

Welcome

9:15 am-9:30 am
Real-time/ live
Eileen Parsons, NARST President

Plenary Session

Title: Beyond Buzzwords: Reimagining the Default Settings of Science & Society

9:30 am-11:00 am
Real-time/ live

Presiders:

Terrell Morton, University of Missouri
Beth Covitt, University of Montana
Alison Cullinane, University of Oxford

Keynote Presenter: Ruha Benjamin, Princeton University

Abstract: From everyday apps to complex algorithms, data science and technology have the potential to hide, speed, and deepen discrimination, while appearing neutral and even benevolent when compared to racist practices of a previous era. In this talk, Ruha Benjamin explores a range of discriminatory designs that encode inequity -- what she terms the "New Jim Code." This presentation takes us into the world of biased bots, altruistic algorithms, and their many entanglements, and provides conceptual tools to decode tech promises with historical and sociological insight. In so doing, Ruha will also focus on the role of STEM education as the ground zero for reimagining and retooling the default settings of science, technology, and society.

Award 2020 & 2021 DCRA Citations

11:00 am- 11:30 am
President: Noemi Waight, University of Buffalo

LUNCH BREAK (on your own)
11:30am -12:30pm

Networking / Social Sessions

12:30pm -1:30 pm
Real-time/ live

Research Interest Groups (RIGs) Meetings

Continental and Diasporic Africa in Science Education (CADASE)

12:30pm – 1:30pm
Real-time/ live

Contemporary Methods for Science Education Research

12:30pm – 1:30pm
Real-time/ live

Concurrent Session # 1 (Format: Real Time / Live)
1:45 pm-3:15 pm

Administrative Sponsored Session
Strand 11: Cultural, Social, and Gender Issues

Engaging Science Education Research and Praxis for the Good of the "Public" Amid Global Pandemics

1:45 pm -3:15 pm
Real time/ live

Presenters:

Bryan Brown, Stanford University
Angela Calabrese-Barton, University of Michigan
Natalie King, Georgia State University
Okhee Lee, New York University
Jomo Mutege, Indiana University, IUPUI
Vanessa Grady, Georgia State University
Laura Peña, Georgia State University
Elizabeth Davis, University of Michigan
Leslie Herrenkohl, University of Michigan
Day Greenberg, Michigan State University

Administrative Sponsored Session
Graduate Student Committee

Graduate Student Research Symposium

1:45pm-3:15pm
Real time/ live / posters

Presiders:

Christa Haverly, Northwestern University
Kathryn Green, University of Georgia
Melanie Kinskey, Sam Houston State University
Theila Smith, University of Groningen
Timothy Klavon, Temple University
Lindsay Lightner, Washington State University
Jessica Karch, University of Massachusetts Boston
Chelsea Sexton, University of Georgia
Klaudja Causi, University of Massachusetts – Boston
Ayca Fackler, University of Georgia

Effects of preservice biology teachers' conceptions of purpose on engagement of learners' funds of knowledge

Matthew Shackley, UC Santa Barbara

Engaging in Sensemaking For Equity: STEM Teacher Professional Development in Core Practices

Karen Woodruff, Monclair State University

Investigating Perceptions, Experiences, and Collectivism within Interdisciplinary Collaborations: A National Survey

Katie McCance, NC State University

The Girl Boat: Shifting marginalized Mexican students' identities, participation, and agency through community conservation

Kelsie Fowler, University of Washington

Opportunities for Sense-Making in Science for Students with Learning Disabilities/Difficulties: A Mixed Methods Study

Rachel Juergensen, University of Missouri Columbia

Towards a Conceptual Profile of Chemical Control

Klaudja Causi, University of Massachusetts Boston

Biology Methods: A Course in Need of a Catalogue

Cole Entress, Columbia University

A Portrait of Identity and Context: Manifestation of Postsecondary STEM Teaching

Sule Aksoy, Syracuse University

Going Virtual: Underrepresented Student Experiences in a Virtual Computing Camp

Kristina Kramarczuk, University of Maryland, College Park

Intersectionality of Black Male College Students: Their Science Identity, Science Learning, and Science Profession Decisions

Regina McCurdy, University of Central Florida

An Investigation of Undergraduate Students' Spatial Thinking about Groundwater

Holly White, University of Nebraska Lincoln

Tracking elementary pre-service teachers' teaching efficacy and attitudes towards STEM after engagement with nanotechnology basics

Martyna Laszcz, University of Massachusetts Boston

Elementary Teachers' Verbal Support of Disciplinary Integration in an NGSS-Aligned Unit

Sarah Lilly, University of Virginia

Exploring Epistemic Practices of Middle School Students in Collaborative Contexts

Ramya Sivaraj, University of Minnesota

Informal Education Outreach to Combat Deficit SciComm Training in University STEM Students

Brenda Guerrero, Florida International University

How Do Young Children Learn Science through Narrative, Embodiment, and Play?

Kyungjin Cho, Pennsylvania State University

An Exploration of Urban Latinx Youth Growth Mindsets in a Middle School Science Classroom

Mark Waka, University of Buffalo

What are the sources of teaching self-efficacy for international graduate students? A survey study

Zhigang Jia, Middle Tennessee State University

Administrative Sponsored Session Indigenous Science Knowledge Research Interest Group

Science Education, a Public Good for the Good of the Public? Contributing Indigenous Methodologies to Teaching, Learning and Research

1:45pm-3:15pm

Real time/ live

Presenters:

Julie Robinson, University of North Dakota

Joshua Hunter, University of North Dakota

Bonni Gourneau, University of North Dakota

Anna Bahnson, United Tribes Technical College

Pauline Chinn, University of Hawai'i at Manoa

Dinesh Gautam, Shree Jagadamba Higher Secondary School

Yun-Ciao Wang, National Museum of Marine Biology and Aquarium

Bhaskar Upadhyay, University of Minnesota

Paichi Shein, National Sun Yat-sen University

Peresang Sukinarhimi, Rukai Cultural Museum of the Indigenous People Cultural Development Center

Strand 1: Science Learning: Development of Student Understanding

Ethics and Decision-Making in Science Education

1:45 pm -3:15 pm

Real time/ live

President: Amy Farris, Pennsylvania State University

Developing and Using Multiple Models to Promote Scientific Literacy

Li Ke, University of North Carolina at Chapel Hill

Troy Sadler, University of North Carolina at Chapel Hill

Laura Zangori, University of Missouri-Columbia

Patricia Friedrichsen, University of Missouri-Columbia

Consideration of participatory ethics when eliciting etic and emic perspectives of learning

Sarah Frodsham, Oxford Brookes University

Deb McGregor, Oxford Brookes University

Defining Skills Required in the Decision-Making Process around Socioscientific Issues

Caitlin Kirby, University of Nebraska-Lincoln

Amanda Sorensen, Michigan State University

Jenny Dauer, University of Nebraska—Lincoln

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Contexts, Characteristics, and Interactions in Science Education

1:45 pm -3:15 pm

Real time/ live

President: Susanna Hapgood, University of Toledo

Sounds of Science Sensemaking: Interrogating the Norms of Learning Spaces with Acoustemology and Critical Frames

Michelle Brown, Pennsylvania State University

Frances Nebus Bose, Pennsylvania State University

Carla Zembal-Saul, Pennsylvania State University

The Influence of Teacher Questioning Approaches on Students' Productive Thinking

Anne Emerson Leak, High Point University

Corrie Bruce, High Point University

Selcen Guzey, Purdue University

Defining the Future and Standing Apart: Opportunity Structures at an Urban, Inclusive STEM-Focused High School

Jennifer Tripp, University of Buffalo

Noemi Waight, University of Buffalo

What's the Point?: Student Perspectives on Computation in Physics Class

Paul Hamerski, Michigan State University

Daryl McPadden, Michigan State University

Marcos Caballero, Michigan State University

Paul Irving, Michigan State University

Strand 3: Science Teaching—Primary School (Grades preK-6)

Engaging Young Children in Science and Engineering Practices: A Conversation about Approaches to Research and Design

1:45 pm -3:15 pm

Real time/ live

Dance-STEP: Collective Embodied Science Models and the Particulate Nature of Matter

Chris Georgen, Boston University

Using Iterative Co-Design to Develop Classroom Empirical Activity

Eve Manz, Boston University

Betsy Beckert, Boston University

Kindergarten Playground Collisions: Reconceptualizing Gravity as a Necessary Intellectual Resource

Michelle Salgado, University of Washington

David Phelps, University of Washington

Considerations when Engaging Young Learners in Scientific Modeling for Sense-making

Christina Schwarz, Michigan State University

Eve Manz, Boston University

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

Curricular Sensemaking and Implementation

1:45 pm -3:15 pm

Real time/ live

President: Magdeline Stephen, University of Witwatersrand

Changing Teacher Practice at Scale through Instructional Routines: Findings from a Field Test of High School Materials

Kiran Purohit, New Visions for Public Schools

Elizabeth Chatham, New Visions for Public Schools

Teacher planning for epistemic agency in discussion-based, storyline unit lessons

Kevin Cherbow, Boston College

Katherine McNeill, Boston College

Secondary Science Teachers Implementation of a Curricular Intervention when Teaching with Global Climate Models

Kimberly C Steward, University of Nebraska – Lincoln

Devarati Bhattacharya, University of Nebraska – Lincoln

Cory Forbes, University of Nebraska – Lincoln

Mark Chandler, Columbia University

3D Alignment Between Curriculum and Assessments Matters: Results from a New Genetics Curriculum Field Test

Ann Lambert, University of Utah

Dina Drita-Esser, University of Utah

Sheila Homburger, University of Utah

Kristin Fenker, University of Utah

Molly Malone, University of Utah

Louisa Stark, University of Utah

Strand 5: College Science Teaching and Learning (Grades 13-20)

Intersection of Socio-cultural factors and college STEM

1:45 pm -3:15 pm

Real time/ live

President: Andy Cavagnetto, Washington State University

BioTAP: Barriers and Supports to Conducting Science Education Research on Graduate Student Teaching Development Practices

Grant Gardner, Middle Tennessee State University

Judith Ridgway, Ohio State University

Gili Marbach-Ad, University of Maryland

Kristen Miller, University of Georgia

Elisabeth Schussler, University of Tennessee

Knoxville

Facilitating First-Generation College Student Persistence in STEM Majors

Lisa Marco-Bujosa, Villanova University

Lauren Baker, Villanova University

Using Cultural-Historical Activity Theory to Understand an Interdisciplinary Team's Co-Development of High School Lab Activities

Katherine McCance, North Carolina State University

Stephanie Teeter, North Carolina State University

Margaret Blanchard, North Carolina State University

Richard Vanditti, North Carolina State University

Productive Patterns of Overcoming Struggle During Undergraduate Chemistry Laboratory Activities

Clarissa Keen, University of Massachusetts Boston

Hannah Sevan, University of Massachusetts Boston

Strand 6: Science Learning in Informal Contexts

Youth Centered Informal Science

1:45 pm -3:15 pm

Real time/ live

President: Ngozi Okafor, University of Lagos

A Mixed Methods Study of Youths' STEM Interests in an After-School Club

Deena Gould, University of New Mexico

Ian Gould, Arizona State University

The Design and Development of a Youth-Centered Art-Science Program

Megan McKinley-Hicks, Boston College

Michael Barnett, Boston College

Helen Zhang, Boston College

Ariella Suchow, Boston College

Adding narrative elements to engineering activities evokes empathy and supports girls' use of engineering practices

Susan Letourneau, New York Hall of Science

Dorothy Bennett, New York Hall of Science

ChangChia Liu, New York Hall of Science

Yessenia Argudo, New York Hall of Science

Dana Schloss, New York Hall of Science

Amelia Merker, New York Hall of Science

Satbir Multani, New York Hall of Science

Katherine Culp, New York Hall of Science

Hearing the Engineering in Children's Talk

Ron Skinner, The Wolf Museum of Exploration + Innovation

Danielle Harlow, University of California at Santa Barbara

Alexandria Muller, University of California at Santa Barbara

Strand 7: Pre-service Science Teacher Education

Equity-driven approaches among pre-service teachers

1:45 pm -3:15 pm

Real time/ live

Presider: Scott Cohen, Georgia State University

Examining Relevance in Pre-service Science Teacher Lesson Plans

Kirby Whittington, Gooru.Org

Sherry Southerland, Florida State University

Miray Tekkumru Kisa, Florida State University

Pre-Service Science Teachers' Development of Equitable and Just Approaches to Practice in University Methods Coursework

Rachel Gordon, University of Michigan

'Staying with the Trouble': Praxis Crisis in Science Teacher Education for Emergent Bilingual Learners

Sara Tolbert, Te Whare Wananga O Waitaha

University of Canterbury

Caroline Spurgin, University of California- Santa Cruz

Doris Ash, University of California- Santa Cruz

"Others have it, why can't they?" Leveraging collaborative inquiry in science teacher education

Christina Macias, California State University- Fresno

Myunghwan Shin, California State University- Fresno

Strand 8: In-service Science Teacher Education

Approaches to PD Supporting Teacher Learning

1:45 pm -3:15 pm

Real time/ live

Presider: Elizabeth Lewis, University of Nebraska–Lincoln

Comparing Contexts for Professional Development: Student Work Analysis and Video Club

Heather Johnson, Vanderbilt University

Andrea Henrie, Vanderbilt University

Bethany Daniel, Vanderbilt University

Ashlyn Pierson, Ohio State University

Danielle Kiefert, University of North Texas

Elementary Science Teachers' Purposes and Practices for Connecting Multiple Representations

Ashlyn Pierson, Ohio State University

Danielle Kiefert, University of North Texas

Sarah Lee, Vanderbilt University

Heather Johnson, Vanderbilt University

Andrea Henrie, Vanderbilt University

Supporting Science Instruction with Vertical Teams: Teachers' Perceptions of Mixed Grade-Band Professional Learning Communities

Daniel Pimentel, Stanford University

Tammy Moriarty, Stanford University

Janet Carlson, Stanford University

Preparing Science Educators for Contextualized Instruction

Kassandra L'Heureux, Université de Sherbrooke

Michael Giamellaro, Oregon State University

Marie-Claude Beaudry, Université de Sherbrooke

Jean-Philippe Ayotte-Beaudet, Université de Sherbrooke

Cory Buxton, Oregon State University

Talal Alajmi, Oregon State University

Strand 10: Curriculum and Assessment

NGSS aligned assessment and instruction

1:45 pm -3:15 pm

Real time/ live

Presenter: Marcus Kubsch, IPN - Leibniz Institute for Science and Mathematics Education

Noticing-Sensemaking-Modeling: A Framework for the Crosscutting Concepts

Lori Andersen, University of Hawaii at Manoa

A Three-Dimensional Integrated Learning Progression and Aligned Assessments to Monitor Middle School Student Proficiency of Energy, Modeling and Cause and Effect

Namsu Shin, Michigan State University

Peng He, Michigan State University

Tingting Li, CREATE for STEM Institute

Joseph Krajcik, Michigan State University

Bridging the Gap: Evaluating a Design Approach for Curriculum-neutral NGSS Benchmark Assessments in Middle School

Maia Binding, UC Berkeley - Lawrence Hall of Science

Lauren Brodsky, UC Berkeley - Lawrence Hall of

Science

Validating a Claim-Evidence-Science Idea-Reasoning (CESR) Framework for use in NGSS assessment Tasks

Joseph Hardcastle, American Association for the Advancement of Science

Carey Hermann Abell, BSCS Science Learning

George De Boer, American Association for the Advancement of Science

Strand 11: Cultural, Social, and Gender Issues

Science Identity

1:45 pm -3:15 pm

Real time/ live

Presenter: Terrell Morton, University of Missouri-Columbia

Figured Worlds of Successful Women in Science During Their School Years

Jonathan Hall, University of West Florida

Novice to Expert: Science Identity Development in Academically Proficient Students at an HBCU

Karen Marshall, Oakwood University

Carmen Bucknor, Oakwood University

Sylvia James, National Science Foundation

Christyn Byrd, Oakwood University

Tatiana Fowler, Oakwood University

Promoting Scientific Literacy for All in the Classroom

Gianna Lopez-Colson, University of Texas Rio Grande Valley

Miriam Ortiz, University of Texas Rio Grande Valley

Afterschool STEM Program as a Transformative Space for Teachers to Support Relationship Building with Students

Ti'Era Worsely, University of North Carolina - Greensboro

Sara Heredia, University of North Carolina - Greensboro

Strand 12: Technology for Teaching, Learning, and Research

Reconstructing Reality through Simulations to Enable Classroom Enactment of Science Practices

1:45 pm -3:15 pm

Real time/ live

Presider: Hee-Sun Lee, The Concord Consortium

Discussant: Scott McDonald, Pennsylvania State University

Presenters:

Hee-Sun Lee, The Concord Consortium

Scott McDonald, Pennsylvania State University

Amy Pallant, The Concord Consortium

Chris Lore, The Concord Consortium

Jie Chao, The Concord Consortium

Gey-Hong Gweon, Physics Front

Charles Conner, University of South Florida

Trudi Lord, The Concord Consortium

Lisa Hardy, The Concord Consortium

Strand 13: History, Philosophy, Sociology, and Nature of Science

Socioscientific Issues

1:45 pm -3:15 pm

Real time/ live

Presider: Shaghig Chaparian, American University of Beirut

University Biology Students' Pandemic Decisions: The Role of COVID-19 Science Beliefs and Sociocultural Membership

Benjamin Herman, Texas A&M University

Michael Clough, Texas A&M University

Asha Rao, Texas A&M University

Joanne Olson, Texas A&M University

Alister Olson, Texas A&M University

Alex Sobota, Texas A&M University

Sarah Poor, Texas A&M University

Exploring Undergraduates' Breadth of Socio-Scientific Reasoning through Domains of Knowledge

David Owens, Georgia Southern University

Troy Sadler, University of North Carolina at Chapel Hill

Destini Petitt, University of Nebraska-Lincoln

Corey Forbes, University of Nebraska-Lincoln

Changes in NOS Understandings after Engaging in Reflective Discussions and Information Evaluation about Socioscientific Issues

Shaghig Chaparian, American University of Beirut

Saouma Boujaoude, American University of Beirut

Reviving the Orchard: Visions of Reclaiming Science Education for Nicaragua

Kelsie Fowler, University of Washington

Strand 14: Environmental Education and Sustainability

Sociocultural and Situated Perspectives of Environmental Science Education

1:45 pm -3:15 pm

Real time/ live

Presider: Tamara Pfeffer, Pennsylvania Department of Education

An Inclusive Model of Theoretical Rigor in Environmental Education

Roberta Hunter, Michigan State University

Gail Richmond, Michigan State University

Productive Disciplinary Engagement in Three-Dimensional Agriscience Instruction

Craig Kohn, Michigan State University

A Situated Learning Approach for Designing and Implementation Educational Escape Games about Healthy Nutrition

Tal Yachin, Technion Israel Institute of Technology

Miri Barak, Technion Israel Institute of Technology

Environmental science curriculum development in local communities: A 'Cultural Historical Activity Theory perspective

Xavier Fazio, Brock University

Strand 15: Policy, Reform, and Program Evaluation

Science teacher resiliency, commitments, and disciplinary sense-making within complex systems

1:45 pm -3:15 pm

Real time/ live

Presider: Kathryn Bateman, Temple University

Self-Efficacy and Commitment of Mid and Late Career High School Science Teachers

Dorothy Holley, West Johnston High School

Soonhye Park, North Carolina State University

Disciplinary Conflation in Integrated Science and Engineering

Jacob Pleasants, Keene State College

Iliana De La Cruz, Texas A&M University

Are the best and brightest high school students interested in science or mathematics teaching careers?

Travis Fuchs, The University of British Columbia

Gerhard Sonnert, Harvard Smithsonian

Sandra Scott, The University of British Columbia

Philip Sadler, Harvard Smithsonian

Perceptions of Coherence: Learning About Systems and Structures Through Participatory Redesign and Implementation

William Lindsay, University of Colorado Boulder

**3:30 pm-5:00 pm (Real time/
Live)**

Administrative Sponsored Session Graduate Student Committee

Graduate Student Forum

3:30 pm- 5:00 pm
Real time / live

The forum aims to guide and encourage beginning researchers by discussing the various parts of a graduate career, including getting involved in NARST, completing the dissertation, or searching for a position. Attendees of the forum are given the opportunity to participate in discussions with experienced colleagues on matters of academic and career interest.

**5:00 pm-6:00 pm (Real time/
Live)**

Administrative Sponsored Session Membership Committee

Mentor-Mentee Nexus

5:00 pm- 6:00 pm
Real-time/ live

Presiders: ReAnna Roby, Vanderbilt University
Shirly Avargil, Technion Israel Institute of Technology
Sule Aksoy, Syracuse University

This session serves as a context for those first-time attendees, or those relatively new, to NARST (i.e. Mentee) to interact with more experienced NARST members (i.e. Mentor). Session leaders facilitate the introduction of mentors and mentees by identifying and matching interested parties and creating an environment that supports communication among mentors and mentees.

6:00 pm-until (Real time/ Live)

NETWORKING/ SOCIAL SESSIONS

6:00 pm-until
Real Time/ Live

Thursday 8:00am through Friday 7:00am

Poster Session #1

Posters are available for viewing for a 23-hour window for asynchronous interactions. Attendees can view the poster at the indicated link and post comments to which the presenter may respond. The posters in Session 1 will become inactive and inaccessible after Friday, 7:00 am. For a complete listing of Thursday's posters, please refer to the end of the Thursday schedule.

Author-scheduled 30-minute Q&A sessions

Presenters will pre-record their presentations. Attendees will view the recorded presentations in advance of the Q&A session. Presenters will schedule a 30-minute block (like "office hours") on a sign-up sheet in advance of the conference. The scheduled time will be listed in the conference program.

6:30am-8:00am Real time/ Live

Administrative Sponsored Session International Committee

Promoting an International Agenda for Research and Science Teacher Education to Improve Science and Special Education

6:30am-8:00am
Real time/ live

Presenters:

Sonya Martin, Seoul National University
Ileana Greca, Universidad de Burgos
Eva Silfver, Umeå University, Sweden
Ying-Ting Chiu, The Ohio State University
Da Yeon Kang, Seoul National University
Sungmin Im, Daegu University
Daniel Cha, Daegu University
Scott Cohen, Georgia State University
Patrick Enderle, Georgia State University
Renee Schwartz, Georgia State University

Concurrent Session # 2 (Real Time / Live)
8:00am -9:30am

**Administrative Sponsored Session
Awards Committee**

***DCRA: On a Continuum of the Professional Scholarly
Trajectories in Science Education: The Urgent
Questions for the Next Generation of Science
Education Research***

8:00am-9:30am

Real time/ live

Presenters:

Noemi Waight, University at Buffalo

**Strand 1: Science Learning: Development
of Student Understanding**

Science Learning through Modeling

8:00am-9:30am

Real time/ Live

President: Sharona Levy, University of Haifa

**Modeling-based Inquiry Instruction for promoting
10th graders' modeling competence and conceptual
understanding of the Periodic Table**

Mei-Hung Chiu, National Taiwan Normal University

Mao-Ren Zeng, National Taiwan Normal University

Taipei Municipal Dazhi High School

Shiao-Lan Chung, New Taipei Municipal New Taipei

Senior High School, Sanchong District

Jing-Ping Jong, New Taipei Municipal Jinhe High

School, Zhonghe District

**Enhancing Student Modeling within an Integrated
Chemistry and Earth Science Curriculum**

Jonathan Grooms, George Washington University

Kevin Fleming, George Washington University

Alan Berkowitz, Cary Institute of Ecosystem Studies

Bess Caplan, Cary Institute of Ecosystem Studies

**Climate Education in Secondary Science:
Comparison of Model-Based and Non-Model- Based
Investigations of Global Climate Data**

Devarati Bhattacharya, University of Nebraska

Kimberly Carroll Steward, University of Nebraska -
Lincoln

Corey Forbes, University of Nebraska – Lincoln

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Community & Social Factors in Identity, Motivation, and Learning

8:00am-9:30am

Real time/ Live

Presenter: Cesar Delgado, North Carolina State University

Factors Contributing to Career Aspirations: Access to Science Resources and People

Gail Jones, North Carolina State University

Katherine Chesnutt, North Carolina State University

Megan Ennes, University of Florida

Emily Cayton, Campbell University

Health in Our Hands: A community-inspired project-based learning approach to support social and emotional learning

Idit Adler, Tel Aviv University

Consuelo Morales, Michigan State University

Irene Bayer, Michigan State University

Tali Tal, Technion Israel Institute of Technology

Joseph Krajcik, Michigan State University

Gender Differences in STEM Classroom Emotional

Felicity McLure, Curtin University

Barry Fraser, Curtin University

Rekha Koul, Curtin University

Capturing Chemical Control Speaking, Thinking and Doing

Klaudja Caushi, University of Massachusetts – Boston

Hannah Sevan, University of Massachusetts – Boston

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Studying Contestations of Hegemonic Science Education as Public Good

8:00am -9:30am

Real time/ live

Rejecting Narrow Definitions: Reimagining Equitable Science Classroom Discourse

Enrique Suarez, University of Massachusetts – Amherst

Children's Play in Making as Contestations and Moves to Sociopolitical Elsewhere(s)

Natalie Davis, Georgia State University

Shirin Vossoughi, Northwestern University

Repurposing the Physics Classroom for Environmental Justice

Jasmine Jones, University of Illinois at Chicago

Co-designing Professional Development to Support Science Teachers Transdisciplinary Learning

Daniel Morales-Doyle, University of Illinois at Chicago

Alejandra Frausto, Chicago Public Schools

Mindy Chappell, University of Illinois at Chicago

Tiffany Childress Price, University of Illinois at Chicago

Abel Farias, University of Illinois at Chicago

Strand 3: Science Teaching—Primary School (Grades preK-6)

Engaging Students in Science and Engineering Practices

8:00am-9:30am

Real time/ Live

Presenter: Anna Arias, Kennesaw State University

Teaching evolution in a 5th grade Spanish classroom: "Why do we have different skin colours?"

