Sunday, March 30th

NARST Board of Directors Meeting 2
8:00am – 12:00pm
Room: Essex A & B

Pre-Conference Workshops

8:00am – 11:30am
Equity and Ethics Committee Sponsored Pre-Conference Workshop: Building a Community of Scholars in NARST: Gaining Strength through Diversity
Room: Dover B

Presider: Maria Rivera Maulucci

Presenters:
Felicia Moore
Alejandro Gallard

Facilitators:
Bryan Brown
Bhaskar Upadhyay
Shawn Holmes
Sanghee Choi
Line Augustin
Hsiao-Lin Tuan
Jing-Wen Lin
Alberto Rodriguez

8:00am – 11:30pm
Research Committee Sponsored Pre-Conference Workshop: Research Agenda in Science Education: An Examination of Three Domains of Inquiry
Room: Dover A

Presider: Patricia Simmons

Vincent Lunetta
John Penick

8:00am – 2:00pm
Research Committee Sponsored Pre-Conference Workshop: Using Video Cases to Support and Study Preservice Teacher Learning: Two Approaches
Room: Dover C

Presider: Kathleen Roth

Catherine Chen
Karen Givvin
Leslie Atkins
Kathleen Schwille

Session 1
12:30pm – 2:00pm

Strand 1: Related Paper Set: Earth Systems Education as a Platform for the Development of Thinking Skills and Scientific Understanding
Room: Essex B

Presider: Ayush Gupta

Paper 1: *Design-Based Research of an Oceanography Course for High School Earth Sciences Students*
Carmit Cohen
Nir Orion

Paper 2**:** *System Thinking Skills at the Elementary School Level*
Orit Ben Zvi-Assaraf
Nir Orion

Paper 3: *Characterization of High School Students' System Thinking Skills in the Context of Earth Systems*
Tamar Basis
Nir Orion

Paper 4: *Earth Systems Education in a Multidisciplinary Focus*
Nir Orion
Carmit Cohen

Strand 2: **Coordinator Organized Paper Set: Motivation, Context, and Inquiry in Science Education**
Room: Laurel D

Presider: Alan Szeto

Paper 1: *Science Anxiety Among Failing Students*
Ebru Kaya
Ali Yildirim

Paper 2: *Describing the Construction Process of Models of Physical Phenomena: A Discourse-Based Analysis of Elementary Student Modeling Conversations*

Loucas Louca
Zacharias Zacharia
Constantinos Constantinou

Paper 3: *Can Inquiry Teaching Enhance Motivation and Inquiry Abilities of Different Achievers?*
Kuei-Hsiang Chen
Hsiao-Lin Tuan
Chih-Chung Tsai
Jung-Chi Chang

Paper 4: *Motivation Theory in Action: Using Saltwater Aquaria to Teach Science in Schools*
Giuliano Reis
Shelley Ross
Catherine C. neé Pennachetti
Wolff-Michael Roth

Strand 5: Coordinator Organized Paper Set: Cognition and Modeling
Room: Essex A

Presider: Christopher Wilson

Paper 1: *Assessing Students' Understanding of Cladograms*
Laura R. Novick
Kefyn M. Catley

Paper 2: *Embedded Science Textbook Questions Used to Increase Comprehension*
Cynthia Ghent
William Holliday

Paper 3*: Lizards and Frogs or Lizards and Mammals: University Students' Understanding of Most Recent Common Ancestry*
Nancy P. Morabito
Kefyn M. Catley
Laura R. Novick

Paper 4: *Undergraduates' Abilities to Use Representations in Biology: Interpreting Phylogenetic Tree Thinking*
Kristy L. Halverson
J. C. Pires
Sandra K. Abell

Strand 6: Related Paper Set: Research on Learning across Museum Contexts
Room: Laurel C

Presider: Jim Kisiel

Paper 1: *Middle School Aged Students' Interactions with 3-D Visualizations on a Spherical Display at a Science Museum*
Celeste Barthel

Paper 2: *Examining the Role of Affect in Visitor Engagement with Touch Tanks*
Coral Gehrke
Shawn Rowe

Paper 3: *iPods and Chaos: Using Design Research and Clinical Interviews in an Interactive Exhibit*
Molly Phipps

Paper 4: *Teacher Perspectives in Ocean Sciences Education: A Look at the SMILE-CIOSS Partnership*
Bronwen Rice
SueAnn Bottoms
Shawn Rowe

Strand 7: Symposium: Recruitment of Science and Mathematics Teachers: National and International Perspectives on Issues and Policies
Room: Kent B

Presider: Abdulkadir Demir

Abdulkadir Demir
Charlene M. Czerniak
Fouad Abd-El-Khalick
Laura Moin
Frances Lawrenz

Strand 7: Coordinator Organized Paper Set: Approaches for Science Teacher Education II
Room: Kent C

Presider: Cherie McCollough

Paper 1: *Concept Mapping to Promote Acquisition of Pedagogical Knowledge in Secondary Education Students*
Barbara A. Austin

Paper 2: *New Pre-Service Experiences in Authentic Settings: Family Learning Events in Science Teacher Education*
Cherie McCollough

Paper 3: *Crafting a Community-centered and Culturally Relevant Pedagogy in Preservice Science Teacher Education: A Collaborative Action Ethnography*
Vicente C. Handa

Deborah Tippins
Norman F. Thomson

Paper 4: *Enhancing Student Teachers' Reflective Thinking Through Reflective Practices*
Miwha Park
Gyoungho Lee
Jinwoong Song
Young-Shin Park

Strand 8: Coordinator Organized Paper Set: Fostering Educational Change
Room: Dover B

Presider: Avi Hofstein

Paper 1: *Sustainable Improvements of Science Teaching Through the Development of Local School Science Cultures*
Jan Solberg

Paper 2: *Building Leadership to Support Teachers' Integration of Technology-Enhanced Science Instruction*
Libby F. Gerard
Jane B Bowyer
Ronald W Marx

Paper 3: *Science Teacher Thinking About Mentoring as Revealed Through Written Cases*
Thomas R. Koballa
Julie Kittleson
Leslie Bradbury
Michael Dias

Strand 10: Symposium: Assessment Linked to Middle School Science Learning Goals: Development and Use
Room: Essex C

Presider: George M. Bodner

George DeBoer
Cari F. Herrmann-Abell
Kristen A .Lennon
Natalie S. Dubois

Strand 11: Coordinator Organized Paper Set: Learning, Participation, and Access in Physics Education
Room: Laurel A

Presider: Christopher Emdin

Paper 1: *Students, Language, and Physics: Discourse in the Science Classroom*
Susan M. Kowalski

Paper 2: *Construction of a Latent Variable to Predict Physics Access in U.S. Urban High Schools*
Angela M. Kelly
Keith Sheppard

Paper 3*: The Impact of Gender on Conceptual Theoretical Framework and Cognition Across Cultures*
Sharon Schleigh
Douglas Clark
Cynthia DAngelo

Paper 4: *Adopting Gender Stereotypes: Unraveling Bias From Student Evaluations of Their Teachers*
Geoff Potvin
Zahra Hazari
Robert H. Tai
Philip M. Sadler

Strand 12: Coordinator Organized Paper Set: Teaching with Technologies
Room: Laurel B

Presider: Kate Popejoy

Paper 1: *Pre-service Teachers' Perspectives Towards Integrating Interactive Whiteboard into Elementary School Natural Science Course*
Tzu-Hua Wang
Kai-Ti Yang

Paper 2: *What Facilitates Integration of One-to-One Laptops According to Science Teachers?*
Aviva Klieger
Yehuda Ben-Hur
Nurit Bar-Yossef

Paper 3: *Pre-service Biology Teachers' Use of Interactive Display Systems: Reform-Based Teaching or Chalk and Talk?*
Christine G. Schnittka
Ian C. Binns
Randy L. Bell

Paper 4: *Constructing Classroom Meaning with the Integration of Computer Technology into Science Teaching*
Karthigeyan Subramaniam

Strand 13: Coordinator Organized Paper Set: Students' Views of the Nature of Science
Room: Kent A

Presider: Lawrence C. Scharmann

Paper 1: *Teaching Nature of Science to K-2 Students: What Can They Gain From Instruction and What Influences Changes in Their Views?*
Valarie L. Akerson
Lisa A. Donnelly

Paper 2: *Correlating Students' Drawings of Scientists with Interview Data: Further Validation of E-DAST*
Donna L. Farlland
William F. McComas

Paper 3: *An Instrument to Assess Views of Scientific Inquiry: The VOSI Questionnaire*
Renee S. Schwartz
Norman G. Lederman
Judith S. Lederman

Equity and Ethics Committee Sponsored Workshop: How Identity and Cultural Frameworks Shape Access to and Appropriation of Science Literacy
Room: Dover A

Presider: Bryan Anthony Brown

Bryan Anthony Brown
Shawn Y. Holmes
Sanghee Choi
Crystal S. Gomillion
Edna Tan
Gillian U. Bayne

PM Break
2:00pm – 2:30pm

Session 2
2:30pm – 4:00pm

International Committee Sponsored Session: ESERA: The Impact of Science Education Reform in Europe
Room: Dover A

Presiders: Mei-Hung Chiu and Justin Dillon
Discussant: Manueka Welzel

Paper 1: *Relations Between Public Policy and the Research-Based-Design of Instructional Materials: Their Mutual Influences*
Andree Tiberghien

Paper 2: *Danish Science Municipalities—A Convergence of Science Education Research and Political Trends*
Jan Solberg

Paper 3: *A "Centre of Maths & Science Education" as a Specific Learning Site for Pupils, Pre- and In-Service Teacher and the General Public*
Franz Bogner

Paper 4: *Swiss National Standards—A Political Mandate to Researchers in Science Education*
Albert Zeyer
Marco Adamina
Francois Gingin
Peter Labudde

Strand 1: Symposium: Pedagogical Content Knowledge Development as Conceptual Change
Room: Essex B

Presider: Eva E. Toth
Discussant: Sandra K. Abell

Strand 2: Coordinator Organized Paper Set: Modeling Scientific Practices in Science Classrooms
Room: Laurel D

Presider: Alan Oliveira

Paper 1: *Identity and Science Education: Sociocultural Approach*
Ashraf Shady

Paper 2: *Meaningful Learning About Models and Modeling Using Authentic Chemical Practices as Contexts*
Gjalt T. Prins
Astrid M. W. Bulte
Albert Pilot

Paper 3: *Development of Senior High School Students' Modeling About Air Quality*
Li-Fen Lin
Ying-Shao Hsu

Hsin-Kai Wu
Fu-Kwun Huang

Paper 4: *Developing the Practice of Scientific Modeling through Classroom Discussions*
Ayelet Weizman
Yael Shwartz
David Fortus
Joe Krajcik

Strand 5: Coordinator Organized Paper Set: Reasoning and Assessment
Room: Essex A

Presider: Brett Merritt

Paper 1: *College Science Faculty's Assessment Practices: Trends From the National Study of Postsecondary Faculty*
Karleen R. Goubeaud

Paper 2: *Assessment-Informed Instructional Design to Support Principled Reasoning in College-Level Biology*
Gail Richmond
Joyce Parker
Mark Urban-Lurain
Brett Merritt
John Merrill
Ronald Patterson

Paper 3: *Principled Reasoning and Procedural Display in Undergraduate Biology Education: A Model for Assessment*
Christopher D. Wilson
Brett Merritt
Andy W. Anderson
John Merrill
Joyce Parker

Paper 4: *Understanding Undergraduate Students' Conceptions In Science: Using Lexical Analysis Software to Analyze Students' Constructed Responses in Biology*
Rosa A. Moscarella
Mark Urban-Lurain
John Merrill
Gail Richmond
Ronald Patterson
Joyce Parker

Strand 6: Coordinator Organized Paper Set: New Ways of Researching Field Trips
Room: Laurel C

Presider: Tali Tal

Paper 1: *Building a Quality Field Trip Teacher Survey Instrument*
Martin Storksdieck

Paper 2: *The Impact of Multiple Visits to an Informal Learning Facility on the Development of Interest in Science*
Pascal Guderian
Burkhard Priemer

Paper 3: *Using Personal Meaning Mapping to Assess Learning at a Natural History Museum*
Gary M. Holliday
Norman G. Lederman
Judith S. Lederman

Paper 4: *Best Practices for Field Days Assessment Tool*
Stephan P. Carlson
Joe Heimlich
Martin Storksdieck
Dawn Tanner

Strand 7: Symposium: Preservice K-8 Teachers' Developing Pedagogical Context Knowledge Within an Integrated Science and Education Continuum
Room: Kent B

Presider: Danielle J. Ford

Danielle J. Ford
Steve Fifield
Xiaoyu Qian
Deborah Allen
Richard Donham
Yovita Gwekwerere

Strand 7: Coordinator Organized Paper Set: Preservice Teachers' Perceptions of Science
Room: Kent C

Presider: John Tillotson

Paper 1: *Teachers' Classroom Attitude and Behavior and Their Effects on Students' Science Learning*
Tahsin Khalid

Paper 2: *Out-Of-School Learning-To-Teach Experiences as Support for Professional Identity Development: Impact of Facilitating an Inquiry-Based Camp*

Michael A. Occhino
April L. Luehmann

Paper 3: *The Impact of Pre-service Program Experiences on Early-Induction and Post-Induction Science Teachers' Epistemological Beliefs*
John Tillotson
Monica J. Young

Paper 4: *Future Elementary Teachers' Epistemological Beliefs and Views about the Nature of Science*
Charles B. Mamolo
N. Sanjay Rebello

Strand 8: Related Paper Set: Using the Communication in Science Inquiry Model to Facilitate Learning in Biology
Room: Dover B

Presider: Dale R. Baker

Paper 1: *Using the Communication in Science Inquiry Model to Facilitate Learning Biology*
Dale R. Baker
Elizabeth Lewis
Sibel Uysal
Senay Yasar-Purzer
Michael Lang
Perry Baker

Paper 2: *Measuring Short-Term Teacher Learning of Scientific Classroom Discourse Communities*
Elizabeth Lewis
Dale R. Baker
Senay Yasar-Purzer
Sibel Uysal
Michael Lang

Paper 3: *Teachers' Meaning-Making During Professional Development of Scientific Classroom Discourse Communities*
Sibel Uysal
Senay Yasar-Purzer
Dale R. Baker
Elizabeth Lewis
Michael Lang

Paper 4: *Teachers' Progress Towards a Modernist View of Nature of Science Communication*
Senay Yasar-Purzer
Sibel Uysal

Dale R. Baker
Elizabeth Lewis
Michael Lang

Strand 10: Symposium: PISA 2006: Results from an International Assessment of Scientific Literacy
Room: Essex C

Presider: Bruce G. Waldrip

Barry McCrae
Raymond J. Adams
Peter Fensham
Robert Laurie
Rodger W. Bybee
Manfred Prenzel

Strand 11: Coordinator Organized Paper Set: Implications of Identity for Science Teaching and Learning
Room: Laurel A

Presider: Angela Johnson

Paper 1: *Critical Science Literacy: Identifying Scientific Inscription in Lives of Resistance*
Matthew Weinstein

Paper 2: *Learning to Teaching Science: Negotiating Identity and Discursive Conflict in the Science Classroom*
Maria S. Rivera Maulucci

Paper 3: *Negotiating Respect and Learning in a Middle School Science Classroom*
Adriane M. Slaton
Howard M. Glasser
Angela Calabrese-Barton

Strand 12: Symposium: Learning Science Through Video Games
Room: Laurel B

Presider: Carolyn Parker

Leonard A. Annetta
Shawn Y. Holmes
James Minogue
Meng-Tzu Cheng

Strand 13: Coordinator Organized Paper Set: Historical/Contextual Perspectives on the Nature of Science
Room: Kent A

Presider: Renee S. Schwartz

Paper 1: *The Model Muddle: The Necessity of Epistemology for Learning Science*
Michael R. Matthews

Paper 2: *Genetics Instruction with History of Science: Nature of Science Learning*
Sun Young Kim
Irving E. Karen

Paper 3: *A Dispute on Colour Optics*
Helmut F. Mikelskis
Lutz Kasper

Session 3
4:15pm – 5:45pm

Committee Sponsored Session: How Can We Translate and Communicate our Science Education Research to Practice (RTP)?
Room:

Publications Advisory Committee
Presider: Barbara A. Crawford

Barbara A. Crawford
Carla Zembal-Saul
Sandra K. Abell
William Holliday
Julie Luft

Strand 1: Symposium: Investigating Dynamic Transfer in Multiple Contexts
Room: Essex B

Presider: Eva E. Toth

N. Sanjay Rebello
Edgar G. Corpuz
Jacquelyn J. Haynicz
Bijaya Aryal
Dyan McBride
Edward F. Redish

Strand 2: Coordinator Organized Paper Set: Building Science Identities and Student Achievement
Room: Laurel D

