

# 6TH STEM ED ANNUAL CONFERENCE

SCIENCE  
TECHNOLOGY  
ENGINEERING  
MATHEMATICS



## Building interdisciplinary collaborations in STEM Education: Towards transformative practices



# 6<sup>th</sup> Annual STEM Education Conference

February 15 – 17, 2023

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## **Board members**

Angela Chapman, University of Texas Rio Grande Valley

Jennifer Adams, University of Calgary

Bindhu Alappat, St. Catherine's University

Daryl Chubin

Alejandro Gallard, Georgia Southern University

Patricia Alvarez McHatton, Branch Alliance for Educator Diversity

Volker Quetschke, University of Texas Rio Grande Valley

Lizette Ramos de Robles, University of Guadalajara

Bhaskar Upadhyay, University of Minnesota

Christopher Wright, Drexel University

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## Schedule at-a-glance

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Day	Time	Item
Feb 15	6:00 PM – 9:00 PM	Preconference social Live music provided by Vanguard Academy students: Miguel Hernandez, Vanesa Calvillo, Viviana Calvillo, Carlos Mena, Ricky Hernandez
Feb 16	7:30 AM – 6:00 PM	On-site registration and check-in
	9:00 AM – 10:30 AM	Concurrent Session A
	10:45 AM – 11:45 AM	Concurrent Session B
	11:45 AM – 1:15 PM	Luncheon (provided)
	1:15 PM – 2:45 PM	Concurrent Session C
	3:00 PM – 4:30 PM	Concurrent Session D
Feb 17	7:30 AM – 3:00 PM	On-site registration and check-in
	9:00 AM – 10:30 AM	Concurrent Session E
	10:45 AM – 12:15 PM	Concurrent Session F
	12:15 PM – 1:30 PM	Lunch (on your own)
	1:30 PM – 3:00 PM	Concurrent Session G

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## Welcome!

Dear STEM Education Conference Attendee:

The College of Education and P-16 Integration and the University of Texas Rio Grande Valley welcome you to the 2023 STEM Education Conference, *Building Interdisciplinary Collaborations in STEM Education: Toward Transformative Practices*. We will continue to provide an intentional space that brings everyone involved in P-20 STEM education together. This includes higher education faculty, P-12 educators and administrators, informal educators, and P-12 students. We will continue transforming STEM education through critical dialogue, dissemination, and implementation of best practices, research, and policy.

A fundamental goal of this conference is to ensure that all STEM educators are prepared to successfully implement best practices in STEM education, from preschool to college. This conference is for those who have a willingness to have discussions around difficult conversations about what is transpiring in STEM classrooms and how to unpack how our presence, actions, and inactions contribute to the sociocultural landscape and influence those around us.

Through this conference experience, you will join a growing movement of local, national, and international group of STEM education scholars, innovators, and challengers that are committed and ready to enact equitable practices. You will leave this conference inspired and armed with the latest research, knowledge, and best practices to transform STEM education.

The STEM Education Advisory Board

**Wednesday, February 15, 2023**

**Pre-Conference**

Preconference Social Location: Bar Louie Beach Bar Time: 6:00 – 9:00 PM	Join us for appetizers while listening to live music by Vanguard Academy students Miguel Hernandez, Vanesa Calvillo, Viviana Calvillo, and Carlos Mena as well as Ricky Hernandez, Former Vanguard Academy student.
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**Thursday, February 16, 2023**

**Day 1**

**Concurrent Sessions A-D**

**Concurrent Session A.1**

<b>Time/Location/Format</b>	<b>Session Information</b>
9:00 – 10:30 AM Location: Spoonbill Format: Deeper Dive	<i>Teaching Calculus 1 via Specifications Grading: a Growth-Mindset Approach</i> We report on our current efforts in implementing specifications grading in Calculus I courses, including our recommendations for future implementations. Additionally, we describe the results of these efforts regarding students' perceptions of specifications grading and how it supports students in developing a growth mindset and more robust mathematics identity. Luis Fernandez, Kaitlyn Serbin, Guillermo Garza, Cristina Villalobos, Shaghayegh Setayesh

