



# 3<sup>rd</sup> Annual RGV STEM Education Conference

## Be the Disruption: Towards Transformative Practices in STEM Education



Thursday, February 13<sup>th</sup> - Saturday, February 15<sup>th</sup>, 2020  
DoubleTree Suites by Hilton Hotel  
McAllen, Texas

The University of Texas  
Rio Grande Valley  
Office of Student Success



UTRGV  
College of Education  
& P-16 Integration



The University of Texas  
Rio Grande Valley  
Department of  
Teaching & Learning



**UTRGV STEM Education Consortium**  
**3<sup>rd</sup> Annual STEM Education Conference**  
DoubleTree Suites by Hilton Hotel  
McAllen, Texas  
February 13-15, 2020  
**Be the Disruption:**  
**Towards Transformative**  
**Practices in STEM Education**

UTRGV STEM Education Consortium Steering Committee

Angela Chapman, Teaching & Learning

Anthony Bailey, Donna ISD Secondary Mathematics

Lupe Chavez, La Joya ISD T STEM Academies Director

Shizue Mito, Chemistry

Joy Esquierdo, Bilingual & Literacy Studies

Kathryn Perez, Biology

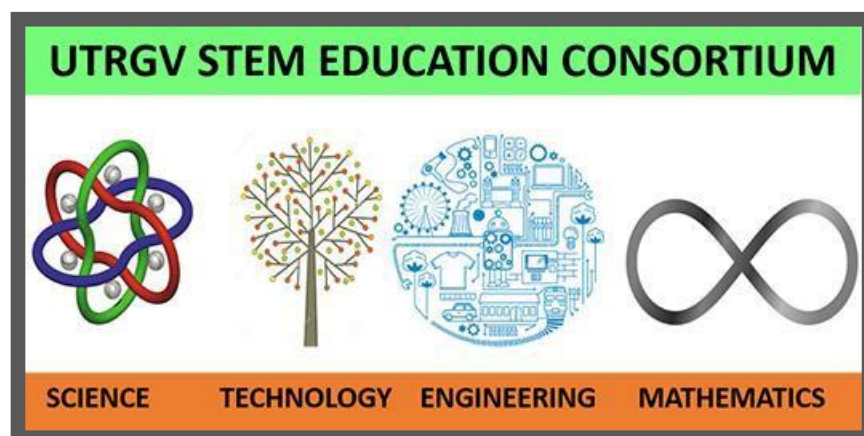
Stephany Pinales, Teaching & Learning

Shania Pintor, Biology Undergraduate

Volker Quetschke, Physics

Chris Smith, Chemistry

Cristina Villalobos, Mathematics





Dear Colleagues:

The College of Education and P-16 Integration and the University of Texas Rio Grande Valley welcome you to the 2019 RGV STEM Education Conference, *Be the Disruption: Towards Transformative Practices in STEM Education*. We will continue to create a purposeful environment that brings everyone involved in P-16 STEM education together, including higher education faculty, P-12 educators and administrators, informal educators, and students. We will continue pushing the frontiers of STEM education toward transformation of best practices, research, and policy by finding ways to disrupt inequitable practices in STEM. This year is certain to push the boundaries through a combination of practitioner sessions, critical dialogue, and discussion of research.

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 the “doers”, who have a willingness to be introspective, have dialogue around difficult conversations about what is transpiring in STEM classrooms, how to look in the mirror and to acknowledge how our presence, actions, and inactions contribute to student success in STEM.

The RGV STEM Education Consortium invites P-16 STEM practitioners, scholars of all disciplines, administrators and students to attend this innovative conference. Collectively, we will explore how topics such as STEM teacher agency, promoting social justice through integration of arts and STEM in today’s youth, and sociopolitical consciousness of marginalized groups, to name a few. There will be opportunities for practitioners to learn innovative ways to teach STEM, such as how to implement Vernier technologies in their classroom and using inquiry to teach STEM.

Through this conference experience, you will join a growing movement of local, national and international group of STEM education innovators and challengers that are not only committed to social justice but are ready to enact equitable and justice in the STEM classroom. You will leave this conference with tools to help your students positioning them to be successful in their learning of STEM.

Sincerely,

A handwritten signature in black ink that reads "Angela Chapman". The signature is fluid and cursive.

Angela Chapman, Ph.D.

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## About our Speakers

**Dr. Xicoténcatl Martínez Ruiz**, Insituto Nacional De Ciencias Penales  
Youth, Peace, and STEM+A(rts)



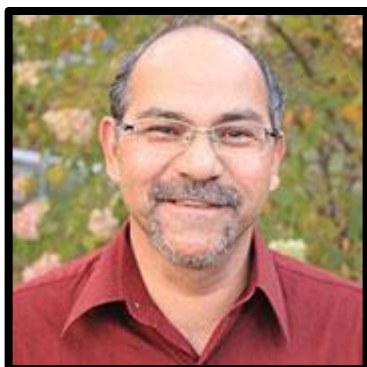
Dr. Xicoténcatl Martínez Ruiz is the Coordinator of Academic Systems and Editorial Coordinator at the Instituto Politécnico Nacional, IPN, (National Polytechnic Institute, México), and Editor in Chief of the Journal *Innovación Educativa*. He is an invited professor of ancient cultures of Asia in the Instituto de Investigaciones Mora, México. He has initiated and directed the editorial collection "Paideia Siglo XXI" at IPN, and was the director of the project Cultural House of India in México, founded by Octavio Paz. He was a visiting researcher in the University of Madras in the Radhakrishnan Institute for Advanced Studies in Philosophy, India; in Bazzano, Italy; Maharashtra, India and Sèvres, France. Advisor for the National System of Education in Mexico (SEP-Educación Media Superior), and for the development of policies focused on humanistic culture for engineers and scientists. His projects underway are narrowed down to Philosophy of Education, Non-violence and mindfulness in contemporary education, Eastern and Western approaches in education, ethics and humanistic prospective.



**Dr. Jennifer Adams**, Associate Professor, University of Calgary Creativity in STEM

Dr. Jennifer D. Adams was born and raised in Brooklyn, NY. After college she worked in physical therapy for two years before entering the field of education. Dr. Adams taught high school Biology in the New York City Public Schools. Dr. Adams then moved on to the American Museum of Natural History where she worked as a manager of teacher education. Dr. Adams completed an MS in nutrition at Brooklyn College, CUNY and an MA in education at New York University followed by a PhD in urban education with a Science, Math and Technology specialization at The Graduate Center, CUNY. Prior to joining the University of Calgary in 2017, Dr. Adams was an associate professor of science education at Brooklyn College, CUNY. Dr. Adams' research has focused on two areas: 1) urban place-based and environmental education and 2) informal science learning a) teacher learning, identity and agency and b) youth agency and identity. Underlying her work are critical and decolonizing stances towards science and science teaching and learning. Her research will now extend into examining the intersection of creativity and STEM in postsecondary science teaching and learning contexts. Dr. Adams will emphasize design towards increasing the creative capacities of STEM learners and theorizing a critical stance towards creativity and STEM.