Presider: Anat Yarden

Paper 1: *How Girls and Boys Use Computers in Physics Classes*
Helga Stadler

Paper 2: *The Role of Identity and Motivation to Resolve Misconceptions*
Meena M. Balgopal

Paper 3: *An Investigation of Factors Associated with Students' Interest in Physics*
Hayati Seker
Aysegul Terzi

Paper 4: *The Effects of Different Science-Subject Achievements on Self-Concept in Science Learning - Are They Same for 8th Graders in Taiwan?*
Jen Tsung-Hau
Lee Che-Di
Chang Chun-Yen

Strand 5: Coordinator Organized Paper Set: Reasoning and Argumentation
Room: Essex A

Presider: Gail Richmond

Paper 1: *Scientific Reasoning Skills Development in an Introductory Biology Course Sequence for Undergraduates*
Melissa S. Schen

Paper 2: *Quality and Evolution of Students' Argumentation in Organic Agriculture Issue*
Shu-Mey Yu

Paper 3: *Examining Students' Scientific Arguments as a Consequence of Inquiry-Based Chemistry Experiences*
Aeran Choi
Brian Hand
Thomas Greenbowe

Paper 4: *Decision Making in Higher Education: A Probe into STES-Oriented Courses*
Uri Zoller
David Ben-Chaim
Orit Herscovitz
Azaiza Ibtisam

Strand 6: Coordinator Organized Paper Set: Learning from Underrepresented Learners in Informal Science Studies
Room: Laurel C

Presider: John Falk

Paper 1: *Gender Differences in Elementary School Students' Environmental Education*
Sarah J. Carrier
Anthony J. Guarino

Paper 2: *The Impact of Free-Choice STEM Experiences on Girls' Interest, Engagement, and Participation in Science Communities, Hobbies and Careers: Results of Phase 1*
Lynn D. Dierking
Dale McCreedy

Paper 3: *African American Parents' Perspectives of Informal Science: A Cultural Dimension*
Jamila R. Simpson
Eileen C. Parsons

Paper 4: *Free-Choice Family Learning in a Bilingual Marine Science Program: A Qualitative Investigation of Interactions and Long-Term Impacts Among Mexican-Descent Families*
Heidi I. Schmoock
Shawn Rowe

Strand 7: Coordinator Organized Paper Set: Approaches for Science Teacher Education I
Room: Kent B

Presider: Peter W. Hewson

Paper 1: *Does Completion of University Science Courses Affect the Spatial Ability of Preservice Elementary/Middle Teachers?*
Alice A. Black

Paper 2: *Conceptual Change in Pre-service Teacher Belief Structures-Through Japanese Lesson Study*
Brian S. Fortney
James P. Barufaldi

Paper 3: *Teaching Argumentation to Pre-Service Science and Technology Teachers: The Critical Thinking Group*
Peter W. Hewson
Maureen Robinson

Paper 4: *Investigation of Pre-service Teachers' Reasoning Abilities and Learning Approaches in Inquiry Based Learning Environment*
Sinan Ozgelen

Esme Hacieminoglu
Ozgul Yilmaz-Tuzun

Strand 7: Coordinator Organized Paper Set: Assessing Preservice Teachers' Knowledge
Room: Kent C

Presider: Kimberly A. Staples

Paper 1: *Persistent Misconceptions of Biological Concepts Among Preservice Teachers and 2nd Grade Students: The Power of Probing*
Kimberly A. Staples

Paper 2: *Relationship between Environmental Literacy and Background Characteristics of Teacher-Training Students- Implications for Training Programs*
Sara Peer
Daphne Goldman
Bela Yavetz

Paper 3: *Investigating the Pedagogical Content Knowledge of Pre-Service Elementary Teachers Concerning Models*
Susan A. Everett
Gail R. Luera
Charlotte A. Otto

Paper 4: *Design and Development of an Instrument to Assess Pedagogical Content Knowledge of Inquiry Science Teaching*
David Schuster
William W. Cobern
Brooks Applegate
Renee S. Schwartz
Adriana Undreiu
Paul Vellom

Strand 8: Coordinator Organized Paper Set: Fostering Content Knowledge and NOS
Room: Dover B

Presider: Kefyn M Catley

Paper 1: *Explicit Nature of Science Instruction: Can It Change In-Service Teachers' Perceptions of NOS?*
Monica J Macklin
April D Adams

Paper 2: *The Pedagogical Beliefs and Values of Physics Alternative Certification Teacher Candidates*
Kathleen A Falconer

Joseph L Zawicki

Paper 3: *Connecting Professional Development to Classroom Based Instruction*
Kimberly A Lebak
Norma Boakes

Paper 4: *Using a Concept Map to Guide Instruction: The Impact on Teachers' Understanding of Evolution.*
Susan Gomez-Zwiep
Shawn Y Holmes

Strand 10: Coordinator Organized Paper Set: Curriculum Implementation I
Room: Essex C

Presider: Douglas Huffman

Paper 1: *Fidelity of Implementation to Instructional Strategies as a Moderator of Science Curriculum Unit Effectiveness*
Carol O'Donnell
Sharon J. Lynch

Paper 2: *Middle School Science Curriculum: Coherence as a Design Principle*
Yael Shwartz
Ayelet Weizman
David Fortus
Joe Krajcik
Brian J. Reiser

Paper 3: *A Framework for Measuring Fidelity of Implementation of Science Instructional Materials*
Jeanne R. Century
Mollie Rudnick
Cassie Freeman
Debbie Leslie
Murat Kahveci
Andy Isaacs

Paper 4: *Measuring Fidelity of Implementation: Understanding "Critical Components" of Science Instructional Materials*
Mollie Rudnick
Jeanne R. Century
Cassie Freeman
Debbie Leslie
Murat Kahveci
David Beer

Strand 11: Symposium: Immigration, Culture, and Science Education in New York City
Room: Laurel A

Presider: Karen E Phillips

Wesley B. Pitts
Ashraf Shady
Gillian U. Bayne
Karen E. Phillips
Kenneth G. Tobin

Strand 12: Coordinator Organized Paper Set: Technology and Students' Conceptual Learning
Room: Laurel B

Presider: Diane Jass Ketelhut

Paper 1: *The Use of Internet-Based Instruction for the Development of Conceptions of and Approaches to Learning Science in a Physiology Class*
Jhy-Chong Liang
Chin-Chung Tsai

Paper 2: *The Application of the 3D Virtual Reality on Field Trip: Taking the Example of Hsiaoyukeng*

Ming Chao Lin
Chun-Yen Chang

Paper 3: *Promoting Middle-School Students' Spatial Perception of the Moon Phases with a Web-Based Module*
Meytal Hans
Yael Kali
Yoav Yair

Paper 4: *Virtual World, Real Impact: Gender, Race and The Use of a 3D Virtual World to Teach Concepts Around Water Quality*
Janice L. Anderson
Cindy Jong
Mike Barnett

Strand 13: Coordinator Organized Paper Set: Sociocultural Studies of the Nature of Science
Room: Kent A

Presider: Fouad Abd-El-Khalick

Paper 1: *Children's Practice of the Social Construction of Scientific Facts: Meta-Ethnographic Synthesis and Science Education Research*
James B. Cooper

Paper 2: *Student Predispositions Toward Understanding Evolutionary Concepts*
Ronald S. Hermann

Paper 3: *The Applicability of Science to Decision Making: Moral & Reflective Factors*
Sharon Dotger
Lisa Johnson
Benjamin H. Dotger

Paper 4: *Scientists, Profit-driven Science, and School Science*
John Bencze
Gervase M. Bowen
Maurice DiGiuseppe
Marijana Kanisek

Evening Events

Membership and Elections Committee Sponsored Session: Mentor-Mentee Nexus
6:00pm – 7:00pm
Room: Dover C

Presider: Mary M. Atwater

Brian Fortney
Laura Henriques
Julie Grady

Opening: Presidential Welcome Reception—All invited!
7:00pm – 9:00pm
Room: Harborside Ballroom

Monday, March 31st

NARST Committee Meetings
7:00 - 8:15am

Awards Committee Chairs and Co-Chairs Meeting
Room: Essex A

Equity and Ethics Committee Meeting
Room: Laurel A

External Policy and Relations Committee Meeting
Room: Laurel B

International Committee Meeting
Room: Essex B

Membership and Election Committee Meeting
Room: Laurel C

Program Committee Meeting
Room: Laurel D

Publications Advisory Committee Meeting
Room: Kent A

Research Committee Meeting
Room: Kent B

Ad hoc: History of Science Education Committee Meeting
Room: Kent C

Plenary Session 1
8:30AM – 10AM

Room: Grand Ballroom V & VI

Program Committee Sponsored Plenary 1: Marcia Linn --Keynote Speaker: *Science, Technology and Policy*

Presider: Penny J. Gilmer

Session 4
10:15AM – 11:45AM

Strand 1 & Strand 9 Combined: Interactive Poster Session
Room: Laurel B

Presider: Shawn Rowe

Strand 1
Paper 1: *Understanding the Relationship Between Learning and Forms of Representations by Analyzing Students' Mental Models of Atomic Structure*
Eun Jung Park

Paper 2: *Representational Tools for Teaching Science: Designing a Research-Based Approach*
Eva E. Toth

Paper 3: *A Comparison of Visual Representations of DNA Replication*
Michelle Cook
Eric N. Wiebe
Glenda Carter

Paper 4: *Teaching and Learning From a Representational Perspective: Insights From a Classroom Video Study*
Peter Hubber
Maria F. Haslam
Russell W. Tytler

Strand 9
Paper 1: Learning About Sound through Inquiry. A Study with 8th Grade Pupils
Monica L. Baptista
Ana M. Freire

Paper 2: Improving Our Practice: Teachers' Stories about Supported Collaborative Inquiry
Tamara D. H. Nelson
Keith Johnson
Charlotte Waters

Linda Lebard

Strand 1: Interactive Poster Session--Science Learning and Conceptual Change Poster Session
Room: Dover B

Presider: Vicente Talanquer

Paper 1: *Extending Grade One Student's Views of the Social Nature of Scientific Work Through the Use of Stories About Scientists*
Azza Sharkawy

Paper 2: *Peer Scaffolding and Transfer in the Context of Learning*
Bijaya Aryal
Dean A. Zollman

Paper 3: *Investigating Students' Ideas About Wavefront Aberrometry*
Dyan McBride
Dean A. Zollman

Paper 4: *Student Preconceptions of the Role of Pollination in the Plant Life Cycle*
Stephen M. Rybczynski
Elisabeth E. Schussler

Paper 5: *Christopher Columbus Discovers ... Magnetic Declination Changes! Improving Metaconceptual Knowledge with Learning About Change of Models and Historical Mistakes in Science*
Lutz Kasper
Helmut F. Mikelskis

Paper 6: *Understanding Middle School Students' Views of the Nature of Science: Perspectives from a Seventh Grade Classroom*
Jamie M. Chan
Kimberly D. Tanner

Paper 7: *Understanding Novices' Versus Experts' Conceptions About the Biological Basis of Learning and Memory*
Rebecca M. Fulop
Kimberly D. Tanner

Paper 8: *A Longitudinal Study of Elementary Students' Understandings of Lunar Concepts Related to Moon Phases*
Mark Guy
Tim Young

Paper 9: *Learning to Think about Gravity II: Aristotle, Newton, and Einstein*

Esther L. Zirbel
Claudine I. Kavanagh
Cary Sneider

Paper 10: *Investigating the Relationship Between Students' Motivation and Concept Learning in a Digital Learning Context*
Chung-Hsien Tseng
Hsiao-Lin Tuan
Chi-Chin Chin

Paper 11: *Relationship Between Students´ General and Theory-Specific Beliefs on the Nature of Science*
Kerstin Kremer
Detlef Urhahne
Juergen Mayer

Paper 12: *An Examination of Fifth- to Eighth- Grade Students' Understandings About Inquiry and Doing Inquiry*
Eunkyung Ko
Byoung-Sug Kim
Norman G. Lederman

Paper 13: Cross-*Cultural Analysis of Knowledge Structure Coherence and Understanding of Force*
Douglas Clark
Sharon Schleigh
Cynthia Dangelo
Gokhan Ozdemir
Helen Zhang
Edgar Corpuz

Strand 2: Interactive Poster Session--Theorizing and Modeling Inquiry

Room: Grand Ballroom Salon 1

Presider: Christopher Emdin

Paper 1: *High School Students' Understanding of the Distinction Between Scientific Theories and Scientific Laws*
Eun Ah Lee
Byeong-Geon Park

Paper 2: *"Maybe The Algae Was From The Filter": Theorizing 'Maybe' And Its Use By Young Children In Conversation*
Susan A. Kirch
Christina Siry

Paper 3: *Science as Argument-Driven Inquiry: The Impact on Students' Conceptions of NOS*
Victor D. Sampson
Jonathon Grooms

Paper 4: *Learning to Think Like Scientists with the PET Curriculum*
Valerie K. Otero
Kara Gray

Paper 5: *Elements of Online Inquiry: Integrating Inquiry With Content in an Online Chemistry Course for Teachers*
Mary V. Mawn
Kathleen S. Davis

Paper 6: *The Comparison of Scientific Creativity Levels Between Students and Teachers*
Anne Laius
Miia Rannikmäe

Paper 7: *The Planetarium as an Outdoor Learning Environment*
Ayelet Weizman
Nir Orion

Paper 8: *A Discourse-Based Analysis of Student Inquiry in Elementary Science Classroom: Examining Students' Mechanistic Reasoning, Analogical Reasoning, Argumentation and Scientific explanations*
Loucas T. Louca
Zacharias C. Zacharia
Aristos Evagorou

Paper 9: *The Influence of Prior Knowledge and Cognitive Load Theory on Instructional Design Principles*
Michelle Cook
Glenda Carter
Eric N. Wiebe

Paper 10: *Sixth Graders' Approaches to Maps and Mapping*
Angelica Reid-Griffin
Glenda Carter
Eric N. Wiebe
John Park
Susan Butler

Strand 3: Interactive Poster Session--Science Teaching at Primary School

Room: Laurel A

Presider: Valerie L. Talsma

Paper 1: *Elementary School Teachers' Learning of Science Content Through Teaching*
Brian E. Kinghorn

Paper 2: *Revisiting Elementary Teachers' Physical Science Conceptions After the No Child Left Behind Act*
Nazan U. Bautista

Paper 3: *Improving the Argumentation Skills of the Sixth Graders Through the Instruction of the Socioscientific Issues in Taiwan*
Shu-Sheng Lin
Po-Hung Huang

Paper 4: *Inquiry and Astronomy: Investigations in Celestial Motion*
Julia D. Plummer
Rebecca Rice

Paper 5: *Unpacking Sixth Grade Students' Mental Models of Popular Astronomy Concepts*
Dorian W. Janney
William Holliday

Paper 6: *Infusing Guided TAPing with a Socioscientific Issue in Science Teaching*
Chi-Chin Chin
Wei-Cheng Yang
Hsiao-Lin Tuan

Paper 7: *On the Nature of Teaching Nature of Science: Preservice Early Childhood Teachers' Instruction in Preschool and Elementary Settings*
Valarie L. Akerson
Cary A. Buzzelli
Lisa A. Donnelly

Paper 8: *Patterns in the Science Knowledge of Elementary Preservice Teachers Engaged in Inquiry Teaching*
Betty J. Young
Barbara Sullivan Watts
Robert Pockalny
Barbara L. Nowicki

Paper 9: *Puppets Promoting Reasoning and Argument Science*
Shirley Simon
Stuart Naylor
Brenda Keogh
Jane Maloney
Brigid Downing

Strand 4: Interactive Poster Session--Teaching Strategies, Assessment, and Technology
Room: Dover A

Presider: Melissa Luna

Paper 1: *Developing Assessments of Science Content Knowledge for Teaching*
Mark Olson

Paper 2: *Suggestion of a New Strategy to Teach Evolution*
Minsu Ha
Heeyoung Cha

Paper 3: *A Comparison of the Teaching Strategies for Problem Solving in Senior High School Physics*
Jang-Jeng Chern
Ming-Jun Su
Ming-Liang Lin
Shing-Ho Chiang

Paper 4: *Integrating FAM-WATA into Elementary School Natural Science and Technology Education: Analyzing the Benefits for Students with Different Cognitive Styles*
Chao Li Ling
Tang Xing Juan
Yen Chiung Fen
Wang Tzu Hua
Wang Wei Lung

Paper 5: *The Effect of Reflective Discussions Following Inquiry-Based Laboratory Activities on Students' Views of Nature of Science*
Hagop Yacoubian
Saouma B. BouJaoude

Strand 5: Interactive Poster Session--College Science Teaching and Learning
Room: Essex B

Presider: Peter Garik

Paper 1: *Misconceptions University Students Have in Astronomy*
Hyunju Lee

Paper 2: *Argumentation for the Future*
Emily J. Diefendorf
Gregory J. Kelly

Paper 3: *Does Computer-Based Animation Sequence Impact Student Understanding of the Model of Global Atmospheric Circulation?*
Daniel W. Harris
William Holliday

