

Friday, March 9, 2018

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NARST Executive Board Meeting Session #1

7:30am – 5:00pm, Chastain F

Conference Registration

2:00pm – 5:00pm, Peachtree Terrace

Saturday, March 10, 2018

Conference Registration

7:00am – 5:00pm, Peachtree Terrace

NARST Executive Board Meeting Session #1 (continued)

7:30am – 10:15am, Chastain F

Pre-Conference Workshops

8:00am – 11:45am

Pre-Conference Workshop #1: Equity and Ethics Committee (Free – 90 participants max)

Re-Centering on Scientific Literacy in an Era of Science Mistrust and Misunderstanding

8:00am – 11:45am, Savannah C

Organizers:

Senetta Bancroft, Southern Illinois University

Saiqa Azam, Memorial University of Newfoundland, CAN

Sanghee Choi, University of North Georgia

Deniz Saribas, Istanbul Aydin University, Turkey

Phillip Boda, Stanford University

Sheron Mark, University of Louisville

Sara Raven, Texas A&M University

Lizette Ramos, University of Guadalajara

Pre-Conference Workshop #2: Research Committee (\$25 for regular membership / Free for all other memberships – 40 participants max)

LARIG: Supporting the Success of Early Career Educators and Scholars in Science Education (Multilingual Workshop)

8:00am – 11:45am, Augusta 3

Presenters:

Fatima Elvira Terrazas Arellanes, University of Oregon

Alejandro Gallard, Georgia Southern University

Peter R. Licon, Elizabethtown College

Regina Suriel, Valdosta State University

Diego Rojas-Perilla, Teachers College, Columbia University

Pre-Conference Workshop #3: Research Committee (Free – 40 participants max)

Using R for Rasch Analysis to Explore Student Learning Progression

8:00am – 11:45am, Peachtree 1

Presenters:

Ling Liang, La Salle University
Xiufeng Liu, University at Buffalo, SUNY
Gavin W. Fulmer, University of Iowa
Irene Neumann, Leibniz-Institute for Science and Mathematics Education, Germany

Pre-Conference Workshop #4: Research Committee (\$25 – 30 participants max)
Integration of Neuroscience and Science Education to Understand Student Learning
8:00am – 11:45am, Augusta A

Presenters:
Richard Lamb, University at Buffalo, SUNY
Pavlo Antonenko, University of Florida
John B. Firestone, Washington State University

Pre-Conference Workshop #5: External Policy and Relations Committee (Free – 50 participants max)
Research-practice Partnerships with State and Local Science Education Leaders
8:00am – 11:45am, Augusta 1

Presenters:
Charles W. (Andy) Anderson, Michigan State University
Phillip Bell, University of Washington
Amelia Gotwals, Michigan State University
Tiffany Neill, Oklahoma State Department of Education
William Penuel, University of Colorado
Tamara (TJ) Smolek, Michigan State University
Douglas Watkins, Denver Public School District
Mary Margaret Welch, Seattle Public Schools

Pre-Conference Workshop #6: Publications Advisory Committee (Free – 40 participants max)
Workshop on Scholarly Writing and Innovation for NARST Newcomers
8:00am – 11:45am, Augusta F

Organizers:
Deborah Tippins, University of Georgia
Sophia Jeong, University of Georgia
Presenters:
Lynn Bryan, Purdue University
Felicia Mensah Moore, Teachers College, Columbia University
Victor Sampson, University of Texas at Austin
Christina Schwarz, Michigan State University
Jan van Driel, Melbourne, Australia
Maria Varelas, University of Illinois Chicago
Deborah Tippins, University of Georgia
Dana Zeidler, University of South Florida

Pre-Conference Workshop #7: Membership Committee (Free – 90 participants max)

Early Career Faculty Forum

10:30am – 11:45am, Savannah A

Early Career Faculty Forum

Organizers:

Sonya Martin, Seoul National University

Brooke Withworth, University of Mississippi

Presenters:

Senior NARST Scholars

Lunch—On Your Own

11:45am – 12:50pm

Committee Meetings (Box lunch provided for committee members)

11:45am – 12:50pm

Awards Committee Chairs & Co-Chairs Meeting

11:45am – 12:50pm, Savannah A

Equity and Ethics Committee Meeting

11:45am – 12:50pm, Savannah B

External Policy and Relations Committee Meeting

11:45am – 12:50pm, Savannah C

Research Committee Meeting

11:45am – 12:50pm, Augusta 1

Membership Committee Meeting

11:45am – 12:50pm, Augusta 2

Election Committee Meeting

11:45am – 12:50pm, Augusta B

International Committee Meeting

11:45am – 12:50pm, Augusta 3

Program Committee Meeting

11:45am – 12:50pm, Peachtree 1

Publications Advisory Committee Meeting

11:45am – 12:50pm, Augusta A

Graduate Student Committee Meeting

7:15am – 8:30pm, Augusta C

Website Committee Meeting

7:15am – 8:30pm, Augusta D

Plenary Session #1

Science in a Post-Truth World

1:00pm – 2:30pm, Peachtree Ballroom

Presenter:

Jane Lubchenco, Oregon State University

Concurrent Session #1

2:40pm – 4:10pm

Publications Advisory Committee

Symposium – How to Get Your Research Published in Science Education Journals

2:40pm-4:10pm, Savannah C

Presenter:

Ron Gray, Northern Arizona University

Presenters:

Journal of Research in Science Teaching

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

Dana L. Zeidler, University of South Florida

Science Education

Sherry A. Southerland, Florida State University

John Settlage, University of Connecticut

International Journal of Science Education

Jan H. Van Driel, University of Melbourne

CBE Life Sciences Education

Erin L. Dolan, University of Georgia

Cultural Studies in Science Education

Catherine E. Milne, New York University
Christina Siry, University of Luxembourg
Michael Mueller, University of Alaska Anchorage

Journal of Engineering Education
Lisa Benson, Clemson University

Journal of the Learning Sciences
Leema Berland, University of Wisconsin

Journal of Science Education and Technology
Kent Crippen, University of Florida

Journal of Science Teacher Education
Normal Lederman, Illinois Institute of Technology
Judith Lederman, Illinois Institute of Technology

Science & Education
Kostas Kamourakis, University of Geneva

Research in Science Education
David Geelan, Griffith University

School Science and Mathematics
Carla C. Johnson, Purdue University

Studies in Science Education
Justin Dillon, University of Exeter
Lucy Avraamidou, University of Groningen

Strand 1: Science Learning, Understanding and Conceptual Change

The Role of Spatial Thinking in Science Learning: Examples from Early Childhood through Experts

2:40pm-4:10pm, Peachtree 1

Presenter: Kim Cheek, University of North Florida

Discussant: Cesar Delgado, North Carolina State University

Spatial Thinking or Deliberate Practice: Understanding Diagrams on a High School Earth Science Assessment

Nicle D. LaDue, Northern Illinois University

Helping Students Learn Chemistry by Supporting Their Representational Competencies
Martina Rau, University of Wisconsin-Madison

Spatial Thinking in Meteorology

Peggy M. McNeal, Western Michigan University
Heather Petcovic, Western Michigan University
Todd D. Ellis, Western Michigan University
Nicole D. LaDue, Northern Illinois University

How Do Astronomy Textbook Images Support Learning about Scale, Proportion, and Quantity in Grades K-8?

Kim Cheek, University of North Florida
Caroline George, University of North Florida

Investigating Undergraduate Sub-meter Perceptions of Scale

Laura A Tinigin, Western Michigan University
Heather L. Petcovic, Western Michigan University

Strand 2: Science Learning: Contexts, Characteristics and Interactions
Approaches for Studying Equitable and Responsive Science Teaching

2:40pm-4:10pm, Augusta A

Presider: Christa Haverly, Michigan State University

Discussant: Jessica Thompson, University of Washington

Noticing and Responding Episodes: Accessing Elementary Teachers' Responsiveness Towards Equitable Sense-making

Christina V. Schwarz, Michigan State University
Melissa Braaten, University of Colorado, Boulder
Angela Calabrese-Barton, Michigan State University
Christa Haverly, Michigan State University
Elizabeth X. De Los Santos, University of Nevada, Reno
Jessica J. Thompson, University of Washington

Situating Teachers' Productive Responsiveness in Instructional Contexts

Hosun Kang, University of California, Irvine

Examining How Responsive Teaching Supports Scientific Inquiry in an Online Learning Environment

Lama Jaber, Florida State University
Jessica Watkins, Tufts University
Vesal Dini, Tufts University

Supporting Emerging Bilingual Students' Translanguaging When Making Sense of Electrical Phenomena

Enrique Suarez, University of Colorado, Boulder

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

Student Participation in Science-Related Discourses – the Roles of Representations

2:40pm-4:10pm, Augusta C

Discussant: Carolyn Wallace, Kennesaw State University

Using Representations to Learn about the Greenhouse Effect

Tobias Fredlund, University of Oslo

Erik Knain, University of Oslo

Anniken Furberg, University of Oslo

Carolyn S. Wallace, Kennesaw State University

Students' Engagement with Representations in Science

Torunn Aanesland Strømme, University of Oslo

Anniken Furberg, University of Oslo

Erik Knain, University of Oslo

Line Ingulfsen, University of Oslo

Carolyn S. Wallace, Kennesaw State University

Students' Argumentation on SSI – the Role of Representations

Erik Knain, University of Oslo

Kari Beate Remmen, University of Oslo

Tobias Fredlund, University of Oslo

Carolyn S. Wallace, Kennesaw State University

Representations and Student Teachers' Experiences from Teacher Practice

Mai Lill Suhr Lunde, University of Oslo

Ketil Mathiassen, University of Oslo

Marianne Ødegaard, University of Oslo

Erik Knain, University of Oslo

Tobias Fredlund, University of Oslo

Carolyn S. Wallace, Kennesaw State University

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

Exploring Socio-Scientific Issues

2:40pm-4:10pm, Augusta H

Presenter: Merchi Edry, Technion - Israel Institute of Technology

Improving Students' Argumentation Performance Through a Socioscientific Issue Instruction

Regarding Solar Cell Production

Shih-Yeh Chen, National Taiwan Normal University

Shiang-Yao Liu, National Taiwan Normal University

Xiaoying Wang, Stony Brook University

Socio-cultural Factors and Scientific Explanations by Biology Students

Peter A. Okebukola, Lagos State University, Nigeria

Tunde Owolabi, Lagos State University, Lagos, Nigeria
Sunday Banjoko, Lagos State University, Nigeria

Teaching Practices for the Enactment of Socio-Scientific Issues Oriented Teaching: How an Experienced Teacher Delivers SSI Instruction

Troy Sadler, University of Missouri
David Owens, University of Missouri

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

Understanding Active Learning and Learning Assistant Support in Undergraduate Science Classrooms

2:40pm-4:10pm, Augusta D

Presider: Robert M. Talbot, University of Colorado, Denver

Characterizing Mediating Artifacts: Authenticity of Active Learning Tasks

Leanne Doughty, University of Colorado, Denver
Robert M. Talbot, University of Colorado, Denver
Laurel Hartley, University of Colorado, Denver
Paul Le, University of Colorado, Denver
Amreen Nasim Thompson, University of Colorado, Denver

Learning Assistants' Actions: An Analysis of their Interactions with Students

Amreen Nasim Thompson, University of Colorado, Denver
Leanne Doughty, University of Colorado, Denver
Robert M. Talbot, University of Colorado, Denver
Paul Le, University of Colorado, Denver
Laurel Hartley, University of Colorado, Denver

The Classroom Community: What Students, Faculty and Learning Assistants are doing in the Active Learning Class

Laurel Hartley, University of Colorado, Denver
Leanne Doughty, University of Colorado, Denver
Paul Le, University of Colorado, Denver
Amreen Nasim Thompson, University of Colorado, Denver
Robert M. Talbot, University of Colorado, Denver

The Classroom Community: How Student Interaction Relates to Outcomes

Paul Le, University of Colorado, Denver
Robert M. Talbot, University of Colorado, Denver
Andrew L. McDevitt, Illinois State University
Laurel Hartley, University of Colorado, Denver
Amreen Nasim Thompson, University of Colorado, Denver
Leanne Doughty, University of Colorado, Denver

Strand 6: Science Learning in Informal Contexts

Reimagining STEM Through Theatre: A Cross-Disciplinary Science-Theatre Project for Middle School Youth

2:40pm-4:10pm, Augusta B

Presenters:

Ariella F. Suchow, Boston College
Megan T. McKinley, Boston College
Amy R. Semerjian, Boston College
Helen Zhihui Zhang, Boston College
Mike Barnett, Boston College

Strand 7: Pre-service Science Teacher Education

Argumentation

2:40pm-4:10pm, Augusta G

Presenter: Meenakshi Sharma, Michigan State University

From Didactic to Dialogical Teaching – Intervention to Foster Scientific Argumentation in Ethiopian Teacher Education

Vanessa Kind, Durham University
Per Morten Kind, Durham University
Mulugeta Atnafu, Addis Ababa University
Kassa Michael, Addis Ababa University
Mekbib Alemu, Addis Ababa University
Mesfin Tadesse, Addis Ababa University

Preservice Teachers' use of Discourse to Control the Construction of Scientific Arguments

Brent Gilles, University of West Georgia
Gayle A. Buck, Indiana University

The Impact of Socio-scientific Biology Instruction on Argumentation Skills of Preservice Science Teachers

Yilmaz Kara, Karadeniz Technical University
Gozde Yalcin, Bartin University

Strand 7: Pre-service Science Teacher Education

Mentoring

2:40pm-4:10pm, Savannah B

Presenter: Michelle Forsythe, Texas State University

Digital Community of Practice: What do Veteran Teachers Talk About?

Susan P. Unger, University of Rhode Island
Jay A. Fogleman, University of Rhode Island
Sara B. Sweetman, University of Rhode Island

Mind the Gap: Exploring (Mis)alignment in Inservice and Preservice Science Teacher Mentoring Relationships

Alison R. Miller, Bowdoin College
Laura Zangori, University of Missouri
Brooke A. Whitworth, University of Mississippi
Mandy Biggers, Texas Woman's University

Promoting Science Teacher Candidate Learning through Content-Specific Disciplined Inquiry
Danielle E. Dani, Ohio University

The Triad Project: A Professional Development Activity System for Teaching to the NGSS

Al Schademan, California State University, Chico
Mimi Miller, California State University, Chico
Tal Slemrod, California State University, Chico

Strand 8: In-service Science Teacher Education

Conceptions of Engineers and Engineering

2:40pm-4:10pm, Augusta E

Presider: Emily A. Dare, Michigan Technological University

Exploring Teacher-Engineer Partnerships in Professional Development in the Time of NGSS
Emily A. Dare, Michigan Technological University

Identifying Teachers' Conceptions of Engineering and Teaching Engineering

Shannon M. Smith, University of Cincinnati
William H. Thatcher, University of Cincinnati
Helen Meyer, University of Cincinnati

Perspectives of Failure: Using Engineering Students' Viewpoints to Reimagine Failure in K-12 Schools

Jessica Cellitti, Drexel University

Strand 10: Curriculum, Evaluation, and Assessment

Assessing the Next Generation Science Standards

2:40pm-4:10pm, Augusta 3

Identifying Construct Validity Issues Raised by NGSS Assessments

Jill A. Wertheim, Stanford University
Jonathan Francis Osborne, Stanford
Cathy Zozakiewicz, Stanford University
Nicole Holthuis, Stanford University
Susan E. Schultz, Stanford University
KC Busch, North Carolina State

Designing Classroom-Based Assessments for Supporting Three-Dimensional Teaching and Learning

Christopher J. Harris, SRI International
Joseph S. Krajcik, Michigan State University
James Pellegrino, University of Illinois, Chicago
Kevin W. McElhaney, SRI International
Phyllis H. Pennock, Western Michigan University
Brian D. Gane, University of Illinois, Chicago

Applying Automated Analysis to the Measurement of Constructed Responses: Applications in Student Argumentation

Christopher Wilson, BSCS
Molly Stuhlsatz, BSCS
Brian M. Donovan, BSCS
Zoe E. Buck Bracey, BSCS
Jonathan Francis Osborne, Stanford University
Mark Urban-Lurain, Michigan State University
John Merrill, Michigan State University
Kevin C. Haudek, Michigan State University

Modeling the Relationship between Argumentation and Content Items: Possible Task Formats

Mark Wilson, University of California, Berkely
Linda Morell, University of California, Berkeley
Jonathan Francis Osborne, Stanford University

Strand 11: Cultural, Social, and Gender Issues

Symposium – Cultural Connections - Hispanic and Latin American Teachers and Students

2:40pm-4:10pm, Augusta F

Presenters:

Anna R. Lewis, La Pontificia Universidad Católica del Perú
Angela Chapman, University of Texas, Rio Grande Valley
Becca Shareff, University of California, Berkeley
Lorraine Ramirez, Florida Institute of Technology
Nikeetha Dsouza, Clemson University
Felicia Rodriguez, University of Texas, Rio Grande Valley

Strand 11: Cultural, Social, and Gender Issues

The Experiences of Underrpresented Groups in STEM

2:40pm-4:10pm, Chastain J

Presider: Natalie S. King, Georgia State University

Black Girls Speak STEM!

Natalie S. King, Georgia State University
Rose M. Pringle, University of Florida

Persistence in STEM: Perspectives from African American Male PhD Scientists and Engineers
Shari Watkins, University of Delaware

Exploring the Relationship between In-School and Out-of-School Time Science Experiences for African American Girls
Katherine Wade-Jaimes, University of Memphis

Using Personal Histories to Develop Racial Literacy with Science Teachers of Color: A Multiple Case Study
Althea B. Hoard, Columbia University
Felicia Moore Mensah, Columbia University

A Case Study of the Experiences of Exclusion Among Undergraduate Engineering Students
Christopher Dittrick, University of Virginia
Robert H. Tai, University of Virginia
Angela Skeeles-Worley, University of Virginia

Strand 12: Educational Technology

Augmented Reality

2:40pm-4:10pm, Augusta 2

Presider: Richard Lamb, University at Buffalo

Understanding Student Engagement while Using an Augmented Reality Sandbox
Nicholas A. Soltis, Auburn University
Karen S. Mcneal, Auburn University
Rachel M. Atkins, North Carolina State University
Lindsay C. Maudlin, North Carolina State University
Christine Schnittka, Auburn University

Using Epistemic Network Analysis to Examine Discourse and Scientific Practice during a Mobile AR Game
Denise M. Bressler, Rutgers University
Alec M. Bodzin, Lehigh University

Gender Differences in the Engagement and Knowledge Gains of Students using a Virtual Field Trip
Michael S. Tutwiler, University of Rhode Island
Ming-Chao J. Lin, National Taiwan Science Education Center
Chun-Yen Chang, National Taiwan Normal University

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

Symposium – Creating a Polyphonic and Dialogic Process to Address the Issue of Science Mistrust and Misunderstanding

2:40pm-4:10pm, Augusta 1

Presider: Sophia (Sun Kyung) Jeong, University of Georgia

Discussant: J. Oliver, University of Georgia

Presenters:

Sophia (Sun Kyung) Jeong, University of Georgia

Gretchen P. King, University of Nebraska-Lincoln

David L. Pauli, University of Georgia

Cary W. Sell, University of Georgia

David P. Steele, University of Georgia

Daniel K. Capps, University of Georgia

David F. Jackson, University of Georgia

Logan M. Leslie, University of Georgia

J. Steve Oliver, University of Georgia

Deborah J. Tippins, University of Georgia

Strand 14: Environmental Education

Symposium – Provocative Tensions: How Four Approaches Inform Visions of Sustainability-Oriented Science Education

2:40pm-4:10pm, Savannah A

Presider:

Kim Haverkos, Thomas More College

Discussant:

Theresa Shume, North Dakota State University

Presenters:

John Lawrence Bencze, University of Toronto

Rachel Gisewhite, National Coalition of Independent Scholars

Sami Kahn, Ohio University

Bhaskar Upadhyay, University of Minnesota

Concurrent Session #2

4:20pm – 5:50pm

Equity and Ethics Committee

Re-centering Science Education for All

4:20pm-5:50pm, Savannah C

Presiders:

Melody Russell, Auburn University

Catherine Quinlan, Howard University

Nam-Hwa Kang, Korea National University of Education

Miri Barak, Israel Institute of Technology

Presenters:

Sungmin Im, Deagu University, South Korea

Orit Ben Zvi Assaraf, University of the Negev, Israel.

Mary M. Atwater, University of Georgia, USA

Regina Suriel, Valdosta State University, USA
Pauline Chinn, University of Hawaii, USA
Meshach Ogunniyi, University of the Western Cape, Republic of South Africa

International Committee

ESERA Symposium - Physics Education and Gender: Identity as an Analytic Lens for Research

4:20pm-5:50pm, Augusta 1

Presenters:

Allison Gonsalves, McGill University
Anna T. Danielsson, Uppsala University
Heidi B. Carlone, University of North Carolina, Greensboro
Louise Archer, University College London
Jennifer Dewitt, UCL Institute of Education
Anders Johansson, Uppsala University
Adrienne Traxler, Wright State University
Jennifer Blue, Miami University

Strand 1: Science Learning, Understanding and Conceptual Change

Communication, Argumentation and Problem-Solving In Science Learning

4:20pm-5:50pm, Augusta A

President: Amity F. Gann, Temple University

Epistemic Games in Chemistry

Hannah Sevia, University of Massachusetts, Boston
Steven Couture, University of Massachusetts, Boston

Refining Methods for Assessing Cohesiveness in Multimodal Communication

Andrea Malek, University of Iowa
Mark A. McDermott, University of Iowa

Secondary Students' Argumentation Performance across Science and Social Topics

Hui Jin, Educational Testing Service
Kenneth F. Llord, ETS
Cathy E. Mehl, The Ohio State University
Wenju Cui, Educational Testing Service
Duanli Yan, Educational Testing Service

Using Scenario-based Assessment to Investigate Students' Argumentation Practice

Kenneth F. Llord, ETS
Hui Jin, Educational Testing Service
Scott Grapin, New York University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Analyzing Conceptual Understanding

4:20pm-5:50pm, Augusta B

President: Asli Sezen-Barrie, University of Maine

Multimodal Interaction Analysis of Student Science Notebook Use: Science and Language In Action

Sara Wilmes, University of Luxembourg

Rasch Analysis of Measuring Students' Epistemic Language Practices in Science Learning

Yejun Bae, The University of Iowa

Gavin W. Fulmer, University of Iowa

Brian M. Hand, University of Iowa

William Hansen, University of Iowa

Reading to Problematize: An Exploratory Analysis of Students' Annotations as Evidence of Disciplinary Sensemaking

Mon Lin Ko, University of Illinois, Chicago

Willard R. Brown, West Ed

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Shifting Elementary Science Classrooms to Support Science Practices

4:20pm-5:50pm, Savannah A

Discussant: Eve Manz, Boston University

Instructional Leaders Views of "Good" Science Instruction: Moving from General Pedagogy and Hands on to the Science Practices

Katherine L. McNeill, Boston College

Rebecca Lowenhaupt, Boston College

Supporting Elementary Teachers to Cultivate Model-Centered Science Learning Environments

Dante Cisterna, University of Missouri

Devarati Bhattacharya, University of Nebraska-Lincoln

Tina Vo, University of Nebraska-Lincoln

Laura Zangori, University of Missouri

Cory T. Forbes, University of Nebraska-Lincoln

Pre-service Teachers Reframing Pedagogy to Support Scientific Sensemaking Practices

Leema Berland, University of Wisconsin-Madison

Corinna West, University of Wisconsin-Madison

Rosemary Russ, University of Wisconsin-Madison

Co-constructing Discursive Identities to Participate in the Scientific Practices

Emily C. Miller, University of Wisconsin-Madison

Leema Berland, University of Wisconsin-Madison

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

Teachers' Use of Learning Progressions to Inform Classroom Instruction

4:20pm-5:50pm, Augusta D

Presider: Alicia C. Alonzo, Michigan State University

Discussant: Amelia Wenk Gotwals, Michigan State University

Teachers' Use of a Learning Progression When Anticipating Student Responses to Assessment Items

James B. Hancock, Michigan State University

Alicia C. Alonzo, Michigan State University

Design Decisions Supporting Teachers' Use of Learning Progressions

Jason Buell, Colorado University of Colorado, Boulder

Kelsey Tayne, University of Colorado, Boulder

Erin M. Furtak, University of Colorado, Boulder

Facilitating Teacher Sensemaking about Student Ideas Linked to a Learning Progression Through Score Reports

Kate Henson, University of Colorado, Boulder

Rajendra Chattergoon, University of Colorado, Boulder

Erin M. Furtak, University of Colorado, Boulder

Teachers' Use of a Learning Progression to Inform Planned Instruction

Julie Christensen, Michigan State University

Alicia C. Alonzo, Michigan State University

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

Supporting Opportunities for Theoretical Practices in Undergraduate Biology

4:20pm-5:50pm, Augusta E

Integrating Conceptual and Quantitative Understandings of Variation to Develop Students' Capacity to Theorize about Experimental Data

Anita Schuchardt, University of Minnesota

Maxwell Kramer, University of Minnesota

Catherine Kirkpatrick, University of Minnesota

How Equations Can Support Student Theorizing in Biology

Matthew Lira, University of Iowa

Supporting Generative Reasoning in an Undergraduate Laboratory Course through a Model-Based-Inquiry Curriculum

Molly Bolger, University of Arizona
Susan Hester, University of Arizona
Michelle Nadler, University of Arizona
Lisa Elfring, University of Arizona
Jennifer Katcher, Pima Community College

Exploratory Theorizing in the 'Hybrid Space' between Modeling and Experimentation

Julia Gouvea, Tufts University
Aditi Wagh, Tufts University

Creating a Space for Students to Theorize about Model Evaluation

Gretchen P. King, University of Nebraska-Lincoln
Joseph Dauer, University of Nebraska-Lincoln
Heather Bergan-Roller, University of Nebraska
Nick Galt, University of Nebraska
Tomas Helikar, University of Nebraska

Strand 6: Science Learning in Informal Contexts

Symposium – Ecological Perspectives on Learning: Rethinking Our Questions, Methods, and Partnerships

4:20pm-5:50pm, Augusta C

Presenters:

Martin Storksdieck, Oregon State University
Angela Calabrese-Barton, Michigan State University
Lynn D. Dierking, Oregon State University
Bronwyn Bevan, University of Washington
Edna Tan, University of North Carolina, Greensboro

Strand 7: Pre-service Science Teacher Education

Beginning Science Teachers' Subject Matter Knowledge, Misconceptions, and Emerging Inquiry-based Teaching Practices

4:20pm-5:50pm, Augusta F

Guidelines to Ensure Beginning Science Teachers' Strong Subject Matter Knowledge

Elizabeth B. Lewis, University of Nebraska-Lincoln
Brandon A. Holding, Boulder Learning, Inc.