**Dr. Bhaskar Upadhyay**, Associate Professor of Science Education at the University of Minnesota, Twin Cities



Dr. Upadhyay is a Fulbright Scholar and a recipient of the Matthew Stark Civil Rights and Civil Liberties Award for his research and community engagement work in urban schools and indigenous communities in the US and Nepal. His work in STEM education explores issues of social justice, equity, racism, indigeneity, citizen science, and sociopolitical change. He is currently serving a three years term as an Executive Board member of the National Association of Research in Science Teaching (NARST). He has published peer reviewed research papers and book chapters in science/STEM education. He is coediting a book titled "Stories for sustainable and resilient communities: STEM education from Indigenous perspectives". Currently, he is working on three projects funded by NSF and the Spencer Foundation. Each of the projects is exploring how teachers from marginalized or underrepresented groups engage in culturally and racially inclusive STEM learning environments. Furthermore, in these projects he is also investigating how teachers' pedagogical decisions support STEM learning for social change and sociopolitical consciousness and how students utilize STEM knowledge and skills for local sociopolitical activism. In one of the NSF projects he is partnering with an indigenous tribe, Bell Museum, and middle school indigenous students to create a planetarium show on indigenous water stories that blends indigenous sociocultural and STEM knowledge, Western STEM knowledge, and activism.

**Dr. Alejandro J. Gallard Martinez**, Professor and Goizueta distinguished Chair in the Middle and Secondary Department and the Director of the Georgia Center for Educational Renewal at Georgia Southern University



Alejandro's interests include researching societal complexities promulgated by contextual mitigating factors (CMFs) that contribute to students' lack of success (or success) in general and in the STEM fields. His frameworks include global perspectives on differences, otherness, polyphony of voices and meaning making that reflects categories used to situate people in social life. His current research efforts include working with an international team to understand the characteristics of Latinas who are successful in STEM fields.

## Conference Overview

### Thursday, February 13, 2020

|                   |   |
|-------------------|---|
| 5:00 pm – 8:00 pm | Preconference meetings and social<br>Citrus Ballroom, Doubletree Hilton Hotel |
|-------------------|---|

### Friday, February 14, 2020

|                     |   |
|---------------------|---|
| 7:30 am – 4:00 pm   | Check-in and onsite registration  |
| 8:00 am – 8:10 pm   | Dr. Alejandro Gallard Martinez: Introductions and Welcome   |
| 8:15 am – 9:15 pm   | Opening Keynote Address, Dr. Bhaskar Upadhyay   |
| 9:30 am – 11:00 am  | Concurrent Session 1  |
| 11:10 am – 12:40 pm | Concurrent Session 2  |
| 12:55 pm – 2:25 pm  | Lunch Plenary Session, Dr. Jennifer Adams introduced by Dr. Alma Rodriguez, Dean of the College of Education and P-16 Integration |
| 2:40 pm – 4:10 pm   | Concurrent Session 3  |
| 4:15 pm – 5:45 pm   | Concurrent Session 4  |

### Saturday, February 15, 2020

|                     |   |
|---------------------|---|
| 7:00 am – 5:45 pm   | Check-in and onsite registration  |
| 9:00 am – 10:30 am  | Concurrent Session 5  |
| 10:45 am – 11:45 am | Concurrent Session 6  |
| 12:00 pm – 1:30 pm  | Lunch Plenary Session, Dr. Xicoténcatl Martínez Ruiz, introduced by Dr. Patricia Alvarez McHatton |
| 1:30 pm – 2:00 pm   | Closing remarks, recognitions, and next steps   |
| 2:30 pm – 4:00 pm   | Executive Meeting, Closed Session   |



## Schedule at a glance: Thursday, February 13, 2020

Preconference Social 5:00 pm – 8:00 pm

Citrus Ballroom at DoubleTree Suites by Hilton Hotel, McAllen

## Schedule at a glance: Friday, February 14, 2020

### Concurrent Session 1: 9:30 am – 11:00 am

|   |               |
|---|---------------|
| 1A STEM Practitioner Workshop<br><b>Integrating Disciplinary Literacy in Secondary STEM Classrooms</b><br>Elena Venegas, University of Texas Rio Grande Valley  | Royal 1       |
| 1B Professional Development<br><b>NSF Grant Writing Session #1: Project Design</b><br>Volker Quetschke, Associate Dean College of Sciences, University of Texas Rio Grande Valley   | Royal 2       |
| 1C STEM Practitioner Workshop<br><b>Can You Escape?</b><br>Pamela Groves, University of Texas Rio Grande Valley, UTeach   | Valencia Room |
| 1D Curriculum, Evaluation, and Assessment in STEM<br><b>Pre-Service Teachers &amp; Elementary Science Unit Plan Devt. Skills</b><br>Mamta Singh, Lamar University<br><b>The Effects of Socioscientific Issues on Middle School Students' Abilities to Engage in Evidence-Based Reasoning</b><br>Wardell Powell, Framingham State University<br><b>An Innovative Approach to STEM Education: Professional Development for Area Teachers Providing Unique Summer Camps</b><br>Elisabeth M. Krimbill, Texas A&M University – San Antonio, Amber Middlebrook, The Science Mill, Bonnie Baskin, The Science Mill | Marrs Room    |
| 1E STEM Practitioner Workshop<br><b>Genetic Diversity: Seen Through the Eyes of Your Students</b><br>Araceli Adame, University of Texas Rio Grande Valley, UTeach   | Rio Room      |
| 1F Diversity, Equity, and Inclusion<br><b>Intersectionality and the Bicultural Experiences of Nigerian- American Female STEM Students: A Case Study</b><br>David Sparks, University of Texas at Arlington<br><b>Latino/a Student Perceptions Toward Spanish and Learning in STEM</b><br>Anthony Bailey, Donna ISD, Stephany Pinales, Shania Pintor, Angela Chapman, University of Texas Rio Grande Valley<br><b>Exploring Student Learning of the Nature of Science through a Culturally Relevant Authentic Science Summer Program</b><br>Noushin Nouri, University of Texas Rio Grande Valley              | Ruby Room     |

### Concurrent Session 2: 11:10 am – 12:40 pm

|   |            |
|---|------------|
| 2A STEM Teacher Practice<br><b>LxD for STEM Education</b><br>Pierre Lu, University of Texas Rio Grande Valley<br><b>Cultivating faculty-student partnerships: Using a theory of change to catalyze culturally relevant undergraduate STEM instruction</b><br>Alice Olmstead, Texas State University, Eleanor Close, Texas State University, Li Feng, Texas State University, Cynthia Luxford, Texas State University, Heather Galloway, Texas State University<br><b>STREAM Preparation for Pre-Service Bilingual Educators in Dual Language Classrooms</b><br>Esther Garza, Texas A&M University-San Antonio | Marrs Room |
|---|------------|

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|---|---------------|
| 2B STEM Practitioner Workshop<br><b>What the....?</b><br><i>Elizabeth Goldberg, University of Texas Rio Grande Valley, UTeach</i>   | Royal 1       |
| 2C Professional Development<br><b>NSF Grant Writing Session #2: Team Building and Writing Your Budget</b><br><i>Constantine Tarawneh, Associate Dean College of Engineering and Computer Sciences, University of Texas Rio Grande Valley</i>  | Royal 2       |
| 2D STEM Practitioner Workshop<br><b>Engaging District-Level Depts. to Promote Internship Opportunities in STEM</b><br><i>Luis C. Bocanegra, Academy Director Palmview High School T- STEM Academy</i><br><i>Clem A. Garza, La Joya ISD Technology Instructional Resources</i>   | Valencia Room |
| 2E Diversity, Equity, and Inclusion<br><b>Exploring Relationship Between Pre-service Teacher Cognitions Towards Mathematics and EL Students' Mathematics Education" to "Pre-Service Teachers' Beliefs about Mathematics and the Mathematics Education of EB Students: An Exploratory Study</b><br><i>Luis M. Fernandez, The University of Texas at Austin</i><br><b>Opportunity (mis)alignment: What do students perceive as opportunities to learn in mathematics classrooms?</b><br><i>Rosa Chavez, Stanford University - CANCELLED DUE TO ILLNESS</i><br><b>The Metamorphosis: A Journey of My Science Teacher Identity</b><br><i>Johanna Esparza, University of Texas Rio Grande Valley</i> | Ruby Room     |
| 2F STEM Practitioner Workshop<br><b>STEAM: Creating Opportunities for All</b><br><i>Lindsey Balderaz, University of Texas Permian Basin</i>   | Rio Room      |