Paper 4: *Immediate Feedback From Videotaping to Increase Science Process Skills in General Chemistry Lab*
Dawne Taylor
Amy L. Rogers

Paper 5: *Influences on Undergraduate Physical Science Learners' Subject Decision Making*
Len R. Newton
Andy Noyes
Andy Clapham

Paper 6: *Biology Students' Ideas about Germs and Illness: An Exploratory Study of Conceptual Change*
Cheryl Berg
Stephanie Touchman
Muhsin Menekse

Paper 7: *Exploring the Relationships Between Epistemic Beliefs and Nature of Science in a College Biology Course*
Moon-Heum Cho
Deanna M. Lankford
Daniel J. Wescott
Deborah Cunningham

Paper 8: *Undergraduate Learning at the Interface of Mathematics and Biology*
Cynthia Passmore
Julia Svoboda
Carole Hom
Grosberg Rick

Paper 9: *Effects of Embedding Nature of Science Concepts in a College Level Physical Science Course*
Lisa M. Martin-Hansen
John Wilson
Joseph Placanica
Robert Gable

Paper 10: *Visual Physics: Using a Case Correlation Study to Inform Introductory Physics Course Design*
Cathy M. Ezrailson
Cathleen C. Loving
Peter L. McIntyre

Teruki Kamon

Strand 6: Interactive Poster Session--Beyond the Museum's Walls: Informal Science Across Contexts
Room: Kent B

Presider: Shawn Rowe

Paper 1: *Understanding Science (Fairs) in the News Media*
G. Michael Bowen
J. Lawrence Bencze
Elizabeth Sampson

Paper 2: *Evidence-based Explanation of High School Students in Natural History Museum*
JooHye Jung

Paper 3: *A Review of Measures of Student Concept Learning From Field trips to Informal Science Institutions*
William A. Watson

Paper 4: *Enhancing Science Understanding for Middle School Students Through Interactions With a Field Botanist*
Debby Peck
Karen S. Sullenger

Paper 5: *21st Century Community Learning Science Education Camp*
Andre M. Green
Phillip Feldman

Paper 6: *Responses to Traveling Do-It-Yourself Science Exhibits in Community Settings*
Leonie Rennie Rosemary S. Evans
Fiona E. Mayne

Paper 7: *Informal Settings for Learning and Achievement: Museums in Action*
Sandra T. Martell
Elizabeth Drame
Raquel Oxford

Paper 8: *A Cultural-Historical Activity Theory Perspective on Science Outreach Programs*
Nicole Arsenault
G. Michael Bowen
J. Lawrence Bencze
Bradley Tucker

Paper 9: *Involving Elementary Teachers in Informal Learning Experiences*
Nicholas Stroud

Megan Roberts
Jenny Ingber
Katherine Brown

Strand 7: Interactive Poster Session--Preservice Science Teacher Education

Room: Grand Ballroom Salon II

Presider: Meredith Park Rogers

Paper 1: *Learning and Teaching Science as Inquiry*
Hui-Ju Huang

Paper 2: *Investigating "Life in a Square": An Examination of Elementary Preservice Teachers' Understanding of Observation and Inference*
Meredith Park Rogers

Paper 3: *Contributions of the Mentor Teacher: Opportunities for Pre-service Science Teacher Learning During the Methods Semester*
Karen A. Travers
Christopher J. Harris

Paper 4: *Navigating the Bottleneck of Curriculum Planning: Exploring the Struggles in Planning the Pre-service Elementary Science Method Course.*
Hedy Moscovici
Irene Osisioma

Paper 5: *Validation of Mentoring for Effective Primary Science Teaching Instrument for a Turkish Sample*
Ozgul Yilmaz-Tuzun
Nurcan Turker

Paper 6: *Teacher-in-Residence Programs: Supporting Physics Teacher Education at the University and Beyond*
Marcia K. Fetters
Paul Hickman

Paper 7: *Giving Priority to Evidence in Science .....and History? How Preservice Elementary Teachers Make Sense of Evidence in Science and Social Studies Methods Courses.*
Leigh A. Haefner
Timothy D. Slekar

Paper 8: *Learning Physics by Listening to Children*
Danielle B. Harlow
Valerie K. Otero

Paper 9: *Preparing Secondary Science Teachers at the University of Arizona*
Ingrid Novodvorsky
Vicente Talanquer
Debra Tomanek

Paper 10: *BEST Model of Professional Development: Helping Science Intern Teachers to Meet the Needs at the Front Line*
Ming-Liang Lin
Ming-Jun Su
Jeng-Fung Hung

Paper 11: *Constructivist and Traditional Approaches to Teaching and Learning: Validation of Teacher Beliefs Survey*
Bugrahan Yalvac
Nurcan Turker
Ozgul Yilmaz-Tuzun

Strand 8: Interactive Poster Session--Facets and Issues of Professional Development
Room: Grand Ballroom Salon IV

Presider: Carla Johnson

Paper 1: *Context of Science Teachers' Learning: Inquiry-Based Teaching Practices of Beginning Science Teachers*
Abdulkadir Demir
Sandra K. Abell

Paper 2: *Does Change From Professional Development Programs Last? A Longitudinal Study of Sustained and Increased Science Teacher Improvement*
Carla Johnson
Jane B. Kahle
Jamison D. Fargo

Paper 3: *Community Advisory Panels in American Indian School Communities*
Rebecca M. Monhardt
Vessela K. Ilieva
James Barta
Kurt Becker

Paper 4: *Subject Mentors: Professional Development in a School-Based Mentor Training Program*
Tung-Hsing Hsiung
Wen-Hua Chang
Chao-Ti Hsiung

Ricy Chang

Paper 5: *Teachers' Burning Questions: Understanding Challenges That Science Teachers Face and Problem-Based Learning as a Framework to Support Teacher Researcher*
Meilan Zhang
Tom J. McConnell
Mary Lundeberg
Matthew J. Koehler
Jan Eberhardt

Paper 6: *The Impact of Teaching the Conceptual History of Physics as a Sequence of Models on the Understanding of the Nature of Science by Physics Teachers*
Charles Winrich
Andrew Duffy
Arthur Eisenkraft
Russ Faux
Luciana Garbayo
Peter Garik

Paper 7: *Building a Continuum of Practice: First Year Secondary Science Teachers*
Julie Luft
Gillian H. Roehrig
Krista Adams
Selcen Guskey
Sarah Hick
Jonah Firestone

Strand 10: Interactive Poster Session--Curriculum, Evaluation, and Assessment
Room: Dover C

Presider: Kimberly D. Tanner

Paper 1: *Plant Versus Animal Content in Elementary Science Textbooks*
Elisabeth E. Schussler

Paper 2: *Intended, Taught and Learned Curriculum: Student Learning Through a Problem-Based Environmental Health Science Curriculum*
Nam-Hwa Kang

Paper 3: *Tracking Students' Process of Learning*
Dorita A. Demetriou
Constantinos Korfiatis

Paper 4: *Collaborative Evaluation Communities in Urban Schools: Developing the Capacity of Teachers to Evaluate Science Programs*

Dana Atwood
Douglas Huffman

Paper 5: *Probing Middle School Students' Understanding of Ideas About Interdependence in Living Systems through Content-Aligned Assessment*
Kristen A. Lennon
George DeBoer

Paper 6: *Probing Middle School Students' Understanding of Ideas about Matter Transformations in Living Systems Through Content-Aligned Assessment*
Natalie S. Dubois
George DeBoer

Paper 7: *Developing a Two-Tiered Instrument with Confidence Levels for Assessing Students' Conceptions of Direct Current Circuits*
Saed Sabah
Xiufeng Liu

Paper 8: *The Nature of Scientific Thinking: Assessing How Students Respond to Lessons Designed to Develop Understanding of the Nature of Science and Modeling*
Amanda Heffner-Wong
Tina Grotzer
Lucy Morris

Paper 9: *Scaffolded Inquiry Curriculum for Science Learning*
Ying-Shao Hsu
Fang-Ying Yang
Meng-Jung Tsai

Paper 10: *Preliminary Use of an Assessment for Scientific Inquiry Creativity*
Michelle R. McCombs
Marco Molinaro
Ken Peterson
Richard Ponzio

Paper 11: *Innovating Science Curricular Materials for Future Citizenship- 3C-AIMS Project*
Yeong-Jing Cheng
Ying-Shao Hsu
Wen-Hua Chang
Tsung-Hau Jen
Shu-Fen Lin
Che-Di Lee

Strand 11: Interactive Poster Session--Diverse Learners and Teachers in Science Education
Room: Laurel C

Presider: Bhaskar Upadhyay

Paper 1: *Student Voice Matters: Using Student Feedback to Evaluate Curriculum in an After School Science Program*
Janell N. Catlin

Paper 2: *Dynamics of Successful Student Kinship Groups in a College Physics Class of Inner City High School Students*
Konstantinos Alexakos

Paper 3: *Highly Qualified Does Not Equal High Quality: A Study of Urban Stakeholders' Perceptions of Quality in Science Teaching*
Rommel J. Miranda

Paper 4: *An Analysis of the Association of Gender and Ethnicity with Departure from the Biology Major*
Sarah A. Lang

Paper 5: *Exploring Pakistani High School Student Understanding of Evolution*
Anila Asghar
Jason Wiles
Brian Alters

Paper 6: *Theory to Practice – Challenges and Successes Implementing an Inquiry-Based Science Curriculum with Diverse Learners and Its Impacts on Student Learning and Engagement*
Sybil S. Kelley
William G. Becker
Dalton Miller-Jones

Strand 11: Interactive Poster Session--Science Careers and Identity Issues in Science Education
Room: Essex A

Presider: Felicia M. Moore

Paper 1: *The Motivation and Perseverance of Women Science Students of Color*
Angela Johnson

Paper 2:: *Negotiating Pathways to Successful Science Careers: The Life Experiences of African-American Women*
Claudette Giscombe

Paper 3: *Positioning in the World of Science: A Look at Four Youths' Hybrid Identity Work Within and Beyond a Math and Science Upward Bound Program*
Jrene Rahm

Paper 4: *Teachers' Self-Identity and Conceptual Hurdles to "Science For All"*
Alejandro Gallard
Sherry A. Southerland

Paper 5: *Women in Undergraduate Physics, Chemistry, Mathematics, and Computer Science: How Can We Sustain Them Through Graduation?*
Barbara A. Burke
Dennis W. Sunal
Glenda Ogletree

Paper 6: *Science Teachers' Conflicts and Practices in Relationship Between Science and Religion: A Life-Historical Approach to Two Realms*
Hunkoog Jho
Miran Chun
Jinwoong Song

Paper 7: *A Look at Meaning-Making Inside Partnership Projects Among Scientists, Museums and Schools: Struggles, Confusions or Cocreations?*
Jrene Rahm

Strand 12: Interactive Poster Session--Technology in Science Classrooms

Room: Kent A

Presider: Christine G. Schnittka

Paper 1: *Using Educational Computer and Video Games in K-12 Classrooms to Promote Learning: A Critical Literature Review*
Janice L. Anderson

Paper 2: *Multimedia Learning in a Real Classroom*
Nathan Wood

Paper 3: *Investigating the Use of ThinkerTools to Promote Learning of Newton's Laws of Motion - A Case Study*
Han-Chin Liu
Hsueh-Hua Chuang

Paper 4: *Interactive Whiteboards: Beginning a Study on Their Impact in a Wholly Wireless / Laptop Classroom Environment*
Lyn C. Carter
Philip C. Clarkson

Paper 5: *Engineering in Health Care: A Multimedia Curriculum for Secondary Science Teachers*
Carolyn Parker
Taryn M. Bayles

Julia Ross

Strand 13: Interactive Poster Session--History, Philosophy, and Sociology of Science
Room: Essex C

Presider: Valarie L. Akerson

Paper 1: *Research and Development of Nature of Science-Explicit Curricular Materials-Pedagogy Perspective*
Sang-Chong Lieu
Wen-Ling Chen
Sufen Chen
Shu-Fen Lin
Mao-Tsai Huang
Tung-Hsing Hsiung

Paper 2: *Research and Development of Nature of Science-Explicit Curricular Materials for the Dissolving Unit*
Sufen Chen
Wen-Ling Chen
Shu-Fen Lin
Sang-Chong Lieu
Wen-Hua Chang

Strand 14: Interactive Poster Session--Environmental Issues
Room: Laurel D

Presider: Rita Anne Hagevik

Paper 1: *Students' Post-Ecological Discourse in a Secondary One SETS (Science-Technology-Society-Environment) Education*
Albert Zeyer

Paper 2: *Earth and Environmental Science Textbooks' Coverage of Secondary Students' Concepts of Global Warming*
Soyoung Choi
Dan P. Shepardson
Dev Niyogi
Umarporn Charusombat

Paper 3: *Precipitation, Evaporation, and Condensation: Student Conceptions of the Hydrologic Cycle*
Daniel P. Shepardson

Paper 4: *High School Students' and Science Teachers' Knowledge of the Socioscientific Controversies on Global Climate Change*
Virginie Albe

Paper 5: *Children's Ideas About Rare and Threatened Species: Implications for Teaching*
Demetra P. Hadjichambi
Konstantinos Korfiatis
Andreas Ch Hadjichambis

Paper 6: *Rhetorical Analysis of Global Warming and Other Socioscientific Issues in Popular News Media*
Daniel Dickerson
Craig Stewart
Rose Hotchkiss
Daniel Cutshaw
Julie Lambert

Strand 14: Interactive Poster Session--Environmental Education

Room: Kent C

Presider: Eleanor D. Abrams

Paper 1: *Using the Model of Ecological Values to Examine Stability of and Changes in Children's Environmental Perceptions over Time*
Bruce Johnson
Constantinos Manoli

Paper 2: *Science Teacher Learning of Ecological Concepts in an Online Biology Course*
Kathleen S. Davis
Mary V. Mawn

Paper 3: *Connecting Community Elders with Primary Schools in Africa Using Mobile Phones and Web 2.0 Technologies*
George E. Glasson
Micahael Evans

Paper 4: *Improving Science Education for Sustainable Development*
Michiel van Eijck
Wolff-Michael Roth

Paper 5: *"Who Polluted the Potomac?" The Translation and Implementation of an Environmental Story in Brazilian and Turkish Elementary Classrooms*
Alan Oliveira
Huseyin Colak
Valarie L. Akerson

Paper 6: *Science Teachers' Motivation for Encouraging Students to Promote Individual, Social & Environmental Wellbeing*
John Bencze
Steve Alsop
Jasodhara Bhattacharya
Michelle Beimers

Paper 7: *Factors Influencing Students' Ecological Actions Following Participation in an Earth Education Program*
Constantinos Manoli

NARST Business Meeting
Room: Grand Ballroom V &VI
12 – 12:30PM
Free box lunch for attendees who have registered for this event

Session 5
12:45PM – 2:15PM

Committee Sponsored Workshop: IESDOE Workshop: Preparing Research Grant Proposals for the Institute of Education Sciences
Room: Dover A

Elizabeth Albro

Strand 1: Related Paper Set: Representation and Learning in Science: Exploring Recent Perspectives from Cognitive Science
Room: Essex B

Presider: Eva E. Toth

Paper 1: ***Representation and Learning in Science: Exploring Recent Perspectives from Cognitive Science***
Vaughan Prain
Russell W. Tytler
Peter Hubber
Stephen P Norris

Paper 2: *Examining the Impact of Student Use of Multiple-Mode Representations on Argument Construction*
Brian Hand
Aeran Choi

Thomas Greenbowe
Jacob Schroeder
William Bennett
Stephen P. Norris

Paper 3: *Using Multi-Modal Representations to Improve Learning in Junior Secondary Science*
Bruce G. Waldrip
Vaughan Prain
James Carolan
Stephen P. Norris

Paper 4: *Pacific Crystal Project: Explicit Literacy Instruction Embedded in Middle School Science Classrooms*
Robert Anthony
Christine Tippett
Larry Yore

Strand 1: Coordinator Organized Paper Set: Naive Beliefs and Mental Models
Room: Laurel C

Presider: Anat Yarden

Paper 1: *On Constraints and Learning Progressions: The Case of "Structure of Matter"*
Vicente Talanquer

Paper 2: *The Challenges Ahead for Research and Development on Conceptual Change in Science*
Reinders Duit
David Treagust

Paper 3: *A Learning Progression for Apparent Celestial Motion*
Julia D. Plummer
Joe Krajcik

Paper 4: *Investigating the Influences of Mental and Model Based Teaching-Learning Sequences on Students' Learning in Electricity*
Jing-Wen Lin
Mei-Hung Chiu

Strand 2: Coordinator Organized Paper Set: Tutoring and Peer Guided Interactions in Science Education
Room: Grand Ballroom Salon IV

