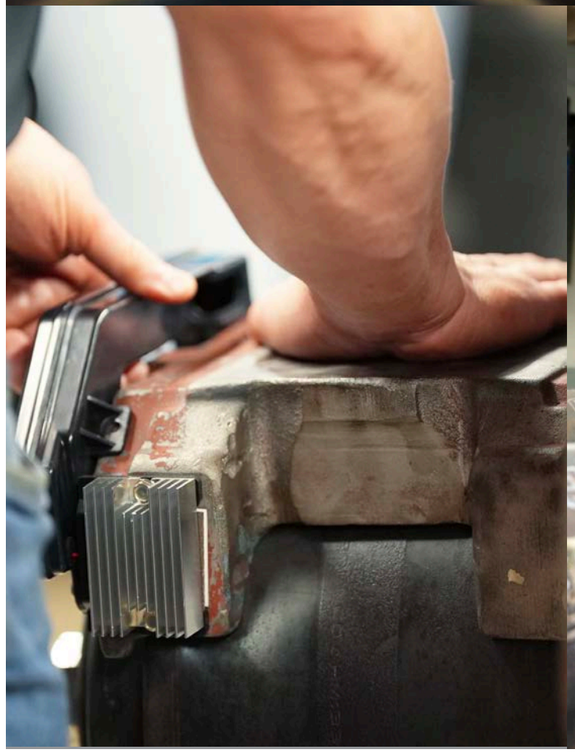
Under the leadership of Dr. Constantine Tarawneh, UTCRS is committed to reducing railway accidents and equipment failures, aiming to decrease fatalities, injuries, and economic losses. "Our center's mission is to create a safer future for rail transportation by advancing cutting-edge research and developing the skilled workforce needed to implement these solutions," Tarawneh said.

UTCRS' research addresses key aspects of railway safety through three primary focus areas: mechanical, operations, and infrastructure systems. Each area is targeted to solve safety challenges that impact the rail industry. Through these initiatives, UTCRS works to reduce fatalities at highway-rail grade crossings, improve the reliability of railway materials, and develop advanced tools for monitoring infrastructure health.

The center's railway mechanical systems focus on improving the performance of rolling stock components. UTCRS researchers are developing maintenance-friendly designs to simplify repairs and reduce downtime. Meanwhile, the railway operations systems are creating autonomous monitoring systems for grade crossing safety and railway surveillance, and the railway infrastructure systems are studying advanced technologies to assess and improve track durability.

Collaboration is central to UTCRS' mission. The center has established partnerships with leading institutions, including the University of Nebraska-Lincoln, the University of South Carolina, Texas A&M University, and the University of California-Riverside, among others. Additionally, UTCRS collaborates closely with the National Transportation Safety Board (NTSB), Federal Railroad Administration (FRA), Transportation Technology Center (TTC) operated by ENSCO, Inc., MxV Rail, and major railroad companies such as CSX Transportation and BNSF Railway. These partnerships support a wide range of research, from field testing to policy recommendations.

Beyond its academic partnerships, UTCRS engages with 25 local school districts, offering K-12 STEM programs designed to foster an early interest in transportation safety and engineering. Since its inception, UTCRS has provided STEM summer camps for more than 10,000 students and 1,000 teachers, making it one of the largest STEM outreach initiatives in the nation.



Photography by Jesús Alférez

One of UTCRS' important achievements is the development of wireless onboard sensors for condition monitoring of railroad rolling stock. These sensors, now licensed to the rail industry start-up Hum Industrial Technology, Inc., offer an innovative alternative to traditional wayside systems by enabling real-time monitoring. "By transferring our technology to the industry, we're helping to create a safer rail environment while fostering new business growth," Tarawneh said.

The center's work in derailment prevention is especially timely, as incidents in freight rail have drawn national attention to the importance of rail safety. In response, UTCRS' research on rolling stock and infrastructure monitoring aims to reduce derailments and strengthen the center's relevance in the field.

As part of its commitment to workforce development, UTCRS provides valuable opportunities for student engagement across academic levels. Each year, approximately 95 students gain hands-on research experience at UTCRS, working alongside faculty and industry experts. The center's affiliation with the National Science Foundation Centers of Research Excellence in Science and Technology: Materials and Engineering for Cognitive and Intelligent Systems (NSF CREST MECIS) program provides support for doctoral students in physics, teaching, and learning. Future initiatives include funding support for new PhD programs in computer science and material science and engineering.

UTCRS has state-of-the-art testing facilities, including two railroad-bearing testing labs and advanced tools for analyzing material properties. These resources are available to industry partners and researchers, making UTCRS a key resource for railway technology testing and innovation. Additionally, the center's bearing testers are the only publicly accessible ones of their kind, offering unique capabilities for specialized performance testing.

With ongoing support from federal agencies, private industry, and local stakeholders, UTCRS is positioned to continue its work in rail safety. Looking ahead, the center is seeking major funding opportunities, such as NSF CREST Phase II and NSF Expand AI grants, to further expand its research and training programs. "Our vision is to lead the way in rail safety advancements, creating a safer rail infrastructure for the nation while inspiring the next generation of transportation leaders," Tarawneh said.

Through research, educational programs, and engagement efforts, the University Transportation Center for Railway Safety at UTRGV continues to contribute to the advancement of rail safety in the United States. ■

Transforming Manufacturing Practices Across Texas

Written by María González

The Texas Manufacturing Assistance Center (TMAC) in the College of Engineering and Computer Science at The University of Texas Rio Grande Valley (UTRGV) is dedicated to enhancing the competitiveness and growth of manufacturing companies across Texas. With $576,415 in restricted research expenditures, $596,597 in externally sponsored project expenditures, and three awards totaling $770,000, TMAC focuses on improving manufacturing processes, technology adoption, and workforce development. The center provides consulting and training services that optimize operational efficiency and support economic development, fostering innovation and preparing skilled professionals for the manufacturing industry.

College of Engineering and Computer Science

José David Ortiz

TMAC Director

Photography by Jesús Alférez

The Texas Manufacturing Assistance Center (TMAC) at The University of Texas Rio Grande Valley (UTRGV) supports the growth and competitiveness of manufacturing companies across Texas. With a focus on improving profits, processes, people, and technologies, TMAC provides support to businesses seeking to improve performance, adopt innovative manufacturing practices, and develop skilled workforces.

Under the leadership of José David Ortiz, TMAC is committed to helping Texas manufacturers increase productivity, reduce costs, and create sustainable business solutions. “Our mission is to empower manufacturers by providing customized consulting and training that lead to measurable improvements in their operations,” Ortiz said. “Through our work, we’re not just improving businesses; we’re helping support the regional economy and workforce.”

TMAC’s core mission is to improve manufacturing best practices, processes, and workforce development. By offering hands-on consulting and training services, the center helps businesses across Texas adopt advanced manufacturing methods, improve product quality, and optimize operational efficiency. From the design of efficient production systems to the implementation new technologies, TMAC helps companies address the challenges they face in a highly competitive industry.

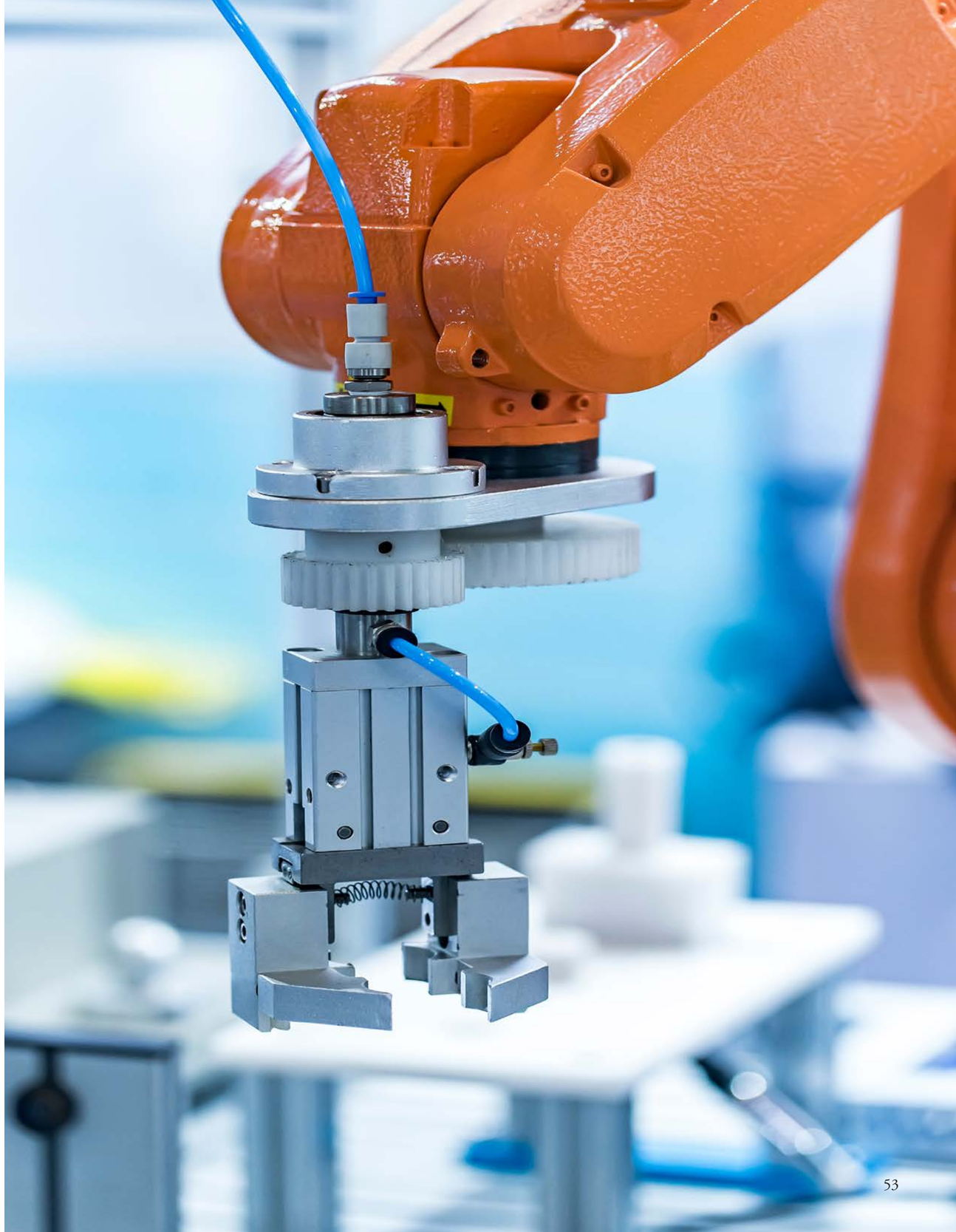
The center’s research targets advanced manufacturing processes, technology adoption, and workforce development. Through the affiliation with the Manufacturing Extension Partnership (MEP) with over 400 nationwide centers and the National Institute of Standards and Technology (NIST), TMAC has expanded its reach and impact, facilitating cost-effective solutions for manufacturers nationwide.

The center collaborates with a wide selection of local, regional, and national partners. In the Rio Grande Valley, TMAC works closely with regional economic development corporations, educational institutions, and industry associations to foster economic development and job creation.Key partners include the City of Pharr, Pharr International Bridge, Pharr Economic Development Corporation (Pharr EDC); McAllen Economic Development Corporation (McAllen EDC); and the Council for South Texas Economic Progress (COSTEP). Additionally, the center partners with the South Texas Manufacturing Association (STMA). TMAC is also part of a statewide network of centers based at universities such as The University of Texas at Arlington, The University of Texas at El Paso, Texas Tech University, Lamar University, and the University of Houston–Clear Lake, as well as the Southwest Research Institute (SwRI). This network expands its collaborative research efforts and brings additional resources to the region.

Through these partnerships, TMAC has contributed to regional economic growth. For example, its work with Red Sun Farms resulted in an estimated annual savings of $3 million, while its support of Pharr International Bridge has helped the facility develop a strategic plan to increase revenue by 3.5% each year. These partnerships reflect TMAC’s commitment to improving regional infrastructure and fostering long-term sustainability for businesses.