Lucia Vazquez-Ben, Universidade da Coruña

Anxela Bugallo-Rodriguez, Universidade da Coruña

An Exploratory Study on Computational Thinking in Elementary Science

Jennifer Pietros, University of Rhode Island

Sara Sweetman, University of Rhode Island

Elementary Teachers' Verbal Supports Across Science, Engineering, and Computer Science Disciplines in an NGSS-Aligned Unit

Sarah Lilly, University of Virginia

Anne McAlister, University of Virginia

Sarah Fick, Washington State University

Jennifer Chiu, University of Virginia

Implementation of NGSS Scientific Practices in Elementary Science Classrooms: A Comparative Study of Video Analysis

Peter Hu, University of Pittsburgh

Ling Liang, La Salle University

Ying-Chih Chen, Arizona State University

Takeshi Terada, Arizona State University

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

Model-based Teaching and Learning

8:00am-9:30am

Real time/ Live

Presenter: Zac Patterson, The Ohio State University

High School Science Teachers' Integration of Computational Thinking into Data Practices to Support Student Investigations

Erin Peters-Burton, George Mason University

Peter Rich, Brigham Young University

Laura Laclede, George Mason University

Stephanie Stehle, George Mason University

Anastasia Kitsantas, George Mason University

Timothy Cleary, Rutgers University

A Preliminary Study to Explore In-Service Science Teachers Assessment Literacy in MBT

Alexis Gonzalez-Donoso, University of British Columbia

Samia Khan, University of British Columbia

Engaging secondary school students in model-based reasoning for conceptual understanding

Shingo Uchinokura, Kagoshima University

Scientific Simulations as Educational Tools for the Post-Pandemic Era: the Case of the Susceptible-Infectious-Removed Model

Eleonora Barelli, University of Bologna

Olivia Levrini, University of Bologna

Strand 5: College Science Teaching and Learning (Grades 13-20)

Scaffolding and Support for College STEM Learning

8:00am-9:30am

Real time/ Live

President: Robert Idsardi, Eastern Washington University

Vygotskian professional development for biology instructors focusing on student thinking

Sophia (Sun Kyung) Jeong, The Ohio State University
Jakayla Clyburn, University of North Carolina at Greensboro

Paula Lemons, University of Georgia

Mentoring early-year undergraduate researchers:

Structures and support mechanisms

Gaye Ceyhan, Bogazici University

John Tillotson, Syracuse University

A Framework Situating Failure in Developing Scientific Understanding: Investigating Students' Scientific Failures in Undergraduate Research

Sandhya Krishnan, University of Georgia

Investigating the Relationship Between Self-Efficacy and Approach to Teaching in Undergraduate and Graduate Teaching Assistants

Cody Smith, University of Nebraska-Lincoln

Annette Wierzbicki, University of Nebraska-Lincoln

Jenny Dauer, University of Nebraska-Lincoln

Strand 6: Science Learning in Informal Contexts

From 'Physical to Digital': How institutions of informal science education adapt to an online presence during the COVID-19 crisis (and beyond)

8:00am-9:30am

Real time/ Live

President: Neta Shaby, Ben Gurion University of the Negev

Discussant: Ran Peleg, University of Southampton

Presenters:

Ran Peleg, University of Southampton

Neta Shaby, Ben Gurion University of the Negev

Carys Hughes, University of Southampton

Sarah Funk, Science Center Network

Claudia Sodini, K-productions

Nancy Staus, Oregon State University

Victoria Bonebrake, University of Washington

Ann Astroga, University of Washington

Elena Janniello, Università di Pisa

Antonella Gioli, Università di Pisa

Strand 7: Pre-service Science Teacher Education

Making a Case for Emphasizing Modeling and Engineering

8:00am-9:30am

Real time/ Live

President: Jianlan Wang, Texas Tech University

Results of Elementary Preservice Teachers' Promotion of Norms of Interaction for Engineering Design

Elaine Silva Mangiante, Salve Regina University

Kaitlin Gabriele-Black, Salve Regina University

Developing Preservice Science Teachers' Conceptions of Engineer and Engineering through an Elective STEM Course

Nilay Ozturk, Kirsehir Ahi Evran University

Meltem Irmak, Gazi University

Preservice Elementary Teachers Making Sense of Scientific Modeling: A Longitudinal Study

Adam Bennion, University of Michigan

Elizabeth Davis, University of Michigan

Dimensions of modeling: Knowledge, practice and product

Maximillian Göhner, Freie Universität Berlin

Tom Bielik, Freie Universität Berlin

Moritz Krell, Freie Universität Berlin

Strand 8: In-service Science Teacher Education

Curriculum and Assessment

8:00am -9:30am

Real time/live

President: Ashley Iveland, WestEd

Assessment for Learning: High School Science Teachers' Performance Assessment Practices during Integrated Science Teaching

Nam-Hwa Kang, Korea National University of Education

Impact of Scoring the Illinois Science Assessment on K-12 Science Teachers' Practices

Senetta Bancroft, Southern Illinois University Carbondale

Harvey Henson, Southern Illinois University Carbondale

Daniel Brown, Illinois State Board of Education

Angela Box, Southern Illinois University-Carbondale

Yanyan Sheng, University of Chicago

Jennifer Rhodes, Southern Illinois University-Carbondale

Growth in STEM Teachers' Formative Assessment Practices as Teachers Remain in High-Need Districts

Shahar Abramvotich, University of Massachusetts Boston

Hannah Sevan, University of Massachusetts Boston

Expectations Regarding Students' Knowledge and Teachers' Content Knowledge in Particle Physics: A Comparative Study

Anja Kranjc Horvat, CERN & University of Potsdam

Gerfried Wiener, CERN

Sascha Schmeling, CERN

Andreas Borowski, University of Potsdam

Strand 10: Curriculum and Assessment

Learning progression assessments and teachers' classroom enactments of curricula

8:00am-9:30am

Real time/ Live

Presenter: Joseph Krajcik, Michigan State University

Discussant: Knut Neumann, Leibniz Institute for Science and Mathematics Education (IPN)

Presenters:

Elon Langbeheim, Ben-Gurion University of the Negev

David Fortus, Weizmann Institute of Science

Jeffery Nordine, Leibniz Institute for Science and Mathematics Education (IPN)

Knut Neumann, Leibniz Institute for Science and Mathematics Education (IPN)

Joseph Krajcik, Michigan State University

Hui Jin, Educational Testing Service

Hyo-Jeong Shin, Educational Testing Service

Dante Cisterna, Educational Testing Service

Erin Furtak, University of Colorado

Clarissa Deverel-Rico, University of Colorado-Boulder

Strand 11: Cultural, Social, and Gender Issues

Context, gender, and guidance

8:00am-9:30am

Real time/ Live

Presenter: Charnell Long, University of Wisconsin-Madison

Connections between negative academic experiences and the impostor phenomenon in STEM

Devasmita Chakraverty, Indian Institute of Management, Ahmedabad

Can the Culturo-Techno-Contextual Approach (CTCA) Dissolve the Barriers of African Students to Learning Difficult Concepts in Biology?

Peter Okebukola, Lagos State University

Franklin Onowugbeda, Lagos State University

Oluseyi Ajayi, Lagos State University

Tokunbo Odekeye, Lagos State University

Deborah Agbanimu, Lagos State University

Esther Peter, Lagos State University

Aderonke Ebisin, Lagos State University

Fred Awaah, University of Professional Studies Accra

Exploring Gender Issues in Higher Secondary Science Classroom

Mohammad Siddique, University of Dhaka

Anina Mahmud, University of Dhaka

How Biology and Physics Faculty Guide Female and URM Faculty toward Leadership, Research, and Teaching

Eugene Judson, Arizona State University

Lydia Ross, Arizona State University

Strand 12: Technology for Teaching, Learning, and Research

Modeling Tools that Support Thinking and Learning

8:00am-9:30am

Real time/ Live

Presider: Megan Silander, Center for Children and Technology

Using Automated Feedback to Engage Students in Discourse-Rich Modeling Practices

Kihyun Ryoo, University of North Carolina-Chapel Hill

The World as a Lab: Real-life Data in STEM Projects

Lutz Kasper, University of Education Schwabach Gmuend

Patrik Vogt, Institute of Teacher Training, Mainz

Students' development of mental models when constructing particle-based computational models of electric conductors

Elon Langbeheim, Ben Gurion University of the Negev

Sharona Levy, University of Haifa

Hagit Hel-Or, University of Haifa

Janan Saba, University of Haifa

Learning about Photosynthesis and Cellular Respiration in Plants with Cell-based Emergent Models (CEM)

Sharona Levy, University of Haifa

Shani Goldstein, University of Haifa

Hana Anutza Almog, University of Haifa

Anat Yarden, Weizmann Institute of Science

Strand 13: History, Philosophy, Sociology, and Nature of Science

Nature of Science in K-12 Education

8:00am-9:30am

Real time/ Live

Presider: Alison Cullinane, University of Oxford

Indiana Third/Fourth Grade Students' Conceptions of the Nature of Scientific Inquiry

Valarie Akerson, Indiana University

Claire Cesljar, Indiana University

Conghui Liu, Indiana University

Judith Lederman, Illinois Institute of Technology

Norman Lederman, Illinois Institute of Technology

Formative assessment of nature of science in a Grade 10 lesson on paradigm shift

Wonyong Park, University of Oxford

Sibel Erduran, University of Oxford

Judith Hillier, University of Oxford

Exploring the Nature of Science in the Italian Physics Curriculum

Alison Cullinane, University of Oxford

Martina Caramaschi, University of Bologna

Olivia Levrini, University of Bologna

Sibel Erduran, University of Oxford

NOS and Science Identity: "I Learned I didn't Know How to do Science"

Robert Bennett, Georgia State University

Emily Turner, Georgia State University

Renee Schwartz, Georgia State University

Strand 14: Environmental Education and Sustainability

Engaging with Socioscientific Issues

8:00am-9:30am

Real time/ Live

President: Bryan Nichols, Florida Atlantic University

Problematizing intuitive universals in socioscientific reasoning: using meta-epistemic reasoning practices to link mechanisms to context

John Ruppert, Saint Peter's University

Masiel Infante, Saint Peter's University

Fostering Transformative Agency in Science Education: Students Imagining Technological Futures

Antti Laherto, University of Helsinki

Tapio Rasa, University of Helsinki

Elina Palmgren, University of Helsinki

Doing Battle with the Dragons of Inaction: Place-Based SSI and Pro-Environmental Behaviors

Mark Newton, East Carolina University

Benjamin Herman, Texas A&M University

Dana Zeidler, University of South Florida

Middle School Students' Informal Reasoning and Argument Quality for Different SSI

Cansu Başak Uygün, Middle East Technical University

Ozgul Yilmaz-Tuzun, Middle East Technical University

Concurrent Session # 3 (Real Time / Live)
9:45 am- 11:15 am

Administrative Sponsored Session
Publications Advisory Committee

NSTA's Annual Research Worth Reading
Recognition

9:45 am -11:45 am
Real time/ live

Presenters:

Deena Gould, Arizona State University
Shakhnoza Kayumova, University of Massachusetts-
Dartmouth
Michael Bowen, National Science Teacher
Association
Cynthia Crockett, Harvard-Smithsonian Center for
Astrophysics, Science Education Department,
Cambridge, Massachusetts
Knut Neumann, Leibniz Institute for Science
Education

Administrative Sponsored Session
External Policy and Relations Committee

Beyond Policies and Statements: Towards Equity in
STEM Education

9:45 am -11:45 am
Real time/ live

Presenters:

Maya Garcia, Colorado Department of Education
André DeLeón, Nevada Department of Education
Jamie Ramage, Oregon Department of Education
Philip Bell, University of Washington
Remy Dou, Florida International University
Deb Morrison, University of Washington

Administrative Sponsored Session
Research Committee

2019 Sandra K. Abell Institute for Doctoral Students

9:45 am -11:45 am
Real time/ live

Presenters:

Gregory Rushton, Middle Tennessee State University
Grant Gardner, Middle Tennessee State University
Julie Luft, University of Georgia
Anna Grinath, Idaho State University

Strand 1: Science Learning: Development of Student Understanding

Using Assessment to Characterize Student Knowledge

9:45am -11:15 am

Real time/live

Presenter: Cesar Delgado, North Carolina State University

Mapping Consensus and Dissensus in Perspectives on Learning Progressions Research: Past, Present, and Future Figurations

Michelle Wooten, University of Colorado Boulder
Scott McDonald, Pennsylvania State University

Mind wandering of grade five students with high and low performance in TIMSS-like science test

Sulaiman Al-Balushi, Sultan Qaboos University
Khadijah Al-Balushi, Ministry of Education, Oman
Rashid Al-Mherzi, Sultan Qaboos University
Ibrahim Al-Harhi, Sultan Qaboos University
Abdullah Ambusaidi, Ministry of Education, Oman
Khalid Al-Saadi, Sultan Qaboos University
Mohammed Al-Aghbari, Sultan Qaboos University

Using Mind Maps to Determine Students' Knowledge Dimensions on Disciplinary & Interdisciplinary Core Ideas

Helen Semilarski, University of Tartu
Regina Soobard, University of Tartu
Miia Rannikmae, University of Tartu

Characterization of Undergraduate Students' and Instructors' Knowledge Integration of Cellular Biology Concepts

Sharleen Flowers, Purdue University
Stephanie Gardner, Purdue University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Eliciting and Supporting Students Doing Science

9:45am -11:15 am

Real time/live

Presenter: Andy Cavagnetto, Washington State University

Strategies to Manage Uncertainty in Scientific Argumentation

Ying-Chih Chen, Arizona State University

The Development of Middle School Students' Model-Based Explanations on Energy Transformations through Design Thinking

Mustafa Topcu, Yildiz Technical University
Ayse Ciftci, Mus Alparslan University

Factors Impacting Teachers' Understanding and Experiences Supporting Student Epistemic Agency During STEM Design Challenges

Maria González-Howard, University of Texas at Austin
Victor Sampson, University of Texas At Austin
Christina Baze, University of Texas At Austin

Uncertainty and Cognitive Demand on Students' Thinking in Science Classrooms

Danielle Vande Zande, Florida State University
Ozlem Akcil Okan, Florida State University
Miray Tekkumru Kisa, Florida State University

Strand 3: Science Teaching—Primary School (Grades preK-6)

Science Education in Preschool

9:45am -11:15 am

Real time/live

Presenter: Alison Mercier, University of Wyoming

Developing Preschool-Age Children's Spatial Sensemaking Practices through a Story-Driven Investigation

Kyungjin Cho, Pennsylvania State University

Madison Botch, Pennsylvania State University

Julia Plummer, Pennsylvania State University

Culturally Responsive Teaching in an Elementary Science Enrichment Class

Misty Thomas, Academic Venture Teacher

Melody Russell, Auburn University

Introducing a Lab Center in the Classroom—Promoting Preschoolers' Inquiry Practices and Science Preferences

Netta Perry, Bar Ilan University

Ronit Fridman, Bar Ilan University

Ornit Spektor-Levy, Bar Ilan University

Modeling-based learning through distance education: The case of pre-school children investigating snails during covid-19 quarantine

Loucas Luca, European University-Cyprus

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

Curriculum Integration

9:45am -11:15 am

Real time/live

Presenter: Zehavit Kohen, Technion Israel Institute of Technology

An Exploratory Study of the Goals Science Teachers' Achieve by Integrating Engineering into Science Class

Todd Hutner, University of Alabama

Victor Sampson, University of Texas At Austin

Lawrence Chu, University of Texas At Austin

Christina Baze, University of Texas At Austin

Richard Crawford, University of Texas At Austin

The Effects of Integrated STEM Teaching on Students' STEM Literacy: A meta-analysis

Waralee Sinthuwa, Kasetsart university

Chatree Faikhamta, Kasetsart University

Pongprapan Pongsophon, Kasetsart University

A Methodological Framework for Analyzing An Integrated STEM Curriculum and Its Enactment

Chelsey Dankenbring, Purdue University

Selcen Guzey, Purdue University

Lynn Bryan, Purdue University

Teacher Change during Integrated Curriculum Reform as Evidenced by Episodes of Pedagogical Reasoning

Kevin Fleming, George Washington University

Jonathon Grooms, George Washington University

Alan Berkowitz, Cary Institute of Ecosystem Studies

Bess Caplan, Cary Institute of Ecosystem Studies

Strand 5: College Science Teaching and Learning (Grades 13-20)

Innovative Techniques in College STEM Instruction

9:45am -11:15 am

Real time/live

Presenter: Jonah Firestone, Washington State University Tri-Cities

The Effects of Scaling Up the Flipped Classroom Approach

Robert Idsardi, Eastern Washington University
Luis Matos, Eastern Washington University

Understanding the Emergence of Abstraction in Physical Chemistry Problem Solving

Jessica Karch, University of Massachusetts Boston
Hannah Sevan, University of Massachusetts Boston

Faculty Perceptions of College Students' Preparedness to Use Quantitative Reasoning (QR) in Introductory Biology Courses

Anne Cleveland, Maine Maritime Academy
Asli Sezen-Barrie, University of Maine
Gili Marbach-Ad, University of Maryland

Out of Sight, Out of Mind? Effects of Using Concept Mapping in a Retrieval Setting

Lukas Becker, University of Cologne
Virginia Welter, University of Cologne
Steffen Tröbst, Kiel University
Ellen Aschermann, University of Cologne
Jörg Großschedl, University of Cologne

Strand 6: Science Learning in Informal Contexts

The Role of Informal Science Learning Environments in Supporting Scientific Engagement

9:45am -11:15 am

Real time/live

Presenter: Orit Ben Zvi Assaraf, Ben-Gurion University of the Negev

Discussant: Eleni Kyza, Cyprus University of Technology

Presenters:

Tali Tal, Technion Israel Institute of Technology
Merav Shreiber, Netaim School, Ramat Gan
Tom Bielik, Berlin Freie Universität
Patricia Patrick, Columbus State University
Neta Shaby, Ben-Gurion University of the Negev
Orit Ben Zvi Assaraf, Ben-Gurion University of the Negev
Richard Sheldrake, University College London
Michael Reiss, University of London
Eleni Kyza, Cyprus University of Technology

Strand 7: Pre-service Science Teacher Education

Coherent and current approaches in science teacher preparation

9:45am -11:15 am

Real time/live

Presider: Richard Lamb, East Carolina University

Promoting Coherent Science Teaching through Coherent Science Teacher Education: A Model Framework for Program Design

Jeffrey Nordine, Leibniz Institute for Science and Mathematics Education

Stefan Sorge, Leibniz Institute for Science and Mathematics Education

Ibrahim Delen, Usak University

Robert Evans, University of Copenhagen

Kalle Juuti, University of Helsinki

Jari Lavonen, University of Helsinki

Pernilla Nilsson, Halmstad University

Mathias Ropohl, University of Duisburg-Essen

Matthias Stadler, University of Bergen

The tangle of emotions, agency, digital communication, and science as pre-service teachers learn to teach climate change

Elizabeth Hufnagel, University of Maine

Teacher discourse practices supporting student progressive discourse in an ambitious science classroom

Kraig Wray, Pennsylvania State University

Madison Botch, Pennsylvania State University

Scott McDonald, Pennsylvania State University

Amy Pallant, The Concord Consortium

Hee-Son Lee, The Concord Consortium

Investigating Preservice Teachers' Conceptualizations on Teaching Engineering: A Sequential Explanatory Design

Rebekah Hammack, Montana State University

Tina Vo, University of Nevada- Las Vegas

Strand 8: In-service Science Teacher Education

Computational Thinking and STEM Integration

9:45am-11:15am

Real time/ Live

Presider: Stephen Witzig, University of Massachusetts Dartmouth

The Effects of Teacher Professional Development in STEM Education: A Meta-Analysis

Hye Sun You, Arkansas Tech University

Sunyoung Park, California Lutheran University

Minju Hong, University of Georgia

STEM as Pakistani Teachers view it: A Case of contextually relevant curricular units

Tasneem Anwar, The Aga Khan University

Help Me Understand CT: Science Teachers' Perceived Barriers to CT Integration and Professional Support Needs

Vance Kite, North Carolina State University

Soonhye Park, North Carolina State University

Integrating Computational Thinking into Elementary Inquiry-based Science Instruction: Affordances of a Community of Practice Model

Heather Killen, University of Maryland

Merijke Coenraad, University of Maryland

Lautaro Cabrera, University of Maryland

Virginia Byrne, Morgan State University

Diane Ketelhut, University of Maryland

Strand 10: Curriculum and Assessment

Linguistic and cultural aspects of science curricula

9:45am -11:15 am

Real time/live

President: Peng He, Michigan State University

Exploring Plurality in Students' Ways of Knowing with Learning Progression-based Assessments of Computational Thinking

Beth Covitt, University of Montana - SpectrUM Discovery Area

Caroline Staudt, Concord Consortium

Dale Cope, Independent Education Consultant

Joyce Massicotte, The Concord Consortium

Authentic Literacy and Language (ALL) for Science: Evaluating a Curriculum to Develop Elementary Disciplinary Literacy

Nancy Moreno, Baylor College of Medicine

Alana Newell, Baylor College of Medicine

Misty Sailors, University of North Texas

Culturally relevant or more of the same? Unpacking standards-aligned elementary science curriculum materials

Terrance Burgess, Michigan State University

Evaluating Educative Features for Emergent Multilingual Learners' Opportunities to Learn and Support for Three-dimensional Science and Language instruction

Samuel Lee, Boston College Lynch School of Education and Human Development

Sage Andersen, University of Texas at Austin

Karina Mendez Perez, University of Texas at Austin

Katherine McNeill, Boston College

Strand 11: Cultural, Social, and Gender Issues

Physical Sciences and Equity

9:45am -11:15 am

Real time/live

President: Bhaskar Upadhyay, University of Minnesota

Scientists' perspectives: Choosing an academic career in chemistry

Shirly Avargil, Technion - Israel Institute of Technology

Daphna Shwarts Asher, Technion - Israel Institute of Technology

Shari Reiss, Technion - Israel Institute of Technology

Yehudit Judy Dori, Technion - Israel Institute of Technology

Samuel Neaman Institute for National Policy Research

Experiences in Freshman Chemistry: Using Cogenerative Dialogues to Identify Critical Issues Impacting African American Females

Natasha Johnson, University of Toledo

David Jackson, University of Georgia

Deborah Tippins, University of Georgia

Ji Shen, University of Miami

Examining English Learners' Perceptions of Native Language Use in a Physical Science Classroom

Rebecca Robertson Konz, University of Minnesota Twin Cities

Felicia Dawn Leammukda, Saint Cloud State University

Preethi Titu, Kennesaw State University

Gillian Roehrig, University of Minnesota

Israeli Arab students' participation in authentic physics inquiry in school

Lulu Garah, Technion - Israel Institute of Technology

Shulamit Kapon, Technion - Israel Institute of Technology

Strand 12: Technology for Teaching, Learning, and Research

Using technology to improve students' scientific thinking

9:45 am-11:45 am

Real time/ live

President: Jonah Firestone, Washington State University Tri-Cities

CAI on Adaptation in Organisms and Biological Mechanism among Igbo Senior Secondary School Students

Ngozika Mbajiorgu, Enugu State University of Science and Technology

Patrick Ugwu, Enugu State University of Science and Technology

Framing in gesture-augmented simulations: How differing student frames impacts their sensemaking

Nitasha Mathayas, Indiana University

Opening the Gate of Logic Gate as a Difficult Topic in Computer Studies in Nigerian Secondary Schools: Can CTCA be the Key?

Deborah Agbanimu, Lagos State University

Peter Okebukola, Lagos State University

Esther Peter, Lagos State University

Aderonke Ebisin, Lagos State University

Franklin Onowugbeda, Lagos State University

Adewale Adesina, National Open University of Nigeria

The Generation of Location-based Questions as means for Promoting Scientific Thinking among Middle School Students

Shadi Asakle, Technion – Israel Institute of Technology

Miri Barak, Technion – Israel Institute of Technology

Strand 12: Technology for Teaching, Learning, and Research

Inservice Teachers' Needs and Uses of Digital Tools and Resources

9:45am -11:15 am

Real time/live

President: Alpaslan Sahin, Harmony Public Schools

Elementary Teachers' Adaptations of Technology for Knowledge Generation: Do Their Epistemic Orientations Make a Difference?