Presider: Gillian U. Bayne

Paper 1: *Science for All and Inclusion: Learning From Dion*

Michele Hollingsworth Koomen

Paper 2: *Metacognition and Affect in the Language of Chemistry Tutors*
Karen E. Phillips
Mya Marquis

Paper 3: *Learning From Young Experts. A Study of the Interplay Between Students and Young Experts in a Biology Lab*
Jesús Piqueras
Nadia Seneby
Karim M. Hamza

Paper 4: *What Are They Talking About? Lessons Learned From a Study of Peer Instruction Discourse*
Mark James
Federica Barbieri
Paula Garcia

Strand 2: Coordinator Organized Paper Set: Investigating Teacher Epistemologies and Practices
Room: Laurel D

Presider: Ann Rivet

Paper 1: *Student Learning in Problem-based Inquiry: From the Perspectives of Teachers*
Nam-Hwa Kang
Daniel Balls

Paper 2: *An Investigation of Level of Reasoning in Biology Teachers' Teaching Practices Through Argumentation*
Pelin Yalcinoglu
David Haury

Paper 3: *Using Preschool Science Activities to Impact Teaching Interactions and Learning Environments*
Liesel Copeland
Kathleen C. Haynie

Paper 4: *An Analysis of Teachers' Scientific Epistemological Views and Reactions to Incidents with Misconceptions*
Harika Ozge Arslan
Aylin Cam
Ceyhan Cigdemoglu
Omer Geban

Strand 4: Related Paper Set: Identifying Different Levels of Strategies in Model-Based Instruction

Room: Dover C

Presider: John Clement

Paper 1: *Six Strategy Levels for Model Based Teaching*
John Clement
John Gilbert

Paper 2: *Determining Effective Target Concepts and Learning Pathways*
Mary Anne Rea-Ramirez

Paper 3: *Anchoring Student Reasoning in Prior Knowledge: Characteristics of Anchoring Cases in a Curriculum*
A. Lynn Stephens
John Clement

Paper 4: *Co-Constructing Explanatory Mental Models in High School Physics: Comparing Ratios of Teacher/Student Participation*
E. Grant Williams
John Clement

Strand 4: Coordinator Organized Paper Set: Partnerships in Science Education

Room: Kent A

Presider: Angelica Reid-Griffin

Paper 1: *Investigating the Short-Term and Longitudinal Impact of Scientist-Teacher Partnerships on Middle and High School Science Teachers*
Loretta A. Kelley
Kimberly D. Tanner
Allison Busch

Paper 2: *Examining the Role of Teacher Partnerships in Science Education Research, Professional Development, and Teacher Learning*
Keisha Varma
Marcia Linn
Freda Husic

Paper 3: *The Influence of Service Learning in High School Science on Undergraduate Majors*
Vanessa L. Wyss
Christine Liu
Robert H. Tai

Strand 5: Coordinator Organized Paper Set: Life Sciences Methods of Instruction
Room: Essex A

Presider: Leslie Sandra Jones

Paper 1: *A Matter of Concern: Marginalizing the Voice of Reason(ing) in College Science Teaching*
Brett Merritt

Paper 2: *An Interaction Analysis of College Biology Laboratory Students' Discussion Board Contributions*
James H. Wandersee
William Holliday

Paper 3: *Cogenerative Dialogue: Improving Undergraduate Biochemistry Teaching and Learning*
Penny J. Gilmer
Mohammed Al-humiari
Donald D. Bratton

Paper 4: *Math Bench Biology Modules: Web-Based Math for All Biology Undergraduates*
Karen C. Nelson
Gili Marbach-Ad
Katerina V. Thompson
Patricia Shields

Strand 7: Related Paper Set: Preservice Elementary Teachers and Curriculum Materials
Room: Kent B

Presider: Cynthia Passmore

Paper 1: *Pre-Service Elementary Teachers' Appropriation of an Instructional Planning Framework*
Jennifer Cartier
Wendy M. Sink
Jeanetta L. Kochhar
Carla Zembal-Saul
Cynthia Passmore

Paper 2: *Preservice Elementary Teachers Learning to Use Science Curriculum Materials*
Kristin Gunckel

Paper 3: *Supporting Preservice Elementary Teachers' Critique and Adaptation of Science Curriculum Materials Using Two Types of Educative Supports*
Carrie Beyer
Elizabeth Davis

Paper 4: *Facilitating Preservice Teachers' Development of Professional Practice Through a Boundary Spanning Activity*
Beth A. Covitt
Christina Schwarz
Minjung Bae
Jamie Mikeska

Paper 5: *Planning and Teaching in Culturally Responsive Ways: Elementary Preservice Teachers' Integration of Multicultural Themes and Goals in Science Curriculum*
Felicia M. Moore

Strand 8: Symposium: Elementary Teachers Learning Science Content through Video Analysis of Practice: Impact of the STeLLA Program on Teacher and Student Learning
Room: Dover B

Presider: Kathy Roth

Paper 1: *Elementary Teachers Learning Science Content Through Video Analysis of Practice: Impact of the STeLLA Program on Teacher and Student Learning*
Nicole Wickler
Meike Lemmens
Kathy Roth
Kathleen Schwille
Catherine Chen
Sharon J. Lynch

Strand 8: Coordinator Organized Paper Set: Action Research as a Model of Teacher Professional Development
Room: Kent C

Presider: David Kanter

Paper 1: *Generating "Knowledge of Practice" in the Context of Science Education: Case Studies in Teacher Learning*
Karen C. Goodnough

Paper 2: *STSE (Science, Technology, Society, and the Environment): Interactions Between Policy, Curriculum Development, Social Justice Issues and Political Content Knowledge.*
Katherine Bellomo

Paper 3: *Action Research and Support Groups - An Induction Framework for Novice STEM Teachers*
Miri Barak
Shulamit Witenoff
Judy Dori

Paper 4: *Science Teacher Education in Place: A Participatory Action Research Approach*
Anne Fiona White
Sheliza Ibrahim
Steve Alsop

Strand 10: Coordinator Organized Paper Set: Curriculum Implementation II

Room: Essex C

Presider: Mollie Rudnick

Paper 1: *The Impact of State Testing Under NCLB on Elementary Science Curriculum*
Chris L. Miller

Paper 2: *What Influence Does Regularly Using a Hands-On Science Curriculum Have on State Standardized Science Test Scores?*
Scott A. Ashmann

Paper 3: *Creating Tightly Aligned Assessments That Measure Student Growth in Primary Science in the Realities of an Urban School District*
Sanlyn R. Buxner
Christopher J. Harris
Bruce Johnson

Strand 10: Coordinator Organized Paper Set: Assessment Development IV

Room: Grand Ballroom Salon 1

Presider: Barbara A. Crawford

Paper 1: *Impact of Portfolio Assessment on Student Learning in Physics*
Feral Ogan-Bekiroglu
Abdulkadir Gunay

Paper 2: *Embedded Assessment for Learning: Students' Views*
Shirley Miedijensky
Tali Tal

Paper 3: *A Computer-Based Instrument to Assess Understanding of the Concept of a Substance: Evidence from Rasch Analysis for Unidimensionality.*
Philip Johnson
Peter B. Tymms
Shaun P. Roberts

Strand 11: Symposium: Listening to Children: Understanding the Development of Everyday Expertise in Using Evidence, Keeping Healthy, and Understanding Scientific Practices
Room: Laurel A

Presider: Leah A. Bricker

Paper 1: *Listening To Children: Understanding The Development of Everyday Expertise in Using Evidence, Keeping Healthy, and Understanding Scientific Practices*
Philip Bell
Leah A. Bricker
Suzanne Reeve
Carrie Tzou
Heather Zimmerman
Richard A. Duschl

Strand 12: Coordinator Organized Paper Set: Students' Perceptions and Attitudes towards Technologies
Room: Laurel B

Presider: Leonard A. Annetta

Paper 1: *The Impact of Student Self-Efficacy on Scientific Inquiry Skills*
Diane Jass Ketelhut

Paper 2: *Students' Perceptions of the World Wide Web as a Research Tool in Science Learning*
Hanna Kim

Paper 3: *A Comparison of Self-Directed Learning in a Virtual World Environment to Traditional Science Teaching Methods*
Catherine I. Norton
Margaret D. Corbit
Luis Ormaechea

Paper 4: *Developing an Instrument to Assess Students' Online Information Anxiety in Inquiry-Based Science Learning*
Meng-Jung Tsai
Chien Chou
Ying-Shao Hsu
Fang-Ying Yang

Strand 14: Coordinator Organized Paper Set: Integrating Environmental and Teacher Education
Room: Grand Ballroom Salon II

Presider: Eleanor D. Abrams

Paper 1: *Na Pua O Maunalua: Transdisciplinary Literacies and Multiple Identities*
Pauline W. Chinn

Paper 2: *How Do People Make Decisions on Local Environmental Issues? Investigating Reasoning Modes of Elementary School Teachers in Taiwan*
Chuan-Shun Lin
Shiang-Yao Liu

Paper 3: *Environmental Education Professional Development Programs: Characteristics that Bring Positive Impacts*
Toni Sondergeld
Charles Rop
Andrea Milner

Paper 4: *Environmental Knowledge: What It Tells to Create Environmental Learning of Pre-Service Teachers in Turkey*
Gaye Teksoz Tuncer
Ceren Tekkaya
Semra Sungur
Jale Cakiroglu
Hamide Ertepinar

BREAK
2:15PM – 2:45PM

Session 6
3PM – 4:30PM

Program Committee Sponsored Workshop: Research on K-12 Science and Math Education at the National Science Foundation
Room: Dover A

Presider: Julia Clark

Joan Ferrini-Mundy
Julia V. Clark
David Hanych
Sharon Locke
Larry Suter

Strand 1: Coordinator Organized Paper Set: Scaffolding Learning
Room: Laurel C

Presider: Gail Jones

Paper 1: *Developing Students' Metacognition Through Realigning Their Views of the Nature of Chemistry Learning: An Activity Theory Perspective*
Gregory P. Thomas

Paper 2: *Progression in Grade 11 Students' Conceptions About the Aspects of the Particle Theory*
Emine Adadan
Kathy C. Trundle
Karen E. Irving

Paper 3: *Crossroads of Science and Mathematics: The Intersection of Scale and Proportional Reasoning*
Amy Taylor

Paper 4: *Impact of the Science Writing Heuristic as a Tool for Learning in Introductory Physics Laboratory*

Strand 1: Coordinator Organized Paper Set: Mixed Methods Studies of Conceptual Change
Room: Essex B

Presider: Catherine Milne

Paper 1: *The Role of Content Knowledge in General Chemistry Students' Understanding About Molecular Polarity*
Chia-Yu Wang
Lloyd H. Barrow

Paper 2: *Scaffolding Activities to Facilitate Student Modeling of Microscopic Friction*
Edgar G. Corpuz
N. Sanjay Rebello

Paper 3: *High School Students' Scientific Epistemological Beliefs, Cognitive Structures Regarding Nuclear Power Usage, and Their Informal Reasoning on the Debates of Nuclear Power Usage*
Ying-Tien Wu
Chin-Chung Tsai
Chun-Yen Chang

Paper 4: *Writing for Learning Science: What Cognitive Tools Can Do to Structure Online Writing of Biostories*

Stephen M. Ritchie
Donna L. Rigano
Louisa Tomas
Andy Yeh

Strand 1: New Poster Symposium: Learning Progressions for Environmental Science Literacy (Cross-Listed in Strand 14)
Room: Grand Ballroom Salon II

Presider: Julie Lambert

Paper 1: *Comparing Palestinian and American Students' Accounts of Water in Environmental Systems*
Hasan Abdel-Kareem
Charles W. Anderson

Paper 2: *Developing a Learning Progression for Energy in Environmental Systems*
Hui Jin
Charles W. Anderson

Paper 3: *Developing a K-12 Learning Progression for Carbon Cycling in Socio-Ecological Systems*
Jing Chen
Lindsey Mohan
Charles W. Anderson

Paper 4: *Developing a Learning Progression for Environmental Science Citizenship,*
Blakely K. Tsurusaki
Beth A. Covitt
Edna Tan
Charles W. Anderson

Paper 5: *Developing Progress Variables for the Carbon Cycle*
Karen Draney
Jinnie Choi
Yong-Sang Lee
Mark Wilson

Paper 6: *Learning Progressions for Environmental Science Literacy*
Charles W. Anderson
Joe Krajcik
Richard A. Duschl
Kristin Gunckel
Blakely K. Tsurusaki
Karen Draney

Paper 7: *The Development of a K-12 Learning Progression for Biodiversity in Environmental Systems*
Josie Zesaguli
Blakely K. Tsurusaki
Brook Wilke
Charles W. Anderson
Christopher D. Wilson

Paper 8: *A Learning Progression for Processes that Move Water through Socio-Ecological Systems*
Kristin Gunckel
Beth A. Covitt
Hasan Abdel-Kareem
Charles W. Anderson
Rebecca Dudek

Paper 9: *A Learning Progression for Processes that Alter Water Quality in Socio-Ecological Systems*
Beth A. Covitt
Kristin Gunckel
Hasan Abdel-Kareem
Charles W. Anderson
Rebecca Dudek

Strand 2: Coordinator Organized Paper Set: Exploring Learning Experiences and Achievement in Science Education
Room: Grand Ballroom Salon IV

Presider: Shari L. Britner

Paper 1: *Enabling Constraints: How Physics Olympics Competitions Can Create Meaningful Learning Experiences*
Rachel F. Moll

Paper 2: *How Do Misconceptions of Electrochemistry Identified in Interviews Enter Into Students' Reasoning in a More Authentic Setting?*
Karim M. Hamza
Per-Olof Wickman

Paper 3: *Context-Oriented Learning and Its Effects on Students' Achievement Levels in Chemistry Education*
Sabine Fechner
Marion Haugwitz
Angela Sandmann
Elke Sumfleth

Paper 4: *Content Linkage and Cumulative Learning in Chemistry and Physics*
Knut Neumann
Anna Lau
Hans E. Fischer
Elke Sumfleth

Strand 2: Coordinator Organized Paper Set: Science Discourse and Argumentation
Room: Laurel D

Presider: Brandon Emig

Paper 1: *Interpreting Student Learning Through Integrated Classroom-Field Trip Science Discourses in Kenya*
Samson M. Nashon
David Anderson

Paper 2: *Differences in the Ways More and Less Successful Groups Engage in Argumentation: A Case Study*
Victor D. Sampson
Douglas Clark

Paper 3: *The Nature of Student Discourse During the Generation of Argument*
Andy R. Cavagnetto
Brian Hand
Lori Norton-Meier

Paper 4: *Argumentation and Scientific Reasoning - An Exploration of Their Interrelationship*
Claudia von Aufschnaiter
Christian Rogge
Jan Fleischhauer
Tanja Riemeier

Strand 3: Symposium: Effects of Scaffolded Guided Instruction on Student Achievement in Elementary Science
Room: Grand Ballroom Salon 1

Presider: Kathryn S. Weisbaum

Paper 1: S-459-689: *Effects of Scaffolded Guided Instruction on Student Achievement in Elementary Science*
Rick Vanosdall
Michael Klentschy
Laurie Thompson
Kathryn S. Weisbaum
Larry V. Hedges

Strand 4: Related Paper Set: Large Scale Quality Development Projects in Science Education

Room: Dover C

Presider: Reinders Duit

Paper 1: *Systematic Reform of Science and Mathematics Education: Results from a Decade of Collaborative Efforts in Ohio*
Reinders Duit
Michael E. Beeth
Terry L. McCollum

Paper 2: *Raising the Quality of Science Teaching in Austria - The Project IMST2*
Helga Stadler
Konrad Krainer
Helmut Khnelt

Paper 3: *School Innovation in Science: A Viable Model for System Change?*
Russell W. Tytler

Paper 4: *Improving Science and Mathematics Instruction – The SINUS-Project as an Example for Reform as Teacher Professional Development*
Christian Ostermeier
Manfred Prenzel
Reinders Duit

Strand 5: Coordinator Organized Paper Set: STEM Recruitment and Course Reform
Room: Essex A

Presider: Bruce R Patton

Paper 1: *College Science Instructors' Views and Experiences of Curriculum Reform*
Hsiu-Ling Chen
Sufen Chen

Paper 2: *Examining the Impact of Critical Events on the Decisions of Science Undergraduates to Pursue Careers as Research Scientists*
Tina M. Roberts
Marcelle A. Siegel
Linda Blockus

Paper 3: *Attracting Undeclared College Students into STEM Majors Through Their Immersion into a Scientific Community of Practice*

Stephen R. Hale
Eleanor D. Abrams
Karen Graham
Barrett N. Rock

Paper 4: *Impact of Undergraduate Science Course Reform on Student Outcomes*
Dennis W. Sunal
Cynthia Sunal
Cheryl L. Mason
Dean A. Zollman
Corinne Lardy
Erika Steele

Strand 7: Symposium: Introducing Coteaching as an Important Element of Science Teacher Education
Room: Kent B

