9th Annual STEM Education Conference

February 12-14, 2026

FEBRUARY 12

Time	Event
2:00 PM – 6:00 PM	On-Site Registration
5:00 PM – 8:00 PM	Preconference Social

FEBRUARY 13

Time	Event
7:30 AM – 6:00 PM	On-Site Registration and Check-In
9:00 AM – 10:30 AM	Opening Keynote
10:30 AM – 12:00 PM	Concurrent Session A
12:00 PM – 1:30 PM	Luncheon & Awards
1:30 PM – 3:30 PM	Concurrent Session B
3:30 PM – 5:00 PM	Concurrent Session C

FEBRUARY 14

Time	Event
7:30 AM – 12:00 PM	On-Site Registration and Check-In
9:00 AM – 10:00 AM	Concurrent Session D
10:00 AM – 11:00 AM	Concurrent Session E
11:00 AM – 12:00 PM	Concurrent Session F
12:00 PM – 1:00 PM	Concurrent Session G

Friday, February 13, 2026 Day 1	
General Session **9:00 – 10:30 AM**	
Location: Pelican/Heron/Egret	*Educating vs. Training Teachers: A Regenerative Reframing* Keynote: Alejandro Gallard, Patricia Alvarez McHatton

Concurrent Session A 10:30 AM – 12:00 PM	
Location/Format	**Session Information**
Location: Pelican/Heron/Egret Format: Poster Session 10:30 AM – 12:00 PM	*Poster Session A* *Click here for link to poster presentations*
Location: Ibis Format: Interactive Workshop 10:30 AM – 12:00 PM	*Centering Servingness: Plática Pilot Study to Explore an Uncommon Faculty Development Approach* This interactive workshop engages participants in a *plática* for an in-depth exploration of context and learning that fosters scholars and leaders in STEM educational contexts. This *plática* interactive workshop shares emerging practices for faculty/teacher professional development that explore sociocultural factors affecting learning and facilitate discussion among researchers, educators, and students. Presenters: Karin A. Lewis, Miryam Espinosa Dulanto, Eunice Lerma
Location: Spoonbill Format: Deeper Dive 10:30 AM – 12:00 PM	*STEM Education Alliance Across the Americas* The purpose of the STEM Education Alliance to enhance STEM learning opportunities for all students, including those who are Spanish English bilingual. Presenters: William Medina-Jerez, Mourat Tchoshanov
Location: Seagull	*Inspirational Images & Powerful Poetry: A Lived and Blended STREAM PBL for Digital Expression.* This session presents "Inspirational Images & Powerful Poetry", a blended, STREAM-aligned PBL merging student-created-digital-photography, creative writing, and

Format: Interactive Workshop 10:30 AM – 11:30 AM	cultural reflection. Participants will explore how students' photos and poems—published through Google Workspace—ignite academic vocabulary, digital-literacy, and self-expression through lived, culturally relevant PBLs, and use digital photos to create their own photo-poetry! Presenter: Norma Ochoa Urban-Palomarez
Location: Seagull Format: Paper Presentation 11:30 AM - Noon	*Fostering Transformative Practices Through a STEAM Cross-Curricular Approach with Teacher Residents.* This study investigates how teacher residents internalize and enact STEAM pedagogies through cross-curricular design, collaborative practice, and alignment with new science TEKS. Findings reveal residents' deep pedagogical integration, evidence of accomplished T-TESS performance, and emerging professional dispositions, demonstrating the transformative potential of practice-embedded STEAM preparation. Presenters: Zulema Williams, Miriam Ortiz
Location: Sandpiper Format: Interactive Workshop 10:30 AM– 11:30 AM	*AI With Curipod: Level Up Your Presentations* Curipod is an AI enhanced, slide-based, assessment and presentation tool that can make your lessons more inquiry-based. You can take existing texts or PowerPoints and upgrade them to have embedded activities and assessments that get students engaged. Participants will leave with the tools to create AI-enhanced activities and assessments. Presenter: Pamela Groves
Location: Sandpiper Format: Paper Presentation 11:30 AM - Noon	*Biology and AI* Phenology as a framework for experiential learning and climate literacy integrates citizen science and AI into UTRGV's STEM curriculum. Through semester-long projects at the Brownsville campus and Duck Head Preserve, students monitor plant phenology, analyze climate impacts, and contribute data to national databases, fostering scientific literacy and sustainability engagement. Presenters: Soraya Delgado, Karl S. Berg
Location: Caracara Format: Interactive Workshop 10:30 AM - Noon	*Cultivating Civic Science Scholars: High School Teachers and Students Leading Environmental Justice Through Culturally Sustaining STEM Education* San Benito CISD teachers and students share their transformative journey implementing civic science education through environmental justice projects. Through culturally and linguistically sustaining STEM curricula, students investigate local water quality and environmental challenges, developing as civic scholars who use STEM knowledge to advocate for change in the Rio Grande Valley. Presenter: Uma Ganesan
Location: Osprey	*Asynchronous Tools to Empower Learners and Individualized Instruction in College Mathematics.*

Format: Interactive Workshop 10:30 AM – 11:30 AM	This session shares a validated framework for effective asynchronous College Algebra instruction grounded in the Community of Inquiry and Universal Design for Learning. Participants will explore strategies such as adaptive practice, short videos, and multimodal feedback that build presence, equity, and engagement in online STEM courses while maintaining academic rigor. Presenter: Mariam Hussein
Location: Osprey Format: Interactive Workshop 11:30 AM - Noon	*Bridging Numerical and Visual Reasoning: Interviews and Interventions to Strengthen Elementary Students' Understanding of Addition and Subtraction.* The need to develop critical thinking skills within our mathematics education starting at the elementary grade levels is crucial. Mastering basic reasoning in numeracy, such as adding and subtracting, can avoid challenges to our students' skills in upcoming years if prioritized from a young age. Presenter: Larissa Flores

Concurrent Session B
1:30 PM – 3:30 PM

Location: Pelican/Heron/Egret Format: Poster Presentation 1:30 PM – 3:00 PM	*Authentic STEM Research Experiences for High School and Undergraduate Students* This poster session will share research conducted by high school students who participated in the 2025 JSTEM summer program. In addition, STEM faculty from UTRGV and South Texas College will share the course-based undergraduate research experience (CURE) projects as part of an NSF funded professional development. Last, undergraduate students will share their findings from the CUREs bridge to research (CB2R) projects conducted in Fall 2025. Click here for the link to the presentations. Moderators: Megan Keniry, Sue Anne Chew Facilitators: Joshua Reyna, Lluvia Garcia
Location: Ibis Format: Paper Presentation 1:30 PM – 2:00 PM	*What do Teacher Observers Observe?* Teacher observations promote effective teaching; however, this practice assumes teacher observers have the content knowledge for quality feedback. This study investigated how teacher observers with varying levels of biology content knowledge alter their focus and feedback. Findings indicate knowledge bases influenced the quality, not quantity of content-based focuses and feedback. Presenter: Elizabeth Goldberg
Location: Ibis Format: Paper Presentation	*Building Foundations for STEM Success: Integrating Funds of Knowledge and Math Readiness in Civil Engineering Education.*

