ASTE 2012 Conference

Clearwater Beach, FL

Promoting Democratic Decision-making and Discourse through Science Teacher Education
# aste 2012

Promoting Democratic Decision-making and Discourse through Science Teacher Education

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Welcome to the 2012 Annual International Conference of the
Association for Science Teacher Education,
Clearwater Beach, Florida, USA.

We at the University of South Florida wish to welcome you to our little slice of paradise! Clearwater Beach edition 2.0 is our newest release since the breakout debut of the ASTE 2007 conference held at the same venue. There are many amenities to take advantage of while you are here. These range from simply walking on the beach at sunrise or sunset spotting dolphins trolling the waters just offshore or visiting the Clearwater Beach Aquarium (home of Winter, who starred in the recent theatrical release of “A Dolphins Tale”) to arranging trip to the Dali Museum in St. Petersburg or visiting Busch Gardens in Tampa Bay. The beaches at Fort Desoto State Park offer many miles of unspoiled habitat! Right next to our fine hotel at Pier 60 you will find the free family Sunset Festival nightly.

Of course, the Conference will provide you with many opportunities for intellectual growth, forming lasting friendships and participating in discussions directed toward the state of the art for scholarship in Science Teacher Education. We hope you will participate in the many of the engaging presentations informed by our conference theme: Promoting Democratic Decision-making and Discourse through Science Teacher Education. Whatever your notions of scientific literacy entail, they no doubt certainly include the ability to thoughtfully engage in meaningful dialogue about scientific issues in both ecologically and socially responsible ways. As our scholarship and pedagogy touch a global society, it becomes ethically obligatory for science teacher educators to examine their role in the cultivation of a new generation of teachers. Consider the extent to which this theme may be realized both explicitly and implicitly in the many presentations and the keynote addresses that you hear.

The ASTE leadership team has worked hard to represent your interests – and is always interested in your voice. You should take this opportunity to meet with members of the ASTE Board and find out how to become more involved with ASTE. Take advantage of meeting new colleagues and reconnecting with others. Engage in serious discussions and plan your future research and pedagogical endeavors in a laid-back venue! If you are new to ASTE you should know that we pride ourselves on being an open, friendly and supportive association – particularly with our graduate students. So, if you have any questions or ideas you wish to share, this is the time and place!

Clearwater Beach in 2012 is the place to be in early January. We look forward to seeing you and encourage you to think of ASTE as your “home away from home!”

The Conference Team Abides....

Dana L. Zeidler, Allan Feldman, Ben Herman, Malcolm Butler - Co-Chairs
Anna Lewis - Associate Chair
President’s Welcome

Dear Colleagues,

Welcome to the 2012 Association for Science Teacher Education International Conference in Clearwater, Florida! This year’s theme is Promoting Democratic Decision-making and Discourse through Science Teacher Education. Certainly, the current political and economic landscapes illustrate the need for more thoughtful discourse and informed decision-making, particularly in regard to the many socio-scientific challenges we face today. As science educators, we are entrusted with the responsibility (and privilege) of educating science teachers in the most effective practices to prepare the next generation of scientifically literate decision-makers. With our mission of promoting leadership and support for the development of science teachers through scholarship, collaboration, and innovation, ASTE is uniquely positioned to make a difference in our nation’s decision-making and discourse.

Nowhere is this mission better illustrated than in our international conference. The program you now hold in your hands reflects the efforts of dozens of individuals who have offered their time and expertise to support our membership. As such, the program promises a variety of rich experiences as you interact with experts, colleagues and friends. To this end, I encourage you to take full advantage of the workshops, sessions, keynote addresses, committee meetings, and social opportunities the conference offers.

Your Program Committee has made a special effort to invite keynote speakers who can address the conference theme. Dr. Norman G. Lederman will discuss the current debate related to what it means to teach the nature of science and the role the construct has in developing an informed citizenry. Dr. Stephen Macko will discuss his scientific work which uses stable isotopes to inform research and decision-making in such diverse fields as history, geography, consumer science, and even the origins of life. No doubt these two speakers will broaden our understandings of how science and science education can work together to improve discourse and decision-making in our democracy.

Finally, I wish to acknowledge the hard work and dedication of the 2011 Board and Program Committee for their extraordinary efforts to serve ASTE and to prepare an informative and engaging conference experience. Enjoy the fruits of their labor, the interactions with your colleagues, (and of course, the beach) as you participate in this year’s conference!

Excelsior!

Randy L. Bell
President 2011
Types of Concurrent Sessions at ASTE 2012

Traditional Paper Presentation
A presentation of a research study, philosophical essay, position paper, or innovative idea delivered in a traditional transmission format of 15 minutes, followed by 5 minutes of discussion. Each session has a Presider who will ensure sessions flow smoothly by: a) starting and ending the session on time; b) maintaining pacing/timing between papers; and c) assisting with the question and answer period.

Experimental Session
This is a hands-on 60 minute session in which a facilitator demonstrates, and participants interact with, materials/equipment, methods, activities, and/or technology applications. Each of these sessions should encourage the free exchange of ideas among the facilitator(s) and participants.

Themed Paper Set
Multiple paper presentations regarding a single theme, that follow a one-hour format with 4 to 6 papers being presented during this period. Each of these sessions also has a Presider.

Professional Development Session
There are 6 pre-conference and 8 embedded workshops that run for two hours at various times on Wednesday, Thursday, Friday and Saturday.

Small Group Roundtable
This session is similar to a traditional roundtable but with multiple papers being discussed simultaneously. Each author will provide a brief synopsis of the paper (5-7 minutes) followed by a whole group discussion to share perspectives on the issues presented.

Syllabus Sharing
These sessions are designed for the purpose of sharing science education syllabi. Presenters will share evidence of outcomes or student learning to support the course activities and assessments shared.

Poster Session
This year all posters will be shared and viewed on Saturday during a two-hour block in the morning. We hope this format allows for a more concentrated focus on the research being presented and stimulates greater interaction and networking.
Special ASTE Sponsored Sessions

Presider Training  
*Wednesday 6:00-7:00 pm Manatee Room & Thursday 8:15-9:15 am, Salon F*  
Dr. Bill Baird, Auburn University Professor Emeritus, will offer a one-hour special training and information session for Presiders.

ASTE Inclusion Forum Inaugural Film Night  
*Wednesday 7:30 pm Tarpon Room*  
Michele Koomen from Gustavus Adolphus College offers the film: *Including Samuel*: Before his son Samuel was diagnosed with cerebral palsy, photojournalist Dan Habib rarely thought about the inclusion of people with disabilities. Now he thinks about inclusion every day. Shot and produced over four years, Habib’s award-winning documentary film, Including Samuel, honestly chronicles the Habib family’s efforts to include Samuel in every facet of their lives. The film also features four other families with varied inclusion experiences, plus interviews with dozens of teachers, young people, parents and disability rights experts.

Mentoring Program and First Time Attendees  
*Thursday 9:30-10:30 am, Mandalay Room*  
This session offers new members and first time attendees an opportunity to learn about the conference, meet experienced members of ASTE, and to connect with a mentor to begin developing a professional connection to the Association.

Meet the ASTE Board  
*Friday 9:30-10:30 in Salon C*

Town Hall Meeting  
*Friday 2:00-3:00 in Salon C*  
This opportunity to share ideas about ASTE with board members is open to all conference attendees.

Committee Meetings  
*Friday morning from 7:00-8:00 during the morning buffet,* please refer to the program for room assignments for **ASTE Committee meetings.**  
*Saturday morning from 7:00-8:00 during the morning buffet* the **Regional Directors** will meet in the Dolphin room and **Equity Committee** will meet in the Coral room. **Saturday at 10:45-12:30** The **Oversight Committee** will meet in the Dolphin room.
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Regional ASTE Meetings
Friday from 4:30-5:30 see schedule for room assignments
The 8 regions will meet as individual groups to discuss regional matters.

Women in Science Education Forum
Friday from 5:30-7:00 the Women in Science Education (WISE) social dinner will be at Beachcomber Restaurant. A few tickets may still be available. Stop by the registration office if you wish attend this event.

2012 NTLI Paper Presentations
Saturday at 10:45 in the Manatee room listen to the authors present their winning papers.

ASTE Publications - Meet the Editors
Friday 8:15 – 9:15 in the Mandalay room
This session offers new and experienced conference attendees an opportunity to meet and talk with the editors of ASTE journals. Editors will provide information about acceptance rates, submission guidelines and upcoming monographs and journal issues.

Interviewing Room
All day Thursday, Friday & Saturday in Palm Room
Members wishing to interview potential candidates may sign up to use the Palm rooms on a first come first served basis. The room will be available Thursday and Friday from 8:30-5:00, Saturday 8:30 – Noon. Please limit use to 1 hour at a time. Time sign-up sheet will be posted outside of the room.

Board of Directors Meeting
Wednesday 6:00 & Saturday 2:00 in the Citrus Room & Saturday after the Award Luncheon
The Board of Directors will meet and have dinner.
ASTE 2012 Thread Coordinators

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2012 Professional Development Workshop Reviewers

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# 2012 Proposal Reviewers

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ASTE 2011 Annual Conference Proceedings

All presentations will be included in the Conference Proceedings available online at http://TheASTE.org after the conclusion of the conference

Special Thanks to the Following People for Extra Assistance Before and During the Conference

- Eugene Wagner, ASTE Executive Director
- Bob Hollann, Incoming ASTE Executive Director
- Meredith McAllister, ASTE Coordinator of Exhibits
- University of South Florida for providing computers for the technology room

Thank You to Our Conference Sponsors and Exhibitors

Sponsors

- Carolina Biological Supply Co. (Award I and V)
- School Specialty Science/Frey Scientific (Award II and IV)

Exhibitors

- Springer
- Vernier
- Sense
- Software & Technology
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**Note:** The image contains a table and a schedule for ASTE Pre-Conference, with times and locations for various meetings and events.
Pre-conference Workshops - January 3-4, 2012

Tuesday

8:00-5:00  Faculty Institute for NASA Earth and Space Science Education (FINESSE)

Wednesday

8:00-5:00  FINESSE Workshop
8:00- 5:00  Myakka River State Park Field Trip
12:00-2:00  Executive Board of Directors Meeting
1:00-3:00  Preconference Workshops: 21018 & 21022
3:00-5:00  Preconference Workshops: 25002 & 25001
4:00- 8:00  Conference Registrations
6:00-7:00  Presider Training
6:00-8:00  Board of Directors Meeting & Dinner
7:30-9:30  ASTE Inclusion Forum Film
Commercial Pre-conference Workshop
ID: 21009 | Myakka River State Park Field Trip: Incorporating Environmental Field Trip Pedagogy into Science Teacher Professional Development
Alec Bodzin, Lehigh University
Learn to plan and implement environmental field trips at Myakka River State Park. Workshop includes airboat and tram tours, canopy walk, and transportation.

Commercial Pre-conference Workshop
ID: 25002 | Faculty Institutes for NASA Earth and Space Science Education (FINESSE) workshop
Christine Shupla, Lunar and Planetary Institute
NASA Earth and space scientists and educators share authentic inquiry activities, data, and resources related to key topics from the newly released Common Core Science Education Frameworks (formerly known as the National Science Education Standards). Participants receive a $300 stipend and lunch, and develop implementation plans.

Commercial Pre-conference Workshop
ID: 21018 | Addressing All Aspects of the Learning Cycle to Deliver High Quality Early Childhood Science Instruction
Mary Hobbs, University of Texas at Austin
Experience standards-based assessments, instructional activities, and professional development strategies for PK-2 science as developed and implemented during ongoing NSF supported research.

Commercial Pre-conference Workshop
ID: 21022 | Earth Exploration Toolkit: Using web based, large datasets to explore science concepts
Mike Taber, Colorado College
The workshop will introduce participants to skills and tools necessary to analyze online datasets that can be used in inquiry-based science investigations.

Commercial Pre-conference Workshop
ID: 31080 | Life is a Journey: Set Your Student’s GPS for a Great First Job!
Katherine Burik, The Interview Doctor, Inc.; Martha Fewell; Liz Taft,
Learn about the advantages of offering students a guide through the rocky job search process. Join The Interview Doctor Katherine Burik and East Carolina University Professors Dr. Liz Taft and Dr. Martha Fewell to learn about great placement success at ECU Science Ed Department.