<b>Concurrent Session A.2</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
9:00 – 10:30 AM Location: Ibis Format: Interactive Workshop	<p><i>Expanding HERizons: The Quest to Develop more BIPOC women leaders in science at St. Catherine University</i></p> <p>Saint Catherine University is one of only eight women's colleges that are designated as minority-serving Institutions. We are dedicated to launching a diverse pipeline of women into influential scientific careers. Our goal is to meet the growing demand -locally and nationally- for female experts in STEM subjects. The sciences are an essential component of a St. Catherine education since giving women access to a scientific education is important for the future of our world. Expanding HERizons directly addresses the ongoing lack of support for BIPOC women leaders in science by providing access to all the tools necessary to succeed beyond St. Kate's.</p> <p>Bindhu Alappat, Maison Blanton</p>
<b>Concurrent Session A.3</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
9:00 – 9:30 AM Location: Egret Format: Paper Presentation	<p><i>Social-Emotional Learning, State Policy, and STEM Education: Examining Equity, Investigating Implementation</i></p> <p>This study addresses how state education policy embraces or negates equity. Enlisting document analyses and interviews, this project analyzes states' social-emotional learning policy for equity, determines the alignment of state policy to district level policy, and discerns the degree of integration of state level SEL policy into STEM curriculums.</p> <p>Ashley Griffin-Gilchrist, Anthony E Muhammad</p>
9:30 – 10:00 AM Location: Egret Format: Paper Presentation	<p><i>Emotional nature of science engagement: Indigenous perspectives from one Indigenous group in Nepal</i></p> <p>In this paper, we present how Indigenous science teachers and students experience emotions of struggles and opportunities aroused by school science teaching and learning. Using the constructivist research paradigm, we explore emotions as political, social justice, and equity space through stories that science teaching and learning produce.</p> <p>Bhaskar Upadhyay, Baliram Tharu</p>



<p>10:00 – 10:30 AM Location: Egret Format: Paper Presentation</p>	<p><i>The Intersectional Experiences of Black Immigrant Women Undergraduate STEM Students: A Phenomenological Study</i></p> <p>The experiences of 3 Black immigrant females in the fields of Science, Technology, Engineering, and Mathematics (STEM) are explored to investigate the unique process of identity construction for African immigrants, the intersectionality of their experiences, and the factors necessary to meet the needs of all Black students in STEM programs.</p> <p>David Sparks</p>
<b>Concurrent Session A.4</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
<p>9:00 – 9:30 AM Location: Heron Format: Paper Presentation</p>	<p><i>Assessing Preservice Teachers' Understanding of Disease and its Spread using Scientific Illustrations and Virtual Labs</i></p> <p>Creating awareness of the disease and its spread using scientific illustrations and virtual labs can be one of the most effective ways of providing knowledge and skills to preservice teachers.</p> <p>Mamta Singh, Tiya Davi</p>
<p>9:30 – 10:00 AM Location: Heron Format: Paper Presentation</p>	<p><i>Teacher's perceptions and opinions of Mixed-Reality Simulation as a professional development tool</i></p> <p>Mixed-Reality Simulation (MRS) has been an emerging technology used by teachers' preparation programs as a tool to better prepare pre-service teachers. This study focusses on the use of MRS, now from the perspective of in-service Teachers, as a tool to provide effective, emerging, technological professional development to enhance their skills.</p> <p>Jair Aguilar, Chandler Kang, Mariann Villarreal</p>
<p>10:00 – 10:30 AM Location: Heron Format: Paper Presentation</p>	<p><i>Students' Misconceptions about the Electrical Field</i></p> <p>This qualitative phenomenology investigates 18 Iranian students' understanding of the concept of electric field and particularly uniform electric field after an intervention. Data were collected via interviews, class discussions, and homework. The procedure of intervention as well as students' misconceptions would be discussed in the presentation.</p> <p>Fargol Seifollahi, Maryam Saberi, Noushin Nouri</p>

<b>Concurrent Session A.5</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
9:00 – 9:30 AM Location: Sandpiper & Seagull Format: Deeper Dive	<p><i>Decolonizing Research Session - Welcome Words</i></p> <p>Alma Rodríguez, Dean College of Education and P-16 Integration; Angela Chapman, Director Engaged Scholarship &amp; Learning; James Jupp Chair Department of Teaching &amp; Learning, Laura Jewett, C&amp;I Doctoral Program Coordinator; Raul Olmo Fregoso Bailon, Assistant Professor Teaching and Learning</p>
9:30 – 10:00 AM Location: Sandpiper & Seagull Format: Deeper Dive	<p><i>Epistemologies of Belonging</i></p> <p>In this presentation I will connect the notion of epistemologies of belonging with the idea of critical community building through creating community commitments. How is it that people know when they belong and to what they belong? This question, about the epistemology of belonging, carries a particular complexity for mixed-race individuals. How is it that individuals create a sense of identification with others? What are the unities and disjuncture's? Through qualitative work based on my work with students and communities I will address these questions in my presentation illustrating how belonging in human relations is connected to identity, both self-identification and identification with others.</p> <p>Silvia Bettez</p>
10:00 – 10:30 AM Location: Sandpiper & Seagull Format: Paper Presentation	<p><i>Epistemologies from Indigenous O'dam Normalistas teachers.</i></p> <p>In this paper, I present how Indigenous teachers from Durango Mexico are providers of new educational foundations from their daily experiences, challenges and hopes. Using the narrative inquiry perspective and techniques I show how the data-narratives I collected from the students-teachers represent those ideas and concepts missing in the decolonial turn in education.</p> <p>Rolando Cruz Garcia</p>