Teachers' Chemistry Misconceptions at Various Subject Matter Knowledge Levels

Ana M. Rivero, Seattle University
Lyrica L. Lucas, University of Nebraska-Lincoln

Teachers' Misconceptions at Various Levels of Physics Subject Matter Knowledge

Lyrica L. Lucas, University of Nebraska-Lincoln
Ana M. Rivero, Seattle University

Subject Matter Knowledge Needed to Teach Middle School Life Science

Amy Tankersley, University of Nebraska-Lincoln
Elizabeth B. Lewis, University of Nebraska-Lincoln

Strand 8: In-service Science Teacher Education

Science Teacher Learning in Communities

4:20pm-5:50pm, Augusta G

President: Jan H. Van Driel, University of Melbourne

Establishing a Community of Practice (CoP) To Support Pre-Service Science Teachers' Pedagogical Development

Rebecca Cooper, Monash University
Karen Marangio, Monash University

Developing Primary Teachers' TPACK through Digital Didactic Design (D3)

Pernilla Nilsson, Halmstad University

Pre-Service teachers' Conceptions of STEM and Self-Perceptions as STEM Educators throughout a Partner Mentoring Project

Amanda K. Berry, RMIT University
Grant Cooper, RMIT University
Patricia McLaughlin, RMIT University

Finding the Connection between Research and Design: A Professional Learning Community for STEM Teachers

Tessa Vossen, Leiden University
Ineke Henze-Rietveld, Delft University of Technology
Marc J. De Vries, Delft University of Technology
Jan H. Van Driel, University of Melbourne

Strand 8: In-service Science Teacher Education

Considering Professional Development Design

4:20pm-5:50pm, Augusta H

President: Christine R. Lotter, University of South Carolina

A Systematic Review of Equity Focused K-12 US Science Teacher Professional Development Programs: 2001-2016

Senetta Bancroft, Southern Illinois University Carbondale
Eugenia M. Nyirenda, Southern Illinois University Carbondale

Investigation on the Professional Ethics of Science Teachers in China's Primary and Middle Schools

Jing Lin, Beijing Normal University

Xiufeng Liu, State University of New York, Buffalo
Chun-Yen Chang, National Taiwan Normal University
Tianying Sun, Beijing Normal University

Variation As a Hard Reality: Profiles of Teacher Learning Trajectories

Max L. Longhurst, Utah State University
Hyunju Lee, Smithsonian Institute
Todd Campbell, University of Connecticut

Strand 10: Curriculum, Evaluation, and Assessment

Crafting Assessments to Measure Student Learning in Project-Based Science

4:20pm-5:50pm, Peachtree 1

Evaluating Learning of Conceptual, Procedural, and Epistemic Knowledge in a Project-Based Learning Unit

Jari Lavonen, University of Helsinki
Kalle Juuti, University of Helsinki

Effect of Project-Based Learning on Student Performance: A Simulation Study

Israel Touitou, Michigan State University
Joseph S. Krajcik, Michigan State University
Barbara Schneider, Michigan State University
Christopher Klager, Michigan State University
Tom Bielik, Michigan State University

Assessing Collaboration and Competition through Project-Based Learning

Katariina Salmela-Aro, University of Helsinki
Christopher Klager, Michigan State University
Lindsey W. Young, Michigan State University
Barbara Schneider, Michigan State University

Using Artifacts Developed in Project-Based Learning Classrooms as Evidence of Three-Dimensional Learning

Deborah C. Peek-Brown, Michigan State University
Kellie Finnie, Michigan State University
Joseph S. Krajcik, Michigan State University
Tom Bielik, Michigan State University

Strand 12: Educational Technology

Digital Learning Environments

4:20pm-5:50pm, Augusta 3

President: Noemi Waight, University at Buffalo

Computationally-enabled Modeling Environments: Simulating Epidemic Diseases in Science

Classrooms using Block-based Programming

Bitu Akram, North Carolina State University
Andy Smith, North Carolina State University
Cody Smith, North Carolina State University
Osman Aksit, North Carolina State University
Eric N. Wiebe, North Carolina State University
James C. Lester, North Carolina State University

Digital Games in the Science Classroom: How Students Use Internal and External Scaffolds During Game Play

Kara Krinks, Lipscomb University
Heather J. Johnson, Vanderbilt University
Douglas B. Clark, Vanderbilt University

Roving with GigaPan Technology in a Garden-Based Science Learning Context

Ashley Murphy, West Virginia University
Melissa J. Luna, West Virginia University
James Rye, West Virginia University

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

Symposium – Practical Perspectives in Teaching and Learning Nature of Science

4:20pm-5:50pm, Augusta 2

President: Kostas Kampourakis, University of Geneva

Discussant: Judith Lederman, Illinois Institute of Technology

Presenters:

Kostas Kampourakis, University of Geneva
Fouad Abd-El-Khalick, University of North Carolina, Chapel Hill
Judith S. Lederman, Illinois Institute of Technology
Norman G. Lederman, Illinois Institute of Technology
Michael Clough, Texas A&M University
William F. McComas, University of Arkansas
Sibel Erduran, University of Oxford
Ebru Kaya, Bogazici University
Busra Aksoz, Bogazici University
Selin Akgun, Bogazici University

Evening/Social Events

Membership Committee Sponsored Session

Mentor-Mentee Nexus

Informal discussion: Early career NARST members are matched with more seasoned members to help launch or expand professional networks.

6:00pm – 7:00pm, Savannah A

Presiders:

Gary Holiday, University of Akron
Selina Bartels, Illinois Institute of Technology

Research Interest Groups (RIGs) Meetings

Contemporary Methods for Science Education Research

The broad purpose of this RIG is to advance the mission of NARST by maintaining the rigor of science education studies, and promote more standardized research practices across the organization such that we are better able to learn from and synthesize each other's work. The intent is that these outcomes will, in turn, allow us to keep advancing the field and maintain the relevance of our research to improving science teaching and learning. At the 2018 meeting we would will update you on the RIG projects, and more importantly structure the meeting to help those currently experiencing methodological roadblocks in their work. We invite all attendees to submit a short description of a project (at any stage) where you are experiencing difficulties figuring out how to move forward from a methodological standpoint. We will focus the discussions on a few methodological issues (sent to the RIG ahead of time) and you and your NARST peers will spend some time addressing the issues, with the goal of helping you to move forward. If you have such a methodological difficulty please send a brief description to robert.talbot@ucdenver.edu. The RIG steering committee will use the submissions to structure the conversations in a way that will hopefully benefit both the submitters of the methodological problems and all conversants. We also plan to provide light refreshments to promote a reception-style atmosphere for discussion.

6:00pm – 7:00pm, Augusta 3

Presiders:

Robert (Bud) Talbot, University of Colorado, Denver

Continental and Diasporic Africa in Science Education (CADASE)

CADASE RIG is driven by the mission to support research in science education that will have a positive impact on the lives of children of African ancestry. This is accomplished by (a) encouraging science educators to engage in research aimed at meeting the needs of people of African ancestry; and (b) providing intellectual, professional, and personal space for science educators engaged in such research. At the 2018 NARST-CADASE RIG business meeting, members will engage in the following: (a) a brief business meeting that will include the acceptance of the 2017 business minutes, the financial report from the treasurer, and a brief report from the CADASE Steering Committee Chair, (b) break-out sessions for the CADASE Graduate Students Committee, (c) break-out session for the CADASE Special Session Committee, (d) break-out session for the Publication Committee (newsletter), (e) break-out session for the CADASE logo, (f) break-out session for the Membership Committee, and (g) break-out session for the Special Journal Issue.

6:00pm – 7:00pm, Augusta C

Presider:

Mary M. Atwater, University of Georgia – CADASE Chair

Engineering Education RIG (ENE-RIG)

The purpose of the RIG in Engineering Education is to synergize research in science and engineering education, promote rigorous research in engineering education, and provide a collaboration and discussion space supporting intellectual and professional exchange and networking. At the 2014 Business Meeting, the RIG members will discuss the following items: a) Updates on membership (60+ members), listserv, and development of a member directory; b) Discussion on revisions of NARST strands and how this may impact the ENE-RIG; c) Plans for collaborative paper sets, symposiums, and panels; and d) Updates on leadership team, roles, and budget.

6:00pm – 7:00pm, Augusta D

Presiders:

Cathy Lachapelle, Museum of Science, Boston

Tamara Moore, Purdue University

Selcen Guzey, Purdue University

Indigenous Science Knowledge (ISK)

The overarching goal of the ISK-RIG is to increase awareness of what indigenous knowledge systems research is all about. The RIG is a forum for showcasing and providing support for current and future research works of a growing number of Indigenous Knowledge Systems (IKS) researchers working within indigenous communities throughout the world who are members of NARST. Researchers are either members of indigenous community, or others, conducting researches in indigenous communities who are interested in decolonizing indigenous research world-wide. This group includes active NARST members from Africa and the African Diaspora, Alaska, Australia, Canada, Indigenous populations of the Americas, Asia and the Pacific, the Middle East, Thailand, Nordic Regions, New Zealand, Scandinavia, the West and East Indies, etc. The RIG is our fire-place (eZiko) - a social context for socio-cultural activities as we prepare, cook and share knowledge.

6:00pm – 7:00pm, Augusta E

Presiders:

Femi S. Otulaja, University of the Witwatersrand

Cikigaq-Irasema Ortega, University of Alaska, Anchorage

Latino/a RIG (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.

6:00pm – 7:00pm, Augusta F

Presider:

Fatima Elvira Terrazas Arellanes, University of Oregon

Saturday, March 10, 2018

Presidential/Welcome Reception

Social Event: All NARST conference participants are welcome—free appetizers and cash bar.

7:00pm – 9:30pm, Augusta Conference Center

Sunday, March 11, 2018

Mind and Sole (Off-Site)

**This event is not sponsored or endorsed by NARST.

6:00am-7:15am, Westin Peachtree Plaza Lobby

Conference Registration

7:00am – 5:00pm, Peachtree Terrace

Concurrent Session #3

8:30am – 10:00am

Publications Advisory Committee

Symposium – NSTA's Annual Research Worth Reading Recognition

8:30am-10:00am, Augusta 1

Presenters:

Deborah L. Hanuscin, Western Washington University

Emily G. Schoerning, National Center for Science Education

Heba El-deghaidy, American University, Cairo

Strand 1: Science Learning, Understanding and Conceptual Change

Epistemic Aims and Learning Progressions: Tensions Between Promoting Sensemaking and the Acquisition of Disciplinary Knowledge

8:30am-10:00am, Augusta A

Learning Progressions in Context: Tensions and Insights from a Middle School Modeling Curriculum

Ashlyn Pierson, Vanderbilt University

Douglas B. Clark, University of Calgary

Avoiding Overspecification of Expertise in Learning Progressions: The Example of Epistemic Aims

Tiffanyrose Sikorski, George Washington University

Contexts of Epistemic Practices

Gregory J. Kelly, Pennsylvania State University

Inquiry Science vs. Invented Science

Rosemary Russ, University of Wisconsin-Madison

Leema Berland, University of Wisconsin-Madison

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Multiple Factors Influencing Science Learning

8:30am-10:00am, Augusta C

Presider: Samia Khan, University of British Columbia

Assessment of Science Teachers with English Language Learners and Self-Efficacy Levels

Laura M. Crowe, Auburn City Schools/Auburn University

Melody Russell, Auburn University

Contextual Factors that Influence TIMSS 2015 Biology, Chemistry, Physics Performance in Twelve Diverse Countries

Pongprapan Pongsophon, Kasetsart University

Ben C. Herman, University of Missouri

Factors Contributing to Student Participation in Science Classroom: A Survey Study

Yu-Ta Chien, National Taiwan Ocean University

Chun-Hui Jen, National Taiwan Normal University

Sonya N. Martin, Seoul National University

Hye-Eun Chu, Macquarie University

Chun-Yen Chang, National Taiwan Normal University

Factors Influencing the Transfer Process in Contextualized Learning Environments in the Chemistry Classroom

Franziska Kehne, University of Paderborn

Sabine Fechner, University of Paderborn

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

Analyzing Classroom Discourse

8:30am-10:00am, Augusta H

Presider: Jan H. Van Driel, University of Melbourne

Classroom Discourse and Student Learning in an Engineering Design-based Science Unit

Richard Lie, Purdue University

Maurina L. Aranda, Purdue University

Selcen Guzey, Purdue University

Murat Akarsu, Purdue University

Tamara J. Moore, Purdue University

Facilitating Student Scientific Discussions: Exploring the Enactment of Collaboration in

a Middle Grades Science Classroom

Kerry A. Bartlett, University of North Carolina, Chapel Hill
Josh Corbat, University of North Carolina, Chapel Hill
Janice L. Anderson, University of North Carolina, Chapel Hill
Sharon J. Derry, University of North Carolina, Chapel Hill
Lana Minshew, University of North Carolina, Chapel Hill
Kelly Barber-Lester, University of North Carolina, Chapel Hill

Hybrid Disciplinary Discourses within a Science and Engineering Unit

Maurina L. Aranda, Purdue University
Selcen Guzey, Purdue University
Richard Lie, Purdue University
Tamara J. Moore, Purdue University

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

Instructor Knowledge

8:30am-10:00am, Savannah C

President: Phillip A. Boda, Stanford University

Does Subject Area Matter? Differences in Instruction Between Different Content Area Faculty

Julie A. Luft, University of Georgia
Blake Whitt, University of Georgia
Robert Idsardi, University of Georgia
Jenna Wingfield, University of Georgia
Taurean Brown, Claremont College
Paola Barriga, University of Georgia
Jason Lang, University of North Georgia

Exploring Instructors' Changing Conceptions of and Approaches to Teaching through Memorable Moments in the Classroom

Stanley M. Lo, University of California, San Diego
Lindsey A. Warnock, University of California, San Diego

Teacher Knowledge for Active-learning Instruction: What do Instructors Need to Know to be Effective?

Anna Jo J. Auerbach, University of Georgia
Tessa C. Andrews, University of Georgia

The Characteristics of Pedagogical Content Knowledge (PCK) in Community College Biology Instructors

Brandy L. Bowling, North Carolina State University
Soonhye Park, North Carolina State University

Graduate Student International Collaboration for Investigating Science Teachers'

Professional Learning

Yael Shwartz, The Weizmann Institute of Science
Irene S. Bayer, Michigan State University
Tom Bielik, Michigan State University
Angela D. Kolonich, Michigan State University
Rachel Rosanne Eidelman, Weizmann Institute
Gabby Shwartz, Technion
Stefanie Marshall, Michigan State University
Rea Lavi, Technion- Israeli Institute of Technology
Kirsten Edwards, Michigan State University
Joshua M. Rosenberg, Michigan State University

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

Assessing Students' Ideas

8:30am-10:00am, Augusta F

Presider: Joshua Reid, Middle Tennessee State University

A Comparison of Hake's G and Cohen's D for Analyzing Student Learning

Jayson M. Nissen, California State University, Chico
Robert M. Talbot, University of Colorado, Denver
Amreen Nasim Thompson, University of Colorado, Denver
Ben Van Dusen, California State University, Chico

College Biology Instructors' Personal Practice Assessment Theories' Influence on Formative Assessment Practices

Mojtaba Khajeloo, University of Missouri
Julie A. Birt, University of Missouri
Marcelle Siegel, University of Missouri, Columbia
Linh Ngo, University of Missouri, Columbia
Hai T. Nguyen, University of Missouri, Columbia
Elizabeth Gammel, University of Missouri, Columbia
Keala Cummings, University of Missouri, Columbia
Bethany Mordhorst, University of Missouri, Columbia

Exploring Intent and Behavior through the Observed and Self-reported Teaching Practices of Postsecondary STEM Instructors

Evelin E. Muñoz, California State University, Fresno
Mireya Lemus, California State University, Fresno
Emily M. Walter, California State University, Fresno

Instructor Noticing in a General Biology Lecture Course for Non-Majors

Ryan C. Coker, Florida State University
Anna S. Grinath, Middle Tennessee State University
Kate Hill, Florida State University

Brittany Kraft, Florida State University

Strand 6: Science Learning in Informal Contexts

Promoting STEM Interest Pathways

8:30am-10:00am, Augusta E

Presider: Scott A. Pattison, Institute for Learning Innovation

Deciphering the Code: Girls in the STEM Pipeline at the American Museum of Natural History

Georgia S. Hall, Wellesley College

Preeti Gupta, American Museum of Natural History

Yvonne de la Pena, American Museum of Natural History

Do STEM Ecosystem Approaches Positively Affect Youth Outcomes? Preliminary Results From an Underserved Community

Nancy L. Staus, Oregon State University

Lynn D. Dierking, Oregon State University

John H. Falk, Oregon State University

Jennifer N. Wyld, Oregon State University

Yoon Ha Choi, Oregon State University

Making Her Way, One Youth's Path to Well-Developed Interest in Digital Fabrication

Ryan Cain, Utah State University

Abigail L. Phillips, Utah State University

Victor R. Lee, Utah State University

STEM Friends: A Case Study of Agency and Interest in an After-school STEM Club

Deena Gould, Arizona State University

Strand 7: Pre-service Science Teacher Education

Content Knowledge

8:30am-10:00am, Augusta D

Presider: Consuelo J. Morales, University of Michigan

Assessing Preservice Elementary Teachers' Understanding of Science Practices Using Dual-Purpose Children's Storybooks

Julia Plummer, Pennsylvania State University

Christopher Palma, Pennsylvania State University

Timothy G. Gleason, Pennsylvania State University

Daniel Barringer, Pennsylvania State University

Elementary Preservice Teachers' Use of Professional Learning Networks for Science Teaching

Jeanne Brunner, University of Massachusetts, Amherst

Torrey Trust, University of Massachusetts, Amherst

Examining the Impact of a Museum-based Teacher Preparation Program on New Science Teachers

Bernadette Doykos, University of Southern Main

Cathie Fallona, University of Southern Maine

Misunderstanding of Neuroscience in Pre-Service Science Teacher Education

Finja Grospietsch, Universität Kassel

Jürgen Mayer, Universität Kassel

Strand 8: In-service Science Teacher Education

Argumentation in Engineering Education

8:30am-10:00am, Augusta 3

Presider: Jeanna Wieselmann, University of Minnesota

Developing Middle School Science Teachers' Views of NOS and PCK for Argumentation

Renee S. Schwartz, Georgia State University

Patrick J. Enderle, Georgia State University

Ozden Sengul, Georgia State University

Elementary Students' Group Decision-Making for Engineering Design

Elaine M. Silva Mangiante, Salve Regina University

Teachers' Planning for Argumentation During Engineering Design Professional Development

Anna Maria Arias, Illinois State University

Allison Antink-Meyer, Illinois State University

Strand 8: In-service Science Teacher Education

NGSS Instruction & 3-Dimensional Learning

8:30am-10:00am, Augusta G

Presider: Lisa A. Borgerding, Kent State University

Influential Factors Impacting the Design and Use of Three-Dimensional, Formative Assessments in Elementary Science Classrooms

Thomas R. Tretter, University of Louisville

Justin McFadden, University of Louisville

Brian Robinson, University of Louisville

Real Kids in Real Time: Teachers Learning From Live Demonstrations of NGSS-Aligned Science Lessons

Patricia S. Bills, Northern Kentucky University

Madhura Kulkarni, Northern Kentucky University

Joseph Nolan, Northern Kentucky University

Alyssa Farmer, Northern Kentucky University

Understanding Pedagogical Content Knowledge in a Three Dimensional Learning Context

Quentin Bidy, University of Oklahoma

Timothy A. Laubach, University of Oklahoma

Strand 8: In-service Science Teacher Education

NGSS Practices and Scientific Inquiry

8:30am-10:00am, Savannah B

Presider: Sanlyn Buxner, University of Arizona

A Professional Development Program to Advance Science Centre-School Curricula Integration- The Effects on Views about Scientific Inquiry of Teachers

Ceyhan Cigdemoglu, Atilim University

Fitnat Köseoglu, Gazi University

Professional Learning in Urban Advantage and the Development of Core Science Teaching Practices

Anna C. MacPherson, American Museum of Natural History

Michael Chavez-Reilly, American Museum of Natural History

Karen Hammerness, American Museum of Natural History

Understanding Teacher Instructional Change: The Case of Integrating NGSS and Stewardship in Professional Development

Kathryn N. Hayes, California State University, East Bay

Mele Wheaton, Stanford University

Deborah Tucker, University of La Verne

Strand 10: Curriculum, Evaluation, and Assessment

ELeVATE: Exploring Learning in Various Approaches to Teaching Energy

8:30am-10:00am, Augusta B

A Teacher's Perspective on Teaching Energy Differently: Transitioning from a Forms and Transformation Approach to a Transfer Approach

Israel Touitou, Michigan State University

Katherine Carswell, Holly Academy

Joseph S. Krajcik, Michigan State University

Jeffrey Nordine, IPN-Kiel

Knut Neumann, Leibniz Institute for Science Education (IPN) Kiel

David L. Fortus, Weizmann Institute of Science

Assessing Students' Progression in Developing a Deeper Understanding of Energy

Knut Neumann, Leibniz Institute for Science Education (IPN) Kiel

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

Jeffrey Nordine, IPN-Kiel
David L. Fortus, Weizmann Institute of Science
Joseph S. Krajcik, Michigan State University

Assessing Middle School Students' Preparation for Future Learning about Energy

Jeffrey Nordine, IPN-Kiel
Sebastian T. Opitz, Michigan State University
Yaron Lehavi, Weizmann institute of science
Marcus Kubsch, IPN - Leibniz Institute for Science and Mathematics Education
David L. Fortus, Weizmann Institute of Science
Joseph S. Krajcik, Michigan State University
Knut Neumann, Leibniz Institute for Science Education (IPN) Kiel

Students' Sense of Self-Efficacy in Using the Energy Concept

David L. Fortus, Weizmann Institute of Science
Knut Neumann, Leibniz Institute for Science Education (IPN) Kiel
Joseph S. Krajcik, Michigan State University
Jeffrey Nordine, IPN-Kiel

Strand 11: Cultural, Social, and Gender Issues

Gender Equity in STEM I

8:30am-10:00am, Chastain J

Presider: Edmund S. Adjapong, Teachers College, Columbia University

A Critical Analysis of the Representation and Portrayals of Females in YALSA Award-Winning Science Comics

Christopher R. Bowen, University of Tennessee

Gendered Genetics: Reading about the Genetics of Sex Differences could Affect Gender Stereotypes about Intelligence

Brian M. Donovan, BSCS
Molly Stuhlsatz, BSCS
Daniel C. Edelson, BSCS

Impostor Phenomenon among Graduate Students in STEM

Devasmita Chakraverty, Washington State University

Making the Invisible Visible: Providing Context of Women's STEM Experiences

Helen Douglass, SVVSD
Geeta Verma, University of Colorado, Denver

Strand 11: Cultural, Social, and Gender Issues

Symposium – Equity in Science Teacher Education: Toward an Expanded Definition

8:30am-10:00am, Savannah A

Presenters:

Deb Morrison, University of Washington
Brian Scott Fortney, University of North Texas
Bhaskar Upadhyay, University of Minnesota
Alaina Szostkowski, University of Minnesota
Alexis Patterson, University of California, Davis

Strand 12: Educational Technology

Attitudes Towards Technology

8:30am-10:00am, Peachtree 1

Presider: Margaret R. Blanchard, North Carolina State University

Student Opinions on Digital Art Media:

Joseph T. Wong, University of California, Irvine
Christa Greenfader, University of California, Irvine
Brad Hughes, UCI

Transformations in Students' Attitudes about Learning with Personal Laptops: During the Program and in Retrospect

Tal Berger-Tikochinski, Bar-Ilan University
Michal Zion, Bar - Ilan University
Ornit Spektor-Levy, Bar Ilan University

How Culture and Values Impact Realizations of Technology-Supported, Inquiry-Based Science Teaching and Learning

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

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

Literacy and Language

8:30am-10:00am, Augusta 2

Presider: Valarie L. Akerson, Indiana University

Exploring Using Literacy to Teach about Nature of Science—Case Studies of Preservice Early Childhood Teachers

Valarie L. Akerson, Indiana University
Banu Avsar Erumit, Indiana University
Naime Elcan, Indiana University

Effects of Argumentation Instruction on Teachers' Conceptions of the Nature of Science

Meshach Mobolaji Ogunniyi, University of the Western Cape

Effects of Historical Story Telling on Student Understanding of NOS and Mendelian Genetics

Cody T. Williams, Western Michigan University
David W. Rudge, Western Michigan University

*Learning About the Unique Linguistic Characteristics of Scientific Texts Through
Adapted Primary Literature (APL)*

Moriah Ariely, Weizmann Institute of Science
Zohar Livnat, Bar-Ilan University
Anat Yarden, Weizmann Institute of Science

Concurrent Session #4 **10:15am – 11:45am**

Presidential Sponsored Symposium

International Perspectives on Re-centering on Scientific Literacy in Classrooms

10:15am-11:45am, Augusta 3

Presenters:

Barbara A. Crawford, University of Georgia
Kok-Sing Tang, Curtin University, Western Australia
Christine Tippett, University of Ottawa, Canada
Sandra Nitz, Landau University, Germany
Marianne Odegaard, University of Oslo, Norway
Lay Hoon Seah, National Institute of Education, Singapore
Mark McDermott, University of Iowa
William McClune, Queens University Belfast, Northern Ireland

Strand 1: Science Learning, Understanding and Conceptual Change

*Integrating Computational Thinking and Data Sense-making to Build Model-based
Water Literacy*

10:15am-11:45am, Augusta C

*A Systems Thinking Framework for Integrating Computational Thinking and Data Sense-
making into Learning about Hydrologic Systems*

John C. Moore, Colorado State University
Kristin L. Gunckel, University of Arizona
Alan R. Berkowitz, Cary Institute of Ecosystem Studies
Beth A. Covitt, University of Montana

*Student Ideas about Computational Thinking Concepts When Learning About Modeling
Hydrologic Systems*

Kristin L. Gunckel, University of Arizona
Judith Cooper-Wagoner, University of Arizona
Beth A. Covitt, University of Montana

Garrett Love, North Carolina School of Science and Mathematics
Randall Boone, Colorado State University
Alan R. Berkowitz, Cary Institute of Ecosystem Studies
John C. Moore, Colorado State University

Patterns in Student Sense-making about Data Representations from Hydrological Contexts

Beth A. Covitt, University of Montana
Bess Caplan, Cary Institute of Ecosystem Studies
Agatha Podrasky, University of Montana
Kristin L. Gunckel, University of Arizona
Alan R. Berkowitz, Cary Institute of Ecosystem Studies
John C. Moore, Colorado State University

Teachers' Experiences Integrating Data Sense-making and Computational Thinking into Science Instruction

Alan R. Berkowitz, Cary Institute of Ecosystem Studies
Kristin L. Gunckel, University of Arizona
Beth A. Covitt, University of Montana
Bess Caplan, Cary Institute of Ecosystem Studies
Agatha Podrasky, University of Montana
John C. Moore, Colorado State University
Amanda J. Morrison, Colorado State University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Exploring Supports for Teachers and Students to Engage with Productive Uncertainty in Science Activity

10:15am-11:45am, Augusta B

Discussant: Brian Reiser, Northwestern University

Incorporating Productive Uncertainty into Empirical Work in Elementary Classrooms

Eve Manz, Boston University
Andrea Wells, Boston Teacher Residency

Examining How Classroom Communities Take up Uncertainty for Scientific Sense-making

Jessica Watkins, Tufts University
Eve Manz, Boston University

Designing for Productive Uncertainty in Novice Teacher Learning

Tammy L. Cook-Endres, Exploratorium
Sara C. Heredia, The University of North Carolina, Greensboro

Exploring the Process of Incorporating Uncertainty in Middle School Science: One Teacher's Sensemaking about NGSS

Sara C. Heredia, The University of North Carolina, Greensboro

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Elementary Students? Thinking about Scientists and Engineers

10:15am-11:45am, Augusta 1

Presider: Georgia Hodges, University of Georgia

A Mixed Methods Study of Learning Gains Associated with Serious Educational Gameplay by Primary Learners

Georgia Hodges, University of Georgia

Kayla Pritchard, University of Georgia

Sandhya Krishnan, University of Georgia

Austin Betancourt

Emoni Cook

Juyeon Lee

Encloded Cognition: The Effects of Lab Coats on Students' Science Identities and Career Aspirations

M. Gail Jones, North Carolina State University

Tammy D. Lee, East Carolina University

Katherine Chesnutt, North Carolina State University

Sarah J. Carrier, North Carolina State University

Lauren Madden, The College of New Jersey

Megan Ennes, North Carolina State University

Marissa Bellino, City University of New York

Emily Cayton, North Carolina State University

Lanette Phillips, North Carolina State University

Pamela Huff, North Carolina State University

Revisiting Students' Understanding of Scientists and Engineers in Light of STEM: the Case of Elementary Students

Tian Luo, The Education University of Hong Kong

Wing Mui Winnie So, The Education University of Hong Kong

Science Identity, Encloded Cognition and Self Efficacy: Kids in White Lab Coats

M. Gail Jones, North Carolina State University

Tammy D. Lee, East Carolina University

Emily Cayton, North Carolina State University

Lauren Madden, The College of New Jersey

Sarah J. Carrier, North Carolina State University

Katherine Chesnutt, NC State University

Megan Ennes, North Carolina State University

Pamela Huff, North Carolina State University

Lanette Phillips, North Carolina State University

Marissa Bellino, City University of New York, Graduate Center

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

Exploring Teachers' Pedagogical Content Knowledge

10:15am-11:45am, Augusta H

Presider: Mon Lin Ko, University of Illinois, Chicago

A Grand Rubric for Differentiating the Quality of Science Teachers' Pedagogical Content Knowledge