Commercial Pre-conference Workshop
ID: 25001 | Developing 21st-Century Minds with Vernier Probeware
David Carter, Vernier Software and Technology
In this hands-on workshop explore state-of-the-art probeware solutions that help teach core science topics in physics, chemistry, biology, Earth science and environmental science.
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Thursday - January 5, 2011

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<td>7:30-3:00 PM</td>
<td>Registration</td>
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<td>8:15-9:15</td>
<td>Concurrent Sessions and Workshops</td>
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<td>General Session 1 Keynote Presentation</td>
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Dr. Norman Lederman: **“NOS Left Behind”**

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**Thursday**

**Thurs: 8:15  Room: Mangrove**  **Experimental Session**

**ID: 13002 | Learning to Shift from Cookbook to Inquiry with Model Secondary School Lab Activities**  
*Sandra L. Westmoreland, Texas Woman’s University; Rita Rich, Northwest Independent School District; Jacque Garcia, Northwest Independent School District*

Participants in this workshop will learn to remodel a series of labs that will engage students in increasing levels of science inquiry via "subtle shifts”

**Thurs: 8:15  Room: Citrus**  **Themed Paper Set**  
Presider: Jennifer Maeng

**ID: 14016 | Tailoring Cogenerative Dialogues to Strengthen Undergraduate STEM Teaching and Learning: Insights Gained from Three Varied Learning Environments**  
*Gillian U. Bayne, Lehman College of the City University of New York; Sharon Miller, The Borough of Manhattan Community College; Ling Chen, The Borough of Manhattan Community College of the City University of New York; Wesley Pitts, Lehman College of the City University of New York; Nelson Nunez-Rodriguez, Hostos Community College of the City University of New York; Ashraf Shady, Queens College of the City University of New York*

We explore the use of cogenerative dialogues as a contextual platform, in order to introduce instructional methods aimed toward improving post-secondary STEM teaching and learning.

**Thurs: 8:15  Room: Dolphin**  **Experimental Session**

**ID: 13004 | Promoting Inquiry in Our Schools: Using Hands-on Performance Assessment in K-12 Classrooms**  
*Deborah L. Tucker, Science Education Consultant; Grant M. Gardner, Assessment Services, Inc.*

Assessing inquiry is essential to instruction. Participants will engage in a hands-on performance task and explore the uses and advantages of this form of assessment.

**Thurs: 8:15  Room: Tarpon**  **Themed Paper Set**  
Presider: Wardell Powell

**ID: 14012 | Areas of Congruence in the Orientations to Reflection Held by Science Educators and the Teacher Education Program in Which They Teach**  
*Frederick Nelson, University of Florida; Stephen Burgin, University of Florida; Michelle Klosterman, Wake Forest University*

We compared the orientation to reflection manifested by a teacher education program with the personal orientations held by two science educators with experience in it.

**Thurs: 8:15  Room: Coral**  **Paper Set**  
Presider: Tiffany Wild

**ID: 10102 | A View of the Practice of Science as Varied as the Members of the Science Classroom Community**  
*Michele H. Koomen, Gustavus Adolphus College*

This paper reports on five culturally, linguistically and academically diverse students and their perspectives science learned as twelve grade students about to graduate.

**ID: 10210 | Bringing Cultural Awareness To Pre-service Teachers For The Teaching Of Science**  
*Line A. Saint-Hilaire, Queens College - CUNY*

This project brings relevance of culturally adaptive pedagogy to pre-service teachers by helping them relate science to their cultural background and to that of others.

**ID: 10159 | An Argument for Training Teachers to Interrupt Heteronormativity in Life Science**  
*Mary H. Hoelscher, University of Minnesota*

Teachers must be prepared to recognize and interrupt heteronormativity in their classroom to achieve success for all learners. Significance and strategies will be reviewed.
Thurs: 8:15  Room: Manatee  Small Group Roundtable
ID: 12007  Sciberspace 2.0: Using Web 2.0 Tools in 4th and 5th Grade Inquiry-Based Science Curriculum

Michael Dias, Kennesaw State University; Laurie Brantley-Dias, Georgia State University; Erin Davis, Georgia State University

Urban elementary teachers applied learning technologies to nature study to support inquiry learning of life and Earth science concepts.

Thurs: 8:15  Room: Exec Conference  Embedded Workshop
ID: 21002  Inquiry-based approach to understand the spherical earth model using Global Positioning System (GPS)

Richard Schwenz, University of Northern Colorado

This workshop focuses on how Global Positioning System can be used for inquiry-based approach to deepen pre-service teachers' understanding of the spherical earth model.

Thurs: 8:15  Room: Salon A  Paper Set
ID: 10018  The National Science Teachers Association Revised Standards for Science Teacher Preparation and Review Processes

Jon E. Pedersen, University of Nebraska-Lincoln; Elizabeth Allan, University of Central Oklahoma; William Veal, University of Charleston

This session will be a review of the new NSTA standards and required assessments with examples of exemplars given.

ID: 10027  An Analysis of the Preservice Elementary Teachers in the Understanding of Inquiry-Based Science Learning and Teaching and How it is Modeled in a Science Methods Course

Carole K Lee, University of Maine at Farmington

Modeling science inquiry-based teaching is essential to elementary teachers as their prior knowledge of inquiry teaching may confound them with inquiry science learning and teaching.

ID: 10037  Science Teacher Practice in the Classroom: Predicting Reform Based Pedagogy

Lauren E Jetty, Syracuse University; Deborah S Barry, Syracuse University; John W Tiltonson, Syracuse University

This research investigates factors that are influential in predicting teachers' scores using the Reformed Teacher Observation Protocol (RTOP)

Thurs: 8:15  Room: Salon B  Small Group Roundtable
ID: 12009  Farm to School: Cultivating the Next Crop of Science Educators

Patricia L Bricker, Western Carolina University

A research study focused on implementing a Farm to School educational component in a pre-service elementary and middle grades education science methods course and internship.

Thurs: 8:15  Room: Salon C  Paper Set
ID: 13007  How effective are concept maps for assessing teachers' understanding of ecological concepts?

Miriam Munck, Eastern Oregon University; Donna Rainboth, Eastern Oregon University

This study examines the use of concepts maps to investigate teachers understanding of ecological concepts in an environmental engineering context.

ID: 10116  Rethinking of the continuing professional development in Saudi Arabia: Teachers' perspectives

Nasser Mansour, The Excellence Research Center of Science and Mathematics Education - King Saud University & Graduate school of Education, University of Exeter; Saeed M. Alshamrani, The Excellence Research Center of Science and Mathematics Education - King Saud University & Graduate school of Education, University of Exeter

The aims of the research were to provide a baseline of teachers' previous experience of CPD and their future expectations.
**aste 2012 Thursday**

**ID: 10104 | Teachers’ Concerns about Biotechnology Education**

*Lisa A Borgerding, Kent State University; Troy D Sadler, University of Missouri*

Twenty high school life science teachers attending a biotechnology institute were interviewed about their stages of concern regarding biotechnology instruction.

**Thurs: 8:15   Room: Mandalay   Experimental Session**

**ID: 13006 | Using news reports to explore the hidden connection between daily life and ecology**

*Yael M Wyner, City College of New York/Secondary Education/Department of Biology*

This presentation describes the use of published news articles to explore the ways every day life affects ecological interactions.

**Thurs: 8:15   Room: Salon D   Themed Paper Set**

**ID: 14007 | Teacher Professional Development for Climate Change Education in Native Communities**

*Anne L Kern, University of Idaho; Gillian H Roehrig, University of Minnesota; Bree Renynolds, University of Idaho; Devarati Bhattacharya, University of Minnesota; Keisha Varma, University of Minnesota; R. Justin Hougham, University of Idaho; Frank Finley, University of Idaho; Brant Miller, University of Idaho; Jeremy Wang, University of Minnesota; Younkyeong Nam, University of Minnesota; Engin Karahan, University of Minnesota*

This presentation shares the place-based and culturally responsive approaches to professional development to promote Climate Change Education in Native communities from two NASA funded projects.

**Thurs: 8:15   Room: Salon G   Themed Session**

**ID: 31000 | Finding your first faculty position and being successful**

*William F. McComas, University of Arkansas; Lloyd H. Barrow, University of Missouri*

This session will address topics pertinent to graduate students who will soon be on the job market looking for faculty positions in science education.

**Thurs: 9:30   Room: Mangrove   Paper Set**

**ID: 10033 | Secondary Science Teachers’ Experiences Differentiating Science Instruction**

*Jennifer L Maeng, University of Virginia; Randy L Bell, University of Virginia*

This study investigated the characteristics and practices of high school science teachers who differentiate instruction by exploring how they planned for and implemented differentiated instruction.

**ID: 10043 | Investigating the Effects of a Master’s Program on Teachers’ Instruction: Perspectives of External Observers, Teachers, and Students**

*Yasemin Copur-Genceturk, University of Illinois at Urbana-Champaign; Barbara Hug, University of Illinois at Urbana-Champaign*

This paper examines the effects of a master’s program on K-8 teachers’ instructional practices by analyzing classroom observations, teachers’self-reports, and students’reports.

**ID: 10054 | Creating Shared Instructional Products for Integrating Engineering Education in the Science Learning Through Engineering Design (SLED) Partnership**

*James D Lehman, Purdue University; Brenda M. Capobianco, Purdue University*

Researchers examine essential features that support a partnership among STEM faculty and teachers for creating shared instructional products aimed at integrating engineering in elementary science.
Paper Set

ID: 10072 | Iterative Model Building: Developing Preservice Elementary Teachers' Abilities to Uncover Students’ Scientific Thinking to Inform Instruction
Heidi L. Wiebe, Indiana University; Meredith A Park Rogers, Indiana University; Vanashri Nargund-Joshi, Indiana University; Valerie L Akerson, Indiana University
Our presentation discusses a field experience approach designed to support preservice teachers in making instructional decisions based on a progressive understanding of students' scientific thinking.

ID: 10101 | How Is Cognition Distributed Among Middle School Science Students and Their Distance Mentors in a Blended Learning Environment?
Randall Spaid, Macon State College; Stuart Fleischer, The American International School in Israel; Sumitra Himangshu, Macon State College
The session audience will explore blended learning tools and TPACK strategies impacting Distributed Cognition in problem-solving conducting a distance mentored middle school science fair investigation.

ID: 10129 | Teachers’ Feedback to Foster Scientific Discourse in Connected Science Classrooms
Soon C Lee, Ohio State University; Karen E Irving, The Ohio State University
An analytical framework to assess classroom discourse informs science teachers how their feedback fosters scientific discourse and how CCT affects the discourse for science learning.

Paper Set

ID: 10160 | Secondary Science Preservice Teachers’ Changing Expertise in Equitable Science Assessment
Edward G Lyon, University of California, Santa Cruz
This study reports on the ways in which preservice science teachers' expertise in equitable science assessment changed over the span of their teacher education program.

ID: 10161 | Using Inquiry-Based Undergraduate Biology Laboratories as a Modified Field-Experience for Pre-Service Science Teachers
Julie Angle, Oklahoma State University; Donald French, Oklahoma State University
Come learn how we use inquiry-based, college-level introductory biology laboratories as a low-threat training ground for pre-service teachers enrolled in their science methods course.

ID: 10166 | Preservice Teachers Reflections about Service Learning as an Effective Science Teaching Strategy
James T. McDonald, Central Michigan University
Preservice elementary teachers used service learning when planning/implementing a Family Science Experience. Research results shared about how service learning can be used to teach science.

Paper Set

ID: 10016 | "Wow! Look at That!": The Impact of Professional Development in Informal Science Contexts on Teachers’ Discourse
Gary M. Holliday, University of Akron; Judith S. Lederman, Illinois Institute of Technology; Norman G. Lederman, Illinois Institute of Technology
This study addresses elementary and middle school teachers' discourse while interacting with exhibits during two science content courses at a large science and technology museum.

ID: 10044 | Steps to Opening Science Inquiry: A New Support Framework
Carol A.B. Rees, Thompson Rivers University
This study describes pre-service teachers' in-classroom experiences where their mentors use a new support framework to shift control of science inquiry to their students.

ID: 10094 | Multicultural Science and Preservice Teachers: An Action Research Study
M. Katheryn Grimes, University of Nevada, Las Vegas; Janelle M. Bailey, University of Nevada, Las Vegas
This presentation describes an action research conducted with elementary science methods students—the purpose being to explore their progress in the understanding of multicultural science.
Thurs: 9:30  Room: Coral  Themed Paper Set  Presider: Mitchel Ruzek
ID: 14006  Inquiry-base science for English Language Learners: An issue of equity
Molly H. Weinburg, Texas Christian University; Jenesta Nettles, Texas Christian University; Cecilia Silva, Texas Christian University; Kathy H Smith, Tarleton University
This research, situated in the overlap of theory and practice (praxis), describes different events that contributed to or detracted from learning science for ELLs.