Jale Ercan-Dursun, University of Alabama

Krystal Flantroy, University of Alabama

Jee Keyung Suh, University of Alabama

Brian Hand, University of Iowa

Gavin Fulmer, University of Iowa

Computer-Supported Collaborative Learning (CSCL): Pedagogical design framework

Irit Sasson, Tel-Hai College

The Use of Simulations in Science Education

Lisa Stinken-Rösner, Leuphana Universität Lüneburg

Design Principles and Evaluation of an Online Nanotechnology Professional Development Course for Teachers

Yael Feldman-Maggor, Weizmann Institute of Science

Inbal Tuvi-Arad, The Open University of Israel

Ron Blonder, Weizmann Institute of Science

Strand 13: History, Philosophy, Sociology, and Nature of Science

Acknowledging African American Scientists and Scientific Research

9:45am -11:15 am

Real time/live

Presider: Shari Watkins, American University

Discussant: Brian McGowan, American University

Presenters:

Shari Watkins, American University

Melody Russell, Auburn University

Willie Pearson, Georgia Institute of Technology

Ronald Mickens, Clark Atlanta University

Christopher Williams, National Museum of African

American History and Culture

Brian McGowan, American University

Strand 14: Environmental Education and Sustainability

Education in Place and Community

9:45am -11:15 am

Real time/live

Presider: Devarati Bhattacharya, University of Nebraska

Indigenous Education and Behavior Modification Strategies for HIV/AIDS Management in Mining Communities in Zimbabwe: A case Study

Emmanuel Mushayikwa, University of the Witwatersrand

Ledwina Hungwe, University of the Witwatersrand

The Impact of Place Attachment in Socioscientific Reasoning of Puerto Rican High School Students

Lorraine Ramirez Villarin, University of North Georgia

Samantha Fowler, Florida Institute of Technology

Bridging Home Culture and School Science Culture Through Ethnic Education in Indigenous Community

Mu-Yin Lin, University of Georgia

Community Science, Citizen Science, and Community Scientific Literacy: Opportunities and Challenges for Environmental Stewardship

Christopher Jadallah, University of California, Davis

Alexis Patterson Williams, University of California, Davis

Heidi Ballard, University of California, Davis

Concurrent Session # 4. (Real Time / Live)
11:30 am- 1:00 pm

Administrative Sponsored Session
Strand 6: Science Learning in Informal Contexts

Learning in the Informal Context

11:30am -1:00pm

Real time/ live

Examining the nature of science understanding through Canadians' Tweets about COVID-19

Samantha Jewett, University of Western Ontario
Anton Puvirajah, University of Western Ontario
Mohammad Azzam, University of Western Ontario
Jingrui Jiang, University of Western Ontario

Multimodal analysis of engagement in a science museum: The role of the body

Dana Vedder-Weiss, Ben Gurion University of the Negev
Neta Shaby, Ben-Gurion University of the Negev

Leveraging acts of authentication to engage recent immigrant children in informal STEM

Anton Puvirajah, University of Western Ontario
Mina Sedaghatjou, Alfred University
Mohammad Azzam, University of Western Ontario

Engaging Learners in Computer Modeling and Flight Simulation to Create STEM Pathways

Geeta Verma, University of Colorado Denver

"I feel like I know everything about ants" - How youth navigate a learning ecosystem?

Neta Shaby, Ben-Gurion University of the Negev
Nancy Staus, Oregon State University
Lynn D. Dierking, Oregon State University
John Falk, Oregon State University

Minoritized teens' communication competency as a proxy to STEM identification: A science center context

Anton Puvirajah, University of Western Ontario
Todd Campbell, University of Connecticut
Geeta Verma, University of Colorado Denver

Administrative Sponsored Session
Research Committee

A Retrospective of the Abell Institute for Doctoral Students: Mentorship within the NARST community

11:30am-1:00pm

Real time/ live

Presenters:

Tina Vo, University of Nevada, Las Vegas
Asli Sezen-Barrie, University of Maine
Li Ke, University of North Carolina at Chapel Hill
Joshua Reid, Middle Tennessee State University
Kelsey Lipsitz, Exploratorium

Administrative Sponsored Session Equity and Ethics Committee

Basu Symposium

11:30am -1:00pm

Real time/ live

Understanding international graduate students' teaching experience in science classroom through the lens of cultural competence: An exploratory study

Zhigang Jia, Middle Tennessee State University

Grant E. Gardner, Middle Tennessee State University

Access points that facilitate preservice teachers' sense-making about systemic issues within a field experience

Victor Kasper, Florida State University

Shannon Davidson, Florida State University

Lama Jaber, Florida State University

Virtual Mentoring and Epistemic Justice

Deena L. Gould, University of New Mexico

Priyanka Parekh, Transylvania University

Eduardo Jose Nuñez Cruz, University of New Mexico

Learning to Integrate Science-Specific Literacy in Science Teaching: A Study of Elementary Preservice Teachers

Regina McCurdy, University of Central Florida

Su Gao, University of Central Florida

Vassiliki Zygoris-Coe, University of Central Florida

Katherine Cruz-Dieter, University of Central Florida

Rebeca Grysko, University of Central Florida

Examining assessments in a technology-enhanced active learning science classroom

Lucía B. Chacón-Díaz, The Ohio State University

Case study pedagogy and learning outcomes: A framework for teaching biology with narratives

Ally Hunter, University of Massachusetts at Amherst

Melissa Zwick, Stockton University

Creating Nuance for Black Girls' Science Alignment Using the CLIC Framework

Ashley Jackson, University of Michigan

A Critical Race Perspective of African American Elementary Teachers of Science

Mario Pickens, University of North Florida

Exploring Pre-Service Teachers Science Teaching Identity and Agents of Change

Katherine Cruz-Deiter, University of Central Florida

Fugitive Science Societies

Charnell Chasten Long, University of Wisconsin-Madison

The STEM impostor: A comparative study of Black females in two global contexts

Marsha Simon, University of West Georgia

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Engaging science teachers in Socioscientific implementation for global citizenship

11:30 am -1:00pm

Real time/ live

Discussant: Troy Sadler, University of North Carolina at Chapel Hill

Science teachers' pedagogical content knowledge development during enactment of socioscientific curriculum materials

Durham Bayram-Jacobs, Eindhoven University of Technology

Relation between SSI and scientific knowledge, according to a group of secondary school science teachers from Spain

Silvia Alcaraz-Dominguez, Universitat de Barcelona

Tension and conflict in implementing SSI as reflected in teachers' beliefs and implementation

Emil Eidin, Michigan State University

Yael Schwartz, The Weizmann Institute of Science

Socio-scientific issues as tools for improving environmental knowledge, skills, and behavior in pre-service education

Anat Abramovich, Gordon Teachers College

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Science Teaching, Learning, & Social Justice

11:30 am -1:00pm

Real time/ live

Presider: Sameer Honwad, SUNY Buffalo

A Longitudinal Study Comparing Student Motivational Changes towards Science Learning in Grades 6 to 9

Moonika Teppo, University of Tartu

Regina Soobard, University of Tartu

Miia Rannikmäe, University of Tartu

Tools for Learning or Tools for Power? Middle School Students' Use of Engineering Tools

Jeanna Wieselmann, Southern Methodist University

Khomson Keratithamkul, University of Minnesota

Emily Dare, Florida International University

Elizabeth Ring-Whalen, St. Catherine University

Gillian Roehrig, University of Minnesota

Let's Count the Flowers: How Emergent Bilinguals' Collaboration Leads to Productive Disciplinary Engagement

Sara Lee, Vanderbilt University

Science Citizenship through Secondary Agricultural Education

Rosalind Gawryla, Onondaga Central Schools

Kevin Curry, Pennsylvania State University

Strand 5: College Science Teaching and Learning (Grades 13-20)

Supporting 21st Century Students and Faculty

11:30 am -1:00pm

Real time/ live

Presiders: Anne Emerson Leak, High Point University

Suddenly Online: Exploring Postsecondary Teaching, Attitudes, Technology, and Faculty Mental Well Being in Spring 2020

Emily Walter, California State University, Fresno

Makayla Bailey, California State University, Fresno

Patricia Fernandez, California State University, Fresno

Arashnoor Gill, California State University, Fresno

Investigating instructional and discourse practices of college STEM instructors across instructor types, disciplines, years of teaching experiences, and class sizes

Jourjina Alkhouri, University of California Merced

Cristie Donham, University of California Merced

Téa Pusey, University of California Merced

Alexander Stivers, University of California Merced

Adriana Signorini, Center for Engaged Teaching and Learning, University of California Merced

Petra Kranzfelder, University of California Merced

Exploring the Role of Peer Learning Assistants in Supporting Student Learning in College Biology Courses

Brittney Ferrari, University of Georgia

Peyton LeBonte, University of North Carolina Greensboro

Julie Kittleson, University of Georgia

Developing 21st Century Skills Through Teaching and Learning Methods: Perceptions of STEM Students and Alumni

Marina Tal, Technion - Israel Institute of Technology

Rea Lavi, Massachusetts Institute of Technology

Yehudit Judy Dori, Technion - Israel Institute of Technology & Samuel Neaman Institute for National Policy Research

Strand 7: Pre-service Science Teacher Education

Examining Empathy and Emotions in Science Education

11:30 am -1:00pm

Real time/ live

President: Jennifer Mesa, University of West Florida

The Role of Epistemic Empathy in Teachers' Learning and Responsiveness to Students' Experiences in Science

Lama Jaber, Florida State University

Design Thinking for Making: Preservice Teachers' Learning to Teach Human-centered Making

Myunghwan Shin, California State University, Fresno

Trang Phan, California State University, Fresno

Experiencing Science Through Wonder: Incorporating Aesthetics in Pre-Service Teacher Science Education

Sharon Pelech, University of Lethbridge

David Blades, University of Victoria

Preservice Teacher Emotions in Teaching Science and Math

Mihwa Park, Texas Tech University

Raymond Flores, Texas Tech University

Strand 8: In-service Science Teacher Education

The Influence of Networks on Teachers' Professional Development and Retention: Insights from Examining Communities of Practice through a Lens of Social Networks

11:30 am -1:00pm

Real time/ live

Teacher Perceptions of Belonging in Communities of Practice: What are you Belonging to?

Rebecca Konz, University of Minnesota Twin Cities
Jessica Doering, University of Kentucky
Gillian Roehrig, University of Minnesota
Margaret Schroeder, University of Kentucky
Michael Beeth, University of Wisconsin
Oshkosh/COEHS

Science and Mathematics Teacher Communities of Practice: Social Influences on Discipline-based Identity and Self-efficacy Beliefs

Samuel Polizzi, Georgia Highlands College
Joshua Reid, Middle Tennessee State University
Yicong Zhu, Stony Brook University
Gregory Rushton, Middle Tennessee State University

Early Career Teachers: Social Networks in Schools Affect Job Satisfaction and Career Commitment

Gregory Rushton, Middle Tennessee State University
Samuel Polizzi, Georgia Highlands College
Yicong Zhu, Stony Brook University
Joshua Reid, Middle Tennessee State University

Perceived Network Bridging Influences the Retention Decisions of Early Career Teachers

Gillian Roehrig, University of Minnesota
Yicong Zhu, Stony Brook University
Samuel Justin Polizzi, Georgia Highlands College
Joshua Reid, Middle Tennessee State University
Greg Rushton, Middle Tennessee State University

Strand 10: Curriculum and Assessment

Automated Assessment of Argumentation in School Science: Developments and Challenges

11:30am -1:00pm

Real time/live

Assessing Higher Order Thinking of Complex Skill using Selected Response Items

Linda Morrell, University of California- Berkeley
Sara Dozier, Stanford University
Weerephat Suksiri, University of California- Berkeley
Jonathan Osborne, Stanford University
Mark Wilson, University of California- Berkeley

Developing Automated Analysis for a Learning Progression to Assess Scientific Argumentation in Middle School Students

Christopher Wilson, BSCS Science Learning
Molly Stuhlsatz, BSCS Science Learning
Brian Donovan, BSCS Science Learning
Zoe Buck Bracey, BSCS Science Learning
April Gardner, BSCS Science Learning
Jonathan Osborne, Stanford University
Tina Cheuk, Stanford University
Kevin Haudek, Michigan State University
Xiaoming Zhai, Michigan State University

Automated feedback to support students' revision of scientific arguments based on data from simulations

Hee-Sun Lee, The Concord Consortium
Gey-Hong Sam Gweon, Physics Front
Amy Pallant, The Concord Consortium

Exploring bias in automated scoring of student argumentation

Zoe Buck Bracey, BSCS Science Learning
Molly Stuhlsatz, BSCS Science Learning
Tina Cheuk, Stanford University
Marisol Mercado Santiago, Michigan State University
Christopher Wilson, BSCS Science Learning
Jonathan Osborne, Stanford University
Kevin Haudek, Michigan State University
Brian Donovan, BSCS Science Learning
April Gardner, BSCS Science Learning

Strand 11: Cultural, Social, and Gender Issues

Teachers and Justice

11:30 am -1:00pm

Real time/ live

Presider: Mary Atwater, University of Georgia

Teachers of Color negotiating positionality in implementing justice-centered science pedagogy

David Segura, Beloit College

Maria Varelas, University of Illinois at Chicago

Daniel Morales-Doyle, University of Illinois at Chicago

Leadership Professional Development for Diversifying the K-12 STEM Teaching Workforce

Hyunju Lee, Smithsonian Science Education Center

Katie Gainsback, Smithsonian Science Education Center

Amy D'Amico, Smithsonian Science Education Center

Is it possible to teach just science? Designing Professional Development for justice-oriented science education

Lenora Crabtree, University of North Carolina Charlotte

Understanding the Impact of STEM Teaching Internships on Underrepresented Student of Color

Vanessa Gee, Indiana University–Purdue University Indianapolis

Jomo Mutegi, Indiana University–Purdue University Indianapolis

Strand 11: Cultural, Social, and Gender Issues

Towards a Socially Just Society: Creating Learning Environments for Dignity and Equity in Engineering Education

11:30am -1:00pm

Real time/live

An Identity Resources Approach for Supporting Teachers-of-Engineering for Minoritized Young People

Christopher Wright, Drexel University

Bryan Brown, Stanford University

Rasheda Likely, Drexel University

Mikhail Miller, Drexel University

Centering Social Justice in Engineering: The Transformative Power of Learning about Diversity and Equity in Design

Greses Pérez, Stanford University

Shannon Gilmartin, Stanford University

Carol Muller, Stanford University

Patrick Danner, Technical University of Munich (TUM)

Sheri Sheppard, Stanford University

Becoming Part of an Engineering Community of Practice: How Students Across Lines of Difference Find Their Place in a Makerspace

Eric Reynolds Brubaker, Stanford University

Chielo Mbaezue, Stanford University

My Life's Work: Re-engineering Education for Black Boys

James Holly, Jr., Wayne State University

Design Justice in Humanitarian Engineering Education

Brandon Reynante, Stanford University

Strand 11: Cultural, Social, and Gender Issues

Storied-Identities as a Lens to Studying Science Identity

11:30am-1:00pm

Real time/ Live

Presenters:

Amal Ibourk, Florida State University
Lucy Avraamidou, University of Groningen
Theila Smith, University of Groningen
Alison Mercier, University of North Carolina at Greensboro
Shakhnoza Kayumova, University of Massachusetts-Dartmouth
Allison Gonsalves, McGill University
Anna Danielsson, Uppsala University
Katia Nielsen, University of Copenhagen
Jennifer Adams, University of Calgary

Strand 12: Technology for Teaching, Learning, and Research

Integrating Computational Thinking in Science Curricula: Teacher Professional Development and Student Assessment

11:30 am -1:00pm

Real time/ live

Positioning Teachers as Co-designers To Integrate CT Practices in STEM

Sally Wu, Northwestern University
Amanda Peel, Northwestern University
Michael Horn, Northwestern University
Uri Wilensky, Northwestern University

Teachers' Sensemaking of CT Integration and Pedagogical Approaches

Marissa Levy, Northwestern University
Sally Wu, Northwestern University
Sugat Dabholkar, Northwestern University
Michael Horn, Northwestern University
Uri Wilensky, Northwestern University

Teachers' Perceptions of the Contribution of Computational Thinking to Science and Math Classrooms

Arnon HersHKovitz, Tel Aviv University
Connor Bain, Northwestern University
Jacob Kelter, Northwestern University
Michael Horn, Northwestern University
Michael Horn, Northwestern University
Uri Wilensky, Northwestern University

Identifying Evidence of Student Engagement in CT via Automated Response Analysis

Connor Bain, Northwestern University
Arnon HersHKovitz, Tel Aviv University
Sugat Dabholkar, Northwestern University
Michael Horn, Northwestern University
Uri Wilensky, Northwestern University

Students' Attitudinal Change After Participating in a CT integrated Biology Unit

Sugat Dabholkar, Northwestern University
Susan Tran, Northwestern University
Michael Horn, Northwestern University
Uri Wilensky, Northwestern University

Strand 13: History, Philosophy, Sociology, and Nature of Science

Reimagining Science Education in the Anthropocene

11:30am -1:00pm

Real time/live

Presider: Maria Wallace, University of Southern Mississippi

Discussant: Sara Tolbert, University of Canterbury

Presenters:

Maria Wallace, University of Southern Mississippi

Sara Tolbert, University of Canterbury

Matthew Weinstein, University of Washington-Tacoma

Darrin Collins, University of Illinois at Chicago

Chessa Adsit-Morris, University of California - Santa Cruz

Lawrence Bencze, University of Ontario - Toronto

Michelle Wooten, University of Colorado-Boulder

Kathryn Ryker, University of South Carolina

Travis Weiland, University of Houston

Rachel Askew, Vanderbilt University

Strand 14: Environmental Education and Sustainability

Models for Place-Based Science Education in Schools

11:30am -1:00pmpm

Real time/live

Investigating local environmental issues and fostering youth agency through a place-based participatory science model

Erin Bird, University of California – Davis

Heidi Ballard, University of California – Davis

Centering Power, Historicity, and Nature-Culture Relations in Place-Based Science Education

Megan Bang, University of Washington

Carrie Tzou, University of Washington Bothell

Sharon Siehl, Tilth Alliance

Charlene Nolan, Western Washington University – Bremerton

Priya Pugh, Western Washington University – Bremerton

Jordan Sherry-Wagner, University of Washington

Christine Benita, Seattle Public Schools

Leah Bricker, Spencer Foundation and Northwestern University

Veronica McGowan, University of Washington

A national-scale curriculum adaptation model to incorporate local phenomena

Katahdin Cook Whitt, Maine Mathematics and Science Alliance

Emily Harris, BSCS Science Learning

Lindsay Mohan, BSCS Science Learning

Place-based storyline design: Selecting an anchoring problem for engineering in the garden

Emily Harris, BSCS Science Learning

Lindsay Mohan, BSCS Science Learning

Whitney Cohen, Life Lab

Sara Severance, Life Lab

Jeffery Snowden, BSCS Science Learning

Strand 14: Environmental Education and Sustainability

Supporting climate and data literacy in rural communities by incorporating authentic experiences in formal and informal settings

11:30 am -1:00pm

Real time/ live

Iterating a scientifically authentic data-rich informal learning experience to empower the next generation of climate stewards

Leigh Peake, Gulf of Maine Research Institute

Andrew Pershing, Gulf of Maine Research Institute

Jeff Bate, Gulf of Maine Research Institute

Jacqueline DeLisi, Education Development Center, Inc.

Developing data- and climate-focused classroom curriculum

Erin Bardar, Education Development Center

Amy Busey, Education Development Center

Patrick McDeed, Education Development Center

Randy Kochevar, Education Development Center

Got Data? Developing an online, choice-based assessment of data literacy skills

Doris Chin, Stanford University

Rachel Wolf, Stanford University

Kristin Blair, Stanford University

Daniel Schwartz, Stanford University

Supporting student learning and interest in climate and data through a formal-informal connection

Jacqueline DeLisi, Education Development Center, Inc.

Janna Kook, Education Development Center

Una MacDowell, Education Development Center

Peter Tierney-Fife, Education Development Center

Virginia Fitzhugh, Education Development Center

Building a data-focused science center community of practice

Virginia Fitzhugh, Education Development Center

Jeff Bate, Gulf of Maine Research Institute

Leigh Peake, Gulf of Maine Research Institute

Strand 15: Policy, Reform, and Program Evaluation

Theorizing and envisioning more equitable science education

11:30am -1:00pm

Real time/live

President: Stefanie Marshall, University of Minnesota

The Impact of Neoliberal Ideologies on Elementary Science Education Policy: A Case Study

Stefanie Marshall, University of Minnesota

Using Assemblage Theory to Develop New Ideas for Science Teacher Learning

Kathryn Bateman, Temple University

Scott McDonald, Pennsylvania State University

Using an Ecological Model to Study Novice STEM Teacher Professional Resilience During the COVID-19 Pandemic

Diane Wright, Colorado State University

Meena Balgopal, Colorado State University

Laura Sample McMeeking, Colorado State University

Andrea Weinberg, Arizona State University

How State Leaders Would Change Their State Systems of Science Education

Abby Rhinehart, University of Washington

William Penuel, University of Colorado

Kathleen Arada, University of Washington

Maya Garcia, Colorado Department of Education

LUNCH BREAK

1:00pm -2:00pm

Concurrent Session # 5 (Format: Advance Viewing of Pre-recorded Presentations with 60-minute Real time/ Live Q&A)
2:00pm-3:00pm

Strand 2: Science Learning: Contexts, Characteristics, and Interactions

Scientific Discourse and Argumentation

2:00pm- 3:00pm

Advanced Pre-recorded Viewing & Live Q&A

President: David McKinney, University of Nevada, Las Vegas

Towards improving science discussions: A framework to guide instructional decision making

Emily Reigh, Stanford University

Jonathan Osborne, Stanford University

Using a Discussion Types Framework to Support Collective Sensemaking

Benjamin Lowell, Boston College

Kevin Cherbow, Boston College

Katherine McNeill, Boston College

Students' argument evaluation as an epistemic and cognitive practice

Qingna Jin, University of Alberta

Mijung Kim, University of Alberta

Supporting progressive discourse in epistemically authentic geoscience investigations

Scott McDonald, Pennsylvania State University

Kraig Wray, Pennsylvania State University

Jonathan McCausland, Pennsylvania State University

Kathryn Bateman, Temple University

Amy Pallant, The Concord Consortium

Hee-Sun Lee, The Concord Consortium

Strand 2: Science Learning: Contexts, Characteristics, and Interactions

Constructing and Receiving Peer Feedback on Engineering Designs: Student Engagement and Pedagogical Supports

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Exploring Peer-Observers' Feedback on Engineering Communication Challenges

Michelle Jordan, Arizona State University

Mia DeLaRosa, Arizona State University

"I'm like a scientist:" Critique Sessions as Spaces of Learning and Identity in Urban Classrooms

Rasheda Likely, Drexel University

Christopher Wright, Drexel University

Mikhail Miller, Drexel University

Structures of Interaction in Elementary Engineering Peer-to-Peer Feedback

Nicole Batrouny, Tufts University

Elementary Teachers' Responsiveness to Supporting Students' Engineering Design Feedback

Jeffrey Radloff, SUNY Cortland

Brenda Capobianco, Purdue University

Towards a More Expansive Framing of Feedback in Elementary Engineering: The Social and Affective Benefits of Asking for and Giving Advice

Chelsea Andrews, Tufts University

Kristen Wendell, Tufts University

Strand 3: Science Teaching—Primary School (Grades preK-6)

Elementary teachers' agency, confidence, and knowledge

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Karl Jung, University of South Florida

Variations in Rural Elementary Teachers' Confidence and Experience with Computer Science Integration by Teacher Type

Joseph Brobst, Old Dominion University

Jennifer Maeng, University of Virginia

Joanna Garner, Old Dominion University

What is Necessary beyond Knowledge?: Exploring Epistemic Orientation as a Critical Element for Adaptive Expertise

Jee Kyung Suh, University of Alabama

Jale Dursun, University of Alabama

Catherine Lammert, University of Iowa

Krystal Flantroy, University of Alabama

Eric Akuoko, University of Iowa

Brian Hand, University of Iowa

Gavin Fulmer, University of Iowa

Agency of In-service Elementary Science Teachers During a Global Pandemic

Anica Miller-Rushing, University of Maine

Science as Thinkable and Doable: The Nature of Elementary Teachers' Professional Agency in High-Needs Schools

Alison Mercier, University of Wyoming

Strand 3: Science Teaching—Primary School (Grades preK-6)

Implementing Elementary Science New Curricula

2:00pm- 3:00pm

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Susanna Hapgood, University of Toledo

STEAM Curriculum Design and Implementation: Understanding Curricular Changes in an Elementary School

Cassie Quigley, University of Pittsburgh

Dani Herro, Clemson University

Holly Plank, University of Pittsburgh

Framing Participant Structures for NGSS Teaching: Exploring Tenuous Terrain

Laura Zangori, University of Missouri

Rachael Pinnow, University of Missouri

How Teacher Practices Influence Elementary Students' Social Emotional Learning

I-Chien Chen, Michigan State University

Cory Miller, Michigan State University

Tingting Li, Michigan State University

Kayla Bartz, Michigan State University

Joseph Krajcik, Michigan State University

Barbara Schneider, Michigan State University

First Grade Teachers' Uptake of an Integrated Science-Literacy Curriculum in support of NGSS Instruction

Ashley Iveland, WestEd

Robert Murphy, RAND

Alison Billman, University of California, Berkeley

Melissa Rego, WestEd

Christopher Harris, WestEd

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

Pedagogical Content Knowledge

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Henriette Burns, Washington State University

Investigating Science Teachers' Pedagogical Content Knowledge Related to Socio-scientific Issues and Development of their Students' Citizenship Skills

Saiqa Azam, Memorial University of Newfoundland

Dürdane Bayram-Jacobs, Eindhoven University of Technology

Ineke Henze, Radboud University, Nymegen

Patrick Wells, Memorial University of Newfoundland

Biology teachers' Pedagogical Content Knowledge of Argumentation in China through Rasch analysis

Yingzhi Zhang, Capital Normal University

Chenyan Liu, Taiyuan Normal University

Interactions between science teachers' pedagogical content knowledge and skills in their chemistry teaching practice

Imran Tufail, University of Waikato

Chris Eames, University of Waikato

Maurice Cheng, University of Waikato

Pedagogical Content Knowledge of Computer Science Teachers for Teaching Algorithms

Jacqueline Nijenhuis-Voogt, Radboud University, Nijmegen

Dürdane Bayram-Jacobs, Eindhoven University of Technology

Paulien Meijer, Radboud University, Nijmegen

Erik Barendsen, Radboud University & Open University

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

How Teachers Navigate Tensions between Enacting Coherent Curriculum Materials and Supporting Students' Epistemic Agency