Kennedy Chan, The University of Hong Kong

Marissa S. Rollnick, Wits University

Julie Gess-Newsome, Oregon State University, Cascades

Researching Chemistry Teachers' PCK Development Using Midstream Modulation Focusing on Formative Assessment in Design Education

Hanna Stammes, Delft University of Technology

Steven Flipse, Delft University of Technology

Ineke Henze-Rietveld, Delft University of Technology

Erik Barendsen, Radboud University Nijmegen

Marc J. De Vries, Delft University of Technology

Teacher Profiles for Teaching Stoichiometry Based on Topic-Specific Pedagogical Content Knowledge, Content Knowledge and Conceptions of the Mole

Stephen A. Malcolm, University of the Witwatersrand

Elizabeth Mavhunga, University of Witwaterrand

Marissa S. Rollnick, Wits University

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

Course Reform

10:15am-11:45am, Augusta F

Presider: Emily M. Walter, California State University, Fresno

Educating towards Responsible Conduct of Research: Science and Engineering Graduates' Perspective

Miri Barak, Technion, Israel Institute of Technology

Gizelle Green, Israel Institute of Technology

Influence of Metacognitive Practice and Increased Structure on Student Calibration and Achievement

Paula Soneral, Bethel University

Kelsey J. Metzger, University of Minnesota, Rochester

Brittany Smith, Minnesota State University Mankato

Introductory Earth Science for Preservice Elementary Teachers: Incorporating the NGSS, Active, and Placed-based Learning

Danielle J. Ford, University of Delaware
Jennifer Gallo-Fox, University of Delaware
Susan McGeary, University of Delaware
Cheryl Ackerman, University of Delaware

The Influence of College Professor's Epistemology on their Application of Culturally Relevant Pedagogy

Paulette Vincent-Ruz, University of Pittsburgh
Gina A. Garcia, University of Pittsburgh

Strand 6: Science Learning in Informal Contexts

Conservation and Environmental Education In Out-of-School Contexts

10:15am-11:45am, Augusta D

Presider: Heather Toomey Zimmerman, Pennsylvania State University

A Typology of Media Use in Aquariums

Kea Anderson, SRI International
Claire Christensen, SRI International
Savitha Moorthy, SRI International

Investigating the Confluence of Visitor and Institutional Agendas

Kelly Riedinger, Oregon State University
Nicolette Canzoneri, Oregon State University
Martin Storksdieck, Oregon State University

Effects of Interest and Engagement in Learning Science on Adults' Environmental Actions and Scientific Competency

Yi Ting Pan, National Sun Yat-sen University, Taiwan
Kuay-Keng Yang, National Sun Yat-sen University, Kaohsiung, Taiwan
Zuway-R Hong, National Sun Yat-Sen University
Huann-Shyang Lin, National Sun Yat-Sen University

A Field Trip Partnership: Views from Outdoor Educators

James F. Ammons, The University of Georgia
Barbara A. Crawford, The University of Georgia

Strand 7: Pre-service Science Teacher Education

Nature of Science

10:15am-11:45am, Augusta E

Presider: Anna Maria Arias, Illinois State University

Investigating Pre-Service Science Teachers' Understanding about Cognitive-Epistemic

Systems of Science

Busra Aksoz, Bogazici University
Sibel Erduran, University of Oxford, University of Limerick
Ebru Kaya, Bogazici University
Selin Akgun, Bogazici University

Preservice Science Teachers' Pedagogical Content Knowledge for NOS and NOSI: A Successful Case Study

Gunkut Mesci, Giresun University
Renee S. Schwartz, Georgia State University

Promoting Science Pre-service Teachers' Cognitive and Affective Learning with Constructivist Pedagogical Instruction

Jianlan Wang, Texas Tech University
Stacey Sneed, Texas Tech University

The Impact of a Course on Nature of Science Pedagogical Views and Rationales

Jaelyn M. Easter, Grand View University
Jerrid W. Kruse, Drake University
Hallie Edgerly, Drake University

Strand 7: Pre-service Science Teacher Education

Symposium – Re-framing Problems of Practice in Preparing New Science Teachers for Equity in the NGSS Era

10:15am-11:45am, Savannah B

Presider: Hosun Kang, University of California, Irvine

Discussant: Maria Varelas, University of Illinois, Chicago

Presenters:

Julie A. Bianchini, University of California, Santa Barbara
Angela Calabrese-Barton, Michigan State University
Megan Hopkins, University of California, San Diego
Heather J. Johnson, Vanderbilt University
Hosun Kang, University of California, Irvine
Kirsten K. Mawyer, University of Hawaii
Felicia Moore Mensah, Teachers College, Columbia University
David Stroupe, Michigan State University
Carla Zembal-Saul, Pennsylvania State University
Edna Tan, University of North Carolina, Greensboro

Strand 8: In-service Science Teacher Education

Professional Learning Communities

10:15am-11:45am, Augusta G

Presider: Amy R. Ricketts, University of Delaware

Developing a Shared Understanding of Explanation-Driven Instruction in a Teacher Learning Group

Amy R. Ricketts, University of Delaware

Effects of Professional Development on Teacher Knowledge, Practice, and Student Learning of Interdisciplinary Science

Yang Yang, Qingdao University

Peng He, Northeast Normal University

Yin Wu, State University of New York, Buffalo

Xiufeng Liu, State University of New York, Buffalo

Joseph Gardella, State University of New York, Buffalo

Siqi Li, State University of New York University, Buffalo

Lock-Step: Teacher Agency Over Curriculum in an Online Community of IB Physics Teachers

Andrew Wild, Woodrow Wilson Academy of Teaching and Learning

Jodie Galosy, Knowles Teacher Initiative

Melissa Kagle, Knowles Teacher Initiative

Nicole Gillespie, Knowles Teacher Initiative

Jeffrey J. Rozelle, Knowles Teacher Initiative

Kate Miller, Knowles Teacher Initiative Senior Fellow

Mark Hartman, Knowles Teacher Initiative Senior Fellow

Heather Hotchkiss, Knowles Teacher Initiative Senior Fellow

Strand 9: Reflective Practice

New Developments in Video-Based Professional Learning Communities for STEM Educators

10:15am-11:45am, Savannah C

Presider: Sue Allen, Maine Mathematics and Science Alliance

The Potential of Video Annotation Tools for Promoting Teacher Growth and Reflection

Lynne Zummo, Stanford University

Janet Carlson, Stanford University

Mary Hauser, Stanford University

Video Clubs as Professional Learning Communities for Teachers' Reflective Practice

Anushree D. Bopardikar, TERC, Cambridge, MA

Susan Doubler, TERC, Cambridge, MA

Supporting Science Teacher Learning through Capturing and Selecting Video of One's Own Classroom

Elizabeth B. Dyer, Stanford University

Miriam G. Sherin, Northwestern University

Adapting Video-Based Reflections to Afterschool Settings

Sue Allen, Maine Mathematics and Science Alliance
Alexandria Brasili, Maine Mathematics and Science Alliance
Scott Byrd, Maine Mathematics and Science Alliance
Perrin C. Chick, Maine Mathematics and Science Alliance
Kristy Ouelette, University of Maine
Jennifer Lobley, University of Maine

Strand 10: Curriculum, Evaluation, and Assessment

Designing and Implementing Instructionally Supportive Assessment Tasks for Promoting Three Dimensional Learning for all Students

10:15am-11:45am, Peachtree 1

President: Joseph S. Krajcik, Michigan State University

Discussant: Ted Willard, National Science Teachers Association

An Equity Framework to Inform the Design and Development of NGSS-Aligned Formative Assessment Tasks

Nonye M. Alozie, SRI International
Phyllis H. Pennock, Michigan State University
Krystal Madden, University of Illinois, Chicago
Sania Z. Zaidi, University of Illinois, Chicago
Christopher J. Harris, SRI International
Joseph S. Krajcik, Michigan State University

Designing NGSS-aligned Assessment Tasks and Rubrics to Support Classroom-based Formative Assessment

Kevin W. McElhaney, SRI International
Sania Z. Zaidi, University of Illinois, Chicago
Brian D. Gane, University of Illinois, Chicago
Joseph S. Krajcik, Michigan State University
Nonye M. Alozie, SRI International
Christopher J. Harris, SRI International

Analysis of Student and Item Performance on Three-Dimensional Constructed Response Assessment Tasks

Brian D. Gane, University of Illinois, Chicago
Kevin W. McElhaney, SRI International
Sania Z. Zaidi, University of Illinois, Chicago
James Pellegrino, University of Illinois, Chicago

Portraits of Teachers Using Three-Dimensional Assessment Tasks to Inform Instruction

Sania Z. Zaidi, University of Illinois, Chicago
Mon Lin Ko, University of Illinois, Chicago
Brian D. Gane, University of Illinois, Chicago
Krystal Madden, University of Illinois, Chicago
Diksha Gaur, University of Illinois, Chicago

James Pellegrino, University of Illinois, Chicago

Strand 11: Cultural, Social, and Gender Issues

Gender Equity in STEM II

10:15am-11:45am, Chastain J

President: Felicia Leammukda, University of Minnesota

Are Male and Female STEM Faculty Encouraged Toward Research, Leadership, and Teaching Differently?

Eugene Judson, Arizona State University

Lydia Ross, Arizona State University

Kristi Glassmeyer, Arizona State University

Attracting and Supporting First-Generation Female STEM Undergraduates through an NSF-Funded Program

Carol C. Johnston, Mount Saint Mary's University, Los Angeles

Suzanne Markoe-Hayes, Mount Saint Mary's University, Los Angeles

Gender Equity in STEM Education: The Case of Egyptian STEM Girls

Mohamed A El Nagdi, University of Minnesota

Gillian Roehrig, University of Minnesota

Women in Science: What's Intersectionality Got to Do With It?

Lucy Avraamidou, University of Groningen, Netherlands

Strand 12: Educational Technology

Learning Through Interactive Technologies

10:15am-11:45am, Augusta A

President: Choi Yun Hee, Soongmoon Middle School

PlayFlu: A Kinesthetic Learning Approach in Alignment with the NGSS

Nirit Glazer, PlayFlu

Yariv Glazer, PlayFlu

Kevin Linder, PlayFlu

Professional Molecular Modeling Software: An Authentic Tool for Learning about Modeling in High School Biology

Stephen R. Burgin, University of Arkansas

Jennifer F. Oramous, University of Arkansas

Michelle J. Childress, University of Arkansas

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

Poster Symposium – International Collaborative Investigation of High School

Students' Understandings of Scientific Inquiry- A Follow Up Study

10:15am-11:45am, Savannah A

Presenters:

Judith S. Lederman, Illinois Institute of Technology
Norman G. Lederman, Illinois Institute of Technology
Juan Jimenez, Illinois Institute of Technology
Selina L. Bartels, Concordia University Chicago
Cigdem Han Tosunoglu, Marmara University
Mark Akubo, Florida State University
Irene Neumann, Leibniz Institute (IPN)
Anne-Marie Hattingh, University of Cape Town
Cheng Liu, Beijing Normal University
Christine V. McDonald, Griffith University
David Santibanez Gomez, Universidad Catholica Silva Henriquez
Enshan Liu, Beijing Normal University
Estella Blanquet, Universite de Bordeaux
Frauke Voitle, IPN – Leibniz Institute for Science and Mathematics Education
Gary Holliday, The University of Akron
Heba El-Deghaidy, American University in Cairo
Jari Lavonen, University of Helsinki
Jessica Leung, The University of Hong Kong
Jim Concannon, Westminster College
Naruho Fukuda, University of Tsukuba
Niwat Srisawasdi, Khon Kaen University
Ozgur Kivilcan Dogan, Marmara University
Patrick Brown, Fort Zumwalt School District
Rachel Mamlok-Naaman, Weizmann Institute of Science
Renee Schwartz, Georgia State University
Runaaz Sharma, Fiji National University
Serhat Irez, Marmara University
Shiang-Yao Liu, National Taiwan Normal University
Shu-Fen Lin, National Changhua University of Education
Xiao Huang, Zhejiang Normal University
Yaozhen Pan, Zhejiang International Studies University
Yovita Gwekwerere, Laurentain University

Strand 15: Policy

Symposium – Evolution Education around the Globe

10:15am-11:45am, Augusta 2

President: Hasan Deniz, University of Nevada

Discussant: Lisa Borgerding, Kent State University

Presenters:

Lisa A. Borgerding, Kent State University
Hasan Deniz, University of Nevada
Saouma B. Boujaoude, American University, Beirut

Patricia J. Friedrichsen, University of Missouri, Columbia
Khadija E. Fouad, Appalachian State University
Amanda Glaze, Georgia Southern University
Kostas Kampourakis, University of Geneva
Kamisah Osman, Universiti Kebangsaan Malaysia
Arif Rachmatullah, Kangwon National University
Martie Sanders, University of the Witwatersrand, South Africa

NARST Annual Membership Meeting (formerly NARST Business Meeting)

12:00pm – 1:00pm, Chastain H and I

Lunch—On Your Own

12:00pm – 1:00pm

Concurrent Session #5

1:15pm – 2:45pm

Administrative Session

Poster Symposium – Abell Institute 2017

1:15pm-2:45pm, Savannah A

Presenters:

Institute 2017 Abell, National Taiwan Normal University

Sibel Erduran, University of Oxford

Exploring Internal and External Influences on Students' Attitudes towards STEM Subjects

Benjamin James Barlow, Griffith University

Exploring the Influence of Policy Messages on Teachers' Instructional Choices

Kathryn M. Bateman, Pennsylvania State University

Designing for Model-Based Explanation

Jason Y. Buell, University of Colorado, Boulder

Unveiling Student STEM Interest, Belongingness and Empathy

Henriette Burns, Washington State University, Vancouver

How an Environmental Science Camp can Improve Environmental Science Learning

Carmen Carrion, Georgia State University

Renee Schwartz, Georgia State University

Come Some Blending? Teachers' Beliefs and Instructional Strategies Regarding Out-of-School Science Activity in Schools

Chen Chih-Ling, National Dong Hwa University, Taiwan

Lin Jing-wen, National Dong Hwa University, Taiwan

Exploring 7th-grade Students' Initial Mental Model of Blood Circulation in both Biology and Physical Education Classes

Tsung-Hui Cheng, National Dong Hwa University

Jing-Wen Lin, National Dong Hwa University

A Phenomenological Study Research: Do Science Teachers' Classroom Practices Really Align with their Perceived Technological Pedagogical Content Knowledge Level?

Jale Ercan Dursun, Gazi University

A Longitudinal Study of Science Teachers' Epistemic Beliefs and Opinions of Education Studies as Useful to Professional Practice

Liam Guilfoyle¹, University of Limerick

Orla McCormack, University of Limerick

Sibel Erduran, University of Oxford

Research Practice Partnerships with Urban Elementary Teachers: Affordances & Challenges

Christa Haverly, Michigan State University

Small Group Discourse to Support Literacy and Epistemic Practices for Sense-making in K-5 Science

LeeAnna Hooper, Pennsylvania State University

Understanding Korean Elementary School Teachers who Avoid Teaching Science

Eunjin Jang, Seoul National University

Chan-jong Kim, Seoul National University

Seung-Urn Choe, Seoul National University

Using Actor-Network Theory to Explore the Culture of an AP Biology Class:

Reconceptualization of Gender and Race in Science Education

Sophia (Sun Kyung) Jeong, University of Georgia

Deborah J. Tippins, University of Georgia

Pre-service Science Teachers' Perceptions of Economics of Science and Entrepreneurship in Ireland

Sila Kaya, University of Limerick, Ireland

Naomi Birdthistle, Swinburne University of Technology, Australia

Sibel Erduran, University of Oxford, UK

Examining Middle School Students' Development of Model-based Explanations over Time Using a Web-based Modeling Tool

Li Ke, Michigan State University
Joseph Krajcik, Michigan State University
Christina Schwarz, Michigan State University

A Model of Science Teachers' Knowledge and Behavior Changing Progress Based on a Conceptual Change PD Program

Nuo Li, Beijing Normal University
Enshan Liu, Beijing Normal University

A Comparison of the Effectiveness of Animation and Augmented Reality in Learning the Concepts of DNA

Jia-ying Lin, National Taiwan Normal University
Mei-Hung Chiu, National Taiwan Normal University
Jia-Hong Lin, National Sun Yat-sen University
Chun-Mei Hu, National Taiwan Normal University

Exploring the Current State of Modeling in High School Biology Courses in a Large School District

Karen Lionberger, University of Georgia

Teacher Conceptions of Authentic Science: Exploring One Teacher's Practical and Formal Epistemologies

Kelsey Lipsitz, University of Missouri

The Influence of School-based Mathematics Teacher Professional Learning Community with Pre-service Teachers' Participation on the Development of the Participants' Knowledge of Inquiry Teaching

Pei-Wan Liu, National Changhua University
Erh-Tsung Chin, National Changhua University

The Development of Technology Integration Practices of Beginning Secondary Science Teachers: Barriers and Gateways in the First Five Years of Teaching

Lyrica L. Lucas, Elizabeth B. Lewis, University of Nebraska-Lincoln

Elementary Student Perception of their Teacher's Self-Efficacy, Interest, and Enjoyment in Science and Science Teaching

Noelle A. Luccioni and Doug Lombardi, Temple University

The Impact of Race on Sensemaking within an Elementary Science Network

Stefanie Marshall, Michigan State University

Rasch Modelling and Cognitive Interview: Construct Validation of the Primary Scientific Reasoning Test

Diana Ng, Oxford University

STEM Education: Origins and Implications from an Australian Perspective

Ann Osman, The University of Melbourne

Preparing Undergraduate Biology Instructors to Teach with Technology: An Exploratory Multi-Case Study of Biology Graduate Teaching Assistants Technology Integration Capacity

Joshua W. Reid, Middle Tennessee State University

Supporting the Development of Youth-Centered, Equity-Oriented Teaching Practices in an Elementary Methods Science Education Course

Christina Restrepo Nazar, Michigan State University

Angela Calabrese Barton, Michigan State University

Exploring High School Teachers' Pedagogical Framing about Scientific Modeling from their Interactions in a Professional Learning Community and Classrooms

Soo-Yean Shim, University of Washington

Jessica Thompson, University of Washington

Using Scientific Modeling and Technology to Explore Elementary Preservice Teachers' Conceptualizations about Water

Tina Vo, University of Nebraska-Lincoln

The Development of National Elementary Science Curriculum in China: Perspective from Scientific Literacy

Yan Wang, University of Helsinki

Factors Influencing First-year Science Teacher's Enactment of High-leverage Practices

Kraig A. Wray, Michigan State University

Gail Richmond, Michigan State University

Teenager's Online Science Learning: Analysis of Factors Affecting Engagement or Lack Thereof

Dong Yang, University of Helsinki

Jari Lavonen, University of Helsinki

Hannele Niemi, University of Helsinki

Investigation of High School Students' Learning Outcomes via Modeling-based Inquiry Instruction in "Inquiry and Practice" Science Curriculum

Tsai Che-Ming, Taipei Municipal Jianguo High School, Taipei, Taiwan

Mei-Hung Chiu, NTNU, Taipei, Taiwan

Strand 1: Science Learning, Understanding and Conceptual Change
Symposium – Evolving Theoretical Perspectives on Student Learning

1:15pm-2:45pm, Augusta B

Presenters:

Joseph S. Krajcik, Michigan State University
Richard A. Duschl, Pennsylvania State University
Marcia C. Linn, University of California, Berkeley
Andrea diSessa, University of California, Berkeley
Hannah Sevian, University of Massachusetts, Boston

Strand 2: Science Learning: Contexts, Characteristics and Interactions
Learning in the Socioscientific Issues Context

1:15pm-2:45pm, Peachtree 1

Presider: Dana L. Zeidler, University of South Florida

An Exploration of Students' Communication about Controversial, Agricultural Issues as they Engage In International Exchanges

Andri Christodoulou, University of Southampton
Willeke Rietdijk, University of Southampton
Kathryn Garthwaite, University of Auckland
Laurence Simonneaux, Ecole Nationale de Formation Agronomique

Identifying the Static that can Influence Students' Views of a SocioScientific Issue

Beverley M.A. France, The University of Auckland
Sally E. Birdsall, University of Auckland
Ralph Levinson, University College London
Michel Vidal, SuprAgro Montpellier, Institut d'éducation à l'agro-environnement de Florac
Andri Christodoulou, University of Southampton
Willeke Rietdijk, University of Southampton
Laurence Simonneaux, Ecole Nationale de Formation Agronomique

Plurilingual Students' Engagement with Socioscientific Issues - Between Curiosity, Need for Admiration, and Resistance

Anna M. Gorges, University of Luxembourg

Socioscientific Issues: Teaching and Learning in an Evolving Context

Dana L. Zeidler, University of South Florida
Scott M. Applebaum, University of South Florida
Michael Mitchell, University of South Florida
Karrie A. Wikman, University of South Florida
Selene Y. Willis, University of South Florida
Tara M. Nkrumah, University of South Florida
Melanie Kinsky, University of South Florida

Eunhang Lee, University of South Florida

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Elementary Teachers? Experiences and Perspectives

1:15pm-2:45pm, Augusta 3

Presider: Jamie N. Mikeska, ETS

"I've Got Some Work to Do": Elementary Teachers Learning Science through Teaching Experience

Ryan S. Nixon, Brigham Young University

Leigh K. Smith, Brigham Young University

Richard R. Sudweeks, Brigham Young University

Sophisticated Preservice Teacher Beliefs: Predictors of Effective, Reflective Instruction as Novice Teachers?

Joseph A. Brobst, Western Washington University

Josie Melton, Western Washington University

Teachers' Practices and Enactments of their Conceptual Models of STEM During Classroom Implementation of an Integrated STEM Curriculum

Elizabeth A. Ring-Whalen, St. Catherine University

Emily A. Dare, Michigan Technological University

Gillian Roehrig, University of Minnesota

Jeanna Wieselmann, University of Minnesota

Teaching About Engineering Versus Teaching About Science: Perspectives From Elementary Teachers

Jacob Pleasants, Iowa State University

Joanne K. Olson, Texas A&M University

Christopher Spinler, Iowa State University

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

Integrating STEM Fields in Formal and Informal Learning

1:15pm-2:45pm, Augusta H

Presider: Mike Ryan, Georgia Institute of Technology

A Social Cognitive Career Lens onto 10th Grade Students' STEM College Major Plans

Alpaslan Sahin, Harmony Public Schools

Adem Ekmekci, Weiss School of Natural Sciences Rice University

Hersh C. Waxman, Director, Texas A&M University

Exploring Approaches to the Implementation of Middle School Science Fairs

Jacqueline DeLisi, Education Development Center, Inc
Abigail Jurist Levy, Education Development Center, Inc.
Janna Kook, Education Development Center, Inc
Erica T. Fields, Education Development Center, Inc.
Marian Pasquale, Education Development Center Inc.
Leana Nordstrom, Education Development Center, Inc

Increasing High School Students' Interest in STEM Careers Through Participation in a Project-Based Bioscience Course

Danielle K. Ross, Northern Arizona University
Ron Gray, Northern Arizona University

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

Epistemic Beliefs

1:15pm-2:45pm, Augusta F

Presider: Carina M. Rebello, Purdue University

Characterizing Epistemic Beliefs Among Scientists

Katherine E. Ray King, University of Louisville
Linda C. Fuselier, University of Louisville
Justin McFadden, University of Louisville

Characterizing Graduate Teaching Assistant Epistemic Beliefs as they Emerge in the Biology Laboratory

Justin McFadden, University of Louisville
Linda C. Fuselier, University of Louisville
Katherine E. Ray King, University of Louisville

Faculty Epistemological Beliefs: The influence of a Professional Development

Lloyd M. Mataka, Lewis-Clark State College
Jon Saderholm, Berea College
Tracy Hodge, Berea College

Can Concept Mapping Improve Biology Students' Metacognition, Academic Self-Efficacy, and Course Grades at an HBCU?

Catherine Martin-Dunlop, Morgan State University
Samala Lewis, Morgan State University
Dara Davis, Morgan State University

Strand 6: Science Learning in Informal Contexts

Science Agency as Transformational Pivots for Science and Learning

1:15pm-2:45pm, Augusta C

Scholars Taking on Authentic Science: Producing Science and Films

April L. Luehmann, University of Rochester
Angela Calabrese-Barton, Michigan State University
Jessica J. Thompson, University of Washington
Sara Hagenah, Boise State University
Rachel L. Chaffee, American Museum of Natural History
Day W. Greenberg, Michigan State University

Of Fancy Grandmothers & Blue Jay Mansions: Engineering Designs for Community, Videos for the World

Day W. Greenberg, Michigan State University
Angela Calabrese-Barton, Michigan State University

Green Lake: Building Cultural Bridges across School, Home, Community and [The Club]

Sara Hagenah, Boise State University
Jessica J. Thompson, University of Washington

You are Not Alone: Making Science and a Difference

Rachel L. Chaffee, American Museum of Natural History
April Lynn Luehmann, University of Rochester

Strand 7: Pre-service Science Teacher Education

Computational Thinking

1:15pm-2:45pm, Augusta D

Presider: Amanda Benedict-Chambers, Missouri State University

Emerging Trends in Computational Thinking Research and Best-Practices for Computational Thinking Education in Science

Vance J. Kite, North Carolina State University
Soonhye Park, North Carolina State University
Eric N. Wiebe, North Carolina State University

Investigating Preservice Science Teachers' Understanding of an NGSS Practice: Using Mathematics and Computational Thinking

Walter Aminger, University of California, Santa Barbara
Sarah Hough, University of California, Santa Barbara
Valerie Meier, University of California, Santa Barbara
Mandy McLean, University of California, Santa Barbara
Sungmin Moon, University of California, Santa Barbara
Stacey L. Carpenter, University of California, Santa Barbara
Julie A. Bianchini, University of California, Santa Barbara

Preservice Elementary Science Teachers' Inclusion of Computational Thinking Concepts in Lesson Plans

Zoubeida R. Dagher, University of Delaware

Strand 7: Pre-service Science Teacher Education

Efficacy

1:15pm-2:45pm, Savannah B

President: David F. Jackson, University of Georgia

Comparing Practicum Experiences in Science Methods Courses: Effects of Field on Science Teaching Efficacy

Sheryl L. McGlamery, University of Nebraska, Omaha

Bridget Franks, University of Nebraska, Omaha

Saundra L. Shillingstad, University of Nebraska, Omaha

Observation Based Learning Experiences on Preservice Teachers' Perceptions of Self Efficacy Beliefs for Teaching Science

Ranu Roy, Indiana University, Bloomington

Meredith A. Park Rogers, Indiana University, Bloomington

Relationship between Preservice Teachers' Conceptions of Science Teaching and Self-efficacy for Inquiry Science Teaching

Rebekka D. Gougis, Illinois State University

Frackson Mumba, University of Virginia

Kara E. Baldwin, Illinois State University

William J. F. Hunter, Illinois State University

Anthony W. Lorschach, Illinois State University

Role of Self-efficacy in Preservice Science Teacher Identity: The Influence of Field-experiences

Deepika Menon, Towson University, Maryland

The Effect of Collective Efficacy on Group Performance regarding Preparing Science Lesson Plans

Volkan Atasoy, Kastamonu University

Jale Cakiroglu, Middle East Technical University

Strand 7: Pre-service Science Teacher Education

STEAM

1:15pm-2:45pm, Augusta E

President: Enrique Suarez, University of Colorado, Boulder

Mapping Pre-service Teachers' STEM Teaching Preparedness through Engagement in Integrated STEM Modules

Tejaswini S. Dalvi, University of Massachusetts

Practicum Student Teachers and Middle Schoolers: Teaching and Learning a STEM-based Interdisciplinary Curriculum

Regina L. Suriel, Valdosta State University
Robert Spires, Valdosta State University
Barbara Radcliffe, Valdosta State University
Deborah G. Paine, Valdosta State University
Ellice Martin, Valdosta State University

Pre-Service Math and Science Teachers and their Conception and Emerging Implementation of Humanizing STEAM

Imelda L. Nava, University of California, Los Angeles
Jarod Kawasaki, University of California, Los Angeles

The Impact of Engagement in STEM Activities on Primary Teachers' Conceptualization of STEM and STEM Pedagogy

Mehmet Aydeniz, University of Tennessee
Kader Bilican, Kirikkale University

Strand 7: Pre-service Science Teacher Education

Symposium – Implications of Inclusive Science Education Research for Pre-Service Science Teacher Education