<b>Concurrent Session A.6</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
9:00 – 10:30 AM Location: Pelican Format: Deeper Dive	<p><i>Developing Equity Oriented Practices in Secondary STEM Education</i></p> <p>Join us as we explore critical reflection as a way to advance equity-oriented practice for STEM classrooms. Critical reflection centered on identity and local food will help us to explore, reflect, connect, and raise awareness about daily experiences as well as values, assumptions, and beliefs that impact STEM learning environments. Participants will have opportunities to enhance their equity literacy, engage in applied experience (traditional food and cultural heritage), as well as to examine the dissonance between traditions, modernity, and opportunities to change and connect development and heritage in the STEM classroom.</p> <p>Miryam Espinosa-Dulanto, Vejoya Viren, Johanna Lynn Esparza</p>

<b>Concurrent Session B.1</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 – 11:45 AM Location: Spoonbill Format: Interactive Workshop	<p><i>Fact Checking with Checkology</i></p> <p>Today's students are facing the most daunting task of any generation in distinguishing credible and accurate information. Educators play an important role in facilitating students' right to become news literate.</p> <p>Juan G. Alvarado</p>
<b>Concurrent Session B.2</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 – 11:15 AM Location: Ibis Format: Interactive Workshop	<p><i>Developing equitable disciplinary STEM biliteracies approaches in bilingual and dual language education setting</i></p> <p>Through this interactive workshop, participants will learn about the results of a concurrent mixed methods study that included inquiry-based instructional strategies under the framework of Disciplinary Biliteracies in STEM Development Model. This workshop will highlight exemplary projects, and share teachers' experiences in their implementation, including hands-on activities and praxis.</p> <p>Marialuisa Di Stefano</p>

11:15 – 11:45 AM Location: Ibis Format: Paper Presentation	<i>Caring differently for STEM education: Re-designing for equity and creativity</i>  This presentation engages researchers and practitioners in STEM education to examine hidden assumptions within existing STEM practices and how they might exclude alternate ways of knowing, being and valuing in science learning contexts. We present a tool that could help re-center equitable practices and present some preliminary findings.  Sophia Marlow, Sarah El Halwany, Jennifer Adams
<b>Concurrent Session B.3</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 – 11:45 AM Location: Egret Format: Interactive Workshop	<i>Practitioner Session - Teaching and learning through STEM activities and student organizations</i>  This practical presentation enables teachers to explore new ideas and learn how to integrate STEM teaching and learning in a pandemic and post-pandemic period. STEM is a great tool that allows educators to create and establish a sustaining Community that empowers students to build their own intrinsic motivation to become transformative change agents. Learn how Vanguard Academy has incorporated Space Exploration (NASA, NWEESP, SpaceCRAFT Exploration Challenge), FIRST Robotics, and assembly of electric vehicles for Greenpower USA F24 race competitions, making these STEM opportunities relevant, intentional, and engaging while incorporating safety practices to improve the lives of students as well as promote improvements in the community and beyond.  Belinda Guzman, Oscar Flores, Gerardo Flores, Roy Villaneuva
<b>Concurrent Session B.4</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 – 11:15 AM Location: Heron	<i>Investigating the Role of Context in Student's Answers to Kinematic Questions.</i>  The project is a qualitative research study reporting students' misconceptions in kinematics.  Noushin Nouri, Mojgan Behzadipour, Mojtaba Jahanifar
11:15 – 11:45 AM Location: Heron Format: Paper Presentation	<i>Reflective Homework System Environment in Calculus Courses</i>  We introduce a formative assessment in the form of a reflective homework system that can be implemented across the mathematics curriculum. We then report on a survey that we administered in the traditional university undergraduate calculus sequence that we designed to measure student attitude and perception of this reflective assessment.  Wiktor Mogiliski

<b>Concurrent Session B.5</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 – 11:15 AM Location: Sandpiper & Seagull Format: Paper Presentation	<i>Part I. Graduate students sharing their work.</i> We will share findings from our dissertations to show the challenges and opportunities of relating decolonial perspectives in the Rio Grande Valley. Raul Garza, Miriam Ortiz
11:15 – 11:45 AM Location: Sandpiper & Seagull Format: Paper Presentation	<i>Epistemologies from Indigenous Wixaritari educators</i> This study addresses how testimonios from Indigenous Wixaritari educators from Mexico point out theoretical and practical contributions that can enrich the methods in decolonial research in education. Through the case of testimonios of Wixaritari teachers I will show the main factors that made those individual to take the teaching career and the theoretical implications of those stories. Lya Sañudo Guera