As part of its mission to enhance manufacturing practices, TMAC provides workforce development services. By offering training in manufacturing best practices and advanced technologies, TMAC prepares students to become the next generation of skilled workers. The center’s collaboration with UTRGV’s College of Engineering and Computer Science has created pathways for students to engage in hands-on industry projects, where they gain valuable skills for future careers in manufacturing.

The Texas Manufacturing Assistance Center contributes to doctoral programs by involving students in advanced manufacturing research and industry-based projects. This collaboration helps students apply their academic knowledge to real-world manufacturing challenges, gaining skills that are directly applicable to the industry. “Our students have the opportunity to apply their academic knowledge to real-world manufacturing challenges, gaining skills that are directly applicable to the industry,” Ortiz said. ■



Shaping Engineers, Transforming the Future

Written by María González

The Center for Broadening Participation in Engineering (CBPE) in the College of Engineering and Computer Science at The University of Texas Rio Grande Valley (UTRGV) works to increase the representation and success of students in engineering careers, particularly first-generation and low-income students. With $1,137,275 in restricted research expenditures, $1,195,844 in externally sponsored project expenditures, and six awards totaling $1,854,822, CBPE supports students through K-12 outreach, curriculum development, and professional preparation programs. The center's initiatives focus on building a stronger, more talented STEM workforce through targeted education and research.

Photography by Jesús Alférez

The Center for Broadening Participation in Engineering (CBPE) at The University of Texas Rio Grande Valley (UTRGV) is committed to increasing the representation and success of first-generation and low-income students in engineering careers. As the second-largest Hispanic-Serving Institution in the nation, UTRGV is positioned to help broaden participation in engineering. Through its focus on addressing challenges in the engineering career continuum, CBPE works to prepare students for successful careers in engineering, and contribute to a stronger and more capable STEM workforce.

Under the leadership of Dr. Ala Qubbaj, CBPE seeks to be a national model for the education, professional preparation, and success of engineering students. "Our goal is to increase the enrollment, retention, and advancement of students, especially first-generation students, in engineering by providing the support they need at every stage of their academic and professional journey," Qubbaj said.

The center's mission focuses on three core objectives: engaging students early through K-12 outreach, educating K-12 teachers and higher education faculty through innovative programs and training, and enhancing college students' academic experiences with professional development and research opportunities. These efforts are designed to address critical gaps in the engineering workforce.

Through outreach programs such as Familia ENGAGE, Summer Youth Camps, and the High School Engineering Scholars Program, the center works to introduce students early on to engineering careers and provide positive role models. These initiatives encourage students to explore engineering as a viable career path, particularly for individuals from communities with limited opportunities. The center also aims to improve the engineering education experience by revising curricula to meet emerging industry needs. One of the center's primary programs, the Jumpstart Bootcamp, helps incoming freshmen build academic skills and overcome gaps in preparation due to differences in high school curricula. This program has benefited numerous participants, enhancing their preparedness for engineering studies.

In addition to academic development, the center provides professional exposure and leadership training through programs such as the Engineering Student Leadership Academy. These initiatives prepare students with soft skills such as communication, teamwork, and problem-solving—skills that are often overlooked in traditional engineering programs but are crucial to career success. The center's professional development programs also include travel support to major engineering conferences, allowing students to network with professionals and learn from industry leaders.

CBPE's research focuses on understanding the factors that influence the recruitment, retention, and success of students in engineering. The center is conducting studies on culturally relevant pedagogy, mentoring, and the impact of role models, providing valuable insights that can be applied to educational strategies across the nation. "Our research not only sheds light on the unique challenges that our students face but also highlights the critical support systems that can help them thrive," Qubbaj said. These findings help refine best practices for broadening participation in engineering at the national level, ensuring these initiatives are effective and sustainable.

The center also partners with a range of organizations to expand its impact. These include regional school districts, national professional organizations such as the Society of Hispanic Professional Engineers and the Society of Women Engineers, and industry leaders including Boeing and Raytheon Technologies. These partnerships enhance CBPE's research and educational initiatives. "Our collaborations with these organizations are crucial to advancing our mission and ensuring the success of our students," Qubbaj said. "By partnering with these organizations, we are building a stronger, more comprehensive pipeline that guides students from K-12 through college and into successful engineering careers."

CBPE's achievements include the successful launch of the Broadening Participation in Engineering Summit hosted in 2023, 2024, and soon in 2025. The summit brings together stakeholders from K-12 education, higher education, professional organizations, and industry to share best practices for increasing the participation and success of students in engineering. The center has also implemented the Summer Youth Camp, a one-week, non-residential program that introduces 8th and 9th-grade students to engineering through hands-on activities. Several hundred students have participated in this program, advancing the center's goal of providing early exposure to engineering.

As the Center for Broadening Participation in Engineering continues to grow, its vision remains focused on creating a more educated and capable workforce. The center aims to expand its programs and partnerships to reach even more students, faculty, and industry professionals at regional and national levels. "The work we're doing at CBPE is not only impacting students in the Rio Grande Valley but also helping to prepare the next generation of engineers for our nation," Qubbaj said. "Our focus is on creating lasting change that opens doors for future generations, empowering them to succeed in engineering and beyond." ■

Advancing Latin American Arts and Cultural Research

Written by Jesús Alférez

The Center for Latin American Arts (CLAA) in the College of Fine Arts at The University of Texas Rio Grande Valley (UTRGV) is dedicated to promoting and preserving Latin American and Iberian arts through scholarly research, performances, and community engagement. With $56,647 in externally sponsored project expenditures and two awards totaling $155,794, CLAA supports academic publications, art exhibitions, and performances that celebrate the region's rich cultural heritage. The center collaborates with local, national, and international institutions to foster cultural exchange and create opportunities for students and community members to participate in and explore Latin American arts and traditions.

College of Fine Arts

Katherine McAllen, PhD

CLAA Director

Photography by Jesús Alférez

The Center for Latin American Arts (CLAA) at The University of Texas Rio Grande Valley (UTRGV) is dedicated to promoting and preserving the rich traditions of Latin American and Iberian arts. The center serves as a hub for scholarly and creative collaboration, supporting academic research and publications, new performances, and art exhibitions in many media that foster cultural connections across and outside the Rio Grande Valley (RGV).

Under the leadership of Dr. Katherine McAllen, the center has created a platform where students, artists, and scholars engage with Latin American art forms and histories through a variety of programs and activities. Located on the second floor of the UTRGV Edinburg campus library, CLAA hosts lectures, symposia, and exhibitions to promote the exchange of ideas. "The Center for Latin American Arts not only supports the arts academically, but it also connects our community to the cultural heritage of Latin America," McAllen said. "We're dedicated to creating meaningful connections through arts education and public engagement."

The CLAA's research focus includes the production of academic publications, exhibitions, and performances that span music, theater, dance, creative writing, art, and art history. The center also collaborates with prestigious partners, including the International Museum of Art and Science (IMAS) in McAllen, Texas, the San Antonio Museum of Art, the McNay Art Museum in San Antonio, Texas and the Museo de Arte in Lima, Peru. These partnerships support academic and artistic exchanges, enriching the UTRGV community and wider audiences.

In recent years, CLAA has achieved several key milestones. One of its notable events, the "Uncovered Spaces" exhibition at IMAS, showcased art that resonates with the cultural and social experiences of the RGV. "This exhibition allowed us to celebrate the unique voices and perspectives within our community," McAllen shared. "We're committed to presenting works that connect deeply with local audiences and foster a sense of pride in our shared heritage." Last year, the center secured more than $150,000 in grants, further demonstrating its commitment to advancing arts scholarship and production. Another significant accomplishment was the publication of a two-volume bilingual edition with the University of California Press, further establishing the center as a leader in Latin American art history studies.

Photography by Jesús Alférez

The center's commitment extends beyond academia. With strong community engagement as a value, CLAA has organized performances featuring international dancers from Spain and Mexico, brining audiences in the RGV a unique glimpse into diverse Latin American cultures. These events serve as a platform for cultural exchange, building a deeper understanding of shared histories and traditions. McAllen said, "Our performances are designed to bridge cultures and bring the vibrancy of Latin American and Iberian arts directly to our community. Each event aims to inspire a broader appreciation of our collective heritage."

The center also collaborates with regional organizations, such as Catholic Charities of the Rio Grande Valley, on arts-based projects that reinforce UTRGV's connection to South Texas communities. These partnerships allow CLAA to support not only artistic programming but also educational initiatives that engage new artist students. Several of these organizations, including The Raul Tijerina Jr. Foundation and the Alice Kleberg Reynolds Foundation, not only support community-based initiatives but also serve as key sponsors of CLAA's broader mission. Other current sponsors include the Thoma Foundation, The Hollyfield Foundation, The Rea Charitable Trust at Wells Fargo, and The Brown Foundation, Inc., along with the Universidad Nacional Autónoma de México (UNAM) in San Antonio, Texas, Vanderbilt University, and the Universidad de San Francisco in Quito. McAllen noted, "Support from these foundations and universities has been invaluable in advancing our mission. Our vision is to grow this support network and build on these relationships to expand our research and collaborations." An upcoming 2025 exhibition at the IMAS, in collaboration with the Thoma Foundation, demonstrates how these partnerships enhance cultural engagement and expand artistic initiatives.

Through its dedication to student success, CLAA provides opportunities for students to engage in the arts both on and off campus. Events and performances are specifically designed to encourage student enrollment and participation in the arts, nurturing a new generation of artists and scholars connected to Latin American heritage. McAllen shared, "Our students are at the heart of what we do. By connecting them with their cultural roots through the arts, we are helping to shape the next generation of creators and leaders."

The Center for Latin American Arts remains committed to preserving and advancing Latin American cultural heritage through the arts. "Every exhibition, every performance, and every publication is a chance to celebrate and preserve our cultural heritage," McAllen said. "As we grow, we aim to serve as a bridge between the past and the future, using the arts to connect, educate, and inspire." As it continues to grow, CLAA will help drive meaningful cultural exchange, strengthening the university's role in preserving and celebrating the rich artistic traditions that define the region. ■

Addressing Vector-Borne Disease Challenges in South Texas

Written by María González

The Center for Vector-Borne Disease (CVBD) in the College of Sciences at The University of Texas Rio Grande Valley (UTRGV) advances research, education, and public health initiatives related to vector-borne diseases. With $1,972,495 in restricted research expenditures, $1,972,495 in externally sponsored project expenditures, and seven awards totaling $2,348,726, CVBD addresses public health challenges through research on vector biology, disease transmission, and community education. The center's efforts include engaging students, supporting public health initiatives, and collaborating with local and federal agencies to improve regional health outcomes.

Photography by Jesús Alférez

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The Center for Vector-Borne Disease (CVBD) at The University of Texas Rio Grande Valley (UTRGV) advances research, education, and public health initiatives focused on vector-borne diseases. Located in South Texas, a region facing significant vector-borne disease risks, the center serves as a key resource for research, student education, and community engagement in this field.

Under the leadership of Dr. Christopher Vitek, the center conducts research on vector and vector-borne disease biology, offering students hands-on opportunities and serving as a resource for public education and health consultation. “Vector-borne diseases are a pressing health issue for South Texas,” Vitek said. “Our goal is to expand our understanding of these diseases and improve regional health through research and community outreach.”

The CVBD’s primary research areas include the biology, ecology, and transmission cycles of disease-carrying vectors, including mosquitoes, assassin bugs, fleas, and ticks. South Texas provides an ideal setting for studying these vectors due to its warm climate and proximity to regions where vector-borne diseases are common. Through collaboration with institutions such as the Western Gulf Center for Vector-Borne Disease at The University of Texas Medical Branch (UTMB), the Texas Department of State Health Services (DSHS), and local county and city public health offices, the center conducts applied research and supports vector surveillance efforts that benefit the community and public health response initiatives.