Thurs: 9:30  Room: Manatee  Paper Set  Presider: Scott Robinson
ID: 10221  Science Education and the use of Assistive Technology for Students with Learning Differences
Clement V Gomes, Teachers College, Columbia University; Felicia Mensah, Teachers College, Columbia University
This study examines the use of audio assistive technology to teach science content to a student with the Language Learning Impairment of Dyslexia.

ID: 10193  "iPad"ing the Field: Using iPads to enhance science and mathematics teaching and learning
Dionysius T Gnanakkan, Illinois Institute of Technology; Megan E Faurot, Illinois Institute of Technology; Judith S Lederman, Illinois Institute of Technology
Science and math teachers provided with access to technology, professional development support, and planning time explore creative ways to enhance teaching and learning using iPads.

ID: 10227  Modeling TPACK Integration in the Science Methods Classroom
Richard P Hechter, University of Manitoba; Lynette D Phye, University of Manitoba
This session discusses modeling the TPACK framework as a means of moving preservice teachers from novice towards expert integrators of technology into science education.

Thurs: 9:30  Room: Salon A  Paper Set  Presider: Erica Brownstein
ID: 10042  An Investigation of Teacher Certification Tests for Elementary School Teachers
Charlotte A Otto, University of Michigan-Dearborn; Suria H Beydoun, University of Michigan-Dearborn; Susan A Everett, University of Michigan-Dearborn
An exploration of elementary education subject matter tests for teacher certification in all 50 states compared content, level of test questions and passing scores.

ID: 10050  Elementary Level Evolution Instruction: Are Elementary Education Majors Willing and Able to Teach Evolution?
Ronald S Hermann, Towson University
This study explores the extent to which elementary education majors are willing and able to teach evolutionary concepts. The findings are compared to other majors.

ID: 10051  What Does the Teacher Performance Assessment Reveal about Science Education Teacher Candidates’ Understanding of Inquiry-based Instruction?
Barbara L Billington, University of Minnesota, College of Education and Human Development; James Nyachwaya, University of Minnesota/College of Education and Human Development; Mary Hoelscher, University of Minnesota/College of Education and Human Development; Gillian H Roehrig, University of Minnesota
Teacher candidates have a rich understanding of inquiry in their reflective commentary; however, video evidence of student engagement was a limiting factor on TPA scores.

Thurs: 9:30  Room: Salon B  Small Group Roundtable
ID: 12002  Explaining and Resolving Science Achievement Gaps: Could Leadership Structures, School Climate and Social Capital Offer Solutions?
Lara K Smetana, Loyola University of Chicago; John Settlage, University of Connecticut; Malcolm Butler, University of South Florida St. Petersburg
School leadership's influence on student science performance has not been systematically studied. Join us in a conversation about our research efforts in diverse elementary schools.
**Paper Set**

**ID: 10189 | Changing the culture of science teaching-one teacher at a time**
Deborah L Hanson, Hanover College

This presentation investigates the effects of a professional development program for elementary teachers focused on connecting literacy to inquiry-based science.

**ID: 10231 | Teacher Transition Toward an Immersive Argument-Based Science Instruction**
Cavagnetto Andy, Binghamton University-SUNY; Brian Hand, University of Iowa; Lore Norton-Meier, University of Louisville

This paper reports on two grade five teachers’ transition toward an immersive approach to argument-based inquiry. Elements influencing their transition will be reported and discussed.

**ID: 10235 | The Collaborative Advantage: Teacher-Led in Situ Professional Development**
Rachel M Ruggirello, Washington University in St. Louis; Phyllis Balcerzak, Washington University in St. Louis; Jill McNew, Washington University in St. Louis; Vicki May, Washington University in St. Louis

This presentation examines the efficacy of a teacher-initiated, teacher-led collaborative professional development for developing teacher leaders and improving the quality of science teaching and learning.

**KeyNote**

**ID: | NOS Left Behind**
Norman G. Lederman, Illinois Institute of Technology

Students’ and teachers’ understandings of nature of science (NOS) has been an important educational objective since 1907. There have been various rationales for its importance, but in the past three decades understandings of NOS has primarily been justified as an important educational outcome as an essential component of scientific/science literacy. Unfortunately, NOS has suffered from a perennial identity crisis more so than any other construct in science education. Certainly, there have been the usual discussions about the teaching, learning, and assessment of NOS. Some of these discussions have been productive, but the continual (and recently increasing) discussions about the meaning/definition of NOS have ranged from the uniformed to the unproductive. Often discussions around the meaning of NOS have ignored the instructional audience, developmental appropriateness, and the general goals of science education, not to mention research in the field. This presentation will clarify the confusion surrounding NOS and illuminate the unproductive nature of recent discussions about the meaning of the construct. More importantly, more productive directions for future research will be illuminated in an effort to move us beyond unproductive and academic arguments to more productive and practical directions for the improvement of our students’ development of scientific/science literacy.
**Thurs: 2:00  Room: Citrus  Themed Paper Set**  
**ID: 14015 | Using a learning progression framework to design graduate preservice science teacher education**  
*Rebecca Schneider, University of Toledo; Jenny Denyer, University of Toledo; Mark Templin, University of Toledo*  
Three papers describe the sequence of experiences designed to advance science teacher thinking about science learning, academic language, and instructional planning across the preservice year.

**Thurs: 2:00  Room: Dolphin  Embedded Workshop**  
**ID: 21007 | Publishing in ASTE Journals: A Workshop for Current and Prospective Reviewers**  
*Deborah Hanuscin, University of Missouri*  
The Editors of ASTE journals invite all current and prospective reviewers to participate in an interactive session focused on improving the quality of peer review.

**Thurs: 2:00  Room: Tarpon  Paper Set**  
**ID: 10176 | Designing a course to develop pedagogical content knowledge among pre- and in service biology teachers.**  
*Karel A. Jacobs, Chicago State University; Norm G. Lederman, Illinois Institute of Technology*  
Description and analysis of a 6 week summer course entitled 'Biology Pedagogical Content Knowledge'is presented including sample assignments, work samples and assessment of learning.

**ID: 10182 | The Depression Cure, literature circles and transmediation – a science and literacy collaboration**  
*Paula A Magee, Indiana University - Indianapolis; Jane H Leeth, Indiana University - Indianapolis*  
A study that explores the impact of using the adult non-fiction text "The Depression Cure" in a elementary preservice science education course.

**ID: 10232 | Investigating the Impact of Field verses University Based Science Methods on Preservice Teachers’ Belief and Abilities to Design Inquiry Based Science Instruction for Diverse Learners**  
*Anne P Gatling, Merrimack College*  
This study investigates the impact of experience-based and traditional-focused elementary science methods courses on preservice teachers’ perception of inquiry-based science instruction with diverse students.

**Thurs: 2:00  Room: Coral  Paper Set**  
**ID: 10119 | Students' with Visual Impairments Conceptual Understanding of Sound**  
*Tiffany A Wild, Ohio State University; Sally M. Hobson, The Ohio State University; Margilee Hilson, The Ohio State University*  
This study examined students'with visual impairments conceptual understandings of sound before and after completion an inquiry-based science curriculum.

**ID: 10219 | The Teaching of Science for Deaf and Hard of Hearing Students: A Case Study Approach**  
*Rita A. Hagevik, University of North Carolina at Pembroke; M. Lynn Woolsey, The University of the Cumberlands*  
An ecobehavioral assessment instrument and analysis of videotapes of science teaching was used to observe ten teachers of the D/HH in grades 3 - 5.

**ID: 10111 | Blended and Tiered Approach to Teaching Academic Vocabulary to English Language Learners (ELL) within an Inquiry Based Earth Science Unit of Instruction in Sixth Grade**  
*Bernadette Leonis, University of Nevada, Reno; David T Crowther, University of Nevada, Reno; Elisa Storke,*  
Study utilizing the Blended / Tiered approach to teaching academic vocabulary to ELL within an inquiry based unit on Earth science to sixth graders.
Thurs: 2:00   Room: **Manatee**  Paper Set  President: Lissa Ledbetter

**ID: 10223 | Pictorial Representation in Science Read-Alouds: How Elementary Teachers Communicate Science to Children across Grade Levels**

Seema Rivera, University at Albany; Michael Mastroianni, University at Albany; Alan Oliveira, University at Albany; Rory Glass, University at Albany; Francine Wisner, University at Albany

This study looks at the multimodal communication channels that are used when elementary teachers conduct science read-alouds and their relationship to pictorial models.

**ID: 10039 | The Communicative Use of Pictorial Representations by Fourth Grade Teachers during Science Read-Alouds**

Seema Rivera, University at Albany; Alaneom Oliveira, University at Albany; Michael Mastroianni, University at Albany; Rory Glass, University at Albany

This study examines how elementary teachers and students co-construct meanings with pictorial representations (photographs, drawings, and cartoons) in children’s science books being read aloud.

**ID: 10191 | Science Notebooks as Tools for Developing Scientific Understandings**

Lori A Fulton, University of Nevada, Las Vegas

This session examines strategies second grade teachers implemented to focus science notebook entries on the science content rather than the science activity and student outcomes.

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Thurs: 2:00   Room: **Exec Conference**  Embedded Workshop

**ID: 21010 | A new generation of teacher education tools: Incorporating iPad and Livescribe technologies to facilitate preservice and inservice teacher growth**

Judith Lederman, Illinois Institute of Technology; Allison Antink Meyer,; Daniel Z. Meyer,; Stephen A. Bartos,; Norman Lederman,; Gary Holliday,

This workshop will model new technologies that can serve as valuable aides to teacher educators to support and research reflective teacher practice.

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Thurs: 2:00   Room: **Salon A**  Experimental Session

**ID: 13008 | Integrating Multicultural Education into the Science Teacher Education Program: Effective Strategies for the Classroom**

Mary M Atwater, University of Georgia; Melody L. Russell, Auburn University

The purpose of this one half-hour experiential session is to enhance the participants understanding on the infusion of multicultural education into science teacher education programs.

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Thurs: 2:00   Room: **Salon B**  Small Group Roundtable

**ID: 12003 | A Disciplinary Focus on Reading in Science**

Carmen M Woodhall, University of Central Florida; Vicky Zygouri-Co, University of Central Florida

Author will share gains in the application of literacy strategies in teachers'science classrooms who were participants in a semester-long statewide professional development in reading.

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Thurs: 2:00   Room: **Salon C**  Paper Set  President: Selina Bartels

**ID: 10086 | In-Service Elementary Teachers' Familiarity and Interest in the Science Process Skills**

Erin N Miles, Southern Illinois University Carbondale; Frackson Mumba, Southern Illinois University Carbondale; Vivien M Chabalengula, Southern Illinois University Carbondale; Kevin C Wise, Southern Illinois University Carbondale

We examined primary school teachers' familiarity with and interest in science process skills. Teachers were highly familiar with but moderately interested in learning process skills.
ID: 10090 | Concept-Focused Instruction (CFI): Using a Theory of Instruction to Enhance Middle Level Science Teachers’ Understanding and Use of Constructivist Teaching Approaches

Austin M Hitt, Coastal Carolina University; Denise B Forrest, Coastal Carolina University

This presentation focuses on the development and impact of a theory of instruction on middle level science teachers' perceptions of constructivist-based science instruction.

ID: 10220 | The IRISE Project: a New Model for Educating Both Science and Engineering Researchers and In-Service Teachers

Sharlene Denos, University of Illinois at Urbana - Champaign; Barbara Hug, University of Illinois at Urbana-Champaign

Describes a new course that trains science and engineering graduate students in K-12 outreach and the teacher professional development workshop that grew out of it.

Thurs: 2:00  Room: Mandalay  Experimental Session

ID: 13009 | Which Qualities Matter Most in Creating (STEM) Methods Videos?

Andrea C. Burrows, University of Wyoming; Mike Borowczak, University of Cincinnati

Student created videos can be used as an assessment tool. We show what qualities allowed the audience to understand and connect with the material presented.

Thurs: 2:00  Room: Saloon D  Themed Paper Set  Presider: George Navratil

ID: 14008 | Facilitating Coastal Climate Change Education, Mitigation, and Adaptation in the Natural and Built Environments: Progress of the Coastal Areas Climate Change Education (CACCE) Partnership

Benjamin C Herman, University of South Florida; Allan Feldman, University of South Florida; C.J. Reynolds, Sunshine State Strategies; Larry Plank, Hillsborough County Public Schools; Vanessa Vernaza, University of South Florida; Angela Chapman, University of South Florida

We describe CACCE’s efforts to: identify teachers’climate change conceptions and instruction; implement innovative climate change education models; and develop multi-disciplinary climate change education partnerships.