<b>Concurrent Session C.1</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
1:15 – 2:45 PM Location: Spoonbill & Ibis Format: Deeper Dive	<i>Career Reflections – Themes, Regrets, Unsolicited Advice</i> This presentation features organized reflections on a half-century career. It is offered as a case study with lessons for STEM students and early faculty, tracing a circuitous path from research to policy to advocacy across academic, federal, and nonprofit sectors. The subsequent Q&A will elaborate and clarify as the audience reflects on the arc of their own prospects and challenges. Daryl Chubin

<b>Concurrent Session C.3</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
1:15 – 2:45 PM Location: Egret Format: Interactive Workshop	<p><i>Reimagining teaching and learning in STEAM: Cultivating sustainable symbiotic relationships among faculty and students at an HSI</i></p> <p>We collectively explore and disrupt the barriers we face as faculty and students. We identify needs and curate ideas, strategies, resources, and approaches for what works. We endeavor to create spaces for empowerment, scholarly productivity grounded and sustained in wellness, and cultivate holistic symbiotic relationships among colleagues and our students.</p> <p>Karin Lewis, Miryam Espinosa-Dulanto, Vejoya Viren, David Martinez Prieto, Silvia Solis</p>
<b>Concurrent Session C.4</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
1:15 - 1:45 PM Location: Heron Format: Paper Presentation	<p><i>Promoting Understanding of Four Dimensions of Science learning (4D) Using Phenomenon-Based learning: Candle Experiment</i></p> <p>The aim of this paper is to introduce a complete procedure for teaching science based on a phenomenon. We would explain the connection between this method of teaching using this particular phenomenon and the 3 dimensions of NGSS plus nature of science.</p> <p>Maryam Saberi, Noushin Nouri, Mansour Vesali</p>
1:45 - 2:45 PM Location: Heron Format: Interactive Workshop	<p><i>The Power of Visual Aids in the Science Classroom</i></p> <p>This interactive workshop will present in-depth research and data that supports the need and the importance of anchor charts and visuals in a STEM classroom. Participants will be presented with ways to create and incorporate different visuals to improve comprehension and increase participation in a science classroom.</p> <p>Karime Flores</p>

<b>Concurrent Session C.5</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
<p>1:15 – 1:45 PM</p> <p>Location: Sandpiper &amp; Seagull</p> <p>Format: Research presentation</p>	<p><i>Part II. Graduate students sharing their work</i></p> <p>We will share findings from our dissertations to show the challenges and opportunities of relating decolonial perspectives in the Rio Grande Valley.</p> <p>Johana Esparza, Zulema Williams</p>
<p>1:45 – 2:15 PM</p> <p>Location: Sandpiper &amp; Seagull</p> <p>Format: Research/paper presentation</p>	<p><i>Epistemologies from Afro-Mexican Normalistas teachers from Oaxaca, México</i></p> <p>My work will show the importance of Afro-Mexican educators in the construction of knowledge in education. The stories of Afro-Mexican teachers from Oaxaca Mexico will illustrate the latent yet missing conceptual repertoire from that Afro-descendant intellectual tradition in a country that does not acknowledge its Afro-identity. I am including my own testimonio as Africa-Mexican teacher to address the internal colonialism in Mexico, but also to bring up the epistemologies new possibilities that can emerge from those silenced ways of knowing.</p> <p>Angustia Torres Diaz</p>
<p>2:15 – 2:45 PM</p> <p>Location: Sandpiper &amp; Seagull</p> <p>Format: Research presentation</p>	<p><i>Part III. Group of graduate students sharing their work</i></p> <p>We will share findings from our dissertations to show the challenges and opportunities of relating decolonial perspectives in the Rio Grande Valley.</p> <p>Luisa Valdez, Dalia Mendoza</p>