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Discussant: Andy Elby, University of Maryland

Designing materials for student coherence, then revising for epistemic agency: A case for epistemic agency as an explicit design focus

Mon Lin Ko, University of Illinois Chicago

Barbara Hug, University of Illinois At Urbana-Champaign

Stina Krist, University of Illinois at Urbana-Champaign

Variations in one teacher's conceptualization and support of students' epistemic agency within and across instructional moments

Soo-Yean Shim, University of Illinois

Susan Kelly, University of Illinois

Daniel Voss, Northwestern University

Jacqueline Chis, University of Illinois at Urbana-Champaign

"Shutting down" now to "open up" later: Temporal tensions in pedagogical strategies for supporting epistemic agency

Stina Krist, University of Illinois at Urbana-Champaign

Nitasha Mathayas, Indiana University

Nessrine Machaka, University of Illinois at Urbana-Champaign

Coordinating strategic responsiveness: Building on student thinking over time through instructional design

Elizabeth Dyer, Middle Tennessee State University

Strand 5: College Science Teaching and Learning (Grades 13-20)

Educational Reform for Justice and Access

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Jacquelyn Chini, University of Central Florida

Teaching- & Research-Focused Faculty: Exploring STEM Instructional Reform in Higher Education

Melo-Jean Yap, San Diego State University

Felisha Herrera, San Diego State University

Gabriela Kovats Sánchez, San Diego State University

Helping Students Rise to Their Full Potential through a Research Immersive Scholastic Experience in Biology

Brittany Smith, Minnesota State University Mankato

David Sharlin, Minnesota State University Mankato

Rachel Cohen, Minnesota State University Mankato

Allison Land, Minnesota State University Mankato

Supporting Transfer Students Career Development through Science/Engineering Internships: A Narrative Case Study

Shana Mcalexander, North Carolina State University

Margaret Blanchard, North Carolina State University

Richard Venditti, North Carolina State University

An Exploration of Perceptions of Justice in a Career-Forward Problem-Based Chemistry Laboratory

Corey Payne, University of Florida

Kent Crippen, University of Florida

Strand 6: Science Learning in Informal Contexts

Social Justice & Citizen Science

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Ayelet Baram-Tsabari, Technion - Israel Institute of Technology

Developing Sense of Place in Urban Youth Through Citizen Science

Cornelia Harris, University at Albany, SUNY

Alandeom Oliveira, University at Albany, SUNY

James Wager, University at Albany, SUNY

The Impacts of Informal Science Education on the Science Identity of Students of Color

Roya Heydari, Columbia University

Felicia Mensah, Columbia University

Examining youth perceptions of citizen science and their agency with science during Citizen Science Programs

Maryam Ghadiri, University of California-Davis

Heidi Ballard, University of California-Davis

Ana Benavides Lahnstein, The Natural History Museum, London, UK

Sasha Pratt-Taweh, The Natural History Museum, London, UK

Julia Lorke, Wissenschaft im Dialog, Berlin, Germany

Jessie Jennewein, Natural History Museum of Los Angeles County

Annie Miller, California Academy of Sciences, SF, USA

Lila Higgins, Natural History Museum of Los Angeles County

Rebecca Johnson, California Academy of Sciences

Lucy Robinson, The Natural History Museum, London, UK

Youth-Initiated Moments Seeking Justice: Making Visible Youth's Imaginaries for STEM Learning

Won Kim, Michigan State University

Angela Calabrese-Barton, University of Michigan

Sinead Brien, Michigan State University

Louise Archer, UCL Institute of Education

Strand 7: Pre-service Science Teacher Education

Culture and Language Considerations in Pre-service Programs

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Justina Ogoto, Baylor University

Proposing Translanguaging Pedagogical Competencies for Enhancing Science Learning for Bilingual Students: A Meta-Synthesis Approach

Noushin Nouri, University of Texas Rio Grande Valley

Alma Rodriguez, University of Texas Rio Grande Valley

Maryam Saberi, The University of Shiraz

Fostering the Discourse of English Learners During the Enactment of Cognitively Demanding Task

Walter Aminger, University of California, Santa Barbara

Barbara and Nevada State College

Secondary Science Pre-Service Teachers' Enactment of Language- and Literacy-Integrated Science Instruction in Linguistically Diverse Classrooms

Alexis Rutt, University of Virginia

Frackson Mumba, University of Virginia

Virtual STEM Microteaching Experiences for Pre-Service Teachers: A Community Cultural Wealth Approach

Vanessa Grady, Georgia State University

Natalie King, Georgia State University

Strand 7: Pre-service Science Teacher Education

Early Childhood and Elementary Pre-service teachers

2:00pm- 3:00pm

Advanced Pre-recorded Viewing & Live Q&A

President: Stephen Thompson, University of South Carolina

Pinterest as a Resource for Elementary Science Teachers: A Comparison of Two Science Topics

Ryan Nixon, Brigham Young University

Shannon Navy, Kent State University

Developing Perceptions About Science in Pre-service Early Childhood Educators

Bridget Miller, University of South Carolina

Benjamin Wiles, Clemson University

Engineering Practices as Fertile Ground for Pre-Service Teachers' Development of Pedagogical Beliefs

Godze Tosun, Pennsylvania State University

Amy Farris, Pennsylvania State University

"Can we add a goal?": Examining unintended teacher learning within an instructional coaching partnership

Amanda Tompkins, University of South Florida

Karl Jung, University of South Florida

Strand 8: In-service Science Teacher Education

In-service Teachers Engaging in Science and Engineering Practices

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Changes in teacher self-efficacy and beliefs: The impact of an engineering research experience for teachers (RET) program on science teachers

Tiffany Lewis, Pennsylvania State University

Amber Cesare, Pennsylvania State Center for Science and the Schools

Kathleen Hill, Pennsylvania State University

Supporting teachers to MASTER developing practices-based curriculum

Jennifer Jackson, Pennsylvania State University

Kathleen Hill, Pennsylvania State University

Advancing Teachers' Curricular Integration of Mathematics and Computational Thinking through a Research Experience Program

Amber Cesare, Pennsylvania State Center for Science and the Schools

Kathleen Hill, Pennsylvania State University

Tiffany Lewis, Pennsylvania State University

Amy Farris, Pennsylvania State University

Courtney Nagle, Pennsylvania State University – Behrend

K-12 teachers use authentic STEM practices in the classroom based on research immersion experiences

Matthew Johnson, Pennsylvania State University

Kathleen Hill, Pennsylvania State University

Strand 10: Curriculum and Assessment

Design, Development, and Testing of a Media-Rich Three-dimensional Middle School Science Unit

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Developing a unit designed for NGSS: Successes and Lessons Learned in the Development Process

Lindsey Mohan, BSCS Science Learning

Developing a Media-Rich Digital Unit to Support 3D Teaching and Learning

Catherine Stimac, Oregon Public Broadcasting

Heather Young, Oregon Public Broadcasting

Professional Development: Moving Beyond the Curriculum

Betty Stennett, BSCS Science Learning

A Quasi-experimental Study of the Efficacy of a Designed-for-NGSS Unit and PD

Susan Kowalski, BSCS Science Learning

Jeffrey Snowden, BSCS Science Learning

Lisa Carey, BSCS Science Learning

Strand 11: Cultural, Social, and Gender Issues

Culturally Responsive Instruction

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Noemi Waight, University of Buffalo

A Case Study of a Teacher Attempting to Introduce a Culturally Relevant Approach to Physics

Clausell Mathis, University of Washington

Sherry Southerland, Florida State University

Science Education in a Diaspora Refugee Community: Perspectives from Two Tibetan Science Teachers

Ngawang Gonsar, Gustavus Adolphus College,
University of Minnesota

The Relationship between Secondary Science Teachers' Self-Efficacy for Culturally Responsive Instruction and their Observed Practices

Zachary Stepp, University of Florida

Julie Brown, University of Florida

The Emphasis on Culturally Responsive Instruction in NSTA Science Scope and The Science Teacher Journals

Michelle Joyce, University of Florida

Julie Brown, University of Florida

Strand 12: Technology for Teaching, Learning, and Research

Capitalizing on the Intersections of Pop Culture and Science

2:00pm -3:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Denise Bressler, East Carolina University

Forecasting Community Development and Sustainability on Social Media with Topic Modeling

Lisa Lundgren, Utah State University

Richard Bex, University of Florida

Kent Crippen, University of Florida

Jennifer Bauer, University of Michigan Museum of Paleontology

Visual Literacy in Chemistry: Infographic vs Comic Book

Christopher Preece, University of Kentucky

Using Flipgrid as a reflection tool to capture students' design thinking in a second grade science classroom

Sarah Guffy, University of South Alabama

Joe Gaston, University of South Alabama

Angela Rand, University of South Alabama

Imagining Robots of the Future: Examining Sixth-Graders' Perceptions of Robots Through Their Literary Products

Changzhao Wang, University of Miami

Ji Shen, University of Miami

Hua Ran, University of Miami

**Thurs 3:15- pm-4:15 pm
(Real time/ Live)**

Research Interest Groups (RIGs) Meeting

3:15pm – 4:15pm
Real-time/ live

Latino/a (LARIG)

The Latino/a research interest group supports social networks that further research agendas regarding Latino/a science learners. LARIG also serves as a support and mentoring alcoba (space) for Latin@s/Latino science educators and others interested in Latin@ science education. During our business meeting, we seek to plan future presentation formats, themes associated with presentations and online discussions, establish a system for collaborating on paper sets and workshops, update member contact lists, and discuss leadership roles and budget.

**3:30pm-until (Real time/
Live)**

**NETWORKING/ SOCIAL CONCURRENT
SESSIONS**

3:30pm – until
Real-time/ live

**Thurs 4:15- pm-5:45 pm
(Real time/ Live)**

**Administrative Sponsored Session
Publications Advisory Committee**

Publishing, Reviewing, and Writing for JRST

4:15pm – 5:45pm
Real-time/ live

Presenters:

Felicia Mensah, Teachers College, Columbia University
Troy Sadler, University of North Carolina, Chapel Hill
Doug Lombardi, University of Maryland, College Park
Christine McDonald, Griffith University

Poster Session #1 Thursday 8:00am through Friday 7:00am

The following posters are available for viewing for a 23-hour window for asynchronous interactions. Attendees can view the poster (links will be provided) and post comments to the presenter, to which the presenter can respond. The posters will become inactive and inaccessible after Friday, 7:00 am.

Strand 1 Posters

Consistency and Contradiction

Cesar Delgado, North Carolina State University
Gary Wright, North Carolina State University

Socioscientific issues to engage middle school students in claims, evidence and reasoning

Sissy Wong, University of Houston
Jie Zhang, University of Houston
Jennifer Donze, University of Houston
Ma Glenda Wui, University of Houston
Jackie Relyea, University of North Carolina
Araceli Enriquez, University of Houston

Student Learning in OTL Engineering Design integrated Science Instruction

Laura Pottmeyer, University of Virginia
Frackson Mumba, University of Virginia
Ji Hoon Ryoo, Yonsei University, South Korea

The role of confusion in conceptual change scenarios for pre-service science teachers

Hye-Eun Chu, Macquarie University
Mariya Pachman, Florida University
Lori Lockyer, University of Technology Sydney

Strand 2 Posters

Negotiation to Consensus: Argumentation about Climate Change Evidence and Explanations

Donna Governor, University of North Georgia
Doug Lombardi, University of Maryland, College Park
Catie Duffield, Temple University

Research mentors' perceptions on ways to engage high school students in authentic inquiry

Salih Yousef Faraj, Technion - Israel Institute of Technology
Amos Cohn Oranim, Haifa University and ACHERET Center, Israel
Shulamit Kapon, Technion - Israel Institute of Technology

Metacognitive knowledge of science university students: the relationship with critical thinking skills

Takuya Matsuura, Hiroshima University

Introduce a coding instrument for the quantitative analysis of teachers' questioning chains

Jianlan Wang, Texas Tech University
Yuanhua Wang, West Virginia University
Lu Guo, Texas Tech University
Yanhong Guo, Texas Tech University
Stacey Sneed, Texas Tech University
Kyle Wipfli, Texas Tech University

Computational Thinkers in Unplugged Pre-K Science Classrooms

Seminha Gun-Yildiz, University of Massachusetts Dartmouth
Stephen Witzig, University of Massachusetts Dartmouth

The effects of flipped classrooms on K-16 students' science and math achievement: A systematic review

Gary Wright, North Carolina State University
Soonhye Park, North Carolina State University

Using Social Network Analysis to Understand Longitudinal Change in Small Groups

Brock Couch, Middle Tennessee State University
Grant Gardner, Middle Tennessee State University

Students' Understandings and Experiences of Creativity and Risk in Science Learning

Claire Paton, University of Calgary

Jennifer Adams, University of Calgary

Kristal Turner, University of Calgary

Impact of Argumentation on Students' Informal Reasoning about Socio-Scientific Issues

Ihsan Ghazal, *missing*

Saouma Boujaoude, American University of Beirut

When an NGSS-friendly Genetics Curriculum Unit Goes Online: A Naturalistic Study

Ann Lambert, University of Utah

Dina Drits-Esser, University of Utah

Sheila Homburger, University of Utah

Kristin Fenker, University of Utah

Molly Malone, University of Utah

Louisa Stark, University of Utah

Translanguaging from the Perspective of Disciplinary Science

Ashlyn Pierson, Ohio State University

Strand 3 Posters

Engaging students in PBL in science classrooms: The challenges for Chinese primary teachers

Jing Lin, Beijing Normal University

Liang Zeng, Beijing Normal University

Huilei Han, Beijing Normal University

David Fortus, Weizmann Institute of Science

Knut Neumann, Leibniz-Institute for Science and

Mathematics Education (IPN)

Declarative Knowledge about the NGSS Among Early Childhood Educators Across A Year of Professional Development

Susanna Hapgood, The University of Toledo

Grant Wilson, The University of Toledo

Jeanna Heuring, Keene State College

Charlene Czerniak, The University of Toledo

Science Visual Literacy Practices of Current Elementary Teachers

Michele Colandene, George Mason University

Examining the Relationship between Preschool Teachers' Attitudes and Beliefs towards Science and Classroom Practice

Elica Bahar Sharifnia, University of Miami

Using Online Interventions to Address Summer Learning Loss in Rising Sixth-Graders

Bob Shaw, Mary Institute and St. Louis Country Day School

Scott Osborne, Clayton School District

Involvement of Industry in STEM education is South Africa

Magdeline Stephen, Wits School of Education

Emmanuel Mushayikwa, University of the

Witwatersrand

Strand 4 Posters

A Storied Discipline: Exploring a Place for Narrative in Science Education

Matthew Kloser, University of Notre Dame

Michael Szopiak, University of Notre Dame

Catherine Wagner, University of Notre Dame

Characteristics of Science Instructional Practices used by Arab Science Teachers in Israel

Iyad M. Dkeidek, Al-Qasimi Academic College for Teachers and Al-Quds University

Nael Eysa, Al-Qasimi Academic College for Teachers

Teacher Impacts on Middle School Students' Understanding of Lunar Phases: A Quantitative Inquiry

Merryn Cole, University of Nevada Las

Jennifer Wilhelm, University of Kentucky

The Progression of Preservice and In-service Science Teachers' Abilities to Teach Inquiry-based Science

Jeanette Bartley, Illinois Institute of Technology

Judith Lederman, Illinois Institute of Technology

Evaluating intercultural STEAM program in Australia-Korea contexts: Teachers' attitudes and beliefs towards STEAM

Hye-Eun Chu, Macquarie University

Sonya Martin, Seoul National University

The MakerSTEM Project: Building secondary educator's capacity engage youth in independent, place and community-based, scientific inquiry

Judith Lemus, University of Hawaii at Manoa
Tara O'Neill, University of Hawaii - Manoa, College of Education

Revisiting the Relationship Between Science Teaching Practice and Scientific Literacy from a Global Perspective

Hye Sun You, Arkansas Tech University
Sunyoung Park, California Lutheran University

Investigating Groundwater: 7th-Grade Students' Mapping Models to Phenomena

Holly White, University of Nebraska—Lincoln
Cory Forbes, University of Nebraska—Lincoln

Exploring the Intersection of Data Practices and Computational Thinking: A Literature Review

Laura Laclede, George Mason University

Knowledge Transfer: Instructional Approaches for Helping Students Understand the Deep Structure of Scientific Problems

Hong Tran, University of Georgia
Deborah Tippins, University of Georgia

Strand 5 Posters

Manifestation of Antisocial and Prosocial Power: Teacher Authority in Undergraduate Student Research Field Study Experiences

Patricia Patrick, Columbus State University

Designing Professional Development of Higher Education Science Faculty Which Impacts Student Learning

Peter Cormas, California University of Pennsylvania
Louise Nicholson, California University of Pennsylvania

Kyle Fredrick, California University of Pennsylvania
Gregg Gould, California University of Pennsylvania

The Impact of Biology Instruction on Evolution Acceptance and Conflict in Underrepresented Minority Undergraduates

Gena Sbeglia, Stony Brook University
Ross Nehm, Stony Brook University – SUNY

Training Scientists to Teach: Lessons Learned from Course Participant Reflections

Sara Petchey, University of Zurich
Kai Niebert, University of Zurich

Examining the Reasons Women Choose and Stay in a Geology Major: A Qualitative Multi-Case Analysis

Ron Gray, Northern Arizona University
Alexis Riche, Northern Arizona University
Isabel Shinnick-Gordon, Northern Arizona University
James C. Sample, Northern Arizona University

Chemistry students' understanding of dissolving and associated phenomena: The case of sodium chloride

James Nyachwaya, North Dakota State University
Krystal Grieger, North Dakota State University

Everything is Connected: Building Preservice Elementary Teachers' Content Knowledge through Educative Curriculum Materials

Brooke Whitworth, Clemson University
Lauren Simpson, Center for Mathematics & Science Education
Whitney Jackson, University of Mississippi
Julie James, University of Mississippi
Alice Steimle, University of Mississippi

Examining Pre-service Teachers' Scientific Reasoning Skills When Learning to Attend to Students' Scientific Thinking

Andrea Phillips, Indiana University—Bloomington
Meredith Park Rogers, Indiana University

Undergraduate Engineering Students' Value Beliefs for Modeling Problems in Chemistry

Lorelie Imperial, University of Florida
Kent Crippen, University of Florida
Charlotte Bolch, University of Florida
Corey Payne, University of Florida

Building Student Confidence through Micro-Internships at a Central California Community College

Zoe Buck Bracey, BSCS Science Learning
Monica Weindling, BSCS Science Learning
Mohammed Yahdi, Hartnell Community College

Emergency Response Teaching Online: STEM Faculty Perceptions and the Zone of Proximal Development

Lynn Tashiro, California State University, Sacramento
Mary McCarthy Hintz, Sacramento State University
Judith Kusnick, California State University
Sacramento

Distinct Role of Peer Effects and Sense of Belonging in Student Socialization and College Success

Narmin Ghalichi, Bowling Green State University
Clare Barratt, Bowling Green State University
Moira Van Staaden, Bowling Green State University

Strand 6 Posters

Navigating a STEM Learning Ecosystem: Obstacles and Opportunities

Neta Shaby, Oregon State University
Nancy Staus, Oregon State University
Lynn Dierking, Oregon State University
John Falk, Institute for Learning Innovation

Who has a ruler? Parent and youth perceptions of family science capital

Megan Ennes, University of Florida
M. Gail Jones, North Carolina State University
Gina Childers, Texas Tech University
Katherine Chesnutt, North Carolina State University
Emily Cayton, Campbell University

Exploring the presentation of climate change through virtual aquarium exhibits

Dominique Ocampo, Texas State University
Jenn Idema, Texas State University
Kristy Daniel, Texas State University

Peer-Learning Research Community: An Investigation into the Effects on High School Students' Identity in Research

Ben Koo, The Lawrence Hall of Science
Shruti Bathia, University of California Berkeley
Linda Morell, University of California, Berkeley
Perman Gochyyev, University of California
Mark Wilson, University of California
Rebecca Smith, University of California, San Francisco

Parents Attitudes Towards Wi-Fi In Schools: The Role of Education in Engagement with Real-Life SSIs

Keren Dalyot, Technion Israel Institute of
Ayelet Baram-Tsabari, Technion - Israel Institute of
Technology

The weight of motivational factors on undergraduate students' decision to join STEM youth-based programming

Alexandria Muller, University of California- Santa Barbara
Barbara
Kassandra Ortega, University of California- Santa Barbara
Devon Christman, University of California- Santa Barbara
Diana Arya, University of California- Santa Barbara
Sarah Hirsch, University of California- Santa Barbara

Informal learning in social media? Comparing a popular COVID-19 podcast with its YouTube comments

Anna Beniermann, Humboldt-Universität zu Berlin
Alexander Bergmann, Leipzig University
Alexander Büssing, Leibniz University Hannover;
Institute of Natural Science Education

Identity Across the STEM Ecosystem

Katie Wade, University of Memphis
Kate Ayers, St. Jude Children's Research Hospital
Robyn Penella, St. Jude Children's Research Hospital

Strand 7 Posters

Revisiting the Elementary Science Partnership: Adjusting to Shifting Challenges in a Pre-Service School-University Collaboration

Jerome Shaw, University of California - Santa Cruz
Samuel Severance, University of California, Santa Cruz

Mapping Community Assets in Preservice Secondary Science Education

Kirsten Mawyer, University of Hawaii
Heather Johnson, Vanderbilt University

Researching Teacher Self-efficacy: Linking Self-Efficacy to Teacher Effectiveness, Persistence and Retention

Sarah Haines, Towson University
Deepika Menon, University of Nebraska-Lincoln
Jeanna Wieselmann, Southern Methodist University
Sumreen Asim, Indiana University Southeast

Preservice Teachers' Unpacking Community Cultural Wealth with 5th Graders Learning about the COVID-19

Christina Restrepo Nazar, California State University, Los Angeles
Jamie Marsh, California State University, Los Angeles
Socorro Orozco, California State University, Los Angeles

Convergence of Scientific and Mathematical modeling: Investigating elementary pre-service teacher interest and confidence in STEM

Andrew Gilbert, George Mason University
Jennifer Suh, George Mason University

Linking Pedagogical Content Knowledge and Teaching Practice in Science Teacher Education: A Systematic Literature Review

Lukas Mientus, University of Potsdam
Anne Hume, University of Waikato
Peter Wulff, University of Potsdam
Andreas Borowski, University of Potsdam

How Effective Is Feedback regarding Pre-Service Teachers' Representational Competence?

Mathias Ropohl, University of Duisburg-Essen
Julia Schwanewedel, Humboldt University of Berlin

Examining PCK Readiness from Participating in a Co-plan, Co-teach, and Co-reflect Early Practicum Experience

Steven Newman, Indiana University
Meredith Park Rogers, Indiana University

Exploring Teacher Candidates' Knowledge of Assessment through Science Journals

E.J. Bahng, Iowa State University

Exploring the Relationship Between Personal Scientific Epistemologies and Free-Choice Learning Experiences

Allison Metcalf, Florida State University
Katrina Roseler, Chaminade University
Sherry Southerland, Florida State University

Learning to Listen: Cultivating Pre-Service Teachers' Attunement and Responsiveness to Student Thinking

Shannon Davidson, Florida State University
Lama Jaber, Florida State University
Allison Metcalf, Florida State University

Perspectivization: Empowering, Evoking and Revolutionizing Science Teacher Education for Social Justice

Christina Restrepo Nazar, California State University, Los Angeles
Jose Martinez Hinstroza, Texas State University

Friday 8:00am through Saturday 7:00am

Poster Session #2

Posters are available for viewing for a 23-hour window for asynchronous interactions. Attendees can view the poster at the indicated link and post comments to the presenter for which the presenter may respond. The posters will become inactive and inaccessible after Saturday, 7:00 am. For a complete listing of Friday's posters, please refer to the end of the Friday schedule.

Presenters will pre-record their presentations.

Author-scheduled, 30-minute Q&A sessions #2

Attendees will view the recorded presentations in advance of the Q&A session. Presenters will schedule a 30-minute block (like "office hours") on a sign-up sheet in advance of the conference. The scheduled time will be listed in the conference program.

8:30 am-9:30 am (Real time/ Live)

Research Interest Groups (RIGs) Meetings

8:30am – 9:30am

Real-time/ live

Engineering Education Research Interest Group (ENE-RIG)

Agenda to be added

Indigenous Science Knowledge Research Interest Group (ISK-RIG)

At the 2021 business meeting, ISK members will discuss the following items: developing ideas and activities to engage with Indigenous Tribes and the NARST, developing ideas and activities to promote visions and missions of the ISK RIG more globally, developing priorities on how to use funds donated to ISK by NARST members, update on the edited book series on ISK, and any other ISK RIG related business the membership needs to discuss.