Thurs: 2:00  Room: Saloon E  Paper Set  Presider: Catherine Martin-Dunlop

ID: 10012 | The Use of Clinical Interviews to Develop In-Service Secondary Science Teachers’ Nature of Science Knowledge and Assessment of Student NOS Knowledge

Erin E Peters Burton, George Mason University

Twenty eight in-service teachers participated in a study of their use of clinical interviews to analyze student NOS knowledge.

ID: 10023 | Exploring the Relationship Between Formal Assessment Strategies and Nature of Science Learning of Preservice Elementary Teachers

Jerrid W Kruse, Drake University; Jesse L Wilcox, Iowa State University

This qualitative study explored how course assessment strategies related to elementary preservice teachers’learning of NOS within the explicit/reflective framework.

ID: 10134 | NOS and Science Teacher Education: What the Research Reveals about Trends, Conclusions and Future Directions

William (Bill) F McComas, University of Arkansas; Amy R Ricketts, Pennsylvania State University

We review the NOS research literature in science teacher education for the past 15 years and present trends, reach conclusions and suggest future directions.
Thurs: 2:00  Room: Salon F  Paper Set  President: Samantha Fowler

ID: 10025 | Epistemological Orientations to Socioscientific Issues in High School Students: A Cross-Cultural Perspective
Dana L. Zeidler, University of South Florida; Ben Herman, University of South Florida; Mitch Ruzek, University of South Florida

This investigation examines a cross-cultural perspective of students' epistemological patterns of reasoning about socioscientific issues, and identifies potential interactions of cultural and scientific identity.

ID: 10045 | The use of socioscientific issues to assess students' argumentation quality and knowledge transfer.
Wardell A. Powell, University of South Florida; Dana L. Zeidler, University of South Florida; Milton Huling, University of South Florida

Students' argumentation on socioscientific issues revealed their commitment to rationalistic, emotive, religious and ethical considerations to influence their argumentation quality on socioscientific dilemmas.

ID: 10149 | The Impact of Socioscientific Issues Based Curriculum Involving Environmental Outdoor Education for Fourth Grade Students
Karen J. Burek, University of South Florida; Dana L. Zeidler, University of South Florida; Bryan Nichols, University of South Florida; Dean Pinzino, University of South Florida; Mitchell Ruzek, University of South Florida

The impact of SSI based curriculum on the critical thinking and decision making skills of fourth grade students involved in environmental education.

Thurs: 2:00  Room: Salon G  Experimental Session

ID: 13012 | Video Stimulate Recall Technique: The Case of Teachers Sharing their Perspectives on Eliciting Students' Knowledge during Instruction.
Compton M. Atch, Providence College; Sexton Zachary, Providence College

Video stimulated recall is an introspective research procedure that gave voice to teachers to share their perspectives on their elicitation practices during instruction.

Thurs: 3:15  Room: Mangrove  Paper Set  President: Trish Morrell

ID: 10075 | Using Reflective Inquiry to Facilitate Conversations about Instructional Practice
Robbie L Higdon, Clemson University

Engaging in a cycle of self-reflection and professional growth can assist teachers in understanding the connection between their instructional decisions and implementation of inquiry-based practices.

ID: 10062 | Beyond Optimism: Designing and Adapting Science Teacher Video Clubs to Support Teacher Learning
Melissa L Braaten, University of Wisconsin-Madison

Data from a year-long video club and participants' science classrooms are used to examine the design and adaptation of supports for professional learning across contexts.

ID: 10071 | Using Secondary Data Sets to Develop Teachers' Understandings about Scientific Inquiry and Investigations
James B. Short, American Museum of Natural History; Hudson Roditi, American Museum of Natural History; Jamie N. Mikeska, Michigan State University; Suzanne M. Wilson, Michigan State University; Suzanne H. Elgendy, American Museum of Natural History

We describe how a professional development program designs and uses resources about secondary data sets to develop science teachers' understandings about scientific inquiry and investigations.
**Paper Set**

**Thurs: 3:15**  
**Room: Citrus**

**ID: 10147** | **Evaluating the Value-added of Video Reflection in an Elementary Science Methods Course**  
*Maria S Rivera Maulucci, Barnard College*  
This study evaluates the value-added of video reflection in an elementary science methods course through comparisons of lesson reflections with and without video reflection.

**ID: 10151** | **Engineered Teaching & Learning Environments for STEM Related Educational Programs**  
*Elsie Ovrahim, Museum of Science and Industry*  
A responsive model for learning how to weave relational and analytical learning styles with strategic pedagogical practices in any science classroom or teacher preparation program.

**ID: 10215** | **Educative Instructional Materials for Middle School Science**  
*Susan M Kowalski, BSCS; Janet Carlson, BSCS; Pamela Van Scater, BSCS; Paul Beardsley, BSCS; Brooke N. Bourdelat-Parks, BSCS; Stephen Getty, BSCS; Betty Stennett, BSCS*  
We showcase a model of educative instructional materials, designed to promote learning by both teachers and students. We present findings from a national field test.

**Paper Set**

**Thurs: 3:15**  
**Room: Tarpon**

**ID: 10047** | **An Examination of an Explicit-Reflective Approach to Influencing the Translation of Teachers’ Subject Matter Structures into Classroom Practice**  
*Stephen A Bartos, Illinois Institute of Technology; Norman G Lederman, Illinois Institute of Technology; Judith S Lederman, Illinois Institute of Technology*  
The goal of this study was to examine whether making teachers explicitly reflect on their subject matter structures would facilitate their translation in classroom practice.

**ID: 10065** | **The Impact of Science Writing Heuristic Teacher Training Programs on Three Different Groups**  
*Mark A McDermott, Wartburg College; Brian Hand, University of Iowa; Cheryl O’Brien, Wartburg College*  
Explanation of three programs designed to train unique groups of teachers to use the SWH teaching approach, including analysis of impact on beliefs and practices.

**Paper Set**

**Thurs: 3:15**  
**Room: Coral**

**ID: 10233** | **Perceived Proficiency of Teachers in Junior High Schools in Kumasi Metropolis(Ghana) in Using some Selected Equipment in Science**  
*Cecilia Bokye, Institute of Education, University of Cape Coast, Ghana; Godwin Egbenya,*  
The study investigated Junior High School (JHS) teachers' knowledge of some selected scientific equipment. The teachers were generally unskillful in using the equipment.

**ID: 10237** | **Of Course, Earth is Round and Gravity Pulls Us Down: Preservice Teachers’ Understanding of Earth Shape and Gravity**  
*Alice (Jill) A. Black, Missouri State University*  
Elementary/middle preservice teachers’ ideas of Earth shape and gravity were related to spatial ability and Earth science conceptual understanding, and were compared with children’s ideas.

**ID: 10093** | **Oral Interviews as a Final Exam Format for a Science Methods Course**  
*Julianne A Wenner, University of Georgia; David F Jackson, University of Georgia*  
The authors have found the use of oral interview exams to encourage higher-level thinking in students and allow instructors a better glimpse into student understanding.
**Paper Set**

**ID: 10001** | Images of Scientists Viewed Through the Lens of Vosniadou’s Conceptual Change Model
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Kevin D. Finson, Bradley University; Donna Farland-Smith, The Ohio State University - Mansfield

In this presentation, we’ll examine how Vosniadou’s conceptual change model can be applied to learners’ perceptions of scientists (DASTI) and development of “conceptions of scientists”.

**ID: 10003** | Trajectories of Science Identity Formation
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Roxanne Hughes, National High Magnetic Field Laboratory; Kristen Molyneaux, National High Magnetic Field Laboratory

This study focuses on middle school students’ science identity formations before and after their participation in an informal science/engineering program.

**ID: 10015** | Student scientific self-efficacy: What factors matter in predicting positive attitudes toward science?
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Deborah S Barry, Syracuse University; John W. Tillotson, Syracuse University; Janet Wilmoth, Syracuse University

This research investigates how student efficacy in science varies as a function of reformed teaching, when controlling for gender, ethnicity, parental attitudes, and self-reported grades.

**Paper Set**

**ID: 10058** | Investigating Essential Features for Successful Implementation of an Elementary Science Methods Course on Engineering Design
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Brenda M. Capobianco, Purdue University

This paper presentation examines the introduction of an elementary science methods course designed to prepare students to teach science through engineering design.

**ID: 10059** | Creating RTOP Profiles to Investigate Pre-Service Science Teachers and the Teaching of Science as Inquiry.
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Wayne Melville, Lakehead University; Todd Campbell, Utah State University, Logan UT, U.S.; Anthony Bartley, Lakehead University, Thunder Bay, Ontario, Canada; Xavier Fazio, Brock University, St. Catharines, Ontario, Canada; Nick Tkaczuk, Lakehead University, Thunder Bay, Ontario, Canada; Antonio Stefanile, Lakehead University, Thunder Bay, Ontario, Canada

This research closely examines pre-service science teachers’ teaching science as inquiry by exploring RTOP profiles of two teachers across their student teaching experience.

**ID: 10060** | Learning to Teach Science Through Inquiry: Experiences of Preservice Teachers
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Shannon E Popp;, Ian C Binns, University of North Carolina at Charlotte

This paper examines the experiences of a cohort of preservice teachers learning to teach science during student teaching, focusing on their experiences with inquiry.

**Small Group Roundtable**

**ID: 12011** | The Satellites, Weather and Climate (SWAC) teacher professional development program: Making the case for climate and geospatial literacy
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Regina Toolin, University of Vermont; Lesley-Ann Dupigny-Giroix, University of Vermont

This paper will highlight the SWAC program goals and outcomes for addressing teacher professional development needs and constraints in one realm of the geosciences.
Thurs: 3:15  Room: **Salon C**  
**Themed Paper Set**  
Presider: Angela Chapman  

ID: 14018  
**Improving Preservice Teacher Preparation Through NASA Institutes**  
*Stephanie S Shipp, Lunar and Planetary Institute; Janelle M. Bailey, University of Nevada, Las Vegas; Debra Stork, University of Dubuque; Christine B. Shupla, Lunar and Planetary Institute; Rick Pomeroy, University of California, Davis; Timothy Slater, University of Wyoming; Stephanie Slater, University of Wyoming*  
FINESSE has been conducting two-day preservice faculty institutes in conjunction with ASTE for three years. Presenters share workshop planning, content, evaluations, and participant perspectives.

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Thurs: 3:15  Room: **Mandalay**  
**Experimental Session**  

ID: 13017  
**Across the Sciences: An Online Professional Development Resource**  
*Paul Beardsley, BSCS; Susan M Kowalski, BSCS; Pamela Van Scooter, BSCS*  
We describe a free, online professional development course for high school teachers. We explore the use of this resource in pre-service and in-service settings.

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Thurs: 3:15  Room: **Salon D**  
**Paper Set**  
Presider: Jim Thomas  

ID: 10088  
**Developing a Knowledge of Global Climate Change Instrument**  
*Robert E Bleicher, California State University Channel Islands; Julie Lambert, Florida Atlantic University; Joan Lindgren, Florida Atlantic University*  
Development of the Knowledge of Global Climate Change instrument as a reliable tool to assess preservice and practicing teachers' knowledge about global climate change.

ID: 10019  
**Outcomes of Four Environmental Science Institutes on Urban Middle School Students**  
*Sherri L Brown, University of Louisville*  
This study examined affective and cognitive environmental science outcomes of multiple community site visits and science activities on economically disadvantaged, urban, minority middle school students.

ID: 10028  
**Curricular and Teaching Perspectives of Environmental Education in Schools**  
*Xavier Fazio, Brock University; Douglas D Karrow, Brock University*  
This presentation discusses details regarding elementary and secondary schools' environmental education curriculum and teaching practices, and the factors that support and inhibit these practices.

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Thurs: 3:15  Room: **Salon E**  
**Paper Set**  
Presider: Scott Robinson  

ID: 10005  
**How the Expressed Epistemologies of Secondary Science Teachers Relate to Their Classroom Practice: Implications for Teacher Education Programs**  
*Glenn R Dolphin, Syracuse University; John W Tillotson, Syracuse University*  
Analysis of secondary science teacher interviews showed little coherence among expressed epistemologies and their practice. We infer a more complex relationship between beliefs and practice.

ID: 10183  
**How Understandings of the Nature of Science and Broader Epistemological Beliefs Effect Reasoning Ability**  
*Milton D Huling, University of South Florida; Wardell Powell, University of South Florida*  
A comparison of reasoning abilities of high school physics students to their understandings of the nature of science and broader epistemological beliefs.