<b>Concurrent Session D.1</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
3:00 – 4:30 PM  Location: Spoonbill & Ibis  Format: Deeper Dive	<p><i>JSTEM+Arts: A model of Interdisciplinary Learning for High School Students</i></p> <p>We describe an innovative approach to promoting learning for high school students in STEM. <a href="#">Click here for more information.</a></p> <p>Megan Keniry, Javier Macossay-Torres, Elena, Venegas, Lilia Cabrera, Sophia Briseno, Sophia Gonzalez, Cathryn Guerrero, Elisa Martinez, Sam Medellin, Adan Nunez, Sofia Reyes, Hennessey Rodriguez, Jackie Ceballos, Jazmin Martinez, Leslie Celaya, Lexie Lucio, Aylin Rios, Kendra Chavez-Alaniz, Magdalena Alvarado, Marisol Saucedo, Violeta Galvan, Emily Solis, Krystal Garcia, Sophia Morrison, Ernesto Alvarez, Javier Gonzalez, Josiah Salinas, Juan Vasquez, Leonardo Munoz, Rodolfo Rodriguez, Skylar Rodriguez, Ruben Trevino, Alan Villegas, Daniel Palomo</p>
4:30 – 6:00 PM  Location: Osprey	<p><i>JSTEM Interviews - Closed Session</i></p>
<b>Concurrent Session D.3</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
3:00 – 4:30 PM  Location: Egret & Heron	<p><i>Poster Presentations</i></p> <p><a href="#">Click here for poster titles and descriptions</a></p> <p>Andrew Tsin, Laura Valdez, Ellen Lukasik, Genesis Shalom Rubio, Victoria Galvan, Javier A. Ortega, Jenna Scoggin, Christopher Kenneth Smith, Liang Zeng, Guang Zeng, Luis Fernandez, Parama Chaudhuri, Daniel Davila-Prince, Jarrod Perez</p>
6:00 – 8:00 PM  Location: Osprey	<p><i>Advisory Board Dinner and Working Meeting - Closed Session</i></p>
<b>Concurrent Session D.5</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
3:00 – 5:00 PM  Location: Sandpiper & Seagull  Format: Deeper Dive	<p><i>Highlighted Session: Decolonial Research Today</i></p> <p>Dr. Maldonado-Torres will discuss current debates on decolonial research, especially the connection between Latin American and African American perspectives in which Franz Fanon’s work is key to understand the decolonial studies to come.</p> <p>Nelson Maldonado-Torres</p>



## Day 2 Friday, February 17, 2023

### Concurrent Sessions E-G

#### Concurrent Session E.1

Time/Location/Format	Session Information
9:00 – 10:30 AM Location: Spoonbill Format: Deeper Dive	<p><i>Teaching Engineering Students to Self-Transform: Parallelisms between Product Innovation and Student Career Path Planning.</i></p> <p>The freshman year is critical for the success of engineering students. This session proposes an approach to teach students how to self-transform by analogy, identifying the similarities between the engineering design and innovation of a technical product and the definition of a student's career pathway.</p> <p>Noe Vargas Hernandez, Arturo Fuentes, Javier Ortega, Karen Lozano, Eleazar Marquez</p>

#### Concurrent Session E.2

Time/Location/Format	Session Information
9:00 – 9:30 AM Location: Ibis Format: Paper Presentation	<p><i>The Effects of School Re-Districting and Underfunding on STEM in low-income Communities</i></p> <p>We aim to review the effects redistricting and the underfunding of STEM programs has on students of color and those living within low-income communities.</p> <p>Cassia Guajardo, Johnny Salinas</p>
9:30 – 10:30 AM Location: Ibis Format: Interactive Workshop	<p><i>Mitosis Mystery!</i></p> <p>Join us to discover clues to solve our Mitosis Mystery! This is an introductory lesson taught in an inquiry-based fashion to help students learn and understand the phases and the result of mitosis with and without errors.</p> <p>Lluvia Garcia, Damaris Alanis</p>

<b>Concurrent Session E.3</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
9:00 – 10:00 AM Location: Egret	<p><i>Empowering a Thriving Generation, of Student Change-Makers through Data, Technology, and Student Innovation</i></p> <p>Join EcoRise educators in a hands-on session to learn how to leverage your school building, data collection tools, technology, and community support to position students as change makers on their campus and in their community to address the sustainability and climate challenges most relevant to their lived experience.</p> <p>Elizabeth Harper (Stephens), Isabel Anaya</p>
10:00 – 10:30 AM Location: Egret Format: Paper Presentation	<p><i>Flipped Virtual Classrooms for Promoting Active Learning: Using EDFR 6302 As an Example</i></p> <p>The paper aims to discuss and report the rationales and results of a flipped classroom pedagogy implemented in an accelerated online program course. Findings and implications will be further discussed.</p> <p>Pierre Lu, Chandler Kang</p>
<b>Concurrent Session E.4</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
9:00 – 9:30 AM Location: Heron Format: Paper Presentation	<p><i>Outcomes of Teaching a Live Demonstration in a Virtual Setting</i></p> <p>To measure the effectiveness of instruction, students were given an assignment. The teachers reflected on their lesson at the end of the school day and discussed methods of improvement. Roughly 75% of the students were able to properly utilize the demonstration and were able to master the concept taught.</p> <p>Muhammad Bhatti</p>
9:30 – 10:30 AM Location: Heron Format: Interactive Workshop	<p><i>The Next Step</i></p> <p>Participants will learn about an innovative STEM experience where high school and Special Education 18+ students can learn job skills by participating in STEM activities. Participants will engage in activities and learn the connection between STEM and real-world job skills.</p> <p>Melinda Wright</p>

<b>Concurrent Session E.5</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
9:00 – 10:30 AM Location: Pelican Format: Deeper Dive	<i>UTeach: Preparing the Next Generation of Secondary STEM Teachers for Diverse Classrooms</i>  David Sparks, Brianna Lozano, Bhaskar Upadhyay, Yailen Gomez, Cuc Vu, Shannon Redbrook
<b>Concurrent Session E.6</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:00 – 10:30 AM Location: Osprey	<i>JSTEM Interviews – Closed Session</i>  Lluvia Garcia, Isabel Amaro, Mario Almanza, Yailen Gomez