2:00 PM – 2:30 PM	This presentation highlights findings from the Civil Engineering Student Math Academy (CESMA), a culturally responsive, research-based program at UTRGV that integrates math remediation, family engagement, and students' "Funds of Knowledge." Pre/post assessments and qualitative feedback show notable gains in math proficiency, self-efficacy, and family support, strengthening STEM persistence and belonging. Presenter: Thuy Vu
Location: Ibis Format: Interactive Workshop 2:30 PM – 3:30 PM	*The Laser Target Challenge: Engaging Pre-Service Teachers in Phenomenon-Based Learning.* This interactive session immerses participants in The Laser Target Challenge, a phenomenon-based lesson connecting light energy and reflection to the Engineering Design Process. Participants will explore how Trauth and Mulvena's (2021) six-step framework transforms pre-service teachers into confident facilitators of inquiry through reflection, collaboration, and authentic scientific modeling. Presenters: Leslie Yvette Garrido, Johanna Lynn Esparza
Location: Spoonbill Format: Interactive Workshop 1:30 PM – 3:30 PM	CUREs Professional Development - Part 1 Closed Session Presenter: Allan Feldman
Location: Seagull Format: Paper Presentation 2:00 PM – 2:30 PM	*Culturally Responsive Science Instruction: Fostering Critical Thinking Among Emergent Bilinguals in Elementary Classrooms* This in-progress research explores how ESOL-endorsed and bilingual-certified elementary teachers use culturally responsive strategies to promote critical thinking in science instruction for emergent bilingual students. The digital PowerPoint poster presentation summarizes the study's purpose, framework, preliminary themes, and implications for STEM teacher preparation and equitable classroom practices. Presenter: Lydia S. Ratel
Location: Seagull Format: Interactive Workshop 2:30 PM – 3:30 PM	*Dream STEAM: Actively Engaging Students in Learning, Research, and Service through Sports* The purpose of this investigation is to show how teachers/coaches can make the most of PE and team training. It focuses on ways to integrate STEM learning across K–12 using teaching methods aligned with physical education goals. Suggestions for applying these methods in various settings will be provided. Presenter: Seanah Mireles

Location: Sandpiper Format: Interactive Workshop 1:30 PM – 2:30 PM	*Podcasting as Alternative Assessment: Empowering Student Voice and Creativity.* Discover how podcasting can replace traditional assessments to enhance creativity, collaboration, and soft skills. This interactive workshop demonstrates how Laredo College faculty implemented podcasting as a project-based assessment tool, improved student outcomes, and cultivated transferable communication skills vital to STEM success. Presenters: Brenda Carmona, Prakash Mansinghani
Location: Sandpiper Format: Interactive Workshop 2:30 PM – 3:30 PM	*Predictable Chaos: Guiding Students to Discover the Limits of Hurricane Predictability.* In this inquiry-based hurricane lesson, AP Environmental Science students analyze authentic meteorological data to explore predictability in complex systems. By examining relationships among pressure, wind speed, and storm structure, students discover that apparent chaos often reflects data limitations—transforming hurricanes into models of scientific reasoning and systems thinking. Presenter: Madelene Trujillo
Location: Caracara Formats: Deeper Dive 1:30 PM – 2:30 PM	*Repurposing Food Wastes into Superfoods.* Roundtable discussing higher education student engagement through community-oriented actions, real learning through real world problems and materializing learning through community action. Presenter: Claudia Ordaz
Location: Caracara Formats: Interactive Workshop 1:30 PM – 2:30 PM	*From Seeds to Systems: Cultivating Green Literacy in STEM Education to Foster Inclusive Learning, Environmental Stewardship, and Sustainable Pathways for All Students.* Through the Green Literacy framework, this session highlights how children's books and digital media strengthen literacy within STEM education. Participants will explore reading, writing, and discussion strategies that build scientific understanding, equity, and environmental awareness. Presenter: Jen Cullerton Johnson
Location: Osprey Format: Deeper Dive 1:30 PM – 3:30 PM	*Count Me In: An Analysis of the Future Teachers of Mathematics Dual Enrollment Program.* Jackson State University has become a hub for strategic "grow-your-own" initiatives designed to research and directly address shortages among licensed mathematics educators in Mississippi. The interactive workshop will include discussions of "Count Me In" a dual enrollment program that recruits, trains, and places teachers in geographical critical shortage school districts. Presenters: Deidre L. Wheaton, Tony Latiker, Sam Mozee

	De la Práctica a la Investigación en Educación en STEM: Un Diálogo sobre Evaluación e Implementación. Esta propuesta es para una mesa redonda bilingüe en donde se examinará la implementación y evaluación de competencias STEM mediante el diálogo entre investigadores de la Universidad de Granada, España y Universidad de Texas Río Grande Valley, abordando temas desde el uso de la estadística hasta la preparación de maestros. Presenters: Jair J. Aguilar, Jose Luis Lupianez, Juan Fco Ruiz, Nuria Rico

Concurrent Session C 3:30 PM – 5:00 PM	
Location: Pelican Format: Poster Presentation 3:30 PM – 5:00 PM	*Poster Session C – CREST-MECIS* Click here to view poster presentations.
Location: Ibis Format: Interactive Workshop 3:30 PM – 5:00 PM	*Exploring Mendelian Genetics with Corn!* Participants will model Mendelian inheritance patterns using corn ears, collect and analyze data, and experience a 5E lesson that is culturally sustaining and grounded in students' foodways. They will connect Mendelian genetics to corn, masa, and nixtamalization while strengthening their understanding of Punnett squares, probability, and selective breeding. Presenters: Miriam Ortiz, Lluvia Garcia, Ashley Villanueva, Amy Dominguez
Location: Spoonbill Format: Paper Presentation 3:30 PM – 5:00 PM	*High School Biology Science Teachers' Experiences Integrating Social Issues.* This paper explores two biology teachers' teaching experiences as they integrate social issues of race in teaching. The analysis of the qualitative data shows that teachers have immense influence of their own life experiences in how much they find race an integral part of science teaching and learning. Presenter: Bhaskar Upadhyay
	A(n) (re)awakening: Preservice teachers connecting their culture to science teaching along the U.S. Mexico border. This case study examined how Latina/o preservice teachers (PSTs) draw on community knowledge to embed cultural wisdom into STEM instruction for students along the U.S.–Mexico border. Findings show that engaging PSTs in culturally reflective practices fosters a science educator identity that views science teaching as a culturally grounded, community-connected practice. Presenters: Angela Chapman, William Medina-Jerez, Janine Schall, Uma Ganesan, Ruby Lynch-Arroyo, Mourat Tschoshanov
	Exploring the nature of joy and why that might matter for a more inclusive and equitable STEM education Why isn't joy the underlying goal for all education and STEM education specifically? Taking an agential realist (Barad, 2007) approach to science education, I invite you to explore with me the nature of joy and how STEM education through entanglement and attunement with the world can create spaces for joy. Presenter: Catherine Milne