ID: 10079  
**Professional Journals as a Source of Information about Teaching NOS: An Examination of Articles Published in Science Scope, 1999-2010**  
*Eun Ju Lee, University of Missouri; Adam Pettis, University of Missouri; Deborah Hanuscin, University of Missouri*  
Content analyses of articles from professional journals shed light on how aspects of NOS are addressed and how teachers' PCK for NOS can be supported.
**Thurs: 3:15  Room: Salon F  Themed Paper Set**

**President: Jeff Orasky**

**ID: 14003 | The Confluence of EcoJustice, Socioscientific Issues & Socioscientific Reasoning in Science Teacher Education**

*Debra B. Mitchell, University of Georgia; Rachel A. Luther, University of Georgia; Deborah J. Tippins, University of Georgia; Michael P. Mueller, University of Georgia; Dana L. Zeidler, University of South Florida; Tray D. Sadler, University of Missouri*

The popular trend of socioscientific issues and socioscientific reasoning is explored as methods to advance epistemological development and ethical aptitudes for ecojustice in science education.

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**Thurs: 3:15  Room: Salon G  Paper Set**

**President: Lissa Ledbetter**

**ID: 10097 | Piloting the SEIS Modules: Implementing and Assessing an Inquiry-Based Integrative Research Approach**

*Karin M Bengtson, College of St. Benedict/St. John’s University*

The process of using research theme based modules as an effective program to enhance undergraduate students’ dispositions towards science, interdisciplinary thinking and problem solving.

**ID: 10099 | Examining factors that influence teacher utilization of informal science education institutions: Defining the avid-user.**

*James Kisiel, California State University, Long Beach*

This investigation examines characteristics of teachers identified as ‘avid-users’ of informal science education resources. Findings suggest steps that may help strengthen such school-community collaborations.

**ID: 10074 | Journal Clubs as a Way to Bridge the Theory-Practice Gap in Science Teacher Education**

*Karen Tallman, University of Massachusetts; Allan Feldman, University of South Florida*

This study reports on a case study of a medical journal club and its implications for preservice science teacher education.

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**Thurs: 4:30  Room: Mangrove  Themed Paper Set**

**President: Selina Bartels**

**ID: 14009 | Enhancing Teachers’ Understanding of Climate Change for Teaching Native American Students**

*Gillian H Roehrig, University of Minnesota; Anne L Kern, University of Idaho; Keisha Varma, University of Minnesota; Devarati Bhattacharya, University of Minnesota; Shiyu Liu, University of Minnesota; Younkyeong Nam, University of Minnesota; Bree Reynolds, University of Idaho; Jeremy Wang, University of Minnesota; R. Justin Hougham, University of Idaho*

In this presentation we share research findings on improving teachers’ knowledge and teaching of climate change in Native Communities through an intensive professional development experience.

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**Thurs: 4:30  Room: Citrus  Themed Paper Set**

**President: Lisa Martin-Hansen**

**ID: 14013 | STEM Professional Development in an Online Fellowship Program: Impacts on Teacher Beliefs and Practices**

*Meghan E Marrero, Mercy College; Jessica F Riccio, Teachers College, Columbia University; Amanda M Gunning, Teachers College, Columbia University; Nermeen Dashoush, Teachers College, Columbia University; Felicia M Mensah, Teachers College, Columbia University*

Three papers examine impacts of the NASA Endeavor STEM program in terms of teacher pedagogical beliefs, mental models, and self-efficacy.

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**Thurs: 4:30  Room: Dolphin  Paper Set**

**President: Eun Ju Lee**

**ID: 10057 | Serving Diverse Community College STEM Scholars with Grant-Funded Programs**

*Nina A Leonhardt, Suffolk County Community College; Arlene T Jackson, Suffolk County Community College*

For the US to remain competitive, diverse students must succeed in STEM disciplines. A community college is using grant funds to create a supportive environment.
ID: 10085 | **Women Scientists’ Scientific and Spiritual Ways of Knowing**  
*Angela C. Buffetton, Texas Christian University; Molly Weinburgh, Texas Christian University*

This exploratory study uses interviews and grounded theory to understand the relationship between five female scientists’ scientific and spiritual ways of knowing.

ID: 10096 | **Overturning Typologies: Contradictions and Tensions in the Beliefs and Knowledge of Preservice Science Teachers about Equity in Science Instruction**  
*Sara E Tolbert, University of Arizona*

Findings complicate those from prior studies which have pointed to clear distinctions between those who are disposed toward diversity issues and those who are not.

Thurs: 4:30  Room: **Preservation** Paper Set  Presider: Danielle Ford

ID: 10136 | **Preservice Teachers’ Perspectives on Global Climate Change**  
*Julie L Lambert, Florida Atlantic University; Joan Lindgren, Florida Atlantic University; Robert Bleicher, California State University Channel Islands; Anne Henderson, Florida Atlantic University; Alana Edwards, Florida Atlantic University*

This study examines changes in elementary science methods students’ views about global climate change, content knowledge, and the impact of the course instructional approach.

ID: 10179 | **Pioneers of Science Education**  
*Jon E Pedersen, University of Nebraska-Lincoln; Barbara S. Spector, University of South Florida; Paul C Jablon, Lesley University; Kevin Finson, Bradley University*

We present biographical excerpts from a forthcoming book of pioneering science educators who set the groundwork for the rich tradition in science education.

Thurs: 4:30  Room: **Coral** Paper Set  Presider: Angela Chapman

ID: 10203 | **Socialization Patterns Along the Science Career Trajectory: An Exploration of High School Girls’ Nature of Experiences in a High School – University Science Partnership Program**  
*Megan E Faurot, Illinois Institute of Technology; Stephen A Bartos, Illinois Institute of Technology; Norman G Lederman, Illinois Institute of Technology; Teresa K Woodruff, Northwestern University; Cathryn Smeyers, Northwestern University; Nadia Reynolds, Northwestern University*

Nature of experiences of high school girls’ in a high school-university science partnership program provides insight into the socialization patterns of underrepresented groups in science.

ID: 10186 | **Where the Boys Are—Issues in Single Sex Classes for Science and Mathematics**  
*Anthony W Bartley, Lakehead University; Wayne S Melville, Lakehead University; Doug Jones, Sir Winston Churchill CVI School; Molly Weinburgh, Texas Christian University; Andrea Lampa, Sir Winston Churchill CVI School; Heather Campbell, Sir Winston Churchill CVI School; Jane Lower, Sir Winston Churchill CVI School*

We review our successes and tensions with male single sex classes for at-risk students in science and math in a public secondary school.

Thurs: 4:30  Room: **Manatee** Paper Set  Presider: Jenesta Nettles Marshall

ID: 10127 | **Technology Use in Science Classrooms and Reformed Teaching**  
*Todd Campbell, Utah State University; Max Longhurst, Utah State University, Logan UT, U.S.; Aaron M Duffy, Utah State University, Logan UT, U.S.; Paul G Wold, Utah State University, Logan UT, U.S.; Brett E Shelton, Utah State University*

This research reveals a framework for integrating technology into science classrooms and examines the current practice with this lens.

ID: 10181 | **Snow snakes through Adventure Learning: How using a hybrid online environment supports the development of science agency**  
*Brant Miller, University of Idaho; Gillian Roehrig, University of Minnesota; Aaron Doering, University of Minnesota*

Learn about the Adventure Learning framework and how it was mobilized to deliver a culturally based STEM curriculum. Associated research findings will be discussed.
ID: 10006 | The Effectiveness of Educatice Curriculum Materials as a Form of Science Teacher Professional Development for a Geospatial Technologies–Integrated Energy Resources Curriculum

Alec M. Bodzin, Lehigh University; Violet Kulo, Lehigh University; Tamara Peffer, Lehigh University

An effectiveness study of using educative curriculum materials that promote teachers’ environmental content knowledge and science pedagogical content knowledge with geospatial technologies is presented.

Thurs. 4:30 Room: Exec Conference  Paper Set  Presider: Aletta Zietsman-Thomas

ID: 10030 | The Impact of Gender and Ethnicity on Eighth Grade Science Performance Outcomes

Kay A Kohlhaas, University of Houston - Victoria

Eighth grade data from the Early Childhood Longitudinal Study were utilized to investigate the impact of gender and ethnicity on students’ science achievement outcomes.

ID: 10032 | Digging into Children’s Understandings of Rocks and Soils

Kathy Cabe Trundle, Ohio State University; Sally M. Hobson, Hillard City Schools; Heather L. Miller, The Ohio State University; Mandy M. Smith, The Ohio State University; Margilee P. Hilson, Columbus City Schools; Lawrence A. Krisek, The Ohio State University

This study describes second and third grade children’s (n = 73) understandings of earth materials, including the properties and uses of rocks and soils.

ID: 10034 | Development of a Diagnostic Self-Efficacy Measure and its Implications for Teachers.

Richard L. Lamb, George Mason University; Len Annetta, George Mason University; David Vallet, George Mason University; Rebecca Cheng, George Mason University

Development of a short form, diagnostic instrument for measuring student science and technology self-efficacy and the implications for students and teachers.

Thurs. 4:30 Room: Salon A  Paper Set  Presider: Jeffery Townsend

ID: 10061 | Planning 5E Inquiry Lessons: A Psychometric Analysis of a Revised 5E Inquiry Lesson Plan Rubric

M. Jenice “Dee” Goldston, The University of Alabama; Jeanelle Day, Eastern Connecticut University; John Dantzler, University of Alabama-Birmingham; Brenda Webb, University of North Alabama

This study reports on the development and analysis of a 5E inquiry lesson plan (ILPv2) rubric assessing preservice teachers' skill in developing 5E lesson plans.

ID: 10064 | Comparing the Classroom Interactive Behaviors of Science and Non-Science Pre-Service Teachers

Daniel J Bergman, Wichita State University; Jason Morphew, Wichita State University

This session features data, comparisons, and discussion of science and non-science pre-service teachers' use of questions and responses when interacting with students in fieldwork settings.

ID: 10083 | Exploring how a coteaching model used during student teaching fosters discourse between candidates and their mentors as candidates learn to teach inquiry science

Christine L. Manzey, University of Toledo; Rebecca Schneider, University of Toledo

Preservice teachers using a coteaching model during student teaching showed seven distinct conversation patterns with their mentors while learning to teach inquiry science.

Thurs. 4:30 Room: Salon B  Small Group Roundtable

ID: 12005 | Urban STEM students: The cognitive ecologies of urban STEM graduate teacher candidates

Francis S. Broadway, University of Akron; Sheri L Leafgren, Miami University; Nidaa Makki, The University of Akron

Sharing fictional short stories autobiographically to develop an urban science pedagogy and to depict STEM graduate teacher candidates is “who is an urban high school student”.


Paper Set

**ID: 10107 | Science Teacher Educators as Consultants to Scientists: Developing a Residential Institute for High School Teachers**

*Barbara S Spector, University of South Florida; Jeremy P Lake, Earth Force; Amy Basham, Hillel School of Tampa*

We describe lessons learned as consultants to scientists about teacher/scientist interactions and decision-making while scientists planned and implemented an ecology institute for teacher professional development.

**ID: 10092 | A High-Quality Professional Development for Implementing Engineering into Your Classroom for Teachers of Grades 3-6**

*Selcen Guzey, STEM Education Center, University of Minnesota; Kristie Tank, STEM Education Center, University of Minnesota; Hui-Hui Wang, STEM Education Center, University of Minnesota; Gillian Roehrig, STEM Education Center, University of Minnesota; Tamara Moore, STEM Education Center, University of Minnesota*

We will present the professional development module designed to help teachers in grades 3-6 implement the engineering component of the new Minnesota science standards.

Paper Set

**ID: 10146 | The impact of using a scaffolded written framework prompting reading on students' conceptual understanding**

*Jeong-yoon Jang, University of Iowa; Brian Hand, University of Iowa*

This study investigated the impact of using a Structured Reading Framework within the Science Writing Heuristic approach on students' conceptual understanding.

**ID: 10052 | Reflections on outdoor experiences: An analysis of the views expressed by students, parents and educators**

*Margaret M Pop, North Carolina State University; Sarah Carrier, North Carolina State University; Linda Tugurian, North Carolina State University*

The purpose of this qualitative study was to document elementary science teaching and learning at two elementary schools, examining teachers' views of science instruction.