<b>Concurrent Session F.1</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 AM – 12:15 PM Location: Spoonbill Format: Interactive Workshop	<i>May the odds be in your favor! Digital class games for learning and assessment.</i>  In this session we will discuss the benefits of using digital games for formative and summative assessment. Participants will learn how to use Kahoot!, Blooket, Quizizz, Plickers, and Secretive.  Pamela Groves
<b>Concurrent Session F.2</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 AM – 12:15 PM Location: Ibis Format: Interactive Workshop	<i>Addressing Socioeconomic Status, Students of Color, and Academic Achievement in Undergraduate STEM Education</i>  This session aims to engage the participants in a critical discussion to identify mitigation measures that higher education institutions can institute in the classroom to combat the high DFW rates among First-Time, First Year students of color.  Wardell Powell, Milt Huling, Angela Chapman

<b>Concurrent Session F.3</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 AM – 12:15 PM  Location: Egret	<i>CREST</i>
<b>Concurrent Session F.4</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 – 11:15 AM  Location: Heron  Format: Paper Presentation	<i>Preservice Teachers: Assessing Climate Change Knowledge &amp; Awareness</i>  The purpose of this study is to evaluate preservice teachers' knowledge of climate change, its effects, and mitigative actions. Because climate change is an essential socio-scientific topic, it is imperative that preservice teachers are knowledgeable about and willing to implement climate change lessons in their future classrooms.  Mamta Singh, Itzanami Madrid
11:15 – 11:45 AM  Location: Heron  Format: Paper Presentation	<i>Teachers Conceptions of Place-Based Education: Place as object or context of investigation</i>  This study describes the outcome of a program for secondary teachers interested in applying principles and practices of place-based education in their teaching. Interviews and classroom observations found that teachers think about PBE as the context for teaching or the object of investigation.  Regina Toolin
11:45 AM – 12:15 PM  Location: Heron  Format: Paper Presentation	<i>Sociocultural Factors that Influence Latinas' STEM Trajectory</i>  Latina students pursuing a STEM degree at UTRGV were interviewed about their STEM experiences, yielding 100+ pages of transcripts. Grounded by iterative and inductive qualitative data analysis, participant narratives describe the overarching themes present in their experiences. In turn, this work reimagines how to construct inclusive STEM identity models.  Kristen Hallas

<b>Concurrent Session F.5</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
10:45 - 11:15 AM  Location: Pelican  Format: Paper Presentation	<p><i>Contextualizing Science Education in Non-communicable Diseases</i></p> <p>Non-communicable diseases present a critical socio-scientific issue. Interventions empowering students to engage in science-based health-promoting behaviors can strengthen students' science literacy and mitigate the prevalence of non-communicable diseases. We discuss the design and implementation of a non-communicable disease-contextualized science education approach, along with reflections and implications for practice.</p> <p>Keila Cervantes, Linda Palominos, Miriam Ortiz</p>
11:15 AM – 12:15 PM  Location: Pelican  Format: Interactive Workshop	<p><i>Young Innovators and Frugal Innovations in Emerging Markets</i></p> <p>The Young Innovators' and Frugal Innovation program involves the introduction of global needs issues and orientation to frugal innovations to teach young students (10 -20 years) frugal innovation with critical thinking, problem solving, research, writing, teamwork, and leadership skills — all valuable skills for college, career, and lifelong learning.</p> <p>Dr. Esi A. Elliot</p>

<b>Concurrent Session G.2</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
1:30 – 2:00 PM Location: Ibis Format: Paper Presentation	<p><i>Applying an Integrative Model to the Study of Academic Outcomes in Diverse Learners in STEM</i></p> <p>To understand factors underlying the disproportionate rates of student success in STEM fields by ethnicity and gender, it is necessary to consider multiple predictors and processes affecting learners' success. A data analytic approach that focuses on addressing the underrepresentation of socioeconomically and culturally diverse learners in STEM will be discussed.</p> <p>Amy Weimer, Nick Weimer</p>
2:00 – 3:00 PM Location: Ibis Format: Interactive Workshop	<p><i>Food Security: at the Intersection of Entrepreneurship, Engineering, and Agriculture</i></p> <p>This session is at the intersection of entrepreneurship, engineering, and agriculture. This is a great opportunity for students to work on community engagement projects in a real-world context that demand comprehensive solutions. This sounds great, but it is not easy to do ... maybe we can help!</p> <p>Noe Vargas Hernandez, Sylvia Robles, Joanne Rampersad-Ammons</p>
<b>Concurrent Session G.3</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
1:30 – 3:00 PM Location: Egret	<p><i>CREST</i></p>
<b>Concurrent Session G.4</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
1:30 – 2:30 PM Location: Heron Format: Deeper Dive	<p><i>Confluence of STEM - Creating Collaboration across disciplines and stakeholders</i></p> <p>Come build your component of a successful STEM pipeline by collaborating with educational stakeholders invested in creating meaningful STEM experiences for students of all backgrounds. Join Jeff Wheatcraft, 2019 Texas Teacher of the Year, to dive deeply into what makes great collaboration and where to get started.</p> <p>Jeff Wheatcraft</p>