1:15pm-2:45pm, Augusta 2

Discussant: Sami Kahn, Ohio University

Presenters:

Sami Kahn, Ohio University
Michele Koomen, Gustavus Adolphus College
Lauren Madden, The College of New Jersey
Lacey D. Huffling, Georgia Southern University
Kevin Fleming, Area Cooperative Educational Services
Bill Lindquist, Hamline University
Judith S. Lederman, Illinois Institute of Technology
Phillip A. Boda, Stanford University
Teresa Shume, North Dakota State University
Elaine M. Silva Mangiante, Salve Regina University

Strand 8: In-service Science Teacher Education

Physics, Engineering, and Technology

1:15pm-2:45pm, Augusta G

President: Meenakshi Sharma, Michigan State University

Constraining Secondary Science Teacher Development: An Examination of Teaching Out-of-Field

Jessica B. Bennett, Gwinnett County Public Schools
Harleen Singh, The University of Georgia

Julie A. Luft, University of Georgia
Design-Based Pedagogy: A Model for Collaborative Lesson Planning for Integrating Robotics

Adam Devitt, New York University
Catherine E. Milne, New York University

Elementary Teachers' Implementation of the Nature of Technology in the Classroom

Hallie S. Edgerly, Drake University
Jerrid W. Kruse, Drake University
Jaclyn M. Easter, Grand View University
Jesse L. Wilcox, Drake University

Strand 10: Curriculum, Evaluation, and Assessment

Designing for Coherence in NGSS Storylines: Supporting K-12 Students in Meaningful Sensemaking

1:15pm-2:45pm, Augusta A

President: Brian J. Reiser, Northwestern University
Engaging First Grade Students in NGSS Practices through Engineering Design
Laura Zangori, University of Missouri
Kelsey Edwards, Northwestern University

'I'm Just Saying That's the Question I Have': Co-Constructing Investigations in a Fifth Grade Classroom

John F. Smith, Northwestern University
Brian J. Reiser, Northwestern University

Supporting Students in Incrementally Developing Wave Models of How Matter Produces Sound

Michael J. Novak, Northwestern University
Tara A. W. McGill, Northwestern University

Journey to the Structure of the Atom: Motivating Chemical Thinking at All Levels

Aliza Zivic, Northwestern University
Brian J. Reiser, Northwestern University

Strand 11: Cultural, Social, and Gender Issues

The Intersection of Identity and Science

1:15pm-2:45pm, Chastain J

President: Felisa (Hsueh-Yun) Yu, National Changhua University of Education

The Experiences of Gay Men in STEM Majors with Heteronormativity and Heterosexism

David P. Steele, The University of Georgia

Examining First Year Science Teachers' Beliefs About Culturally Relevant Teaching

Preethi Titu, University of Minnesota
Hillary A Barron, University of Minnesota, Twin Cities
Julie C. Brown, University of Minnesota

Gender and Culture Effects on High School Students' Overconfidence Bias Genetics and Evolution Exams

Arif Rachmatullah, Kangwon National University
Minsu Ha, Division of Science Education, Kangwon National University

Understanding Science Identity and Capital: A Study of Undergraduate Research Experiences in Life Sciences Education

Danielle K. Jensen-Ryan, University of Wyoming
Jennifer Jo Thompson, University of Georgia

The Changing Nature of Science Identity: Examining the Physics Identity of Female Physics Students

Zahra Hazari, Florida International University
Geoff Potvin, Florida International University
Eric Brewe, Drexel University
Deepa Chari, Florida International University
Renee Michelle Goertzen, American Physical Society
Theodore Hodapp, American Physical Society

Strand 14: Environmental Education

Environmental Attitudes and Motivations

1:15pm-2:45pm, Augusta 1

Presider: Peter A. Okebukola

Environmental Perceptions and Uni- or Multi-Dimensional: Comparison of the NEP and 2-MEV

Bruce Johnson, University of Arizona
Sanlyn Buxner, University of Arizona
Constantinos C. Manoli, Cooper Center for Environmental Learning

Relationship of

Franz X. Bogner, University of Bayreuth
Michael Wiseman, Leibniz Computing Center

Break

2:45pm – 3:15pm

Concurrent Session #6A
Poster Session
3:15pm – 4:15pm

Poster Session A
3:15pm – 4:15pm, Augusta Conference Center

Strand 1: Science Learning, Understanding and Conceptual Change

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

Development of a Model Describing Scientific Thinking in Earth Science Students

Shondricka Burrell, Temple University

Doug Lombardi, Temple University

Elliot S. Bickel, Temple University

Janelle M. Bailey, Temple University

An Empirically-Based Conditional Learning Progression for Climate Change

Wayne Breslyn, University of Maryland, College Park

Andrea Drewes, University of Delaware

J. Randy McGinnis, University of Maryland

Emily Hestness, University of Maryland, College Park

Chrystalla Mouza, University of Delaware

Elementary Students' Knowledge Sources of Ecosystems

Hayat Hokayem, Texas Christian University

Hui Jin, Educational Testing Service

Shelly Wu, Texas Christian University

Investigating Teachers' and Students' Understanding of Scientific Models

Meng-Fei Cheng, National Changhua University of Education

Tsung-Yu Wu, National Changhua University of Education

Shu-Fen Lin, National Changhua University of Education

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

Cultivating Scientific Literacy among Future Malaysians by Rejuvenating their Interest

towards Science

Kamisah Osman, Universiti Kebangsaan Malaysia
Nurnadiah Mohamed Bahari, Universiti Kebangsaan Malaysia
Cindy Wong Chee Chen, Universiti Kebangsaan Malaysia

Dialogic Teaching and the Interactive Whiteboard: Case Studies from Science Classrooms in Northern Lebanon

Sara Salloum, University of Balamand
Maria Al Merheby, University of Balamand

Examining Teacher-Student Exchange Occurring within Evolution and Human Genetics Units in a Rural High School

Banu Avsar Erumit, Recep tayyip Erdogan Universty
Valarie L. Akerson, Indiana University

Experimentation With Pictorial Based Worked Examples In The Context of Scientific Inquiry In Biology

Annika Vohl, Universität Duisburg-Essen
Angela Sandmann, Universität Duisburg-Essen
Christine Florian, Universität Duisburg-Essen

Exploring the Differences in Epistemic Beliefs in Science and Reasoning Performance between Students from Taiwan and India

Fang-Ying Yang, National Taiwan Normal University
Kaushal Kumar Bhagat, Beijing Normal University

Linguistically-Diverse Pairs' Collaborative Discourse Patterns in the Context of Visualization-Rich Inquiry-Based Learning

Kristin Bedell, University of North Carolina, Chapel Hill
Kihyun (Kelly) Ryoo, University of North Carolina, Chapel Hill

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

Exploring How 3rd-grade Students' Engage in Socio-Scientific Argumentation

Laura Zangori, University of Missouri
Troy Sadler, University of Missouri
Amanda N. Peel, University of Missouri

Exploring the Translation into Practice of Elementary Engineering Design-based Instruction

Kristina Maruyama Tank, Iowa State University
Michale DuPont, Iowa State University

Anne Estapa, Iowa State University

Facilitating Discussions Focused on Argumentation via Simulated Classrooms: Results from a Pilot Study

Jamie N. Mikeska, ETS

Heather Howell, ETS

Adam Devitt, New York University

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

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

Scientific Literacy through Materials Based on Socioscientific Issues: How Students Connect Chemistry Content to Everyday Life

Dürdane Bayram-Jacobs, Radboud University Nijmegen

Ineke Henze, Delft University of Technology

Erik Barendsen, Radboud University Nijmegen

An Exploration of High School Biology Teachers' Knowledge About Students' Natural Selection Ideas

Margaret M. Lucero, Santa Clara University

Katie Green, North Carolina State University

Cesar Delgado, North Carolina State University

An Exploration of Students' Socio-scientific Reasoning through Socio-scientific Issue-based Instruction

Hai T. Nguyen, University of Missouri, Columbia

Andrew T. Kinslow, University of Missouri

Troy Sadler, University of Missouri

Citizen Science brought to the Underrepresented Population of Puerto Rico through Socioscientific Issues

Lorraine Ramirez, Florida Institute of Technology

Samantha R. Fowler, Florida Institute of Technology

Exploring Teacher Questioning During Model-Based Inquiry Lessons in a High School Biology Classroom

Trevor T. Tuma, Whittier College

Lauren H. Swanson, Whittier College

High School Biology Students' Learning Interests and Formal Curriculum Emphasis

Ian Nicolaidis, Southern Illinois University

Vivien M. Chabalengula, University of Virginia

Frackson Mumba, University of Virginia

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

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

A Qualitative Exploration of Graduating Seniors' Perceptions of Their Undergraduate Studies

Carly Hunt, University of Maryland, College Park

Gili Marbach-Ad, University of Maryland

Michelle Bertke, University of Maryland, College Park

Katerina Thompson, University of Maryland

An Investigation of Science Writing Tasks and Cognitive Processing

Richard Lamb, University at Buffalo

Brian M. Hand, University of Iowa

Sae Yeol Yoon, Delaware State University

Differential Impact of Science Teaching on Undergraduates' Science Self-Efficacy

Nicholas Stroud, Massachusetts College of Liberal Arts

Enhancing Graduate Students' Ability to Conduct and Communicate Research Through an Interdisciplinary Lens

Hailey V. Marr, University of Maryland

Gili Marbach-Ad, University of Maryland

Gains in Undergraduate Biology Student Achievement from a Combined Cognitive-Motivational Intervention across Multiple Semesters

Jennifer Cromley, University of Illinois, Urbana-Champaign

Avi Kaplan, Temple University

Kyle Mara, University of Southern Indiana

Martin Van Boekel, The SEARCH Institute

Michael J. Balsai, Temple University

Ting Dai, University of Illinois, Chicago

Tony Perez, Old Dominion University

Wanda Brooks, Old Dominion University

Yona Davidson, Temple University

Guiding Students' STEAM Projects with the Integrated Approach Checklist

Eun Ah Lee, University of Texas, Dallas

Roger F. Malina, University of Texas, Dallas

Holistic STEM Faculty Development

Cindy M. Lee, Clemson University

Karen A. High, Clemson University

Sandra M. Linder, Clemson University
Shannon K. Stefl, Clemson University

Strand 6: Science Learning in Informal Contexts

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

Educative Social Media for Informal Science Learning: Effective Message Design Across Two Digital Niches

Lisa Lundgren, University of Florida
Kent J. Crippen, University of Florida

Examination of Interactions between Museum Educators and Students on a School Visit to Science Museum

Neta Shaby, Ben-Gurion University of the Negev, Israel
Orit Ben Zvi Assaraf, Ben-Gurion University of the Negev, Israel
Tali Tal, Technion

How to Assess Learning School Visits? Personal Meaning Maps as a Tool for Assessing Learning

Cláudia Faria, Institute of Education of the University of Lisbon

Identifying High Leverage Practices in an Informal Project: Sustaining a Research Practice Partnership

Todd Campbell, University of Connecticut
Anton Puvirajah, Western University

Science Capital and Identity: Factors influencing STEM Interests

Megan Ennes, North Carolina State University
M. Gail Jones, North Carolina State University
Emily Cayton, North Carolina State University
Katherine Chesnutt, North Carolina State University
Pamela Huff, North Carolina State University
Lanette Phillips, North Carolina State University

Strand 7: Pre-service Science Teacher Education

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

A Storied-Identity Analysis of a Teacher Candidate's Learning to Teach in an Urban Setting

Amal Ibourk, Florida State University

Disrupting Traditional Science Teaching: Ambitious Science Teaching in a Practice-

based Teaching Methods Course

Gale A. Seiler, Iowa State University
Hildah Makori, Iowa State University

Early Childhood and Elementary Education Teacher Preparation in Science: Variations in Content and Methods

Diane Silva Pimentel, Brown University

Effect of the Practicum Course on pre-Service Science Teachers' Beliefs and Attitudes toward Teaching Sciences

Iyad M. Dkeidek, Al-Quds University

Efficacy of Argumentation Models for Discourses about Scientific Literacy Inherent in Indigenous Knowledge

Keith R. Langenhoven, University of the Western Cape

Exploring Influencing Factors on Pre-Service Early Elementary Educators' Science Teaching Self-Efficacy Beliefs: Teachers and Standards

Shannon Gooden, Florida State University

Use of Schema Theory to Explain Argumentation Dialogues of Preservice Students during a Science Investigation

Catherine L. Quinlan, Howard University

Strand 8: In-service Science Teacher Education

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

A Case Study of Panamanian Teachers in a Blended Elementary Science Teaching Professional Development Program

Katie Laux, University of South Florida
Jeni R. Davis, Salisbury University

An Examination of Persistence in Becoming a Rural Teacher

Diane Wright, Colorado State University
Meena M. Balgopal, Colorado State University
Andrea Weinberg, Colorado State University
Laura B. Sample McMeeking, Colorado State University STEM Center

Determining the Effectiveness of a Design-based, Continuous Professional Development Programme for Science Teachers

Ana Valdmann, University of Tartu
Jack B. Holbrook, University of Tartu
Miia Rannikmae, University of Tartu

Gaps in Science Teacher Understanding of the Epistemic Nature of NGSS Science Practices

Vance J. Kite, North Carolina State University
Soonhye Park, North Carolina State University
Lanette Phillips, North Carolina State University

Measuring Pedagogy and the Integration of Engineering Design in STEM Classrooms

Tory H. Williams, University of Maryland, Baltimore
Jonathan Singer, University of Maryland, Baltimore
Christopher Rakes, University of Maryland, Baltimore
Jacqueline Krikorian, University of Maryland, Baltimore
Julia Ross, Virginia Tech

Strand 10: Curriculum, Evaluation, and Assessment

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

Assessing Students' Disciplinary and Interdisciplinary Understanding of Global Carbon Cycling

Hye Sun You, New York University
Cesar Delgado, North Carolina State University
Jill A. Marshall, University of Texas, Austin

Charting Coherence in State System K-12 STEM Education: Focus Group Study of Teachers and Administrators

Thomas A. Kameronoski, The Pennsylvania State University
Richard A. Duschl, Pennsylvania State University
Carla Zembal-Saul, Pennsylvania State University

Identifying Best Practices in Implementing Complex Neuroscience Content In Elementary School

Alana Newell, Baylor College of Medicine
Nancy Moreno, Baylor College of Medicine

Expert Panel Review of the Middle School-Life Science Concept Inventory (MS-LSCI)

Andria Stammen, The Ohio State University
Kathy Lea Malone, Nazarbayev University
William Boone, Miami University
Karen E. Irving, The Ohio State University
Zakee Sabree, The Ohio State University

Scientific Literacy in Zambian High School

Vivien M. Chabalengula, University of Virginia
Frackson Mumba, University of Virginia

Strand 11: Cultural, Social, and Gender Issues

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

A Counternarrative from the Mississippi Delta: Teacher and Student Experiences in a Pre-Engineering Program

Takumi Sato, Virginia Tech

Brenda R. Brand, Virginia Tech

Anza Mitchell, Virginia Tech

Lezly Taylor, Virginia Tech

African American Persistence in STEM Majors at a Predominantly White Institution

Andre M. Green, University of South Alabama

Brenda R. Brand, Virginia Tech University

George E. Glasson, Virginia Polytechnic Institute and State University

Network Differences in Underrepresented Students in Learning Assistant Supported Undergraduate Science Classrooms

Paul Le, University of Colorado, Denver

Robert M. Talbot, University of Colorado, Denver

Laurel Hartley, University of Colorado, Denver

Leanne Doughty, University of Colorado, Denver

Amreen Nasim Thompson, University of Colorado, Denver

Andrew McDevitt, University of Colorado, Denver

Preservice Teachers' use of Culturally Relevant Instruction

Kirby Whittington, Florida State University

Sherry A. Southerland, Florida State University

Harini C. Krishnan, Florida State University

The Dependency of Middle School Student' STEM-related Career Awareness on Gender and Career Field Choices

Tormi Kotkas, University of Tartu

Miia Rannikmae, University of Tartu

Jack B. Holbrook, University of Tartu

Beyond the City Lights: Resiliency of Secondary Science Teachers in Rural Schools.

Beverly R. DeVore-Wedding, University of Nebraska-Lincoln

Julie A. Thomas, University of Nebraska

Strand 12: Educational Technology

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

2D or 3D? Effects of Stimulus Dimensionality on Molecular Model Comparison in Organic Chemistry Task

Pavlo D. Antonenko, University of Florida
Matthew Schneps, Smithsonian Astrophysical Observatory
Richard Lamb, University, Buffalo
Marc Pomplun, University of Massachusetts, Boston
Do H. Koh, University of Massachusetts, Boston
Kendra Saunders, University of Florida
Andrea Burgess, University of Florida
Li Cheng, University of Florida
Zhen Xu, University of Florida
Jingwei Li, University of Florida

Elementary Teacher Candidates in the 3-D Online Virtual World Second Life

EunJin Bahng, Iowa State University
Mimi Lee, Hongik University

Identifying Productive Discussion in Peer Instruction with Clickers to Promote Student Conceptual Understanding of Science

Yu-Ta Chien, National Taiwan Ocean University
Learning Science through Practice and Play
Kayla Pritchard, University of Georgia
Georgia Hodges, University of Georgia

Upper Elementary Students' Explanations of "Why Ice Melts" and the Influence of Haptic Force-feedback

James Minogue, North Carolina State University
Diane Hunter, North Carolina State University
David Borland, Renaissance Computing Institute (RENCI)
Marc Russo, North Carolina State University

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

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

A Case Study of a Year-long Science Internship to Teach Nature of Science

Cary W. Sell, University of Georgia
J. Steve Oliver, University of Georgia

Change of Secondary Students' Perceptions of the Theory of Evolution after an Instructional Intervention that Include Nature of Science: Relevance, Acceptance and Understanding Issues

Beatriz Becerra, Pontificia Universidad Católica de Valparaíso
Alejandra Vegas, Pontificia Universidad Católica de Valparaíso
Kareen Norambuena, Pontificia Universidad Católica de Valparaíso

Hernan Cofre, Pontificia Universidad Católica de Valparaíso

Fake News and Climate Change: Understanding the Framework

Amelia A. Brown, University of Tennessee, Knoxville

Barry Golden, University of Tennessee

Mind the Gap: Combining Bachelards' Philosophy of Science and Chemistry Education in Theory and Practice

Mareike Frevert, University of Kassel

David S. Di Fuccia, University of Kassel

Strand 14: Environmental Education

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

Designing Conservation Education Programs Using Community Participatory Approaches

Ian Hanley, University of New Hampshire

Sameer Honwad, University of New Hampshire

Exploring the Sustainability-Related Career Outcome Expectations of Community College Students Interested in Science

Allison Godwin, Purdue University

Strand 15: Policy

Poster Session A

3:15pm-4:15pm, Augusta Conference Center

How Students are Recruited into Enrolling into AP Courses and Enticed to Take AP Exams

Eugene Judson, Arizona State University

Nicole Bowers, Arizona State University

Kristi Glassmeyer, Arizona State University

A Logic Model of Successful STEM-Focused Elementary Schools: Analysis of Critical Components

Erin E. Peters-Burton, George Mason University

Ann House, SRI International

Vanessa L. Peters, SRI International

Julie Remold, SRI International

Concurrent Session #6B

Poster Session
4:15pm – 5:15pm

Poster Session B
4:15pm – 5:15pm, Augusta Conference Center

Strand 1: Science Learning, Understanding and Conceptual Change

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Learning That Models Are Abstract: A Description of The Learning Processes Within Synthesis Modeling

Ayca Karasahinoglu, University of Georgia

Daniel K. Capps, University of Georgia

Students' Self-Efficacy Towards Competences and the Content Frame in which Big Ideas are Embedded

Helen Semilarski, Tartu University

Regina Soobard, University of Tartu

Miia Rannikmae, University of Tartu

The Effect of ABI Approach on the Critical Thinking Skills of the 5th Grade Students

Esra Kabatas Memis, Kastamonu University

Büsra Nur Çakan Akkas, Kastamonu University

The Nature of Solutions and Solubility (NSS–DI Eng) Pilot Evaluation for Cultural Layout Norms

Mandy McCormick Smith, The Ohio State University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Relationship of Contextual Interest and Motivation Dimensions among Grade 6 and 9 Students' in Science Learning

Moonika Teppo, University of Tartu

Miia Rannikmae, University of Tartu

Margus Pedaste, University of Tartu

Scientific Epistemological Beliefs between the Poles of Professional and Classroom Science

Frauke Voitle, Leibniz Institute for Science and Mathematics Education

Nele Kampa, Leibniz Institute for Science and Mathematics Education

Julia Schwanewedel, Leibniz Institute for Science and Mathematics Education
Irene Neumann, Leibniz Institute for Science and Mathematics Education
Kerstin Kremer, Leibniz Institute for Science and Mathematics Education

Secondary Student's Science-Learning Motivation in Korea and Indonesia

Arif Rachmatullah, Kangwon National University
Sein Shin, Chonbuk National University
Jun-Ki Lee, Chonbuk National University
Fenny Roshayanti, Universitas PGRI Semarang
Minsu Ha, Kangwon National University

The Ethic of Care, English learners, and their Teachers in Middle School Science Classes

Rhonda K. Rackley, The Gwinnett School of Mathematics, Science, & Technology
Mary M. Atwater, University of Georgia

The Longitudinal Relationship of Positive and Negative Science Attitudes of Middle School Students

Angela Skeeles-Worley, University of Virginia
Robert H. Tai, University of Virginia
Ji Hoon Ryoo, University of Virginia
Christopher Dittrick, University of Virginia

Thinking Spatially: Improving Middle-school Students' Use of Perspective Taking Through An Astronomy Curriculum

Abha Vaishampayan, Pennsylvania State University
Julia Plummer, Pennsylvania State University
Kyungjin Cho, Pennsylvania State University
Patricia Udomprasert, Harvard University
Erin Johnson, Harvard University
Susan Sunbury, Harvard-Smithsonian Center for Astrophysics
Henry Houghton, Harvard University
Erika Wright, Harvard-Smithsonian Center for Astrophysics
Helen Zhang, Boston College
Alyssa Goodman, Harvard University

Using Cogenerative Dialogues to Address Emotional Issues in a Project-Based Learning Science Internship

Pei-Ling Hsu, University of Texas, El Paso
Kenneth George Tobin, The City University of New York

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Supporting Scientific Modeling Practices in Elementary Science Instruction about Inheritance

Devarati Bhattacharya, University of Nebraska-Lincoln
Cory T. Forbes, University of Nebraska-Lincoln
Erin Ingram, University of Nebraska-Lincoln
Leslie Hawley, University of Nebraska-Lincoln
Jared Stevans, University of Nebraska-Lincoln
Dante Cisterna, University of Nebraska-Lincoln

The Tendency of Children's Evidence-based Reasoning during Classroom Problem Solving

Mijung Kim, University of Alberta
Jerine Pegg, University of Alberta

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

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Integrating Programming and Biology in 8th Grade

Kit Martin, Northwestern University
Ashlyn Pierson, Vanderbilt University
Pratim Sengupta, University of Calgary

Investigating Students' Attitudes About STEM and 21st Century Skills In A Project-Based Learning Program

Stephen C. Scogin, Hope College
Katie Rietberg, Hope College
Michelle Austin, Hope College
Katherine Supanich, Hope College
Carly Sommavilla, Hope College
Cindy Alexander, Hope College
Lara Iaderosa, Hope College
Julie Isola, Hope College

Moving from Realist to Relativist Worldview in the Digital Age

Dina Tsybulsky, Tel Aviv University
Asaf Dajczman, Tel Aviv University
Ilya Levin, Tel Aviv University
Teaching Genetics Using Learning Technologies: A Snap Shot of Four Case Studies
Dionysius T. Gnanakkan, Illinois Institute of Technology
Norman G. Lederman, Illinois Institute of Technology
Judith S. Lederman, Illinois Institute of Technology
The Role of Teachers' Epistemic Aims and Cognition in SSI Teaching

Suna Ryu, Korea National University of Education
Hangnam Jeong, Korea National University of Education
Sunhee Noh, Korea National University of Education
Soyoung Beyon, Korea National University of Education

The State of Climate Change Education in the First State
Andrea Drewes, University of Delaware
Joseph Henderson, University of Delaware
Amy Trauth, University of Delaware

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

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Helping Undergraduate Students' CREATE Understanding of Scientific and Popular Media Articles about Contemporary Water Issues
Diane Lally, University of Nebraska-Lincoln
Cory T. Forbes, University of Nebraska-Lincoln
Jenny M. Dauer, University of Nebraska-Lincoln

How Do Students use Writing-to-learn Activities to Demonstrate Aspects of Science Literacy across Three Domains?
Samantha L. Jusino, West Virginia University
Learning Assistants' Actions in Undergraduate Science courses: Point-of-View Video Analysis
Amreen Nasim Thompson, University of Colorado, Denver
Leanne Doughty, University of Colorado, Denver
Robert M. Talbot, University of Colorado, Denver
Laurel Hartley, University of Colorado, Denver
Paul Le, University of Colorado, Denver

Learning Assistants in Large-Enrollment Undergraduate Biology: Results of a Multi-Year Quasi-Experimental Study
Ellen Christine Davis, University of Florida
Pavlo D. Antonenko, University of Florida
Alice Harmon, University of Florida

Process-Oriented Guided-Inquiry Learning Marginally Effects Student Achievement but Increases the Odds of Passing a Course
Abdirizak M. Warfa, University of Minnesota
Lindsey Walker, University of Minnesota

Toward the Development of Interdisciplinary Course and an Analytical Framework for Assessing Interdisciplinary Sciences Reasoning
Shannon H. Sung, Spelman College

Derrick J. Hylton, Spelman College

Transdisciplinary Students' Learning and Reasoning about Socio-hydrological Issues in an Undergraduate Water Course

Destini N. Pettit, University of Nebraska - Lincoln

Diane Lally, University of Nebraska-Lincoln

Cory T. Forbes, University of Nebraska-Lincoln

Nick Brozovic, University of Nebraska-Lincoln

Trenton Franz, University of Nebraska-Lincoln

Strand 6: Science Learning in Informal Contexts

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Students' Role Taking Patterns in an Integrated STEM and Literacy Academy

Ji Shen, University of Miami

Blaine E. Smith, University of Arizona

Shiyan Jiang, University of Miami

Guanhua Chen, University of Miami

Marie Hamaoui, University of Miami

Juan Torralba, University of Miami

The Non/Canonical Nature of Science Fair Project Titles and the Relationship to Prize Winning

G. Michael Bowen, Mount Saint Vincent University

Kimberley P. Good, Dalhousie University

J. Lawrence Bencze, University of Toronto

Using Science Storybooks to Support Preschool-Age Children's Development of Evidence-Based Explanations during Museum-based Programming

Kyungjin Cho, Pennsylvania State University

Julia Plummer, Pennsylvania State University

Individual Family Members' Perspectives of a Science-Themed Community Event

Jennifer L. Idema, Texas State University

Patricia Patrick, Columbus State University

Strand 7: Pre-service Science Teacher Education

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Programmatic Model Building in Undergraduate Elementary Science Teacher Education for Computational Thinking

J. Randy McGinnis, University of Maryland

Diane Jass Ketelhut, University of Maryland
Emily Hestness, University of Maryland, College Park
Hannoori Jeong, University of Maryland

*Iterative Development and Use of an Online Problem-Based Learning Module for
Preservice and Inservice Teachers*

Peter Rillero, Arizona State University
Laurie Camposeco, Arizona State University

*Preparing Reform-Minded Science and Mathematics Teachers: An Empirical
Investigation Across Six Teacher Education Programs*

Alexandria K. Hansen, University of California, Santa Barbara
Stacey L. Carpenter, University of California, Santa Barbara
Julie A. Bianchini, University of California, Santa Barbara
Elisa Stone, University of California, Berkeley
Cheryl Forbes, University of California, San Diego

Preservice Science Teachers' Notice and Response to Students' Scientific Thinking

Meenakshi Sharma, Michigan State University
Christina V. Schwarz, Michigan State University

*Preservice Science Teachers' SSI Teaching Self-efficacy Beliefs and Related Factors: A
Model Testing*

Nilay Ozturk, Ahi Evran University
Ozgul Yilmaz-Tuzun, Middle East Technical University