Location: Seagull Format: Interactive Workshop 3:30 PM – 4:30 PM	*Developing and Assessing Spatial Thinking in STEM.* At the California State University, Long Beach, science education researchers are working to grow STEM students' abilities to think spatially. In this session, we will explore the initial data collection and provide experiences with some of the resources used in the course. Presenters: Lisa Martin Hansen, Youngjin Song, Susan Gomez-Zwiep, H.S. You
Location: Seagull Format: Paper Presentation 4:30 PM – 5:00 PM	*Walls that Unite: A STEAM Project to Build Community and Belonging.* This work presents a transversal STEAM project fostering belonging and strengthening school–community bonds in a vulnerable secondary school. Through murals integrating Arts, Technology, Science, and Mathematics, students address violence and bullying, promote sustainability and virtual reality use, and become agents of social change through impactful STEAM methodologies. Presenters: Luis Alberto Zarate Siordia, Silvia Lizette Ramos De Robles
Location: Sandpiper Format: Interactive Workshop 3:30 PM – 4:30 PM	*Integrating Data Science Directly into STEM Coursework.* Data science pedagogy can enhance learning experiences for students across all STEM courses, regardless of traditional data science use. Come learn how to integrate data storytelling directly into your class. This session will provide you with resources that you can implement right away in your classroom. Presenters: Elaine Anita de Melo Gomes Soares, James Newland
Location: Sandpiper Format: Paper Presentation 4:30 PM – 5:00 PM	*Integrating Indigenous Knowledge into Cybersecurity Education to Improve Students' Interests.* The study explores the integration of Indigenous Knowledge Systems (IKS) into cybersecurity education using the Culturo-Techno-Contextual Approach and the Afrocyberlibrary. Results show a significant impact on students' interest levels, with no gender differences. The study suggests that Afrocentric inventions can transform educational ecosystems and cultivate future-ready talent. Presenters: Michael Armah, Alejandro Gallard, Andrew Tetteh
Location: Caracara Format: Interactive Workshop 3:30 PM – 4:30 PM	*Biodiversity Beads: Visualizing the Hidden Patterns of Ecology.* This hands-on activity helps visualize biodiversity using colored beads to model species richness and evenness—balance of individuals among species. Through inquiry and data analysis, students discover how ecosystems vary in diversity despite similar species counts, connecting conceptual understanding with quantitative reasoning to reveal biodiversity as an emergent property of systems. Presenter: Madelene Trujillo
Location: Caracara	*Generative AI in Higher Education: A Literature Review of Student Use, Faculty Adaptation, and Institutional Policy with a New Focus on Dual Enrollment Students.* This session will present a literature review of recent literature on GenAI use by

Format: Interactive Workshop 4:30 PM – 5:00 PM	college students, faculty adaptation, and institutional responses. The presentation identifies a key research gap: dual enrollment/early college high school students. It proposes future inquiry into GenAI use by this student population. Presenter: Miguel Aguilera
Location: Osprey Format: Deeper Dive 3:30 PM – 5:00 PM	*Learning About the Esto'k Gna (Carrizo/Comecrudo) Tribe in South Texas & Their Fight to Protect Ancestral Land* This session introduces a place-based pedagogical approach that centers learning on the physical, cultural, and historical environments of students' communities. Place-based education emphasizes hands-on, real-world experiences to enhance academic achievement, strengthen community ties, foster appreciation for the natural world, and cultivate civic engagement. Presenters: Juan Benito Mancias, Miryam Espinosa-Dulanto

Saturday, February 14, 2026 Day 2	
Concurrent Session D 9:00 AM -10:00 AM	
Location: Pelican Format: Interactive Workshop 9:00 AM – 10:30 AM	*CIGAR-BOX-PBL* Explore the transformative potential of lived curriculum through a hands-on "Make-&-Take" CIGAR-BOX-PBL experience. Participants will design replicable STEM/STEAM/STREAM lessons that foster equity, creativity, and collaboration—reimagining students not as passive recipients of content but as active creators, problem-solvers, and innovative leaders shaping the future of learning and community. Presenter: Norma Ochoa Urban-Palomarez
Location: Pelican Format: Paper Presentation 10:30 AM – 11:00 AM	*Teaching Interdisciplinary Through Research: Lessons from an International Project on Water and Sanitation* This study investigates an NSF-funded international wastewater project led by environmental engineers and medical anthropologists. Through interviews and discussions, researchers found that while students gained valuable exposure to interdisciplinary research by combining engineering and anthropology methods, true disciplinary integration remained elusive. Results indicate that intentional collaborative design, early multi-disciplinary engagement, and strong institutional support are crucial for developing authentically interdisciplinary student research apprenticeships. Presenter: Allan Feldman
Location: Ibis Format: Paper Presentation 9:00 AM – 9:30 AM	*Exploring the Effect of Self-concept and Self-efficacy in PSTs Through in Informal STEM Setting* As pre-service teachers (PSTs) prepare for their careers, teacher education programs often focus on professional skills like lesson planning. However, personal traits such as self-efficacy and self-concept are just as important but often overlooked. This mixed-methods study explores how participation in an informal STEM setting affects PSTs' self-efficacy and self-concept. Presenters: Lluvia Garcia, Asheley Villanueva, Miriam Ortiz

Location: Spoonbill Format: Interactive Workshop 9:00 AM – 10:00 AM	*Integrating Technology and SEL to Foster Bilingual Student Engagement in Community-Based STEM Learning* This interactive workshop shows how educational technology and social-emotional learning (SEL) spark bilingual students' curiosity and confidence in STEM. Using digital tools, reflection, and community examples, participants will explore inclusive practices that make classrooms vibrant spaces for discovery, connection, and real-world problem-solving across K–12 and beyond. Presenter: Noe Estrada
Location: Seagull Format: Interactive Workshop 9:00 AM – 10:00 AM	*CUREs Professional Development - Part 2* Closed Session Presenter: Allan Feldman
Location: Sandpiper Format: Interactive Workshop 9:00 AM – 10:00 AM	*Integrating Data Science Across STEM: Practitioner Strategies for Middle and High School Integration* This panel brings together experienced educators and researchers to share practical strategies for integrating data science across STEM subjects at the secondary level. Panelists will discuss classroom implementations, address integration challenges, and provide actionable insights for educators seeking to make data science accessible and meaningful to their students. Presenters: Dr. Marc Sager, James Newland, Elaine Soares
Location: Caracara Format: Interactive Workshop 9:00 AM – 10:00 AM	*Models of Change: Communicating to your Funder and Stakeholders How You Believe Your Project will Succeed* Grant funders often ask applicants to present theories of change to explain how the applicants believe their programs will bring about the intended outcomes as solicited by the funder. Differences between four examples of common STEM ED change models will be discussed, as well as the evaluations from each model. Presenters: Jean McLaughlin, Noe Vargas, Arturo Fuentes, Thuy Vu
Location: Osprey Format: Interactive Workshop 9:00 AM – 10:00 AM	*Designing STEM Lessons with Students' Cultural Wisdom* Hands-on practitioner session for participants to design TEKS-aligned, culturally centered STEM lessons. Using Funds of Knowledge, culturally sustaining pedagogy, and *nepantla*, participants will learn approaches to design STEM lessons that honor students' cultural wisdom and produce a pilot plan that honors bilingual resources and community wisdom. Presenters: Miriam Ortiz, Uma Ganesan, Angela Chapman, William Medina-Jerez, Ruby Lynch-Arroyo, Mourat A. Tchoshanov