Paper Set

**ID: 10040 | Teachers’ beliefs About Ocean Literacy and the Impact of Three Experiential Marine Science Professional Development Programs**

*Catherine L Linsky, University of Georgia*

This study describes the impact of three experiential marine science professional development courses on teachers' beliefs about Ocean Literacy and its relevancy to classroom practice.

**ID: 10010 | A Collaborative Partnership to Increase Elementary Students’ Experiences with the Outdoors**

*María M Ferreiro, Wayne State University*

A collaborative partnership between a local university, school district, and community organization was established to develop and implement outdoor classrooms in seven local elementary schools.

**ID: 10026 | Green Science Teachers: Earth Smarts as a Tool for Teacher Education.**

*Bryan H. Nichols, University of South Florida*

This presentation will introduce teacher educators to earth smarts, a practical educational framework based on justly maintaining quality of life in a changing world.

Paper Set

**ID: 10068 | The Implicit Communication of Nature of Science through Teacher Hedging**

*Alandeom W. Oliveira, State University of New York at Albany; Valarie L. Akerson, Indiana University Bloomington; Huseyin Colak, Northeastern Illinois University*

This study explores how the oral language used by three elementary teachers facilitating science inquiry discussions implicitly communicates the tentative nature of science.
Paper Set

ID: 10167 | Teachers’ translations of their improved nature of science views into instruction
Bridget K. Mulvey, University of Virginia; Randy L. Bell, University of Virginia
Nature-of-science and inquiry workshop teachers who created a video reflection on their own NOS instruction improved their views and taught the NOS more than required.

ID: 10046 | Informal Reasoning Patterns: What Students’ Writing Reveal About Their Conceptions of Cloning Animals for Their Body Parts.
Wardell A Powell, University of South Florida; Dana L Zeidler, University of South Florida; Milton Huling, University of South Florida
Students’ informal reasoning patterns on socioscientific issues revealed their commitment to emotive reasoning, religious considerations and moral considerations to influence argumentation and decision-making skills.

ID: 10188 | Title Impact of a Targeted Laboratory Intervention on Introductory Biology Majors’ Learning of Evolution
Jill Grace, California State University, Long Beach; Laura Henriques, California State University, Long Beach; Alan Colburn, California State University, Long Beach; Kelly Young, California State University, Long Beach; Elizabeth Eldon, California State University, Long Beach; Susan Platt, California State University, Long Beach
A targeted laboratory alongside modest TA training was tested in a majors’ biology course to see what impact it had on student learning of evolution.

ID: 10122 | Putting Students in the Hot Seat to Promote Science in a Biology Course for Non-Majors
Samantha R Fowler, Clayton State University
This presentation describes the Hot Seat activity, how it is assessed, and how it has impacts students’ attitudes toward the course and biology in general.

Paper Set

ID: 10194 | Science Teacher Identity Formation: Possible-Selves and Non-Formal Teaching Experiences
Jennifer H Forrester, University of Wyoming; Jason M Katzmann, The University of Wyoming; Joel Pontius, The University of Wyoming
This study reports the impact of non-formal teaching experiences on science teacher identity formation.

ID: 10202 | Science Teacher Research Experiences = Increased Student Achievement
Jay Dubner, Columbia University
Research experience programs engage teachers in the hands-on practice of Science. Columbia University’s Summer Research Program’s assessment found an increase in teachers’ and students’ achievement.

ID: 10208 | Teaching Science through the Lens of Gravity
Esther L Zirbel, Brown University
This paper presents a historical constructivist approach to learning science. By comparing theories of Aristotle, Newton, and Einstein students will challenge their understanding of gravity.
### Conference Schedule

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<tr>
<th>Time</th>
<th>Event</th>
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<th>Location</th>
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<tr>
<td>8:00 AM</td>
<td>Breakfast Buffet</td>
<td>North-East, MB</td>
<td>Meeting Room 101</td>
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<tr>
<td>10:00 AM</td>
<td>Keynote Address</td>
<td>South-East, MB</td>
<td>Meeting Room 101</td>
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<tr>
<td>11:00 AM</td>
<td>Lunch on the Lawn</td>
<td>East, MB</td>
<td>Meeting Room 101</td>
</tr>
<tr>
<td>12:00 PM</td>
<td>Keynote Address</td>
<td>West, MB</td>
<td>Meeting Room 101</td>
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<tr>
<td>2:00 PM</td>
<td>Welcome Reception</td>
<td>MB Ballroom</td>
<td>Meeting Room 101</td>
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<tr>
<td>5:00 PM</td>
<td>Dinner</td>
<td>MB Restaurant</td>
<td>Meeting Room 101</td>
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**ASTE Conference Schedule Friday, January 6, 2012**
Friday - January 6, 2011

7:00-8:00  Breakfast Banquet Foyer D-G & Committee Meetings
7:30-3:00  Registration
8:15-9:15  Concurrent Sessions and Workshops
9:30-10:30 Concurrent Sessions, Workshops, and Poster Session 1
10:45-12:30 General Session 2 Keynote Presentation

Dr. Stephen A. Macko: “From Laughing Gulls and Dolphins to Meteorites: Stable Isotopes As a Tool for Science and Decision Making”

12:30-2:00  Lunch on your own
2:00-3:00  Concurrent Sessions and Workshops
3:15-4:15  Concurrent Sessions and Workshops
4:30-5:30  Regional ASTE Meetings
5:30  Dinner on your own or WISE Dinner
Fri: 8:15 Room: **Mangrove** Paper Set Presider: Jeffery Townsend

**ID: 10112 | From Elementary Teacher to Science Teacher: K-8 Teachers’ Identity Development during a 3-Year Physical Science Masters Program**

Martina Nieswandt, University of Massachusetts, Amherst; Jay Kubarek-Sandor, Illinois Institute of Technology; Margaret Stanfield, Illinois Institute of Technology

This qualitative study explored how a group of K-8 teachers’ understanding of teacher-self developed throughout a 3-year masters program emphasizing physical science.

**ID: 10137 | Inservice Teachers’ Learning Inquiry and Teaching Preservice Teachers about Inquiry**

Felicia M Mensah, Teachers College, Columbia University; Li-Ling Yang, Roger Williams University

This study reports findings of a partnership with elementary in service teachers and preservice teachers in learning and teaching inquiry.

**ID: 10145 | An Exploration of Different Approaches to Classroom Implementation Following a Workshop on Neuroscience**

J. McClelland, University of Minnesota; Devarati Bhattacharya, University of Minnesota; Mary Hoelscher, University of Minnesota; Rachelle Haroldson, University of Minnesota; Gillian Roehrig, University of Minnesota; Janet Dubinsky, University of Minnesota

In this presentation we share details about a two-week neuroscience professional development for high school teachers and explore different classroom implementation strategies employed by participants.

Fri: 8:15 Room: **Citrus** Themed Paper Set Presider: Anna Lewis

**ID: 14010 | Supporting the Forgotten Teachers: Creating Professional Development for Informal Science Educators**

James Kisiel, California State University, Long Beach; Celeste Barthel, Wilson College; Amy Cox-Petersen, California State University, Fullerton; Debbie DeRoma, Reuben H. Fleet Science Center; Maria Grant, California State University, Fullerton; Donna L Ross, San Diego State University

This session documents three professional development efforts aimed at educators working in informal science environments. Results suggest a variety of outcomes for these out-of-classroom teachers.

Fri: 8:15 Room: **Dolphin** Paper Set Presider: Karen Irving

**ID: 10120 | The use of Backwards Design principles to develop literacy and technology skills through socioscientific instruction.**

Brendan E Callahan, Ferris State University

A theoretical paper that describes the process for of using "Backwards design" principles to develop socioscientific issues based instruction to promote literacy and technology skills.

**ID: 10226 | Negotiating culturally relevant science education in a diverse small high school**

Ashraf A Shady, Queens College, CUNY

This study examined the effects of the small school model, on the collective efficacy of teachers, and students who did not share the school's vision.

**ID: 10126 | 2011 ASTE Policy and Government Relations Forum Survey: A Representative Voice on National Science Education Policies?**

Julie F Westerlund, Texas State University- San Marcos; Colleen Megowan-Romanowicz, Arizona State University

The ASTE Policy and Government Relations Forum survey of the ASTE membership to determine consensus views on national issues pertaining to science teacher education.
Fri: 8:15  Room: Torpon  

**Paper Set**  

**ID: 10038 | Students, They Inquire but Do They Know? Teaching Students About Knowledge of Inquiry**  
Selina L Bartels, Illinois Institute of Technology; Norman G Lederman, Illinois Institute of Technology; Judith S Lederman, Illinois Institute of Technology  
Inquiry is an important aspect taught in science classrooms today, this study looks at students' understanding of inquiry not just the action of conducting inquiry.

**ID: 10041 | Science Mentoring Integrative Learning Experience (SMILE) – Results of a First Year Pilot Program**  
Brenda Fredette, Medaille College  
The SMILE program studied the impact of serving as a mentor on student learning and motivation in a General Chemistry course.

**ID: 10056 | Discursive Modes in Model-Based Science Inquiry Classrooms**  
Todd Campbell, Utah State University; Phil S. Oh, Gyeongin National University of Education, Republic of Korea; Drew Neilson, Logan High School, Logan UT  
This research examines roles of teachers and students in MBI classrooms where dominant discourse modes such as exploring, retrieving, and elaborating emerge as significant discourses.

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Fri: 8:15  Room: Coral  

**Paper Set**  

**ID: 10004 | Liberatory Science Education in a Single Sex and a Coeducational Setting**  
Roxanne Hughes, National High Magnetic Field Laboratory; Kristen Molyneaux, National High Magnetic Field Laboratory  
This study looks at the effects of liberatory science education in a single sex setting and a co-educational setting.

**ID: 10011 | Urban High School Teachers’ Beliefs of Essential Science Teaching Dispositions**  
Rommel J Miranda, Towson University  
Investigated urban educators’ views of what constitutes essential science teaching dispositions, as well as how these dispositions might be exhibited in urban high school classrooms.

**ID: 10192 | The Design of Culturally Based Inquiry Units for Young Children**  
Mia Dubosarsky, University of Minnesota; Gillian Roehrig, University of Minnesota; Barb Murphy, University of Minnesota; Stephan Carlson, University of Minnesota; Jennifer Jones, University of Minnesota; Linda Frost, University of Minnesota  
Culturally based inquiry units on ice-fishing and animal tracks weave together Ojibwe traditions and critical thinking skills in American Indian Head Start classrooms.

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Fri: 8:15  Room: Manatee  

**Experimental Session**  

**ID: 13016 | Exploring New Technology Tools to Enhance Astronomy Teaching & Learning in Grades 3 – 8 Classrooms: Year One Implementation**  
Timothy Young, University of North Dakota; Bruce Farnsworth, University of North Dakota; Mark Guy, University of North Dakota; Cindy Grabe, University of North Dakota  
Presentation on an innovative technology-supported project to enhance astronomy learning in elementary and middle level classrooms called SITE: Simulation Immersion in Teacher Education.
Fri: 8:15  Room: **Exec Conference**  
ID: 21017  |  **Embedded Workshop**  
**Videocases for Science Teaching Analysis (VISTA): Exploring an Online Analysis-of-Practice Curriculum for Preservice Teachers**  
*Kathleen Roth, BSCS*

Participants will explore online, videobased analysis-of-practice modules for preservice teachers. Discussion will focus on ways in which videobased, analysis-of-practice programs can maximize preservice teacher learning.

Fri: 8:15  Room: **Salon A**  
ID: 13011  |  **Experimental Session**  
**Experiencing Communication Barriers: An Experiential Lesson Developed for K-5 Preservice Teachers**  
*Katie L Brkich, Georgia Southern University*

Experiential session to share a lesson developed for use with K-5 preservice teachers teaching the importance of ELL accommodations through affective experience and empathy development.

Fri: 8:15  Room: **Salon B**  
ID: 10180  |  Paper Set  
**Creating Competent STEM Elementary Teachers**  
*Tony P Murphy, National Center for STEM Elementary Education, St. Catherine University*

Education and STEM professors created a STEM certificate for SCU’s elementary education majors. Results show gains in STEM knowledge and attitudes to STEM.

ID: 10200  |  "Accomplished Teachers Make It Look So Easy" Educating Career Changers Transitioning to Secondary STEM Teaching  
*Alan W Oliveira, State University of New York at Albany; Catherine Snyder, Union Graduate College*

Using the Theory of Transformative Learning, this qualitative case study demonstrates that highly skilled career changers face daunting challenges as they transition to secondary teaching.