Presider: Colette Murphy

Paper1: *Introducing Coteaching as an Important Element of Science Teacher Education*
Colette Murphy
Jennifer Gallo-Fox
Karen Carlisle
Chris Siry
Kathryn Scantlebury
Kenneth G. Tobin

Strand 8: Symposium: Beginning/Newly Qualified Science Teachers: Guiding This Emerging Domain
Room: Dover B

Presider: Julie Luft

Julie Bianchini
Barbara A. Crawford
Betsy Davis
Julie Luft
Mark Olson
John Tillotson

Strand 8: Coordinator Organized Paper Set: Praxis and Views of Inquiry Teaching
Room: Kent C

Presider: Kathy Roth

Paper 1: *Improving Science Through Authentic Inquiry*
Nikki L. Hanegan
C. R. Nelson

Paper 2: *Preparing Elementary School Teachers to Integrate Inquiry Science Instruction and Language Development for English Language Learners*
Trish Stoddart
Sara E. Tolbert

Paper 3: *Lesson Study in Elementary School Science: Steps to Investigative Culture*
Martha H. Galganski
Tommie Y. Turner

Paper 4: *Infusing Inquiry Teaching into Classroom Practice: A Junior High School Science Teacher's Professional Development Experience*
Jun-Yi Chen
Huey-Por Chang
Chorng-Jee Guo
Wen-Yu Chang

Strand 9: Coordinator Organized Paper Set: Reflective Practice and Science Teacher Education I
Room: Laurel B

Presider: Jerine Pegg

Paper 1: *Engaging in Socioscientific Issues (SSI) Instruction: A Unique Resource for Science Teacher Reflection and Learning*
Robert M. Danielowich

Paper 2: *Attitudes and Behaviors of Teachers Exposed to Action Research*
Marianne B. Barnes
Lehman W. Barnes
Jerry Everhart

Paper 3: *Professional Development: The Role of Principals in Supporting Action Research*
Isha DeCoito
Erminia Pedretti
Derek Hodson
Maurice DiGiuseppe
Larry Bencze
Lisa Serebrin

Strand 10: Coordinator Organized Paper Set: Curriculum Implementation III

Room: Essex C

Presider: Jeanne R. Century

Paper 1: *Competing Horizons: Biology Instruction and No Child Left Behind*
Isaak Aronson

Paper 2: *Comparison of Curricular Emphasis on Inquiry and NAEP Science Scores*
John Murdock

Paper 3: *Scaling-Up a Middle School Motion and Forces Unit in a Large, Diverse School District: Results and Implications of a Quasi-Experiment*
William A. Watson
Curtis Pike
Sharon J. Lynch
Robert J. Ochsendorf

Paper 4: *Alignment Between the Physics Content Standard and Standardized Test: A Comparison Among US-NY, Singapore, and China-Jiangsu*
Xiufeng Liu
BaoHui Zhang
Ling L. Liang
Gavin Fulmer
Beaumie Kim

Strand 11: Coordinator Organized Paper Set: Investigating Culture and Learning

Room: Laurel A

Presider: Jon Saderholm

Paper 1: *Culturally-Sensitive Pedagogy in an Elementary Science Classroom: A Case Study of a Hmong Elementary Teacher*
Bhaskar Upadhyay

Paper 2: *Notes on Making STEM (Science, Technology, Engineering and Mathematics) Education a Culturally Transformative Tool for African Americans*
Jomo Mutegi
LaTasha R. Thompson
Julius Davis

Paper 3: *"It's Asking Me Like As If I Were the Mother…": Examining How Students From Different Cultural Groups Interpret Test Items*
Min Li
Guillermo Solano-Flores

Melissa Kwon
Shinping Tsai

Strand 13: Coordinator Organized Paper Set: Teachers' Views (or Understandings) of the Nature of Science
Room: Kent A

Presider: Mike U. Smith

Paper 1: *Exploring the Influence of an Argumentation-Based Science Content Course on Preservice Elementary Teachers' Views of Nature of Science*
Christine V. McDonald

Paper 2: *What 'Ideas-About-Science' Should Be Taught in School Science? A Chemistry Teachers' Perspective*
Mansoor Niaz

Paper 3: *Experienced Science Teachers' Talks on Teaching SSI: Exploration of Teachers' Personal Practical Knowledge*
Hyunju Lee
Hyunsook Chang

Paper 4: *Linking Progressive Development of Teachers' Understandings of Nature of Science and Scientific Inquiry with Progressive Development of Instructional Ability*
Norman G. Lederman
Judith S. Lederman
Kevin White

Strand 14: New Poster Symposium: Learning Progressions for Environmental Science Literacy (Cross-Listed in Strand 1)
Room: Grand Ballroom Salon II

Presider: Julie Lambert

Paper 1: *Comparing Palestinian and American Students' Accounts of Water in Environmental Systems*
Hasan Abdel-Kareem
Charles W. Anderson

Paper 2: *Developing a Learning Progression for Energy in Environmental Systems*
Hui Jin
Charles W. Anderson

Paper 3: *Developing a K-12 Learning Progression for Carbon Cycling in Socio-Ecological Systems*
Jing Chen

Lindsey Mohan
Charles W. Anderson

Paper 4: *Developing a Learning Progression for Environmental Science Citizenship,*
Blakely K. Tsurusaki
Beth A. Covitt
Edna Tan
Charles W. Anderson

Paper 5: *Developing Progress Variables for the Carbon Cycle*
Karen Draney
Jinnie Choi
Yong-Sang Lee
Mark Wilson

Paper 6: *Learning Progressions for Environmental Science Literacy*
Charles W. Anderson
Joe Krajcik
Richard A. Duschl
Kristin Gunckel
Blakely K. Tsurusaki
Karen Draney

Paper 7: *The Development of a K-12 Learning Progression for Biodiversity in Environmental Systems*
Josie Zesaguli
Blakely K. Tsurusaki
Brook Wilke
Charles W. Anderson
Christopher D. Wilson

Paper 8: *A Learning Progression for Processes that Move Water through Socio-Ecological Systems*
Kristin Gunckel
Beth A. Covitt
Hasan Abdel-Kareem
Charles W. Anderson
Rebecca Dudek

Paper 9: *A Learning Progression for Processes that Alter Water Quality in Socio-Ecological Systems*
Beth A. Covitt
Kristin Gunckel
Hasan Abdel-Kareem
Charles W. Anderson
Rebecca Dudek

Session 7
4:45pm – 6:15pm

Committee Sponsored Workshop: How Far We Have Come After Two Decades of Progress: A Re-Visitation to the Challenge of "Science For All Americans."
Room: Dover A

Presider: Kenneth G Tobin

Kenneth G Tobin
Alberto Rodriguez
Deborah Tippins
Wolff-Michael Roth
Cathy Zozakiewicz
Nancy Brickhouse

Strand 1: Coordinator Organized Paper Set: Examining Beliefs and Understandings in Science
Room: Essex B

Presider: Claudia von Aufschnaiter

Paper 1: *A Learning Progression for Understanding the Context, Cyclic Nature, and Timescales Associated With the Rock Cycle*
Molly L. Yunker

Paper 2: *Learning to Think about Gravity I: From Aristotle to Newton*
Claudine I. Kavanagh
Esther L. Zirbel
Cary Sneider

Paper 3: *Using Formative Assessment to Promote Conceptual Change*
Yue Yin
Miki K. Tomita
Richard J. Shavelson

Paper 4: *Effectiveness of a Learning Pathway Based on Model Construction and Criticism Theory*
Maria C. Nunez-Oviedo
Rosa Catalan
Juan Godoy
Sergio Rojas

Strand 2: Symposium: Using Evidence: Students' Abilities and Needed Support
Room: Laurel D

Presider: Barbara Ladewski

Paper 1: *Using Evidence: What Are Students Able To Do, And How Do We Best Support Them Across Elementary, Middle, And High School?*
Carrie Beyer
Barbara Hug
Lisa Kenyon
Leema Kuhn
Katherine McNeill
Ted Willard

Strand 2: Coordinator Organized Paper Set: Learning from Shared Experiences and Discourse in Science Education
Room: Grand Ballroom Salon IV

Presider: Obed Norman

Paper 1: *Making Meaning of Shared Experiences Using Cogenerative Dialogues*
Gillian U. Bayne

Paper 2: *Effects of Computer Simulation on English Language Learners' Science Learning*
Kihyun Ryoo

Paper 3: *Orchestrating Productive Discussions: A Study of Dialogic Exchange in Science Classrooms*
Lindsey Mohan

Paper 4: *Exploring Students' Dialogue with Evolution and the Influence of their Questions in the Teacher's Discourse*
Marina Lima-Tavares
Eduardo F. Mortimer
Maria Pilar
Jimenez Aleixandre

Strand 3: Coordinator Organized Paper Set: Professional Development of Inservice Primary Teachers
Room: Grand Ballroom Salon 1

Presider: Mark Guy

Paper 1: *The Effects of a Science Teaching Intervention on Elementary Teachers' Beliefs About Science Teaching*
Cynthia Lundeen

Diana C. Rice
Sibel Kaya

Paper 2: *Pedagogical Content Knowledge for Teaching the Nature of Science: A Study of Teachers Effective in Impacting Students' Views*
Deborah Hanuscin
Michele H. Lee
Valarie L. Akerson
SOMETHING SEEMS WRONG WITH TITLE ABOVE

Paper 3: *Doing the Work of Reform: Teachers' Narratives of Hard-Won Accomplishments*
Julie Haun-Frank
Sue C. Kimmel
Heidi Carlone
Margaret Vaughn

Paper 4: *Getting the Big Picture: The Impact of a Summer Workshop on Teachers' Views of Scientific Inquiry, Nature of Science and Classroom Interaction*
Khemmawadee Pongsanon
Alan Oliveira
Valarie L. Akerson
Abdulkadir Genel
Huseyin Colak

Strand 4: Symposium: Popularity and Relevance of Science Education and Scientific Literacy - The PARSEL Project in Europe
Room: Dover C

Presider: Wolfgang K. Graeber

Paper 1: S-767-805: *Popularity and Relevance of Science Education and Scientific Literacy - The PARSEL Project in Europe*
Wolfgang K. Graeber
Claus Bolte
Jack Holbrook
Avi Hofstein
Martin Lindner
Claus Michelsen

Strand 4: Coordinator Organized Paper Set: Teacher/Teaching Comparisons
Room: Kent A

Presider: Saouma B. BouJaoude

Paper 1: *A Study of the Science Inquiry Learning Environments Created by National Board Certified Teachers*
Jon Saderholm

Paper 2: *Describing and Comparing Mathematics and Science Teaching: Subject Culture Under the Microscope*
Linda M. Darby

Paper 3: *Understanding First-Time Enactment of Environmental Decision-Making: Lessons for the Support of Teachers and Design of Professional Development*
Richard J. Vath
Anna Switzer

Paper 4: *Experienced and Novice Teachers' Concepts of Scale*
Gail Jones
Thomas R. Tretter
Amy Taylor
Tom Oppewal

Strand 5: Coordinator Organized Paper Set: Conceptual Reasoning and Development
Room: Essex A

Presider: Kristy L. Halverson

Paper 1: *Analysis of Learning Progressions Using Classification Tasks: Application to the Intermolecular Forces Concept*
Marilyne Stains
Vicente Talanquer

Paper 2: *The Metacognition of College Science Students*
Janice M. Bonner
William Holliday

Paper 3: *The Impact of Undergraduate Research Experiences on the Graduate Student /Postdoctoral Fellow Mentor*
Deborah Johnson
Kathryn A. Smith
Erin L. Dolan

Paper 4: *Enhancing Undergraduate Students' Nano-literacy Through an Instructional Module*
Denise L. Drane
Su Swarat
Eun Jung Park
Kathy Chen
Thomas Mason

Strand 6: Coordinator Organized Paper Set: Tracking Conceptual Change in Informal Science
Room: Laurel C

Presider: Lynn D. Dierking

Paper 1: *Changes in Children's Conceptions of Nature Following a Residential Environmental Education Experience*
Bryan M. Rebar

Paper 2: *Uncovering Visitor Conceptions of Fossils and the Fossil Record*
James F. Kisiel
Jeanine Ancelet

Paper 3: *Visitors' Geological Conceptions and Meaning Making at Petrified Forest National Park*
Nievita F. Bueno Watts
Steven Semken
Monica Pineda
Cheryl Alvarado

Paper 4: *Science Learning in a Leisure Setting*
John Falk
Martin Storksdieck

Strand 7: Coordinator Organized Paper Set: Examining Teacher Education/Certification Programs I
Room: Kent B

Presider: Robert D. Sherwood

Paper 1: *Hybrid Coursework in Teacher Preparation: Teacher Education's Structural Response to Increased Demand for Highly Qualified Science Teachers*
Brian C. Baldwin

Paper 2: *Factors Underling Decisions to Pursue Alternative Routes to Secondary Science Certification*
Fouad Abd-El-Khalick

Paper 3: *Recent Policy Documents with Implications for STEM Teacher Education and Research*
Robert D. Sherwood

Paper 4: *Landscape Baseline Data in a Large Scale Science Teacher Preparation Model*
J Randy McGinnis
Marbach-Ad Gili
Dantley J. Dantley

Benson Spencer
Amy Dai
Rebecca Pease

Strand 8: Coordinator Organized Paper Set: Aspects of Learning in Professional Learning Communities
Room: Dover B

Presider: Kate Popejoy

Paper 1: *An Analytical and Interpretive Framework for Examining Social Interactions in Professional Learning Communities*
Hui Jin
Gail Richmond

Paper 2: *Conditions for Collaborative Knowledge Construction of Inservice Science Teachers in Problem-Based Professional Development*
Meilan Zhang
Mary Lundeberg
Tom J. McConnell
Matthew J. Koehler
Jan Eberhardt

Paper 3: *Inquiry into Practice: How Teachers Learn to Engage Their Students in Model-Based Reasoning*
Cynthia Passmore
Connie Hvidsten
Lin Xiang
Arthur Beauchamp
Wendell Potter
Hedman Rich

Paper 4: *Teachers' Collaborative Inquiry: Making Sense of Classroom-Based Data*
Tamara D. H. Nelson
Angie Foster
David Slavit
Anne Kennedy
Wendi Laurence

Strand 8: Related Paper Set: Studies on Teacher Professional Development
Room: Kent C

Presider: Silke Mikelskis-Seifert

Paper 1: *Can a Learning-Process Oriented Training of Physics Teachers Using Video-Feedback Alter Teachers' Subjective Beliefs?*
Rainer Wackermann
Georg Trendel
Hans E. Fischer

Paper 2: *Studies on Video-Based Physics Teacher Professional Development*
Claudia Kastens
Reinders Duit
Manfred Lehrke

Paper 3: *Physics Teacher Professional Development in the Program 'Physics in Context'*
Silke Mikelskis-Seifert
Reinders Duit

Paper 4: *Do Teacher In-Service Training Courses Have an Impact on Teachers' Conceptions of Teaching and Learning and on Students' Understanding in Primary Science?*
Thilo Kleickmann
Kornelia Miller

Strand 10: Coordinator Organized Paper Set: Curriculum Reform
Room: Essex C

Presider: Brian J. Reiser

Paper 1: *Teachers' Perceived Meanings of Their New Curriculum Reforms: Lessons from One School District in South Africa*
Bongani D. Bantwini

Paper 2: *Enactment Indicators of Reform Outcomes in Science Textbooks: An Holistic Look*
Ajda Kahveci

Paper 3: *Under Cultural Conflict: Change of the Teacher Discourses About Taiwanese Curriculum Reform*
Yun-Ping Ge
Huey-Por Chang
Kuo-Hua Wang

Paper 4: *Characterizations of Inquiry: Science Teachers' Descriptions of Curriculum Reform*
Ann Rivet
Mary Petzoldt
Jenny Ingber
Jessica F. Riccio

Strand 11: Symposium: Pathways to New Possibilities: Creolized Science, Solidarity, and Hybrid Identities

Room: Laurel A

Presider: Rowhea Elmesky

Paper 1: *Pathways to New Possibilities: Creolized Science, Solidarity, And Hybrid Identities*
Rowhea Elmesky
Gale Seiler
Christopher Emdin
Lisa Singletary
Wesley B. Pitts

Strand 12: Coordinator Organized Paper Set: Technologies as Tools for Teaching and Learning
Room: Laurel B

Presider: Susan A. Yoon

Paper 1: *Instructional Strategy Enhancing Learners' Sense Toward Online Classroom Community*
Ruey S. Shieh

Paper 2: *Educational Software Evaluation Scale: The Study of Validity and Reliability*
Yilmaz Kara

Paper 3: *Students Becoming Information Technology Fluent: Technology-Embedded Environmental Research Studies*
Jazlin Ebenezer
Osman Kaya
Dionysius Gnanakkan