Concurrent Session E 10:00 AM- 11:00 AM	
Location: Ibis Format: Interactive Workshop 10:00 AM – 11:00 AM	*Strategies for Reframing STEM: Girls as Designers and Changemakers* This hands-on session empowers educators to reframe STEM for girls through inclusive language, creative activities, and diverse role models. Participants will explore how language, context, and representation dramatically influence girls' engagement in STEM—gaining practical strategies, activities, and resources to foster purpose-affirming, collaborative learning environments that close the widening gender gap. Presenter: Laura Roye
Location: Spoonbill Format: Interactive Workshop 10:00 AM – 11:00 AM	*She's Safe: STEM-Driven Crime Mapping for Equity and Community Empowerment* This workshop showcases She's Safe, an offline USSD crime reporting and mapping tool empowering underserved communities in Kenya. Participants will explore how locally relevant STEM innovations can drive equity, safety, and engagement, bridging educational and technological gaps for underrepresented groups in global STEM pathways. Presenters: Jacinta Kazenzi, Hope Wanjeri
Location: Seagull Format: Paper Presentation 10:00 AM – 10:30 AM	*Unlocking Student Math Minds: Insights into Reasoning, Background, and Feelings During Clinical Interviews.* This study explores how connecting algebra problems to students' real-life interests can improve understanding and confidence. Through clinical interviews, it examines how contextual learning helps high school students better grasp quadratic equations and feel more positive about mathematics. Presenter: Adrian Torres
Location: Seagull Format: Paper Presentation 10:30 AM – 11:00 AM	*Arts-Integrated Algebra I: Bridging Academic and Artistic Identity.* This action research proposes an Arts-Integrated Algebra I curriculum at the New Mexico School for the Arts to bridge academic and artistic identities. Adapting Robert Moses's experiential learning and "Experience First, Formalize Later" models, the "Graphing Stories" activity uses narrative emotional arcs to improve students' conceptual understanding of slope. Presenter: Jose Eduardo D. Arcellana

Location: Sandpiper Format: Interactive Workshop 10:00 AM – 11:00 AM	*Defeating the "Stochastic Parrot": How an ACTIVEAI framework Can Overcome Cognitive Decline for Students Using AI* This workshop introduces an actionable framework for teachers and students, which includes critical thinking, ethical practice, and digital literacy support. The ACTIVEAI framework embeds ways to find and evaluate AI "hallucinates", and how educators can engage students in critically evaluating these hallucinations and reduce cognitive decline. Presenter: Leticia De Leon
Location: Caracara Format: Interactive Workshop 10:00 AM – 11:00 AM	*Designing Career Pathways for First-Year Engineering Students through Collaborative Curriculum and Design Thinking* This presentation showcases a collaboration between faculty in the University College's Learning Framework Program and the Mechanical Engineering Department at UTRGV. The initiative enhanced first-year students' engagement in college-specific courses, foster meaningful connections with faculty and peers, and supports the development of career pathways grounded in self-awareness and professional identity. Presenters: Sandra Morrow, Michelle Alvarado, Erika Perez
Location: Osprey Format: Paper Presentation 10:00 AM – 10:30 AM	*Examining Elementary Pre-Service Teachers' Use of iSTEM and their iSTEM Teacher Identities* This poster presentation explores the work in progress related to elementary pre-service teachers' (PSTs') perceptions of teaching and learning integrated STEM (iSTEM). Conference participants will learn about the STEM methods semester, its cross-cutting STEM themes, and the iSTEM course assignments utilized to support PSTs' iSTEM teacher identity development. Presenters: Ursula Nguyen, Deepika Menon, Amanda Henson

Concurrent Session F
11:00 AM - 12:00 PM

Location: Pelican Format: Interactive Workshop 11:30 AM – 1:00 PM	*Critters in the Classroom: A Lived, Blended Learning Approach to STEM/STEAM/STREAM Education* This session explores "Critters in the Classroom", a blended, hands-on STEM/STEAM/STREAM PBL series that integrates life sciences with culturally relevant, lived curriculum design. Participants will discover how live organisms, digital tools, and inquiry-based learning foster curiosity, empathy, and scientific identity among Latinx digital native learners. Presenter: Norma Ochoa Urban-Palomarez

Location: Ibis Format: Deeper Dive 11:00 AM – 12:00 PM	*Rooted in the RGV: Interweaving Día de los Muertos, Indigenous Knowledge, and Scientific Inquiry* This presentation highlights an interdisciplinary sixth-grade STEM lesson integrating Indigenous ecological knowledge and Día de los Muertos traditions. Through pigment diffusion, plant studies, and ofrenda creation, students connect chemistry, ecology, and cultural identity—demonstrating how culturally sustaining STEM education in the RGV honors heritage, deepens inquiry, and nurtures belonging. Presenters: Johanna Lynn Esparza, Sydney Castaneda
Location: Spoonbill Format: Paper Presentation 11:00 AM – 11:30 AM	*Experiential learning in science and medicine left some rural American students feeling less socially supported and more discriminated against.* The Medical Scholars Academy is a week-long experiential learning program for youth in East Texas. Participants (16-18 years old) completed pre- and post-experience surveys. Results showed a decrease in feelings of social support and an increase in beliefs they would face discrimination. Interpretations include unresolved cognitive dissonance with in-group prior beliefs. Presenter: Brandon L. Bretl
Location: Spoonbill Format: Paper Presentation 11:30 AM – 12:00 PM	*Research experience as a tool to understand complex topics* The results of the research are presented, where students who had a research experience were able to better understand complex knowledge that students without such experience were unable to understand at that level. Presenters: Maria Alejandra Quinones Pena, Megan Keniry, Sue Anne Chew, Angela Chapman
Location: Seagull Format: Paper Presentation 11:00 AM – 11:30 AM	*Meaningful Mathematics – Teaching Algebra Using Language Acquisition Strategies.* My proposal aims to help students overcome semiotic complexity in algebra by designing lesson plans through the lens of second language acquisition. Practical strategies can help build students' conceptual understanding of algebra by promoting fluency and confidence in the symbolic register of algebra. Presenters: Michele Mangold, Jair Aguilar