Additionally, partnerships with the U.S. Department of Agriculture (USDA) Moore Air Base allow the center to provide students with applied research experiences, especially in plant and animal vector-borne diseases. These collaborations highlight the center’s commitment to supporting valuable student learning while contributing to the scientific understanding of disease vectors. “We strive to give students practical research experiences that prepare them for careers in public health and research,” Vitek said. “Working alongside these partners prepares them with skills that will be essential in addressing future public health challenges.”

Over recent years, CVBD has made notable progress in both academia and public engagement. The center has sponsored guest speakers for the School of Integrative Biological and Chemical Sciences Research Seminar Series at UTRGV, organized student symposia at the Texas DSHS One Health and Vector-Borne Disease Conference, and funded student travel to present research at leading national and international conferences. “These experiences are invaluable for our students,” Vitek said. “Engaging in conferences and symposiums helps them develop professionally and broadens their perspectives on public health challenges.” Vitek also noted, “By participating in these events, students build confidence, and they gain insight into how their research can have a tangible impact on communities dealing with vector-borne diseases.”

Community education is central to the center’s mission. The CVBD offers public seminars on issues relevant to South Texas, such as mosquito-borne diseases and diagnostic methods for infections. “Public education is one of our strongest tools against vector-borne diseases,” Vitek said. “By informing the community, we empower people to take preventive steps and contribute to disease control efforts.” These seminars create an open dialogue with residents, allowing them to address concerns directly with experts and better understand local health risks.

In addition, the CVBD’s educational outreach efforts extend to developing specialized programs for graduate students, such as a Certificate in Vector-Borne Diseases within UTRGV’s Biology program, which helps prepare students readiness for careers in this field.

The center is also launching an internship program in partnership with the USDA, Texas Department of State Health Services (DSHS), and the Hidalgo County Health Department. This initiative will provide graduate and undergraduate students with real-world experience in vector-borne disease research and control. “The internship program is a significant step forward in preparing our students for practical challenges,” Vitek said. “This experience not only builds their technical expertise but also fosters their understanding of how research translates into actionable public health solutions.” The first cohort of this program includes four students, and the center aims to expand the number of participants and partners in the future.

Looking to the future, the CVBD has several initiatives planned to broaden its impact. In Fall 2024, the center will launch a pilot study award, to support projects that address critical aspects of vector-borne disease biology. Plans are also underway to develop a core research facility with specialized equipment, including a Polymerase Chain Reaction (PCR) machine and a Kingfisher DNA/RNA extractor. These additions will strengthen the center’s research capabilities, providing resources that expand the types of studies CVBD can support.

The Center for Vector-Borne Disease’s adaptability and commitment to public health extend beyond vector-borne disease. During the COVID-19 pandemic, the center supported UTRGV’s emergency response by assisting in the establishment of the UTRGV Health Diagnostic Laboratory. This involvement demonstrated the center’s responsiveness in addressing emerging health threats and highlighted its flexibility in adapting research priorities to meet community needs. ■

Photography by Jesús Alférez

Advancing Sustainable Agriculture and Rural Resilience in South Texas

Written by María González

The Center for Sustainable Agriculture and Rural Advancement (SARA) in the College of Sciences at The University of Texas Rio Grande Valley (UTRGV) is dedicated to promoting agricultural sustainability and supporting rural development. With $356,332 in externally sponsored project expenditures and five awards totaling $364,433, SARA focuses on research, education, and outreach initiatives that enhance sustainable farming practices and rural resilience. The center collaborates with local, national, and international partners to foster community-driven solutions and provide training opportunities for students and rural stakeholders, ensuring the advancement of sustainable agriculture in South Texas.

The Center for Sustainable Agriculture and Rural Advancement (SARA) at The University of Texas Rio Grande Valley (UTRGV) is dedicated to improving agricultural sustainability and supporting rural development across South Texas. Through innovative research, education, and outreach initiatives, SARA serves as a key resource in advancing resilient agricultural practices and supporting the well-being of rural communities.

Under the leadership of Colin M. Cain, the center brings together students, faculty, and community partners in a collaborative effort to address complex challenges in agriculture and rural life. "SARA's mission is to create practical solutions that support sustainable farming and rural prosperity," Cain said. "We aim to empower local communities by connecting them with the resources and knowledge needed to adapt to changing economic and environmental conditions."

SARA's research focuses on the environmental, economic, and social dimensions of agricultural sustainability. By working closely with rural communities, the center supports community-engaged research that emphasizes sustainable farming practices, resource conservation, and economic resilience. Key partnerships with institutions, including Texas A&M University and UC Davis, as well as nonprofit organizations such as Feeding Texas, the Texas Center for Local Food, and Proyecto Desarrollo Humano, further enable SARA to address regional agricultural issues with a multidisciplinary approach. These collaborations expand SARA's capacity to develop programs that directly benefit South Texas communities.

In recent years, the center has advanced its mission by collaborating with South Texas agricultural producers, rural businesses, and cooperatives. This includes innovative projects that evaluate the impact of renewable solar energy on farm sustainability, community-driven mobile conservation education focusing on colonias (rural, low-income communities along the U.S.-Mexico border), and wide-scale technical and financial support for businesses and organizations to strengthen the regional food system. SARA has developed a participatory platform that enables farmers and ranchers to test and implement sustainable agricultural practices. Over 300 farms and ranches in South Texas have adopted conservation-focused methods, including cover cropping and reduced tillage, as a result of SARA's outreach. Additionally, SARA has provided mentorship to over 180 new farmers, supporting them in gaining skills and connecting them to financial resources. "Our work with local farmers and communities is about strengthening our local food system and building a sustainable future for agriculture in South Texas," Cain said. "We're helping these farmers become more resilient and supporting research that can have positive impacts in these communities."

The center's community-focused achievements include organizing annual educational conferences for South Texas farmers and ranchers and developing cooperative marketing opportunities that strengthen the regional food supply chain. SARA's partnerships

with entities such as the Texas Small Farm and Rancher Community Based Organization and the National Cooperative Business Association have been key to these efforts. The center has also supported dozens of UTRGV students in gaining professional experience in sustainable agriculture, preparing them for careers in this field.

Looking to the future, SARA plans to expand its impact by targeting new sponsorships and continuing to offer programs for local farmers and rural businesses. The center is exploring additional funding from sources such as the U.S. Department of Commerce, the Environmental Protection Agency, and private foundations. Cain said, "Securing sustained support will allow us to reach more communities, enhance our research capabilities, and continue making a tangible difference in rural South Texas."

SARA provides a range of specialized services for both researchers and community members. For researchers, the center offers pre-proposal support, partner identification, and assistance with grant administration. Community services include beginning farmer training, business development guidance, cooperative assistance, and direct support for food businesses in underserved areas. SARA also offers off-campus meeting spaces and community training venues, making it an accessible resource for stakeholders across South Texas.

In addition to its programming, the center uses specialized equipment and facilities to advance its mission. Located at UTRGV's Community Engagement & Student Success Building in Edinburg, Texas, SARA's facilities include demonstration and education sites at Hub of Prosperity Farm, equipment such as LI-COR trace gas analyzers, specialized farming machinery, and mobile education units that support field-based learning and outreach. These resources help provide practical, hands-on experience for students and community partners alike.

SARA's overall achievements reflect its commitment to creating sustainable agricultural systems and resilient rural communities. The center recently conducted a comprehensive food access study that led to policy recommendations for the State of Texas, and it continues to explore new ways to support South Texas agriculture through education and outreach. Efforts are underway to expand the center's office space at the UTRGV Edinburg campus, which will accommodate its growing programs and staff.

Through its commitment to sustainable agriculture, rural development, and community partnership, the Center for Sustainable Agriculture and Rural Advancement at UTRGV continues to play a key role in promoting resilience and economic stability in South Texas. As Cain said, "Our work is ultimately about helping local communities thrive. By empowering these producers, training new generations, and fostering collaborative research, SARA is building a sustainable future for agriculture and rural life." ■

Advancing Space Science Through Research and Education

Written by María González

The South Texas Space Science Institute (STSSI) under the Division of Research at The University of Texas Rio Grande Valley (UTRGV) is dedicated to advancing space science research, education, and outreach. With $69,306 in restricted research expenditures, $362,426 from two awards, the institute promotes science literacy and fosters regional access to STEM careers through innovative research and community engagement. The institute builds on the legacy of past discoveries, including contributions to the detection of gravitational waves. By collaborating with space agencies such as NASA, STSSI develops technologies for space exploration and offers hands-on research opportunities for students, inspiring the next generation of scientists and engineers in South Texas.

The South Texas Space Science Institute (STSSI) at The University of Texas Rio Grande Valley (UTRGV) is committed to advancing regional access to STEM careers and promoting science literacy through space science research, education, and outreach activities. Formed through the merger of two former UTRGV centers—the Center for Gravitational Wave Astronomy (CGWA) and the Center for Advanced Radio Astronomy (CARA)—STSSI continues to build on the legacy of these foundational efforts, including collaboration in the groundbreaking discovery of gravitational waves in 2015, an achievement that led to the Nobel Prize in Physics in 2017.

Under the leadership of Dr. Joseph Romano, STSSI is focused on inspiring curiosity and innovation in space science. "Our mission is to not only expand the boundaries of space science but also to prepare the next generation of scientists and engineers to pursue careers in this rapidly growing field," Romano said. "Our work isn't just about exploring the cosmos; it's about creating opportunities for local students to engage with the cutting-edge research that will shape the future of space exploration."

STSSI's research efforts cover a wide range of topics, from astronomy and astrophysics to space technology, materials science, and space medicine. The institute conducts research in multi-messenger astrophysics, which combines data from various cosmic sources, space technologies such as laser communication and phased arrays, and on-site resource utilization aimed at making future space missions more sustainable. Another primary focus is planetary habitability and life detection—research that holds the potential to answer one of humanity's most profound questions: Is there life beyond Earth?

Among the institute's major projects are detecting gravitational waves from space using the Laser Interferometer Space Antenna (LISA), a joint project by the European Space Agency (ESA) and the National Aeronautics and Space Administration (NASA), scheduled to fly in 2034. The Laser Interferometer Lunar Antenna (LILA), proposes to build a gravitational-wave detector on the Moon. Additionally, the development of ceramic composites from lunar regolith has the potential to support future construction on the Moon.

The institute's approach integrates expertise from multiple fields and applies it to astrophysics and space exploration technologies. STSSI is also developing partnerships with NASA and other space agencies to explore the potential of space communication, sensing, and lunar resource utilization. "We're positioning ourselves as not just a local resource, but as a national and international leader in the field of space science," Romano said. "By collaborating with institutions like NASA, we're bringing global space missions right to our doorstep in South Texas."

STSSI seeks to engage students and the broader community in its work through various outreach programs, and by partnering with local and regional organizations such as the South Texas Astronomical Society (STARS) to facilitate these efforts. STARS has several successful programs, including "Astronomy at the Park" and "Generation Artemis," which are designed to foster interest in STEM from a young age. Other STARS programs, such as stargazing events at the Cristina Torres Memorial Observatory, along with internships through NASA's STEM Enhancement in Earth Science summer programs, offer students experience with real-world applications of space science. "By providing opportunities for students to participate in hands-on activities and research, we are fostering a pipeline of talent that will drive the space industry forward," Romano said. "This is about preparing students not only for careers in space but for careers in the ever-evolving technology fields that power this industry."

As STSSI continues to grow, its focus on research, education, and outreach will contribute to the development of a skilled workforce in space technology, helping to address the increasing demand for talent in the aerospace industry. With its focus on research and community engagement, STSSI is set to play a key role in the future of space exploration and STEM education, ensuring that the space industry remains accessible and innovative for generations to come. ■

Photography by Jesús Alférez

Photography by Jesús Alférez

Building Pathways to STEM Success

Written by María González

The Center of Excellence in STEM Education (C-STEM) in the College of Sciences at The University of Texas Rio Grande Valley (UTRGV) is dedicated to promoting STEM education and expanding opportunities for students. With $1,202,956 in restricted research expenditures, $1,464,028 in externally sponsored project expenditures, and seven awards totaling $2,052,474, C-STEM focuses on promoting student engagement, supporting professional development, and building pathways for STEM careers. The center's initiatives include hands-on activities, research experiences, and K-12 outreach programs that prepare students for advanced education and careers in STEM fields.