*Pre-service Science Teachers' Views towards Socio-scientific Issues and Socio-scientific
Issue-based Instruction*

Okan Sibiç, Istanbul University
Mustafa S. Topcu, Yildiz Technical University

*PSTs' Overarching Conceptions about Technology Integration and their Technology
Integration Plans in SSI Teaching Context*

Meltem Irmak, Gazi University
Ozgul Yilmaz-Tuzun, Middle East Technical University
Nejla Yuruk, Gazi University

*The Effectiveness of Using 5E Lesson Planning on Understanding of Preservice Science
Teachers' Nature of Scientific Inquiry and It's Transferring to Teaching Practice*

Funda Hasançebi, Giresun University
Seda Çavuş? Güngören, Çanakkale Onsekiz Mart University
Gunkut Mesci, Giresun University

*The Effects of Socio-Scientific Contexts on Pre-Service Science Teachers' Socio-Scientific
Reasoning*

Emine Sarikaya, Yildiz Technical University

Mustafa Sami Topçu, Yildiz Technical University

Strand 8: In-service Science Teacher Education

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Middle School Science Teachers' Experiences in Implementing Scientific Practices-based Argumentation Lessons

Bahadir Oguz Namdar, Recep Tayyip Erdogan University

Aysegul Oguz Namdar, Recep Tayyip Erdogan University

Productive Disciplinary Engagement as a Model for Science Teacher Learning in the Age of NGSS

Sara C. Heredia, The University of North Carolina, Greensboro

David Schouweiler, The University of North Carolina, Greensboro

STEAM Professional Development for Teachers in Indigenous Contexts: Using The Language and Inquiry Science Tool

Irasema Ortega, University of Alaska-Anchorage

Katherine Galauska,

The Pivotal Role of Academic Collaborations in Boosting Confidence in Teaching Inquiry and Inquiry Enactment

Pongprapan Pongsophon, Kasetsart University

Ben C. Herman, University of Missouri

The Role of Teacher Questioning for Maintaining Cognitive Demand in Science Classrooms

Miray Tekkumru Kisa, Florida State University

Three Secondary Science Teachers' Experiences with the NGSS: A Social Practice Theory Perspective

Elysa N. Corin, Institute for Learning Innovation

Tammy L. Cook-Endres, Exploratorium

Understanding Science as Culture: Examining the Influence of a Research Experience for Teachers Program

Shannon Gooden, Florida State University

Strand 10: Curriculum, Evaluation, and Assessment

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

INSECT: A Framework for INtegrating Science Education and Computational Thinking

Amanda N. Peel, University of Missouri
Troy Sadler, University of Missouri

Examining Physics Teachers' Formative Assessment Knowledge of Force and Motion: A Rasch Model Approach

Marilyn M. Stephens, University of Alabama
Dennis Sunal, University of Alabama
James W. Harrell, University of Alabama
Stephanie Wind, University of Alabama

Examining Formative Assessment Strategies of Secondary Science Teachers

Hüseyin Inaltun, Gazi University
Salih Ates, Gazi University

Developing an Interactive Simulation-based Formative Assessment System: A feasibility Study

Mihwa Park, University at Buffalo
Ying Sun, University at Buffalo
Jennifer Tripp, University at Buffalo
Jennifer Tripp, University at Buffalo

A Design Framework for the Development of Scenario-Based Assessments for Summative Assessment Settings

Gary Weiser, Teachers College Columbia University
Lei Liu, Educational Testing Service

Science and Mathematics Performance and College Readiness in an Urban Portfolio Community High School

Robin E. Fleshman, Columbia University
Felicia Moore Mensah, Columbia University

Strand 11: Cultural, Social, and Gender Issues

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

The Process of Becoming: Identity Challenges for African-American Female Science and Mathematics Pre-Service Teachers

David M. Sparks, University of Texas, Arlington

Using Writing to Understand Self, Others and Learning Science Concepts

Line A. Saint-Hilaire, City University of New York, Queens College

Sixth Graders of the "Law of the Lever" Through a Culturally Responsive Inquiry Activity

Felisa (Hsueh-Yun) Yu, National Changhua University of Education

Erh-Tsung Chin, National Changhua University of Education
Huey-Lien Kao, National Pingtung University of Education

Culturally-responsive Science Education: Restructuring Science in Interdisciplinary Contexts

Sheron Mark, University of Louisville
Geena Constantin, Jefferson County Public Schools
Olivia Alexander, University of Louisville

Gender and Grade Differences in Student Preferences for Making/Creating and Discovering Activities Associated with Science Career Aspirations in Grades 3-6

Angela D. Skeeles-Worley, University of Virginia
Robert H. Tai, University of Virginia
Ji Hoon Ryoo, University of Virginia
Christopher Dittrick, University of Virginia

Using Scientific Practice to Address the Girls' Crisis: Designing Science Education From a Feminist Perspective

Heather B. Page, New York University

Strand 12: Educational Technology

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Capturing Gender Differences on Creativity in High School Students Participating in a Serious Educational Game Design and Development Project: How A Technological Project-Based Learning Approach Affects Creative Endeavors

Len Annetta, East Carolina University
Marina Shapiro, George Mason University
Richard Lamb, University at Buffalo
David B. Vallett, University of Nevada, Las Vegas
Amanda Luh, George Mason University
Rebecca Cheng, George Mason University

The Impacts of a Computer Simulation on Student Learning Experience in Science Classrooms

Xiaoyang Gong, University of Maryland
Diane Jass Ketelhut, University of Maryland
Ebony Terrell Shockley, University of Maryland

AugmentedWorld: Preparing Preservice STEM Teachers to Create Location-based Multimedia Questions

Miri Barak, Technion, Israel Institute of Technology
Shadi Asakle, Technion - Israel Institute of Technology

Programming and Science Literacy: Examining Enactment of a Robotics Course for High School Girls

Noemi Waight, University at Buffalo
Alyssa Mello, University at Buffalo
Somaia Morsy, University at Buffalo
Melissa Lindner, Saints Peter and Paul School

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

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

Novel Method for Teaching the Difference and Relationship between Theories and Laws

Khadija E. Fouad, Appalachian State University
Kathryn L. Gray, Caldwell Early College High School

The Influence of a History of Science Course on Jamaican Teachers' Nature of Science Conceptions

Sharon Bramwell-Lalor, The University of the West Indies

Use of Schema Theory and Think Alouds to Study Knowledge Progression Patterns for Socioscientific Issues

Catherine L. Quinlan, Howard University

What do K-12 Students Need to NoE? A Delphi Study into the Nature of Engineering

Brian Hartman, Walla Walla University
Randy L. Bell, Oregon State University

Relationships between Changes in Teachers' Understanding of Scientific Inquiry and Nature of Science

Yue Li, Miami University
Sarah B. Woodruff, Miami University

Strand 14: Environmental Education

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

How Experts Frame Socio-scientific Issues During Lectures

Anne Marie A. Casper, Colorado State University
Meena M. Balgopal, Colorado State University

What Role have Environmental Education Standards Played in Curriculum Development?: An Historical Investigation

Margaretann G. Connell, Illinois Institute of Technology

Norman G. Lederman, Illinois Institute of Technology

Strand 15: Policy

Poster Session B

4:15pm-5:15pm, Augusta Conference Center

International Standards Documents' Inclusion of the Nature of Science: A Twenty Year Retrospective

Joanne K. Olson, Texas A&M University

Evening/Social Events

Graduate Students Committee Sponsored Session

Graduate Student Forum

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

5:30pm – 7:00pm, Savannah A

Organizers:

Amber Bismack, University of Michigan

Christa Haverly, Michigan State University

Francesca White, Indiana University

JRST Editorial Team Meeting/Dinner

By invitation only – Sponsored by Wiley-Blackwell

6:00pm-8:30pm, Chastain J

Reception: International Journal of Science and Mathematics Education

By invitation only – Sponsored by Springer

6:00pm – 7:30pm, Chastain H and I

Monday, March 12, 2018

Conference Registration

7:00am – 5:00pm, Peachtree Terrace

Committee Meetings (Continental breakfast provided for committee members)

7:15am – 8:30am

Outstanding Doctoral Research Award Committee Meeting

7:15am – 8:30pm, Augusta E

Early Career Research Award Committee Meeting

7:15am – 8:30pm, Augusta F

Distinguished Contributions through Research Award Committee Meeting

7:15am – 8:30pm, Augusta G

Equity and Ethics Committee Meeting

7:15am – 8:30pm, Savannah B

External Policy and Relations Committee Meeting

7:15am – 8:30pm, Savannah C

Research Committee Meeting

7:15am – 8:30pm, Augusta 1

Membership Committee Meeting

7:15am – 8:30pm, Augusta 2

Election Committee Meeting Meeting

7:15am – 8:30pm, Augusta B

International Committee Meeting

7:15am – 8:30pm, Augusta 3

Program Committee Meeting

7:15am – 8:30pm, Peachtree 1

Publications Advisory Committee Meeting

7:15am – 8:30pm, Augusta A

Graduate Student Committee Meeting

7:15am – 8:30pm, Augusta C

Website Committee Meeting

7:15am – 8:30pm, Augusta D

Concurrent Session #7

8:45am – 10:15am

Administrative Session

Graduate Student Research Poster Symposium

8:45am-10:15am, Savannah A

Presenters:

Francesca A. White, Indiana University

Christa Haverly, Michigan State University

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

Heidi Cian, Clemson University

Thomas A. Kameronoski, Pennsylvania State University

Presidential Sponsored Symposium

Data Sharing and Research Transparency at the Article Publishing Stage: Advantages and Limitations

8:45am-10:15am, Augusta 3

President:

Barbara A. Crawford, University of Georgia

Presenters:

Fouad Abd-El-Khalick (Editor), *Journal of Research in Science Teacher*

Dana L. Zeidler (Editor), *Journal of Research in Science Teaching*

Norman G. Lederman (Editor), *Journal of Science Teacher Education*

Judith Lederman (Editor), *Journal of Science Teacher Education*

Sherry Southerland, (Editor) *Science Education*

Lisa C. Benson, (Editor) *Journal of Engineering Education*

Jan van Driel, (Editor) *International Journal of Science Education*

Kostas Kampourakis, (Editor) *Science and Education*

David Geelan, (Editor) *Research in Science Education*

Donna King, (Editor) *Research in Science Education*

Huann-shyang Lin, (Editor) *International Journal of Science and Mathematics Education*

Strand 1: Science Learning, Understanding and Conceptual Change

Modeling-Based Inquiry and Science Learning

8:45am-10:15am, Peachtree 1

President: Sabrina Avila, City University of New York

Modeling-based Instruction and Assessment for Learning Electrochemistry at the Secondary School

Mei-Hung Chiu, National Taiwan Normal University
Mao-Ren Zeng, Taipei Municipal Dazhi High School, Taiwan
Shiao-Lan Chung, New Taipei High School, Taiwan

Students' Models about Quantization and Atomic Spectra Before and After Engaging with Model-Based Inquiry

Tugba Yuksel, Purdue University
Lynn A. Bryan, Purdue University

The Role of Scientific Modeling and Conceptual Knowledge in Context-Based Tasks

Susanne A. Digel, DFG Graduate School Teaching and Learning Processes
Jochen Scheid, University of Landau
Alexander Kauertz, University of Koblenz-Landau
David F. Treagust, Curtin University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

STEM Education

8:45am-10:15am, Augusta B

Presider: Senay Purzer, Purdue University

Impact of an Integrated Engineering Curriculum on Students' Knowledge of and Self-efficacy in Engineering Design

Wondimu Ahmed, The University of Akron
Nidaa Makki, The University of Akron
Kristin L. Koskey, The University of Akron
Nicholas G. Garafolo, The University of Akron
Donald P. Visco, The University of Akron

Middle School Students' Attitudes towards Science-Technology-Engineering-Mathematics (STEM) Fields and their Interests towards STEM Careers

Ayse Ciftci, Mus Alparslan University
Mustafa S. Topcu, Yildiz Technical University
Ibrahim Erdogan, Mus Alparslan University

Productive Conflict: The Anomalous Role of 'Getting Along' in a High-Needs Elementary Engineering Classroom

Heidi B. Carlone, University of North Carolina, Greensboro
Megan R. Lancaster, University of North Carolina, Greensboro

Research Apprenticeship Program for High School Students: Participants' Characteristics and STEM Career Pathways

Irit Sasson, Tel-Hai College
Merchi Edry-Malul, Technion

Yehudit Judy Dori, Technion

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Integrating Arts, Literacy, and Language with Science

8:45am-10:15am, Augusta 2

Presider: Jessica Cellitti, Drexel University

A Comparison of Arts- and Inquiry-based Methods for Teaching Life Sciences to Fifth Graders

Christa Greenfader, University of California, Irvine

Brad Hughes, UCI

Drew Bailey, UCI

Joseph Wong, ESCAPE Program University of California, Irvine

Can Fourth Grade Science Misconceptions Be Reversed Through Inquiry or Arts Integration?

Brad Hughes, UCI

Christa Greenfader, University of California, Irvine

Sage O'Toole, University of California, Irvine

Joseph Wong, ESCAPE Program University of California, Irvine

Drew Bailey, UCI

Investigating Elementary Preservice Teachers' Designs for Integrated Science/Literacy Instruction Highlighting Similar Cognitive Processes

Carolyn S. Wallace, Kennesaw State University

Debra Coffey, Kennesaw State University

Planning and Implementing Scaffolds for Science Academic Language: Successes and Challenges in Elementary Science

Karl G. Jung, University of South Florida

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

Organized Poster Session: Using Data to Develop Systems Supporting Three-Dimensional Science Learning

8:45am-10:15am, Savannah C

Presider: Charles W. Anderson, Michigan State University

Discussant: William Penuel, University of Colorado

Designing Curriculum to Support Students in Engaging in the Science Practices

Kirsten Edwards, Michigan State University

Emily Scott, University of Washington, Seattle

Charles W. Anderson, Michigan State University

Curriculum Materials Supporting Three-Dimensional Learning about the Global Carbon Cycle

Joyce M. Parker, Michigan State University
Craig Kohn, Michigan State University
Beth A. Covitt, University of Montana
May Lee, Michigan State University
Charles W. Anderson, Michigan State University

Machine Scoring and IRT analysis

Jay Thomas, ACT, Inc.
Jinho Kim, University of California, Berkeley
Karen Draney, University of California, Berkeley

Teacher Effectiveness and Their Carbon TIME Practices and Knowledge

Qinyun Lin, Michigan State University
JinHo Kim, University of California, Berkeley
Karen Draney, University of California, Berkeley
Ken Frank, Michigan State University

How Chinese and American Students Construct Explanations of Carbon-Transforming Processes

Pingping Zhao, Hebei Normal University
Emily Scott, University of Washington, Seattle
Charles W. Anderson, Michigan State University

Teachers' Sensemaking about Accountability and Assessment

Elizabeth X. De Los Santos, University of Nevada, Reno
Stefanie Marshall, Michigan State University
James B. Hancock, Michigan State University
Sarah Bodbyl, Michigan State University
Qinyun Lin, Michigan State University
Andrea Forsyth, University of Nevada, Reno
William R. Penuel, University of Colorado
Charles W. Anderson, Michigan State University

Characterizing Discourse Patterns for Assessment Purposes with Evidence from Classroom Video and Student Work

Beth A. Covitt, University of Montana
Christie Morrison Thomas, Michigan State University
Sarah Bodbyl, Michigan State University
Charles W. Anderson, Michigan State University

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

Assessment and Students' Achievement

8:45am-10:15am, Augusta H

Presider: Tia C. Madkins, University of Texas at Austin

Comparative Analysis of Three-Dimensional Research-Based and Classroom-Based Rubrics for Formative Assessment

Phyllis H. Pennock, Western Michigan University

Samuel Severance, Michigan State University

Kevin W. McElhaney, SRI International

Joseph S. Krajcik, Michigan State University

Locating Responsive Formative Assessment Practices for English Learners in Middle School Science Teaching

Edward G. Lyon, Sonoma State University

The Effect of Self-Efficacy on Students' Science Achievement

Somaia Morsy, University at Buffalo

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

Evolution Education

8:45am-10:15am, Augusta F

Presider: Amy M. Lark, Michigan Technological University

An Exploration of Post-Instruction Shifts in Evolution Acceptance 'Profiles' as Documented by the Measure of Acceptance of the Theory of Evolution (MATE)

Ephiram R. Bosse, California State University, Fresno

Emily M. Walter, California State University, Fresno

Changes During a Year of Introductory Biology on Acceptance of Evolution and Associated Factors

Ryan D.P. Dunk, Syracuse University

Jason R. Wiles, Syracuse University

The Gestalt of it: Do Gestalt Grouping Principles Influence College Student Interpretation of Phylogenetic Trees?

Linda C. Fuselier, University of Louisville

Laura R. Novick, Vanderbilt University

The Role of Statistical Thinking in Learning, Understanding, and Accepting Evolution

Daniela Fiedler, Leibniz Institute for Science and Mathematics Education

Ross H. Nehm, State University of New York, Stony Brook University

Gena C. Sbeglia, State University of New York, Stony Brook University

Ute Harms, Leibniz Institute for Science and Mathematics Education

Strand 6: Science Learning in Informal Contexts

Learning Outcomes in Out-of-School Youth Programs

8:45am-10:15am, Augusta A

President: Nancy L. Staus, Oregon State University

Youths Learning with a Genetics and Genealogy Approach: Scientific and Personal Engagement in Summer Camp

Heather Toomey Zimmerman, Penn State University

Jennifer L. Weible, Central Michigan University

Elizabeth Wright, Penn State University

Chrystal Maggiore, Penn State University

Nina G. Jablonski, Penn State University

Newcomer Positioning's Effect on Critical Robotics Agency Development

Colin Hennessy Elliott, New York University

Students' Perceptions of Gender in an Out-of-School STEM Context

Jeanna R. Wieselmann, University of Minnesota

Justine Kim, University of Minnesota

Gillian Roehrig, University of Minnesota

Empowering Youth within the Community to Engage in STEM Activities

Daniel Birmingham, Colorado State University

Christopher W. Schaumberg, Colorado State University

Bhreanna Quinlan, Colorado State University

How a Science Summer Camp can Change Campers' Views on Nature of Science

Carmen A. Carrion, Georgia State University

Renee S. Schwartz, Georgia State University

Andrea Kunze, NCSU

Strand 7: Pre-service Science Teacher Education

Modeling

8:45am-10:15am, Augusta E

President: Claudia Vergara, Alberto Hurtado University

Gender and Creativity among College Pre-Service Chemistry Teachers Using Model Based Inquiry (MBI)

Apollonia A. Nwosu, University of Nigeria, Nsukka

Sa'idu Danladi, Jigawa State College of Education

Preservice Teacher Education Activities and their Impact on Model-based Teaching

Samia Khan, University of Dundee
Alexis Gonzales, University of British Columbia

Prospective Teachers' Development of Knowledge of Modeling: its Implementation in the Context of Peer Teaching

Young Ae Kim, University of Georgia
J. Steve Oliver, University of Georgia

Strand 7: Pre-service Science Teacher Education

PCK

8:45am-10:15am, Augusta D

Presider: Phillip A. Boda, Stanford University

Analyzing Methods Course to Develop Pre-Service Teachers' Knowledge to Teach Academic Language to ELLs

Vanashri Nargund, New Jersey City University

Co-Teaching for STEM Education: Collaboration between Teacher Candidates and Faculty

Michelle M. Dubek, OISE/University of Toronto

Carol Doyle-Jones, Niagara University

Suzanne de Castell, University of Ontario Institute of Technology

PCK Development of Science and Mathematics Preservice Teachers in a Minor Teacher Education Program

Begum Coskun, Delft University of Technology

Ineke Henze-Rietveld, Delft University of Technology

Marc J. De Vries, Delft University of Technology

Pre-Service Teachers' Reflections on Project-Based Learning: Main Themes and Connections to Pedagogical Content Knowledge

Dalila Dragnic-Cindric, University of North Carolina, Chapel Hill

Janice L. Anderson, University of North Carolina, Chapel Hill

Strand 8: In-service Science Teacher Education

Socioscientific Issues & Science Teacher Education

8:45am-10:15am, Augusta G

Presider: Stephen B. Witzig, University of Massachusetts, Dartmouth

"They Said Oh, Just Talk About Climate!": Tensions Teachers Face Implementing Climate Change Lessons

Asli Sezen-Barrie, University of Maine

Gili Marbach-Ad, University of Maryland

Mary Stapleton, Towson University

Investigating the Development of In-Service Biology Teachers' Orientations and Practices Toward Crafting Socioscientific Issues-Based Lessons

Stephen B. Witzig, University of Massachusetts, Dartmouth

STEM Graduate Course: Successes and Challenges of K-12 Teachers to Learn the Socio-Scientific Issues

Augusto Z. Macalalag, Arcadia University

Joseph A. Johnson, Mercyhurst University

Michelle Lai, Arcadia University

Strand 8: In-service Science Teacher Education

Implementing High Leverage Practices

8:45am-10:15am, Augusta C

Presider: Jeni R. Davis, Salisbury University

Attending and Responding to Students' Ideas: Developing Professional Noticing in Expert Secondary Science Teachers

Meredith Houle Vaughn, San Diego State University

Lauren Stewart, San Diego State University

Megan D'Errico, San Diego State University

Donna L. Ross, San Diego State University

Identifying High Leverage Science Teaching Practices Linked to Student Achievement

Kathleen J. Roth, Cal Poly Pomona Foundation

Susan M. Kowalski, BSCS

Jody Bintz, BSCS

Struggles to Organize Productive Discourse in Secondary Science

Alexander Kwako, University of California, Los Angeles

William A. Sandoval, University of California, Los Angeles

Anahid Modrek, University of California, Los Angeles

Science Teachers' Changing Assessment Practices: Case Studies of Individual Change through PD and Professional Collaboration

Stephanie Rafanelli, Stanford University

Hilda Borko, Stanford University

Matthew Kloser, University of Notre Dame

Matthew Wilsey, University of Notre Dame

Strand 10: Curriculum, Evaluation, and Assessment

NGSS Curriculum and Performance Assessments: Mechanisms for Classroom Change and Student Learning

8:45am-10:15am, Savannah B

Designing a NGSS-Aligned, Project-Based Curriculum with Embedded Performance Assessments

Susan E. Schultz, Stanford University
Rebecca Deutscher, Stanford University
Nicole Holthuis, Stanford University
Arash Jamshidi, Stanford University
Lauren K. Stoll, Stanford University

Features of Professional Development to Support Teacher Learning and Implementation of the Learning Through Performance (LTP) Curriculum

Arash Jamshidi, Stanford University
Rebecca Deutscher, Stanford University
Nicole Holthuis, Stanford University
Susan E. Schultz, Stanford University
Lauren Stoll, Stanford University

Supporting Teacher Learning and Shifts in Instructional Practices

Nicole Holthuis, Stanford University
Rebecca Deutscher, Stanford University
Arash Jamshidi, Stanford University
Susan E. Schultz, Stanford University
Lauren Stoll, Stanford University

The Impact of the Learning Through Performance (LTP) Curriculum on Student Engagement and Learning

Rebecca Deutscher, Stanford University
Nicole Holthuis, Stanford University
Arash Jamshidi, Stanford University
Susan E. Schultz, Stanford University
Lauren Stoll, Stanford University

Strand 11: Cultural, Social, and Gender Issues

The Multilingual Classroom

8:45am-10:15am, Chastain J

Presider: Mercy Ogunsola-Bandele, National Open University of Nigeria

Contradictions and Congruence in Multi-Lingual Science Classrooms: An Activity Theory Perspective

Saouma B. Boujaoude, American University of Beirut
Sara Salloum, University of Balamand

Examination of Burmese Youth's Participation and Identity Work in a Community-based Science Program

Minjung Ryu, Purdue University
Mavreen Rose S. Tuvilla, Purdue University
Casey E. Wright, Purdue University

How does Knowing about Misconceptions in a Bilingual Context Help Students Learning: An Indian Experience?

Narendra D. Deshmukh, University of the Witwatersrand, South Africa

Investigating Science Capital, Family Support for Science, and Physics Identity amongst Latino Physics Students

Idaykis Rodriguez, Florida International University

Anabel Sanchez, Florida International University

Jose Lima, Florida International University

Geoff Potvin, Florida International University

Zahra Hazari, Florida International University

Students' Translanguaging and the Next Generation of Science Standards: Bilingual Science Teaching in Engineering Education

Greses A. Perez Gonzalez, Stanford University

Bryan A. Brown, Stanford University

Kathryn Ribay, Stanford GSE

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

Promoting Teacher's and Student's NOE and NOS Engagement

8:45am-10:15am, Augusta 1

President: Bridget K. Mulvey, Kent State University

Scientific Practices in the Digital Age

Dina Tsybulsky, Tel Aviv University

Ilya Levin, Tel Aviv University

K-8 Science and Mathematics Teachers' Nature of Engineering Understandings

Allison Antink-Meyer, Illinois State University

Anna Maria Arias, Illinois State University

Developing a Questionnaire to Measure Students' Conceptions of the Nature of Technology

Katrin Vaino, University of Tartu

Toomas Vaino, University of Tartu

Miia Rannikmae, University of Tartu

Adapting and Reflecting: Elementary Teachers' and Students' NOS Explorations Associated with a Professional Development Program

Bridget K. Mulvey, Kent State University

Lucy Kulbago, Kent State University

Eileen G. Merritt, West Arizona State University
Jennifer Chiu, University of Virginia
Randy L. Bell, Oregon State University

Plenary Session #2

From Accumulating to Integrating Ideas: Technology Matters
10:30am – 12:00pm, Peachtree Ballroom

Presenter:

Marcia C. Linn, University of California, Berkely

Awards Luncheon

12:15pm – 2:15pm, Americas Mart Building 2 – 4th Floor

Concurrent Session #8

2:30pm – 4:00pm

Equity and Ethics Committee

Jhumki Basu Poster Symposium - Hear the Unheard: Voices in Science Education Research

2:30pm-4:00pm, Savannah A

Presiders:

Nam-Hwa Kang, Korea National University of Education

Rekha B. Koul, Curtin University

Sanghee Choi, University of North Georgia

A Teachable Moment: Hidden Figures Articulation of African American Women in STEM

Tara Nkrumah, University of south Florida

Beyond performance metrics: Examining a Decrease in Students' Physics Self-efficacy through a Social Networks Lens

Remy Dou, Florida International University

If You're Willing to Silence Part of Yourself, Then You Can Probably Get the Same Access – Heteronormativity and Heterosexism in STEM: Exploring the Experiences of Gay Men in STEM Majors

David Paul Steele, University of Georgia

The Training Future Scientist Program Impact on Pre-service Teacher's Fears to Teach Science and Providing

Rona Robinson-Hill, Ball State University

Pre-Service Science Teachers in Racially/Ethnically Diverse Classrooms

Suzanna Roman, Georgia State University

Science Education Students' use of Feedback with Struggling Students

Heidi Cian, Clemson University

The Effects of the Engineering Design on Student Learning in Science Classrooms

Eunjeong Kim, The University of Georgia

Metrics of Success STEM Attitudes of Female Students of Color

Felicia Leammukda, University of Minnesota

The Role of Prior Research Experience and Other Related Experiences in Medical School Entry

Devasmitta Chakraverty, Washington State University

Using Actor-Network Theory to Follow the Actors: Exploring a Culture of an Advanced Biology Classroom

Sophia Jeong, The University of Georgia

Discursive Construction of STEM Participation and Identities in Promotional Videos

Francesca A. White, Indiana University, Bloomington

Publications Advisory Committee

Publishing In, and Reviewing For, The Journal of Research in Science Teaching

2:30pm-4:00pm, Augusta 1

Presenters:

Dana L. Zeidler, University of South Florida

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

Methods RIG Sponsored Session

The Problem of Attrition in Large Scale Studies of Science Teacher Professional

Development: Lessons Learned

2:30pm-4:00pm, Augusta D

Presenters:

Molly Stuhlsatz, BSCS

Deborah L. Hanuscin, Western Washington University

Joseph A. Taylor, BSCS

Joan I. Heller, Heller Research Associates

Okhee Lee, New York University

Sharon J. Lynch, The George Washington University
Robert M. Talbot, University of Colorado Denver

Strand 1: Science Learning, Understanding and Conceptual Change
Scientific Literacy and Socio-Scientific Issues: The Role of Decision-Making and Epistemic Thinking