Location: Seagull Format: Paper Presentation 11:30 AM – 12:00 PM	*Building Bridges through Mathematics: Family Learning Events as Catalysts for Asset-Based Understandings of Latin Families* This study examines how pre-service teachers' beliefs about Latin* families evolved after leading culturally relevant mathematics activities at a Family Math Learning Event. Findings show that authentic family engagement fosters empathetic, asset-based perspectives, emphasizing the need to integrate culturally relevant community partnerships into mathematics teacher preparation. Presenters: Mayra Ortiz-Galarza, Luis Miguel Fernández, Olga Ramirez
Location: Sandpiper Format: Interactive Workshop 11:00 AM – 12:00 PM	*Teaching Data Literacy Through Cognitive Science, Exploratory Data Analysis, and AI-Supported Inquiry: A Practical Workshop Using STEM-Relevant Administrative Data* This workshop introduces a cognitive science–informed framework for teaching data literacy through Exploratory Data Analysis and AI-assisted tools. Participants will have the opportunity to experience live, authentic STEM-relevant administrative datasets to practice inquiry, interpretation, and evidence-based reasoning, and will takeaway adaptable strategies for supporting student learning and educator data use. Presenter: Jaime B. Curts
Location: Caracara Format: Paper Presentation 11:00 AM – 11:30 AM	*Representations of STEM in Picturebook Biographies Featuring Latinx or Latin American Subjects* Children develop conceptions of STEM through the materials they interact with. In this critical content analysis I examine how picturebook biographies with Latinx or Latin American subjects portray STEM and STEM careers. Findings suggest a broad conception of STEM, but that STEM professionals depicted do not reflect in-group diversity. Presenter: Janine M. Schall
Location: Caracara Format: Paper Presentation 11:30 AM – 12:00 PM	*¿Malas palabras? Más alla de las groserías. Una mirada interdisciplinaria a las formas de interacción en la escuela* Este trabajo en investigación analiza el uso del lenguaje soez entre los adolescentes de la Escuela Secundaria Mixta 38 "Emiliano Zapata" en Guadalajara, Jalisco, como un elemento constitutivo de identidad y sus interacciones sociales. Frente a la concepción tradicional que lo estigmatiza como meramente vulgar o transgresor. Presenter: Blanca Elizett Brito Ríos, Felicitas Ramirez Aguilar
Location: Osprey Format: Paper Presentation	*Proyecto STEAM en el Estudio del Sistema Digestivo en Preescolar* Presenter: Dulce María González Ramírez

11:00 AM – 11:30 AM	
Location: Osprey Format: Paper Presentation 11:30 AM – 12:00 PM	*Building Young Innovators: Empowering Elementary Students Through LEGO Robotics and Block-Based Programming* This session highlights how a 4th-grade robotics club empowered students to explore programming and problem-solving through LEGO robotics. Students learned coding fundamentals using graphical interfaces, building the confidence and curiosity that lay the groundwork for future STEM learning and computational thinking. Presenters: Brenda Carmona, Alma Carmona

Concurrent Session G 12:00 PM – 1:00 PM	
Location: Ibis Format: Interactive Workshop 12:00 PM – 1:00 PM	*From LEGO Cars to STEM Learning Communities: Intergenerational Engagement and Adult Learning in Digital Environments* This presentation examines an intergenerational LEGO car activity to understand adult participation in STEM learning. Observations and reflections show variation in autonomy, emotional comfort, and motivation. A digital lesson demonstrates how optional simulations and reflective dialogue can support meaningful community learning, personal pacing, and confidence across generations. Presenters: Martha Lovett, Parita Vithlani
Location: Spoonbill Format: Paper Presentation 12:00 PM – 12:30 PM	*Navigating cultural and professional identities: A study of Hispanic women's experiences in aerospace (STEM) internship programs* This study examines how Hispanic women navigate cultural identity and professional development within NASA aerospace-internship programs. It highlights the impact of culturally responsive mentoring on retention and career pathways, offering evidence-based strategies to foster belonging, representation, and long-term success in STEM. Presenter: Jennifer Becerra
Location: Spoonbill Format: Paper Presentation 12:30 PM – 1:00 PM	*Treatment of Eating Disorders among College Students in America* Students face stress due to academic challenges in STEM disciplines (Pester et al., 2023) leading to anxiety and depression (Dohrenwend, 1998). Evidence shows stress can lead to physical and mental health concerns (Iwajomo et al., 2021). STEM students' stress and eating disorders treatment can improve their health and well-being. Presenters: Susheelabai Srinivasa, Sudershan Pasupuleti
Location: Seagull Format: Paper Presentation 12:00 – 12:30 PM	*Teaching with Heart: Health-Promoting STEM Lessons* Teacher residents and their faculty mentor share co-designed, TEKS-aligned, health-promoting STEM lessons grounded in local community contexts, then engage in a panel conversation about what they learned. Participants experience a scaled-down co-design activity and leave with a simple template and ideas for integrating health and STEM in their own settings. Presenter: Miriam Ortiz

Location: Seagull Format: Paper Presentation 12:30 PM – 1:00 PM	*Fostering STEM Scholars from Pre-K to 5th Grades* STEM education is essential at the elementary level. Students' interests and abilities need to be considered and engaged in all aspects of STEM in order to create life-long learners. In this interactive workshop, STEM lessons implemented successfully at Pullam Elementary showcase how students from Pre-K to 5th become STEM Scholars. Presenter: Evangelina Guillen
Location: Sandpiper Format: Interactive Workshop 12:00 PM – 1:00 PM	*An Artificial Intelligence Playground* Explore core artificial intelligence and machine learning concepts through three to four interactive, hands-on activities using physical tools and collaborative tasks. Participants will engage in sorting, decision-making, neural network modeling, and creative storytelling to make abstract ideas tangible, accessible, and relevant—connecting AI principles to real-world applications and human-centered design. Presenters: Ellen James, Jesse James
Location: Caracara Format: Paper Presentation 12:00 PM – 1:00 PM	*Interventions in Calculus Teaching at UTRGV and South Texas College* We showcase a student-focused project: Enhancing Student Success in Calculus to Strengthen STEM Pathways at Hispanic-Serving Institutions supported by NSF-HSI program. By building calculus active learning community (CALC) and providing multilevel student support system, we present a significant improvement in student learning by the data in spring and fall 2025. Presenters: Baofeng Feng, Tim Huber, Shaghayegh Setayesh, Mario Morin
Location: Osprey Format: Deeper Dive 12:00 PM – 1:00 PM	*Somi Se'k and the Struggle for Indigenous Sovereignty: Juan Mancias and the Esto'k Gna Carrizo/Comecrudo Tribe* In this presentation, Tribal Chairman Juan Mancias will share the ongoing struggle of the Esto'k Gna Carrizo/Comecrudo Tribe to protect Somi Se'k, their ancestral homeland in South Texas. He will address the political, legal, and spiritual dimensions of resisting fossil fuel extraction, border wall construction, and privatization of sacred lands. Presenters: Juan Benito Mancias, Miryam Espinosa-Dulanto