Paper 4: *A Collaborative Support Tool for Problem-Solving Ability: Idea Storming Cube*
Chun-Chieh Huang
Chun-Yen Chang
Tsai-Yen Li
Hao-Chuan Wang

Strand 14: Symposium: Intersection of the Influence of Schooling, Culture, and Nature on the Motivation of Hawaiian and Taiwanese Indigenous Children
Room: Grand Ballroom Salon II

Presider: Rita Anne Hagevik

Paper 1: *The Intersection of The Influences of Schooling, Culture And Nature on The Motivation of Hawaiian and Taiwanese Indigenous Children*
Eleanor D. Abrams
Chuing-Fen Yen

Larry Yore
Pauline W. Chinn
Huei Lee
Erica Blatt

Evening Events

Membership and Elections Committee-Sponsored Graduate Student Forum
Room: Dover C
6:30PM – 7:30PM

Journal of Research in Science Teaching Editorial Board meeting
Room: Grand Ballroom IX
6:30PM – 8:30PM

Electronic Journal of Science Education **Reception**
Room: Grand Ballroom VII & VIII
6:30PM – 8:30PM

Tuesday, April 1st

NARST Committee Meetings
7am – 8:15am

NARST Outstanding Paper Award Selection Committee Meeting
Room: Essex A

Equity and Ethics Committee Meeting
Room: Laurel A

External Policy and Relations Committee Meeting
Room: Laurel B

International Committee Meeting
Room: Essex B

Membership and Election Committee Meeting
Room: Laurel C

Program Committee Meeting
Room: Laurel D

Publications Advisory Committee Meeting
Room: Kent A

Research Committee Meeting
Room: Kent B

Ad hoc: History of Science Education Committee Meeting
Room: Kent C

Outstanding Doctoral Research Award Selection Committee
Room: Essex C

JRST Award Selection Committee
Room: Dover A

Early Career Research Award Selection Committee
Room: Dover B

Distinguished Contributions in Research Award Selection Committee
Room: Dover C

Ad Hoc: Teacher as Researcher Committee Business Meeting
Room: Grand Ballroom Salon I

Session 8
8:30am – 10am
Publications Advisory Committee Sponsored Session: Publication in the Journal of Research in Science Teaching
Room: Dover A

Presider: Barbara A. Crawford

J. Randy McGinnis
Angelo Collins

External Policy and Relations Committee Sponsored Session: Taking Action--What Can NARST Members Do To Inform Policymakers and the Public-At-Large?
Room: Grand Ballroom Salon IV

Presider: Catherine Milne

Jodi Peterson
Lynn A. Bryan

Strand 1: Coordinator Organized Paper Set: Inquiry and Design
Room: Essex B

Presider: Gregory P. Thomas

Paper 1: *Utilizing Contrasting Cases to Target Science Reasoning and Content in a Design-for-Science Unit*
Eli M. Silk
Christian D. Schunn

Paper 2: *Fifth Grade Students' Understandings About Inquiry and Doing Inquiry*
Eunkyung Ko
Norman G. Lederman

Paper 3: *Skills and Levels of Students' Inquiry Competence in Lower Secondary Biology Education (Grade 5-10)*
Andrea Moeller
Christiane Grube
Juergen Mayer

Paper 4: *A Cross-Analysis for High-School Students' Personal Epistemology and Understanding About Inquiry*
Fang-Ying Yang
Ying-Shao Hsu
Meng-Jung Tsai

Strand 2: Symposium: Reading Scientific Texts: Adapting Primary Literature for Promoting Scientific Literacy

Room: Laurel D

Presider: Stephen Ritchie

Linda M. Phillips
Anat Yarden
Hedda Falk
Stephen P. Norris
Maria Pilar Jimenez Aleixandre
Danielle J. Ford

Strand 3: Related Paper Set: Preservice, Beginning, and Inservice Elementary Teachers: Issue Related to Effective Elementary Science Teaching
Room: Grand Ballroom Salon 1

Presider: Katherine McNeill

Paper 1: *A Comparison of Field and University Based Science Methods Courses' Impact on Preservice Teacher's View of How Students Learn Science*

Anne P. Gatling
Katherine McNeill
Dean Martin
Michael Barnett

Paper 2: *Classroom Inquiry Style and Its Influence on Preservice Elementary Teachers' Science Teaching Practice*
Annmarie R. Ward
Carla Zembal-Saul

Paper 3: *Beginning Elementary Teachers' Learning to Use Questions and Questioning in Inquiry-Oriented Science Teaching: A Longitudinal Study*
Cory T. Forbes
Elizabeth Davis

Paper 4: *A Professional Development Program for In-Service Elementary Teachers: Supporting Curriculum Planning and Enactment Grounded in the Psychological Tools of Science*
Wendy M. Sink
Jennifer Cartier

Strand 4: Symposium: Hominid Evolution: Theory, Facts, and 'Tales' from the Field
Room: Dover C

Presider: Norman F. Thomson

Hominid Evolution: Theory, Facts, and 'Tales' From the Field
Norman F. Thomson
Jennifer Adams
Sam Odell
Seri Chapman
David Jackson
Jacque Magner

Strand 4: Coordinator Organized Paper Set: Teachers' Beliefs and Interactions
Room: Kent A

Presider: SueAnn I. Bottoms

Paper 1: *The Influence of Beliefs, Knowledge and Goals on the Implementation of Literacy Strategies in the Science Classroom*
Kirsten K. Mawyer
Daniel C. Edelson

Paper 2: *The Analysis of Instructional Variations Among Chemistry Teachers*

Soonhye Park
J. Steve Oliver

Paper 3: *Teachers' Pedagogical Beliefs About SSI and Scientific Literacy in Israel*
Lea Segal
Dana L. Zeidler
Ariel Cohen

Paper 4: *Content Knowledge for Teaching as Reflected in Teacher-Student Interactions: Two Video Case Analyses*
Alicia C. Alonzo
Mareike Kobarg
Tina Seidel

Strand 5: Coordinator Organized Paper Set: Methods of Earth Science Instruction
Room: Essex A

Presider: Kate Popejoy

Paper 1: *Earth Science Teachers' Perceptions of Autonomous Informal Education Assignments in a Nationwide Online Paleontology Course*
Renee M. Clary
James H. Wandersee

Paper 2: *Using Geologic Time Inquiry-Based Activities to Enhance Student Learning in the Introductory Geoscience Labs*
Iris M. Totten
Mo Morse

Paper 3: *Geologic Problem Solving in the Field: Insights into Student Problem Solving Strategies Through Analysis of Field Navigation*
Eric M. Riggs
Russell Balliet
Christopher C. Lieder

Paper 4: *Should "Proof" and "Truth" Be Targeted First? Evidence for Addressing Some Nature of Science Concepts and Misconceptions Earlier Than Others*
Joanne K. Olson
Michael P. Clough
David Vanderlinden

Strand 6: Coordinator Organized Paper Set: Out of School Contexts
Room: Laurel C

Presider: David Anderson

Paper 1: *Scientific Literacy: College Students' Evaluations of Media Reports*
Connie A. Korpan

Paper 2: *A Study of Sixth Graders'¦ Creativity and Problem-solving Ability Through Othello Games*
Wanchu Huang
Huei-Huei Lin

Paper 3: *A Link between Science and Life: An Evaluation of Everyday Science Class*
Mijung Kim
Heesook Yoon
Youngrae Ji
Jinwoong Song

Paper 4: *SPARK! Igniting Student Interest in STEM Through Engineering Design*
Jennifer Chidsey Pizzo
Rashmi Kumar
Wendy Green
Susan A. Yoon

Strand 7: Coordinator Organized Paper Set: Preservice Teachers' Problems of Practice and Rethinking Teacher Education Approaches
Room: Kent B

Presider: Steven F. Tuckey

Paper 1: *Enacting Systems Thinking in Science Education*
Anna Lewis

Paper 2: *Exploration of Korean Preservice Elementary Teachers' Science Teaching-Anxiety and Science Teaching-Efficacy*
Sung-Youn Choi
Sung-Won Kim

Paper 3: *Framing Future Discussions and Research on Science Literacy*
Steven F. Tuckey
Charles Anderson
Kelly M. Merritt
Hosun Kang
Mark Conley

Paper 4: *Understanding Science Teacher Candidates' Views of Problems of Practice: Scientific Literacy and Students*
Hosun Kang
Charles W. Anderson
Steven F. Tuckey
Kelly M. Merritt
Mark Conley

Strand 8: Coordinator Organized Paper Set: From Learning to Teaching Science
Room: Kent C

Presider: Kevin Carr

Paper 1: *Capitalizing on Teacher Expertise: Contemplating Transfer From Professional Development to the Classroom Through Effective Use of Pedagogical Contexts*
Andrea Gay

Paper 2: P-607-372: *From Learning Science to Teaching Science: What Transfers?*
Danielle B. Harlow

Paper 3: *Professional Development in Practice*
Victoria M. Deneroff

Paper 4: *Do Middle School Teachers Integrate Content They Learn in a Physical Science Distance Learning Course into Their Instruction?*
Rebecca McNall Krall
Joe P. Straley
Sally A. Shafer
Kelly D. Bradley
Jessica D. Cunningham
Jeffrey L. Osborn

Strand 8: Symposium: Exploring the First Year of Teaching in Secondary Science Classrooms
Room: Dover B

Presider: Gillian H. Roehrig

Exploring the First Year of Teaching in Secondary Science Classrooms
Julie Luft
Gillian H. Roehrig
Jennifer Neakrase
Jonah Firestone
Allison Kirchhoff
Selcen Guskey

Strand 10: Coordinator Organized Paper Set: Assessment Development I
Room: Essex C

Presider: George DeBoer

Paper 1: *Students' Competence of Argumentation*
Nicola Mittelsten Scheid
Corinna Hößle

Paper 2: *Using Concept Cartoons as a Formative Assessment and Learning Tool in Science*
Christine Chin
Lay-Yen Teou

Paper 3: *The Effects of Portfolio Assessment on Student Outcomes in Chemistry*
Jeffrey S. Carver
William J.F. Hunter

Strand 11: Symposium: Perspectives of Scholar Activism, Pragmatism, and Orchestration in Science Education
Room: Laurel A

Presider: Adam Johnston

Perspectives of Scholar Activism, Pragmatism, and Orchestration in Science Education
Adam Johnston
John Settlage
David Moss
Heidi Carlone

Strand 12: Coordinator Organized Paper Set: Learning with Technologies
Room: Laurel B

Presider: Yilmaz Kara

Paper 1: *Integrating Physics and Math Through Microcomputer-Based Labs (MBL): Effects on Discourse Type and Quality and Mathematization*
Saouma B. BouJaoude
Murad E. Jurdak

Paper 2: *The Connected Classroom: Physical Science Case Studies*
Karen E. Irving
Vehbi A. Sanalan

Melissa L. Shirley

Paper 3: *Unraveling the Influence of Haptic Feedback on Students' Learning about Levers*
Eric N. Wiebe
M. Gail Jones
James Minogue
Jennifer Cowley
Denise Krebs

Strand 14: Coordinator Organized Paper Set: Environmental Education in Elementary School Settings
Room: Grand Ballroom Salon 11

Presider: Rita Anne Hagevik

Paper 1: *An Urban Elementary Teacher's Experience Surrounding Her Students' Participation in an Outdoor Environmental Science Field Trip*
Peggy L. Preusch

Paper 2: *Back in the Classroom: Teacher Influence on Students' Environmental Understandings, Perceptions, and Actions Following an Earth Education Program*
Lisa Felix
Bruce Johnson

Paper 3: *A Case Study of NatureWatch within an Elementary School: Schools, Teachers, Students, and Community Based Monitoring (CBM)*
Douglas Karrow
Xavier Fazio

Paper 4: *Examining Elementary Students' Understanding of Farming and Food Growing Related Issues*
Oksana Bartosh
Jolie Mayer-Smigh
Linda Peterat

BREAK

10AM – 10:30AM

Program Committee Sponsored Plenary 2: Peter Fensham--Keynote Speaker
Science Education Research and Science Education Policy: A Too Often Overlooked Link

Presider: Charlene Czerniak

Room: Grand Ballroom V & VI
10:30AM – 12 NOON

Awards Luncheon

Room: Grand Ballroom VII & VIII

12 NOON – 1:45 PM

Session 9

2pm – 3:30pm

International Committee Sponsored Session: Reforms in Science Education in Different Countries
Room: Dover A

Presider: Mei-Hung Chiu

David Treagust
Uri Zoller
Christine Chin
Avi Hofstein
Gilberto Alfaro-Varela

Strand 1: Related Paper Set: Effect of Model-Based Physics Instruction on the Development of Problem Solving and Metacognitive Strategies
Room: Essex B

Presider: Esther L. Zirbel

Paper 1: *The Effect of Model-based Physics Instruction on the Development of Problem Solving and Metacognitive Strategies*
Kathy Malone

Paper 2: *The Impact of a Modeling Based Ninth Grade Physics Curriculum on Scientific Reasoning and Mathematics Concepts*
Anita Schuchardt
Kathy Malone
Bill Diehl
Kamille Harless

Dudley Parr
Robert McGinnis

Paper 3: *How Mathematical Literacy Impacts Inquiry in Physics*
Doug Vallette
Nanette Dietrich

Paper 4: *Adapting to Modeling Instruction over Time*
Jeff Saul
Lloyd Kramer
D. Jones
Eric Brewe
G. O. Brian

Paper 5: *Framing Student Discourse for Optimal Learning in Physics*
Colleen Megowan-Romanowicz

Strand 2: Coordinator Organized Paper Set: Building Successful Relationships in Science Classrooms and Laboratories
Room: Laurel D

Presider: Erin M. Furtak

Paper 1: *A Comparative Science Study: Uncertainty in the Laboratory and in the Science Education Classroom*
Susan A. Kirch

Paper 2: *Conflict in Cooperative Learning Groups in an Elementary Science Methods Course*
Scott B. Watson
Glenna Dunn

Paper 3: *A Comparison of Science and Mathematics Teachers' Interpersonal Behaviour With Teachers of Other Subjects*
Perry den Brok
Ruurd Taconis
Darrell L. Fisher

Paper 4: *Implementation of Objectives for Laboratory Work in Secondary School Science*
Per Högström
Christina Ottander
Sylvia Benckert

Strand 2: Related Paper Set: Learning Science in Authentic Settings
Room: Grand Ballroom Salon IV

Presider: Penny J. Gilmer

Paper 1: *Learning Science in Authentic Settings: Moving Students to the Inner Circle*
Barbara A. Crawford

Paper 2: *The City as a Research Site: Using Inquiry with English Language Learning Students in an Urban Middle School to Investigate Ecological Concepts*
Xenia Meyer
Barbara A. Crawford

Paper 3: *Towards Independent and Critical Thinking: Learning about Evolutionary Concepts through Inquiry in a Rural High School*
Robert Humphrey
Lynn Vaccaro
Barbara A. Crawford

Paper 4: *Learning the Process and Nature of Science in the Context of Cutting-Edge Plant Biotechnology Research*
Maya Patel
Deborah Trumbull
Elizabeth Fox
Barbara A. Crawford

Strand 3: Coordinator Organized Paper Set: Student Learning and Conceptions in Primary Science
Room: Grand Ballroom Salon 1

Presider: Shireen Desouza

Paper 1: *Integrating Science and Literacy: Does One Size Fit All?*
Leigh K. Smith
Kendra M. Hall
Janet Losser

Paper 2: *The Impact of an Integrated Science Reading Intervention on Elementary Children's Misconceptions Regarding Slow Geomorphological Changes Caused by Water*
Patricia Martinez
Brenda Bannan-Ritland
Anastasia Kitsantas
John Baek

Paper 3: *Promoting Children's Reasoned Argumentation on a Complex Socioscientific Issue*
May Jadallah
Brian Miller
Richard C. Anderson
Kim Nguyen-Jahiel

Paper 4: *Effects of the Implementation of Science Writing Heuristic on Students' Understanding of Electricity Unit in 6th Grade Setting in Turkey*
Esra Kabatas
Murat Gunel
Erdogan Buyukkasap
Mustafa Uzoglu
Brian Hand

Strand 4: Symposium: Teacher Learning of Technology-Enhanced Formative Assessment
Room: Dover C

Presider: Ian D Beatty

Teacher Learning of Technology-Enhanced Formative Assessment
Ian D. Beatty
Allan P. Feldman
Hyunju Lee
Karen St. Cyr
Robby Harris

Strand 5: Coordinator Organized Paper Set: College Science Faculty Development
Room: Essex A

Presider: Vicente Talanquer

Paper 1: *Identity Conflicts in College Science Teaching*
Robert J. Ceglie
John Settlage

Paper 2: *Utilizing K-12 Science Education Partnerships to Develop Better Scientists: Integrating Pedagogy and Partnership Experiences into Graduate Science Training*
Allison Busch
Kimberly D. Tanner