Presiders:

Bhaskar Upadhyay, University of Minnesota

Stacey Britton, University of West Georgia

Sharon Nelson-Barber, WestEd

Rouhollah Aghasaleh, Humboldt State University

NETWORKING/ SOCIAL CONCURRENT SESSIONS

8:30am – 9:30am

Real-time/ live

Concurrent Session # 6 (Advance Viewing of Pre-recorded Presentations with 60-minute Real time/ Live Q&A)
Special Time Slot 7:15 AM - 8:15 AM

Strand 5: College Science Teaching and Learning (Grades 13-20)
Special Time Slot, 7:15-8:15 AM

Pedagogy and partnerships for the modern STEM college classroom

7:15 am -8:15am

Advanced Pre-recorded Viewing & Live Q&A

Revision as an Essential Step in Modeling Cellular Respiration System Dynamics

Lyrice Lucas, University of Nebraska–Lincoln

Tomáš Helikar, University of Nebraska–Lincoln

Joseph Dauer, University of Nebraska–Lincoln

Impacts of Inquiry-based Teaching on Undergraduate Students' Engagement in Science and Environmental Awareness

Ya-Chun Chen, National Chiao Tung University

Zuway-R Hong, Kaohsiung Medical University

Huann-Shyang Lin, National Sun Yat-Sen University;

Australian Catholic University

Enacting a Persona Strategy in Knowledge Construction to Elicit Epistemic Goals and Support Epistemic Agency

Heesoo Ha, Seoul National University

Comparing Learning Assistant and Professor Talk Moves in an Undergraduate Engineering Science Class

Isabella Stuopis, Tufts University

Kristen B. Wendell, Tufts University

Hoda Koushyar, Tufts University

Strand 6: Science Learning in Informal Contexts
Special Time Slot, 7:15-8:15 AM

Informal Science Learning in Museums and other places

7:15 am -8:15am

Advanced Pre-recorded Viewing & Live Q&A

Assessing participant learning outcomes in science museums: Building capacity for collective evaluation

K. C. Busch, North Carolina State University

Lynn Chesnut, North Carolina State University

Regina Ayala Chavez, North Carolina State University

Lincoln Larson, North Carolina State University

Kathryn Stevenson, North Carolina State University

Charles Yelton, North Carolina Museum of Natural Sciences

Nicole Coscolluela, North Carolina Museum of Natural Sciences

Online Learning in Museums and the influence of COVID-19 Museum Closures

Megan Ennes, University of Florida

Characteristics of Students' Abductive Reasoning According to Scientific and Historical Knowledge in Deoksugung Palace, Korea

Jooyoung Jeon, Ewha Womans University

Donghee Shin, Ewha Womans University

Empowering Publics to Engage with Socio-Scientific Issues in Science Exhibitions: Mental Health-Mind Matters

Ana Maria Navas Iannini, University of Los Andes, Colombia

Erminia Pedretti, University of Toronto

Kristen Schaffer, University of Toronto

Daniel Atkinson, University of Toronto

Strand 10: Curriculum and Assessment Special Time Slot, 7:15-8:15 AM

Automated scoring and machine learning in science assessment

7:15 am -8:15am

Advanced Pre-recorded Viewing & Live Q&A

President: Shahar Abramovitch, University of Massachusetts Boston

When Can Multinomial Logistic Regression Best Classify Pre-Service Physics Teachers' Written Reflections?

Peter Wulff, University of Potsdam

David Buschhüter, University of Potsdam

Anna Nowak, University of Potsdam

Andreas Borowski, University of Potsdam

Towards automated formative assessment of students' scientific explanations in Biology using Natural Language Processing

Moriah Ariely, Weizmann Institute of Science

Tanya Nazaretsky, Weizmann Institute of Science

Giora Alexandron, Weizmann Institute of Science

Automated Scoring of Chinese Grades 7-9 Students' Competence in Interpreting and Arguing from Evidence

Cong Wang, Beijing Normal University

Xiufeng Liu, State University of New York At Buffalo

Lei Wang, Beijing Normal University

Ying Sun, State University of New York At Buffalo

Jian Wang, Beijing Normal University

Shan Lin, Beijing Normal University

Applying Machine Learning to Automatically Evaluate Student Scientific Modeling Competence

Xiaoming Zhai, Michigan State University

Jie Yang, Beijing Normal University

Tingting Li, CREATE for STEM Institute

Peng He, Michigan State University

Joseph Krajcik, Michigan State University

Concurrent Session # 6 (Advance Viewing of Pre-recorded Presentations with 60-minute Real time/ Live Q&A)
Regular Time Slot 9:30 AM – 10:30 AM

Strand 1: Science Learning: Development of Student Understanding

Multiple Ways of Representing Knowledge

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

President: Anita Schuchardt, University of Minnesota

A Framework to Foster Knowledge Acquisition Processes in STEM and Computing Education

Burkhard Priemer, Humboldt-Universität zu Berlin
Annette Upmeyer Zu Belzen, Humboldt-Universität zu Berlin

Breaking Barriers to Students Multiple Representations Using Multiple Representations Learning Strategy

Olugbenga Akindoju, Lagos State University
Olatunde Owolabi, Lagos State University
Hakeem Akintoye, Lagos State University, Ojo
Yinka Orulebaja, Lagos State University

Writing in Science: A Tool for Personal and Three-Dimensional Sensemaking

Kirsten Edwards, Michigan State University
Charles Anderson, Michigan State University

A New Perspective on Multimodality in Science Learning and Teaching

Ayca Fackler, University of Georgia

Strand 1: Science Learning: Development of Student Understanding

Student Thinking About Genetics and Evolution

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

President: Cari Herrmann Abell, BSCS Science Learning

Mechanistic reasoning about gene environment interactions

Michal Haskel Ittah, The Weizmann Institute of Science
Ravit Golan Duncan, Rutgers University

Teleology and essentialism in the context of genetics: a fresh look at students' conceptions

Florian Stern, University of Geneva
Kostas Kampourakis, University of Geneva
Marine Delaval, Université de Lille, France
Andreas Mueller, IUFE (University of Geneva)

Learning About Evolution: An Intervention Study on the Elucidation of Misconceptions and Context-related Surface Features

Helena Aptyka, University of Cologne, Germany
Victoria Hollmann, University of Cologne, Germany
Daniela Fiedler, Kiel University, Germany
Jörg Großschedl, University of Cologne, Germany

Characterizing Students' Use of Mechanistic Reasoning to Explain Allele Relationships

Gur Livni Alcasid, Weizmann Institute of Science
Michal Haskel Ittah, Weizmann Institute of Science

Strand 2: Science Learning: Contexts, Characteristics, and Interactions

Interest, Motivation, and Critical Thinking in Science Learning

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Elementary Student Latent Expectancy-Value-Cost Science Motivation Classes and Their Association with Science Achievement

David McKinney, University of Nevada, Las Vegas

Examining the Predictors of Middle School Students' Interests in Computationally Demanding Science Careers

Arif Rachmatullah, North Carolina State University

Madeline Hinckle, North Carolina State University

Danielle Boulden, North Carolina State University

Eric Wiebe, North Carolina State University

The Effects of Critique-driven Inquiry (CDI) Teaching Intervention on Primary and Secondary School Students' Critical Thinking and Scientific Inquiry Competency

Ying-Yan Lu, Kaohsiung Medical University

Zuway-R Hong, Kaohsiung Medical University

Huann-Shyang Lin, National Sun Yat-Sen University

Thomas Smith, Northern Illinois University

Wen-Yi Hsu, Kaohsiung Medical University

An Exploration of Multilevel Effects of Student- and School- Factors on Elementary Students' Attitudes towards Science

Shuchen Guo, Nanjing Normal University

Enshan Liu, Beijing Normal University

Strand 2: Science Learning: Contexts, Characteristics, and Interactions

Research of Primary Science Teaching and Learning in China – the Past and the Future

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

President: Yang Yang, Beijing Normal University

Discussant: Siqi Li, Beijing Normal University

Presenters:

Yang Yang, Beijing Normal University

Siqi Li, Beijing Normal University

Yajie Xin, Qingdao University

Zongfang Zhang, Qingdao University

Yueyuan Meng, Qingdao University

Xinhui Zhou, Qingdao University

Strand 3: Science Teaching—Primary School (Grades preK-6)

Engineering Education in the Primary Grades

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Presider: Laura Zangori, University of Missouri

To What Extent Does Construction Play Enhance Engineering Thinking and Self-Regulation Capabilities?

Ornit Spektor-Levy, Bar-Ilan University

Taly Shechter, Bar Ilan University

Elementary Teachers' Scaffolding of Engineering Practices: Issues with "The Engineering Design Process" as Instructional Model

Jacob Pleasants, Keene State College

Joanne Olson, Texas A&M University

Examining Changes in Practitioner Journals Pre and Post Covid as a Worked Example

Brandi Kamp, Clemson University

Daniel Alston, University of North Carolina at Charlotte

Elementary Teacher Beliefs, Understandings, and Confidence to Integrate Engineering: Implications and Opportunities

Whitney McCoy, University of Virginia

Jennifer Maeng, University of Virginia

Amanda Gonczi, Michigan Technological University

Robert Handler, Michigan Technological University

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

In Search of New Tools for Meaningful Learning in Chemistry – We Stumbled on Culturo-Techno-Contextual-Approach

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Presenters:

Adekunle Ibrahim Oladejo, Lagos State University, Nigeria

Ibukunolu Adebiyi Ademola, Lagos State University, Nigeria

Peter Okebukola, Lagos State University, Nigeria

Fred Awaah, University of Professional Studies, Ghana

Deborah Oluwatosin Agbanimu, Lagos State University, Nigeria

Franklin Onowugbeda, Lagos, Nigeria

Aderonke Foluso Ebin, Ogun State Institute of Technology, Nigeria

Esther Oluwafunmilayo Peter, Lagos State University, Nigeria

Michael Adelani Adewusi, Lagos State University, Nigeria

Tokunbo Ola Odekeye, Lagos State University, Nigeria

Strand 5: College Science Teaching and Learning (Grades 13-20)

Rethinking STEM college course designs

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

President: Joshua Reid, Middle Tennessee State University

Integrating a Real-Life Software Project into a Model-Based Systems Engineering MOOC

Hanan Kohen, Technion - Israel Institute of Technology

Niva Wengrowicz, Technion- Israel Institute of Technology

Dov Dori, Technion- Israel Institute of Technology

Students' and Instructors' Conceptions of Scientific Hypotheses and Predictions: A Case for Closer Scrutiny

Anupriya Karippadath, Purdue University

Stephanie Gardner, Purdue University

Partnering With Undergraduates to Redesign an Introductory Chemistry Laboratory Course

Hannah Jardine, The Catholic University of America

Elizabeth Griffith, University of Maryland

How does the lack of effective training impact biology GTAs? A descriptive study

Santiago Ojeda-Ramírez, Universidad de los Andes

Stephanie Toro, Universidad de los Andes

Catalina Zuluaga-Arias, Universidad de los Andes

Strand 6: Science Learning in Informal Contexts

Scaling an Effective Analysis-of-Practice PD

Program in Four Contexts: Development, Successes, and Challenges

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Translating and Scaling a Face-to-Face, Video-based Elementary Science PD Program to an Online Environment

Susan Kowalski, Biological Science Curriculum Study

Amy Belcastro, Biological Science Curriculum Study

Connie Hvidsten, Biological Science Curriculum Study

Angelina Constantine, University of Minnesota

Farah Faruqi, University of Minnesota

Karen Askinas, Biological Science Curriculum Study

Renee DeVaul, Biological Science Curriculum Study

Gillian Roehrig, University of Minnesota

Adapting and Scaling a Videobased, Analysis-of-Practice PD Program for High School Biology Teachers

Jody Bintz, Biological Science Curriculum Study

Connie Hvidsten, Biological Science Curriculum Study

Cynthia Gay, Biological Science Curriculum Study

Lacey Eckels, Jefferson County KY Public Schools

Christopher Wilson, Biological Science Curriculum Study

Molly Stuhlsatz, Biological Science Curriculum Study

Adapting and Scaling the LAST PD Program Conceptual Framework in Preservice Teacher Education Programs

Abraham Lo, Biological Science Curriculum Study

Betty Stennett, Biological Science Curriculum Study

Connie Hvidsten, Biological Science Curriculum Study

Karen Askinas, Biological Science Curriculum Study

Factors that Support and Challenge Scaling of Videobased Analysis-of-Practice PD through K-6 Teacher Leader Development

Kathleen Roth, Cal Poly Pomona Foundation

Nicole Wickler, Cal Poly Pomona

Rebecca Eddy, Cobblestone Applied Research & Evaluation, Inc.

Strand 7: Pre-service Science Teacher Education

Identity Development in Science Teachers

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Presider: Frackson Mumba, University of Virginia

Challenges in Representing Science Teacher Identity in Classroom-Based Science Formative Assessments

Kristen Larson, Columbia University

Felicia M. Mensah, Columbia University

Jessica Riccio, , Columbia University

"I wasn't aware, until I was aware ": Reflective Practices for Teacher Empowerment

Elanur Yilmaz, Middle East Technical University

Elif Sönmez, Kastamonu University

Persistence in a STEM Teaching Program: Examining the Effects of Disciplinary Identity and Teaching Identity

Ingelise Giles, Florida International University

Nicole Cook, Florida International University

Zahra Hazari, Florida International University

Maria Fernandez, Florida International University

Laird Kramer, Florida International University

The role of motivation in pre-service physics teachers' learning to notice students' preconception

Martin Schwichow, PH Freiburg

Katharina Hellmann, University of Education

Freiburg

Strand 8: In-service Science Teacher Education

Teacher Engagement and Leadership

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Presider: Douglas Larkin, Montclair State University

Which Hat Should I Wear? Examining Teacher Positioning and Engagement in Professional Development

Patrick Enderle, Georgia State University

Jennifer Schellinger, Florida State University

Ozlem Akcil Okan, Florida State University

Claudia Hagan, Georgia State University

Samantha Skrob, Florida State University

Ellen Granger, Florida State University

Todd Bevis, Florida State University

Pushing against the tides: How engaging in research promotes teacher leadership development

Joshua Reid, Middle Tennessee State University

Allison Hardee, Middle Tennessee State University

Brett Criswell, West Chester University

Gregory Rushton, Middle Tennessee State University

Curriculum-Based Professional Development to Support Teachers' Vision of Recent Shifts in Science Instruction

Katherine McNeill, Boston College

Renee Affolter, Boston College

Benjamin Lowell, Boston College

Casandra Gonzalez, Boston College

Kevin Cherbow, Boston College

Job Embeddedness and Professional Support: A Case Study of Science Teacher Retention in One District

Douglas Larkin, Montclair State University

Liz Carletta, Montclair State University

Suzanne Poole Patzelt, Montclair State University

Khadija Ahmed, The Center for Research and

Evaluation on Education and Human Services

Strand 8: In-service Science Teacher Education

Opportunities and Challenges of Facilitating Educators' Understanding and Use of the Next Generation Science Standards

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Discussant: Annemarie Palincsar, University of Michigan

Presenters:

Susanna Hapgood, University of Toledo
Charlene Czerniak, University of Toledo
Amelia Wenk Gotwals, Michigan State University
Tanya Wright, Michigan State University
Gavin Fulmer, University of Iowa
Brian Hand, University of Iowa
Elizabeth Lehman, University of Chicago
James Pellegrino, University of Illinois at Chicago
Nancy Songer, University of Utah
Annemarie Palincsar, University of Michigan

Strand 10: Curriculum and Assessment

Teacher observation and attitudes towards science evaluation

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

President: Lori Andersen, University of Hawai'i, Manoa

Teachers' perspectives of three-dimensional formative assessments embedded within a curriculum: An initial study

Consuelo Morales, Michigan State University
Jane Lee, Michigan State University
Idit Adler, Tel Aviv University
Irene Bayer, Michigan State University

Empirical Validation of a STEM Observation Instrument Using Exploratory Factor Analysis

Joshua Ellis, Florida International University
Emily Dare, Florida International University
Mark Rouleau, Michigan Technological University
Elizabeth Ring-Whalen, St. Catherine University
Benny Mart Hiwatig, University of Minnesota Twin Cities
Khomson Keratithamkul, University of Minnesota
Feng Li, Florida International University
Farah Faruqi, University of Minnesota
Preethi Titu, Kennesaw State University
Gillian Roehrig, University of Minnesota

Challenges in assessing chemistry lab reports among pre-service teachers

Yoram Zemel, Technion - Israel Institute of Technology
Gabriela Shwartz, Technion - Israel Institute of Technology
Shirly Avargil, Technion - Israel Institute of Technology

Educative Curriculum Materials for Teacher Educators: Building Preservice Teachers' Content Knowledge for Teaching about Matter

Deborah Hanuscin, Western Washington University
Emily Borda, Western Washington University
Josie Melton, Western Washington University
Jamie Mikeska, Educational Testing Service

Strand 12: Technology for Teaching, Learning, and Research

Virtual Rehearsal Simulations to Explore Elementary Pre-service Teachers' Scientific Discourse Skills

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Discussant: Carrie Lee, East Carolina University

Presenters:

Tammy Lee, East Carolina University

Carrie Lee, East Carolina University

Mark Newton, East Carolina University

Paul Vos, East Carolina University

Jennifer Gallagher, East Carolina University

Daniel Dickerson, East Carolina University

Strand 13: History, Philosophy, Sociology, and Nature of Science

Teaching and Learning in the College Science Classroom

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Sally Wu, Northwestern University

The design components of an online course in research ethics for science and engineering students

Miri Barak, Technion - Israel Institute of Technology

Interrelationship between perceived innovative thinking and actual innovation, online vs. face-to-face learners

Maya Usher, Technion - Israel Institute of Technology

Miri Barak, Technion - Israel Institute of Technology

Computational Practices in Science Disciplines

Claudia Fracchiolla, University College Dublin

Claire Mullen, University College Dublin

Maria Mehaan, University College Dublin

Investigating Students' Engagement with Science Videos: An EEG Study

Ido Davidesco, University of Connecticut

Or Dagan, New York University

Strand 14: Environmental Education and Sustainability

Approaches to education for sustainability and sustainable development

9:30 am -10:30 am

Advanced Pre-recorded Viewing & Live Q&A

Presider: Shelley Rap, Weizmann Institute of Science

"Speak to Me in Numbers" – Interdisciplinary Teaching of Sustainable Development Goals

Shelley Rap, Weizmann Institute of Science

Ayshi Sindiani, Weizmann Institute of Science

Moran Bodas, The Gertner Institute for Epidemiology and Health Policy Research, Sheba Medical Center; Tel Aviv University, Israel

Sherman Rosenfeld, Weizmann Institute of Science

Ron Blonder, Weizmann Institute of Science

Science Comics for the Public Good: Enhancing Environmental Literacy in/of the Anthropocene

Katherine Bruna, Iowa State University

Lyric Bartholomay, University of Wisconsin-Madison

Sara Erickson, Iowa State University

Realizing the social dimension of science education for desired citizenry

Tapashi Binte Chowdhury, University of Tartu

Jack Holbrook, University of Tartu

Miia Rannikmae, University of Tartu

Sustainable Development Practices: Impacts of Significant Life Experiences, Knowledge, and Attitudes by Controlling School Environment

Ridvan Elmas, Afyon Kocatepe University

Savas Pamuk, Akdeniz University

Yakup Saban, Afyon Kocatepe University

Concurrent Session # 7 (Advance Viewing of Pre-recorded Presentations with 60-minute Real time/ Live Q&A)
10:45-11:45 AM

Strand 2: Science Learning: Contexts, Characteristics, and Interactions

COVID & Social Justice

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Gianna Lopez-Colson, University of Texas Rio Grande Valley

STEM teachers' curriculum practices in online teaching during the Covid-19 pandemic: A Canadian context

Isha DeCoito, Western University

Mohammed Estaiteyeh, University of Western Ontario

Empowering K-12 Science Teachers as Equity Advocates and Designers of Transformative Justice-Centered Science Learning Communities

Tammy Visintainer, San José State University

Ideological Practice in Science Learning: Navigating Complex Terrain of Climate and Politics in US Classrooms

Lynn Zummo, University of Utah

Has COVID-19 left 3D Science in Elementary School on Life Support?

Sally Crissman, TERC

Roger Tobin, Tufts University

Sara Lacy, TERC

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

Teaching Practices

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Todd Hutner, University of Alabama

Testing Two Teacher Preparation Programs for Effective Science Teaching

Elizabeth Lewis, University of Nebraska–Lincoln

Lyrice Lucas, University of Nebraska–Lincoln

Amy Tankersley, University of Nebraska–Lincoln

Elizabeth Hasseler, University of Nebraska–Lincoln

Anna Rivero, Seattle University

Brandon Holding, University of Nebraska-Lincoln

Overcoming Obstacles - Supporting Teachers to Implement Inquiry-Based Teaching

Alice Hesse, IPN - Leibniz Institute for Science and Mathematics Education

Stefan Sorge, IPN - Leibniz Institute for Science and Mathematics Education

Knut Neumann, IPN - Leibniz Institute for Science and Mathematics Education

Evoking Meaning and Connection: Using Awe to Teach Science

Julianna Nieuwsma, North Carolina State University

Gail Jones, North Carolina State University

Kathryn Rende, North Carolina State University

Emma Refvem, North Carolina State University

Sarah Carrier, North Carolina State University

Jill Grifenhagen, North Carolina State University

Cesar Delgado, North Carolina State University

Pamela Huff, North Carolina State University

Exploring Interactions between Urban Science Teachers' Epistemological Beliefs and their Understanding of Argumentation

Teresa Massey, Georgia State University

Patrick Enderle, Georgia State University

Desmond Lee, Georgia State University

Claudia Hagan, Georgia State University

Strand 6: Science Learning in Informal Contexts

STEM Interest Development

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

Presider: Susan Letourneau, New York Hall of Science

Authentic STEM research, practices of science, and interest development in an informal science education program

Bobby Habig, American Museum of Natural History
Preeti Gutpa, American Museum of Natural History

Content, Context, and Structure of Family STEM Conversations and Their Influence on STEM Identity

Heidi Cian, Florida International University
Remy Dou, Florida International University

Parent Gender as a Contributing Factor in the Development of College Students' STEM Identity

Sheila Castro, Florida International University
Heidi Cian, Florida International University
Remy Dou, Florida International University

Integrating Authentic Learning with Career Role Models to Promote Student Interest in Biosciences

Stephanie Couch, Massachusetts Institute of Technology
Melanie Kalainoff, Kalainoff Consulting and Research, LLC
Leigh Estabrooks, Lemelson-MIT Program
Helen Zhang, Boston College
Anthony Perry, Lemelson-MIT Program
Alazar Ayele, Biogen Community Lab, Biogen Inc.
Amanda Marvelle, Biogen Community Lab, Biogen Inc.
Connor Hanley, Biogen Community Lab, Biogen Inc.
Alex Cameron, Biogen Community Lab, Biogen Inc.