Poster Session A
Friday, February 13, 2026
10:30 AM – 12:00 PM
Location: Pelican

A1: The Sustainability and Future of Bio-Engineering
The purpose is to discuss the problems and reality of biological and medical devices and systems. I intend to advocate for integration between technology and the human body as well as how biomedical devices are sustainable in the long term.
Presenter: Luis Morales Lopez

A2: Problem-Based Learning in Environmental Education: A Systematic Review and Implications for Practice
This poster shows findings from a systematic review of existing literature on the implementation of problem-based learning in environmental education (EE) and its impacts on achieving the goals of EE. Recommendations for improved practice and research are presented.
Presenter: Elizabeth Biney

A3: BTE Primus RS: Where Technology Meets Rehabilitation
This project uses the BTE Primus RS to collect measurable movement and strength data to identify muscle imbalances in repetitive-motion workers. By comparing pre- and post-screening results, the system can detect fatigue patterns and guide interventions that reduce injury risk and improve workplace safety.
Presenters: Dreida Villegas, Adrian Garcia, Laura Quintero Sanchez

A4: The impact of instructor feedback on college students' learning engagement
This six-week action research in Korea examined how feedback frequency and promptness affected university students' learning. Three student groups received feedback under varying conditions. Results showed delayed feedback improved learning outcomes, while frequent feedback enhanced engagement. Suggestions were offered to promote effective student use of feedback.
Presenters: Seokmin Kang, Hye-Sook Park

A5: Body Composition Analysis and Obesity Awareness in the Rio Grande Valley: An InBody Assessment
Using InBody Assessment, we will evaluate body composition to raise awareness on obesity by identifying individuals with elevated levels of body fat percentage and visceral fat levels. Using these metrics, we will aim to highlight obesity prevalence in the Rio Grande Valley and educate the community on healthy lifestyle practices.
Presenters: Ava Isabella Castillo, Ethan Aguirre, Fernando Mora

A6: Kinematic and Kinetic Differences in Vertical Jump Performance Between Athletes and Non-Athletes: A Motion Analysis Approach to STEM and Clinical Education

This project uses the Qualisys Motion Capture System to compare vertical jump mechanics between collegiate athletes and non-athletes. By analyzing joint kinematics, coordination, and force production, the study integrates biomechanics and STEM learning, enhancing understanding of human movement while bridging research, education, and clinical applications in performance and rehabilitation.
Presenters: Matthew Rivera, Cristian Rodriguez, Miranda Flores

A7: EMG-Based Wireless Systems for STEM Learning and Performance Analysis
The explorations of EMG-based wireless biofeedback systems can tie the similarities with health and STEM sciences, by providing hands-on learning in biomechanics, physiology, and data analysis. Using this system, participants can learn how to collect, interpret, and apply muscle activation data to enhance health tracking and performance optimization.
Presenters: Justin Garcia, Alberto Cantú, Allan Benavides

A8: Development of Tribological UHMWPE Composite Coatings at UTRGV as Methods of Fostering STEM Education
The study of UHMWPE/Al2O3 nanocomposite coatings for improved tribological performance at UTRGV allows for a dynamic research environment that focuses on understanding the wear mechanics of composite coatings. It was found that coating performance is influenced by not only coating composition, but also by its dispersion and uniformity.
Presenters: Yazmin Guadalupe Cortes, Javier A. Ortega

A9: Exploration and Approaches to Promote Mathematic Interest Among Female High School Students
Upon engaging in literature analysis to identify educational gaps, we recognized an existing disparity that demonstrated female students in high school consistently performed lower than their male counterparts. In response to this, our research engaged in a meta-synthesis to identify effective educational approaches in mathematics to close this gap.
Presenters: Alejandra Ramos Arevalo, Miriam Ortiz, Itzayani Santiago

A10: Hybrid Nanocomposite Surface Engineering for Laser Side-Scatter Reduction in Aerospace and STEM Education
This project develops hybrid nanocomposite coatings combined with laser surface texturing to reduce laser side-scatter in Particle Image Velocimetry (PIV). By improving optical absorption and minimizing reflections, the work enhances measurement accuracy in aerospace experiments while providing STEM students hands-on training in advanced materials, optics, and experimental techniques.
Presenters: Marcelo Navarro Lozano, Javier Ortega, Elias Ramos

A11: Intelligent Technologies in College Mathematics: A Mixed-Methods Study of Student Perceptions at a Hispanic-Serving Institution
This study examines how intelligent technologies shape students' learning experiences in HSI college mathematics, focusing on a bilingual College Algebra course. Using explanatory sequential mixed-methods, we

measure TAM constructs—perceived usefulness, ease of use, perceived performance—and explore cultural/linguistic responsiveness, generating insights for adoption/practice in mathematics teaching.
Presenters: Jose Ponce, Lida Uribe-Florez

A12: Digital Access and Science Achievement: Examining Inequities in High School Student Performance
This study analyzes disparities in high school science achievement linked to home computer and Internet access using NAEP data and prior research. It examines how technology access affects performance, identifies interventions to reduce achievement gaps, and informs policies promoting equitable digital learning opportunities, especially in high-poverty and rural schools.
Presenters: Maria Luisa Vite, Naomi Pinera, Lauren Sanchez

A13: Exploring Effective Ways Mathematics Learning For English Language Learners with Disabilities
Upon engaging in data analysis to identify educational gaps, we found an existing disparity that showed students who are English language learners and had disabilities had a lower mathematics achievement compared to those students who were not. In response to this, our research engaged a metasynthesis approach to identify effective approaches.
Presenters: Carmen N. Resendez, Yuliana Maidaly Cardoza Rodriguez, Rosio Martinez, Miriam Ortiz

A14: STEM for All: A Model for Designing Authentic and Culturally Relevant Tasks
This research proposes an innovative design model that merges verifiable authenticity criteria with culturally relevant perspectives, materializing into a practical framework that synthesizes fundamental theoretical models to offer an applicable guide for transforming curriculum design. The result is organically integrated STEM learning experiences, where transdisciplinarity transcends theoretical discourse.
Presenters: Jose Antonio Juarez Lopez, Ivonne Alejandra Toledo Nieto