The Center of Excellence in STEM Education (C-STEM) at The University of Texas Rio Grande Valley (UTRGV) serves as a key resource for students interested in Science, Technology, Engineering, and Mathematics (STEM). The center engages K-12, undergraduate, and graduate students with programs that encourage exploration in STEM careers and provide hands-on activities to support learning of these disciplines. With a focus on expanding opportunities for underrepresented groups, C-STEM is committed to preparing students for professional and graduate careers in STEM fields.

Under the leadership of Dr. Cristina Villalobos, the center has developed multiple initiatives to support STEM academic programs and increase the number of STEM graduates. "Our goal is to create pathways for students to engage deeply with STEM fields," Villalobos said. "Through targeted programs and community partnerships, we aim to inspire a lifelong interest in science and technology among our students." Located on the UTRGV Edinburg campus, the center hosts activities ranging from STEM presentations and interactive learning experiences to educational movies covering topics such as the International Space Station, paleontology, and the Arctic.

C-STEM's primary research focus is providing students with valuable educational and professional development through competitive research programs. C-STEM offers professional development workshops twice a week for college students, covering topics such as graduate school, fellowships, career panels, and internships. These include the Science Undergraduate Laboratory Internships (SULI), the University of Nebraska-Lincoln summer research program, and multiple Research Experiences for Undergraduates (REUs) across the STEM fields.

By connecting students with national laboratories, leading universities, and industry projects, these programs offer applied experience in areas from computational biology to mathematics to environmental science, preparing participants for advanced careers. These workshops are designed to help students with the knowledge and skills needed for career advancement, contributing to their academic and professional growth. Additional workshops on preparing competitive scholarship and fellowship applications support students pursuing advanced studies, furthering C-STEM's goal of cultivating well-prepared STEM professionals and providing leaders to address national-agenda issues. "Providing students with access to high-impact research opportunities is a cornerstone of our mission," Villalobos explained. "These experiences not only build technical skills but also foster critical thinking and resilience."

The center's contributions to the STEM fields have earned Villalobos national recognition, including the 2020 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM) from the White House and the recent 2024 Gweneth Humphreys Award for mentoring female college students from the Association for Women in Mathematics. Other honors include being named an elected Fellow of the American Mathematical Society, the Richard A. Tapia Achievement Award, the SACNAS Distinguished Undergraduate Mentor Award, and the UT Board of Regents' Outstanding Teaching Award. Villalobos' achievements reflect the center's dedication to mentorship and its impact on STEM education at UTRGV.

Community engagement is a core element of C-STEM's mission. The center collaborates with local school districts to raise awareness of STEM careers, offering resources and interactive activities designed for K-12 students. "Early exposure to STEM can be life-changing," Villalobos noted. "By engaging young students, we're helping to build a stronger pipeline of future scientists and engineers." Currently, C-STEM has partnered with the International Museum of Art and Science in McAllen, Texas, to offer "Mysterious Cosmos Family Fun Nights" in the coming months.

Looking ahead, C-STEM plans to expand its reach through additional partnerships and sponsorships. Current sponsors include NASA, the U.S. Department of Agriculture (USDA), and the U.S. National Science Foundation (NSF), with the center's establishment supported by a $3 million grant from the U.S. Department of Defense (DoD) Historically Black Colleges and Universities/Minority Serving Institutions (HBCU/MI) program in 2011. Financial support from the Myles and Sylvia Aaronson and Austin-Hennig endowments has allowed C-STEM to grow and provide events for the community. For example, C-STEM and the H-E-B Planetarium hosted the two solar eclipses that occurred in 2023 and 2024 and provided food and solar eclipse glasses for the community. Villalobos envisions continued growth in the center's programs and resources, creating more opportunities for students to participate in STEM learning and research.

Along with Program Coordinator Ms. Idalia Mejía and Program Specialist Mr. Christian Hernández, the C-STEM team supports STEM education and community outreach. The center offers innovative facilities such as the Mobile Laboratory and the Mobile Planetarium, which bring science experiences to students across the Rio Grande Valley (RGV). The H-E-B Planetarium also serves as an educational resource with advanced visualization technologies. These facilities play an important role in strengthening STEM learning, providing interactive and immersive experiences that spark curiosity and inspire future careers in STEM. The center's partnerships with UTRGV faculty and their grants also support K-12 and college-level STEM education goals, contributing to a collaborative academic environment. Collaborations with faculty have allowed C-STEM to provide outreach experiences with the Mobile Laboratory to K-12 schools, especially to low-income schools to bring the excitement of STEM experiments to all students.

With a focus on serving the multicultural communities of the RGV, the Center of Excellence in STEM Education is creating a lasting impact, preparing students to become leaders in the fields of science, technology, engineering, and mathematics. ■

The UTRGV Planetarium, located on the university's Edinburg campus, serves as a hub for educational programs and community engagement in science and astronomy. As part of the Center of Excellence in STEM Education (C-STEM), the building continues to inspire curiosity and learning across the Rio Grande Valley.

Photography by Jesús Alférez

School of Medicine

Ihsan M. Salloum, MD, MPH

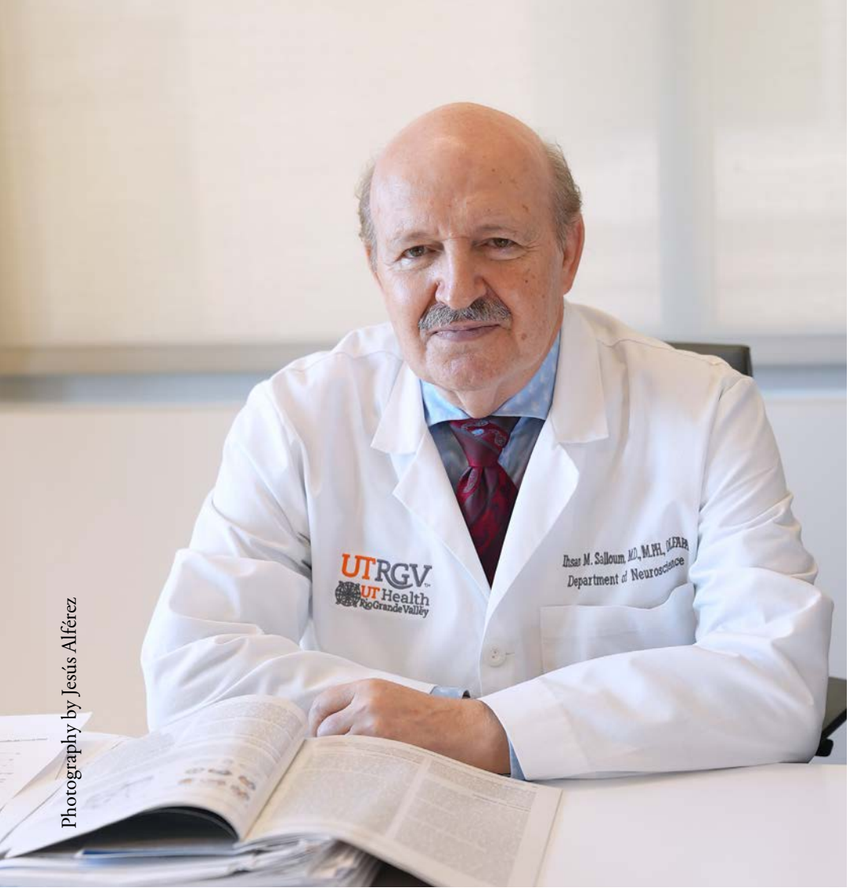
ION Director

Photography by Jesús Alférez

Advancing Brain Health

Written by María González

The Institute of Neuroscience (ION) in the School of Medicine at The University of Texas Rio Grande Valley (UTRGV) is focused on advancing brain health and reducing the impact of neurological disorders. With $12,962 in restricted research expenditures, $500,000 in externally sponsored project expenditures, and one award totaling $500,000, ION conducts research in neuropsychiatric disorders, neurorehabilitation, and brain disease genetics. Through community engagement and collaboration with global research institutions, ION promotes brain health awareness and facilitates access to resources, addressing the needs of underserved populations in the region.



Photography by Jesús Alférez

Photography by Jesús Alférez

The Institute of Neuroscience (ION) at The University of Texas Rio Grande Valley (UTRGV) is focused on improving brain health and reducing the burden of brain diseases within the Rio Grande Valley and beyond. The institute's mission is to advance research on brain health and illness, accelerate innovative interventions, and educate future neuroscience leaders while engaging the community to reduce health disparities.

Under the leadership of Dr. Ihsan M. Salloum, ION is committed to addressing some of the most urgent challenges in neuroscience today. "Our goal is to improve brain health by studying its determinants, developing innovative treatments, and educating the next generation of leaders in neuroscience," Salloum said. "At the same time, we are dedicated to engaging with our community and promoting brain health awareness across the region."

ION's research spans clinical, translational, and basic science with a particular focus on neuropsychiatric disorders such as substance use, depression, Alzheimer's disease, bipolar disorder, and neuropathic pain. Other key research areas include stroke recovery, neurorehabilitation, and the genetics of various brain diseases. In addition, ION applies advanced technologies, including neuroimaging, genomics, and artificial intelligence (AI), to advance the understanding of brain functions and mechanisms impacting brain health.

One of the institute's core research focuses is neuropsychiatric disorders. Through clinical and translational studies, ION scientists are investigating the intersection of genetics, behavior, and brain diseases, especially focusing on Alzheimer's disease, neuropathic pain, and neurorehabilitation for stroke recovery. The application of AI in data analysis and machine learning models is central to their approach to biomedicine. "We are exploring innovative ways to treat brain diseases and to enhance recovery from neurological conditions," Salloum explained. "By leveraging AI and genomics, we are advancing our understanding of brain diseases and our ability to intervene effectively."

ION is also committed to training the next generation of neuroscience professionals. The institute offers research-based training for medical students, graduate and undergraduate trainees and early-stage investigators, including a focus on biomedical sciences, human genetics, aging, clinical psychology, and data science. "Our educational programs integrate cutting-edge research with hands-on training to ensure that our students are ready to take on the challenges in neuroscience," Salloum said.

In partnership with leading global research institutions, ION collaborates with universities such as Columbia University, Johns Hopkins Medicine, and Harvard Medical School, University of Texas Southwestern, as well as organizations such as the National Institutes of Health and the Department of Defense. These collaborations expand ION's research capabilities and enhance its position as a leader in neuroscience research and education. "ION's collaborations with international and national research institutions allow us to stay at the forefront of neuroscience," Salloum said. "By fostering these partnerships, we gain access to resources and expertise that enable us to make a greater impact on brain health."