Strand 7: Pre-service Science Teacher Education

Development of Pedagogy and Practice of Pre-service Teachers

10:45am -11:45 am

Advanced Pre-recorded Viewing & Live Q&A

Presider: Karin Lohwasser, University of California, Santa Barbara

Examining asset and deficit perspectives of preservice science teachers' knowledge and learning

Ron Gray, Northern Arizona University
Scott McDonald, Pennsylvania State University
David Stroupe, Michigan State University

Reflective Practice in Microteaching: An Analysis of Preservice Secondary STEM Teachers' Video-based Reflections

Deepika Menon, University of Nebraska-Lincoln
Rosetta Ngugi, Towson University

Employing Distinctiveness as A Framework to Understand Teacher Noticing

Lu Wang, Indiana University Kokomo

From Fractured to Structured: Examining the Characteristics of Preservice Science Teachers' PCK and PCK Development

William Reynolds, North Carolina State University
Soonhye Park, North Carolina State University
Mwenda Kudumu, North Carolina State University

Strand 7: Pre-service Science Teacher Education

Taking Up Socioscientific Issues

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Stephen Witzig, University of Massachusetts Dartmouth

Pre-service Science Teachers' Informal Reasoning and Decision-Making Modes regarding COVID-19

Cigdem Han Tosunoglu, Marmara University

Ferah Ozer, Bogazici University

Instructional Decision-Making for Preservice Teachers' Socioscientific Issues-Based Teaching

Melanie Kinskey, Sam Houston State University

Dana Zeidler, University of South Florida

Pre-service teachers' experiences and perceptions of learner-learner talk: A lens into future teaching methods

Nomfundo Radebe, University of Witwatersrand

Emmanuel Mushayikwa, University of the Witwatersrand

Influence of a COVID-19 SSI Unit on Elementary Teachers' Trust in Science and Scientists

Lisa Borgerding, Kent State University

Bridget Mulvey, Kent State University

Strand 10: Curriculum and Assessment

Curricular innovations in high school biology

10:45am- 11:45 am

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Cari Hermann Abell, BSCS Science Learning

Measuring the Efficacy of an Approach to Integrating Quantitative Reasoning in High School Biology

Molly Stuhlsatz, BSCS Science Learning

Melissa Kjellvik, Michigan State University

Elizabeth Schultheis, Michigan State University

Jeffrey Snowden, BSCS Science Learning

Brian Donovan, BSCS Science Learning

Louise Mead, Michigan State University

Teacher Decision-Making in High School Biology Curriculum Co-Design: A Comparative Case Study Analysis

Elizabeth Chatham, New Visions for Public Schools

Kiran Purohit, New Visions for Public Schools

Teaching an SSI Unit in an Inclusive Secondary Biology Classroom

Rachel Juergensen, University of Missouri Columbia

Laura Zangori, University of Missouri

Patricia Friedrichsen, University of Missouri Columbia

Tanner Oertli, University of Missouri Columbia

Troy Sadler, University of North Carolina at Chapel Hill

Updating Genetics Education - Introducing Epigenetics with Dialogic Teaching in Secondary Classrooms

Karin Thörne, Karlstad university

Niklas Gericke, Department of Environmental and Life Sciences

Birgitta Mc Ewen, Karlstad University

Strand 10: Curriculum and Assessment

In-service Teachers Engaging in Science and Engineering Practices

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

Changes in teacher self-efficacy and beliefs: The impact of an engineering research experience for teachers (RET) program on science teachers

Tiffany Lewis, Pennsylvania State University

Amber Cesare, Pennsylvania State Center for Science and the Schools

Kathleen Hill, Pennsylvania State University

Supporting teachers to MASTER developing practices-based curriculum

Jennifer Jackson, Pennsylvania State University

Advancing Teachers' Curricular Integration of Mathematics and Computational Thinking through a Research Experience Program

Amber Cesare, Pennsylvania State Center for Science and the Schools

Kathleen Hill, Pennsylvania State University

Tiffany Lewis, Pennsylvania State University

Amy Farris, Pennsylvania State University

Courtney Nagle, Pennsylvania State University - Behrend

K-12 teachers use authentic STEM practices in the classroom based on research immersion experiences

Matthew Johnson, Pennsylvania State University

Kathleen Hill, Pennsylvania State University

Strand 10: Curriculum and Assessment

Evaluating science identity, attitudes, and career aspirations

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Xiaoming Zhai, Michigan State University

A Survey to Measure Secondary School Students' Identity in Research (IR-SH)

Linda Morrell, University of California, Berkeley

Shruti Bathia, University of California, Berkeley

Ben Koo, Lawrence Hall of Science

Perman Gochyyev, University of California, Berkeley

Mark Wilson, University of California, Berkeley

Rebecca Smith, University of California, San Francisco

A systematic review of the conceptual framework of attitude toward science instruments

Radu Bogdan Toma, Universidad de Burgos

Jesús Ángel Meneses Villagrà, Universidad de Burgos

Norman Lederman, Illinois Institute Of Technology

Career Aspirations in Elementary Students: A Comparison of Three Measures

Kelli Paul, Indiana University

Adam Maltese, Indiana University

Merredith Portsmore, Tufts University

Karen Miel, Tufts University

Jungsun Kim, Indiana University

Reproducing Oppression: Identifying How Four Levels of Oppression are Reproduced within the Science Classroom

Khanh Tran, Purdue University

Selcen Guzey, Purdue University

Strand 11: Cultural, Social, and Gender Issues

Science Education Research in Culturally and Linguistically Diverse Contexts: Critical Views and Emerging Questions

10:45am- 11:45 am

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Sara Wilmes, University of Luxembourg

Presenters:

Sara Wilmes, University of Luxembourg

Christina Siry, University of Luxembourg

Helen Douglass, University of Tulsa

Shakhnoza Kayumova, University of Massachusetts-Dartmouth

Minjung Ryu, University of Illinois at Chicago

Casey Wright, Purdue University

Sara Salloum, University of Balamand

Mavreen Rose Tuvilla, Texas State University

Geeta Verma, University of Colorado Denver

Maria Varelas, University of Illinois At Chicago

Strand 12: Technology for Teaching, Learning, and Research

STEM Capital

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Cassie Quigley, University of Pittsburgh

Constructing "STEM Identity": Test of an Expanded Identity Model

Remy Dou, Florida International University

Heidi Cian, Florida International University

Gender Differences in Early STEM Capital: A Focus on K-4 STEM Experiences

Susie Cohen, Florida International University

Zahra Hazari, Florida International University

Gerhard Sonnert, Harvard Smithsonian

Philip Sadler, Harvard Smithsonian

'It Was a Completely Different Change in Environment': Contribution of Immigration History to STEM Identity

Alexandra Martinez, Florida International University

Remy Dou, Florida International University

Heidi Cian, Florida International University

Building Community and Leveraging Cultural Resources: Black & Latina Girls in a Virtual STEM Camp

Laura Peña, Georgia State University

Natalie King, Georgia State University

Strand 12: Technology for Teaching, Learning, and Research

Leveraging Mixed-reality Classroom Simulators for Professional Development to Support Student-centered STEM Learning Environments

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

Using TeachLivE Mathematics Diagnosis Simulations with Pre-service Elementary Teachers

Enrique Ortiz, University of Central Florida

How Do GTAs Conceptualize and Utilize Error Framing in a Mixed-reality Classroom Simulator

Ashley Geraets, University of Central Florida

Constance Doty, University of Central Florida

Andrew Chesire, University of Central Florida

Tong Wan, Westminster College

Jacqueline Chini, University of Central Florida

Erin Saitta, University of Central Florida

Impact of GTA Practice with Questioning Strategies Using a Mixed-reality Simulator

Constance Doty, University of Central Florida

Ashley Geraets, University of Central Florida

Tong Wan, Westminster College

Erin Saitta, University of Central Florida

Jacqueline Chini, University of Central Florida

Mixed Reality Integrated Learning Environment for Teaching Training of STEM Teaching Assistants

Fengfeng Ke, Florida State University

Zhaihuan Dai, Florida State University

Chih-Pu Dai, Florida State University

Luke West, Florida State University

Xin Yuan, Florida State University

Strand 13: History, Philosophy, Sociology, and Nature of Science

The Nature of Science & Engineering Practices

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

Presider: Sahar Alameh, University of Kentucky

The Nature of Scientific Explanation (NOSE): Examining the Quality and 'Goodness' of Explanation among Students, Teachers, and Scientists

Sahar Alameh, University of Kentucky

Fouad Abd-El-Khalick, University of North Carolina at Chapel Hill

David Brown, University of Illinois

County Science Specialists' Views of Aligning Historical and Experimental Sciences with NGSS Science Practices

Laura Schneider, St. Mary's College of Maryland

Julie Kittleson, University of Georgia

Epistemic Aspects of Engineering for K-12 Education

Ezgi Yesilyurt, Weber State University

Hasan Denzi, University of Nevada, Las Vegas

Erdogan Kaya, George Mason University

Differences and interrelations between science and engineering – Stereotypes and experts' perceptions

Lior Keren, Technion - Israel Institute of Technology

Shulamit Kapon, Technion - Israel Institute of Technology

Strand 14: Environmental Education and Sustainability

Factors intervening with formal and informal green educational initiatives

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

Biosphere 2 as an Informal Learning Platform to Assess Motivation, Fascination, and Cognitive Achievement for Sustainable Development

Baierl Tessa, University of Bayreuth

Bruce Johnson, University of Arizona

Kevin Bonine, University of Arizona

Franz Bogner, University of Bayreuth

Knowledge Acquisition and Environmental Values in a Microplastic Learning Module: Does the Learning Environment Matter?

Patrica Raab, University of Bayreuth

Franz Bogner, University of Bayreuth

Environmental attitude-sets and fascination for biology as predictors of biodiversity-related, cognitive achievement

Jennifer Schneiderhan, University of Bayreuth

Franz Bogner, University of Bayreuth

Covid-19 and Lockdown Schooling: How Digital Learning Environments Influence Semantic Structures & Sustainability Knowledge

Sonja Fiedler, University of Wuerzburg

Franz Bogner, University of Bayreuth

Strand 15: Policy, Reform, and Program Evaluation

From 'Physical to Digital': How institutions of informal science education adapt to an online presence during the COVID-19 crisis (and beyond)

10:45am -11:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Neta Shaby, Ben Gurion University of the Negev

Presenters:

Ran Peleg, University of Southampton

Neta Shaby, Ben Gurion University of the Negev

Carys Hughes, University of Southampton

Sarah Funk, Science Center Network

Claudia Sodini, K-productions

Nancy Staus, Oregon State University

Victoria Bonebrake, University of Washington

Ann Astroga, University of Washington

Elena Janniello, Università di Pisa

Antonella Gioli, Università di Pisa

NARST MEMBERSHIP MEETING

12:00pm -1:00pm

LUNCH BREAK

12:00pm -1:00pm

Concurrent Session # 8 (Real Time / Live)
1:15 -2:45pm

Administrative Sponsored Session
Equity and Ethics Committee

Making the Case to Empower, Evoke, and Revolutionize the Culture of Science for Social Equity

1:15 pm -2:45 pm
Real time/ live

Presenters:

Sami Kahn, Princeton University
Stefanie Marshall, University of Minnesota
Shari Watkins, American University

Administrative Sponsored Session
Publications Advisory Committee

How to Get Your Research Published in Science Education Journals

1:15 pm -2:45 pm
Real time/ live

Presenters:

Shakhnoza Kayumova, University of Massachusetts-Dartmouth
Tina Cheuk, Stanford University
Dante Cisterna, Educational Testing Service

Administrative Sponsored Session
Continental and Diasporic Africa in Science Education (CADASE) RIG

CADASE RIG: Educative STEM Materials That Use and Evoke African American Capital

1:15 pm -2:45 pm
Real time/ live

Going beyond Ceremony: Creating Educative STEM Materials That Use and Evoke African American Capital

Catharine Quinlan, Howard University

Science Education, A Public Good for the Good of the Public? Research on and for the African Diaspora to Empower, Evoke, and Revolutionize
Contributed CADASE posters

Administrative Sponsored Session
President

National Academies of Sciences (NAS) Board of Science Education (BOSE) Contribution to Science Education as a Public Good

1:15pm -2:45pm
Real time/ live

Presenters:

Heidi Schweingruber, National Academies of Science BOSE
Kenne Dibner, The National Academies of Sciences, Engineering and Medicine
Megan Bang, Northwestern University
Maya Garcia, Colorado Department of Education
William Penuel, University of Colorado

Strand 2: Science Learning: Contexts, Characteristics, and Interactions

Social Factors in College Science

1:15pm- 2:45 pm

Real time/ Live

Presider: Veronique Merritt, Teachers College
Columbia University

Group interaction patterns during argument-based data interpretation tasks in undergraduate biology

Andy Cavagnetto, Washington State University

Olivia Prestis, Washington State University

Ayden Hackett, Washington State University

Larry Collins, Washington State University

Jessie Arneson, Washington State University

Jacob Woodbury, Washington State University

William Davis, Washington State University

Erika Offerdahl, Washington State University

What Professors Say during Collaborative Tasks: Facilitation in a POGIL Chemistry Class

Shaghayegh Fateh, Middle Tennessee State University

Zubeyde Demet Kirbulut, Harran University

Amy Phelps, Middle Tennessee State University

Joshua Reid, Middle Tennessee State University

Gregory Rushton, Middle Tennessee State University

Should high school biology teachers relate to students' religious faith during evolution class?

Reut Stahi-Hitin, Weizmann Institute of Science

Anat Yarden, Weizmann Institute of Science

Disparities in Mentoring Experiences and Academic/Career Outcomes of STEM

Undergraduates during the COVID-19 Pandemic

Guan Saw, Claremont Graduate University

Chi-Ning Chang, University of Kansas

Paul Hernandez, Texas A&M University

Strand 3: Science Teaching—Primary School (Grades preK-6)

The Roles and Uses of Crosscutting Concepts in Elementary Teaching

1:15pm -2:45pm

Real time/ Live

Co-occurring Crosscutting Concept Use in Elementary Preservice Teachers' Lesson Plans to Support Ambitious Teaching and Three-dimensional Science Learning

Amanda Benedict-Chambers, Missouri State University

Carrie-Ann Sherwood, Southern Connecticut State University

A Comparative Case Study of Preservice and Inservice Teachers' Implicit Use of CCCs in Lesson Planning

Tina Vo, University of Nevada- Las Vegas

Nicole Thomas, University of Nevada- Las Vegas

Astha Metha, University of Nevada- Las Vegas

Exploring Relationships among Educative Materials and Elementary Teachers' Use of CCCs in NGSS-based instruction

Sarah Fick, Washington State University

Jennifer Chiu, University of Virginia

Inservice Elementary Teachers' Successes and Challenges in Using the Crosscutting Concepts in Three-Dimensional Learning

Anna Maria Arias, Kennesaw State University

Brendan Callahan, Kennesaw State University

Michael Dias, Kennesaw State University

Karen Kuhel, Kennesaw State University

Deborah Hanuscin, Western Washington University

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

Investigating Aspects of the Modeling Competence: Practices and Metaknowledge

1:15 pm -2:45 pm

Advanced Pre-recorded Viewing & Live Q&A

Examining Student Engagement with ST and CT through Modeling in a Science Classroom

Jonathan Bowers, Michigan State University

Characterizing students progression patterns in CT and ST through modeling

Emil Eidin, Michigan State University

Israel Touitou, Michigan State University

Validation of a Rating Scale to Assess Learners' Meta modeling Knowledge using the Argument-based Approach

Paul Engelschalt, Humboldt University of Berlin

Anna Beniermann, Humboldt University of Berlin

Annette Upmeier Zu Belzen, Humboldt-Universität Zu Berlin

Dirk Krueger, Freie Universitaet Berlin

Evaluating Pre-service Science Teachers' Metacognitive Knowledge of the Modeling Process

Tom Bielik, Freie Universitaet Berlin

Moretz Krell, Freie Universitaet Berlin

Dirk Krueger, Freie Universitaet Berlin

Strand 7: Pre-service Science Teacher Education

Beliefs and Efficacy Among Pre-service teachers

1:15pm -2:45 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Jennifer Maguire, Virginia Tech University

Experiences in Science Methods Courses and Science Teaching Efficacy

Sheryl McGlamery, University of Nebraska Omaha

Bridget Franks, University of Nebraska at Omaha

Saundra Shillingstad, University of Nebraska at Omaha

Influence of preservice science teachers' beliefs and goals in the learning tasks they design

Diego Rojas-Perilla, Teachers College, Columbia University

Changes in Pre-Service Elementary Teachers' Science Teaching Self-Efficacy and Reformed-Based Science Teaching and Learning Beliefs

Laura Eicher, Clemson University

Cynthia Deaton, Clemson University

To Teach or not to Teach: Examining persistence of interest in mathematics and science teaching

Andrew Marichal, Florida International University

Zahra Hazari, Florida International University

Gerhard Sonnert, Harvard Smithsonian

Philip Sadler, Harvard Smithsonian

Strand 8: In-service Science Teacher Education

Handbook of Research on Science Teacher Education

1:15pm -2:45pm

Real time/ Live

Discussant: Michele Koomen, Gustavus Adolphus College

Presenters:

Julie Luft, University of Georgia

Gail Jones, North Carolina State University

Andrew Gilbert, George Mason University

Elizabeth Edmondson, Virginia Commonwealth University

Allan Feldman, University of South Florida

Michael Reiss, University of London

Eve Manz, Boston University

David Stroupe, Michigan State University

Michele Koomen, Gustavus Adolphus College

Shannon Navy, Kent State University

Strand 10: Curriculum and Assessment

Assessing student reasoning in the context of systems and processes

1:15 pm -2:45 pm

Real time/ Live

Presider: Molly Stuhlsatz, BSCS

Improving Student's Understanding of Biological Variation in Experimental Design and Analysis Through a Curricular Intervention

Anita Schuchardt, University of Minnesota

Jessica Dewey, University of Minnesota

Jenna Hicks, University of Minnesota

Uncovering Students' Developing Understanding of Interdependent Relationships in Ecosystems

Sara Dozier, Stanford University

Anna MacPherson, American Museum of Natural History

Linda Morell, University of California, Berkeley

Weerephat Suksiri, University of California, Berkeley

Mark Wilson, University of California, Berkeley

Jonathan Osborne, Stanford University

Rethinking Assessments for Systems

Karyn Housh, Indiana University

Abeera Rehmat, Indiana University-Bloomington

Cindy Hmelo-Silver, Center for Research on Learning & Technology

Dante Cisterna, Educational Testing Service

Lei Liu, Educational Testing Service

High school students' ability to connect biological processes when studying evolution

Rebecca Ellis, Michigan State University

Louise Mead, Michigan State University

Frieda Reichsman, The Concord Consortium

Jim Smith, Michigan State University

Kiley McElroy-Brown, The Concord Consortium

Genevive Bondaryk, Brandeis University

Maria Berry, Michigan State University

Pete White, Michigan State University

Strand 11: Cultural, Social, and Gender Issues

Whiteness

1:15pm-2:45pm

Real time/ live

Presenter: Natalie King, Georgia State University

The Power of Faculty Learning Communities on the development of Inclusive Teaching in STEM Learning Environments

Mojtaba Khajeloo, University of Missouri – Columbia

Marcelle Siegel, University of Missouri – Columbia

Yejun Bae, University of Missouri – Columbia

Terrell Morton, University of Missouri – Columbia

Charles Nilon, University of Missouri – Columbia

Johannes Schul, University of Missouri – Columbia

Courtney Ngai, University of Missouri – Columbia

Adele Du, University of Missouri – Columbia

STEM Schools as a Property of Whiteness in Urban Areas

Katherine Wade-Jaimes, University of Memphis

Bonelli Dobbs, University of Memphis

Hear and Listen: Experiences of Adult Black Women in Science Classes

Renee Schwartz, Georgia State University

Melissa Schoene, Georgia State University

Discourses White Men Use to Maintain White and Male Supremacy in Physics

Melissa Dancy, Dancy Consulting

Apriel Hodari, Eureka Scientific Inc

Strand 11: Cultural, Social, and Gender Issues

Motivation and Under-Representation

1:15pm – 2:45 pm

Real Time/ Live

Presenter: Katherine Wade-Jaimes, University of Memphis

Analyzing discussions of under-representation in a high school classroom

Ben Archibeque, Florida International University

Geoff Potvin, Florida International University

Zahra Hazari, Florida International University

Robynne Lock, Texas A&M Commerce

Individualistic or Systemic? High School Girls Make Sense of Gender Inequality in Engineering

Tatiane Russo-Tait, University of Texas at Austin

Katherine Doerr, University of Texas at Austin

Catherine Riegler-Crumb, University of Texas at Austin

Ursula Nguyen, University of Texas at Austin

Motivational factors mediating attitudes toward STEM careers amongst a national sample of middle school students

Elif Oz, University of Notre Dame

Matthew Kloser, University of Notre Dame

Making Explicit Latinx Female Physics Students' Goal Contents

Brian Zamarripa Roman, University of Central Florida

Jacqueline Chini, University of Central Florida

Strand 12: Technology for Teaching, Learning, and Research

Alternate Avenues of Assessment

1:15pm – 2:45 pm

Real time/ Live

Presider: Jamie Mikeska, Educational Testing Service

Exploring the Effect of Construct Complexity on Machine Learning Assessments of Argumentation

Kevin Haudek, Michigan State University

Xiaoming Zhai, Michigan State University

Automatic Assessment of Electronic Causal Maps for Authentic Scientific Inquiry

Joseph Reilly, Harvard University

Comparing two Task Analysis Guides in Science: Examination of Cognitive Demand

Richard Lamb, East Carolina University

Troy Sadler, University of North Carolina at Chapel Hill

Knut Neumann, Leibniz Institute for Science Education

David Fortus, Weizmann Institute of Science

Pavlo Antonenko, University of Florida

Amanda Kavner, East Carolina University

Douglas Hoston, East Carolina University

Integrating Flipgrid for Science Formative Assessment: A Case Study of an Elementary Preservice Teacher's Learning

Sharfun Islam Nancy, University of Florida

Karl Jung, University of Florida

Strand 14: Environmental Education and Sustainability

Education for environmental science literacy

1:15pm -2:45pm

Real time/ Live

Presider: May Lee, University of Groningen

Secondary Students' Sense-Making of Graphs Related to Climate Change

May Lee, University of Groningen

Alicia Alonzo, Michigan State University

Unifying formal academic and environmental education priorities: Student outcomes framework for Environmental Literacy Education

Amy Green, University of Maryland, College Park

John Baek, NOAA Education

Reimagining open schooling as a sustainable goal in the pandemic era

Giulia Tasquier, University of Bologna

Olivia Levrini, University of Bologna

Paola Fantini, University of Bologna

Erik Knain, University of Oslo

Alfredo Jornet Gil, University of Oslo

Perceptions of Environmental Literacy Preparedness: An Intrastate Systemic Analysis of Districts' Environmental Literacy Plan Implementation

Tamara Pepper, Pennsylvania Department of Education

Ann Gaudino, Millersville University

Nanette Marcum-Dietrich, Millersville University

Steven Kerlin, Stroud Water Research Center

Friday, April 9, 2021

Strand 15: Policy, Reform, and Program Evaluation

Designing Learning for Just and Resilient Climate Action

1:15pm -2:45pm

Real time/ Live

Presider: Rachel Han, University of Washington

Discussant: Alberto Saldamando, Indigenous Environmental Network

Presenters:

Rachel Han, University of Washington

Alberto Saldamando, Indigenous Environmental Network

Sara Tolbert, Te Whare Wananga O Waitaha University of Canterbury

Daniel Wildcat, Haskell Indian Nations University

Asli Sezen-Barrie, University of Maine

David Long, Morehead State University

Alexandra Gillis, Brooklyn College

Christina Guevara, University of Washington

Roberta Hunter, Michigan State University

Deb Morrison, University of Washington

Fri 3:15pm – until (Real time/ Live)

NETWORKING/ SOCIAL CONCURRENT SESSIONS

3:15pm – until

Real-time/ live

Poster Session #2

Friday 8:00am through Saturday 7:00am

The following posters are available for viewing for a 23-hour window for asynchronous interactions. Attendees can view the poster (links will be provided) and post comments to the presenter, to which the presenter can respond. The posters will become inactive and inaccessible after Saturday, 7:00 am.

Strand 8 Posters

Rethinking Professional Development in STEM education: A situated perspective in Qatar

Nasser Mansour, University of Exeter
Carol Murphy, University of Tasmania
Abdullah Abu-Tineh, Qatar University
Nigel Calder, Waikato University

Moving beyond providing resources: A multi-system analysis of science teacher leadership

Rachel Ruggirello, Washington University St. Louis
Alison Brockhouse, Washington University St. Louis
Maia Elkana, Washington University St. Louis
Derek Scott, Wentzville School District

PD for Elementary Teachers' Instruction for Space-Sciences Lessons Focusing on Crosscutting Concepts

Soon Lee, Kennesaw State University

Evaluating a Network Improvement Community Program: A Cohort-Based Study of Longitudinal Student STEM Outcomes

Jessica Richardi, University of Rhode Island
Shane Tutwiler, University of Rhode Island
Jay Fogleman, University of Rhode Island
Sara Sweetman, University of Rhode Island

Science Teachers' Discourse and Professional Vision of Student Motivation

Wisam Sedawi, Ben-Gurion University of the Negev
Livat Eshchar- Netz, Ben-Gurion University of the Negev
Hasida Yakobov, Ben-Gurion University of the Negev
Dana Vedder-Weiss, Ben-Gurion University of the Negev

Developing Ambitious Instruction through Pedagogical Reasoning with Peers

Kimberly Lebak, Stockton University

A review of Intervention Studies to improve Teacher 21st Century Skills

Hiya Almazroa, Princess Nourah Bint Abdulrahman University
Wadha Alotaibi, Princess Nourah Bint Abdulrahman University

Invested Students are Engaged Students: Science Teachers' Focus on Student Behavior and Student-Centered Teaching

Vance Kite, North Carolina State
Megan Polzin North Carolina State
Wm. Matthew Reynolds. North Carolina State University
Soonhye Park, North Carolina State University

"That's not evidence!": Teacher's navigating conceptual and pedagogical dilemmas in Earth science teaching

Jonathan McCausland, Pennsylvania State University
Jennifer Jackson, Pennsylvania State University
Scott McDonald, Pennsylvania State University
Amy Pallant, The Concord Consortium
Hee-Sun Lee, The Concord Consortium

From Being A Science Teacher to A Science Teacher Leader: A Review of the Literature

Hatice Ozen Tasdemir, University of Georgia
Julie Luft, University of Georgia

A Study of Teacher Sensemaking about Productive Student Talk in Science Classrooms Problem

Danielle Vande Zande, Florida State University
Miray Tekkumru Kisa, Florida State University

District Science Coordinators and Science Teaching-Research Officers: A Review of the Literature Comparing Science Teacher Leaders in the United States and Mainland China

Yuxi Huang, University of Georgia
Julie Luft, University of Georgia

Creating community through the Noyce Buddy Program with novice STEM teachers

Sarah Guffey, University of South Alabama
Susan Ferguson, University of South Alabama
Andre Green, University of South Alabama

Talking about English Learners: Integrating Language and Content in Inquiry Science

Bethany Daniel, Vanderbilt University

Exploring Experienced Science Teachers' Vision for Science Teaching

Alfred Limbere, Montclair State University
Mika Munakata, Montclair State University
Emily Klein, Montclair State University
Monica Taylor, Montclair State University

Strand 10 Posters

Developing Assessment Tasks to Measure Model-Based Reasoning in Biology

Cari Herrmann Abell, BSCS Science Learning
Brian Donovan, BSCS Science Learning
Emily Harris, BSCS Science Learning
Jeffery Snowden, BSCS Science Learning
Molly Stuhlsatz, BSCS Science Learning
Christopher Wilson, BSCS Science Learning

Exploring Science Teacher Educators' Evaluation of a Score Report to Support Content Knowledge for Teaching

Dante Cisterna, Educational Testing Service
Jamie Mikeska, Educational Testing Service
Katherine astellano, Educational Testing
Jennifer Lentini, Educational Testing Service

Challenges of Prospective Science Teacher Educators When Designing Science Methods Courses: Analysis Through a PCK Lens

Jose Pavez, University of Georgia

Conceptual Models of Technological Solutions: Assessing Graduate Engineering Students' Novelty and Model-based Systems Thinking

Rea Lavi, Massachusetts Institute of Technology
Yehudit Judy Dori, Technion - Israel Institute of Technology
Dov Dori, Technion - Israel Institute of Technology;
Massachusetts Institute of Technology

Does the term "argument" make it harder to measure argument? Item Difficulty After Revised Wording

Andrea Ash, University of Iowa
Gavin Fulmer, University of Iowa
Brian Hand, University of Iowa
Jihyun Hwang, University of Iowa
Jee Kyung Suh, University of Alabama

Assessing algorithmic thinking skills in early primary school amid environmental studies

Kalliopi Kanaki, University of Crete
Michail Kalogiannakis, University of
Emmanouil Poulakis, University of Thessaly
Panagiotis Politis, University of Thessaly

Evolution acceptance and knowledge in Europe: a systematic review of the state of research

Anna Beniermann Humboldt-Universität zu Berlin
Paul Kuschmierz, Justus Liebig University Giessen
Andra Meneganzin, Università degli Studi di Padova
Rianne Pinxten, University of Antwerp; Antwerp
Telmo Pievani, Università degli Studi di Padova
Dragana Cvetkovi, University of Belgrade
Evangelia Mavrikaki, National and Kapodistrian
University of Athens
Dittmar Graf, Justus Liebig University Giessen

How does Integrated STEM Life Sciences Unit Affect Middle School Students' Engagement and Academic Success?