Paper 3: *Drivers for Change in Faculty Members Thinking About Teaching*
Erika Offerdahl
Lisa Elfring
Debra Tomanek

Paper 4: *Exploring Scientific Research Disposition from the Perspective of Academic Professors*
Roeland M. Van der Rijst
Jan H. van Driel
Jan W. Kijne
Nico Verloop

Strand 6: Coordinator Organized Paper Set: Seeing Science Learning in Wider Contexts
Room: Laurel C

Presider: Martin Storksdieck

Paper 1: *Growing A Scientist: Scientists' Experiences, Relationships, and Identity Formation*
Jennifer Forrester
Gail Jones

Paper 2: *Designing Curricula to Bridge Informal and Formal Learning Environments*
Jenny Ingber
Nicholas Stroud
Megan Roberts
Katherine Brown
Emily Noto

Paper 3: *Student Learning in an Informal Setting: Rainforest Ecology in the Amazon*
Enrique M. Pareja
Sandra K. Abell

Strand 7: Coordinator Organized Paper Set: Role of Clinical Field Experiences in Preservice Teachers' Development
Room: Kent B

Presider: Jacqueline Leonard

Paper 1: *Cases Studies of Elementary Preservice Teachers' Science Efficacy and Inquiry-Based Practices in Urban Schools*
Jacqueline Leonard
James E. Davis

Paper 2: *Field Experiences of Elementary Preservice Teachers: Does the Involvement of the Science Methods Instructor Make a Difference in New Teacher Confidence?*
Jacqueline T. McDonnough
Juanita Jo Matkins

Paper 3: *One-to-One Field Experiences: How Do Child-Interactions Influence Elementary Preservice Teachers' Science Confidence and Content Knowledge?*
Julie Thomas
Ratna Narayan

Paper 4: *The Role of the Practicum Experience in Supporting Secondary Pre-Service Teachers' Implementing Inquiry Based Science*
Xavier Fazio
Wayne Melville

Anthony Bartley

Strand 8: Coordinator Organized Paper Set: What Matters in PD? Teachers' Needs.
Room: Kent C

Presider: Robert M. Danielowich

Paper 1: *Understanding the Affordances of an Online Induction Program for Beginning Science Teachers*
Joel D. Donna

Paper 2: *What Misconceptions Do US Teachers Have About Lesson Study?*
Andrew B. West
Mark Volkmann

Talk Title 3: *Practice-Based Professional Development: Design Considerations for New and Experienced Users of Curriculum Materials*
Heather Johnson
Kirsten K. Mawyer
Daniel C. Edelson

Strand 8: Symposium: Impact of Socioscientific Issues Research on Research, Policy and Practice
Room: Dover B

Presider: Troy D. Sadler

Impact of Socioscientific Issues Research on Research, Policy and Practice
Dana L. Zeidler
Troy D. Sadler
Martina Nieswandt
Chin-Chung Tsai
Vaille M. Dawson
Grady J. Venville

Strand 9: Symposium: Preparing Policy Researchers in Science Education
Room: Laurel B

Presider: Jerine Pegg

A Model for Preparing Policy Researchers in Science Education: SERGE
Carol Stuessy
Dane Bozeman
Toni Hollas
Toni A. Ivey

Rasheedah Richardson
Sara Spikes
Thomas Stiles
Caroline Vasquez
Robert Wilson

Strand 10: Coordinator Organized Paper Set: Curriculum Analysis: Textbooks
Room: Essex C

Presider: Regina Toolin

Paper 1: *Seeing the Wood for the Trees: An Analysis of Evolutionary Diagrams in Biology Textbooks.*
Kefyn M. Catley
Laura R. Novick

Paper 2: *The Analysis of Diabetes Education in High School Biology Textbooks*
Deanna M. Lankford
Lloyd H. Barrow

Paper 3: *Effects the Representational Structures on Students' Nervous System Image Reading Comprehension*
Wen-Gin Yang
De-Wei Feng
Jia-Cheng Ye

Paper 4: *Balance of Scientific Literacy Themes in Zambian High School Chemistry Textbooks, Syllabus and Examinations*
Frackson Mumba
Vivien M. Chabalengula
William J. F. Hunter

Strand 11: Symposium: Promoting New Directions in Science Education: Part 2, Conceptual Frameworks
Room: Laurel A

Presider: Felicia M. Moore

Promoting New Directions in Science Education: Part 2, Conceptual Frameworks
Felicia M. Moore
Magnia George
Eileen C. Parsons
Brian Williams
Jomo Mutegi
Bryan Anthony Brown

Strand 13: Coordinator Organized Paper Set: Methodology and Pedagogy in the History, Philosophy, and Sociology of Science
Room: Kent A

Presider: Valarie L. Akerson

Paper 1: *Conceptualizing Scientific Explanations in Science Education: Methodological and Pedagogical Considerations*
Deniz Peker

Paper 2: *Utilizing Nature of Science as the Context of Doing Science*
Byoung-Sug Kim
Norman G. Lederman

Paper 3: *Scientific Argumentation and Teacher Expectations*
Jeremy Peterson
Laura C. Price
Nikki L Hanegan

Paper 4: *The Relationship Between Nature of Science and Argumentation*
Rola Khishfe
Shannon Palouci
Todd Medintz

Strand 14: Coordinator Organized Paper Set: Environmental Education in Secondary School Settings
Room: Grand Ballroom Salon 11

Presider: Julie Lambert

Paper 1: *The Interplay Between Teachers' and Students' Personal Values and the Development of Environmental Action Projects Within Two Middle School Classrooms*
Kim E. Charmatz

Paper 2: *Leveraging GIS Technology in Urban Schools to Visualize Impact of Urban Forests on Climate, Energy Use and Air Quality*
Michael Barnett
Meredith E. Houle
Michelle Smith

Paper 3: *Effects of Ethnicity and Gender on 6th Grade Students' Environmental Knowledge and Attitudes*
Rachel M. Shelton
Sybil S. Kelley
William G. Becker

BREAK

3:30PM – 4PM

Session 10

4pm – 5:30pm

Ad hoc History of Science Education Committee Sponsored Session: Science Education Research Traditions in Europe: Shedding Light on Didactics
Room: Dover A

Presider: Fouad Abd-El-Khalick

Fouad Abd-El-Khalick
Saouma B. BouJaoude
Reinders Duit
Andre Tiberghien
Maria Pilar Jimenez Aleixandre
Justin Dillon

Strand 1: Coordinator Organized Paper Set: Inquiring into Understanding in the Physical Sciences
Room: Essex B

Presider: Adam Johnston

Paper 1: *Research And InstructioN-Based/Oriented Work (RAINBOW) for Conceptual Change in Science Learning---An Example of Students' Understanding of Gas Particles*
Mei-Hung Chiu

Paper 2: *Evolution of Students' Model-Building Practices*
Valerie K. Otero
Danielle B. Harlow

Paper 3: *Using Rasch Analysis and Classroom Observations to Examine High-Stakes Testing*
Catherine Milne
Jimmy Ma

Paper 4: *Exploring Variations in and Developing Typology for Undergraduate Students' Conception of "Size and Scale"*
Eun Jung Park
Su Swarat
Greg Light
Denise Drane

Strand 2: Coordinator Organized Paper Set: Exploring Encounters in Science Education
Room: Grand Ballroom Salon IV
Presider: Mark James

Paper 1: *Don't Say Yuk, Say 'Hum':.The Role of Interjections in Students' Engagement During Science Fieldtrips*
Bruno D. O. Jayme

Paper 2: *Synchronizing Face-to-Face Encounters to Produce Success in Urban Science*
Kenneth G. Tobin

Paper 3: *Potentialities Beyond Deficit Perspectives: Improving Solidarity and Science Fluency During Chemistry Laboratory Activities in Urban High Schools*
Wesley B. Pitts

Paper 4: *A Cross-Cultural Comparison in the Use of VAST-Models by Thai and United States High School Students for Learning Atomic Structure*

Panwilai Chomchid
Norman F. Thomson

Paper 5: *Teacher/Student Questioning Interactions*
Kelley Friden
Sara E. Morrison
Nikki L. Hanegan

Strand 2: Related Paper Set: Integrated Science Literacy Enactment: Spaces for Production of Scientific Knowledge

Room: Laurel D

Presider: Chun-Yen Chang

Paper 1: *Children's Encounters with Science and Literacy in Urban Classrooms: Collective Landscapes and Individual Engagement*
Maria Varelas
Christine C. Pappas
Angela Calabrese-Barton

Paper 2: *Children's Encounters with Science and Literacy in Urban Classrooms: Collective Landscapes and Individual Engagement*
Eli Tucker-Raymond
Christine C. Pappas
Maria Varelas

Ibett Ortiz

Paper 3: *Children's Encounters with Science and Literacy in Urban Classrooms: Collective Landscapes and Individual Engagement*
Justine M. Kane
Maria Varelas
Christine C. Pappas
Jennifer Hankes

Paper 4: *Children's Encounters with Science and Literacy in Urban Classrooms: Collective Landscapes and Individual Engagement*
Amy Arsenault
Maria Varelas
Christine C. Pappas
Anne Barry
Neveen Keblawe-Shamah

Strand 4: Coordinator Organized Paper Set: Inquiring into Inquiry
Room: Dover C

Presider: Angela M. Kelly

Paper 1: *Teacher Commitments and Resources to Facilitating Evidence-Based Reasoning in an Inquiry-Based Curriculum*
David Grueber

Paper 2: *Investigating the Effectiveness of Inquiry-Based Versus Traditional Science Teaching Methods in Middle and High School Laboratory Settings*
Margaret R. Blanchard
Sherry A. Southerland
Leonard A. Annetta

Paper 3: *An International, Systematic Investigation of the Relative Effects of Inquiry and Direct Instruction: A Replication Study*
Judith S. Lederman
Norman G. Lederman
Per-Olof Wickman

Paper 4: *Force and Motion: Problem Solving Strategies*
Lori L. Petty
David Lamp
Ratna Narayan
Bunuan Rommel
Cooper Sandi
Clem Darrellee

Strand 4: Related Paper Set: Students Argumentative Discourse in a Seismology Inquiry Unit
Room: Kent A

Presider: Scott P. McDonald

Paper 1: *Student Argumentative Discourse in a Seismology Inquiry Unit*
Steven C. Kerlin
Scott P. McDonald
Gregory J. Kelly

Paper 2: *An Investigation of the 'Dead End' Participant Structure – Examining How Student Cognitive Factors and Teacher Beliefs Impact Its Contribution to Progressive Discourse*
Brett A. Criswell
Scott P. McDonald

Paper 3: *The Development of Professional Identity through Participation in a Community of Practice*
Oliver Dreon Jr.
Scott P. McDonald

Paper 4: *Understanding Professional Vision in Inquiry Science Teaching*
Scott P. McDonald

Strand 5: Using the In-Vivo Method to Expose Inquiry-Based Challenges for University Science Students
Room: Essex A

Presider: Cheryl Berg

Paper 1: *Challenges to Graduate Student Research in the Historical Based Sciences*
Jeff Dodick
Inbal Flash-Gvili

Paper 2: *The Doctoral Experiences of Students and Their Advisors in Chemistry and Physics: A Qualitative Examination*
Robert H. Tai
Geoff Potvin
John Loehr
Scott S. Lloyd

Paper 3: *The Effect of Disciplinary Identity on Interdisciplinary Learning During Scientific Group Meetings*
Anat Yarden
Nir Esterman

Paper 4: *What Can a Laboratory Study of Chemistry Tell Us About Learning?*
Janet Bond-Robinson

Strand 7: Coordinator Organized Paper Set: Preservice Teachers' Learning and Growth Within Teacher Education Programs
Room: Kent B

Presider: Anita Roychoudhury

Paper 1: *Intersection of Teacher and Student ZPDs: Instructional Implications*
Anita Roychoudhury

Paper 2: *Facets of Effective Science Learning Environment: Preservice Elementary Teachers' Observations of Their Clinical Experience in Korea and the U.S.*
Do-Yong Park
Marilyn Morey
Myon U. Lee

Paper 3: *Investigating Teacher Knowledge of Learners and Learning and Sequence of Science Instruction in an Alternative Certification Program*
Patrick L. Brown
Sandra K. Abell
Patricia M Friedrichsen

Paper 4: *Dual Vision: A Method for Capturing the Learning Journey of Pre-Service Primary Teachers of Science*
Christine J. Howitt
Grady J. Venville

Strand 8: Coordinator Organized Paper Set: Impacting Teacher Knowledge, Teaching Practice and Student Learning
Room: Kent C

Presider: Tamara Holmlund Nelson

Paper 1: *Urban School Reform Enabled by Transformative Professional Development: Impact on Teacher Change and Student Learning of Science*
Carla Johnson
Sherry Marx

Paper 2: *Impacting Teacher Knowledge, Teacher Practice, and Student Achievement: The Role of Educative Curriculum Materials and Professional Development*
Julie Gess-Newsome
Janet Carlsen Powell
Joseph Taylor

April Gardner

Paper 3: *Preparing Teachers to Support Students in Conducting a Field-Based, Technology-Rich Scientific Investigation*
Meredith E. Houle
Michael Barnett
Peter Piazza
Eric G. Strauss

Paper 4: *Project-Based Science Curricula Impact Minority Students' Achievement, Attitudes, and Plans Via Teacher Knowledge and Enactment*
David Kanter
Kimberly Tester
Jack Gallagher
Spyros Konstantopolous

Strand 10: Coordinator Organized Paper Set: Assessment Development II
Room: Essex C

Presider: Curtis Pike

Paper 1: *An Analysis of Field Test Results for Assessment Items Aligned to the Topic of Atoms, Molecules, and States of Matter*
Cari F. Herrmann Abell
George DeBoer

Paper 2: *The Context Dependency of Students' Conceptions of Basic Optics Concepts Using a Two-Tier Multiple-Choice Diagnostic Instrument*
Hye-Eun Chu
David Treagust
A. L. Chandrasegaran

Paper 3: *Development, Implementation, and Evaluation of a New Assessment Instrument for Measuring Student Knowledge of Genetics and Natural Selection*
Ross H. Nehm
Alicia Carassco
Mary Driscoll

Paper 4: *Development of a Concept-Inventory-Based Test in Nanoscale Science and Engineering and Its Use at a Professional Development Institute*
Alan K. Szeto
Lynn A. Bryan
Nicholas J. Giordano
George M. Bodner
Emily D. Wischow

Shanna R. Daly

Strand 11: Symposium: Sociocultural Studies and Issues Related to Students and Teachers: Believing, Caring, and Performing
Room: Laurel A

Presider: Mary M. Atwater

Sociocultural Studies and Issues Related to Students and Teachers: Believing, Caring, and Performing
Mary M. Atwater
Tonjua B. Freeman
Georgia Hodges
Weiling Li
Rhonda Rackley
Regina Suriel

Strand 14: Coordinator Organized Paper Set: Scientific Understanding and Environmental Education
Room: Grand Ballroom Salon II

Presider: Julie Lambert

Paper 1: *Facilitating Content Knowledge Through In-depth Examination of Environmental Issues*
James T. McDonald

Paper 2: *Environmental Educators' Conceptions of the Nature of Science and the Role of Science in Environmental Education*
Teddie Phillipson-Mower

Paper 3: *Decisions and Dilemmas: Using WTL Activities to Increase Ecological Literacy*
Alison M. Wallace
Meena M. Balgopal

Paper 4: *The Development and Implementation of a Modeling-Based Curriculum to Enhance Ecosystems' Understanding: A Design Experiment With Fifth Graders*
Marios N. Papaevripidou
Constantinos Constantinou
Zacharias C. Zacharia

Evening Events

Research in Science Education (RISE) Editorial Board Meeting

Room: Laurel C
5PM – 6PM

Membership and Elections Committee-Sponsored New Researcher and Junior Faculty Early Career Discussion

Room: Dover C
5:45PM – 6:45PM

Presider: Jim McDonald

Jim McDonald
Catherine M. Koehler

Other Affiliate Reception I

Room: Grand Ballroom Salon 1
6:30PM –8PM

Other Affiliate Reception II

Room: Grand Ballroom Salon IV
6:30PM – 8PM

Other Affiliate Reception III

Room: Harborside Ballroom Foyer
6:30PM – 8PM

Equity Dinner

6:30pm
Please meet in the lobby at 6:30pm. All members of NARST are invited and encouraged to attend.