<b>Concurrent Session G.5</b>	
<b>Time/Location/Format</b>	<b>Session Information</b>
1:30 – 2:30 PM Location: Pelican Format: Interactive Workshop	<p><i>Developing Equity Oriented Practices in Secondary STEM Classrooms</i></p> <p>Join us as we explore critical reflection as a way to advance equity-oriented practice for STEM classrooms. Critical reflection centered on identity and local food will help us to explore, reflect, connect, and raise awareness about daily experiences as well as values, assumptions, and beliefs that impact STEM learning environments. Participants will have opportunities to enhance their equity literacy, engage in applied experience (traditional food and cultural heritage), as well as to examine the dissonance between traditions, modernity, and opportunities to change and connect development and heritage in the STEM classroom.</p> <p>Miryam Espinosa-Dulanto, Vejoya Viren, Johanna Lynn Esparza</p>

## JSTEM Scholar Session

Thursday, February 16th

3:00 – 4:30 PM

Location: Spoonbill &  
Ibis

*Do microplastics in water stunt yeast growth?*

Jazmin Martinez, Lexie Lucio, Sam Medellin, Adan Nunez

*Investigating bio-based products to find a biodegradable alternative to plastic.*

Sophia Morrison, Jackie Ceballos, Leslie Salinas, Hennessey Rodriguez, and Cathryn Guerrero

*Reforming Plastics*

Ernesto Alvarez, Leonardo Munoz, Javier Gonzales, Juan Pablo Vasquez, Sophia Briseño

*The Effects of Microplastics on E. Coli*

Kendra Chavez-Alaniz, Daniel Palomo, Michelle Alvarado, Josiah Salinas

*The Eternal Dilemma with Microplastics*

Skylar Rodriguez, Violeta Galvan, Ruben Trevino, Aylin Ramos, Marisol Saucedo

*The Mysteries Inside Our Water*

Kapil Manohar, Ana Garcia, Sofia Reyes, Elisa Martinez, Sophia Gonzalez

*The Sun Above Plastic!*

Krystal Garcia, Rodolfo Rodriguez, Bryan Trevino



## Poster Session

Thursday, February 16th

3:00 – 4:30 PM

Location: Egret &  
Heron

*Sustainable STEM mentoring in biomedical Science*

Strategy to promote URM student success in biomedical research will be highlighted.

Andrew Tsin

*Liquid Liquid Separation*

To introduce the concepts of liquid-liquid separation in high school education, a lesson plan was developed to instruct students on the principles and methodologies that are used in research laboratories. This series of activities incorporates the use of solvents and disruptors, introduces ternary phase diagrams, and considers the benefits and uses of these techniques.

Ellen Lukasik

*Ionic Liquid Effects on Metal Ion-based Extractions of Olefin/Paraffin Hydrocarbon*

In coordination and support of the Center for Innovative and Strategic Transformation of Alkane Resources (CISTAR) Research Experience for Teachers (RET) at the University of Texas at Austin and under the guidance and direction of Professor Joan Brennecke, this study examined the addition of silver in an ionic liquid used to separate cyclohexane from cyclohexene. We recreated the liquid-liquid separation experimental results from the literature on cyclohexene, cyclohexane, and [allylmim][Tf2N] to verify our method, then evaluated the separation performance of silver - ionic liquid (IL) mixtures by various characterization techniques.

Ellen Lukasik

*Paradigm Shift: Cultivating our Minds and Meals*

Late in the spring semester 2022, while a freshman in high school at PSJA EHCS, Genesis applied for and was awarded an Eco-Audit Grant to rebuild the greenhouse on campus and turn it into a safe learning space for students in the Special Education unit. This is her proposal.

Genesis Shalom Rubio

*Development of Research Instrumentation in Mechanical Engineering*

Tribology is defined as the science of interacting surfaces in relative motion. The UTRGV NanoLubrication and Tribology Lab includes a collection of instruments and devices to analyze engineering materials' tribological characteristics. Most of these devices have been designed and developed by UTRGV students.

Javier A. Ortega

*Features of general chemistry students' connections between lecture and laboratory*  
Results of a research project based on how students can make connections between chemistry lecture problems and laboratory experiments.