### Lunch Plenary Session

12:55 pm – 2:25 pm, Citrus Ballroom

Dr. Jennifer Adams, introduced by Dr. Alma Rodríguez

Title: Engaging Epistemic Disobedience and Expanding Knowledge Production Enactments for Science Educators

### Concurrent Session 3: 2:40 pm – 4:10 pm

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|--|--------------------|
| 3B STEM Practitioner Workshop<br><b>I Heart Formulas!</b><br><i>Elizabeth Goldberg, University of Texas Rio Grande Valley, UTeach</i>  | Valencia Room      |
| 3C Professional Development<br><b>NSF Grant Writing Session #3: Preparing Your Evaluation Plan and Logic Model</b><br><i>Michelle Burd, Burd's Eye View</i>                              | Royal 2            |
| 3E STEM Practitioner Workshop<br><b>Making STEM Practical</b><br><i>Milt Huling, Polk State College</i>  | Rio Room           |
| 3F STEM Practitioner Workshop<br><b>Teaching and Learning Through STEM Activities and Student Organizations</b><br><i>Oscar Flores, Gerardo Flores, Belinda Guzman, Vanguard Academy</i> | Marrs Room         |
| <b>Poster Session</b>  | Ruby Room, Royal 1 |

## Concurrent Session 4: 4:15 pm – 5:45 pm

|   |               |
|---|---------------|
| <p>4A STEM Practitioner Workshop<br/> <b>Engaging Student Learning Through an Online FPGA Platform</b><br/> <i>Junfei Li, University of Texas Rio Grande Valley</i></p>                   | Rio Room      |
| <p>4B STEM Practitioner Workshop<br/> <b>Welcome to the Future</b><br/> <i>Melinda Wright, Killeen ISD, Central Texas College for Kids</i></p>  | Ruby Room     |
| <p>4C STEM Practitioner Workshop<br/> <b>Come Sail Away! Supporting English Learners through Engineering Experiences</b><br/> <i>Jesus "Chuy" Garcia Museum of Science, Boston MA</i></p> | Valencia Room |
| <p>4D Roundtable Discussion<br/> <b>The Intersection of Race, Ethnicity, and Gender in STEM</b><br/> <i>Discussants: Bindhu Alappat, Rosa Chavez, Selina Mireles, Vivien Incera</i></p>   | Royal 1       |
| <p>4E STEM Practitioner Workshop<br/> <b>Vernier Probes in the STEM Classroom</b><br/> <i>David Carter, Vernier Instruments</i></p>   | Marrs Room    |
| <p>4F STEM Teacher Practices<br/> <b>Visual Learning with Objects in STEM</b><br/> <i>Claudia Martinez, International Museum of Art &amp; Science</i></p>                                 | Royal 2       |

## Schedule at a glance: Saturday, February 15, 2020

### Concurrent Session 5: 9:00 am – 10:30 am

|   |            |
|---|------------|
| <p>5A Diversity, equity, and inclusion<br/> <b>What are Critical Race Theory and Critical White Studies doing in a nice field like STEM Education?</b><br/> <i>Nora Luna, University of Texas Rio Grande Valley</i><br/> <b>A Case Study of Elementary Teachers' Critical Understanding of Culturally Relevant Science Education: Mexican American Teachers</b><br/> <i>Nora Luna, University of Texas Rio Grande Valley</i><br/> <b>There is no Equity Without Direct Interruption of Inequity: Transformation through Equity Literacy</b><br/> <i>Richard Orozco, University of Arizona</i></p>   | Ruby Room  |
| <p>5B STEM Practitioner Workshop<br/> <b>Growing the STEM Workforce through Active Learning and a Growth Mindset</b><br/> <i>Deborah Overath, Texas Southmost College, Martha Casquette, Texas Southmost College, Diana Cortez-Castro, Texas Southmost College</i></p>  | Royal 2    |
| <p>5C Diversity, equity, and inclusion<br/> <b>Equitable Access: A Mixed Methods Examination of STEM Camps in Rural and Underserved Communities</b><br/> <i>Elisabeth Krimbrill, Texas A&amp;M University – San Antonio, Bonnie Baskin, The Science Mill, Bob Elde, The Science Mill</i><br/> <b>Learning to support STEM students' ethical reasoning: Two design-based case studies from undergraduate physics</b><br/> <i>Brianne Gutmann, Texas State University</i><br/> <b>Media Health Literacy and eHealth Literacy: A Vehicle to Promote Adolescent Health Literacy and Mitigate Adolescent Health Risk Behaviors</b><br/> <i>Miriam Ortiz, University of Texas Rio Grande Valley</i></p> | Marrs Room |

|  |               |
|--|---------------|
| 5D STEM Practitioner Workshop<br><b>Computational Thinking (CT): A future proof skill. Are you teaching it?</b><br><i>Lee Baird, SAM Labs Inc</i>          | Rio Room      |
| 5E Roundtable Discussion<br><b>Promoting P-12 Student Success in STEM through the Arts</b><br><i>Xicoténcatl Martínez Ruiz, Alejandro Gallard Martínez</i> | Valencia Room |
| 5F STEM Practitioner Workshop<br><b>Vernier Probes in the STEM Classroom</b><br><i>David Carter, Vernier Instruments</i>                                   | Royal 1       |

### Concurrent Session 6: 10:45 am – 11:45 am

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|---|---------------|
| 6A Diversity, Equity, and Inclusion<br><b>The ABCs of Student Success and Persistence in General Chemistry &amp; Beyond</b><br><i>Bindhu Alappat, Saint Xavier University, Chicago</i>  | Royal 1       |
| 6B Panel Discussion<br><b>High School Student Ambassadors</b><br><i>Lluvia Garcia, La Joya ISD, Genesis Lopez, La Joya ISD, Angel Lopez Caudillo, La Joya ISD, Yhair Matamoros, La Joya ISD, Eliseo Moreno, La Joya ISD, Sebastian Segovia, La Joya ISD, Emmanuel Matamoros, La Joya ISD, Adrian Suarez, La Joya ISD, Vanessa Aguilar, La Joya ISD, Adrian Canales, La Joya ISD, Angela Gonzalez, La Joya ISD, Raul Gonzalez, La Joya ISD, Angel Solano, La Joya ISD, Emily Solis, La Joya ISD, Agustin Lara, Vanguard Academy, Josh Reyna Vanguard Academy</i> | Royal 2       |
| 6C STEM Practitioner Workshop<br><b>STEAMing the Way to a Successful Future!</b><br><i>Michelle Cline, Detroit Public Schools</i>   | Rio Room      |
| 6D Contextual Factors Affecting Learning in STEM<br><b>Using Mixed-Reality Simulation in the Preparation of Pre-Service Mathematics Teachers</b><br><i>Jair Aguilar, University of Texas Rio Grande Valley</i><br><b>Seeing Yourself in a STEM Career: How Attending STEM Summer Camp Can Inspire Students</b><br><i>Elisabeth M. Krimbrill, Texas A&amp;M University – San Ant, Bonnie Baskin, The Science Mill</i>  | Ruby Room     |
| 6E STEM Practitioner Workshop<br><b>Visual Literacy in the Content Area – the Need is Real!</b><br><i>Milt Huling, Polk State College</i>   | Valencia Room |
| 6F Diversity, Equity, and Inclusion<br><b>Using Autoethnographies in a Community of Practice to Implement Social Justice and Develop STEM Teacher Agency</b><br><i>Discussants: Anthony Bailey and Ariana Garza</i>   | Marrs Room    |