Social—FARSE

Room: Grand Ballroom Salon II
8PM – 10PM

Wednesday, April 2nd

NARST Strand Meetings

7:00am - 8:15am

Strand 1 Meeting: Science Learning, Understanding and Conceptual Change
Room: Essex B

Strand 2 Meeting: Science Learning: Contexts, Characteristics and Interactions
Room: Laurel D

Strand 3 Meeting: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies
Room: Grand Ballroom Salon1

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

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

Strand 6 Meeting: Science Learning in Informal Contexts
Room: Laurel C

Strand 7 Meeting: Pre-service Science Teacher Education
Room: Kent B

Strand 8 Meeting: In-service Science Teacher Education
Room: Kent C

Strand 9 Meeting: Reflective Practice
Room: Dover B

Strand 10 Meeting: Curriculum, Evaluation, and Assessment
Room: Essex C

Strand 11 Meeting: Cultural, Social, and Gender Issues
Room: Laurel A

Strand 12 Meeting: Educational Technology
Room: Laurel B

Strand 13 Meeting: History, Philosophy, and Sociology of Science
Room: Dover C

Strand 14 Meeting: Environmental Education
Room: Dover A

Session 11
8:30am – 10am

Equity and Ethics Committee Sponsored Session: Conceptual Frameworks for Research on Diversity in Science Education
Room: Dover A

Presider: Angela Calabrese Barton

Panel Discussants:
Angela Calabrese Barton
Bryan Brown
Pauline Chinn
Jomo Mutegi
Alberto Rodriguez

Strand 1: Coordinator Organized Paper Set: Learning Biological Concepts

Presider: Eric N. Wiebe

Paper 1: *How Do Domain Specific Learning Stimuli Influence the Students' Self-Explanations While Learning With Worked-Out Examples in Biology?*
Iris Mackensen-Friedrichs

Paper 2: *Generating Knowledge in Genetics Through a Simulation of a Research in Genetics and Bioinformatics*
Hadas Gelbart
Anat Yarden

Paper 3: *Students Learn About Their Own Bodies as Part of Their Biological and Citizenship Deduction. How Do They Learn? What Do They Learn First? From Whom Do They Learn?*
Ann W. Wright
Sue D. Tunnicliffe
Michael Reiss

Paper 4: *Promoting Middle School Student's Understandings of Molecular Genetics*
Ravit Golan Duncan
John Ruppert
Andrew Bausch
Hava B. Freidenreich

Strand 2: Coordinator Organized Paper Set: Reform and Practice in Science Education
Room: Laurel D

Presider: Lilian Pozzer-Ardenghi

Paper 1: *What is Hindering Reform-Based Teaching: Cultural Constraints or Professional Limitations?*
Mehmet Aydeniz

Paper 2: *Primary Grade Writers of Scientific Discourse: Two Case Studies From Integrated Science/Literacy Instruction*
Sheryl L. Honig

Paper 3: *Recent Experimental Studies of Inquiry-Based Teaching: A Meta-Analysis and Review*
Erin M. Furtak
Tina Seidel

Paper 4: *Differences in High School Students' Perceptions of What Helps Them Learn Science: A Missing Piece in Decision-Making Regarding Practice and Reform*
Eileen C. Parsons
Rhea Miles
Spike Petersen

Strand 2: Coordinator Organized Paper Set: Improving Science Achievement Using Technology and Other Innovative Strategies
Room: Grand Ballroom Salon IV

Presider: Wesley B. Pitts

Paper 1: *Improving the Quality of Science Instruction in Primary Schools in Cape Coast in Ghana*
Christopher Beccles

Paper 2: *Investigating the University Learning Environment, Student Engagement and Satisfaction Among Science Majors*
Shwu-yong L. Huang

Paper 3: *A Web-Based Science-Technology-Society Program for Gifted Students in South Korea: Development and Implementation*
Gilsun Lim
Robert E. Yager

Paper 4: *High School Biology Students' Evolution Learning Experiences*
Lisa A. Donnelly
Valarie L. Akerson

Strand 3: Coordinator Organized Paper Set: Primary Science Teachers' Conceptions and Practice
Room: Grand Ballroom Salon 1

Presider: Terry Shanahan

Paper 1: *Experienced Primary Teachers' and Primary Science Student Teachers' Collaborative Learning Through Reflection on Their Science Teaching*
Pernilla K. Nilsson
Jan H. van Driel

Paper 2: *Exploring the Intersection of Writing and Science in Elementary Classrooms*
Nicole Glen
Sharon Dotger

Paper 3: *Preservice Elementary Teachers' Ideas about Evolution: Interrelationships with Self-efficacy, College Science Courses, and Science Content Knowledge*
Diana C. Rice
Cynthia Lundeen
Sibel Kaya

Paper 4: *Egomorphism, a Teacher's Discursive Pedagogical Artifact in/for Science Education*
Bruno D. O. Jayme
Giuliano Reis
Wolff-Michael Roth

Strand 4: Coordinator Organized Paper Set: Students' Content Knowledge and Personal Epistemologies
Room: Kent A

Presider: Huseyin Colak

Paper 1: *The Relationship Between the Development of Nature of Science Views and Personal Epistemologies of Upper Elementary and Middle School Students*
Huseyin Colak
Khemmawadee Pongsanon

Paper 2: *Classroom Talk Analysis of a Science Teacher Balancing Teaching to the Test and for Conceptual Understandings*
Sara L. Salloum
Saouma B. BouJaoude

Paper 3: *The Impact of a Kinesthetic Astronomy Curriculum on the Content Knowledge of At-Risk Students*
Stephanie J. Slater
Timothy F. Slater
Cherilynn Morrow

Paper 4: *Nanoscience Instruction in Physics*
Thomas R. Tretter
Gail Jones
Jennifer Wolf

Strand 5: Coordinator Organized Paper Set: Methods of Physics Instruction
Room: Essex A

Presider: Lynn A. Bryan

Paper 1: *Experimentation with Combined Physical and Virtual Materials: An Attempt to Enhance Undergraduate Students' Conceptual Understanding in Physics*
Zacharias C. Zacharia

Paper 2: *The Development of Conceptual Thinking in Inquiry-Based Physics*
Bruce R. Patton
Jennifer Esswein

Paper 3: *Undergraduate Students' Reasoning Skills and Conceptual Development in an Inquiry Class*
Omer Acar
Anita Roychoudhury
Bruce R. Patton

Paper 4: *The Process of Physics TAs' Knowledge Development for Teaching a New Physics Curriculum*
Eulsun Seung
Lynn A. Bryan
Mark Haugan

Strand 6: Coordinator Organized Paper Set: From Children through Staff -- Learning across Science Centers
Room: Laurel C

Presider: Leonie Rennie

Paper 1: *What Did You Learn at the Science Centre? Using Video in Stimulated Recall Interviews With Primary School Children*
Jennifer Dewitt

Paper 2: *Guided Dialogue at Science Centers*
Nana Quistgaard

Paper 3: *Hands-On or Minds-On? Zones of Interaction and Expressions of Curiosity in an Interactive Science Center*
Yael Bamberger

Strand 7: Coordinator Organized Paper Set: Examining Teacher Education/Certification Programs II
Room: Kent B

Presider: Carol Johnston
Paper 1: *Prospective STEM Teachers' Early Schooling Experiences and Exposures as Drivers to Teach in High Needs Schools*
Athena R. Ganchorre
Debra Tomanek

Paper 2: *STEM Career-changers Transition to Teaching: Have to Become a Student Again?*
Carol Johnston
Jeanne M. Grier

Paper 3: *The Student Associates Scheme: Implications for the Quality of Initial Teacher Training (ITT) in England and Wales*
Stuart C. Bevins
Marilyn M. Brodie
Eleanor Brodie

Paper 4: *Science and Mathematics Persistence of First-Generation Mexican American Non-Traditional Students in Teacher Education.*
M. Gail Shroyer
Amanda R. Morales
Cecilia M. Hernandez
Kimberly A. Staples
David Allen

Strand 8: Coordinator Organized Paper Set: Teacher Identity and Beliefs
Room: Kent C

Presider: Martina Nieswandt

Paper 1: *Retention of Urban Science Teachers: Pathways Toward Integration or Participation*
Carol Rinke

Paper 2: *Identities in a Community of Practice: The Role of Beginning Science Teachers' Identities in Becoming a Member of Their School Community and Implementing Science Education Reform*
Yavuz Saka
Sherry A. Southerland

Paper 3: *Between Theory and Practice: Beginning High School Science Teachers' Beliefs About Science and Science Teaching Over Time*.
Martina Nieswandt

Paper 4: *Reforming Science Teaching and Learning in Australian Primary Schools: An Innovative, Low Cost and Successful Model*
Mark Hackling
Vaughan Prain
Shelley Peers

Strand 8: Coordinator Organized Paper Set: In-Service Teacher Programs: What Works?
Room: Dover B

Presider: Anil Banerjee

Paper 1: *An Examination of the Process of Supporting Uncertified Science Teachers: What New Teachers Need to Succeed*
Wendy M. Frazier
Donna R. Sterling
Mollianne G. Logerwell

Paper 2: *The Impact of a Five-Year, K-6 Systemic Reform Effort on Elementary School Students' Achievement in Science*
James A. Shymansky
Leonard A. Annetta
Susan A. Everett
Larry Yore

Paper 3: *"I'm Invested in the Outcome": Professional Development that Matters in the Eyes of Teachers*

Tom J. McConnell
Tianyi Zhang
Meilan Zhang
Mary Lundeberg
Jan Eberhardt

Strand 9: Coordinator Organized Paper Set: Reflective Practice and Science Teacher Education II
Room: Laurel B

Presider: Tamara Holmlund Nelson

Paper 1: *Reflective Practice as a Mechanism for Fostering Science Teacher Educators' Identity Development in an International Context*
Brenda Capobianco

Paper 2: *Students' Learning about Plants in Elementary Science Methods: Journal Writing and the Uncertainties of Assessment*
Elaine V. Howes

Paper 3: *Making Formative Assessment Discernible to Pre-Service Teachers: A Pragmatic Self-Study*
Gayle A. Buck
Julianne L. Kaftan
Jennifer Nelson

Strand 10: Coordinator Organized Paper Set: Assessment Development III
Room: Essex C

Presider: Robert J. Ochsendorf

Paper 1: *Diagnostic Research, Development and Implementation of a New Approach to the Teaching of Chemical Bonding*
Tami Levy Nahum
Rachel Mamlok-Naaman
Avi Hofstein

Paper 2: *A Methodological Framework for Studying Worldviews' Changes*
Konstantinos Korfiatis
Tasos Hovardas

Paper 3: *Developing a Large Scale Assessment Instrument Measuring Students' Competencies in Nature of Science and Scientific Inquiry*
Irene Zilker
Gary M. Holliday
Alexander Kauertz

Hans E. Fischer
Judith S. Lederman
Norman G. Lederman

Paper 4: *Argumentation and Conceptual Understanding: Grade 10 Students' Learning About Genetics*
Vaille M. Dawson
Grady J. Venville

Strand 11: Symposium: Why Our Students Stay: Strategies for Retention and Teaching of Women of Color in STEM Disciplines
Room: Laurel A

Presider: Angela Johnson

Why Our Students Stay: Strategies For Retention And Teaching of Women of Color in STEM Disciplines
Angela Johnson
Sybol C. Anderson
Terrell Lasane
Katherine Norlock
Katherine Socha
Linda Coughlin

BREAK
10AM – 10:30AM

Session 12
10:30am – 12 noon

Research Committee Sponsored Workshop: Considerations and Complexities of Large Scale Studies
Room: Dover A

Presider: Randy Yerrick

Sharon J. Lynch
Curtis Pike
Mike Vitale
Nancy Butler-Songer
Carol ODonnell
Randy Yerrick

Strand 1: Coordinator Organized Paper Set: Students' Understanding of Scientific and Medical Practice
Room: Essex B

Presider: Susan A. Yoon

Paper 1: *Group Interaction in Hands-On Activities Related to Medical Image Reconstruction*
Spartak Kalita
Dean A. Zollman

Paper 2: *Translations of Scientific Practice to High School Students' "Images of Science"*
Michiel van Eijck
Pei-Ling Hsu
Wolff-Michael Roth

Strand 2: Related Paper Set: Designing and Testing the MoDeLS Progression
Room: Laurel D

Presider: Eduardo F Mortimer

Paper 1: *Designing and Testing the MoDeLS Progression*
Christina Schwarz
David Fortus
Jo Ellen Roseman
Barbara Ladewski
Ted Willard
Joe Krajcik

Paper 2: *Incorporating Modeling Practices Into Elementary Students' Scientific Investigations*
Lisa Kenyon
Christina Schwarz
Barbara Hug
Hamin Baek
Brandy Buckingham

Paper 3: *Incorporating Modeling Practices Into Middle School Project-Based Science*
David Fortus
Ayelet Weizman
Yael Shwartz
Joi Merritt
Christina Schwarz

Paper 4: *Promoting Preservice Teachers' Understanding and Use of Scientific Modeling in Teaching and Learning*
Barbara Hug

Lisa Kenyon
Elizabeth Davis
Michele Nelson

Paper 5: *Progress and Challenges in Making Modeling Practices Meaningful*
Brian J. Reiser
Christina Schwarz
Joe Krajcik
Elizabeth Davis

Strand 4: Related Paper Set: Nanoscale Science Education in Grades 7-12: What Do Teachers Need to Know?

Room: Kent A

Presider: Lynn A. Bryan

Paper 1: *Middle and High School Teachers' Emerging Conceptions of Nanoscale Science*
Lynn A. Bryan
David Sederberg
Alan Szeto
Shanna Daly
Kelly Hutchinson
Fatima Benaissa
Nick Giordano

Paper 2: *Nanoscale Phenomena Models: Middle and High School Teachers' Conceptions of their Use in Curricula*
Shanna Daly
Lynn A. Bryan

Paper 3: *Development of a Learning Progression for Students' Conceptions of Size and Scale*
Cesar Delgado
Shawn Stevens
Namsoo Shin

Paper 4: *Emergent Conceptions of Size and Properties in the Context of Nanoscale Science*
Clara Cahill
Namsoo Shin
Shawn Stevens
Joseph Krajcik

Paper 5: *A Qualitative Analysis of Factors Influencing Students' Interests in Nanoscale Science*
Kelly Hutchinson
George Bodner
Lynn A. Bryan

Strand 5: Symposium: Is Post-Secondary Biological Education Addressing the Evolution/Creation Controversy?
Room: Essex A

Presider: Kimberly D. Tanner

Is Post-Secondary Biological Education Addressing the Evolution/Creation Controversy?
Leslie Sandra Jones
Deborah Allen
Kathleen Fisher
Ellen Granger
Kim Sadler

Strand 7: Coordinator Organized Paper Set: Inquiry Teaching and Learning for Preservice Teachers
Room: Kent B

Presider: Paul Bueno de Mesquita

Paper 1: *Prospective Science Teachers' Construction of Inquiry in the Context of Planning and Teaching Inquiry Based Lessons*
Larry Horvath
Cynthia Passmore

Paper 2: *Examining the Ability to Construct a 5E Learning Cycle Science Lesson Plan*
Richard H. Moyer
Susan A. Everett

Paper 3: *Teacher Talk, Science Questions, and Depth of Inquiry of Preservice Elementary Teachers During an Initial Inquiry Science Lesson*
Paul Bueno de Mesquita
Betty J. Young
Celeste Bowler
Laurie Center
Cristen Henderson

Paper 4: *Use and Quality of Inquiry Pedagogy in the Science Video Lessons of Elementary Preservice Teachers*
Betty J. Young
Barbara L. Nowicki
Barbara Fitzsimmons
Kathleen Guglielmi
Judy Paolucci
Sharon K. Lee

Strand 8: Coordinator Organized Paper Set: Attitudes and Perceptions Towards NOS and Inquiry
Room: Kent C
Presider: Catherine Wissehr

Paper 1: *"Biology in Context": Teachers' Professional Development in Learning Communities*
Doris Elster

Paper 2: *Investigating the Influence of Teachers' NOS Conceptions on Their Ability and Willingness to Integrate Inquiry into Their Instruction as Revealed through Online Learning*
Hakan Atar
Alejandro Gallard

Paper 3: *Middle Level Teacher Reflections on Inquiry and Standards Based Science Instruction*
Loran C. Parker
Gerald H. Krockover

Paper 4: *Elementary Teachers' Beliefs and Practical Knowledge About Teaching Science as Inquiry: The Effect of an Inquiry-Based Elementary Science Course*
Sanghee Choi
John Ramsey

Strand 10: Coordinator Organized Paper Set: Curriculum Adaptation
Room: Essex C

Presider: Xiufeng Liu

Paper 1: *Smaller is Smarter: Technology Enriched Project-Based Inquiry at a Public Urban Academy*
Regina E. Toolin

Paper 2: *Activities to Promote Student Learning of the Role of Proteins in Modern Genetics*
Jennifer Eklund
Nonye Alozie

Paper 3: *Qualitative Analysis of Primary Level Students' Scientific Competencies Working With M(odeling)-Open Problems*
Sabine Mogge
Helmut Vogt
Bernd Wollring

Paper 4: *Improving Students' Conceptual Understanding of Physics and Chemistry: A Modeling Approach*

Ling L Liang
David Majerich
Richard Clevenstine
Raymond Howanski

Final NARST Board Meeting

Buffet lunch for Board members starting at 12 noon
12:30 – 4 PM