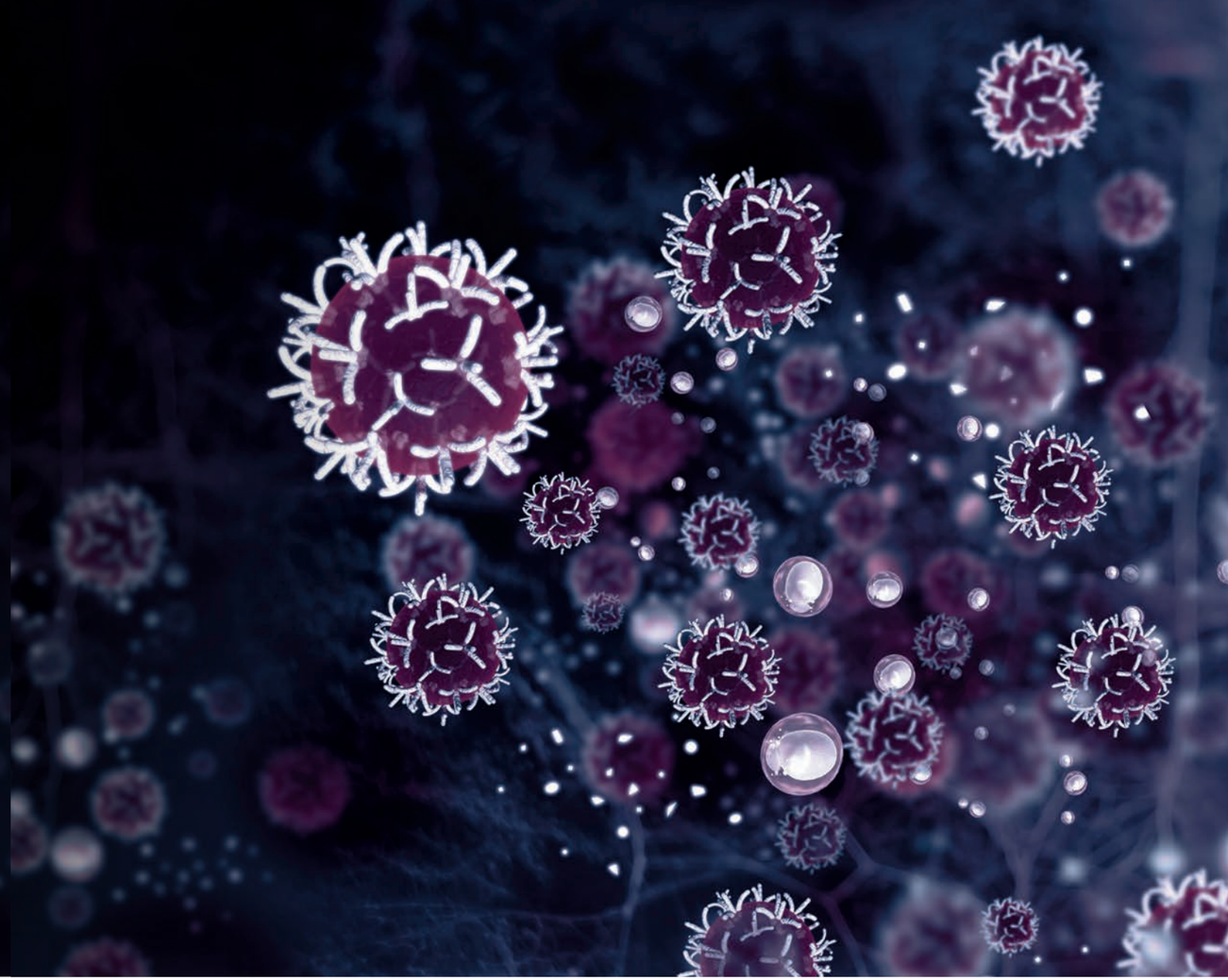
ION's research and educational efforts are supported by state-of-the-art facilities, including a Neuroimaging Suite equipped with advanced MRI and PET/CT scan technologies. The institute also has a Neurorehabilitation Laboratory focused on stroke recovery and a Computational Neuroscience Core (CNC) that uses AI to build data-driven models of diseases. These resources allow ION to conduct high-impact studies on brain function and disease, making meaningful contributions to both science and the community. "We are working tirelessly to expand the reach and impact of our research," Salloum explained. "Our vision is to not only advance brain health in our region but also contribute to the global conversation about brain disease prevention and treatment."

One of ION's key initiatives is its community outreach and public education programs, aimed at raising awareness about brain health, neurological disorders, and available treatments. These programs engage the local community and encourage dialogue about the importance of brain health. Through workshops, conferences, and public lectures, ION aims to increase public understanding of neuroscience and promote brain disease prevention. "By educating the public and raising awareness about brain health, we hope to empower individuals to take charge of their own well-being and reduce the stigma surrounding mental health and neurological diseases," said Salloum.

The Institute of Neuroscience is advancing neuroscience research in the Rio Grande Valley, focusing on underserved communities and improving brain health outcomes. The institute's research not only contributes to national and international standards but focuses on improving brain health in communities disproportionately affected by brain diseases. ION continues to lead in advancing brain health, from research to education and community engagement, making a lasting impact on the future of neuroscience in South Texas ■

Advancing Cancer Research and Reducing Health Disparities in the Rio Grande Valley

Written by María González



The South Texas Center of Excellence in Cancer Research (ST-CECR) in the School of Medicine at The University of Texas Rio Grande Valley (UTRGV) is dedicated to addressing cancer health disparities in the Rio Grande Valley through research, education, and public health initiatives. With $1,716,678 in restricted research expenditures, $1,751,590 in externally sponsored project expenditures, and six awards totaling $18,600,624, ST-CECR focuses on innovative cancer diagnostics, treatments, and prevention strategies tailored to underserved populations. The center also plays a key role in mentoring future scientists and advancing cancer healthcare access in the region.

The South Texas Center of Excellence in Cancer Research (ST-CECR) at The University of Texas Rio Grande Valley (UTRGV) is addressing one of the Rio Grande Valley's (RGV) most significant health challenges: high rates of cancers, including liver, gall bladder, stomach, and cervical cancers. Established in 2019 within UTRGV's School of Medicine, ST-CECR is uniquely positioned to conduct transdisciplinary research that addresses the specific needs of the region, focusing on early diagnostics, innovative treatments, and cancer health disparities.

Under the leadership of Dr. Subhash C. Chauhan, the center has brought together a team of experts to examine the complex factors contributing to cancer rates in the RGV. "Our mission is to reduce cancer disparities and improve health outcomes in South Texas," Chauhan explained. "By focusing on both scientific discovery and public health, we're working to bridge gaps in cancer research and patient care in a region that faces significant healthcare challenges." Located in UTRGV's 80,000-square-foot Biomedical Research Building, the center is equipped with advanced core facilities designed to support high-impact cancer research.

ST-CECR's research targets multiple dimensions of cancer health disparities, investigating biological, genetic, socioeconomic, and behavioral factors that impact cancer incidence and outcomes. Current projects focus on the identification of genetic and molecular markers, drug response rates, and the role of social determinants of health in cancer progression. Through partnerships with local healthcare providers and national collaborators, ST-CECR aims to bring measurable improvements in cancer prevention, detection, and treatment within the RGV. Chauhan emphasized, "Our collaborative approach allows us to tackle cancer from multiple angles. We are leveraging our research to address the full spectrum of cancer-related issues in the region, from diagnosis to survivorship."

One of the center's key achievements has been the establishment of a Cancer Prevention and Research Institute of Texas (CPRIT)-supported research facility that strengthens UTRGV's capacity for cutting-edge cancer research. The center has also implemented training programs for undergraduate, MS, and PhD students, as well as clinician-scientists, providing them with research skills and pathways to leading laboratories for postdoctoral work and specialized fellowships. These programs are important to ST-CECR's goal of developing a pipeline of skilled cancer researchers dedicated to addressing the health needs of underserved communities. "Training future scientists who understand the unique needs of this region is a critical part of our mission," Chauhan said. "We are committed to preparing students and researchers to become leaders in the fight against cancer, especially in underserved areas."

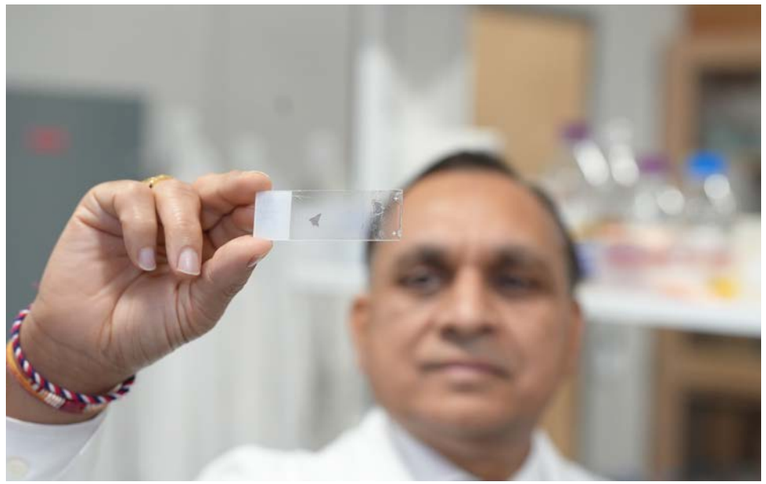
The center's research infrastructure includes advanced equipment for cell analysis, molecular imaging, and drug development. These tools help researchers conduct studies of cancer mechanisms and drug efficacy. The center's specialized focus on antibody-drug conjugates, nanoparticle therapies, and cancer immunotherapy, including CAR-T, further supports its commitment to advancing targeted cancer therapies designed for the unique genetic and clinical profiles of the RGV population.

Looking ahead, ST-CECR plans to expand its research impact through collaborations with local and national partners, including cities, philanthropic organizations, federal agencies, and other institutions. Current sponsors include CPRIT, which has been instrumental in supporting the center's initiatives. "Our goal is to establish ST-CECR as a leader in cancer research on minority and border health issues," Chauhan said. "We aim to make significant strides in understanding and treating cancer within the unique context of the RGV."

In addition to its ongoing research, the center has recently received an $18.4 million National Institutes of Health (NIH) grant to further strengthen its research capacity. This funding, awarded through the NIH's National Institute on Minority Health and Health Disparities (NIMHD), will support the establishment of the Rio Grande Valley Cancer Health Disparity Research Center (RGV-CHDRC). Chauhan stated, "This funding will enable us to accelerate our research efforts, bringing us one step closer to closing the health disparity gap in the RGV. We are committed to utilizing these resources to provide cutting-edge cancer research and treatment solutions for the underserved communities in our region."

Through its commitment to education and training, ST-CECR provides both students and researchers with the opportunity to develop expertise in cancer research. The center's training initiatives include mentorship programs, hands-on research opportunities, career development workshops, and international cancer health disparity conferences, preparing the next generation of scientists with the skills to excel in clinical and biomedical research. These programs also support the center's mission of addressing cancer health disparities by building a community of researchers dedicated to improving public health in South Texas and beyond.

The South Texas Center of Excellence in Cancer Research remains committed to advancing cancer understanding, prevention, and treatment in the RGV. As the center grows, it will contribute significantly to bridging healthcare gaps, training future leaders in cancer research, and making a lasting impact on cancer health outcomes in the community. "Our ultimate vision is to transform the Rio Grande Valley into a model for cancer prevention and treatment," Chauhan said. "With our dedicated team, state-of-the-art facilities, and strong partnerships, we are ready to make a difference that will resonate well beyond our region." ■



Dr. Subhash C. Chauhan examines a cancer cell slide at a laboratory in the UTRGV Biomedical Research Building in McAllen, Texas.

Photography by Jesús Alférez

School of Medicine

Subhash C. Chauhan, PhD

ST-CECR Director

Photography by Jesús Alférez

Addressing Health Disparities Through Research and Community Engagement

Written by María González

The South Texas Diabetes and Obesity Institute (STDOI) in the School of Medicine at The University of Texas Rio Grande Valley (UTRGV) is focused on addressing health challenges related to diabetes, obesity, and associated disorders. With $1,141,908 in restricted research expenditures and five awards totaling $9,761,003, STDOI conducts research to understand the genetic and environmental factors influencing these diseases. The institute also emphasizes training future scientists and engaging the community to improve public health outcomes in the Rio Grande Valley and beyond.

The South Texas Diabetes and Obesity Institute (STDOI) at The University of Texas Rio Grande Valley (UTRGV) is committed to addressing some of the most critical public health challenges facing the South Texas region. Through biomedical research, STDOI is focusing on diabetes, obesity, and related disorders to reduce health disparities and improve the health of populations, both locally and globally.

Under the leadership of Dr. Sarah Williams-Blangero, STDOI has become a key hub for research on the genetic and environmental factors that influence health and disease risk. "Our goal is to better understand how genetic and environmental factors interact to affect health and disease in the Rio Grande Valley," Williams-Blangero said. "Through our research, we aim to develop new treatments and solutions that can improve health outcomes in this region and across the world."