### Closing Plenary Session

12:00 pm – 1:30 pm

Dr. Xicoténcatl Martínez Ruiz, introduced by Dr. Patricia Álvarez McHatton

Title: Why an “A” matters in STEM+A? The role of educational poetics and disruption in our future

1:30 pm – 2:00 pm

Closing remarks, recognitions, next steps

2:30 pm – 4:00 pm

Advisory Board Meeting, Closed Session

## **Full Conference Schedule**

### **Day 1 Friday, February 14, 2020**

#### **Opening Keynote Address**

8:15 am – 9:15 am

Dr. Bhaskar Upadhyay, introduced by Dr. Alejandro Gallard Martínez

#### **Towards Disruptive and Transformative STEM Teaching Practices: Indigenizing and Globalizing Social and Political Consciousness of Marginalized Groups Through Critical Pedagogy**

STEM teaching and learning has been promoted as building untapped youth human capacity to innovate for economic gain and technological power. One of the goals of any education, including STEM education, is to transform youth mind and energy for personal and social good. Yet, youths from marginalized communities, African American, Latinx, Asian, Indigenous, females, LGBTQ, and many others, get left behind or pushed out to the margins of STEM fields, both in education and in professional lives. Students from marginalized groups are left out of the STEM fields because many normative social, political, and cultural practices, norms, expectations, and values of STEM are incongruent to students' personal social, cultural, and historical experiences at home. Therefore, how do we build STEM teaching and learning environment that brings marginalized students' home experiences into everyday STEM learning for social change and personal transformation?

Youth have always been disruptors of old power relationships. They have pushed the boundaries of cultural and political norms to empower and create new centers of power or have brought change in the systems of power. STEM could be a partner in being a tool for transformative social change and help undermine the oppressive systems that tend to keep the status quo. In this process teachers are at the frontlines to transform their teacher-centered uncritical teaching practices into more critical and empowering pedagogy. Critical pedagogy embodies humanizing tendencies of learning. Critical pedagogy encourages and supports students to reject traditional STEM boundaries and supports teachers to continuously value students' lived experiences and help expand their interpretations of their lived world with the knowledge gained from STEM fields.

Schools are social spaces where local culture, politics, history, people, and the school curriculum meet. Therefore, any STEM curriculum that doesn't recognize and include local social, political, historical issues fails to harness the power of relevancy of STEM learning. Indigenizing STEM curriculum and STEM practices can channel local student and community creativity to disrupt the dominant politics of STEM and marginalization and transform STEM experiences for social justice and social change for all.

Finally, teachers, students, parents, educators, and researchers who are invested in STEM education for sociopolitical transformation need to believe that STEM is a tool for sociopolitical critique for social justice and democracy. Thus, STEM education should be a disruptive and transformative tool for local and global social action and change.

**Concurrent Session 1: 9:30 am – 11:00 am**

| <b>Session Title</b>  | <b>Location</b> |
|---|-----------------|
| <p>1A STEM Practitioner Workshop</p> <p><b><i>Integrating Disciplinary Literacy in Secondary STEM Classrooms</i></b><br/><i>Elena Venegas, University of Texas Rio Grande Valley</i></p>  | Royal 1         |
| <p>1B Professional Development</p> <p><b>NSF Grant Writing Session #1: Project Design</b><br/><i>Volker Quetschke, Associate Dean College of Sciences, University of Texas Rio Grande Valley</i></p> <p><i>This is the first of three sessions that is designed for participants to learn about NSF's different programs and how to prepare a proposal. This is a hands-on working session and interested faculty must bring their laptop and a one-page summary or outline of their proposed project to the session. This session will focus on developing on writing your objectives, intellectual merit, broader impacts, and the format of 15-page limit NSF proposal. By the end of the three sessions, faculty will leave with a draft of their NSF proposal.</i></p> | Royal 2         |
| <p>1C STEM Practitioner Workshop</p> <p><b>Can You Escape?</b><br/><i>Pamela Groves, University of Texas Rio Grande Valley, UTeach</i></p> <p><i>This session will guide you through the newest classroom trend: escape rooms! You will learn how to run a whole class escape room style lesson on the topic of photosynthesis. This session is appropriate for middle school or high school teachers interested in seeing how an escape room lesson can be conducted.</i></p>  | Valencia Room   |
| <p>1D Curriculum, Evaluation, and Assessment in STEM</p> <p><b>Pre-Service Teachers &amp; Elementary Science Unit Plan Development Skills</b><br/><i>Mamta Singh, Lamar University</i></p> <p><i>The purpose of the study was to assess pre-service teachers' skills to incorporate collaborative learning, technology, and Gardner's Multiple Intelligence (GMI) teaching methods in unit plan - lessons for elementary science teaching. The study further addressed incorporation of students' prior knowledge pertaining to lesson learning objectives; if the learning objectives were aligned with appropriate evaluative assessments. An assessment rubric was developed to assess sixty science lesson plans.</i></p>   | Marrs Room      |

**The Effects of Socioscientific Issues on Middle School Students' Abilities to Engage in Evidence-Based Reasoning**

*Wardell Powell, Framingham State University*

*This study investigated the implementation of a socioscientific issue curricular unit that was designed to enhance evidence-based reasoning among middle school students. Forty-three six grade school students from a summer enrichment program in the northeastern United States participated in this study. The results showed that socioscientific issues enhanced the students' abilities to engage in evidence-based reasoning.*

**An Innovative Approach to STEM Education: Professional Development for Area Teachers Providing Unique Summer Camps**

*Elisabeth M. Krimbill, Texas A&M University – San Antonio*

*Amber Middlebrook, The Science Mill*

*Bonnie Baskin, The Science Mill*

*This research examines one innovative approach to enhance STEM education in rural and underserved communities through professional development for local teachers. By bringing STEM enriched programming into communities led by local teachers will help to prepare students who are confident and eager to learn and lead in the 21st century.*

1E STEM Practitioner Workshop

**Genetic Diversity: Seen Through the Eyes of Your Students**

*Araceli Adame, University of Texas Rio Grande Valley, UTeach*

*This workshop will model a high school inquiry-based biology lesson about genetic drift; the founders' effect where learners will learn about their own traits and how often dominant and recessive traits are seen in a specific area.*

Rio Room

1F Diversity, Equity, and Inclusion

**Intersectionality and the Bicultural Experiences of Nigerian- American Female STEM Students: A Case Study**

*David Sparks, University of Texas at Arlington*

*Three Nigerian-American female students attending a diverse urban university participated in face-to-face interviews and a focus group about their experiences as science, technology, engineering, and mathematics (STEM) majors. Analyses uncovered their misconceptions about native-born African- American students and biases related to their exceptionalism as a STEM student with recent African heritage.*