2:30pm-4:00pm, Augusta B

Presider: Lori Andersen, University of Kansas

A Framework for Quality Decision-making to Promote Science Literacy in a Postsecondary Classroom Setting

Jenny M. Dauer, University of Nebraska-Lincoln

Ashley R. Alred, University of Nebraska-Lincoln

Characterizing the Epistemic Role of Aims in Science Engagement for Socioscientific Sustainability

John R. Ruppert, Saint Peter's University

Paul Bartlett, Saint Peter's University

Ricardo Pereira, Saint Peter's University

Matthew Hankins, Saint Peter's University

Masiel Infante, Saint Peter's University

Encouraging Science Literate Students: Applying Scientific Evidence When Solving Socio-Scientific Issues Using a Decision-Making Tool

P. Citlally Jimenez, University of Nebraska - Lincoln

Jenny M. Dauer, University of Nebraska-Lincoln

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Promoting Secondary Students' Modeling Practice Using an Online Modeling Tool

2:30pm-4:00pm, Savannah B

Presider: Joseph S. Krajcik, Michigan State University

Discussant: Christina Schwarz, Michigan State University

Using an Online Modeling Tool to Develop Students' Modeling Knowledge

Tom Bielik, Michigan State University

Li Ke, Michigan State University

Joseph S. Krajcik, Michigan State University

Christina V. Schwarz, Michigan State University

Lynn Stephens, University of Massachusetts

The Added Value of Technology in Scaffolding Students' Learning and Modeling Practices

Irene S. Bayer, Michigan State University

Idit Adler, Michigan State University

Jane J. Lee, Michigan State University
Joshua Meyer, University of Michigan
Elliot Soloway, University of Michigan

Linking Agent-Based and Systems Dynamics Modeling Practices

Carolyn Staudt, Concord Consortium
Hee Sun Lee, Concord Consortium

Social and Emotional Experiences of Students Using an Online Modeling Tool

Christopher Klager, Michigan State University
Richard A. Chester, Michigan State University
Israel Touitou, Michigan State University

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Supporting Scientific Modeling in the Elementary Classroom

2:30pm-4:00pm, Augusta 3

Presider: Sara P. Raven, Texas A&M University

Developing 3rd Grade students' Understanding of Inheritance using a Model-based Curriculum

Devarati Bhattacharya, University of Nebraska
Cory T. Forbes, University of Nebraska-Lincoln
Erin Ingram, University of Nebraska-Lincoln
Leslie Hawley, University of Nebraska-Lincoln
Jared Stevans, University of Nebraska-Lincoln
Dante Cisterna, University of Nebraska-Lincoln

Development of an Empirically Grounded Learning Performance Framework for Elementary Students' Modeling Competency of Water

Florian Böschl, University of Leipzig
Tina Vo, University of Nebraska-Lincoln
Cory T. Forbes, University of Nebraska-Lincoln
Kim Lange-Schubert, University of Leipzig

Exploring Elementary Teachers' Understanding of Modeling and Socio-Scientific Issues with Model-Oriented Issue-Based Teaching

Jaimie Foulk, University of Missouri
Laura Zangori, University of Missouri
Troy Sadler, University of Missouri
The Selection and Use of Visual Models for Teaching Systems Science
Tammy D. Lee, East Carolina University
M. Gail Jones, North Carolina State University
Bonnie B. Glass, East Carolina University

Katherine Chesnutt, North Carolina State University

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

Investigating Classroom Instructional Approaches

2:30pm-4:00pm, Augusta H

Presider: Karen Sokolov, Bar-Ilan University

A Comparative Study of the Impacts of Two Active Learning Methods in High School Biology

Grant E. Gardner, Middle Tennessee State University

Jennifer C. Parrish, University of Northern Colorado

Thomas Cheatham, Middle Tennessee State University

Development and application of a Case-Based Reasoning Instructional Model on Climate Change Topics

Hyounghum Kim, Chungbuk National University

Influences on Urban Science Teachers' Implementation of Literacy: Three Case Studies

Michelle R. Eades-Baird, State University of New York, Empire State College

Xiufeng Liu, State University of New York, Buffalo

H. Emily Hayden, Iowa State University

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

Equity and Ethics

2:30pm-4:00pm, Augusta F

Presider: Zahra Hazari, Florida International University

Faith in Science? The Role of Spirituality in Black Women's STEM Identity Development and Retention

Terrell R. Morton, University of Missouri, Columbia

Group Gender Composition Predicts Student Engagement in an Undergraduate Biology Class for Non-Majors

Jonathan Andicoechea, University of Minnesota

Sehoya Cotner, University of Minnesota

Cissy Ballen, University of Minnesota

Gillian Roehrig, University of Minnesota

Improving Classroom Community in an Introductory Engineering Classroom through Targeted Micro-Interventions

Ron Gray, Northern Arizona University

Robin Tuchscherer, Northern Arizona University

Christine A. Gray, Northern Arizona University

The Impact of Peer Assisted Learning on STEM Equity and Student Success

Jennifer Lundmark, California State University, Sacramento

Joel Schwartz, California State University, Sacramento

Lynn M. Tashiro, California State University, Sacramento

Strand 7: Pre-service Science Teacher Education

Physics

2:30pm-4:00pm, Augusta E

Presider: Sebastian Szyjka, Western Illinois University

Increasing Motivation by Focusing on School-Related Content Knowledge in University

Physics Courses

Joost Massolt, University of Potsdam

Andreas Borowski, University of Potsdam

Modeling and Development of Professional Content Knowledge of Pre-Service Physics

Teachers

Patrick Enkrott, University of Potsdam

David Buschhüter, University of Potsdam

Andreas Borowski, University of Potsdam

Recruiting Future Physics Teachers through a Field-based Summer Enrichment Program

Lauren Madden, The College of New Jersey

Marissa Bellino, City University of New York

AJ Richards, The College of New Jersey

Nathan Magee, The College of New Jersey

Melissa Chessler, The College of New Jersey

Strand 8: In-service Science Teacher Education

Improving Science Teacher Education through Leadership, Coaching, and Analysis of Practice

2:30pm-4:00pm, Augusta C

Presider: Tamara Holmlund, Washington State University Vancouver

Analysis of Effective Science Coaching: What, Why, and How

Gwen Nugent, University of Nebraska

Gina Kunz, University of Nebraska

James A. Houston, University of Nebraska-Lincoln

LinLin Luo, University of Nebraska-Lincoln

Danae Peterson, University of Nebraska-Lincoln

Sonia Linder, University of Nebraska-Lincoln

Sustainable Videobased, Analysis-of-Practice Science PD in a High-Needs District: Year

1 Teacher and Student Learning Results

Paul M. Beardsley, California State Polytechnic University, Pomona

Kathleen J. Roth, Cal Poly Pomona Foundation

John A Caine, California State Polytechnic University, Pomona

Nicole Wickler, California State Polytechnic University, Pomona

The Role of Teacher Leadership in Implementing STEM Education

Tamara D. Holmlund, Washington State University

Kristin S. Huggins, Washington State University

Strand 9: Reflective Practice

Improving Teacher Education and Development

2:30pm-4:00pm, Savannah C

Presider: Lana Minshew, University of North Carolina, Chapel Hill

Being and Becoming Science Education Professional Developers: A Co-Autoethnographic Examination

Christina Siry , University of Luxembourg

Kerstin Te Heesen, University of Luxembourg

Sara Wilmes, University of Luxembourg

Nora Kneip, University of Luxembourg

Sandy Heinericy , University of Luxembourg

Educational Research Experience as Means to Bridge STEM Teacher Preparation Pipeline and Teacher Preparation Program

Shannon H. Sung, Assistant Professor, Spelman College

N'sou Hoba, Graduating Senior, Spelman College

Fostering Teacher Educators' Professional Development through Collaborative Action Research

Kader Bilican, Ataturk University

Mehmet Aydeniz, University of Tennessee

Burcu Senler, Mugla University

Dilek Karisan, Adnan Menderes University

Looking Inside the Classroom: Formative Assessment Practices in Physics Classroom

Hye-Eun Chu, Macquarie University

Kok Siang Tan, National Institute of Education Singapore

Utilizing the EQUiP Rubric as a Tool for Teachers to Reflect on their own Science Lessons

Kimberly A. Lebak, Stockton University

Stacey Cullenly, Stockton University

Strand 11: Cultural, Social, and Gender Issues

Symposium – Youth Leadership and Activism in/across STEM Learning Spaces

2:30pm-4:00pm, Chastain J

Presider: Day W. Greenberg, Michigan State University

Presenters:

Day W. Greenberg, Michigan State University

Day W. Greenberg, Michigan State University

Angela Calabrese Barton, Michigan State University

Marcos González, Michigan State University

Christina Restrepo Nazar, Michigan State University

Kathleen A. Schenkel, Michigan State University

Sarah Keenan, Michigan State University

Autumn McDaniel, GET City Program, Boys and Girls Club

Stephen Harden, GET City Program, Boys and Girls Club

Frankie Calabrese Barton, GET City Program, Boys and Girls Club

Strand 12: Educational Technology

In-service Teachers

2:30pm-4:00pm, Augusta A

Presider: Tasneem Anwar, University of Minnesota

E-Learning Platform for Science Inquiry: Primary Teachers' Pedagogical Practices and the Underlying Factors

Wing Mui Winnie So, The Education University of Hong Kong

Yu Chen, The Education University of Hong Kong

Integration of Learning Technologies: Results from a Multiple Case Study of Eight Biology Teachers

Dionysius T. Gnanakkan, Illinois Institute of Technology

Norman G. Lederman, Illinois Institute of Technology

Judith S. Lederman, Illinois Institute of Technology

What do Teachers Say? Exploring Teachers Experience in Computer-Based Science Instruction

Lu Wang, University of Georgia

Georgia Hodges, University of Georgia

Strand 14: Environmental Education

Patterns in the Wild: Fieldwork and Observations

2:30pm-4:00pm, Augusta 2

Presider: Christopher Schaunberg, Colorado State University

Disciplining the Wild: The Co-Development of Students' Scientific Knowledge and Practice During Ecological Fieldwork

Michelle Forsythe, Texas State University

Moving from Exploring Patterns to Causal Explanations in Ecosystems Science Reasoning

Tina Grotzer, Harvard University

Emily Gonzalez, Project Zero

Amy M. Kamarainen, Harvard University

Shari J. Metcalf, Harvard University

Chris Dede, Harvard University

Place-based Environmental Education through the Scientific Observation of Birds: Reflections from a Bedouin Student's Perspective

Wisam Sedawi, Ben Gurion university

Orit Ben Zvi Assaraf, Ben-Gurion University of the Negev, Israel

Michael J. Reiss, University of London

The Role of Naming and Botanical Vocabulary in Students' Ability to Observe Neighborhood Trees

Yael Wyner, City College of New York

Jennifer H. Doherty, University of Washington

Strand 15: Policy

STEM and Sustainability Education Reforms

2:30pm-4:00pm, Peachtree 1

Presider: Sharon J. Lynch, The George Washington University

Taking Stock of Oregon STEM Hubs: Accomplishments and Challenges

Martin Storksdieck, Oregon State University

Kari O'Connell, Oregon State University

Brianna Keys, Oregon State University

STEM Education Centers: Promoting Educational Reform through Research and Translation across Boundaries

Deborah L. Carlisle, University of Massachusetts, Amherst

Gabriela C. Weaver, UMass Amherst

Kacy Redd, Association of Public Land Grant Universities

Teacher Generated Models of STEM Integration when Prescribed Standardized Curricula is Present

Justine Kim, University of Minnesota

Gillian Roehrig, University of Minnesota

Julie C. Brown, University of Minnesota

From Science Teaching to "Know" to Trans-disciplinary Learning to "Think" for Sustainability in Multicultural Societies

Uri Zoller, Haifa University, Oranim

Concurrent Session #9

4:15pm – 5:45pm

Administrative Symposium

Learn about Elections and Get Involved!

4:15pm-5:45pm, Savannah A

Presenters:

Malcolm B. Butler, University of Central Florida

Marcelle Siegel, University of Missouri, Columbia

Saouma BouJaoude, American University, Beirut

Rola Khishfe, American University of Beirut

Ravinder Koul, Pennsylvania State University

Norman G. Lederman, Illinois Institute of Technology

Amber C. Sizemore, University of Michigan

Leon Walls, University of Vermont

Eileen Carlton Parsons, University of North Carolina, Chapel Hill

Mei-Hung Chiu, National Taiwan Normal University

Strand 1: Science Learning, Understanding and Conceptual Change

Cross-Cutting Concepts in Science: Energy and Systems

4:15pm-5:45pm, Savannah B

Presider: Amanda Glaze, Georgia Southern University

Building an Integrated Understanding of Energy In Middle School around the Idea of Energy Transfers

Marcus Kubsch, IPN - Kiel

Jeffrey Nordine, IPN-Kiel

Energy for Future Scientists

Shahar Abramovitch, Weizmann Institute of science

David L. Fortus, Weizmann Institute of Science

The Role of Systems-Oriented Approach in Promoting Students' Systems Understanding of Environmental Issues

Narmin Ghalichi, University of Minnesota

Anita Schuchardt, University of Minnesota

Gillian Roehrig, University of Minnesota

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Instructional Interventions

4:15pm-5:45pm, Savannah C

Presider: Deb Morrison, University of Washington

Investigating the Potential Effects of Living-Learning Communities on Motivational Support in College Biology Courses

Stephen C. Scogin, Hope College

Michelle Austin, Hope College

Katie Rietberg, Hope College

Cindy Alexander, Hope College

Scaffolding Students When Constructing Models of Phenomena in a Project-Based Learning Environment

Idit Adler, Michigan State University

Irene S. Bayer, Michigan State University

Jane J. Lee, Michigan State University

Joseph S. Krajcik, Michigan State University

Tracing Students' Evolving Embodied Conceptions of Heat Transfer: Implications for Designing Dynamic Computer Simulations

Nitasha Mathayas, University of Illinois, Urbana-Champaign

David E. Brown, University of Illinois

Robb Lindgren, University of Illinois Urbana-Champaign

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

Investigating Novice Teachers' Practice

4:15pm-5:45pm, Augusta H

Presider: Gloria Gajewicz, Bowling Green High School

Bonding Ideas about Inquiry: Exploring Knowledge and Practices of Metacognition in Beginning Secondary Science Teachers

Ana Margarita Rivero, University of Nebraska-Lincoln

Elizabeth B. Lewis, University of Nebraska-Lincoln

Crossing the Border: First Year Science Teachers' Experiences Teaching Science as Inquiry

Jeanette Bartley, University of Chicago

Factors Affecting the Enactment of High-Leverage Teaching Practices Among Novice Science Teachers

Kraig A. Wray, Michigan State University

Gail Richmond, Michigan State University

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

Student Knowledge and Understanding

4:15pm-5:45pm, Augusta F

President: Ryan Coker, Florida State University

College Students' Cognitive Processes in Two Writing Tasks: Understanding Resources and Demands for Scientific Literacy

Sae Yeol Yoon, Delaware State University

Brian M. Hand, University of Iowa

Richard Lamb, University, Buffalo

Protein X Structure and Function: How Undergraduate Students Solve a Well-Defined Biochemistry Problem

Stephanie M. Halmo

Kush S. Bhatia

Alexandra Howell

Ersta P. Ferryanto

Bryant Choe

Cheryl A. Sensibaugh

Kaitlin P. Kehoe

Morgan Watson

Paula P. Lemons

Students' Mathematical Performance on Simultaneous Synthesis Physics Problems with varying Mathematical Complexity

Bashirah Ibrahim, The Ohio State University

Lin Ding, The Ohio State University

The Importance of Prior Knowledge in General Chemistry for Content Knowledge Acquisition of Chemistry Freshmen

Daniel Averbeck, University of Duisburg-Essen

Eckart Hasselbrink, University of Duisburg-Essen

Elke Sumfleth, University of Duisburg-Essen

Understanding Undergraduates' Meaning Making through Reflective Disequilibria in a Science-focused Service-learning Course

Gretchen P. King, University of Nebraska-Lincoln

Deborah J. Tippins, University of Georgia

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

Cooperative Grouping

4:15pm-5:45pm, Augusta B

President: Anna S. Grinath, Middle Tennessee State University

Considering Peer Ideas: Relationships between Student Trust, Credibility, and Performance during Group Learning

Kate Juergens, Washington State University
Zachary Coleman, Washington State University
Joshua Premo, Washington State University
William B. Davis, Washington State University
Andy Cavagnetto, Washington State University

Do They Like it or Not? Student Motivation From and Resistance to Active Learning

David C. Owens, University of Missouri
Troy D. Sadler, University of Missouri
Angela T. Barlow, University of Central Arkansas
Cindi Smith-Walters, Middle Tennessee State University

Social CUREs: Optimizing Student Interactions to Promote Richer Collaborative Engagement in Course-based Undergraduate Research Experiences

Joshua Premo, Washington State University
Andy Cavagnetto, Washington State University
William B. Davis, Washington State University

Student Collaborative Engagement and Group Achievement within a Cooperative Course-based Undergraduate Research Experience

Joshua Premo, Washington State University
William B. Davis, Washington State University

Strand 6: Science Learning in Informal Contexts

Forging Career Pathways through Informal STEM Learning Experiences

4:15pm-5:45pm, Augusta 3

President: Georgia S. Hall, Wellesley College

Talking Science: Experiences that Predict STEM Identity and Career Goals

Remy Dou, Florida International University
Zahra Hazari, Florida International University
Katherine P. Dabney, Virginia Commonwealth University
Philip M. Sadler, Harvard Smithsonian
Gerhard Sonnert, Harvard Smithsonian

Identity-forming Recognition in Informal and Formal Science Learning Experiences

Brianna S. Benedict, Purdue University
Allison Godwin, Purdue University

Using Cogenerative Dialogues to Identify and Address Challenges That Occur in High School Students' Science Internships

Pei-Ling Hsu, University of Texas, El Paso

Examining Youth Pathways using Social Network Theory and Analysis

Timothy Podkul, SRI International
Preeti Gupta, American Museum of Natural History
Rachel L. Chaffee, American Museum of Natural History
Karen Hammerness, American Museum of Natural History

Strand 7: Pre-service Science Teacher Education

Core Practices

4:15pm-5:45pm, Augusta D

Presider: Tamara Holmlund, Washington State University Vancouver

Characterizing Sense-making Conversations of Elementary Science Teacher Candidates

Meenakshi Sharma, Michigan State University
Christina V. Schwarz, Michigan State University

Connecting the Dots: Secondary Science Teacher Candidates' Uptake of Facilitating Discussions from Teacher Education Experiences

Matthew Kloser, University of Notre Dame
Matthew Wilsey, University of Notre Dame
Tia C. Madkins, University of Texas at Austin
Mark Windschitl, University of Washington
Andrea Wells
Elizabeth A. Davis, University of Michigan
Janet Carlson, Stanford University

Developing Practices in a 'CoLABorative' Setting: Pre-service Teachers' Progress in Noticing and Interpreting Student Ideas

Julie A. Birt, University of Missouri
Dante Cisterna, University of Nebraska-Lincoln

Development of Science Classroom Discourse During the Student Teaching Year

Heidi Cian, Clemson University
Michelle P. Cook, Clemson University

Strand 7: Pre-service Science Teacher Education

Noticing

4:15pm-5:45pm, Augusta E

Presider: Meredith Thompson, Massachusetts Institute of Technology

Exploring Core Teaching Practices: A Case Study of a New Teacher in a High-needs School

Elaine V. Howes, American Museum of Natural History Richard Gilder Graduate School
Jamie Wallace, American Museum of Natural History, Education Dept

Preservice Teachers' Noticing of Instances for Revision During Rehearsals: A Comparison Across Three University Contexts

Amanda Benedict-Chambers, Missouri State University

Anna Maria Arias, Illinois State University

Sarah J. Fick, Wake Forest University

Profession Noticing Unmasked: Factors Influencing the Selective Noticing of Science Teachers

Michelle Forsythe, Texas State University

Using a Video-based Approach to Investigate Pre-service Science Teachers' Situation-specific Skills for Informal Formative Assessment

Dirac Lam, The University of Hong Kong

Kennedy Chan, The University of Hong Kong

Strand 8: In-service Science Teacher Education

Inquiry-based Science Teacher Education

4:15pm-5:45pm, Augusta C

President: Nuri Balta, Almaty Management University

Teacher Professional Development in Inquiry Science: Gains Re-Examined After Three Years

Joanna Philippoff, University of Hawaii, Manoa

The Impact of a Short-Term Follow-up PD over a Prior PD on Secondary Science Teachers' Inquiry-Based Science Instruction in Rural Schools

SoonChun Lee, Wichita State University

Turkish Middle School Science Teachers' Pedagogical Orientations towards Direct and Inquiry Instructional Approaches

Selcuk Sahingoz, Western Michigan University

William W. Cobern, Western Michigan University

Strand 10: Curriculum, Evaluation, and Assessment

Promoting Science Literacy through STEM Integration

4:15pm-5:45pm, Augusta 1

Discussant: Brenda Capobianco, Purdue University

Integrating Middle School STEM in Practice: Constraints to the Nature & Scope

Marion Usselman, Georgia Institute of Technology

Mike Ryan, Georgia Institute of Technology

Meltem Alemdar, Georgia Institute of Technology

Science Modules Designed to Serve STEM Integration and NGSS

Mike Ryan, Georgia Institute of Technology
Marion Usselman, Georgia Institute of Technology
Meltem Alemdar, Georgia Institute of Technology
Sabrina Grossman, Georgia Institute of Technology
Jayma Koval, Georgia Institute of Technology
Brenda M. Capobianco, Purdue University

Science Integration in a Middle School Engineering Course

Meltem Alemdar, Georgia Institute of Technology
Jessica Gale, Georgia Institute of Technology
Sunni Newton, Georgia Institute of Technology
Jeremy Lingle, Georgia Institute of Technology
Jeff Rosen, Georgia Institute of Technology
Roxanne A. Moore, Georgia Institute of Technology
Brenda M. Capobianco, Purdue University

Exploring Curriculum Implementation Using Self-Report Enactment Checklists

Jessica Gale, Georgia Institute of Technology
Sabrina Grossman, Georgia Institute of Technology
Mike Ryan, Georgia Institute of Technology
Sunni Newton, Georgia Institute of Technology
Marion Usselman, Georgia Institute of Technology
Brenda M. Capobianco, Purdue University

Strand 11: Cultural, Social, and Gender Issues

Ways of Knowing

4:15pm-5:45pm, Chastain J

Presider: Enrique Suarez, University of Colorado, Boulder

College Students' Perceptions of Socio-Ecological Systems in a Multicultural Society Context

Adiv Gal, Kibbutzim College
Dafna Gan, Seminar Hakibuzim - Northeastern University

Indigenous ways of Knowing, Being, and Doing in Canadian Science and Mathematics Teaching and Learning

Dawn Wiseman, McGill University
Florence A Glanfield, University of Alberta
Lisa Lunney Borden, St. Francis Xavier University
Alexandre Soares Cavalcante, McGill University
Ellen Carter, St. Francis Xavier University
Rebecca Clancey, St. Francis Xavier University
Katy Grosicki, St. Francis Xavier University
Eun-Ji A. Kim, McGill University
Simon Sylliboy, St. Francis Xavier University

Christine Wiebe Buchanan, University of Alberta

Rasch Analysis of Survey on Teaching Science to K-12 Students with Disabilities

Anna R. Lewis, La Pontificia Universidad Católica del Perú

William S. Lang, University of South Florida

Science in Silence: How Educators of the Deaf and Hard-of-Hearing Teach Science

Sara P. Raven, Texas A&M University

Gretchen Whitman, Kent State University

Strand 12: Educational Technology

Observation and Assessment

4:15pm-5:45pm, Peachtree 1

Presider: Dionysius T. Gnanakkan, Illinois Institute of Technology

Mind the Gap: Reviewing Measures of Quality and Technology Use In Classroom

Observation Protocols

Cathlyn Stylinski, University of Maryland

Jacqueline DeLisi, Education Development Center, Inc

Joseph Wong, Education Development Center, Inc

Christina Bonney, Education Development Center, Inc

Caroline Parker, Education Development Center, Inc

Peer Assessment in a Project-based Engineering Course: Comparing between On-campus, SPOC, and MOOC Learners

Maya Usher, Technion, Israel Institute of Technology

Miri Barak, Technion, Israel Institute of Technology

Using Eye-tracking Technology to Investigate Cognitive Load Theory

Tianlong Zu, Purdue University

John Hutson, Kansas State University

Lester C. Loschky, Kansas State University

N. Sanjay Rebello, Purdue University

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

Nature of Science and Preservice Teachers

4:15pm-5:45pm, Augusta 2

Presider: Kamisah Osman, Universiti Kebangsaan Malaysia

Preservice Special Education Teachers's Nature of Science Conceptions and Related Experiences

Mila Rosa L. Librea-Carden, Kent State University

Bridget K. Mulvey, Kent State University

Tanzimul Ferdous, Kent State University

A Typology of Preservice Elementary School Teachers' Relationships with Scientific Experts

Audrey Groleau, Université du Québec à Trois-Rivières
Chantal Pouliot, Université Laval

From Traditional to Contemporary Aspects of NOS: Trainee Science Teachers' Perceptions on Economics and Entrepreneurship

Sila Kaya, University of Limerick
Naomi Birdthistle, Assoc. Prof Dr.
Sibel Erduran, University of Oxford

A Document Analysis of Online Curricula for Teaching Human Evolution in K-12 Science

Education
Rebecca Hite, Texas Tech University
Kristopher J. Childs, Texas Tech University
Elizabeth Kirman, Texas Tech University

Evening/Social Events

Equity and Ethics Committee Sponsored Outing

Equity Dinner (Maximum Attendance: 70)

6:30pm – 9:00pm, Off-Site

Braves All Star Grill

200 Peachtree St. NW

Atlanta, GA

Telephone: 404-205-5257

Dinner, including tax and gratuity, is \$53.10.

Please note: You must register for this event with your Advance Conference Registration. Tickets purchased for this event are not refundable.

There will be no tickets sold onsite.

Tuesday, March 13, 2018

Conference Registration

7:00am – 12:00pm, Peachtree Terrace

Strand Meetings

7:00am – 8:15am

Join Strand Coordinators to help shape future strand focus for presentations and administrative sessions. Questions and feedback are welcome.