STDOI's research covers a wide range of topics, from studying the genetic determinants of obesity and diabetes to investigating the role of environmental exposures in disease risk. The institute uses a variety of advanced techniques, including genomic, proteomic, metabolomic, and transcriptomic approaches, to study human populations and animal models. These approaches help identify the genetic factors that contribute to diseases such as diabetes, cardiovascular disease, and liver disease, particularly in underserved populations such as Mexican Americans.

Since its establishment in 2014, STDOI has secured more than $110 million in grant funding and has contributed to over 400 publications in peer-reviewed journals. This success has helped solidify the institute's reputation as a leader in biomedical research focused on health disparities and disease prevention.

One key area of research at STDOI is the study of the impact of environmental exposures on health. For example, the institute is examining how pollutants and other environmental factors contribute to the development of fatty liver disease and major depressive disorder, diseases that disproportionately affect Mexican Americans. The findings from this research have important implications for understanding the broader environmental influences on public health, particularly in regions like South Texas, where environmental exposures can be more significant due to industrial and agricultural activity.

The institute is also conducting research on the aging brain, focusing on the genetic factors that influence cognitive decline and the risk for Alzheimer's disease. This research includes studying the interactive effects of genetics and SARS-CoV-2 infection on cognitive decline and dementia risk. "We are looking at how genetic factors combined with environmental exposures—like a viral infection—can accelerate age-related diseases such as dementia," Williams-Blangero explained.

In addition to its research, STDOI is dedicated to training the next generation of scientists and plays a significant role within the Division of Human Genetics at UTRGV. The Division of Human Genetics offers a four-year PhD program in Human Genetics, where students gain hands-on experience in the STDOI laboratories. The program admits only seven students per year, ensuring that each student receives personalized attention while conducting important research on health disparities, diabetes, and obesity.

STDOI is also focused on providing community outreach to improve public health. Through programs such as the Genomic Research Success Program (GRSP) and monthly seminars, the institute provides training in grantsmanship and facilitates the exchange of knowledge among researchers and community health professionals. "We believe that to improve health, it is not enough to simply conduct research—we must engage with the community, provide education, and share what we learn to help improve health outcomes," Williams-Blangero said.

The institute's vision is to build a global center for research on the genetic and environmental factors that influence diabetes, obesity, and related disorders. STDOI is also focused on developing advanced resources to support this research and create new discoveries that can lead to better treatments and cures.

In collaboration with more than 75 research institutions worldwide, STDOI is advancing the field of genetic research and contributing to the development of targeted solutions. "By identifying the genetic and environmental risk factors for diseases like diabetes and obesity, we are creating solutions that are tailored to the specific needs of our community," Williams-Blangero said. "This research is critical to improving health outcomes for people in the Rio Grande Valley, but it also has global implications that can help us address public health challenges worldwide."

The South Texas Diabetes and Obesity Institute is making important contributions to both scientific knowledge and community health. Through its innovative research and commitment to addressing health disparities, STDOI is a leader in the global fight against diabetes, obesity, and related disorders. ■

School of Medicine

Sarah Williams-Blangero, PhD

STDOI Director

Photography by Jesús Alférez

Supporting Underserved Populations through Research and Community Engagement

Written by María González

The Human Mobility Institute (HMI) in the School of Social Work at The University of Texas Rio Grande Valley (UTRGV) is dedicated to addressing the challenges faced by populations in conditions of human mobility. With $5,009 in restricted research expenditures, $5,009 in externally sponsored project expenditures, and two awards totaling $97,349, HMI focuses on research, community engagement, and workforce development. The institute collaborates with local, national, and international partners to provide trauma-informed services, training, and educational opportunities that promote social and economic stability.

Photography by Jesús Alférez

The Human Mobility Institute (HMI) at The University of Texas Rio Grande Valley (UTRGV) is dedicated to addressing challenges faced by people experiencing mobility due to various circumstances. Through its work with individuals, HMI supports research, community engagement, and professional training to create pathways to social and economic stability.

Under the leadership of director Lauren Serafy and co-director Dr. Luis H. Zayas, UTRGV provost and senior vice president for academic affairs, HMI builds collaborative relationships with local, national, and international organizations to advance the well-being of individuals in mobility. "We are committed to not only studying the factors impacting displaced populations but also providing real-world solutions to improve their quality of life through research," Serafy said. "Our work addresses immediate needs while also building long-term resilience, ensuring that these communities have the resources and support to thrive."

The institute's mission is centered on four key pillars: service, education, workforce development, and research. These pillars guide HMI's initiatives, which range from supporting organizations in delivering trauma-informed mental health services to providing training programs that build capacity for professionals working with mobile communities. Each program is designed with an emphasis on lasting impact, aiming to foster resilience among individuals and communities affected by displacement.

HMI's research primarily examines the experiences of individuals in contexts of human mobility, including seasonal farm workers, victims of human trafficking, and those forcibly displaced by violence or environmental changes. This research extends beyond the Rio Grande Valley to cover broader geographical regions, helping to establish UTRGV as a leader in the field of human mobility studies. Through this, HMI-affiliated faculty across UTRGV actively engage in collaborative, relevant, and impactful research in these areas, while also creating learning opportunities for UTRGV students. "HMI's research partnerships and outreach initiatives make it an ideal environment for students dedicated to making a difference in the lives of vulnerable populations," Serafy said. "We aim to cultivate future leaders who will continue this vital work on a global scale."

HMI partners with a wide network of organizations, including Proyecto Juan Diego and Proyecto Desarrollo Humano. These partnerships facilitate the development of workshops, educational programs, and mental health services designed to meet the needs of mobile individuals and the professionals who serve them.

Through initiatives such as trauma-focused mental health training, HMI provides and empowers organizations and their staff to address the needs of their communities. By offering referrals, assessments, and training, the institute ensures that people facing mobility challenges receive support services, promoting greater social integration and stability.

A core component of HMI's mission is workforce development, with the institute providing training and resources for professionals in social work, healthcare, and allied fields. These efforts aim to build a skilled workforce capable of addressing the complexities of human mobility. HMI's training programs emphasize experiential learning, research participation, and course development to prepare UTRGV students and local professionals for careers.

HMI's workforce development extends to agency staff within partner organizations, where the institute provides resources and training to enhance service delivery. This focus on capacity building is essential for creating long-term improvements in the quality of care and support.

Looking ahead, HMI aims to become a self-sustaining center of excellence within UTRGV. By fostering transdisciplinary collaborations and pursuing additional funding opportunities, HMI is positioned to advance the university's goals of research, community engagement, and social justice. Through partnerships with various agencies and the dedication of HMI-affiliated faculty, the institute addresses the challenges associated with mobility and displacement, serving as a bridge between UTRGV and the broader community. As Serafy said, "Our goal is to create a sustainable impact that not only supports displaced individuals but also strengthens the social fabric of our communities." She emphasized that HMI's unique position allows it to be both a responsive resource and a forward-thinking center. "We're continually adapting our approaches to meet the evolving needs of mobile populations and the community organizations that support them."

As the Human Mobility Institute continues its work, the institute remains committed to addressing the needs of people in mobility through research, community engagement, and professional development. "Our mission is to build a foundation of resilience and support for those navigating the challenges of displacement," Serafy said. "We strive to create pathways for integration that benefit both individuals and the communities they join." ■

Advancing Maternal Health with Research and Community Engagement

Written by María González

The Maternal Health Research Center (MHRC) at The University of Texas Rio Grande Valley (UTRGV) is focused on improving maternal health outcomes through research and community engagement. MHRC addresses issues such as maternal morbidity and mortality, with a special emphasis on reducing disparities affecting Hispanic women in South Texas. Through strategic partnerships and multidisciplinary initiatives, the center develops evidence-based solutions to advance maternal health and increase healthcare access across the region.

School of Medicine

Candace Robledo, PhD

MHRC Director

Photography by Jesús Alférez

The Maternal Health Research Center (MHRC) at The University of Texas Rio Grande Valley (UTRGV) is committed to addressing the critical public health issue of rising maternal morbidity and mortality, particularly among Hispanic women in the South Texas region. Established through a federal award from the Department of Health and Human Services, the Health Resources and Services Administration (HRSA), MHRC's research efforts focus on creating effective, community-engaged solutions to improve maternal health outcomes.

Under the leadership of Dr. Candace Robledo, MHRC is dedicated to advancing healthcare access by conducting research that bridges the gap between medical professionals and community stakeholders. "Our goal is to reduce maternal health disparities and provide solutions tailored to the unique needs of Hispanic women," Robledo said. "By working alongside community partners and utilizing a multidisciplinary approach, we can create effective strategies to improve maternal health outcomes."

The center's primary research focus is maternal health, particularly the factors that contribute to maternal morbidity and mortality. In collaboration with local, state, and federal partners, MHRC aims to explore and address these disparities by conducting community-centered research. The center's work aligns with the mission to improve health across the Rio Grande Valley, with a focus on providing evidence-based solutions for maternal health issues.

In addition to its research, MHRC builds partnerships with several key organizations to help address maternal health challenges. These include the UT Health School of Public Health, the South Texas Promotora Association, the City of Brownsville Maternal and Child Health Division, and the Maternal Health Equity Research Collaborative, which is composed of 16 minority-serving institutions.

"We are working with local stakeholders to identify research gaps and better understand the challenges facing maternal health in our region," Robledo explained. "By fostering these collaborations, we are not only advancing research but also empowering the community to be part of the solution."

MHRC's work extends to the Clinical Psychology PhD program, where students contribute to the center's research initiatives. Two PhD students are currently developing and submitting manuscripts aimed at addressing maternal health disparities. This involvement provides students with hands-on research experience while helping to advance the center's mission of creating evidence-based solutions for maternal health.

The center has achieved key milestones, including the development of study protocols, the establishment of Memorandums of Understanding (MOUs) with public health teams, and the implementation of a Faculty Development Fellowship Program. These initiatives have strengthened the center's ties to local and regional partners, including the Brownsville Breastfeeding Coalition. Additionally, MHRC has made progress on two manuscripts leveraging existing datasets, which will contribute to the body of research addressing maternal health disparities.

MHRC is also working toward advancing maternal health research regionally, nationally, and internationally. The center is committed to serving as a center for advanced research and outreach efforts designed to improve maternal health outcomes, focusing on Hispanic women, one of the most vulnerable populations in terms of maternal morbidity and mortality.

The center's efforts also focus on creating sustainable, community-driven solutions for maternal health in South Texas. "We are dedicated to finding sustainable, community-driven solutions that will have a lasting impact on maternal health in South Texas," Robledo said. "Our work is not just about research; it's about creating real-world, actionable change for the women and families who need it most."

Currently, the center is partnering with several departments at UTRGV, such as Marketing and Anthropology, and is actively seeking additional researchers with similar interests to collaborate on preparing competitive grant applications. This collaboration will help broaden the scope of MHRC's work regionally and beyond.