Zeynep Akdemir, Purdue University
Saira Anwar, University of Florida
Muhsin Menekse, Purdue University
Selcen Guzey, Purdue University

Investigating students' performance on explanations, developing and using model via the use of Next Generation Science Assessment (NGSA)

Mao-Ren Zeng, National Taiwan Normal
Mei-Hung Chiu, National Taiwan Normal
Peng He, Michigan State University
Joseph Krajcik, Michigan State University

Diversity in Knowledge, Conformity in Acceptance of Evolution? Lessons From a Cross-European Evolution Assessment

Paul Kuschmierz, Justus Liebig University Giessen
Anna Beniermann, Humboldt University of Berlin
Dittmar Graf, Justus Liebig University Giessen

Unsung Global Trailblazers in STEM: Promoting Pioneers from the African and Latinx Community

Beverly A. Miller, Georgia Southern University
Amber Whitfield, Georgia Southern University

The Effect of Teacher Talk on Student Engagement during an Integrated Unit

Valarie Bogan, Purdue University
Selcen Guzey, Purdue University

Assessment of Student Learning in Integrated STEM Education: A Descriptive Study

Benny Mart Hiwatig, University of Minnesota - Twin Cities
Gillian Roehrig, University of Minnesota

Strand 11 Posters

Multicultural Science Content and Contexts in Zambian Biology Curriculum Materials

Vivien M. Chabalengula, University of Virginia

STEM Career Transformation: Influences to the Pathways of Community College Women of Color STEM Majors

Melo-Jean Yap, San Diego State University

Preparing Culturally Responsive Elementary Science Teachers: The SCI-Bridge Model

Brian Williams, Georgia State
Nancy Schafer, Georgia State University
Diane Truscott, Georgia State
Ana Solana-Campos, Georgia State
Stephanie Byrd, Georgia State University

Introducing Engineering as an Altruistic STEM Career to Broaden Participation

Joni M Lakin, University of Alabama
Edward W Davis, Auburn University
Zahra Karimi, Auburn University
Lindsay Norris, Auburn University
Virginia Davis, Auburn University

Transnational Ph.D. Students' Learning Trajectories with the Lens of Identity Resources

Selin Akgun, Michigan State

Factors Affecting High School Students' Stem Career Interest: Findings from A 4-Year Study

Alpasian Sahin, Harmony Public Schools
Hersh Waxman, Texas A&M University - College Station

Building antiracist science teachers for Indigenous schools: Lessons from a science professional development workshop

Bhaskar Upadhyay, University of Minnesota

Maintaining Critical Virtual Counterspaces for Minoritized Communities in the COVID-19 Pandemic

Ann Varnedoe, Vanderbilt University
William Robinson, Vanderbilt University
Ebony McGee, Vanderbilt University

Factors affecting science academic achievement of women and girls of color: A Meta-synthesis

Joe De Leon, University of Texas Rio Grande Valley
Maria Rodriguez, University of Texas Rio Grande Valley

Strand 12 Posters

In Their Words: How Students Discuss Motivation, Success, and Learning After Designing STEM Video Games

Denise M. Bressler, East Carolina
Len Annetta, East Carolina University
Richard Lamb, East Carolina
Alexis Dunekack, East Carolina University

Teacher Perceptions about an Engineering Argumentation Discussion within a Simulated Classroom after Feedback and Practice

Jamie Mikeska, Educational Testing Service (ETS)
Pamela Lottero-Perdue, Towson University
Debra Brockway, Educational Testing
Dante Igor, Cisterna-Albuquerque
Samira Sackietey, Educational Testing Service
Joseph Ciofalo, Educational Testing Service

Developing Online Assignments: Chemistry Teachers' Knowledge and Perceptions

Orit Hercovitz, Technion - Israel Institute of Technology
Merav Versano, Technion - Israel Institute of Technology
Yehudit Judy Dori, Samuel Neaman Institute for National Policy Research, Haifa

Development of representational competence through a sequence with augmented reality for the learning of chromatography

Cristian Merino, Pontificia Universidad Católica de Valparaíso
Ainoa Marzabal, Pontificia Universidad Católica de Chile
Waldo Quiroz, Pontificia Universidad Católica de Sonia Pino, Pontificia Universidad Católica de Brant Miller, University of Idaho

Augmented Reality Teaching in Science Education

Philipp Strauß, University of Education, Weingarten
Manuel Krug, University of Education, Weingarten
Johannes Huwer, University of Education Weingarten
Holger Weitzel, University of Education Weingarten

Technological pedagogical content knowledge in biology education: Educational technologies in secondary and post-secondary classrooms a systematic literature review

Olena James, Middle Tennessee State University
Grant Gardner, Middle Tennessee State University

Exploring User Actions while Engaged with a Haptically-enabled Science Simulation (HESSs) for Teaching about Buoyancy

James Minogue, NC State University
Emily Brunsen, NC State
Kern Qi, Davidson College
Tabitha Peck, Davidson College
David Borland UNC - Chapel Hill (RENCI)

Describing Perceptions of Presence Among Students with ADHD in Using Emerging Technologies for Science Learning

Rebecca Hite, Texas Tech University
Gina Childers, Texas Tech University
Gail Jones, North Carolina State University
Elysa Corin, Institute for Learning Innovation
Mariana Pereyra, Universidad De La República Uruguay

A CSCL Approach for Learning Communities: Supporting Development of Students' Scientific Competencies and STEM Identities

Elena Boldyreva, University of Toronto
James Slotta, University of Toronto

Strand 13 Posters

Empowering Informed Action Using an Integrated Nature of Science and Socio-scientific Reasoning Framework

Zoubeida Dagher, University of Delaware

Upper Elementary Students' Interactions with Nature of Science Read-Alouds

Jeanne Brunner, University of Massachusetts Amherst
Christine McGrail, University of Massachusetts Amherst
Kathleen Mahoney, University of Massachusetts Amherst

The Most Common Ideas Secondary Students Considered When Making Decisions Across Socioscientific Issue Topics

Dawnne LePretre, Illinois Institute of Technology
Norman Lederman, Illinois Institute of Technology

Exploring school students' ability to recognise warrants in interdisciplinary argumentation between science and religious education

Liam Guilfoyle, University of Oxford
Sibel Erduran, University of Oxford

How scientists perceive and value communicating the nature of science to the public

Sarah Virginia Poor, Texas A&M University
Benjamin Herman, Texas A&M University

Investigating University Students' Perceptions of the Nature of Science

Selin Akgun, Michigan State University
Ebru Kaya, Bogazici University

New Directions in Socioscientific Issues Research

Dana Zeidler, University of South Florida
Benjamin Herman, Texas A&M University
Troy Sadler, University of North Carolina-Chapel

Illustrating Linkages between Natures of Science and Engineering

Jeffrey Radloff, SUNY Cortland
Brenda Capobianco, Purdue University

Selecting Parts of History of Developing and Using Models: Are Modeling Practices Really New Generation?

Ayca Fackler, University of Georgia

Exploring Physicist, Chemist, and Biologist Views of Scientific Models

Yi-Wen Huang, National Changhua University of Education
Meng-Fei Cheng, National Changhua University of Education

Exploring Physicists' Views of Scientific Models

Meng-Fei Cheng, National Changhua University of Education
Yi-Wen Huang, National Changhua University of Education
Chien-Yu Lin, National Changhua University of Education

Strand 14 Posters

A Multi-Perspective Reflection of High School Science Students on Environmental Issues

Mercy Nyamekye, University of Education of Winneba, Ghana
Sakyiwaa Danso, University of the Witwatersrand, Johannesburg

Art and Travel Abroad: Influencing Student Goals, Environmental Interests and Conceptions of Science

Susannah Sandrin, Arizona State University
Becky Ball, Arizona State University
Richard Lerman, Arizona State University

Investigating the influence of computational affordances of a global climate model on students' explanations about global climate change (GCC)

Devarati Bhattacharya, University of Nebraska
Kimberly Carroll, Steward University of Nebraska - Lincoln
Cory Forbes, University of Nebraska-Lincoln

Caring about where we are: Exploring philosophical and pedagogical perspectives of place

Sara Salisbury, Middle Tennessee State University

How do Faculty at a Business School Conceptualize Environmental Issues and Incorporate these Issues in their Classrooms?

Hamza Malik, University of Massachusetts
Dartmouth
Stephen Witzig, University of Massachusetts
Dartmouth

Relationships between College Students' Epistemological Beliefs About Climate Science and Attitudes toward Climate Change

Lisa Borgerding, Kent State University
Jeff Papa, Kent State University
Barb Currey, Kent State University

Seeing Stuff Differently: Inquiry Science Didn't Change the Environmental Worldview of Preservice Teachers But...

Jean-Philippe Ayotte-Beaudet, Université De Sherbrooke
Bryan Nichols, Florida Atlantic University

Climate Change Education in Rural Spaces

Jean-Philippe Ayotte-Beaudet, Université De Sherbrooke
Madison Scheer, Colorado State University
Meena Balgopal, Colorado State University

Science Education Contexts of Culture, Land, and Community: An 'Aina-Based Model Supporting Teacher Eco-Identity Development

Sheri Fitzgerald, Pacific American Foundation

Turkish Preschool Teachers' Professional Development Needs: A Joint Collaboration Project on Education For Sustainability

Tulin Guler Yildiz, Hacettepe University
Ridvan Elmas, Afyon Kocatepe University
Savas Pamuk, Akdeniz University
Deniz Kahriman-Pamuk, Mersin University
Gelengul Haktanir, Ankara University

Strand 15 Posters

Translating Research into Classroom Practice: Who is Publishing in Science Education Practitioner Journals (SEPIs)?

Joseph A. Taylor, University of Colorado, Colorado Springs
G. Michael Bowen, Mount Saint Vincent University
Marcus Kubsch, IPN - Leibniz Institute for Science and Mathematics Education
Ryan Summers, University of North Dakota
Patricia Patrick, Columbus State University
Abdirizak Warfa, University of Minnesota
Cathy Lachapelle, Boston College
Asli Sezen-Barrie, University of Maine
Selcen Guzey, Purdue University

Teachers' negotiations of bias in relation to teaching resources offered to schools by industrial actors

Maria Andrée, Stockholm University
Lena Hansson, Kristianstad University

Spectacle and Policy: STEM in the Early Trump Administration

Matthew Weinstein, University of Washington-Tacoma

Basu Scholars Posters

2019 Basu Scholars

Examining Elementary Students' Images of Engineers and Interests in Engineering Careers

Ezgi Yesilyurt, Weber State University

Minority STEM Undergraduates: A Comprehensive Model for STEM Identity and Self-Efficacy

Kelly Marie Shepard, Illinois Institute of Technology
Ivan Mutis, Illinois Institute of Technology

Urban Science Teacher Education Across Contexts: An Examination of Teacher Learning through the Lenses of Identity and Agency

Lisa Marco-Bujosa, Villanova University

A case study of how science and mathematics teachers' knowledge and beliefs influence their implementation of a problem and project based curriculum

Mary Nyaema, formerly University of Iowa

Approaches to Learning Biology of Women of Color: The Intersectionality of Gender, Race, and Science Identity

Angela N. Google, Middle Tennessee State University
Anna Grinath, Idaho State University
Grant Gardner, Middle Tennessee State University

How a "Judgement Free" Space Influences African American Girls Sisterhood and STEM Identity

Faith Freeman, Guilford County Schools
Edna Tan, University of North Carolina at Greensboro

Gendered preferences for science education disciplines in elementary grades

Radu Bogdan Toma, University of Burgos

Teaching Practices in large STEM classes: Perception from Undergraduate and Graduate Students

Ngawang Y. Gonsar, University of Minnesota and Gustavus Adolphus College
Lorelai Patrick, Fort Hays State University
Sehoya Cotner, University of Minnesota

2018 Basu Scholars

Supporting multilingual students' engagement in science practices: A case for fostering translanguaging science classrooms

María González-Howard, University of Texas at Austin
Karina Mendez Perez, University of Texas at Austin
Sage Andersen, University of Texas at Austin

Friday, April 9, 2021

**Becoming a Teacher: Reflective Practice as a Way of
Exploring Secondary Science Teacher Beliefs and
Practices**

Preethi Titu, Kennesaw State University

Gillian H. Roehrig, University of Minnesota

Joshua A. Ellis, Florida International University

**Science for Our Children: Othermothering within an
Elementary Science Network**

Stefanie L. Marshall, University of Minnesota-Twin
Cities

Jessica Forrester, University of Minnesota-Twin
Cities

Concurrent Session # 9 (Real Time / Live)
8:00 am – 9:30 pm

**Administrative Sponsored Session
International Committee**

***Crossing Boundaries: Examining and Problematizing
Interdisciplinarity in Science Educations***

8:00 am -9:30 am

Real time/ live

Presenters:

Laura Branchetti, University of Parma, Italy
Olivia Levrini, University of Bologna
Shalamit Kapon, Technion – Israel Institute of
Technology
Maayan Schvartzer, Technion – Israel Institute of
Technology
Tal Peer, Acheret Center, Israel
Wonyong Park, University of Oxford
Jen-Li Wu, National Taiwan Normal University
Sharona Levy, University of Haifa
Asnat Zoharm, University of Haifa
Ilana Dubovi, Ben-Gurion University

**Administrative Sponsored Sessions
Awards Committee**

***ODRA and ECRA: On a Continuum of the
Professional Scholarly Trajectories in Science
Education: The Urgent Questions for the Next
Generation of Science Education Research***

8:00am-9:30am

Real time/ live

Presenter:

Noemi Waight, University at Buffalo

**Strand 2: Science Learning: Contexts,
Characteristics, and Interactions**

***Socioscientific Issues-Based Instruction for Scientific
Literacy Development***

8:00am -9:30 am

Real time/ Live

President: Wardell Powell, Framingham State
University

Discussant: Aysegul Oguz Namdar, Recep Tayyip
Erdogan University

Presenters:

Sami Kahn, Princeton University
Wardell Powell, Framingham State University
Aysegul Oguz Namdar, Recep Tayyip Erdogan
University
Hyunok Lee, Seoul National University
Mark Newton, East Carolina University
Dilek Karisan, Adnan Menderes University
Gillian Roehrig, University of Minnesota
Benzegül Durak, Duzce University
Li Ke, University of North Carolina at Chapel Hill
Dana Zeidler, University of South Florida

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

NGSS Practices and Implementation

8:00am -9:30am

Real time/ Live

Presenter: Teresa Massey, Georgia State University

Impacts of COVID-19 on Science Instruction and NGSS Enactment in Grades 6-8

Meghan Macias, University of California, Santa Barbara

Ashley Iveland, WestEd

Elizabeth Arnett, WestEd

Melissa Rego, WestEd

Maya Salcido White, WestEd

Teachers' use of the Next Generation Science Standards for alignment of instructional materials

Jamie Tanas, University of Iowa

Gavin Fulmer, University of Iowa

How Middle-School Science Teachers Enact Phenomena in NGSS Classrooms

Jonathan Boxerman, WestEd

Kimberly Nguyen, WestEd

Jasmine Marckwordt, University California Santa Barbara

Ashley Iveland, WestEd

The Effect of 5E Instructional Model-Based Class on Students' Understanding of Crosscutting Concepts

Dongxue Jin, Beijing Normal University

Enshan Liu, Beijing Normal University

Strand 7: Pre-service Science Teacher Education

Pre-Service Teachers' Use of Learning Progressions to Inform Classroom Instruction

8:00am -9:30 am

Real time/ Live

Discussant: Erin Furtak, University of Colorado

How Do Pre-Service Teachers Use Learning Progressions When Interpreting Student Thinking in Mechanics?

Cristoph Münster, Justus Liebig University Giessen

Claudia Von Aufschnaiter, Justus Liebig University Giessen

Investigating How Pre-service Teachers Draw on Their Understanding of Student Ideas to Elicit Student Thinking

James Hancock, Alma College

Alicia Alonzo, Michigan State University

Pre-service Teachers' Use of Learning Progressions When Responding to Students' Ideas

Sisi Han, Beijing Normal University

Alicia Alonzo, Michigan State University

A Pre-service Teacher's Use of Learning Progressions When Planning Instruction in Two Contexts

Julia Christensen, Michigan State University

Sisi Han, Beijing Normal University

Alicia Alonzo, Michigan State University

Strand 10: Curriculum and Assessment

Learning and assessment in project-based and problem-based curricula

8:00am -9:30 am

Real time/ Live

President: Jeffery Nordine, Leibniz Institute for Science and Mathematics Education

Integrating Computer Science in Science Classrooms: Learning Computational Thinking and Expanding Perceptions of Computer Science

Eric Greenwald, University of California, Berkeley, Lawrence Hall of Science

Ari Krakowski, University of California, Berkeley, Lawrence Hall of Science

The Performance and Assessment of Students' Collaborative Problem Solving in Project-based Learning

Yanan Zhao, Beijing Normal University

Lei Wang, Beijing Normal University

Examining the relationships between post-unit assessments and summative assessment in elementary project-based science classrooms

Tingting Li, CREATE for STEM Institute

I-Chien Chen, Michigan State University

Emily Miller, University of Wisconsin Madison

Kayla Bartz, Michigan State University

Joseph Krajcik, Michigan State University

Tracking the Progress of High School Students' Modeling Proficiencies Across Sequential Project-based Learning Chemistry Curriculum: A Longitudinal Study

Peng He, Michigan State University

I-Chien Chen, Michigan State University

Israel Tuitou, Michigan State University

Sarah Maestrales, Michigan State University

Joseph Krajcik, Michigan State University

Strand 14: Environmental Education and Sustainability

Traditional Ecological Knowledge (TEK): Water Stories, Sustainability, Models, and Evidence

8:00am -9:30 am

Real time/ Live

President: Bhaskar Upadhyay, University of Minnesota

Discussant: Femi Otulaja, University of the Witwatersrand

Presenters:

Rouhollah Aghasaleh, Humboldt State University

Bhaskar Upadhyay, University of Minnesota

Sharon Nelson-Barber, WestEd

Pauline Chinn, University of Hawaii at Manoa

Jonathan Boxerman, WestEd

Paichi Shein, National Sun Yat-sen University

Kai-Lung Wang, National Sun Yat-sen University

Wei-Ting Li, Taichung Municipal Sha-Lu Junior High School

Peresang Sukinarhimicc, Indigenous People Cultural Development Center

Femi Otulaja, University of the Witwatersrand

Concurrent Session # 10 (Advance Viewing of Pre-recorded Presentations with 60-minute Real time/ Live Q&A)

9:45 am – 10:45 am

Strand 1: Science Learning: Development of Student Understanding

Students' Understanding of Physical Science Concepts

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Jennifer Tripp, University at Buffalo

Experience doesn't matter but the direction does:

Differential accuracy in relative motion problems

Jason Morpew, Purdue University

Mapping the territory: The development of students' repertoires of ideas about energy

Marcus Kubsch, IPN - Leibniz Institute for Science and Mathematics Education

The Development of Middle School Students' Conceptual Learning on Energy Transformations through Design Thinking

Ayse Ciftci, Mus Alparslan University

Mustafa Topcu, Yildiz Technical University

The Process of Doing Science – a Study of Three Students Exploring Sound and Light

Sebastian Björnhammer, Stockholm University

Jakob Gyllenpalm, Stockholm University

Iann Lundegård, Stockholm University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Contextual, Socio-Emotional, and Attitudinal Factors across K-12 Education

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Henriette Burns, Washington State University

Investigating the relevance of an intervention course to raise middle school student's science-related career awareness

Regina Soobard, University of Tartu

Aet Möllits, Tallinn University

Miia Rannikmäe, University of Tartu

The Efficacy of Project-based Learning Science on Supporting Students' Learning Energy in No-Western Classroom

Jie Yang, Beijing Normal University

Sisi Han, Beijing Normal University

Jian-Xin Yao, National Institute for Curriculum and Textbook Research, P. R. China

Yu-Ying Guo, Beijing Normal University

Joseph S. Krajcik, Michigan State University

Addressing the Affective Dimension of Learning through Biophilia in Classroom Gardening

Aimee Fraulo, North Carolina State University

The Trade-Off Between STEM Knowledge Acquisition and Language Learning in Short-Scale Bilingual Implementations

Tamara Roth, University of Bayreuth

Franz Bogner, University of Bayreuth

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Epistemic & Disciplinary Engagement in Middle and Secondary School

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Zoe Buck Bracey, BSCS

Small Teacher Moves with Big Impacts in Shaping Students' Sensemaking and Intellectual Authority in Science

Jennifer Schellinger, Florida State University

Sierra Morandi, Florida State University

Sherry Southerland, Florida State University

Lama Jaber, Florida State University

Miray Tekkumru Kisa, Florida State University

Harini Krishnan, Florida State University

"Dude... Just Put a Mirror Here": Examining Epistemic Practices in Middle School Collaborative Engineering Contexts

Ramya Sivaraj, University of Minnesota

Jeanna Wieselmann, Southern Methodist University

Gillian Roehrig, University of Minnesota

Finding Alignment in Framing: Dynamics of Collaborative Disciplinary Engagement in Science

Harini Krishnan, Florida State University

Lama Jaber, Florida State University

Jennifer Schellinger, Florida State University

Sherry Southerland, Florida State University

Anchoring epistemic agency and participation within place-based learning progressions

Lezly Taylor, Virginia Polytechnic Institute and State University

Brenda Brand, Virginia Tech University

George Glasson, Virginia Polytechnic Institute and State University

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

Socioscientific Issues in the Science Classroom

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Joseph Brobst, Old Dominion University

Teaching Science During a Pandemic: A National Study of Teacher Decision Making

Patrick Smith, Horizon Research, Inc.

Peggy Trygstad, Horizon Research, Inc.

Laura Craven, Horizon Research, Inc.

The most challenges and needs for teachers to engaging students in SSI learning

Jing Lin, Beijing Normal University

Huilei Han, Beijing Normal University

Liang Zeng, Beijing Normal University

Troy Sadler, University of North Carolina at Chapel Hill

Knut Neumann, Leibniz-Institute for Science and Mathematics Education (IPN)

Teaching Controversial Socio-Scientific Issues: Challenges and Affordances

Janelle Bailey, Temple University

Ananya Matewos, St. Norbert College

Sanlyn Buxner, Planetary Science Institute/University of Arizona

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

Student Thinking and Interest in Science

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

Prresider: John Holmquist, Florida Institute of Technology

An Analysis of Secondary Student Views of Quantum Physics

Zac Patterson, The Ohio State University

Lin Ding, Ohio State University

Enhancing Students' Interest in Science and STEM

Careers: The Role of Career-based Scenarios

Irene Drymiotou, University of Cyprus; University of Groningen

Lucy Avraamidou, University of Groningen

Constantinos Constantinou, University of Cyprus

Enacting Rigorous Science Lessons: Leveraging Students' Ideas for Enhancing Demand on Student Thinking Problem

Ozlem Akcil Okan, Florida State University

Miray Tekkumru Kisa, Florida State University

Concept Maps in Learning Biology: Concept Mapping from Memory is more beneficial than from Text

Sina Lenski, University of Cologne

Jörg Großschedl, University of Cologne

Strand 4: Science Teaching—Middle and High School (Grades 5-12)

Teacher Learning Through Practice

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

Prsider: Sina Lenski, University of Cologne

Teacher Emphasis and What It Reveals About Chemical Ideas and Practices

Gregory Banks, University of Massachusetts-Boston

Hannah Sevan, University of Massachusetts-Boston

What Epistemological Resources Affect Chemistry Teachers' Sense of "What worked"

Adam Schafer, University of Wisconsin – Madison

Ryan Stowe, University of Wisconsin - Madison

Expanding the STEM teacher pool: A history teacher's experience teaching a high school engineering course

Adam Robert Carberry, Arizona State University

Medha Dalal, Arizona State University

Malay Nagda, Arizona State University

Brendan McCarthy, College Park Academy

Challenges and Supports for Secondary Science and Mathematics Teacher Retention

Christine Lotter, University of South Carolina

Jennifer Crooks-Monastra, University of South Carolina

Greysi Irdam, University of South Carolina

Jan Yow, University of South Carolina

Strand 5: College Science Teaching and Learning (Grades 13-20)

Authentic Learning Inside and Outside the Classroom

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Jorge Solis, University of Texas At San Antonio

Exploring the Kinds of Evidence Cited in an Integrated STEM Learning Experience Incorporating Argumentation

Carina Rebello, Purdue University

Jeffrey Murray, Purdue University

N. Sanjay Rebello, Purdue University

Exploring Students' Values and Classroom Experiences across a Consortium of Four Universities

Gili Marbach-Ad, University of Maryland

Patrick Sheehan, University of Maryland

Katerina Thompson, University of Maryland

Lindsay Wheeler, University of Virginia

Cindy Ghent, Towson University

Jackie Bortiatynski, Penn State University

Establishing a Baseline of Science Communication Skills

Rashmi Shivni, Northern Illinois University

Christin Cline, Northern Illinois University

Morgan Newport, Northwestern University

Shupeí Yuan, Northern Illinois University

Heather Bergan-Roller, Northern Illinois University

How Different Course-based Undergraduate Research Experience Models Impact Student Perceptions of the Scientific Research Culture

Jessica Dewey, University of Minnesota

Anita Schuchardt, University of Minnesota

Strand 5: College Science Teaching and Learning (Grades 13-20)

Reasoning and Thinking about STEM

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Scott Cohen, Georgia State University

Students' Visual Patterns in Solving Synthesis Physics Tasks

Bashirah Ibrahim, University of Bahrain

Lin Ding, Ohio State University

Student Explanations about Molecular Processes in Information Flow and Transfer in Biology

Juli Uhl, Michigan State University

Kevin Haudek, Michigan State University

An Investigation of Undergraduate Students' Spatial Thinking about Groundwater

Holly White, University of Nebraska–Lincoln

Cory Forbes, University of Nebraska–Lincoln

Sensemaking opportunities for mathematical equations differ across instructors teaching the same scientific phenomenon

FangFang Zhao, NanJing Normal University, China

Linh Chau, University of Minnesota

Anita Schuchardt, University of Minnesota

Strand 6: Science Learning in Informal Contexts

Creating in Informal Science

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Elgin Leary, University of Georgia

Once Upon a Time We Had to Stay at Home: STEM Stories and Phone Photos in My (or Any) Family Culture

Phyllis Katz

Making Board Games as Building Models: What are Some Implications for Environmental Science Education?