Ruby Room

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**Latino/a Student Perceptions Toward Spanish and Learning in STEM**

*Anthony Bailey, Donna ISD  
Stephany Pinales, University of Texas Rio Grande Valley  
Shania Pintor, University of Texas Rio Grande Valley  
Angela Chapman, University of Texas Rio Grande Valley*

*High school students better learn academic vocabulary in science and math when using multiple vocabulary strategies. Strategies using Spanish (L1) or L1 association for Spanish-English bilingual learners, not only demonstrate increased learning but a stronger perception of Spanish as a linguistic asset.*

**Exploring Student Learning of the Nature of Science through a Culturally Relevant Authentic Science Summer Program**

*Noushin Nouri, Anthony Bailey, Angela Chapman, University of Texas Rio Grande Valley*

*This study explored changes in high school students' nature of science (NOS) views as a result of participating in a summer program that highlighted NOS ideas in context of culturally relevant authentic science. Students completed pre- and post- questionnaires and reflected on NOS ideas. Data demonstrated improved and deepened NOS views.*

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**Concurrent Session 2: 11:10 am – 12:40 pm**

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**Session Title**

2A STEM Teacher Practices

**LxD for STEM Education**

*Pierre Lu, University of Texas Rio Grande Valley*

*Drawing from the disciplines of educational science, a group of researchers obtained an NSF-funded grant called PRIMERS. The paper focuses on the Learning by Design (LxD) program within PRIMERS that introduces principles of active learning, student-centered approach, and course (re)designs for STEM education to a selected group of STEM faculty.*

**Cultivating faculty-student partnerships: Using a theory of change to catalyze culturally relevant undergraduate STEM instruction**

*Alice Olmstead, Texas State University  
Eleanor Close, Texas State University  
Li Feng, Texas State University  
Cynthia Luxford, Texas State University  
Heather Galloway, Texas State University*

*This talk will describe how a theory of change guides our new comprehensive initiative at Texas State University. The initiative aims to cultivate sustained use of culturally relevant instruction and empower STEM students and includes four*

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**Location**

Marrs Room



*programmatic components based on research on instructional change strategies and faculty-student partnerships.*

**STREAM Preparation for Pre-Service Bilingual Educators in Dual Language Classrooms**

*Esther Garza, Texas A&M University-San Antonio*

*This session will explore Science Technology Reading Engineering Art Mathematics (STREAM) for Pre-service bilingual teachers in dual language classrooms. STREAM is an integrated approach that addresses learning using an engineering design process where students are propelled to planning, designing and producing solutions for issues in our communities and global world.*

2B STEM Practitioner Workshop

**What the....?**

*Elizabeth Goldberg, University of Texas Rio Grande Valley, UTeach*

*"Why did that happen?!" Discrepant events are a great way to introduce your students to inquiry-based learning and get them engaged in science. In this interactive session, learn how to use surprising results to get your students desperate to find out why certain scientific principals exist.*

Royal 1

2C Professional Development

**NSF Grant Writing Session #2: Team Building and Writing Your Budget**

*Constantine Tarawneh, Associate Dean College of Engineering and Computer Sciences, University of Texas Rio Grande Valley*

*This is the second of three sessions that is designed for participants to learn about NSF's different programs and how to prepare a proposal. This is a hands-on working session and interested faculty must bring their laptop and a one-page summary or outline of their proposed project to the session. This session will focus on building your team, budget, and developing each section of the NSF proposal. By the end of the three sessions, faculty will leave with a draft of their NSF proposal.*

Royal 2

2D STEM Practitioner Workshop

**Engaging District-Level Departments to Promote Internship Opportunities in STEM**

*Luis C. Bocanegra, Academy Director Palmview High School T- STEM Academy  
Clem A. Garza, La Joya ISD Technology Instructional Resources*

Valencia Room

*Explore new methods to expose students to internship opportunities within your own school district. Leaders from La Joya Independent School District will share their experiences in promoting student internships within their STEM Camps.*

Key insight will be shared on how to build partnerships within a school district that will benefit student internships. Participants will walk away with resources that will help implement internship opportunities for their students.

2E Diversity, Equity, and Inclusion

**Exploring Relationship Between Pre-service Teacher Cognitions Towards Mathematics and EL Students' Mathematics Education" to "Pre-Service Teachers' Beliefs about Mathematics and the Mathematics Education of EB Students: An Exploratory Study**

Luis M. Fernandez, The University of Texas at Austin

Evidence suggest that pre-service teachers' cognitions, or their beliefs, perceptions, and attitudes, towards the learning and teaching of mathematics towards English Learners might also be influenced by their own cognitions about mathematics as a field of knowledge as well as how it should be taught and learned. This study aims to explore this relationship through a combination of descriptive and cluster analyses of survey responses aiming to capture both sets of cognitions from 60 PSTs. Moreover, a crosstabulation analysis is implemented that further highlights possible relationships between PSTs' cognitions and the implications these might have.

**Opportunity (mis)alignment: What do students perceive as opportunities to learn in mathematics classrooms?**

Rosa Chavez, Stanford University

This study examined students' perceived opportunities to learn (OTL) in testing environments. Surveys (N=24,208) showed that students perceived their OTL increased as testing environment increased. However, representative videos of classrooms showed otherwise. This indicates a need to interrogate the ways assessment policies may be influencing perceived learning opportunities for students.

**The Metamorphosis: A Journey of My Science Teacher Identity**

Johanna Esparza, University of Texas Rio Grande Valley

I embark on an introspective journey to try and better understand myself through autoethnography. By dissecting all of my different parts from a stage of vulnerability, it paved way to construct my teacher identity. I now have a better picture of who I am as an individual and science teacher. It was a continuous voice of reasoning and awakening that paved way for transformation for this dissertation: How did I arrive where I am as science teacher today? Why do I teach science the way I do? How has my identity guided my science practices?

2F STEM Practitioner Workshop CANCELLED DUE TO ILLNESS

**STEAM: Creating Opportunities for All**

Lindsey Balderaz, University of Texas Permian Basin

Ruby Room

Rio Room

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*The purpose of this interactive presentation is to demonstrate how to create a universally designed STEAM environment through mixed-age grouping, goal setting, and student-centered practices. Participants will view a 360-degree video with key features highlighted along with a discussion.*

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## **Lunch Plenary Session**

12:55 pm – 2:25 pm

Dr. Jennifer Adams, introduced by Dr. Alma Rodríguez

### **Engaging Epistemic Disobedience and Expanding Knowledge Production Enactments for Science Educators**

With the spectre of current global challenges and inequities, educators must work to create environments that allow learners to imagine and produce different futures; one where living, and well-being have precedence over economic gain. This is especially important for educators of students who have been and continued to be systemically racialized, marginalized, and otherwise maligned by dominant discourses of who can learn and succeed. Furthermore, because we have been so long embedded in Western knowledge systems and hegemonic discourses of what counts as knowledge and what is valued as production, we need to actively engage in, what Walter Mignolo and Sylvia Wynter call “epistemic disobedience” were we delink ourselves from and “undo the [dominant] systems through which knowledge and knowing are constituted.” This requires us, as educators, to rethink pedagogical approaches and embrace teaching that is participatory and allows us to expand our notions of what counts as evidences of learning and our understandings of how knowledge is produced. Dr. Adams’ goal is to challenge the audience to engage in epistemic disobedience through teaching and advocacy for all young people. She also hopes to inspire educators to move beyond common pedagogical approaches towards more creative and expansive engagements; engagements that value diverse worldviews, perspectives and ways of understanding and describing our lived experiences and relationships to the natural and built world.