A15: The Use of AI In Psychotherapy: A Philosophical Approach
We will examine the current use of AI in cognitive behavioral therapy and wager if AI can be treated as a linguistic agent. We will also explore the technological possibilities of AI in the future.
Presenters: Gabriel F. Ruiz, Nadia Mazloum, Brenda Santiago

A16: Designing a wheel that will withstand the lunar environment
NASA's Rock and Roll Challenge invites innovative designs for a next-generation lunar wheel capable of withstanding the Moon's extreme conditions. A classmate and I responded to this challenge and, through our research, developed a concept that meets NASA's performance and environmental requirements.
Presenter: Jesus Rico

A17: The Struggle Is Real! Turning Challenge into Confidence in Adult Learning
Explore how guided struggle transforms learning from frustration into confidence. This practitioner-focused session shares practical strategies for fostering curiosity, inquiry, and resilience in adult STEM learners. Participants will reflect on their teaching experiences and discover how to balance challenges and support to create engaging, growth-centered learning environments.
Presenter: Kiersten S. Vallier

A18: Advancing 3D Heterogeneous Integration for Reliable Vertical Chip Stacking and STEM Innovation
This project focuses on developing reliable methods for 3D Heterogeneous Integration (3DHI) by optimizing vertical chip stacking and interconnect design to minimize thermal and mechanical stress. It promotes hands-on STEM education through multidisciplinary research in materials, microelectronics, and reliability engineering, preparing students for careers in advanced semiconductor technologies.
Presenters: Damian Luna, Javier Ortega

A19: The Integrated Math and Computer Science (IMaCS) Project as a 6th Grade Teacher Professional Development Framework
The Integrated Math and Computer Science Project (IMaCS) is a 6th teacher professional development model that was implemented in the Jackson Public School Middle School Network (Jackson, MS). The IMaCS team will share the model, key findings from the project evaluation, and next steps in developing a research practice partnership.
Presenters: Deidre L. Wheaton, Jacqueline Jackson, Loretta Moore, Jane Talley, Carmen Wright, Dakota Price

A20: Detection of bacterial pathogen, Escherichia coli, in the American oysters collected from contaminated and non-contaminated coastal waters in Brownsville.
To determine whether oysters are infected with bacterial pathogens, we collected American oysters from San Martin Lake and South Padre Island. Oysters were dissected for their gills and digestive glands for histology and immunohistochemistry. Immunohistochemical analysis was conducted to detect E. coli in oyster tissues, resulting in concerning high amounts.
Presenters: Juliana Zarate, Valeria Rodriguez

A21: The Use of Supplemental Material with English Language Learners in Science, Technology, Engineering and Math
This session investigates the impact of supplemental materials (visual aids, bilingual vocabulary) on the academic performance of 12th-grade English Language Learners (ELLs) in STEM courses. Grounded in data showing the ELL achievement gap, the research highlights how scaffolding literacy and content-based language learning can support academic growth and disciplinary discourse.
Presenter: Victor Adrian Pesina Avalos

A22: Exploring the Link Between Reading Motivation and Comprehension in Spanish-English Bilingual College Students Through Eye-Tracking Technology
This study explores how reading motivation affects comprehension in Spanish-English bilingual college students using eye-tracking technology. By analyzing eye movements, it aims to reveal how motivation influences bilingual reading and support strategies to improve academic success for Latino students.
Presenters: Jazlynn Richie, Yu-Cheng Lin

A24: Bridging STEM and Counseling to Elevate Hispanic Girls' Financial Futures
This session explore how inclusive STEM education and school counseling can uplift Hispanic female students. The presentation shares grassroots strategies and practical tools to help educators foster financial empowerment, career readiness, and equity—starting in the classroom and extending into lifelong opportunities.
Presenters: Yih-Jiun Shen, Liang Zeng

A25: Sertraline, A Selective Serotonin Reuptake Inhibitor, Disrupts Tissue Structure, Induces Nitrative Stress and Proteasome Protein Expression in Goldfish

This study examined sertraline's effects on goldfish exposed to low and high doses for two weeks. Histopathological analysis revealed significant gill and kidney damage, including tissue disarray, altered gill morphology, and increased mucus production. Immunohistochemical results showed significant changes in 26S proteasome expression, indicating that sertraline exposure impairs goldfish tissue morphology and potentially disrupts physiological functions.
Presenter: Md. Didaruzzaman Sohel

Authentic STEM Research Experiences for High School and Undergraduate Students
Poster Session B
1:30 PM -3:00 PM
Location: Pelican

B1: ***Simulated Impact of Kerosene-Based VOCs Emitted by SpaceX on Plant and Soil Health***

The purpose of this project is to investigate how Volatile Organic Compounds (VOCs) released by the SpaceX activity in Boca Chica affect the environment of the Rio Grande Valley (RGV). Specifically, this study aims to evaluate the impact of VOCs on soil and plant health by comparing samples from affected and unaffected areas.

Presenters: Emily Alcocer, Dahana Yoen Pina Hernandez, Estefani Arriaga, Emily Faith Garcia

B2: ***Investigating the effects of different water sources in the Rio Grande Valley***

The purpose of our project is to investigate Rio Grande Valley (RGV) water quality from different sources (canal, river, tap, distilled). We initially tested the water for pH, Chlorine, Copper, Iron, and hardness. Next, we cultured yeast cells and treated them with the different water samples. This allows us to examine the effects of different RGV water sources on the health of yeast, a model eukaryotic organism that shares fundamental biological processes with other organisms, including humans.

Presenters: Gabriella Recinos, Yaretzi Valenzuela, Arleny Avilez

B3: Alteration and Design of an Eco-friendly Sparkler Prototype

The key goal and focus of this research project is to design and develop an environmentally-friendly sparkler prototype that releases prominently less particulate matter (PM) in the surrounding atmosphere, is composed of more biodegradable materials and components than other commercial sparklers, and all the while maintaining a similar product cost to other commercial sparklers.

Presenters: Sebastian Amilcar Rodriguez, Leonardo Gael Garcia, Ivan Gomez

B4: Investigating the Effects of Water-Dwelling Microorganisms on Yeast Cells

The goal of this project was to investigate the effect that potentially harmful microorganisms can have on yeast cells, which is a eukaryotic organism. By investigating the effect the microorganisms have on the yeast cells, we can make a connection to how they might affect humans.

Presenters: Elisa Martinez, Paola Sanchez, Mia Solis, Hennessy Rodriguez Perez

B5: ***Effects of Electromagnetic Radiation on Baker's Yeast Growth and Survival***

Electromagnetic radiation can be harmful, beneficial, or harmless to living organisms. While lower levels of electromagnetic radiation don't affect the DNA in cells negatively, higher-energy light, like ultraviolet rays, can damage DNA and cause the cells to stop working or die. Over time, this damage in the DNA builds up, increasing

the risk of skin cancer. However, not all eukaryotic organisms have the same reaction to electromagnetic radiation. It has been seen that in yeast cells, such as Saccharomyces *cerevisiae*, lower-energy light could help them grow. Unlike animal cells, yeast cells can also endure UV exposure for longer periods. Our aim in this experiment is to see how the yeast cells react to environmental stressors, in this case EMR exposure, to better understand how solar exposure could affect a human's quality of life using yeast as a model organism.