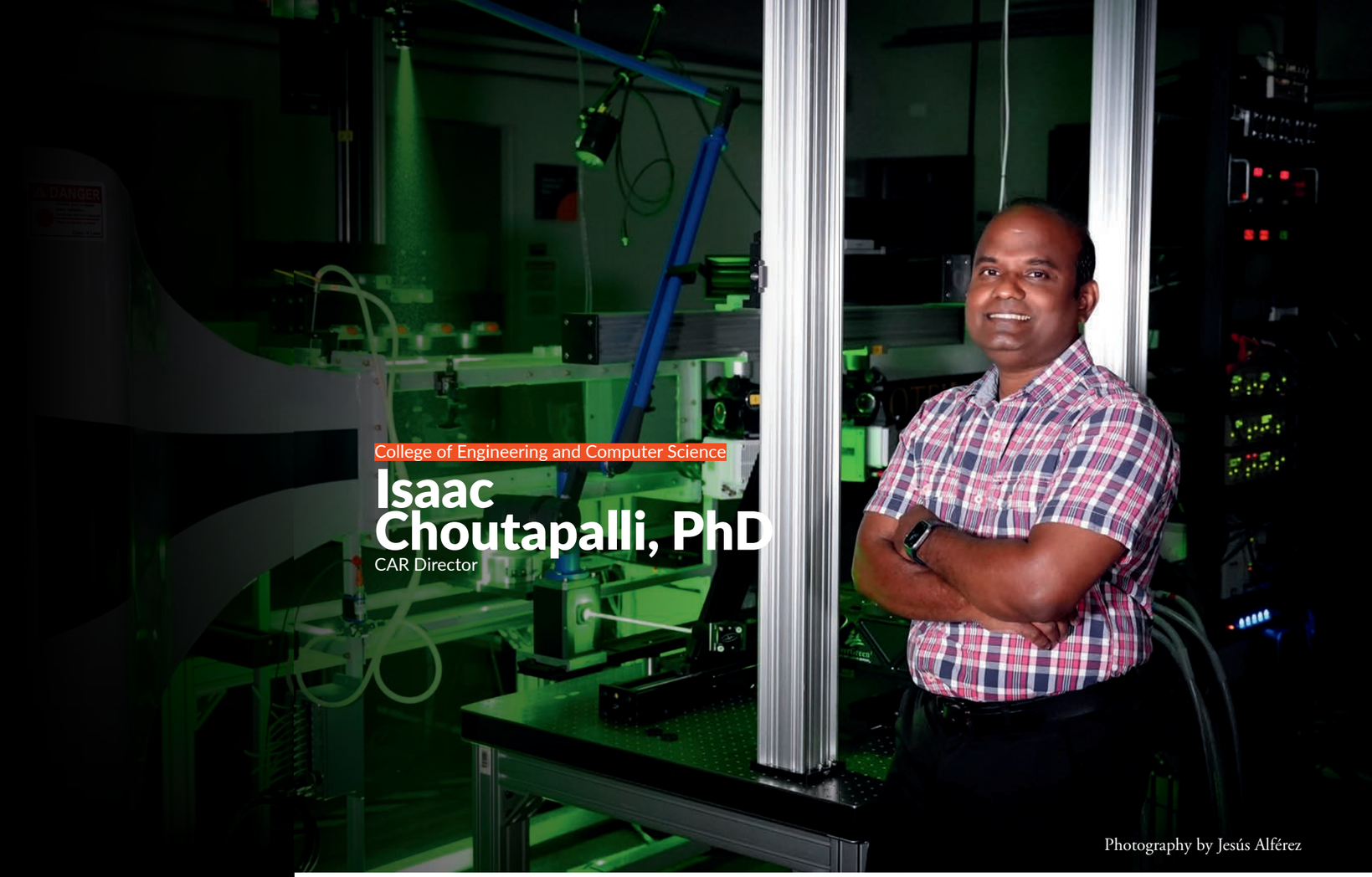
The MHRC's long-term goal is to continue expanding its research capacity while fostering partnerships with leading health organizations and researchers. By building regional capacity and promoting community-engaged research, MHRC hopes to provide the groundwork for future health improvements in maternal care. The center's research and outreach programs aim to create a comprehensive approach to maternal health that will ultimately lead to significant improvements in maternal health outcomes for Hispanic women.

Robledo said she understands the importance of the Maternal Health Research Center's work and the impact it will have not just on South Texas but on maternal health across the country. "We want to be part of a larger movement in addressing maternal health disparities in marginalized communities, and we are excited to see the changes our research will bring to the lives of Hispanic women and families." ■

Advancing Aerospace Science

Written by María González

The Center for Aerospace Research (CAR) at The University of Texas Rio Grande Valley (UTRGV) is dedicated to advancing aerospace science through multidisciplinary research and education. CAR focuses on innovative solutions in areas such as aerospace vehicle design, propulsion systems, computational fluid dynamics, microfluidics, and nanoparticle coatings.



College of Engineering and Computer Science

Isaac Choutapalli, PhD

CAR Director

Photography by Jesús Alférez

The Center for Aerospace Research (CAR) at The University of Texas Rio Grande Valley (UTRGV), under the leadership of Dr. Isaac Choutapalli, is a multidisciplinary center focused on advancing aerospace science and preparing students for careers in the global aerospace sector. CAR uses cutting-edge facilities and forms partnerships to expand aerospace education and innovation, with research covering a wide range of fields, from vehicle design to biomedical biotechnologies. “Our mission is to make UTRGV a recognized leader in aerospace innovation,” Choutapalli said. “Through robust industry collaborations and a strong commitment to student success, we are preparing the next generation of aerospace scientists and engineers.” CAR’s focus on sustainability and practical applications ensures its work has both local and global impact, contributing solutions to critical challenges in the aerospace field.

The center’s research focuses on six main areas: aerospace vehicle design, advanced propulsion systems, computational fluid dynamics (CFD), microfluidics, nanoparticle coatings for aerospace applications, and aerospace medicine. Each area reflects CAR’s commitment to addressing challenges through innovation and collaboration. The center includes several advanced laboratories, including the Aerospace/Aerodynamics Laboratory, which includes a subsonic wind tunnel and high-speed laser diagnostics systems, the Supersonic Jet Propulsion Laboratory, the CFD Laboratory with access to the Texas Advanced Computing Center (TACC) high-performance computing (HPC) cluster, the Nanoparticle Research Laboratory, the Microfluidics Laboratory equipped with high-speed imaging systems, the Drone Research Laboratory, and a specialized Aeromedical Biotechnology Laboratory. “Our facilities allow us to conduct high-level research across multiple disciplines,” Choutapalli said. “By providing students with hands-on experience in these labs, we are preparing them for careers in both industry and academia.”

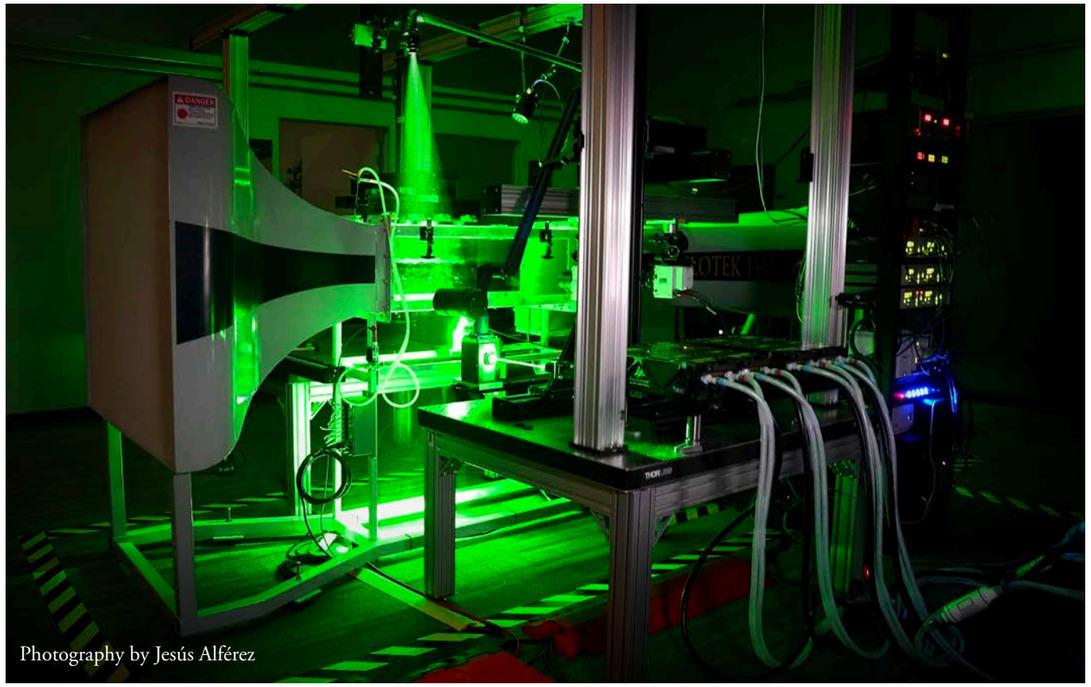
CAR is engaged in several advanced research initiatives. One focus is using a multi-scale approach for passive aerodynamic flow control to increase energy efficiency and reduce fuel consumption

in aircraft. In collaboration with the UTRGV School of Medicine, CAR is developing aerospace medicine solutions to mitigate health risks for fighter pilots, with a focus on reducing the likelihood of aneurysm rupture caused by extreme aerodynamic stresses. Furthermore, CAR is actively involved in the design and development of heavy-lift drones, integrating machine learning with telemetry tracking and command systems for challenging operational environments. Through these research efforts, the center demonstrates a commitment to both innovation and human safety in aerospace.

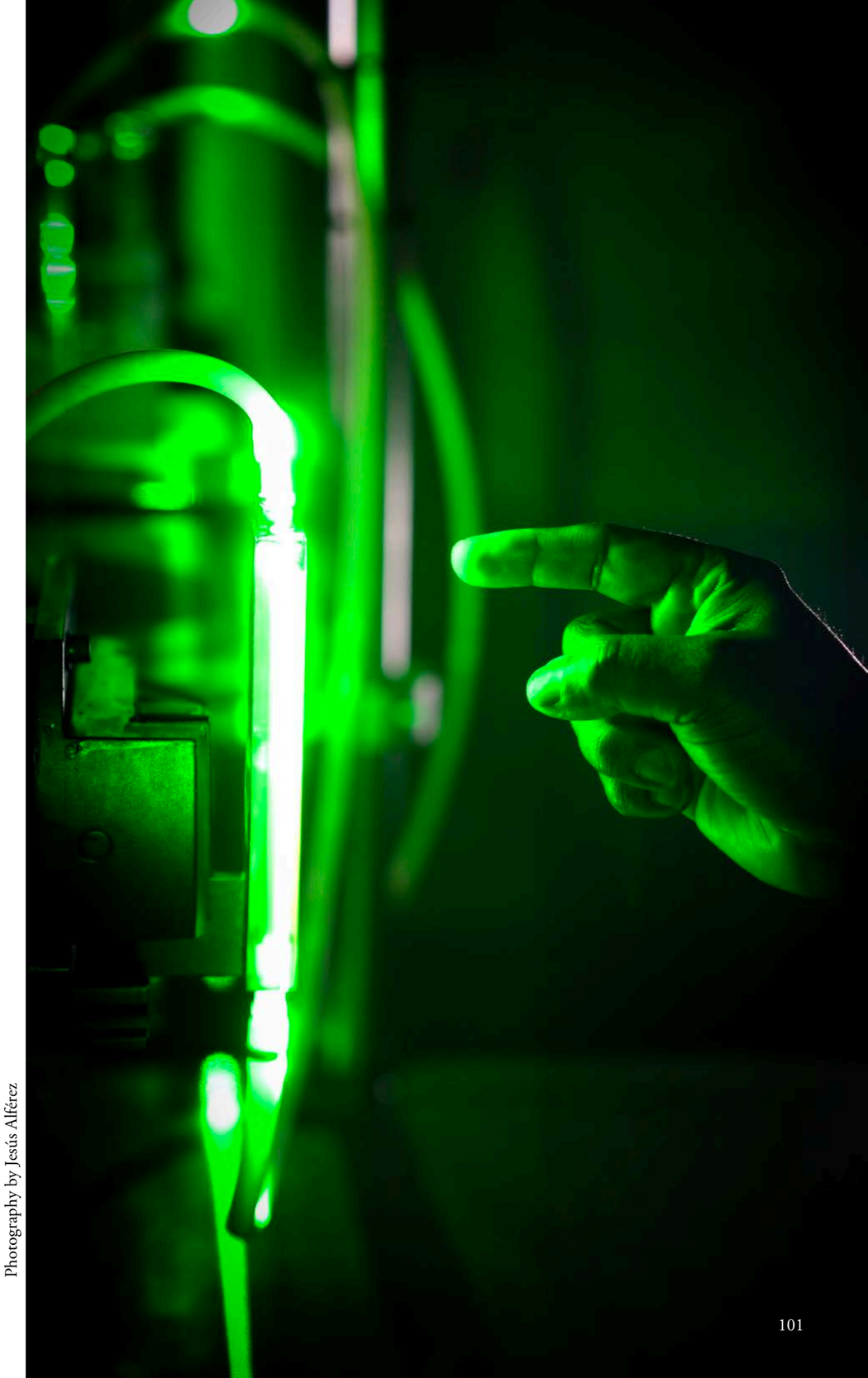
The center's success is built on its collaboration with industry and governmental partners, including the Air Force Office of Scientific Research (AFOSR), Air Force Research Laboratory (AFRL), Office of Naval Research (ONR), and Boeing Commercial Airplanes. These partnerships enhance CAR's research capabilities, provide students with networking and professional development opportunities, and keep CAR at the forefront of aerospace research through knowledge exchange and access to expanded resources. This collaborative approach has secured funding from sponsors, including AFOSR, AFRL, ONR, the U.S. National Science Foundation, and the Naval Surface Warfare Center, allowing the center to pursue high-impact projects that contribute important findings to the aerospace industry.