**Concurrent Session 3: 2:40 pm – 4:10 pm**

| <b>Session Title</b>  | <b>Location</b>       |
|---|-----------------------|
| <p>3B STEM Practitioner Workshop<br/><b>I Heart Formulas!</b><br/><i>Elizabeth Goldberg, University of Texas Rio Grande Valley, UTeach</i></p> <p><i>Are your student’s masters at plug and chug but have no idea what they are doing or why? Get your students to not only understand the purpose behind their formulas but learn to love them as well with these fun activities. This session is great for both math and science teachers.</i></p>  | Valencia Room         |
| <p>3C Professional Development<br/><b>NSF Grant Writing Session #3: Preparing Your Evaluation Plan and Logic Model</b><br/><i>Michelle Burd, Burd’s Eye View</i></p> <p><i>This is the third of three sessions that is designed for participants to learn about NSF’s different programs and how to prepare a proposal. This is a hands-on working session and interested faculty must bring their laptop and a one-page summary or outline of their proposed project to the session. This session will focus on preparing your evaluation plan and preparing a logic model. By the end of the three sessions, faculty will leave with a draft of their NSF proposal.</i></p> | Royal 2               |
| <p>3D Poster Session<br/><b>Two Content Pathways in Presenting Electromagnetism in Introductory Algebra-Based Physics Textbooks</b><br/><i>Liang Zeng, Associate Professor; Yi Zeng, Retired Associate Professor; Guang Zeng, Associate Professor</i></p> <p><i>After examining thirteen introductory algebra-based physics textbooks, we found authors adopt two content pathways in presenting the electromagnetic phenomena. Considering Bloom’s taxonomy of educational objectives and constructivist learning theory, we recommend one of the pathways only.</i></p> <p><b>Hybrid Triboelectric-Electromagnetic Nanogenerator to Harvest Energy from Footsteps</b></p>   | Ruby Room and Royal 1 |

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*Elaijah Islam, University of Texas Rio Grande Valley*

*A triboelectric-electromagnetic (TENG-EMG) hybrid floor-tile nanogenerator converts already expended energy of human footfall to electricity. 5 mA and 1200 V per footstep was generated. Therefore, readily available energy is converted through a cost-effective, simple nanogenerator to decrease energy expenditures without any detrimental effects to the environment or humans.*

**Development of a new testing device to evaluate the durability of biocompatible materials**

*Javier Ortega, University of Texas Rio Grande Valley*

*A new wear testing device has been designed to evaluate the effect of this cross-shear motion on the tribological behavior of different biomaterials. This new instrument is capable to reproduce the "cross-shear" effect with bidirectional motion on bearing biomaterials and to determine coefficient of friction (COF) between surfaces during testing.*

**Development of Biodegradable Nano-lubricants Using Coconut Oil Modified With Nanoparticles as Lubricant Additives**

*Vicente Cortes, University of Texas Rio Grande Valley*

*Nowadays, the depletion of crude oil reserves and the global concern in protecting the environment from contamination have renewed interest in developing environmentally friendly lubricants derived from alternative sources such as vegetable oils. In the present study, a new biodegradable lubricant was developed using coconut oil modified with nanoparticle additives.*

**Using Case Studies for Research and Teaching in Undergraduate Courses in Resilient and Sustainable Infrastructure**

*Rey Montalvo, University of Puerto Rico Mayaguez*

*Outcomes from an undergraduate course designed to increase students' awareness and knowledge about infrastructure vulnerabilities and the need to design sustainable and resilient infrastructure. The physical impact of Hurricanes Irma and María was used for case studies using Project Based Learning methodology to foster interdisciplinary problem solving.*

**Learning Math, Chemistry, and Biology Through Authentic Inquiry**

*Shania Pintor, University of Texas Rio Grande Valley*

*Jennifer Guajardo, University of Texas Rio Grande Valley*

*Claudio Garcia, University of Texas Rio Grande Valley*

*Edson Pinzon, University of Texas Rio Grande Valley*

*Project based learning activities benefit students by allowing them to develop learning skills through real world application. This inquiry-based teaching method also encourages collaboration as they actively complete tasks they are held responsible for. Artifacts are also designed and presented to assess student learning.*

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**Transforming Undergraduate Education in STEM Through Culturally Relevant Pedagogy and Community Engagement.**

*Alex Racelis, University of Texas Rio Grande Valley*  
*Cristina Trejo, University of Texas Rio Grande Valley*  
*Yartiza Marin, University of Texas Rio Grande Valley*  
*Brenda Cantu, University of Texas Rio Grande Valley*  
*Humberto Silva, University of Texas Rio Grande Valley*

**How Teachers' Race Affects Students Scores on Standardized Tests**

*James Abi Medalla, University of Texas Rio Grande Valley*  
*Araceli Adame, University of Texas Rio Grande Valley*  
*Alejandra Pena, University of Texas Rio Grande Valley*

**The Relationship Between Parental Education and Student Achievement in Mathematics**

*Brandon Bada, Jeanette Ramirez, Dora Salas; University of Texas Rio Grande Valley*

**The Effect of Employment on High School Student's Academic Achievement**

*Raymond Hand, University of Texas Rio Grande Valley*  
*Reynaldo Urbina, University of Texas Rio Grande Valley*  
*Joseph Claudio, University of Texas Rio Grande Valley*  
*Brendalee Hernandez, University of Texas Rio Grande Valley*

**Home Language and Students Academic Performance in Secondary Mathematics**

*Nallely Cano, University of Texas Rio Grande Valley*  
*Samantha Estevis, University of Texas Rio Grande Valley*  
*Juan Reyes, University of Texas Rio Grande Valley*  
*Roberto Solis, University of Texas Rio Grande Valley*

**What are the Far-Reaching Effects of Financial Equity in a 12th Grade Science Classroom?**

*Billy Munoz, University of Texas Rio Grande Valley*  
*Alicia Cronkhite, University of Texas Rio Grande Valley*  
*Miranda Castillo, University of Texas Rio Grande Valley*  
*Abeline Sandoval, University of Texas Rio Grande Valley*

**The Effect of Parent Education on Student Educational Success**

*Dulce Colunga, University of Texas Rio Grande Valley*  
*Emilio Hinojosa, University of Texas Rio Grande Valley*  
*Juan Lazo, University of Texas Rio Grande Valley*  
*Daniela Ramirez Quintana, University of Texas Rio Grande Valley*

**The Relationship Between Teacher Perception and Student Achievement on the 8<sup>th</sup> Grade Trends in International Mathematics and Science Study**

*Roxanna Gomez, University of Texas Rio Grande Valley  
Eric Garcia, University of Texas Rio Grande Valley  
Alexa Colunga, University of Texas Rio Grande Valley  
Karina Quintan, University of Texas Rio Grande Valley*

**The Relationship Between Socioeconomic Status and Student Academic Success**

*Alicia Corbitt, University of Texas Rio Grande Valley  
Porfirio Rivera, University of Texas Rio Grande Valley  
Analaura Trevino, University of Texas Rio Grande Valley  
Janelle Barrera, University of Texas Rio Grande Valley*