ID: 10206  |  Increasing secondary science preservice teacher self-efficacy and pedagogical content knowledge; a place-based approach.  
*Jason M Katzmann, University of Wyoming; Jennifer H. Forrester, University of Wyoming; Joel Pontius, University of Wyoming*

Providing preservice secondary science teachers with a week-long place-based science residency program increased their pedagogical content knowledge and science self-efficacy. Preservice teacher implications are discussed.

Fri: 8:15  Room: **Salon C**  
ID: 31090  |  Paper  
**The NRC's Framework for K-12 Science Education: Implications for Teachers of Science Teachers**  
*Thomas Keller, National Research Council, Board on Science Education; Heidi Schweingruber, National Research Council, Board on Science Education*

In July, 2011, the National Research Council released a Framework for K-12 Science Education: Practices, Crosscutting Concepts and Core Ideas that describes a vision for science education and three dimensions critical to that vision. In this workshop, we will explore the framework and dimensions, especially the scientific and engineering practices, and discuss ways to ensure their integration into pre-service programs.

Fri: 8:15  Room: **Salon D**  
ID: 14005  |  Themed Paper Set  
**Beginning Teachers’ Tensions in Citizen Science, Ethics in Citizen Science at Tremont Institute and The Future of Citizen Science**  
*Stacey A Britton, University of Mississippi; Lynda Jenkins, University of Georgia; Michael Mueller, University of Georgia; Deborah Tippins, University of Georgia; Lynn Bryan, Purdue University*

A trend of democratizing science and schooling is characterized as, citizen science. We explore the tensions, roots, and future of this movement in science education.
Fri: 8:15  Room: Saloon E  Themed Paper Set  Presider: Wayne Melville
ID: 14004 | Teachers’ NOS Implementation Practices Two to Five Years after Having Completed an Intensive Science Education Program

Benjamin C Herman, University of South Florida; Michael P Clough, Iowa State University; Joanne K Olson, Iowa State University

We will present a systematic NOS implementation protocol, the largely successful NOS implementation practices of experienced science teachers, and interrelated factors associated with those practices.

Fri: 8:15  Room: Saloon F  Paper Set  Presider: Tiffany Wild

David T Crowther, University of Nevada, Reno; John Cannon, University of Nevada, Reno

The Nevada Earth Space Science Initiative (NESSI) is a professional development program that has completed 5 years of training with demonstrated teacher and student learning.

ID: 10218 | Examining Pre Service Teacher’s Ability to Use Questioning in an Elementary Science Lesson

Elaine M Lucas-Evans, University of Pittsburgh

Questioning is a feature of talk that pre service teachers can plan for so they can connect student ideas to lesson learning goals.

ID: 10212 | Using Teacher Questioning as an Indicator of Teacher Change

Marilyn Morey, Illinois State University; Cynthia Langrall, Illinois State University; Elif Safak, Illinois State University; Josh Hertel, Illinois State University

Our research investigates the influence of a 3-year Master's degree program on the questioning practices of 22 science and mathematics teachers.

Fri: 9:30  Room: Mangrove  Paper Set  Presider: Kate Popejoy
ID: 10150 | The Reconstruction of Pedagogical Content Knowledge in the Context of International and Cross-Cultural Teaching

Charles B. Hutchison, University of North Carolina at Charlotte

This paper explains the reconstruction of teachers' pedagogical content knowledge in the context of international or cross-cultural teaching.

ID: 10152 | Interactions between Classroom Discourse, Teacher Questioning and Student Cognitive Engagement in Middle School Science

Jeff C. Marshall, Clemson University; Julie Smart, Presbyterian College

This study, using a sequential explanatory mixed-methods design, examines interactions between classroom discourse and related student cognitive engagement in inquiry-based middle school science classrooms.

ID: 10165 | Building Communities of Practice: A K-20 Professional Development (PD) Effort

Kathie Maynard, University of Cincinnati; Jonathan M Breiner, University of Cincinnati

We will describe the PD effort from the perspectives of five STEM faculty members who facilitated the monthly cross-disciplinary content-focused inquiry workshops with in-service teachers.
Fri: 9:30  Room: Citrus  Paper Set  Presider: Thomas Dolan
ID: 10234  Developing Essential Features of Science Teachers’ Profession: The development of POCoM (Practical On-site Cooperation Model)
Jongwon Park, Chonnam National University; Young-Shin Park, Chosun University; Youngmin Kim, Pusan National University; Jong-Seok Park, Kyungpook National University; Jin-Su Jeong, Daegu University
This study was to develop essentials of science teaching profession in the context of Korea to create POCoM (Practical On-site Cooperative Model) for teacher profession.

ID: 10171  Robert Noyce Scholarships for Teaching Miners: A Continuous Support Model
Eric A. Hagedorn, University of Texas at El Paso; Olga Kosheleva, University of Texas at El Paso; Laura F. Serpa, University of Texas at El Paso; Amy E. Wagler, University of Texas at El Paso; Ronald R. Wagler, University of Texas at El Paso
Describes unique model for providing various supports for science teachers from the time of selection as undergraduates through induction years. Provides preliminary evaluative findings.

ID: 10076  Educating Prospective Science Teacher Educators: An Innovate Doctoral Seminar
Deborah L. Hanuscin, University of Missouri; Tiffany Hill, University of Missouri; Kemal Izci, University of Missouri; Ya-Wen Cheng, University of Missouri; Somnath Sinha, University of Missouri; Nilay Muslu, University of Missouri; Heather Worsham, University of Missouri
The paper explores innovative practices for preparing future science teacher educators and describes a doctoral seminar organized within the framework of PCK for teaching teachers.

Fri: 9:30  Room: Dolphin  Paper Set  Presider: Melissa Shirley
ID: 10105  Expectations, Mobility, Stability, and Opportunity: Transitions of beginning science teachers
Julie Luft, Arizona State University; Charles B Weeks, Arizona State University
We followed new science teachers to document if they moved, stayed or left the field. Our results guide the selection and support of new teachers.

ID: 10222  First Steps Toward Integrating the Common Core ELA Standards into Science Teaching
Wendy Ruchti, Idaho State University; Ashley Olsen, Idaho State University; Susan Jenkins, Idaho State University
The process and progress of classroom science teachers integrating the Common Core ELA Standards and the Idaho State Science Content Standards.

ID: 10213  Science Competencies That Go Unassessed
Penny J Gilmer, Florida State University; Danielle Sheridan, Florida State University; Aaron Roubey, Florida State University
We develop science competencies for benchmarks that go unassessed in statewide summative tests, based on the “big ideas” across four bodies of knowledge.

Fri: 9:30  Room: Tarpon  Paper Set  Presider: Lindsay Wheeler
ID: 10073  Understanding the role of science teacher relationships in promoting adolescents’ motivation to engage in science: Examining Four Class Cases.
Heather A. Davis, North Carolina State University; Margaret R. Blanchard, North Carolina State University; M. Gail Jones, North Carolina State University
This research investigates 400 students’ perceptions of and motivation for science in the classrooms of 12 middle and high school science teachers in the southeast.

ID: 10078  Importance of Differentiating for the Higher Level Process Skills of Science During Science Instruction for Talented and Gifted Learners
John L. Pecore, Institute for Biomedical Philosophy and Temple University; Wesley D. Thompson, Institute for Biomedical Philosophy; Melissa K. Demetrikopoulos, Institute for Biomedical Philosophy
Although content changes, gifted instruction focuses on processing additional content (enrichment) or learning content earlier (acceleration). Established higher level process skills should be emphasized instead.
A Correlational Study of Nature Awareness and Science Achievement

Nikki L. Votaw, Johnson University; Monica Swartzentruber, Johnson University; Kelly Chandler, Johnson University

The purpose of this study was to determine if there is a connection between students' experiences in nature and their science achievement in the classroom.

Fri: 9:30  Room: Coral  Paper Set  President: Rommel Miranda

Recruiting minority high school students into STEM careers through immersive experiences in learning to be a science and mathematics teacher

Anton Puvarajah, Georgia State University; Lisa M Martin-Hansen, Georgia State University; Yvette Gilbert, Georgia State University; Tim Maley, Georgia State University; Jim Dennis, Georgia State University; Chris Hill, Georgia State University; Glaser Shealey, Elizabeth City State University

The Academy for Future Teachers (AFT) model has shown promise in preparing and inspiring underrepresented high school students to future science careers including science teaching.

An extension of school-based learning into summer: What’s STEM got to do with it?

Jennifer T Dames, University of Central Florida; Meera Ravikumar, University of Central Florida

Female participation in STEM confronted in a camp experience introduced girls to STEM disciplines and increased their interest in STEM careers.

Moving beyond the Periphery: The Role of Communities of Practice for Increasing Representation in Science Fields

Robert J Ceglie, Mercer University

This study examines how communities of practice were formed by women of color to guide them toward legitimization and success when navigating college science disciplines.

Fri: 9:30  Room: Manatee  Paper Set  President: Daniel Bergman

Science Teacher Discourse When Using Photographs and Classroom Response Systems in Discussion-Oriented Pedagogy in the Teaching of Astronomy

Hyunju Lee, University of Massachusetts Amherst; Allan Feldman, University of South Florida

We report various types of teacher's discourses and teacher-students interaction patterns in middle school astronomy classes, implementing photographs and classroom response systems with discussion-oriented pedagogy.

Do student-generated digital animations enhance student understanding of water boiling? A study comparing student learning in a Sci Vis course

Jennifer L Albert, North Carolina State University; Eric N Wiebe, North Carolina State University; Margaret R Blanchard, North Carolina State University

Conceptual learning of 94 Students in six Sci Vis courses is assessed based on whether they created or constructed a digital animation of water boiling

Exploring Scientific Reasoning with Computer Simulation of “Gas Properties”

Tugba Keser, Trakya University

This study investigated scientific reasoning of 8th-grade students who used a "Gas Properties" computer simulation in a collaborative learning context being similar to inquiry-based activities.

Fri: 9:30  Room: Salon A  Paper Set  President: Mary Atwater

Exploring how a coteaching model used during student teaching supports candidates learning to teach inquiry science

Christine L. Manzey, University of Toledo

Preservice teachers using coteaching during student teaching showed evidence of learning to teach inquiry science and reported feeling well-supported because of collaborations with hosting teachers.
ID: 10114 | Retention of Biology Content Knowledge of Pre-service Elementary and Middle Grades Teachers

Elizabeth A E Roland, Morehead State University; Carol Wymer, Morehead State University

The study reports the retention of biology content knowledge of selected standards concepts.

ID: 10123 | Inquiry and models: The case of melting ice cubes.

Mark Olson, Oakland University

Conceptual models are at the core of scientific inquiry. This paper develops and illustrates important features of preservice secondary science teacher knowledge of models.

Fri: 9:30 Room: Salon B

Small Group Roundtable

ID: 12006 | Integration of Environmental Education into a Preservice Teacher Training Program: A Case Study

Greer M Richardson, La Salle University; Ling L Liang, La Salle University; Donna G Wake, University of Central Arkansas

This research will explore the effectiveness of an Environmental Education inclusion model designed to impact preservice teacher knowledge of EE standards, content, and pedagogy.

Fri: 9:30 Room: Mandalay

Experimental Session

ID: 13015 | Connective Technology & Online Resources in the School Science Curriculum: Utilization with pre-service and inservice teachers

Pamela Fraser-Abder, New York University; Paul Jablon, Lesley University

Participants will explore emerging connective technologies, websites, and instructional strategies that they can integrate into science methods classes to create engaging global science classrooms.

: 10:45 Room: Salon D-G

KeyNote

ID: | From Laughing Gulls and Dolphins to Meteorites: Stable Isotopes As a Tool for Science and Decision Making

Stephen A. Macko, University of Virginia

Stephen A. Macko is a Professor of Isotope and Organic Geochemistry in the Department of Environmental Sciences at the University of Virginia. His education includes earning a B.S. in Chemistry from Carnegie-Mellon University, an MS in Oceanography from the University of Maine, and the PhD from the University of Texas in Chemistry. Dr. Macko’s research interests are varied, ranging from marine organic geochemistry with special applications to climate change to exploring the Origins of Life through the geochemistry of meteorites. He is active, as well, in K-12 education and outreach. Dr. Macko’s work has been featured on Discovery and National Geographic television channel programs (The Ultimate Guide to Mummies, The Moche Murder Mystery, The Mummy Road Show). He has participated in numerous oceanographic expeditions, including dives to depths of over 500m in the submersible Johnson Sea Link. Additionally, Dr. Macko served as a research scientist on the high Arctic Canadian Ice Island. The author of more than 250 refereed research papers and books, Dr. Macko was elected a Fellow of the Geochemical Society and of the European Association of Geochemistry in 2003.