Strand 1: Science Learning, Understanding and Conceptual Change

Meeting—7:00am – 8:15am, Savannah A

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Meeting—7:00am – 8:15am, Savannah B

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Meeting—7:00am – 8:15am, Savannah C

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

Meeting—7:00am – 8:15am, Augusta 1

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

Meeting—7:00am – 8:15am, Augusta 2

Strand 6: Science Learning in Informal Contexts

Meeting—7:00am – 8:15am, Augusta 3

Strand 7: Pre-service Science Teacher Education

Meeting—7:00am – 8:15am, Peachtree 1

Strand 8: In-service Science Teacher Education

Meeting—7:00am – 8:15am, Augusta A

Strand 9: Reflective Practice

Meeting—7:00am – 8:15am, Augusta B

Strand 10: Curriculum, Evaluation, and Assessment

Meeting—7:00am – 8:15am, Augusta C

Strand 11: Cultural, Social, and Gender Issues

Meeting—7:00am – 8:15am, Augusta D

Strand 12: Educational Technology

Meeting—7:00am – 8:15am, Augusta E

Strand 13: History, Philosophy, and Sociology of Science

Meeting—7:00am – 8:15am, Augusta F

Strand 14: Environmental Education

Meeting—7:00am – 8:15am, Augusta G

Strand 15: Policy

Meeting—7:00am – 8:15am, Augusta H

Concurrent Session #10

8:30am – 10:00am

Research Committee

Symposium – Research Interest Groups (RIGs) and NARST

8:30am-10:00am, Savannah C

Presider: Maria Rivera Maulucci, Barnard College

Presenters:

Carolyn A. Parker, American University

Phillip A. Boda, Stanford University

Ling L. Liang, La Salle University

Kelsey Lipsitz, University of Missouri

Mary M. Atwater, University of Georgia

Leon Walls, University of Vermont

Irasema Ortega, University of Alaska-Anchorage

Femi S. Otulaja, University of the Witwatersrand

Fatima Elvira Terrazas Arellanes, University of Oregon

Cathy P. Lachapelle, Museum of Science

Leanne M. Avery, SUNY Oneonta

Robert M. Talbot, University of Colorado

Strand 1: Science Learning, Understanding and Conceptual Change

The Role of Content Knowledge in Science Learning

8:30am-10:00am, Augusta A

Presider: May Lee, Michigan State University

Challenges in Representing Three-Dimensional Knowledge: Cases of Different Knowledge from the Same Time

Sarah J. Fick, Wake Forest University

Designing Computer Games about Climate Change: Assessing Students' Content Knowledge

Michael Cassidy, TERC
Gillian Puttick, TERC
Eli Tucker-Raymond, TERC
Rena Stroud, TERC
Jackie Barnes, Northeastern
Casper Harteveld, Northeastern
Gillian Smith, Worcester Polytechnic Institute
Amy Hoover, Northeastern

Sports Experiences as Funds of Knowledge for Science: College Students' Ideas about Science in Sports

Lisa A. Borgerding, Kent State University
Fatma Kaya, Kent State University
Mila Rosa Librea, Kent State University
Davida Buehler, Kent State University
Jaren Maybin, Kent State University

Strand 2: Science Learning: Contexts, Characteristics and Interactions
Student Reasoning and Explanations

8:30am-10:00am, Peachtree 1

Presider: Laura M. Crowe, Auburn City Schools/Auburn University

A Mixed Methods Comparison of Elementary Students' Model Based Explanations about Water

Tina Vo, University of Nebraska-Lincoln
Cory T. Forbes, University of Nebraska-Lincoln

Argumentation in Elementary Science Classroom

Qingna Jin, University of Alberta
Mijung Kim, University of Alberta

The Importance of Interviewing Elementary-Grade Students When Using Scientific Modeling to Assess Conceptual Understanding

Meredith B. Marcum, University of Michigan
Annemarie Palincsar, University of Michigan

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

Investigating Students' Argumentation Practice

8:30am-10:00am, Augusta H

Presider: James B. Hancock, Michigan State University

Effects of the Argument-Driven Inquiry on High School Students' Self-Efficacy and Perceptions about Inquiry and Laboratory Skills
Guluzar Eymur, Giresun University

Exploring Teachers' Design and Enactment of Scientific Argumentation Lessons focused on Epistemological Resources
Youngmi Lee, Seoul National University
Sally B. Gutierrez, Seoul National University
Heui-Baik Kim, Seoul National University

Teaching Science through an Immersive Augment-Based Inquiry: Results of a Three-Year Professional Development Program
Jee Kyung Suh, University of Alabama
Yejun Bae, The University of Iowa
Soonhye Park, North Carolina State University
Brian M. Hand, University of Iowa

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

Instructor Expectations and Perspectives

8:30am-10:00am, Savannah B

Presider: Rebecca L. Matz, Michigan State University

Chemistry Teaching Assistants' Beliefs about Project-Based Guided Inquiry Instruction
Alexis A. Rutt, University of Virginia
Frackson Mumba, University of Virginia
Laura K. Ochs, University of Virginia
Vivien Chabalengula, University of Virginia

Faculty Conceptions of Student Learning during Engagement in Different Professional Development Programs
Robert Idsardi, University of Georgia
Jenna L. Wingfield, University of Georgia
Blake Whitt, University of Georgia
Paola Barriga, University of Georgia
Jason Lang, University of North Georgia
Julie A. Luft, University of Georgia

Science Faculty Perspectives on the Discipline-Specific Academic Needs of Summer Bridge Students
Angela Google, Middle Tennessee State University

University Teachers' Expectations on STEM Freshmen's Mathematical Knowledge and Skills
Irene Neumann, Leibniz Institute for Science and Mathematics Education (IPN)
Christoph Pigge, Leibniz Institute for Science and Mathematics Education (IPN)

Aiso Heinze, Leibniz Institute for Science and Mathematics Education (IPN)

Chemists' and Chemical Engineers' Perceptions of Chemistry-Related Careers in Industry

Zehavit Kohen, Technion

Or Shav-Artza, Technion

Ortal Nitzan-Tamar, Technion

Yehudit Judy Dori, Technion

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

Laboratory Science

8:30am-10:00am, Augusta F

Presider: Idaykis Rodriguez, Florida International University

Between Pre and Post: Using Weekly Prompts to Better Understand Student Outcomes from Undergraduate Research

Joseph A. Harsh, James Madison University

Emily Miller, James Madison University

Faith Hartley, James Madison University

Ellen Jones, James Madison University

Adam V. Maltese, Indiana University

Creating Usable Engineering Design Challenges for General Chemistry Lab

Kent J. Crippen, University of Florida

Lorelie Imperial, University of Florida

Corey A. Payne, University of Florida

Maria D. Korolev, University of Florida

Phil J. Brucat, University of Florida

Chang-Yu Wu, University of Florida

Designing and Implementing an Engineering Design Unit in a Physics Course for Pre-Service Elementary Teachers

Yuri B. Piedrahita, Purdue University

Jeffrey W. Murray, Purdue University

Brenda M. Capobianco, Purdue University

N. Sanjay Rebello, Purdue University

Principles to Fostering Critical Thinking in an Undergraduate Chemistry Practical Course

Lilian Danial, Humboldt-Universität zu Berlin

Jenna Koenen, Universität Hamburg

Rüdiger Tiemann, Humboldt - Universität Zu Berlin

Strand 6: Science Learning in Informal Contexts

Supporting Family Learning: Museums, Libraries, and Everyday Experiences

8:30am-10:00am, Augusta B

Presider: Sue Allen, Maine Mathematics and Science Alliance

Engineering in Early Childhood: Describing Family-Level Interest Development Systems

Scott A. Pattison, Institute for Learning Innovation

Pam Corrie, Mt. Hood Community College Head Start

Gina N. Svarovsky, University of Notre Dame

Marcie Benne, Oregon Museum of Science and Industry

Shannon Weiss, Oregon Museum of Science and Industry

Verónica Nuñez, Oregon Museum of Science and Industry

Families' Shared Inventing: Using Prototyping Technology to Learn Engineering Design in the Library

Heather Toomey Zimmerman, Penn State University

Soo Hyeon Kim, Penn State University

Michele Crowl, Penn State University

How Scientists use Questions to Engage Families in Personally-relevant Learning during Science-themed Workshops

Lucy R. McClain, Pennsylvania State University

Torri H. Withrow, Penn State University

Heather Toomey Zimmerman, Pennsylvania State University

Ocean Data Visualization on a Touch-Interactive Tabletop Promotes Group Engagement with Science Content and Practices

Carrie Schuman, University of Florida

Kathryn Stofer, University of Florida

Annie Luc, University of Florida

Nikita Soni, University of Florida

Alice Darrow, University of Florida

Lisa Anthony, University of Florida

Brittani Kirkland, University of Florida

Amanda Morales, University of Florida

Jeremy Alexandre, Brooklyn College/University of Florida

Strand 7: Pre-service Science Teacher Education

Inquiry

8:30am-10:00am, Augusta D

Presider: Baoling Sun, Tianjin Normal University

A Case Study of Elementary Preservice Teachers: Field and Course Disconnection with Use of Inquiry

Stacey Sneed, Texas Tech University

Jianlan Wang, Texas Tech University
Chen Wang, Texas Tech University

Characterizing Science Practices in an Inquiry-Oriented Chemistry Labs

Suna Ryu, Korea National University of Education
Youngmin Kim, Korea National University of Education
Heontae Sim, Korea National University of Education

Phenomena to Promote Scientific Literacy: Preservice Teacher Data Informing Instruction in Science Methods Courses

Michelle L. Sinapuelas, California State University, East Bay
Meredith Houle Vaughn, San Diego State University
Lin Xiang, Department of Biology, University of Kentucky
Donna L. Ross, San Diego State University
Larry Horvath, University of California, Davis
Corinne H. Lardy, California State University, East Bay
Michele Korb, California State University, East Bay
Rachelle DiStefano, California State University, East Bay

Pre-service Biology Teachers' Conceptions of Controls in Experiments

Bianca Reinisch, Freie Universität Berlin
Sabrina Mathesius, Freie Universität Berlin
Dirk Krüger, Freie Universitaet Berlin

Strand 7: Pre-service Science Teacher Education

Socioscientific Issues

8:30am-10:00am, Augusta E

Presider: Augusto Z. Macalalag, Arcadia University

Case-Based Learning for Prospective Elementary Teachers' Conceptualization of Socioscientific Issues and Socioscientific Issue-Based Teaching

Mutlu Sen, Bogazici University
Sophia (Sun Kyung) Jeong, University of Georgia
Deborah J. Tippins, University of Georgia
Janette R. Hill, The University of Georgia

Psychological Distances to Three Socioscientific Issues and their Connections to Enjoyment and Perceived Behavioral Control when Teaching

Alexander G. Buessing, Osnabrueck University
Maike Schleper, Osnabrueck University
Susanne Menzel, Osnabrueck University

The Effect of Attitudes and Media Literacy on Preservice Teachers' Informal Reasoning about Hydroelectric Power

Bahadir Namdar, Recep Tayyip Erdogan University

Burak Aydn, Recep Tayyip Erdogan University
Sara P. Raven, Texas A&M University

The Effects of Socio-Scientific Issues-Based Instruction on Pre-service Science Teachers' Genetics Knowledge and Socio-Scientific Reasoning
Mustafa S. Topcu, Yildiz Technical University
Emine Sarikaya, Yildiz Technical University

Strand 8: In-service Science Teacher Education
Novel Models of Science Teacher Professional Development
8:30am-10:00am, Augusta C
President: Lillian H. Degand, Illinois Institute of Technology

A Novel Model for Professional Development in Project-Based Learning, Evaluated
Katie Green, North Carolina State University
Cesar Delgado, North Carolina State University

Assessing the Impact of a Professional Development Program on Teacher Implementation of the ASSIST Approach
Mark A. McDermott, University of Iowa
Kathleen Weiss, University of Iowa
Nathan Quarderer, Northeast Iowa Community College
Lillie Durow, University of Iowa

Using Self-Efficacy to Gauge the Effects of Teacher Professional Development and for a Sustainable Impact
Robert H. Evans, University of Copenhagen
Jesper Bruun

Strand 8: In-service Science Teacher Education
Teacher Efficacy Related to Modeling Instruction and Engineering
8:30am-10:00am, Augusta G
President: Malcolm S. Pringle, The Bay School of San Francisco

Challenges to Teachers' Implementation of Inquiry Strategies in the Physics Classroom
Nidaa Makki, The University of Akron
Kristin L. Koskey, The University of Akron

Impact of Modeling Instruction Professional Development on Teacher Content Knowledge, Self-efficacy and Job Satisfaction.
Tracy L. Huziak-Clark, Bowling Green State University
Jacob Burgoon, Bowling Green State University

The Differential Impact of Two Engineering Professional Development Programs on

Elementary Teachers' Engineering Teaching Efficacy Beliefs

Hasan Deniz, University of Nevada
Erdogan Kaya, University of Nevada, Las Vegas
Ezgi Yesilyurt, University of Nevada, Las Vegas

Strand 10: Curriculum, Evaluation, and Assessment

Developing Curriculum for Middle and High School

8:30am-10:00am, Augusta 3

Presider: Enrique Suarez, University of Washington

Precipitating Change: Embedding Computational Thinking into the Middle School Science Classroom

Nanette Dietrich, Millersville University of Pennsylvania
Carolyn Staudt, Concord Consortium

Modeling Energy Flow and Matter Cycling: How the Curricular Approach Influences Students Development of Models

Maia K. Willcox, University of California, Berkeley
Barbara Nagle, University of California-Berkeley

Adapted Primary Literature as an Apprenticeship Genre for Learning Scientific Writing in High School Biology

Galia Zer-Kavod, Weizmann Institute of Science
Anat Yarden, Weizmann Institute of Science

A Grounded Theory Study of Secondary Science Teachers Collaboratively Co-Designing Socio-Scientific Issues-based Curriculum Units

Patricia J. Friedrichsen, University of Missouri, Columbia
Tamara Hancock, University of Missouri
Andrew T. Kinslow, University of Missouri
Troy Sadler, University of Missouri

Developing a Learning Progression to Track 3D Learning of Energy in High School Physical Science

Leonora Kaldaras, Michigan State University
Joseph S. Krajcik, Michigan State University

Strand 11: Cultural, Social, and Gender Issues

Critical Theory and Social Justice in Science Education

8:30am-10:00am, Chastain J

Presider: Franklin S. Allaire, University of Houston-Downtown

Race, Gender, Power and Critical Science Agency

Kathleen A. Schenkel, Michigan State University

Angela Calabrese Barton, Michigan State University

Developing a Hybridized Research Methodology for Aligning Science Curriculum with School Vision in Indigenous Communities

Mae Hey, Virginia Tech

George E. Glasson, Virginia Polytechnic Institute and State University

Brenda R. Brand, Virginia Tech University

Agential Realism Meets Pedagogy of the Oppressed: Towards a Liberatory Chemistry Literacy

Katherine Doerr Morosky, The University of Texas, Austin

Addressing Inequities in Science Teacher Preparation from a Critical Race Perspective

Nikeetha Dsouza, Clemson University

Alison Leonard, Clemson University

Cassie Quigley, Clemson University

Planting Seeds of Social Justice Leadership in Science

Malcolm B. Butler, University of Central Florida

Tonjua B. Freeman, University of Central Florida

Jonathan L. Hall, University of Central Florida

Kimberly Davis, University of Central Florida

Strand 11: Cultural, Social, and Gender Issues

Symposium – Interaction Analysis in Multilingual Science Classrooms: Analytical Frameworks and Methods

8:30am-10:00am, Savannah A

Presenters:

Sara Salloum, University of Balamand

Saouma B. Boujaoude, American University of Beirut

Mariona Espinet, Universitat Autònoma, Barcelona

Christina Siry, University of Luxembourg

Minjung Ryu, Purdue University

Margie J. Probyn, University of the Western Cape

Laura Valdés-Sánchez, Universitat Autònoma de Barcelona

Anna M. Gorges, University of Luxembourg

Roberto Gómez Fernández, Université du Luxembourg

Strand 12: Educational Technology

Pre-service Teachers

8:30am-10:00am, Augusta 2

Presider: Joshua A. Ellis, Michigan Technological University

Clinical Experiences Using Virtual Reality to Train Preservice Science Teachers

Richard Lamb, University at Buffalo
Elisabeth Etopio, University at Buffalo
Len Annetta, East Carolina University
Lynn Shanahan, University at Buffalo
Rebekah Lamb, Enterprise Charter School
Julie Schwab, Enterprise Charter School

Effects on an iPad-based Curriculum: Investigating Preservice Elementary Teachers' Science Conceptual Understanding and Technology Self-efficacy

Meera Chandrasekhar, University of Missouri
Deepika Menon, Towson University, Maryland
Matthew Conway, Towson University, Maryland
Dorina Kosztin, University of Missouri, Columbia
Douglas Steinhoff, University of Missouri, Columbia

How Do Pre-Service Elementary Teachers Perceive and Use Mobile Tools in Developing Mobile-Based Lesson Materials?

Eunhee Kang, Seoul National University

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

Philosophy of Science/History of Science

8:30am-10:00am, Augusta 1

Presider: Uygur Kanli, Gazi University

Goethe's Conception of "Experiment as Mediator" and Implications for School Science Practical Work

Wonyong Park, Seoul National University
Jinwoong Song, Seoul National University

Promoting Teachers' Understanding about the NOS through The Activity of Eratosthenes' Measurement of Earth's Circumference

Gizem Sivrikaya, Ankara University
Uygur KANLI, Gazi University
Yasemin Ozdem-Yilmaz, Gaziosmanpasa University
Fitnat Koseoglu, Gazi University

Scientific Explanation in Science Education: A Critical Review of Literature

Sahar Alameh, University of Illinois, Urbana-Champaign
Fouad Abd-El-Khalick, University of North Carolina, Chapel Hill

Non-science Majors' Development of NOS Understandings during a Historically Contextualized Introductory Undergraduate Geology Course

Glenn Dolphin, University of Calgary

Concurrent Session #11
10:15am – 12:00pm

International Committee

Symposium – Science Identities: Embracing the Diversity and Multiplicity of Theory and Research

10:30am-12:00pm, Augusta 1

Presiders:

Lucy Avraamidou, University of Groningen, Netherlands
Henriette Tolstrup Holmegaard, University of Copenhagen, Denmark

Discussant:

Justin Dillon, University of Exeter

Presenters:

Jennifer Adams, University of Calgary, Canada
Heidi Carlone, University of North Carolina, Greensboro, USA
Anna Danielsson, Uppsala University, Sweden
Bjørn Friis Johannsen, University of Gothenburg, Sweden,
Day Greenberg, Michigan State University, USA
Allison Gonsalves, McGill University, Canada
Zahra Hazari, Florida International University, USA
Henriette Tolstrup Holmegaard, University of Copenhagen, Denmark
Angela Johnson, St Mary's College of Maryland, USA
Katherine Wade-Jaimes, University of Memphis, USA
Peter Wulff, Leibniz Institute for Science and Mathematics Education, Germany
Billy Wong, University of Reading, UK
Felicia Moore, Columbia University, USA

Strand 1: Science Learning, Understanding and Conceptual Change

The Role of Students' Conceptions for Science Learning

10:30am-12:00pm, Augusta B

Presider: Phillip A. Boda, Stanford University

Exploring Misconception as a Trigger for Enhancing Students' Conceptual Understanding in Biochemistry and Molecular Biology

Allen A. Espinosa, The University of Melbourne
Heather Verkade, The University of Melbourne
Terrence D. Mulhern, The University of Melbourne
Jason M. Lodge, The University of Melbourne

Give Me That Cookie! Middle School Students' Understanding of and Learning about Competition

Amanda L. Gonczi, Michigan Technological University
Brenda G. Bergman, Michigan Tech University

Jacqueline E. Huntoon, Michigan Technological University

Prior Conception of the Relationships between Genes and Traits Affect Students' Understanding of Genetic Mechanisms

Michal Haskel Ittah, Weizmann Institute of Science

Anat Yarden, Weizmann Institute of Science

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Teaching Strategies

10:30am-12:00pm, Augusta C

Presider: P. Citlally C. Jimenez, University of Nebraska-Lincoln

Resources for Managing Uncertainty During Argumentation in a Fifth-grade Science Classroom

Xue Qiao, Arizona State University

Ying-Chih Chen, Arizona State University

Jaelyn Hernandez, Arizona State University

Chin-Chung Tsai, National Taiwan Normal University

Teaching and Learning the Learning of the Control-of-Variables Strategy: What Works Best?

Johanna Kranz, University of Trier

Katrin Kaufmann, University Trier

Tobias Tempel

Andrea Moeller, University Trier

The Multimodal Nature of the Iconicity of the Gestures Used in Science Lecturing

Lilian Pozzer, University of Manitoba

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Three Dimensional Learning in the Elementary Classroom

10:30am-12:00pm, Savannah A

Presider: Melissa Luna, West Virginia University

Elementary Engineering Diagrams as Design Tools

Carmen M. Vanderhoof, Pennsylvania State University

Gregory J. Kelly, Pennsylvania State University

Christine M. Cunningham, Museum of Science, Boston

Assessing Five Year Old Pupils Understanding of Reproducibility through a Counter-Intuitive Experiment

Estelle Blanquet, University of Bordeaux

Eric Picholle, CNRS Nice

Integrating Scientific Practice into Learning Science Core Ideas? Exploring Cognitive Bases to Test NGSS Approach

Lin Zhang, Providence College

Promoting Children's Engagement in Learning Science and Science Self-efficacy through a SADI Intervention

Ying-Yan Lu, National Sun Yat-Sen University
Zuway-R Hong, National Sun Yat-Sen University
Hsiang-Ting Chen, National Sun-Yat-sen University
Hsin-Hui Wang, National Sun-Yat-sen University
Kuay-Keng Yang, Institute of Education
Huann-Shyang Lin, National Sun Yat-Sen University

Telling the Energy Story: Preliminary Results from Grades 4 and 5

Roger G. Tobin, Tufts University
Sara J. Lacy, TERC
Sally Crissman, TERC
Nick Haddad, TERC

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

Physics Teaching and Learning

10:30am-12:00pm, Augusta H

President: Jennifer L. Weible, Central Michigan University

Creating Reform in High School Physics Classrooms: Does it Work?

Dennis Sunal, University of Alabama
Cynthia Szymanski Sunal, University of Alabama
Marsha Simon, University of Alabama
James Harrell, University of Alabama
Michelle Wooten, University of Alabama
Justina A. Ogodo, The University of Alabama, Tuscaloosa
Marilyn M. Stephens, University of Alabama
Mohan Aggarwal, Alabama A&M University
Marius Schamschula, Alabama A&M University

Tracking Elements of Specialized Knowledge for Teaching Physics

Shulamit Kapon, Technion - Israel Institute of Technology
Avraham Merzel, Technion - Israel Institute of Technology

Using Choice to Uncover the Role of Gender Stereotypes in High School Physics Assignments

Samuel R. Wheeler, North Carolina State University

Meg Blanchard, North Carolina State University

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

Self-Regulated Learning

10:30am-12:00pm, Augusta F

Presider: Anita Schuchardt, University of Minnesota

Examining the Effectiveness of A Light-Touch Study Skills Intervention in a Large-Enrollment Biology Course

Brian Sato, University of California, Irvine

Fernando Rodriguez, University of California, Irvine

Mariela Rivas, University of California, Irvine

Exploring Self-Efficacy, Reflection Behaviors, and Learning Outcomes in the Context of Mobile Learning Technologies

Muhsin Menekse, Purdue University

Saira Anwar, Purdue University

Investigating Introductory Biology Students' Self-Regulating Learning Strategies using a Reflective Routine

Brittany Smith, Minnesota State University Mankato

Paula Soneral, Bethel University

Kelsey J. Metzger, University of Minnesota, Rochester

Understanding Relationships between Confidence Calibration, Question Complexity, and the Dunning-Kruger Effect in Neuroscience Students

G. Michael Bowen, Mount Saint Vincent University

Kimberley P. Good, Dalhousie University

Strand 6: Science Learning in Informal Contexts

Understanding the Impact of Citizen Science and Public Outreach Efforts

10:30am-12:00pm, Augusta D

Presider: Martin Storksdieck, Oregon State University

The Identity Development of Citizen Scientists in a Museum-based Genetics of Taste Program

Leighanna Hinojosa, University Colorado, Boulder

Rebecca D. Swanson, University of Colorado, Boulder

Joseph L. Polman, University of Colorado, Boulder

Promoting Science through Public Engagement: Exploring Citizens' Science Interest and Motivation in Attending Science Cafes

Gina Childers, University of North Georgia

Donna Governor, University of North Georgia

Stacey Britton, University of West Georgia

The Impact of K-12 Outreach Experiences on Undergraduate STEM Majors' Scientific Literacy and STEM Communication Skills

Hillary Mason, University of Colorado, Denver

Michael Ferrara, University of Colorado, Denver

Bryan Shao-Chang Wee, University of Colorado, Denver

Robert M. Talbot, University of Colorado, Denver

Michael Jacobson, University of Colorado, Denver

Evaluating University-Led STEM Outreach

Efrat Eilam, Victoria University

Kirsten Sadler, Victoria University

Stephen W. Bigger, Victoria University

Fiachra Barry, Victoria University

Strand 7: Pre-service Science Teacher Education

Teacher Beliefs and Attitudes

10:30am-12:00pm, Augusta E

Presider: Sheryl L. McGlamery, University of Nebraska, Omaha

Assessing the Dimensions of Attitudes towards Science (DAS) of Australian Preservice Primary Teachers

Christine V. McDonald, Griffith University

Harry Kanasa, Griffith University

Helen Klieve, Griffith University

Features of Student Teacher Reflections about Self and Peer Classroom Video that Cultivate Reform-Minded Thinking

Robert Danielowich, Adelphi University

Prospective Teachers' Resistance to Teach Inquiry in Secondary Science Classrooms

Kayla P. Flanagan, University of Georgia

Barbara A. Crawford, University of Georgia

Strand 8: In-service Science Teacher Education

Supporting New (or New to Grade Level) Science Teachers

10:30am-12:00pm, Augusta G

Presider: Joshua A. Ellis, Michigan Technological University

Availability and Activation of Contextual Resources by New Secondary Science Teachers

Shannon L. Navy, Kent State University

Ryan Nixon, Brigham Young University

Julie A. Luft, University of Georgia

Melissa A. Jurkiewicz, Mercer University

Practices in the Mentoring Process of STEM Teachers during their Integration into the School System

Effrat Akiri, Technion

Gabriella Shwartz, Technion-Israel Institute of Technology

Nitza Barnea, Technion, Israel Institute of Technology

Orit Herscovitz, Technion, Israel Institute of Technology

Yehudit Judy Dori, Technion

The Consequences of Grade-Level Reassignment for Elementary Science Teacher Professional Development Efforts: A Case Study

Deborah L. Hanuscin, Western Washington University

Kelsey Lipsitz, University of Missouri

Dante Cisterna, University of Nebraska-Lincoln

Mark Ehlert, University of Missouri

Strand 10: Curriculum, Evaluation, and Assessment

Developing Three Dimensional Assessments and Teaching Models

10:30am-12:00pm, Augusta A

Presider: Michael S. Tutwiler, University of Rhode Island

Developing Assessment Tasks to Measure Student Sense-Making of Phenomena Using Three Dimensions of Scientific Proficiency

Emily C. Miller, University of Wisconsin, Madison

Susan K. Codere, Michigan State University

Angela DeBarger, George Lucas Educational Foundation

Joseph S. Krajcik, Michigan State University

Using Evidence-Centered Design to Create Assessments for Understanding of Core Chemistry Ideas in Introductory Biology

Rebecca L. Matz, Michigan State University

Sonia M. Underwood, Florida International University

Amelia Wenk Gotwals, Michigan State University

Kristin N. Parent, Michigan State University

Automated Scoring of Scientific Practices through Open-ended, Scenario-based Assessments

A.J. Womack, University of Missouri

Troy Sadler, University of Missouri

Eric P. Wulff, University of Missouri

The Development of Universally Designed, Fine-Grained Science Learning Map Models

Lori Andersen, University of Kansas

Russell Swinburne Romine, University of Kansas

How Steady is the Direction of Reform? Textbook Analysis and the NGSS

Rudolf V. Kraus, Rhode Island College
Lesley Shapiro, Northeastern University

Strand 11: Cultural, Social, and Gender Issues

Students and Teachers Constructing Identities: People of Color and Science

10:30am-12:00pm, Savannah B

Developing Identities and Changing Roles of Latinx Science Students in College

David Segura, University of Illinois, Chicago

A Black Woman's Transition from Scientist to Science Teacher to Science Teacher

Leader: Science Identity Development in Various Contexts

Olayinka A. Mohorn-Mintah, University of Illinois, Chicago

Let's Get PHYSICS-cal: An Ethno-dance-o-graphy of Black High School Students'

Transition from Biology to Physics

Mindy Chappell, University of Illinois, Chicago

Constructing Identities as Science Teachers Seeking Equity and Excellence

Maria Varelas, University of Illinois, Chicago

Daniel Morales-Doyle, University of Illinois, Chicago

David Segura, University of Illinois, Chicago

Carole P. Mitchener, University of Illinois, Chicago

Marcela Bernal-Munera, University of Illinois, Chicago

Strand 12: Educational Technology

Scientific Literacy

10:30am-12:00pm, Peachtree 1

Presider: Stephen R. Burgin, University of Arkansas

Developing Scientific Literacy through Science Notebooks: Affordances and Limitations of Digital Notebooks

Lori A. Fulton, University of Hawaii, Manoa

Seungoh Paek, University of Hawaii, Manoa

Jon Yoshioka, University of Hawaii, Manoa

ESCOLAR: Improving Science Literacy for Diverse Learners with Online Units

Fatima Elvira Terrazas Arellanes, University of Oregon

Alejandro J. Gallard, Georgia Southern University

Lisa Strycker, University of Oregon

Emily Walden, University of Oregon

Wikis and Interdisciplinary Project-based Learning in Teacher Education Programmes
Heba El-deghaidy, American University, Cairo
Michele Biasutti, University of Padova, Italy