Presenters: Miranda Salas-Hilario, Nylin Alonzo, Amy Dominguez

B6: Retrospective Analysis of Factors Affecting Health Outcomes and Socioeconomic Barriers in the Rio Grande Valley

The RGV is broadly observed as providing poor quality of life and a lack of socioeconomic opportunities for its communities. This research uses data from county reports for Cameron, Hidalgo, Starr, and Willacy to analyze how diverse factors influence poor health outcomes for residents.

Presenters: Ashlee Vu, Shizue Mito

B7: Investigating the Interaction of SAP-102 N-Terminal Domain with the Metal Ion Lead (Pb2+)

This study investigates SAP-102N-terminal domain, its potential to bind lead (Pb2+), and how interactions may disrupt early neurodevelopment. Utilizing protein expression, structural modeling, fluorescence titration, and NMR spectroscopy, I aim to identify the interaction between Pb2+ and SAP-102N-terminal domain, characterizing any potential structural changes that may contribute to lead neurotoxicity.

Presenters: Kaitlynn Fajr Lamghari, Yonghong Zhang

B8: Investigating the Ability of the DYRK1B kinase to promote FOXO1 nuclear Localization in Glioblastoma and Basal Breast Cancer Cells.

By examining the localization of FOXO1-GFP with and without DYRK1B inhibitors using microscopy, recorded data will determine whether DYRK1B drives FOXO1 into the nucleus in glioblastoma and basal breast cancer cells. To test this, cancer cells were transfected with FOXO1-GFP plasmid and were treated with DYRK1B inhibitor (AZ191).

Presenters: Kai Ranae Saenz, Megan Keniry

B9: Anti-glioblastoma activity in 6-amino-5,8-quinolinediones

We synthesized derivatives of the molecule quinoline-5,8-diones containing amine side groups, and then, we tested the cytotoxic effects of these compounds on glioblastoma cells.

Presenters: Alonzo Cabrera Jr., Shizue Mito

B10: The Response of Accelerometer Placement On Freight Railcar Bearings

Presenters: Joseph Mojica, Constantine Tarawneh

B11: FEA Analysis For a Collar to Push Out Stuck Bearings From a 4BT Axle

Presenters: Oscar Valdez, Constantine Tarawneh

B12: CFD analysis on blower duct design/geometry

Presenters: Erick Gomez, Constantine Tarawneh

B13: Sara Black

B14: Kevin Kelly, Urbain Tchoa

B15: Nirakar Sahoo

B16: Frank Dirrgl

B17: Carlos Pena

B18: Lucia Carreon

B19: Jorge Trujillo

CREST MECIS POSTER PRESENTATIONS
Poster Session C
3:30 PM -5:00 PM
Location: Pelican

C1: Learning Adaptive Control Barrier Functions for Safer V2X-Based Autonomous Driving
This poster presents a collaborative autonomous driving framework combining V2Xverse simulation, multi-agent reinforcement learning, and adaptive Control Barrier Functions (CBFs). Vehicles share perception to overcome occlusions and limited sensor range, while an RL trained state-dependent barrier coefficient γ ensures dynamic, context aware safety.
Presenters: Fabian Alexis Hernandez, Carlos Pena Caballero, Qi Lu

C2: Vulnerability Analysis of the US Rail Infrastructure using Network Analysis
An approach on analyzing the resilience of the US rail network against extreme temperature using graph theory.
Presenters: Gabby Gutierrez, Gasser Galal Ali, Constantine Tarawneh

C3: Material Validation and Testing of 3D-Printed Polymer and Short-Fiber Composites for use in Generative Drone Design
The goal of this poster is to optimize the parameters of polymer materials for use in drones for use in heavy load lifting drones while maintaining a lightweight structure that does not fail under the desired load. The main purpose is to obtain parameters for material validation in generative design.
Presenters: Darren Espinoza, Constantine Tarawneh, Farid Ahmed

C4: Auction Consensus Algorithm for Decentralized Multi-Robot Task Allocation
This work presents advancements in decentralized multi-robot task allocation (MRTA) with the development of the Auction Consensus Algorithm with Loss Mechanism (ACALM) and extending toward more general multi-task assignment settings and learning-augmented bidding strategies. The goal is to preserve the robustness and distributed structure of auction-consensus algorithms while improving performance.
Presenters: Jose Rodriguez, Wenjie Dong, Qi Lu, Sven Koenig, Pascal Van Hentenryck

C5: Designing a Collective Memory to Improve Swarm Robotic Efficiency
This project enhances multi-robot search by replacing random exploration with a shared, data-driven strategy. Robots collectively map their environment, target underexplored areas, and search systematically. This reduces redundant effort and improves overall efficiency, demonstrating substantially faster performance than traditional, memoryless swarm algorithms.
Presenters: Arturo Gonzalez, Qi Lu

C6: Autonomous Train Maintenance: Machine Learning Model for Bearing Mileage Prediction
The University Transportation Center for Railway Safety (UTCRS) has conducted extensive experiments and developed onboard sensors to record vibration, speed, load, and mileage data from railcar bearings. This project uses this data to train a machine learning (ML) model that forecasts remaining bearing life and enhances rail industry safety.
Presenters: Elian Alexis Cantu, Diego Cantu, Jinghao Yang, Heinrich Foltz, Constantine Tarawneh

C7: Boron Nitride - Silver Nanocomposites for Enhanced Gas Sensing Applications
This study focuses on the development of boron nitride-based composites designed to sense carbon monoxide using the conductivity change of the composite when exposed to CO and CO2 gas.
Presenters: Casandra Sauceda, Andrea Pelayo Carvajal, Armando Villarreal, Tianna Resendez, Mkhitar Hobosyan, Constantine Tarawneh, Nicholas Dimakis

C8: Optimization of a Drone-Based Crack Detection Sensor for Field Data Acquisition and Environmental Stability
This project focuses on optimizing a near-infrared (NIR) crack detection sensor for drone-based structural inspections. It aims to ensure stable and accurate data collection in outdoor environments by testing and improving sensor performance under real-world conditions such as vibration, sunlight interference, and flight instability.
Presenters: Anahi Hernandez, Amanda Rodriguez

C9: Empowering STEM Education through AI-Driven Multi-UAV Systems
This poster presents an AI-driven multi-UAV collaboration framework designed for autonomous inspection and STEM learning. Using simulation, vision-based detection, and path-planning algorithms, the project demonstrates how drone technology can inspire problem-solving and computational thinking while advancing research in robotics, artificial intelligence, and STEM education for all students.

Presenters: Javier Becerril, Diego Gutierrez