**English Language Learner Instruction Effect on 8th Grade Math Scores**

*Does having students learn in their native language or other language, besides English, affect their academic performance at the 8th grade mathematics level?  
Francesca Gonzalez, University of Texas Rio Grande Valley  
Rafael Palacios, University of Texas Rio Grande Valley  
Brenda Rodriguez, University of Texas Rio Grande Valley  
Amara Guerrero, University of Texas Rio Grande Valley*

*3E STEM Practitioner Workshop*

**Making STEM Practical**

*Milt Huling, Polk State College*

*What is STEM? What should it look like in the classroom? This hands-on session provides participants the opportunity to learn ways to engage students and enhance their learning using engineering design challenges. During the sessions, participants will be engaged in various design challenges. As a take-away, teachers will be provided access to various design challenge lesson plans developed by the presenter.*

Rio Room

*3F STEM Practitioner Workshop*

**Teaching and Learning Through STEM Activities and Student Organizations**

*Oscar Flores, Gerardo Flores, Belinda Guzman, Vanguard Academy*

*This practical presentation enables teachers to explore new ideas and learn how to integrate STEM education and Student Organizations in the classroom and after school programs. Learn how Vanguard Academy has incorporated FIRST Robotics and Cyber Security, Sea Perch and Electrical Car Challenge, making them relevant, intentional, and engaging.*

Marrs Room

**Concurrent Session 4: 4:15 pm – 5:45 pm**

**Session Title**

**Location**

4A STEM Practitioner Workshop

**Engaging Student Learning Through an Online FPGA Platform**

*Junfei Li, University of Texas Rio Grande Valley*

*In this interactive workshop, we explore various features of an innovative online FPGA platform for teaching digital technologies to secondary school students. Developed by the author, the online platform provides students with real-time lab experience 24/7 from anywhere using a computer with an internet browser. Experience from a hardware programming summer camp will be highlighted.*

Rio Room

4B STEM Practitioner Workshop

**Welcome to the Future**

*Melinda Wright, Killeen ISD, Central Texas College for Kids*

*Artificial Intelligence is here! The current generation has been referred to as "artificial intelligence natives." Introduce students to artificial intelligence by exploring activities that get them thinking about what is and isn't artificial intelligence, how it impacts their lives daily, and what AI holds for the future.*

Ruby Room

4C STEM Practitioner Workshop

**Come Sail Away! Supporting English Learners through Engineering Experiences**

*Jesus "Chuy" Garcia Museum of Science, Boston MA*

*How can educators effectively support ELs in the elementary science classroom? Providing an authentic application for science knowledge and skills can help! In this hands-on workshop, participants will work in teams to engage in an engineering design challenge centered on solving a real-world problem. They will briefly participate in background-building investigations, allowing them to unpack relevant science concepts and build familiarity with relevant material properties.*

Valencia Room

4D Roundtable Discussion

**The Intersection of Race, Ethnicity, and Gender in STEM**

*Discussants: Bindhu Alappat, Rosa Chavez, Selina Mireles, Vivien Incera*

*This discussion will begin with current statistics of women of color in STEM careers. The session will then explore how women of color have been positioned by social, cultural, historical, economic, and political factors associated with success. Topics related to identity, persistence, and resilience will be discussed.*

Royal 1



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| <p>4E STEM Practitioner Workshop</p> <p><b>Vernier Probes in the STEM Classroom</b><br/> <i>David Carter, Vernier Instruments</i></p> <p><i>This session will provide hands-on activities on using Vernier equipment in elementary science and math classrooms.</i></p>  | <p>Marrs Room</p> |
| <p>4F STEM Teacher Practices</p> <p><b>Visual Learning with Objects in STEM</b><br/> <i>Claudia Martinez, International Museum of Art &amp; Science</i></p> <p><i>This session explores the foundation of inquiry-based learning with objects. Participants will learn to incorporate visual thinking strategies in STEM curriculum. Moreover, participants will gain hands-on experience in the workshop that can be used in the classroom.</i></p> | <p>Royal 2</p>    |



**Day 2 Saturday, February 15, 2020**  
**Concurrent Session 5: 9:00 am – 10:30 am**  
**Session Title**

**Location**

5A Diversity, equity, and inclusion

**What are Critical Race Theory and Critical White Studies doing in a nice field like STEM Education?**

*Nora Luna, University of Texas Rio Grande Valley*  
*James Jupp, University of Texas Rio Grande Valley*

*We provide a conceptual essay that takes up race-based understanding of STEM advocacy. Our essay provides brief synopses of critical scholarly traditions of Critical Race Theory (CRT) and Critical Whiteness studies (CWS) making explicit ties to the broad fields of teaching and learning and teacher education. We finish our essay by emphasizing race-based advocacy in specific relation to STEM education.*

**A Case Study of Elementary Teachers’ Critical Understanding of Culturally Relevant Science Education: Mexican American Teachers**

*Nora Luna, University of Texas Rio Grande Valley*

*It is assumed that when teachers and students are of the same ethnicity such as Mexican American teachers, they possess strong cultural relevant science understanding. This ethnographic case study will provide insight into the critical understanding of the conceptualization of culturally relevant science instruction by Mexican American teachers.*

**There is no Equity without Direct Interruption of Inequity: Transformation through Equity Literacy**

*Richard Orozco, University of Arizona*

*This session will review the concept of equity literacy. The goal, central tenet, and four abilities necessary to become equity literate will be presented. The transformative potential of equity literacy for STEM teachers via examination of microaggressive discourse will be discussed.*

Ruby Room

5B STEM Practitioner Workshop

**Growing the STEM Workforce through Active Learning and a Growth Mindset**

*Deborah Overath, Texas Southmost College*  
*Martha Casquette, Texas Southmost College*  
*Diana Cortez-Castro, Texas Southmost College*

*Dweck and others have accumulated evidence that cultivating a growth mindset can have huge positive effects on many aspects of student success. In this workshop, our interdisciplinary team will explore growth mindset and its impact on STEM students through active learning activities that participants can use in their own classroom.*

Royal 2

5C Diversity, equity, and inclusion

**Equitable Access: A Mixed Methods Examination of STEM Camps in Rural and Underserved Communities**

*Elisabeth Krimbrill, Texas A&M University – San Antonio*

*Bonnie Baskin, The Science Mill*

*Bob Elde, The Science Mill*

*This study examined four years of data collected from 77 STEM summer camp programs specifically targeting support of students who have traditionally been underrepresented in STEM careers, including girls, low income, rural, minority, and first-generation students. The camps elevated student interest in STEM learning and the 21st century technical workforce.*

**Learning to support STEM students’ ethical reasoning: Two design-based case studies from undergraduate physics**

*Brianne Gutmann, Texas State University*

*Science research and practices have the potential to uplift and liberate or perpetuate harm within society, yet science curricula rarely give space to practice ethical reasoning around their impacts. This talk documents the development and implementation of ethics curricula embedded in physics courses, and describes emerging themes from their analysis.*

**Media Health Literacy and eHealth Literacy: A Vehicle to Promote Adolescent Health Literacy and Mitigate Adolescent Health Risk Behaviors**

*Miriam Ortiz, University of Texas Rio Grande Valley*

*Health risk behavior engagement is prevalent among adolescent students. Low health literacy among adolescents is associated with prevalent health risk behavior engagement. Media Literacy and eHealth Literacy are promising tools to promote the Health Literacy of adolescents and mitigate health risk behavior engagement.*