Priyanka Parekh, Transylvania University

Elisabeth Gee, Arizona State University

Kelly Tran, High Point University

Earl Aguilera, California State University, Fresno

Taylor Kessner, Arizona State University

Luis E. Pérez Cortés, Arizona State University

Sinem Siyahhan, California State University, San

Marcos

Creating Comics about COVID-19 to understand the intersections between Science, Community, and Equity

Shakuntala Devi Gopal, SUNY Buffalo

Anthony White, SUNY Buffalo

Jessica Scates, SUNY Buffalo

Sameer Honwad, SUNY Buffalo

Ryan Rish, SUNY Buffalo

Photo-elicitation as a technique for identifying triggers of Situational Interest during a nature reserve visit

Bhamini Kamudu, University of Witwatersrand

Marissa Rollnick, University of Witwatersrand

Eunice Nyamupangedengu, University of

Witwatersrand

Strand 6: Science Learning in Informal Contexts

Experiences in Informal Science

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Henry James Evans, University of Copenhagen

A Mixed Blessing: High School Students' Visiting a University: Self-Reported Experience and a Wishlist

Efrat Nativ Ronen, Technion - Israel Institute of Technology

Tali Tal, Technion - Israel Institute of Technology

Students' Perception of Kitchen Activities in Promoting Secondary School Chemistry Learning Outcomes in Nigeria

Ngozi Philomena Okafor, University of Lagos

An authentic experience with a SEM as Enacting Endogenous Science for Capacity Building

Ella Yonai, Weizmann Institute of Science

Ron Blonder, Weizmann Institute of Science

Using Makerspace Activity in a Low-income Context

Wanja Gitari, University of Toronto

Strand 6: Science Learning in Informal Contexts

Informal Science in Media and Society

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Sanlyn Buxner, University of Arizona

Supports and Challenges during Educational Crisis: Examining the Impact of the Pandemic on Youth Pathways

Rachel Chaffee, American Museum of Natural History

Preeti Gupta, American Museum of Natural History
Karen Hammerness, American Museum of Natural History

Timothy Podkul, SRI International

Anna MacPherson, American Museum of Natural History

Michael Chavez-Reilly, American Museum of Natural History

Kea Anderson, SRI International

Daniel Princiotta, SRI International

Daniela Saucedo, SRI International

Gendered engagement with posts authored by female scientists on Facebook

Keren Dalyot, Technion - Israel Institute of Technology

Yael Rozenblum, Technion - Israel Institute of Technology

Ella Lachman, Little Big Science

Ayelet Baram-Tsabari, Technion - Israel Institute of Technology

Science News Websites: Making Science Accessible for All

Ifat Zimmerman, Technion - Israel Institute of Technology

Tali Tal, Technion - Israel Institute of Technology

Avshalom Ginosar, The Academic College of Emek Yezreel

Depression and Test Anxiety in Science Stream high Schoolers: Influence of Dummy Schools in India

Parth Soni, Indian Institute of Management

Ahmedabad

Kathan Shukla, Indian Institute of Management

Ahmedabad

Strand 7: Pre-service Science Teacher Education

COVID and Course Design

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Elizabeth Lewis, University of Nebraska–Lincoln

Emergency Remote Teaching of Science Methods Courses During the COVID-19 Pandemic

Martha Canipe, Northern Arizona University

Ed+gineering Teams of Undergraduate Education and Engineering Students Transition Online to Teach Elementary Students Engineering

Kristie Gutierrez, Old Dominion University

Orlando Ayala, Old Dominion University

Jennifer Kidd, Old Dominion University

Pilar Pazos, Old Dominion University

Stacie Ringleb, Old Dominion University

Krishna Kaipa, Old Dominion University

Supporting Preservice Elementary Teachers' Development of Science Concepts and Practices in an Online Course

Nidaa Makki, The University of Akron

Danielle Dani, Ohio University

Andrea Maria Anderson, Ohio University

Strand 8: In-service Science Teacher Education

Sociocultural Perspectives on teacher learning and classroom practice

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Jennifer Maguire, Virginia Tech

Exploring Teachers' Stories through a Culturally Responsive Lens

Jamie Wallace, American Museum of Natural History

Elaine Howes, American Museum of Natural History

Arthur Funk, American Museum of Natural History

Sean Krepski, American Museum of Natural History

Maya Pincus, American Museum of Natural History

Raghida Sharif, American Museum of Natural History

Samantha Swift, American Museum of Natural History

History

Susan Sylvester, American Museum of Natural History

History

Kin Tsoi, American Museum of Natural History

Caity Tully, American Museum of Natural History

Opportunities for Reflecting on Opposition to Learning Evolution During a Teacher Training Course

Merav Siani, Weizmann Institute of Science

Reut Stahi-Hitin, Weizmann Institute of Science

Anat Yarden, Weizmann Institute of Science

Analyzing whether teachers' task values influenced their implementation of bioeconomy-focused lessons: A pilot study

Margaret Blanchard, North Carolina State University

Karen Collier, North Carolina State University

Aparajita Rajwade, North Carolina State University

Katherine McCance, North Carolina State University

Shana McAlexander, North Carolina State University

Richard Venditti, North Carolina State University

Formative Interventions for Expansive Teacher Learning in Multilingual Science Education: Change Laboratories for Transformation of Practice

Sara Salloum, University of Balamand

Saouma Boujaoude, American University of Beirut

Strand 13: History, Philosophy, Sociology, and Nature of Science

Using Augmented Reality and Mixed Reality to Enhance Science Learning

9:45 am -10:45am

Advanced Pre-recorded Viewing & Live Q&A

President: Richard Lamb, East Carolina University

Working as Intended? How Procedural Fidelity and Flow Impact Learning in a Game-Based Science Curriculum

Shane Tutwiler, University of Rhode Island

Denise M. Bressler, East Carolina University

Len Annetta, East Carolina University

Using Augmented-Reality to reduce Cognitive Load while learning Organic Chemistry

Sebastian Keller, University of Duisburg-Essen

Stefan Rumann, University of Duisburg-Essen

Sebastian Habig, University of Duisburg-Essen

Comparing Integrated Presentation Formats for Technology-Enhanced Science Experiments

Michael Thees, Technische Universität Kaiserslautern

Kristin Altmeyer, Saarland University

Sebastian Kapp, Technische Universität Kaiserslautern

Kaiserslautern

Eva Rexigel, Technische Universität Kaiserslautern

Fabian Beil, Technische Universität Kaiserslautern

Pascal Klein, Georg-August Universität Göttingen

Sarah Malone, Saarland University

Roland Brünken, Saarland University

Jochen Kuhn, Technische Universität Kaiserslautern

A Study of Mixed Reality Technology on Elementary School Students Reading of Science Expository Text

Len Annetta, East Carolina University

Denise M. Bressler, East Carolina University

Ashley Holder, Fayetteville State University

Alexis Dunekack, East Carolina University

Concurrent Session # 11 (Advance Viewing of Pre-recorded Presentations with 60-minute Real time/ Live Q&A)

11:00 am – 12:00 pm

Strand 5: College Science Teaching and Learning (Grades 13-20)

Buttress and Barriers to Constructing College Cultures of STEM

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Shana McAlexander, North Carolina State University

Approaches to Learning Biology of Women of Color: The Intersectionality of Gender, Race, and Science-Identity

Angela Google, Middle Tennessee State University

Anna Grinath, Idaho State University

Grant Gardner, Middle Tennessee State University

Eshan Patel, Middle Tennessee State University

A qualitative investigation of students' acceptance of evolution

Ryan D.P. Dunk, University of Northern Colorado

Jason Wiles, Syracuse University

Culturally Responsive Teaching in Undergraduate Science Learning Spaces

Hillary Barron, University of Minnesota - Twin Cities

Julie Brown, University of Florida

Sehoya Cotner, University of Minnesota

Physical Science Doctoral Students' Perspectives on Obstacles and Opportunities for Identity Development in Graduate School

Anne McAlister, The University of Virginia

Sarah Lilly, The University of Virginia

Jennifer Chiu, The University of Virginia

Strand 5: College Science Teaching and Learning (Grades 13-20)

Alternative Routes to College STEM

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Petra Kranzfelder, University of California, Merced

Nature of Uncertainty in Undergraduate Non-Majors Biology Labs: Face-to-Face vs. Online Formats

Samantha Skrob, Florida State University

Sherry Southerland, Florida State University

"In the End, You Actually Remember Learning Stuff": First-Generation College Undergraduates Perspectives of Student-Centered Instruction

Ashley Harlow, University of California, Irvine

Brian Sato, University of California, Irvine

Non-traditional adult learners as legitimate participants in undergraduate STEM outreach programs

Hannah Huvard, University of Colorado, Denver

Robert Talbot, University of Colorado, Denver

Michael Ferrara, National Science Foundation

Creating Communities of Support at Two-Year HSIs: Serving Underrepresented Students in STEM

Victoria Rodriguez-Operana, San Diego State University

Gabriela Kovats Sánchez, San Diego State University

Felisha Herrera, San Diego State University

Marlena Wolfgramm, San Diego State University

Strand 6: Science Learning in Informal Contexts

Informal Educator Experiences

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presider: Clausell Mathis, University of Washington

Preservice Elementary Teachers' Perspectives of Informal Science Spaces

Michelle Forsythe, Texas State University

Yun-Wen Chan, Texas State University

Teaching Science to Refugees: A Multi-site Case Study of Volunteer Educators in Non-formal Education Settings

Erika Gillette, College of Mount Saint Vincent

Informal Science Educators' Perceptions of Effective Facilitation Practices

Alexandria Muller, University of California- Santa

Barbara

Kyle Van Loon, University of California- Santa

Barbara

Molly Hay, University of California- Santa Barbara

Jasmine Marckwordt, University of California- Santa Barbara

Ron Skinner, MOXI, The Wolf Museum of Exploration and Innovation

Danielle Boyd Harlow, University of California- Santa Barbara

Parent-child Science Talk to Support Children's Informal Learning at Home

Wahyu Setioko, Ohio State University

Lin Ding, Ohio State University

Strand 6: Science Learning in Informal Contexts

Informal Science Clubs

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presider: Alpaslan Sahin, Harmony Public Schools

Bridging formal and informal education in an afterschool science club for children from low-income communities

Lydia Burke, OISE, University of Toronto

Megan Pham-Quan, University of Toronto

Novella Ricotti, University of Toronto

Natalie Marentic, University of Toronto

Investigating How 4-H Project Manuals Engage Children in Science & Engineering Practices

Ashley Kookan, West Virginia University

Jennifer Murray, West Virginia University

Melissa Luna, West Virginia University

Students as Informed Citizens: Constructing Socioscientific Arguments in an Elementary After-School Program

Melissa Cieto, University of Massachusetts

Dartmouth

Stephen Witzig, University of Massachusetts

Dartmouth

"A Leg Up": Accelerating High School Students' Career Trajectories Through Informal STEM Programs

Kathryn Rende, North Carolina State University

Emma Refvem, North Carolina State University

M. Gail Jones, North Carolina State University

Sarah Carrier, North Carolina State University

Megan Ennes, University of Florida

Julianna Nieuwsma, North Carolina State University

Strand 7: Pre-service Science Teacher Education

Development of Pre-service Teacher Knowledge and Practice

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Bridget Miller, University of South Carolina

Fostering the TPACK of science teacher students in a pedagogical makerspace

Anna-Lisa Max, PH Weingarten

Sarah Lukas, PH Weingarten

Holger Weitzel, PH Weingarten

The Effects of Modeling Based STEM Education on Alternative Nature of Science Understandings of Pre-service Science Teachers

Ayse Buber, Dokuz Eylul University

Gul Unal Coban, Dokuz Eylul University

Impact of Professional Learning Communities on Preservice Teacher Usage of Reformed Teaching Practices

Rachael Tawbush, The University of Alabama

Dennis Sunal, University of Alabama

Towards a Deeper Understanding - The Impact of Cognitive Support on Pre-Service Teachers' Content Knowledge

Dustin Schiering, IPN - Leibniz Institute for Science and Mathematics Education

Stefan Sorge, IPN - Leibniz Institute for Science and Mathematics Education

Knut Neumann, IPN - Leibniz Institute for Science and Mathematics Education

Strand 7: Pre-service Science Teacher Education

Expanding the Toolkit for Pre-service Teachers

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presenter: Imran Tufail, University of Waikato

Opportunities and Tensions When Teaching for the edTPA

Karin Lohwasser, University of California, Santa Barbara

Soo-Yean Shim, University of Washington

Caroline Hadley Long, University of Washington

Mark Windschitl, University of Washington

Lessons from using PAR as Pedagogy in science methods with elementary preservice teachers

Rachel Askew, Vanderbilt University

Engaging international emerging teachers in co-authoring tools through a TAS framework

Moyu Zhang, New York University

How Practice-oriented Teacher-training Modules Affect Pre-service Biology Teachers' Views on Inclusive Science Education

Elizabeth Watts, Friedrich-Schiller-Universität Jena

Strand 8: In-service Science Teacher Education

Teacher Engagement in Science Practices

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Nidaa Makki, The University of Akron

Research Experience Enriches Teachers' Classroom Practices Related to Science and Engineering Practices and STEM Careers

Sanlyn Buxner, University of Arizona

Daniel Moreno, University of Arizona

Larry Horvath, San Francisco State University

John Keller, University of Colorado

Melissa Yisak, American Institutes for Research

Bo Zhu, American Institutes for Research

Deidre Sessoms, Sacramento State University

Dermot Donnelly-Hermosillo, Fresno State

Elsa Bailey, San Francisco State University

Stamatis Vokos, Cal Poly, SLO

Critical Events as Catalysts for Cultivating Teachers' Understandings about Science through Firsthand Research Experiences

Shannon Davidson, Florida State University

Lama Jaber, Florida State University

Sherry Southerland, Florida State University

Designing professional learning experiences to support teachers' computational thinking learning and confidence

Amanda Peel, Northwestern University

Jacob Kelter, Northwestern University

Michael Horn, Northwestern University

Uri Wilensky, Northwestern University

The Efficacy of SciWorld in Solving the Transfer Problem and Supporting Teacher Enactment of the Next Generation Science Standards

Darby Feldwinn, University of California, Santa Barbara

Barbara

Sarah Hough, University of California, Santa Barbara

Sammi Lambert, University of California, Santa Barbara

Barbara

Vanessa Woods, University of California, Santa Barbara

Barbara

Strand 8: In-service Science Teacher Education

Teacher Self Efficacy and Perceptions

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Elizabeth Lewis, University of Nebraska–Lincoln

Supporting Elementary Teachers in High-need Schools to Teach STEM

Amanda Gunning, Mercy College

Meghan Marrero, Mercy College

Elena Nitecki, Mercy College

Latanya Brandon, SUNY New Paltz

Kristen Larson, Mercy College

Brian Baldwin, Kean University

In-service Course Supporting Teacher Ownership of Proposed Teaching Strategies

Ana Valdmann, University of Tartu

Miia Rannikmäe, University of Tartu

Jack Holbrook, University of Tartu

Teachers' Self-Efficacy Beliefs for Teaching Science as Inquiry: A Large National Sample in Oman

Mohamed Shahat, Sultan Qaboos University

Ambusaid. Abdullah, Sultan Qaboos University

David Treagust, Curtin University

A Comparative Analysis of High School Science Teachers' Perceived Approach and Efficacy Teaching Problem-Solving

Bryanna Nelson, Purdue University

Hui-Hui Wang, Purdue University

Neil Knobloch, Purdue University

Sarah LaRose, Purdue University

Strand 8: In-service Science Teacher Education

Approaches to STEM Implementation

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presider: Matthew Johnson, Pennsylvania State University

Exploring Science Teacher Noticing in Informal Science Settings

Sara Heredia, University of North Carolina Greensboro

Ti'Era Worsley, University of North Carolina at Greensboro

Jakayla Clyburn, University of North Carolina at Greensboro

Digging Deeper into Conceptions of Integrated STEM: Focusing on 21st Century Skills and STEM Careers

Emily Dare, Florida International University

Khomson Keratithamkul, University of Minnesota

Benny Mart Hiwatig, University of Minnesota Twin Cities

Feng Li, Florida International University

Engaging Agency to Teach Science: Examining Elementary Teachers' Participation and Enactment of School-Based Professional Development

Jessica Chen, Teachers College, Columbia University

Enhancement of the pedagogy of scientific argumentation and supporting teacher agency in the secondary classroom

Zeynep Guler, University College London

Strand 10: Curriculum and Assessment

Curriculum and assessment in the context of physics

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presider: Ya-nan Zhao, Beijing Normal University

Analysis of the Spanish-Language Force Concept Inventory: Lost in Translation?

Cesar Delgado, North Carolina State University

Hye Sun You, Arkansas Tech University

Natalia Murillo-Quirós, Instituto Tecnológico de Costa Rica

Mónica Hernández-Campos, Instituto Tecnológico de Costa Rica

Subject matter as a discipline-culture a new curricular organization for improving understanding in learning science

Lina Vinitsky – Pinsky, Achva Academic College, Israel

Irena Vladimirsky, Achva Academic College, Israel

Igal Galili, Hebrew University of Jerusalem, Israel

Student Facets of Thinking in Parallel Contexts

Philip Hernandez, Stanford University

Jim Minstrell, FACET Innovations, LCC

Maria Araceli Ruiz-Primo, Stanford University

Min Li, University of Washington

Klint Kanopka, Stanford University

Ruth Anderson, FACET Innovations, LLC

Dongsheng Dong, University of Washington

Xiaoming Zhai, Michigan State University

Analyzing the Use of Educative Curriculum Materials in Physics Teaching

Judith Breuer, Universität Paderborn

Christoph Vogelsang, Universität Paderborn

Peter Reinhold, Universität Paderborn

Strand 11: Cultural, Social, and Gender Issues

Students and STEM

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presider: Maria Wallace, University of Southern Mississippi

"It just represents, you know, me": Latinx Students Developing Identities as Engineers-in-training

Jasmine McBeath Nation, California Polytechnic University

Science practices as an opportunity for student language development: Affordances, tensions, and ideological contradictions

Emily Reigh, Stanford

Shifting stereotypes: low-stakes assignments highlighting counterstereotypical scientists alter students' perceptions of and relatability to scientists

Kelsey Metzger, University of Minnesota Rochester
Bradley Craker, University of Minnesota Rochester
Yuefei Shen, University of Minnesota Twin Cities

Influences on Historically Underrepresented Minority Students' Decisions to Enroll and Persist in STEM Majors

Shetay Ashford-Hanserd, Texas State University
Kristy Daniel, Texas State University
Dana García, Texas State University
Yasiry Lerma, Texas State University
Rosio Pedroso, Texas State University

Strand 11: Cultural, Social, and Gender Issues

Teacher Leadership and Engagement in PD

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

Presider: Kimberly Staples, Kansas State University

Science Teachers' Process Skills, Inquiry, and Problem-Based Learning During Induction: A Randomized Controlled Trial

Shannon Navy, Kent State University
Jennifer Maeng, University of Virginia
Randy Bell, Oregon State University
Fatma Kaya, Kent State University

STEM Teachers' Professional Learning Community During the COVID-19 Pandemic

Zehavit Kohen, Technion - Israel Institute of Technology
Orit Cohen Nissan, Technion - Israel Institute of Technology

Experiences of School Science Coordinators During the COVID-19 Pandemic: An International Perspective

Harleen Singh, University of Georgia
Hong Tran, University of Georgia
Hatice Ozen Tasdemir, University of Georgia
Yuxi Huang, University of Georgia
Julie Luft, University of Georgia

Science Teacher Engagement in Professional Learning

Irit Vivante, Ben Gurion University of the Negev, Israel
Dana Vedder-Weiss, Ben-Gurion University of the Negev, Israel

Strand 11: Cultural, Social, and Gender Issues

STEM Identity

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Cesar Delgado, North Carolina State University

STEM Identities, First-generation College Students, and Family Influence

Megan McGinty, University of Alaska Fairbanks

Laura Carsten Conner, University of Alaska Fairbanks

Developing STEM identities in students in the "big middle". Connections between identity and socioeconomic level

Carne Grimalt-Álvaro, Universitat Rovira I Virgili

Digna Couso, Crecim-Universitat Autònoma De Barcelona

Examining the Intersection of Spirituality/Religiousness, Race/Ethnicity, and Gender on the Physics Career Choices

Saeed Moshfeghyeganeh, Florida International University

Amanda Smith, Florida International University

Zahra Hazari, Florida International University

Who is a STEM Person?: Analysis of Criteria Used to Define and Differentiate STEM People

Elizabeth Diana Palma-D'Souza, Florida International University

Remy Dou, Florida International University

Heidi Cian, Florida International University

Strand 12: Technology for Teaching, Learning, and Research

Digital Tools to Support Inservice and Pre-Service Teachers' Professional Learning

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Yael Feldman-Maggor, Weizmann Institute of Science

Promote computational thinking of middle-school teachers through SPARC-integrated science instruction

Jianlan Wang, Texas Tech University

Yuanlin Zhang, Texas Tech University

Joshua Hawkins, Texas Tech University

Monica Romero, Texas Tech University

Science teachers' perceptions regarding digital curation as a personalized learning activity that promotes professional learning

Efrat Dayan, Technion - Israel Institute of Technology

Dina Tsybulsky, Technion - Israel Institute of Technology

Elementary Pre-Service Teachers' Learning of Content Knowledge: A Qualitative Research Using Top Hat Digital Platform

Samantha Lynch, Wayne State University

Jazlin Ebenezer, Wayne State University

Different Teaching Experience: How Teachers Personalized a Teaching Unit in an Online Chemistry Learning System

Ehud Aviran, Weizmann Institute of Science

Ron Blonder, Weizmann Institute of Science

Strand 12: Technology for Teaching, Learning, and Research

Teaching and Learning with Technology through the COVID-19 Pandemic

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Miri Barak, Technion - Israel Institute of Technology

The COVID-19 Pandemic Implications on a Flipped Project-Based MBSE course

Niva Wengrowicz, Technion- Israel Institute of Technology

Hanan Kohen, Technion - Israel Institute of Technology

Dov Dori, Technion - Israel Institute of Technology

Uncharted Territories: Teaching Science Virtually in the Era of COVID-19

Justina Ogodo, Baylor University

Marsha Simon, University of West Georgia

Dana Morris, Baylor University

Mark Akubo, Florida State University

Learning Experience and Instructional Design Efforts Promoting Self-Efficacy and Task-Value in Undergraduate Science Online Courses

Joseph Wong, University of California, Irvine

Brad Hughes, University of California, Irvine

Multi-modal online teaching during national lockdown: Exploring the blended continuum teaching science

Frikkie George, Cape Peninsula University of Technology

Ekaterina Rzyankina, Cape Peninsula University of Technology

Keith Langenhoven, University of the Western Cape

Strand 14: Environmental Education and Sustainability

Learning out of doors

11:00am -12:00 pm

Advanced Pre-recorded Viewing & Live Q&A

President: Sara Salisbury, Middle Tennessee State University

Engaging the Urban Classroom with the Natural World: Lessons Learned During A Pandemic

Gary Holliday, University of Akron

Lara Roketenetz, University of Akron

Impacts of contextualized outdoor education on what and how elementary students learn about ecosystem relationships

Jean-Philippe Ayotte-Beaudet, Université De Sherbrooke

Pierre Chastenay, Université du Québec à Montréal

Alain Paquette, Université du Québec à Montréal

Michael Giamellaro, Oregon State University

Marie-Claude Beaudry, Université de Sherbrooke

Kassandra L'Heureux, Université de Sherbrooke

Estelle Desjarlais, Université du Québec à Montréal

A Comparative Study Between Outcomes of an In-person vs. Online Introductory Field Course

Alexandra Race, University of California - Santa Cruz

Maria De Jesus, Florida State University

Roxanne Beltran, University of California - Santa Cruz

Erika Zavaleta, University of California - Santa Cruz

Preservice teachers' perceptions and practices of outdoor learning: A case study of time spent outdoors

Gerald Tembrevilla, The University of British Columbia – Vancouver

Columbia – Vancouver

Hartley Banack, The University of British Columbia

Saturday, April 10, 2021

CLOSING SESSION

12:15-1:00 pm (Real time/ Live)

**Presidential Closing Remarks,
2022 Conference Information**

12:15pm-1:00pm

Real time/ Live

**Author-Scheduled Presentations
Day and Time to be determined by authors**

*Author-scheduled presentations will be listed here as
their dates and times are established.*