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

Scientific Inquiry and Nature of Science

10:30am-12:00pm, Augusta 2

Presider: Dawnne M. LePretre, Illinois Institute of Technology-MSED

Using Students' Exemplar Responses from NOS and SI Survey Instruments as an Explicit and Reflective Approach for Developing Teachers' Understanding of Nature of Science and Scientific Inquiry

Jennifer C. Parrish, University of Northern Colorado
Grant E. Gardner, Middle Tennessee State University

A Sample of Turkish Middle School Students' Views of Nature of Scientific Inquiry

Esra Capkinoglu, Independent Researcher
Gulsen Leblebicioglu, Abant Izzet Baysal University
Duygu Metin, Bozok University
Renee S. Schwartz, Georgia State University
Ismail Berkyurek

Ninth/Tenth versus Eleventh/Twelfth Graders' Views About Scientific Inquiry

James P. Concannon, Westminster College
Patrick Brown, Ft. Zumwalt
Norman G. Lederman, Illinois Institute of Technology
Judith S. Lederman, Illinois Institute of Technology

The Strange Case of "the Scientific Method" Revisited: NGSS's Impact on References in Practitioner Journals

Daniel Z. Meyer, Illinois College

Strand 14: Environmental Education

Preparing Pre-service and In-service K-12 Teachers for Sustainability Education

10:30am-12:00pm, Savannah C

Presider: Ying Syuan Huang, McGill University

"Be a Better Person for the Environment": Teachers' Perceptions of Responsibility for Teaching Climate Change

Andrea Drewes, University of Delaware

A Sociocultural Approach Investigating Pre-service Elementary Teachers' Perceived Obstacles to Taking Students Outdoors

Teresa Shume, North Dakota State University

Erica Blatt, Rowan University

Elementary Teachers' Views on Environmental Sustainability Education: Understandings from A Multi-case Study

Lauren Madden, The College of New Jersey

Rachel DiVanno, Edgar Middle School, Metuchen New Jersey Public Schools

Investigating the Use of Communities of Practice for Sustainability Instruction in Rural Agricultural Education

Craig A. Kohn, Michigan State University

Strand 15: Policy

The Role of Teacher Leadership in Science Education

10:30am-12:00pm, Augusta 3

President: Kathryn N. Hayes, California State University, East Bay

A Synthesis of Math/Science Teacher Leadership Development Programs: Consensus and Recommendation

Jody Bintz, BSCS

Lindsey Mohan, University of Notre Dame/University of Texas Austin

Jodie Galosy, Knowles Science Teaching Foundation

Barbara Miller

Teacher Leadership STEM Teams Examining Critical Components for STEM Schools

Elizabeth A. Crotty, University of Minnesota

Elizabeth A. Ring-Whalen, St. Catherine University

Illana C. Livstrom, University of Minnesota

Gillian Roehrig, University of Minnesota

Julie C. Brown, University of Minnesota

The Impact and Implementation of a High School Science Leadership Program

Joseph A. Taylor, BSCS

Jody Bintz, BSCS

Molly Stuhlsatz, BSCS

Lunch—On Your Own

12:00pm – 1:00pm

Concurrent Session #12
1:00pm – 2:30pm

Strand 1: Science Learning, Understanding and Conceptual Change

The Complexity of Science Learning: The Role of Discourse, Motivation, and Self-Generation

1:00pm-2:30pm, Peachtree 1

Presider: Molly Bolger, University of Arizona

"This is Basically the Thingy, Right?": Student Sense Making in Science

Hillary Barron, University of Minnesota

Michele Koomen, Gustavus Adolphus College

Motivation and Conceptual Learning: An Examination of Self-Efficacy and Achievement Goals in 6th Grade Science

Kelly Boden, University of Pittsburgh

Eric Kuo, University of Pittsburgh

Timothy J. Nokes-Malach, University of Pittsburgh

Tanner Wallace, University of Pittsburgh

Muhsin Menekse, Purdue University

The Role of Self-Generation In Inquiry-Based Learning

Irina Kaiser, Universität Kassel

Jürgen Mayer, Universität Kassel

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Teacher's Role in Science Classrooms

1:00pm-2:30pm, Augusta B

Presider: Mon Lin Ko, University of Illinois, Chicago

Current K-8 Science Instruction: Similarities and Differences with the Science Practices

Kevin Cherbow, Boston College

Megan T. McKinley, Boston College

Katherine L. McNeill, Boston College

Rebecca Lowenhaupt, Boston College

Framing Goals for Argumentation Discussions: Individual Versus Communal Understanding

María González-Howard, University of Texas, Austin

Katherine L. McNeill, Boston College

Teaching and Learning the Practices of Doing Science

Maayan Schvartzter, Technion - Israel Institute of Technology

Shulamit Kapon, Technion - Israel Institute of Technology

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies

Symposium – Working Towards Robust Early Childhood Science Education Approaches that Support Scientific Inquiry and Practices

1:00pm-2:30pm, Savannah B

Presenters:

Christina V. Schwarz, Michigan State University
Charlene M. Czerniak, University of Toledo
Amelia Wenk Gotwals, Michigan State University
Soo-Yean Shim, University of Washington
Rachel Larimore, Michigan State University
Jessica J. Thompson, University of Washington
Kirsten D. Edwards, Michigan State University
Jennifer Richards, University of Washington
Laurie V. Van Egeren, Michigan State University
Tanya Wright, Michigan State University

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

Student Engagement in Scientific Practices

1:00pm-2:30pm, Augusta H

Presider: Consuelo J. Morales, University of Michigan

Exploring the Development and Implementation of Integrating Essential Competencies of Scientific Inquiry in Teaching

Ya-Chun Chen, National Sun Yat-sen University
Huann-Shyang Lin, National Sun Yat-Sen University

Investigating Teacher Effects on English Learners' Chemistry Understanding during Visualization-Rich Inquiry Instruction

Kristin Bedell, University of North Carolina, Chapel Hill
Kihyun (Kelly) Ryoo, University of North Carolina, Chapel Hill

Middle School Students' Spatial Thinking and Understanding of the Conservation of Matter

Merryn Cole, University of Nevada, Las Vegas
Jennifer A. Wilhelm, University of Kentucky
Hailey Fish, University of Wisconsin - LaCrosse
Corinne Fish, Reedsburg Area High School

The Difference Between Peer-Explaining and Device-Explaining

Katja Löppenber, Universität Duisburg-Essen

Angela Sandmann, Universität Duisburg-Essen
Christine Florian, Universität Duisburg-Essen

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

Scaffolds to Support Student Reasoning

1:00pm-2:30pm, Augusta F

Presider: Robert M. Talbot, University of Colorado, Denver

Constructing Explanations to Aid in Conceptual Chemistry Learning in an Active Learning Environment

Sandhya Krishnan, University of Georgia
Molly Atkinson, University of Georgia
LaShawn A. McNeil, University of Georgia
Julie A. Luft, University of Georgia

Contrasting Designs and Argumentation Scaffolds Impact Pre-Service Elementary Teachers' Science Ideas in Engineering Design Tasks

Carina M. Rebello, Purdue University
Yuri B. Piedrahita Uruena, Purdue University
Chandan Dasgupta, Purdue University
Alejandra Magana, Purdue University
N. Sanjay Rebello, Purdue University

The Impact of the Course on College Students' Spatial Thinking Abilities

Youngjin Song, California State University, Long Beach
Hye Sun You, Michigan State University
Lisa M. Martin-Hansen, California State University, Long Beach
Susan Zwiep, California State University, Long Beach

Using the Claim, Evidence, and Reasoning Framework to Develop Prospective Teachers' Scientific Explanations in Physics

Heidi Masters, University of Wisconsin-La Crosse
Jennifer Docktor, University of Wisconsin-La Crosse

Strand 6: Science Learning in Informal Contexts

Professional Learning in Out-of-school Contexts

1:00pm-2:30pm, Augusta C

Presider: Shawn Rowe, Oregon State University

Professional Development for Informal STEM Educators: Instructors as Boundary Crossers in a Community of Practice

Rebecca D. Swanson, University of Colorado, Boulder

Impact of In-service Teacher Professional Development Program about Science Centers on Teachers' Nature of Science Views

Harika Ozge Arslan, Duzce University

Fitnat Koseoglu, Gazi University

Uygar Kanli Gazi University

Measurements of Professional Learning: Surveys and Observation Tools Designed to Improve Quality of Reflective Practice

Ardice Hartry, University of California, Berkeley

Rosalinda Nava, University of California, Berkeley

Elementary School Teachers Learning to Integrate Outdoor Learning and NGSS

Tali Tal, Technion

Irene S. Bayer, Michigan State University

Kara Haas, Michigan State University

Strand 7: Pre-service Science Teacher Education

Culturally Relevant Teaching

1:00pm-2:30pm, Augusta E

Presider: Samia Khan, University of British Columbia

Elementary Science Teacher Development to Empower ELLs

Neporcha Cone, Kennesaw State University

Preservice Teachers Cultural Perceptions of Latino Families: Encounters Through Family Math and Science

Cherie McCollough, Texas A&M University, Corpus Christi

Olga Ramirez, University of Texas, Rio Grande Valley

Promoting Pre-service Science Teachers' Cultural Competence

Danielle E. Dani, Ohio University

Role of Service Learning Teaching Events for Fostering Preservice Science and Math Teacher Development

Lisa A. Borgerding, Kent State University

Strand 7: Pre-service Science Teacher Education

Engineering Design

1:00pm-2:30pm, Augusta D

Presider: Umran Betul Cebesoy, Usak University

Developing Pre-Service Science Teachers' Understanding of Engineering Design Strategies Through Teaching Scenarios

Laura K. Ochs Pottmeyer, University of Virginia

Jennifer Chiu, University of Virginia
Frackson Mumba, University of Virginia

Engineering Design as an Approach to Developing Conceptual Knowledge within integrated STEM Curricula

Eunjeong Kim, University of Georgia
J. Steve Oliver, University of Georgia
Young Ae Kim, University of Georgia

Preservice and Mentor Teachers Co-Learning to Teach Engineering in Elementary Classrooms

Beau Vezino, University of Arizona
Kristin L. Gunckel, University of Arizona

Pre-service Science Teachers' Learning and Cognizance about STEM Education through an Engineering Design Project

Hee Jin Noh, Korea National University of Education, South Korea
Seoung-Hey Paik, Korea National University of Education, South Korea

Strand 10: Curriculum, Evaluation, and Assessment

Assessment of Scientific Reasoning, Scientific Literacy, and Computational Thinking

1:00pm-2:30pm, Augusta 2

Presider: Mauricio Pietrocola, University of Sao Paulo

How Science Teachers DiALoG Classrooms: Towards a Practical and Responsive Formative Assessment of Oral Argumentation

J. Bryan Henderson, Arizona State University
Nicole S. Zillmer, Arizona State University
Eric J. Greenwald, University of California, Berkeley
Megan Goss, University of California, Berkeley
M. Lisette Lopez, University of California, Berkeley
Kevin Close, Arizona State University
April Holton, Arizona State University
P. David Pearson, University of California, Berkeley

Biology Instruction under the View of a Generic Framework of Scientific Reasoning and Argumentation

Tobias Dorfner, Biology Education, Department I, Faculty of Biology, LMU Munich
Christian Förtsch, LMU Munich
Michael Germ, LMU Munich
Birgit Jana Neuhaus, LMU Munich

Measuring Scientific Reasoning: Construct Validation of the Primary Scientific Reasoning Test (PSRT) using Rasch modelling

Diana Ng, Oxford University Centre for Educational Assessment

The Impact of PISA-driven Inquiry Teaching Practices on Students' Scientific Competencies

Shu-Fen Lin, National Changhua University of Education

Exploring Student Conceptual Understanding Using A Model-Based Assessment

Kelly Barber-Lester, University of North Carolina, Chapel Hill

Lana Minshew, University of North Carolina, Chapel Hill

Kerry Bartlett, University of North Carolina, Chapel Hill

Janice L. Anderson, University of North Carolina, Chapel Hill

Sharon J. Derry, University of North Carolina, Chapel Hill

Strand 11: Cultural, Social, and Gender Issues

Women and Careers in STEM

1:00pm-2:30pm, Chastain J

Presider: Cassie Quigley, Clemson University

At a Crossroads with Nature of Science Research: Where do We Go from Here?

Leon Walls, University of Vermont

Cassie Quigley, Clemson University

Bryan Shao-Chang Wee, University of Colorado, Denver

Gender Equitable Teaching and Learning in STEM Spaces

Jennifer Schellinger, Florida State University

Barbara Billington, University of Minnesota

Brenda Britsch, EdLab Group

Sarah Carter,

Roxanne M. Hughes, Florida State University

Alicia Santiago,

STEM Begets STEM: Examining the Effect of Familial Careers on Students' STEM Career Aspirations

Susie M. Cohen, Florida International University

Zahra Hazari, Florida International University

Geoff Potvin, Florida International University

Women Give Up on Pre-med Plans even When They do Well in STEM 'Weeder' Classes

Eben B. Witherspoon, University of Pittsburgh

Christian D. Schunn, University of Pittsburgh

Strand 11: Cultural, Social, and Gender Issues

Symposium – Race, Politics & Teacher Identity: Reflecting on Professional Learning and Practice

1:00pm-2:30pm, Savannah A

Discussant: Lucy Avraamidou, University of Groningen, Netherlands

Presenters:

Jennifer Adams, University of Calgary
Susan McCullough, City University of New York
LaToya Strong, City University of New York
Atasi Das, The Graduate Center, City University of New York
Lucy Avraamidou, University of Groningen, Netherlands

Strand 12: Educational Technology

Simulation

1:00pm-2:30pm, Augusta A

Presider: Mi-young Kim, Ewha Womans University

Design-based Research on a Gesture-controlled Dynamic Simulation to Better Help Students Refocus Causal Intuitions

David E. Brown, University of Illinois, Urbana-Champaign
Nitasha Mathayas, University of Illinois, Urbana-Champaign
Robb Lindgren, University of Illinois, Urbana-Champaign
Robert C. Wallon, University of Illinois, Urbana-Champaign

Effect of an Embodied Simulation on Student Gesturing and Science Reasoning

Jason W. Morphew, University of Illinois, Urbana-Champaign
Sahar Alameh, University of Illinois, Urbana-Champaign
Stephanie Sroczynski, University of Illinois, Urbana-Champaign
Robb Lindgren, University of Illinois Urbana-Champaign
Jina Kang, University of Illinois Urbana-Champaign

Supporting Role of Computer Simulation on Scientific Argumentation about Behaviour of Gases in Student Drawings

Tugba Keser Solak, Trakya University

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

Scientific Literacy

1:00pm-2:30pm, Augusta 3

Presider: Jacob Pleasants, Iowa State University

The Relationship Between Biology Teachers' Understanding of the Nature of Science and the Understanding and Acceptance of the Theory of Evolution

Hernan Cofre, Pontificia Universidad Católica de Valparaíso
Beatriz Becerra, Pontificia Universidad Católica de Valparaíso
Emilia Cuevas, Pontificia Universidad Católica de Valparaíso
Claudia Vergara, Alberto Hurtado University
David Santibáñez, Universidad Católica Silva Henríquez
Juan Jimenez, Illinois Institute of Technology

Scientific Literacy or Scientific Proficiency? Covenants as Mitigating-Circles in Educational Standards Development

Silvia Lizette Ramos de Robles, Centro Universitario de Ciencias Biológicas y Agropecuarias

Alejandro J. Gallard, Georgia Southern University

Katie Brkich, Georgia Southern University

Wesley Pitts, City University of New York, Lehman College

Understanding Activism and Scientific Literacy

Jill Birren, Marquette University

Jennifer Gaul-Stout, Marquette University

"Even a Monk can Become a Scientist:" Dialectical Discourse at a Tibetan Buddhist Monastery

Meena M. Balgopal, Colorado State University

Nicole M. Gerardo, Emory University

Strand 14: Environmental Education

Student Ideas and Voices Revealed Through Digital Technologies and Modeling

1:00pm-2:30pm, Augusta 1

Presider: Patricia Patrick, Columbus State University

#60above60: Creating Global Scientific Discourse around Local Issues

Mary E. Short, The George Washington University

Laura C. Engel, The George Washington University

Initial Results of an Assessment of Students' Spatial Thinking Related to Enhanced Greenhouse Effect

Heather J. Skaza Acosta, Florida Gulf Coast University

Marykay Orgill, University of Nevada, Las Vegas

Kent J. Crippen, University of Florida

Snapping Stories in Science - Local Cultures and Social Media as Entry Points to Sustainable Education

Marianne Odegaard, University of Oslo

Eugene Boland

Mysa Chu

Heidi Kristensen

Using Watershed Modeling and Probeware to Teach Environmental Sustainability

Nanette Dietrich, Millersville University of Pennsylvania

Carolyn Staudt, Concord Consortium

Steven Kerlin, Stroud Water Research Center

Concurrent Session #13
2:45pm – 4:15pm

Strand 1: Science Learning, Understanding and Conceptual Change

Students' Misconceptions about Science Concepts

2:45pm-4:15pm, Savannah B

President: Carina M. Rebello, Purdue University

Students' Model-Based Explanations about Natural Selection and Antibiotic Resistance through Socio-Scientific Issues Based Learning

Amanda N. Peel, University of Missouri

Laura Zangori, University of Missouri

Patricia J. Friedrichsen, University of Missouri, Columbia

Eric Hayes, Southern Boone County High School

Troy Sadler, University of Missouri

Genetic Determinism, Teleology and Essentialism: A Detailed Look at Secondary Students' Conceptions

Florian Stern, University of Geneva

Kostas Kampourakis, University of Geneva

Andreas Müller, University of Geneva

Using TIMSS and TIMSS Advanced Data to Explore Physics Misconceptions of U.S. Students

Teresa A. Neidorf, American Institutes for Research

Liana Bloom, Washington University in St. Louis

Ebru Erberber, American Institutes for Research

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Social Interactions in the Science Classroom

2:45pm-4:15pm, Augusta 2

President: Yen-Ruey Kuo, National Changhua University of Education

Co-configuring a 6th Grade Lepidoptera Learning Community

David Stroupe, Michigan State University

Peter White, Michigan State University

Marcos D. Caballero, Michigan State University

Shifts of Students' Positional Framing in Transitioning Zones of Interaction during Advancement toward Dialectical Argumentation

Heesoo Ha, Seoul National University

Heui-Baik Kim, Seoul National University

Age-dependent Effects of Role Assignment on Student Activity during Cooperative

Inquiry Learning in Science Class
Andrea Moeller, University Trier
Katrin Kaufmann, University Trier

Strand 2: Science Learning: Contexts, Characteristics and Interactions
Student Factors Related to Science Learning

2:45pm-4:15pm, Savannah C

Presider: Lisa A. Borgerding, Kent State University

Early Indications of Scientific Curiosity and Science Orientation toward Tenable Indicators

Ornit Spektor-Levy, Bar Ilan University
Yael Kesner-Baruch, Bar Ilan University
Zemira Mevarech, Bar Ilan University

Evaluation of Student Motivational, Career-Related and Context-Based Scenarios

Miia Rannikmae, University of Tartu
Regina Soobard, University of Tartu
Tormi Kotkas, University of Tartu
Tuula Keinonen, University of Eastern Finland

Examining Relationships between Youths' Science Curiosity and Personal Interests, In- and Out-of-School Experiences, and Familial Attitudes

Jennifer L. Weible, Central Michigan University
Heather Toomey Zimmerman, Pennsylvania State University

Factors that Positively Influence Students' Situational Interest During Outdoor Science Lessons

Jean-Philippe Ayotte-Beaudet, Université Sherbrooke
Patrice Potvin, Université du Québec à Montréal

What Led Me Here? An Exploration of Secondary Students' Attitudes and Intentions in Relation to Elective Course Enrollment

Ryan Summers, University of North Dakota

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

Teachers' Orientations and Beliefs

2:45pm-4:15pm, Augusta H

Presider: May Lee, Michigan State University

Does Teachers' Epistemic Orientation and Epistemic Understanding Matter in Implementing Science Practices?

Soonhye Park, North Carolina State University

Vance J. Kite, North Carolina State University
Lanette Phillips, North Carolina State University
Jee Kyung Suh, University of Alabama
Jinhong Jung, North Carolina Central University

Exploring Science Teachers' Epistemological Beliefs and Their Proposed Teaching Practices in Socio-Scientific Issues Context
Sule Aksoy, Syracuse University

Ultrasound Infused Project-based Curriculum: Influence on Teachers' Content Knowledge, Beliefs, and Practice
Christine Lotter, University of South Carolina
Nathan Carnes, University of South Carolina
Jeff C. Marshall, Clemson University

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

TA Development

2:45pm-4:15pm, Augusta F

President: Jaime L. Sabel, University of Memphis

A Network Initiative to Develop Research Skills in Professional Developers Working with Biology Teaching Assistants

Gili Marbach-Ad, University of Maryland
Grant E. Gardner, Middle Tennessee State University
Kristen R. Miller, University of Georgia
Judy S. Ridgway, The Ohio State University
Elisabeth Schussler, University of Tennessee

Chemistry Teachers' and Teaching assistants' Explanatory Frameworks and TSPCK for Chemical Bonding

Frackson Mumba, University of Virginia
Rene Toerien, University of Cape Town
Marissa S. Rollnick, Wits University

Exploring how Biology Teaching Assistants use Positioning Acts to Promote or Constrain Scientific Discourse

Anna S. Grinath, Middle Tennessee State University
Sherry A. Southerland, Florida State University

Undergraduate Teaching Assistants as a Source of Feedback to Improve Teaching and Learning in Biology

Hannah Jardine, University of Maryland

Strand 7: Pre-service Science Teacher Education

Teacher Education

2:45pm-4:15pm, Augusta E

Presider: Meredith M. Thompson, Massachusetts Institute of Technology

Assessing Pre-Service Teachers' Scientific Reasoning Competencies: Translation of a German MC Instrument into Spanish/English

Moritz Krell, Freie Universität Berlin

Claudia Vergara, Alberto Hurtado University

Jan H. Van Driel, University of Melbourne

Annette Upmeier Zu Belzen, Humboldt-Universität Zu Berlin

Dirk Krueger, Freie Universitaet Berlin

Enhancing or Degrading Quality?: Teacher Educators Talk About a High-Stakes Science Assessment for Pre-service Teachers

Dante Cisterna, University of Nebraska-Lincoln

Shannon Burcks, University of Missouri

Marcelle Siegel, University of Missouri, Columbia

Christopher D. Murakami, University of Missouri, Columbia

Suleyman Cite, University of Missouri, Columbia

Nilay Muslu, University of Missouri, Columbia

Examining the Effects of Teacher Education on Preservice Science and Mathematics Teacher Readiness

Sungmin Moon, University of California, Santa Barbara

Alexandria K. Hansen, University of California, Santa Barbara

Leslie Bushong, University of California, Riverside

Stacey L. Carpenter, University of California - Santa Barbara

Julie A. Bianchini, University of California, Santa Barbara

Moving from Diagnosis to Understanding Students Ideas through the Game of Eliciting Learner Knowledge (ELK)

Meredith M. Thompson, Massachusetts Institute of Technology

Dan Roy, Massachusetts Institute of Technology

Tiffany Wong, Massachusetts Institute of Technology

Justin Reich, Massachusetts Institute of Technology

Eric D. Klopfer, Massachusetts Institute of Technology

Strand 8: In-service Science Teacher Education

Engineering, STEM, and Teacher Identity

2:45pm-4:15pm, Augusta C

Presider: Carolyn A. Parker, American University

An Interdisciplinary Elementary STEM Education Partnership: A Vehicle for Engaged Teaching and Learning

Carolyn A. Parker, American University
Nicholas Lehn, Hanover Research
David E. McKinney, Johns Hopkins University
Susan G. Harper, University of Georgia

Analysis of Science Teachers' Drawings Before and After an NGSS-Based PD Experience
Carrie-Anne Sherwood, Southern Connecticut State University

STEM Teacher Identity in Developing STEM Schools
Felicia D.T. Leammukda, University of Minnesota
Mohamed El Nagdi, University of Minnesota
Gillian Roehrig, University of Minnesota

Strand 10: Curriculum, Evaluation, and Assessment

Assessment Administration, Learning Progressions, and Interdisciplinary Curricula
2:45pm-4:15pm, Savannah A

President: Sanghee Choi, University of North Georgia

Comparability of Computer-Based and Paper-and-Pencil Science Assessments
Cari F. Herrmann Abell, American Association for the Advancement of Science - Project
2061

Joseph M. Hardcastle, American Association for the Advancement of Science
George E. De Boer, American Association for the Advancement of Science - Project
2061

*Performance and Participation Differences for In-Class and Online Administration of
Low-Stakes Research-Based Assessments*

Ben Van Dusen, California State University Chico
Jayson M. Nissen, California State University - Chico
Manher Jariwala, Boston University
Xochith Herrera, California State University, Chico
Eleanor W. Close, Texas State University

*Students' Use of Science During Engineering Design Within Life Science-Focused STEM
Integration Units*

Emilie A. Siverling, Purdue University
Selcen Guzey, Purdue University
Tamara J. Moore, Purdue University

*Using a Novel Assessment and Rasch Analysis to Quantify a Plate Tectonics Learning
Progression*

Aubree Webb, Pennsylvania State University
Scott McDonald, Pennsylvania State University
Tanya Furman, Pennsylvania State University
Kathryn M. Bateman, Pennsylvania State University

Helen D. Gall, Pennsylvania State University
Arzu Tanis Ozcelik, Pennsylvania State University

*Using Rasch Modeling to Construct a Rating Scale for Teaching Competence of
Secondary Science Teachers*

Silin Wei, Hangzhou Normal University
Qiaoli Wang, HangZhou normal university
Yuane Jia, University of Virginia
Zuhao Wang, East China Normal University

Strand 11: Cultural, Social, and Gender Issues

***Symposium – Engaging in Epistemic Disobedience Towards Taking a Critical Stance
Towards Science Literacy***

2:45pm-4:15pm, Augusta 3

Presider: Maria Varelas, University of Illinois, Chicago

Presenters:

Gillian U. Bayne, Lehman College of City University of New York
Jennifer Adams, University of Calgary
LaToya Strong, City University of New York
Jean R. Aguilar-Valdez, Portland State University
Maria Varelas, University of Illinois, Chicago
Maria S. Rivera Maulucci, Barnard College

Strand 12: Educational Technology

Technology Integration

2:45pm-4:15pm, Augusta B

Presider: Bridget K. Mulvey, Kent State University

*Integrating GIS into Secondary School Science Curriculums: A Mixed-Method Study on
Students' Spatial Thinking Ability*

Siqi Li, State University of New York, Buffalo
Xiufeng Liu, State University of New York, Buffalo

*Integrative STEM learning Using 3D Scanning and Printing Technologies: Evidence
from a Mixed-Method Study*

Pavlo D. Antonenko, University of Florida
Mayra Cordero, PK Young Developmental Research School
Claudia Grant, University of Florida
Bruce MacFadden, University of Florida
Wenjing Luo, University of Florida
Victor Perez, University of Florida
Jeanette Pirlo, University of Florida
Min-Chuan Tsai, University of Florida
Tugba Arslantas, Middle Eastern Technical University

Bradford Davey, Technology for Learning Consortium, Inc.

Does Higher Extent of Mobile-Technology-Integrated Physics Learning Indicate Greater Effects?

Xiaoming Zhai, Beijing Normal University

Min Li, University of Washington

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

Socioscientific Issues

2:45pm-4:15pm, Peachtree 1

President: Brendan E. Callahan, Kennesaw State University

In Search of Socioscientific Perspective Taking: Empirical Refinement of a Theoretically-Derived Construct

Sami Kahn, Ohio University

Sarah Cross, Ohio University

Teachers' Pedagogical Content Knowledge For Socioscientific Issues

Cigdem Han Tosunoglu, Marmara University

Serhat Irez, Marmara University

Place-based Contentious Environmental SSI Instruction and Students' NOS Understanding, Compassion, and Pro-Environmental Engagement

Ben C. Herman, University of Missouri

Discourse Analysis of an Online SSI Discussion

Brendan E. Callahan, Kennesaw State University

Michael Dias, Kennesaw State University

Jen S. Dail, Kennesaw State University

Joy Brookshire, Kennesaw State University

Evening Events

NARST Executive Board Meeting #2

5:00pm – 10:00pm, Chastain H and I