The center advances student success and supports doctoral research through active faculty engagement that encourages students to pursue doctoral studies and participate in advanced aerospace-related research. Faculty mentorship is paired with educational programming that emphasizes real-world skills, offering students opportunities to publish papers and present their findings at national and international conferences. "Preparing students for successful careers is at the heart of what we do," Choutapalli said. "Our goal is to ensure that students graduate not only with technical knowledge but with the experience and confidence to thrive in high-stakes aerospace roles." In addition to research initiatives, CAR hosts workshops and webinars, inviting external speakers and industry experts to share their expertise with UTRGV's aerospace students.

Looking ahead, the Center for Aerospace Research plans to expand its role as a leading research and education center by building additional partnerships and enhancing its doctoral research capabilities. Through its research, partnerships, and commitment to student education, CAR plays a key role in advancing aerospace science and preparing future aerospace professionals. As Choutapalli said, "We're not just training students; we are propelling aerospace frontiers." ■



Photography by Jesús Alférez



Photography by Jesús Alférez

The Marine Ecosystems Institute (MEI) under the Division of Research at The University of Texas Rio Grande Valley (UTRGV) is committed to advancing marine ecosystem science through research, education, and community outreach. MEI focuses on key areas such as climate change impacts, coastal management, marine conservation, and human interactions with marine environments. The institute supports collaborative efforts to promote sustainability and protect marine ecosystems.

Protecting Marine Ecosystem

Written by María González

The Marine Ecosystems Institute (MEI) at The University of Texas Rio Grande Valley (UTRGV) is committed to advancing research, education, and community engagement in the field of marine ecosystems sciences. Established in Fall 2024, the institute supports multidisciplinary initiatives that address the challenges facing marine environments, from local coastlines to deep-sea ecosystems, and the human communities that rely on them.

Under the leadership of Dr. Erin E. Easton, MEI engages students, faculty, and external partners in a collaborative effort to build a sustainable future for marine ecosystems. “Our mission is to enhance scientific understanding and management of marine ecosystems, while empowering our students and community to actively participate in protecting these critical resources,” Easton said. “The Gulf Coast and its unique ecosystems are deeply interconnected with the well-being of South Texas communities, and MEI aims to make a meaningful impact through research and outreach.”

MEI’s research focuses on critical aspects of marine ecosystems health, including the effects of climate change, human impact on marine habitats, and the sustainable management of coastal areas like the Bahia Grande. The institute emphasizes integrative education and research that addresses the biological, chemical, geological, and human dimensions of marine ecosystems. UTRGV faculty’s expertise across marine sciences, oceanography, conservation, and policy supports MEI’s goal of applying research to real-world environmental challenges.

Through strategic partnerships with organizations such as the Texas General Land Office, Texas Parks and Wildlife Department, and Laguna Atascosa National Wildlife Refuge, MEI facilitates externally funded research projects that address environmental issues. Additionally, MEI partners with Sea Turtle Inc. to protect and study local sea turtle populations and collaborates with the South Texas Ecotourism Center to give public seminars and encourage broader community involvement in conservation efforts.

College of Sciences

Erin E. Easton, PhD

MEI Director

Photography by Jesús Alférez

Dedicated to student success, MEI plays a central role in preparing students for marine-related careers. The institute offers opportunities for both graduate and undergraduate students to participate in cutting-edge research, with over $9.4 million in active awards supporting more than 20 graduate students, 60 undergraduates, and multiple postdoctoral and research technicians over the next five to six years. MEI's commitment to student access is reflected in its hands-on training programs, which provide students with practical experience in marine ecosystems sciences.

These educational initiatives are supported by MEI's collaborations with the UTRGV Coastal Studies Laboratory in Port Isabel, Texas, and the university's campuses in Brownsville and Edinburg, Texas. The facilities provide a comprehensive platform for field-based learning, where students conduct research on local marine and coastal ecosystems and develop expertise for future roles in environmental science, conservation, and policy-making.

Community outreach is a core component of MEI's mission. By organizing public events and educational programs, the institute seeks to raise awareness and promote a sense of stewardship among South Texas residents. MEI's faculty engage in public seminars and create educational materials, such as conservation pamphlets and status reports, that support community knowledge on marine ecosystems and conservation practices.

Easton said, "Our goal is to connect with the public in meaningful ways, helping people understand the importance of marine ecosystems and what they can do to protect them." MEI's commitment to outreach includes partnerships with organizations such as the Texas Master Naturalist Program, which provides training and volunteer opportunities for individuals interested in conservation. Through these collaborations, MEI is able to reach a diverse audience, from students to community members, with messages that promote environmental awareness and sustainable practices.

Looking ahead, MEI seeks to increase its impact by producing and disseminating research findings to natural resource managers, policymakers, and the scientific community. The institute plans to publish peer-reviewed articles, deliver professional presentations, and provide policy recommendations that guide effective management of marine ecosystems. "Our work doesn't end with research," Easton said. "We're committed to sharing our findings with those who can use them to make informed decisions for the benefit of both the environment and society."

Aligned with UTRGV's mission to advance high-profile research, MEI faculty members will recruit for UTRGV's forthcoming PhD program in Integrated Life Sciences and are working toward the development of a PhD program within the School of Earth, Environmental, and Marine Sciences (SEEMS). By supporting these doctoral programs, MEI enhances UTRGV's research portfolio and plays a role in advancing the university's goal of achieving R1 status.

With a growing portfolio of research, partnerships, and community engagement initiatives, the Marine Ecosystems Institute at UTRGV stands as a key resource for sustainable development and environmental stewardship in marine ecosystems. Through its commitment to integrative education, training, and public service, MEI is creating a lasting impact on both the scientific community and the region it serves. ■

The story of research at The University of Texas Rio Grande Valley is shaped by the ongoing work of faculty, students, and staff. On behalf of Research Communications, we are pleased to present the 2024 issue of *The University of Texas Rio Grande Valley's Research Annual Report*—a summary of progress made and goals ahead in our journey toward becoming a Tier One university. In this issue, we recognize faculty members who have surpassed $1 million in externally sponsored project expenditures, part of UTRGV's total restricted research funding of over $40 million in fiscal year 2024. Additionally, this report provides an overview of key developments across UTRGV's research portfolio, including the expansion of doctoral programs offered by the College of Education and P-16 Integration, and their impact on research capacity and educational leadership. We also highlight how Research Analytics is informing future advancements and introduce UTRGV's 19 research centers and institutes, which cover fields such as space sciences, medical research, and social impact, addressing challenges and opportunities on regional, national, and global levels. This year's report includes a feature on the UTRGV Faculty Research Fellows Program launched to support UTRGV's research priorities and encourage interdisciplinary collaboration. Through this program, faculty are leading research initiatives in areas such as human health, environmental sustainability, data sciences, and societal transformations. The report also highlights the university's strategic Research Pathways, which define UTRGV's focus in seven areas: societal transformations, living on the U.S.-Mexico border, human health, technology and innovation, environment and sustainability, space sciences, and data sciences, analytics, and security. These pathways provide a framework for addressing regional and global challenges through research. Thank you to the faculty and staff who contributed to this report. We appreciate the time, insights, and support you shared during every interview and photography session. Your contributions help advance UTRGV's mission of research excellence. To our readers, thank you for supporting research at The University of Texas Rio Grande Valley.

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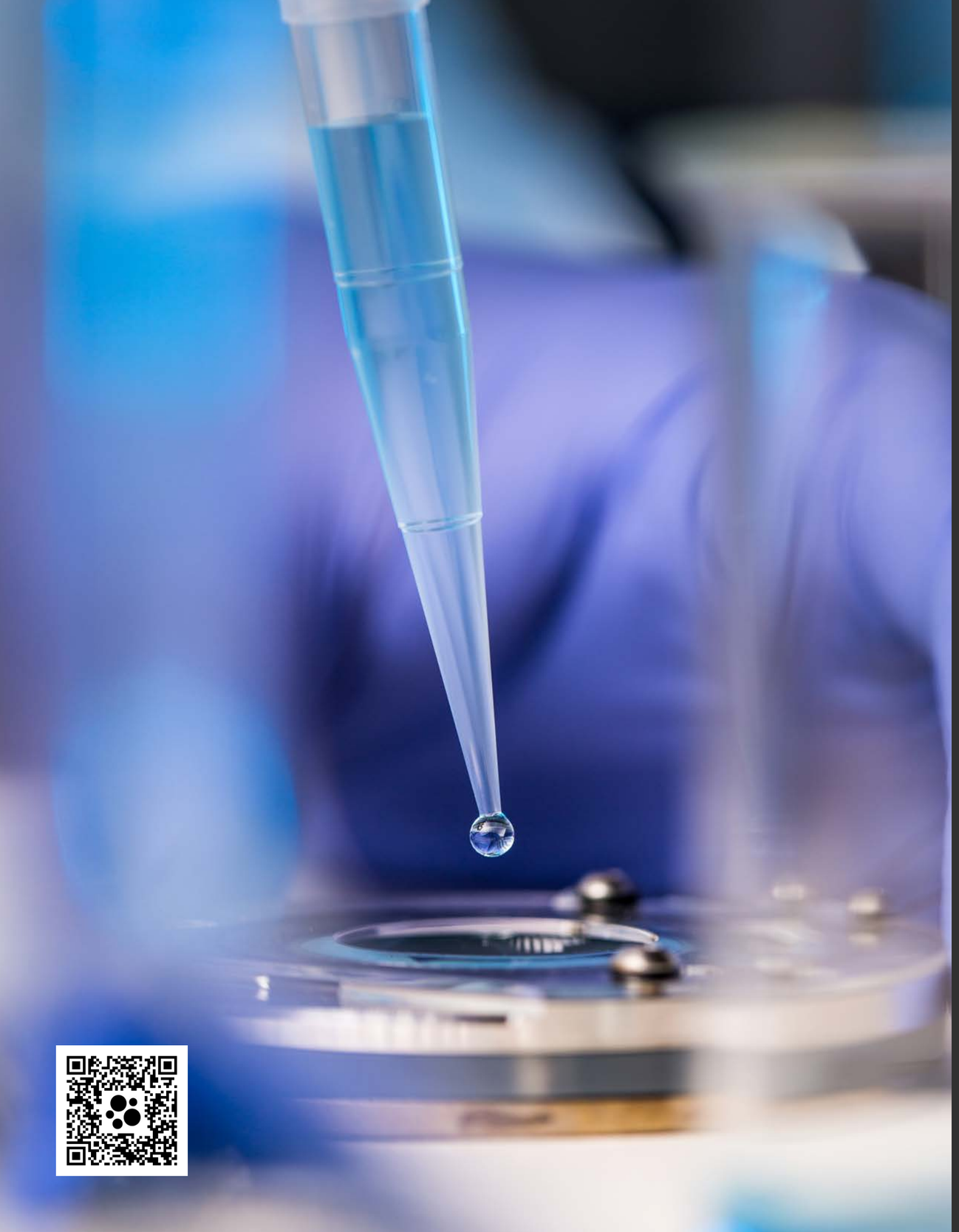


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