Jennifer Scoggin, Christopher Smith

*A Skateboarding Experiential Learning Activity for Introductory Physics*

Instructors of introductory college physics courses are in a unique position to explain the physics of skateboarding and its associated risks. A field trip to a skate park to explore the law of conservation of energy can enhance student analytical thinking skills and their appreciation of physics in everyday life.

Liang Zeng

*Developing Culturally Relevant Rich Mathematics Tasks for Bilingual Pre-Service Teachers*

A recent focus in STEM and Bilingual/Bicultural education implies that we must now prepare teachers with reform-oriented mathematical curricula while also attending the needs of ELs. For this reason, the research team, including five UTEACH students, created a collection of culturally relevant rich mathematical tasks intended for such task.

Luis Fernández

*STEM through Place Based Education*

The purpose of this qualitative, exploratory case study (Creswell, 2013) is to explore how teachers in rural elementary schools are implementing Place based education to teach STEM (science, technology, engineering, math etc.) subjects.

Parama Chaudhuri

*Design and Development of a Cold Spray Additive Manufacturing (CSAM) Equipment at the UTRGV*

In the Cold Spray process, a metal powder is accelerated in a gas stream toward a metal substrate at high velocities, producing a metallurgical bond with the metal substrate on impact. The main objective of this project is to create a low-cost Cold Spray system.

Daniel Davila-Prince

*Design and Development of a Multidisciplinary Pin-on-Disk Tribometer to Evaluate Advanced Materials*

The main objective of the present project is to design a wear-testing device capable of reproducing unidirectional reciprocating motion at high frequencies and temperatures and to validate its functionality by evaluating the influence of the unidirectional reciprocating motion at high frequencies and temperatures on the wear rate of different materials.

Jarrold Perez

## Conference Location Information

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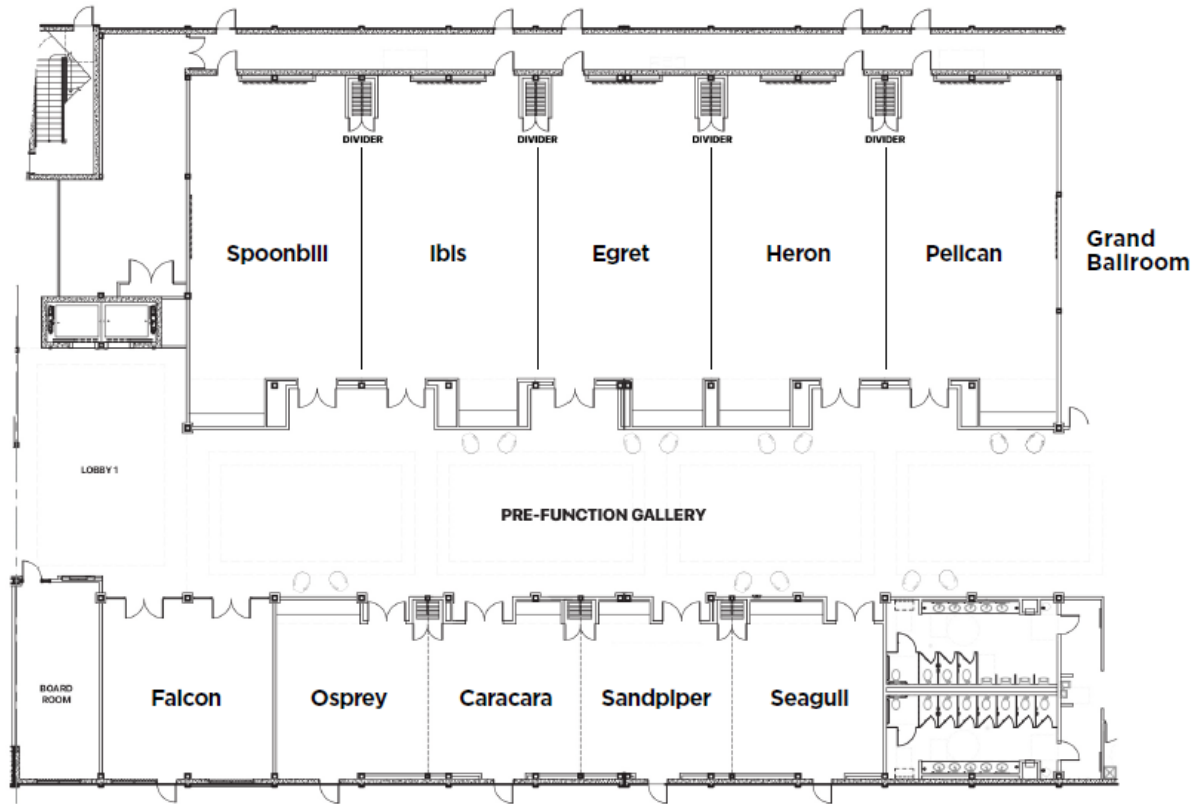
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