Marrs Room

5D STEM Practitioner Workshop

**Computational Thinking (CT): A future proof skill. Are you teaching it?**

*Lee Baird, SAM Labs Inc.*

*Did you know that of the 3.5 mi STEM jobs in 2025, roughly 2 mi will go unfilled due to unqualified candidates? We’ll introduce Computational Thinking, why it’s important & how SAM Labs is helping K-8 educators prepare their students to meet the demand of those 3.5 million STEM jobs. During this hands-on, minds-on session you’ll experience SAM Labs as a student, and you’ll see how our K-5 TEKS aligned content will transform your STEAM curriculum.*

Rio Room

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|--|------------------------|
| <p>5E Roundtable Discussion</p> <p><b>Promoting P-12 Student Success in STEM through the Arts</b><br/> <i>Xicoténcatl Martínez Ruiz, Alejandro Gallard Martínez</i></p> <p><i>Using educational poetics as a theoretical construct and a focus on the creative, imaginative, and poetic experiences in the STEM teaching-learning process. Educational poetics is rooted in the philosophical and aesthetic thought of South Asia.</i></p>   | <p>Valencia Room</p>   |
| <p>5F STEM Practitioner Workshop</p> <p><b>Vernier Probes in the STEM Classroom</b><br/> <i>David Carter, Vernier Instruments</i></p> <p><i>This session will provide hands-on activities on using Vernier equipment in secondary science and math classrooms.</i></p>   | <p>Royal 1</p>         |
| <p><b>Concurrent Session 6: 10:45 am – 11:45 am</b><br/> <b>Session Title</b></p>  | <p><b>Location</b></p> |
| <p>6A Diversity, Equity, and Inclusion</p> <p><b>The ABCs of Student Success and Persistence in General Chemistry &amp; Beyond</b><br/> <i>Bindhu Alappat, Saint Xavier University, Chicago</i></p> <p><i>For science majors, maintaining the pace in chemistry courses is essential for 4-year graduation. Earning a grade of D, F, or W in introductory general chemistry course could set back a semester (or a year) and then students must work much harder catch up. Even more troubling, they are less likely to retake the course, persist in STEM, and graduate from SXU. Interventions such as STEM peer mentoring, supplemental instruction, and tutoring when provided have shown a positive influence on student success far beyond their present coursework. In general chemistry courses where attentive professors noticed and addressed issues early on by connecting students to support interventions indicated a significant decrease in DFW grades. Students who were encouraged to seek out tutoring, met with peer mentors, and/or attended supplemental instruction were more likely to earn a grade of A, B, or C in General Chemistry. Specifically, peer mentoring helped students not only to do better in this course but helped them improve their study skills and note taking abilities. There is a direct correlation between the number of students who earned an A, B, or C in their first-year chemistry course to success in their future chemistry courses, and the number of degrees earned at SXU. These interventions have also shown improved STEM persistence as reflected in an increased number of STEM degrees earned.</i></p> | <p>Royal 1</p>         |

6B Panel Discussion

**High School Student Ambassadors Roundtable Discussion**

- Lluvia Garcia, La Joya ISD*
- Genesis Lopez, La Joya ISD*
- Angel Lopez Caudillo, La Joya ISD*
- Yhair Matamoros, La Joya ISD*
- Eliseo Moreno, La Joya ISD*
- Sebastian Segovia, La Joya ISD*
- Emmanuel Matamoros, La Joya ISD*
- Adrian Suarez, La Joya ISD*
- Vanessa Aguilar, La Joya ISD*
- Adrian Canales, La Joya ISD*
- Angela Gonzalez, La Joya ISD*
- Raul Gonzalez, La Joya ISD*
- Angel Solano, La Joya ISD*
- Emily Solis, La Joya ISD*
- Erick Pena, La Joya ISD*
- Jandri Perez, La Joya ISD*
- Anabell Raya, La Joya iSD*
- Agustin Lara, Vanguard Academy*
- Josh Reyna Vanguard Academy*

*High school students from La Joya ISD and Vanguard Academy will share their experience in the JSTEM Summer Program and perspective on learning in math and science classrooms.*

Royal 2

6C STEM Practitioner Workshop

**STEAMing the Way to a Successful Future!**

*Michelle Cline, Detroit Public Schools*

*STEM or STEAM education is fun and exciting and can be challenging in the K-12 Classroom. This session will explore the use of Breakoutedu and CSI formats to share STEAM investigations with students of all ages in formal or informal educational settings. These investigations focus on the soft skills needed for success as well as content specific information.*

Rio Room

6D Contextual Factors Affecting Learning in STEM

**Using Mixed-Reality Simulation in the Preparation of Pre-Service Mathematics Teachers**

*Jair Aguilar, University of Texas Rio Grande Valley*

*The Use of Mixed-Reality Simulation (MRS) has emerged as a technological tool intended to help improve the learning experiences of students. In this session, the researcher presents how MRSs are implemented to enhance the*

Ruby Room

*learning of high- leverage practices of Pre-service mathematics teachers.*

**Seeing Yourself in a STEM Career: How Attending STEM Summer Camp Can Inspire Students**

*Elisabeth M. Krimbrill, Texas A&M University – San Antonio  
Bonnie Baskin, The Science Mill*

*Rural and underserved populations of students are often unable to envision themselves in a STEM career for a variety of reasons including lack of access to quality STEM programs, little exposure to individuals from similar backgrounds in STEM careers, and limited knowledge of career pathways and opportunities.*

6E STEM Practitioner Workshop

**Visual Literacy in the Content Area – the Need is Real!**

*Milt Huling, Polk State College*

*With over 80% of questions on recent STAAR exams containing pictures, tables, and models, are your students prepared? In this interactive session, best practices for helping students to unlock this critical information will be discussed and practiced. During the session, participants will be engaged in analyzing actual released STAAR assessments.*

Valencia Room

6F Diversity, Equity, and Inclusion

**Using Autoethnographies in a Community of Practice to Implement Social Justice and Develop STEM Teacher Agency**

*Discussants: Anthony Bailey and Ariana Garza*

*During this dialogic session, Ariana and Anthony will share their experience participating in an autoethnographic community of practice, how this led to their conscientization and development of teacher agency. They will discuss how they enact agency in their classrooms, limit situations, and addressing inequitable practices that can contribute to the marginalization of females and students of color.*

Marrs Room

## **Closing Plenary Session**

12:00 pm – 1:30 pm

Dr. Xicoténcatl Martínez Ruiz, introduced by Dr. Patricia Álvarez McHatton

### **Why an “A” matters in STEM+A? The role of educational poetics and disruption in our future**

Dr. Martínez Ruiz will address a global question: why are we teaching youth that science education, skills and subjects are separate to most human goals expressed by arts and creativity? He will discuss the relation, dialogues and disruptions between STEM and the humanizing and constructive role of art, the experience of creative contemplation and the agenda of positive peace in the world. That relationship is understood as priority, not only for today’s pedagogies on science education but also for contemporary societies. STEM education is one of the key issues that can build a more sustainable and environmental peace that cultivates non-violence. Thus, there is a central role of transformative practices in confronting the risks that contain great dangers for the future of human race. Within the word poetics lies the set of practices along with the concept of creation and artistic creativity (*poiesis*), and disruption in cognitive development of students facing a future with many risks.

1:30 pm – 2:00 pm      Closing remarks, recognitions, next steps

2:30 – 4:00 pm      Advisory Board Meeting, Closed Session