Fri: 2:00 Room: Mangrove

Paper Set

ID: 10174 | Teacher Uptake of Science Literacy Ideas: A Cross-case Analysis of Large-Scale, District-wide, and Single School Projects

Christine D Tippett, University of Victoria; Larry D Yore, University of Victoria; Ruthanne Tobin, University of Victoria; James A Shymansky, University of Missouri, St. Louis

This presentation compares and contrasts three professional development in science projects and examines elementary and middle school teachers’ uptake of language tasks and literacy strategies.

ID: 10187 | The influence of a long-term professional development project on the development of physics teacher PCK

Andrew B West, University of Missouri; Mark J Volkmann, University of Missouri

This presentation reports on the development of ninth grade physics teachers’ PCK as a result of their participation in a long-term PD project.
ID: 10156 | Scientists in Teacher Professional Development: Scientists’ Views about Teaching Science and Partnerships with Teachers
Judith A Morrison, Washington State University
This study explored the views scientists hold about the benefits of teachers working with scientists and their views on improving science education in the classroom

Fri: 2:00 Room: Citrus Paper Set Presider: George Navratil
ID: 10209 | How preservice elementary teachers used award winning science trade books to teach cross curriculum standards
Ian C Binns, University of North Carolina at Charlotte; Steven Bickmore, Louisiana State University
Preservice elementary teachers use Giverny Award science trade books to teach cross curriculum standards; which allowed increased instructional time for science integrated with ELA.

ID: 10224 | Post Baccalaureate Programs – Should they seek NCATE IL/PB Recognition?
Erica M. Brownstein, Capital University
Post baccalaureate preparation programs may seek NSTA recognition or NCATE IL/PB. This paper describes the first two implementations of the new NCATE IL/PB recognition system.

Fri: 2:00 Room: Dolphin Paper Set Presider: Melissa Shirley
ID: 10175 | Developing, Implementing, and Assessing Laboratory Experiences Based on the Dimensions of Inquiry
Ann W Wright, Canisius College; Joeseph Engemann, Brock University; Joeseph Zawicki,
Laboratory experiences should differentiate between the capabilities of students. This presentation will provide examples of laboratory activities that reflect several cognitive and/or instructional dimensions.

ID: 10055 | Measuring the quality of inquiry-based instruction: Comparative analysis of two inquiry observational protocols
Jeff C Marshall, Clemson University; Christine Lotter, University of South Carolina; Julie Smart, Presbyterian College
With inquiry being a central tenet of the National Standards, we need a solid means to measure effectively the quality of inquiry-based instruction being facilitated.

ID: 10098 | The Importance of Using Multiple Measures to Assess Science Proficiency
Patrick J Enderle, Florida State University; Victor D Sampson, The Florida State University; Jonathon A Grooms, The Florida State University
Several new assessments that align with new science proficiency frameworks will be described. Student results will provide cases supporting the development of a "Performance Profile".

Fri: 2:00 Room: Tarpon Themed Paper Set Presider: Thomas Dolan
ID: 14011 | A Heuristic for Describing and Interpreting Reflection in Science Teacher Education Programs
Frederick Nelson, University of Florida
A heuristic that is designed to describe and interpret reflection in science teacher education will be presented, considering both orientations to and components of reflection.
Fri: 2:00  Room: **Coral**  Embedded Workshop
ID: 31040 | **Equity Session**
*Rita Hagevik, University of North Carolina at Pembroke; Tiffany Wild, Ohio State University; Maria Rivera Mauucci, Barnard College, Columbia University; Felicia Moore Mensah, Teachers College, Columbia University; Lynn Woolsey, University of the Cumberlands*
Using video to help teachers learn to teach science to special needs and culturally diverse students. This workshop will engage participants in techniques and strategies for using video case studies and other video-based methods with preservice and inservice teachers to prepare them to teach science to students with disabilities and culturally diverse students. A DVD of resources, handouts, digital videos, and activities will be provided to workshop participants.

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Fri: 2:00  Room: **Manatee**  Themed Paper Set
ID: 14001 | **Effects of Science Teacher Professional Development With Geospatial Technologies on Teacher Learning and Student Achievement**
*Alec Bodzin, Lehigh University; Tamara Peffer, Lehigh University; Violet Kulo, Lehigh University*
Studies that focus on promoting geospatial science pedagogical content knowledge with inservice science teachers and resulting effects on student learning in urban science classrooms.

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Fri: 2:00  Room: **Exec Conference**  Embedded Workshop
ID: 21025 | **Stop at the Culture Bump: Assisting Educators in Acknowledging their Cultural Identity**
*Shawn Holmes, North Carolina State University*
Participants will experience intercultural relations strategies that encourage cultural self-awareness. Then learn to incorporate the strategies in preservice science education courses. CDs will be provided.

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Fri: 2:00  Room: **Salon A**  Paper Set
ID: 10124 | **Analyzing Preservice Teachers’ Images of Scientists Using a Conceptual Framework Derived from the Literature on the Role and Work of Scientists.**
*Karthikeyan Subramaniam, University of North Texas, Denton; David Wojnowski, University of North Texas, Denton; Pamela Harrell, University of North Texas, Denton*
This presentation compares preservice teachers’ images of scientists derived from the Draw-A-Scientist-Test and from a conceptual framework based on the role and work of scientists.

ID: 10125 | **Exploring Attitudes, Beliefs, and Self Efficacy of Pre-Service Elementary Teachers Enrolled in a Science Methods Course and Factors Responsible for Possible Changes**
*Mahsa Kazempour, Penn State Berks*
This cross case analysis study examines the impact of a science methods course on three groups of elementary preservice teachers’ beliefs, attitudes, and self-efficacy.

ID: 10133 | **Assessing Pedagogical Content Knowledge of Inquiry Science Instruction**
*David Schuster, Western Michigan University; William W Cobern, Western Michigan University; Betty Adams, Western Michigan University; Brandy Skjold, Western Michigan University; Amy Bentz, Western Michigan University; Kelly Sparks, Western Michigan University*
We describe the design and development of assessment items and instruments to identify science teaching orientations and assess pedagogical content knowledge of inquiry science instruction.
Fri: 2:00  Room: **Salon B**  
**Small Group Roundtable**

ID: 12010  |  **The STEM Summer Institute: Opening the STEM teaching pipeline for community college students**  
*Larry Harvath, San Francisco State University*
Urban Community College students’ perspectives on teaching science in the context of participating in a STEM Summer Institute

Fri: 2:00  Room: **Mandalay**  
**Embedded Workshop**

ID: 21021  |  **Collecting, Sharing, Analyzing and Interpreting Whole-Class Data Using Cloud-Based Collaborative Documents**  
*Brian Foley, California State University, Northridge*
Abstract: Introduction to Computer Supported Collaborative Science (CSCS), a model for engaging all learners in scientific inquiry using free online tools.

Fri: 2:00  Room: **Salon D**  
**Paper Set**  
Presider: Lisa Gross

ID: 10080  |  **The Effects of Middle School Students’ Participation in a Stormwater Retention Pond Research Activity on Their Understandings of Science and Environment, Attitudes Toward Science, and Use of Technology.**  
*Allan Feldman, University of South Florida; Angela Chapman, University of South Florida; Dilek Özalp, University of South Florida; Vanessa Vernaza-Hernández, University of South Florida; Fayez Alshehri, University of South Florida*
This study reports the effects of urban middle school students’ participation in science research on their knowledge and attitudes toward the environment, technology, and science.

ID: 10163  |  **Lessons on Plant Rights from the Tree That Owns Itself and Implications for Science Education**  
*Rachel A Luther, University of Georgia; Debra B Mitchell, University of Georgia; Michael P Mueller, University of Georgia*
Discussion of rights often neglects the interests of plants. We examine what science education would look like if rights for plants were adopted by humans.

Fri: 2:00  Room: **Salon E**  
**Experimental Session**

ID: 13013  |  **From the kitchen to the classroom: Using Cooks Illustrated to promote scientific literacy**  
*Lara K Smetana, Loyola University of Chicago*
Using an explicit inquiry-based approach to teaching about NOS, articles from Cooks Illustrated are used to introduce students to asking good questions and designing experiments.

Fri: 2:00  Room: **Salon F**  
**Paper Set**  
Presider: Wardell Powell

ID: 10115  |  **Learning Science through Inquiry: The Effects on Elementary Teachers’ Views of Scientific Inquiry and Beliefs about Teaching Science.**  
*Kimberly H Lott, Utah State University*
Presents a model for teaching an elementary science methods and explores the impacts of this course on both pre- and inservice elementary teachers’ science teaching self-efficacy.

ID: 10158  |  **Professional Journals as a Source of Information about Teaching NOS: An Examination of Articles Published in Journal of College Science Teaching, 1996-2010**  
*Deepika Menon, University of Missouri, Columbia, MO; Somnath Sinha, University of Missouri, Columbia, MO; Deborah L Hanuscin, University of Missouri*
This study investigates articles in Journal of College Science Teaching, to explore their potential as sources of PCK and models for teaching nature of science.
**ASTE 2012**

**Friday**

ID: 10190 | **Put Me in Coach: A Team Approach to Successful Learning (TASL) in Chemistry**  
*Kate L. Popejoy, University of North Carolina at Charlotte; Kathy Asala, University of North Carolina at Charlotte*  
In this session, we will describe our success using peer-led TASL workshops to improve student performance in an introductory chemistry course.

**Paper Set**  
**Presider:** Allison Antink Meyer

ID: 10091 | **Examining the Discourse Pattern and Teacher's Pedagogy in Promoting Reasoning in Science Writing Heuristic Classroom**  
*Niphon Chanlen, University of Iowa; Bryan Hand, University of Iowa*  
This qualitative study aimed to explore the discourse pattern and teacher's pedagogy that promote students reasoning and critical thinking within claim-evidence presentation and discussion.

ID: 10113 | **The One-Two Punch: Implementing Discrepant Events And Shared Discussions into A Middle School Science Classroom**  
*Lauren Kendra, Rowan University; Issam H Abi-El-Mona, Rowan University*  
This study examined the impact that a combined use of discrepant events and shared discussions have on student achievement, conceptual understanding and on-task behaviors.

ID: 10081 | **Integrating Language Arts and Science: Lessons Learned and Future Directions**  
*Leslie U. Bradbury, Appalachian State University*  
This paper provides a review of literature published during the last 20 years that investigates the impact of integrated science/language arts approaches on student learning.

**Paper Set**  
**Presider:** Thomas Dolan

ID: 10002 | **Photonarratives in an Online Master's Course: A Viable Way to Enhance Teacher Reflection?**  
*Lauren Madden, College of New Jersey; Melissa G Jones, North Carolina State University; Margaret R Blanchard, North Carolina State University*  
Science teachers in an online graduate course produced photonarratives including reflections, photos, and descriptions of factors that help or hinder their science teaching.

ID: 10017 | **The Pedagogy of Ingenuity in Science: Classroom Practice and the Development of Scientific Creativity**  
*Allison Antink Meyer, Illinois Institute of Technology; Norman G. Lederman, Illinois Institute of Technology*  
Creativity is an essential aspect of the development of scientific knowledge. This presentation explores the development of creativity and its relationship to teachers’ classroom practice.

ID: 10029 | **Integration of Mathematics in a Professional Development Program for Middle School Science Teachers**  
*Lois H. Peck, University of the Sciences; Amy Kimchuk, University of the Sciences*  
This presentation introduces a professional development model for middle school science teachers, enhancing their content knowledge and effectiveness in teaching mathematics within the science curriculum.

ID: 10148 | **A Culturally Relevant Case Study Alternative for Developing Science Teachers**  
*Mary Hoelscher, University of Minnesota*  
A culturally relevant alternative to the case study will be presented. Reflections on the effectiveness of its use with developing science teachers will be evaluated.

ID: 10103 | **Beginning teachers' painful but fruitful struggling toward the profession of scientific inquiry**  
*Young-Shin Park, Chosun University*  
This study was to introduce induction program through which how beginning science teachers could struggle and survive to be professional of science teaching as inquiry.

**Paper Set**  
**Presider:** Brooke Whitworth
ID: 10138 | Practicing what we preach. Using inquiry to help pre-service teachers discover the importance of science education reform  
Jennifer S Cable, University of North Carolina at Chapel Hill  
A presentation of multiple methods course activities where pre-service teachers inquire into science education topics, discovering the importance of reform while experiencing reform.

Fri: 3:15  Room: Dolphin  Paper Set  Presider: Abedalbasit Abedalhafiz

ID: 10185 | STEM integration: Critical perspectives from teachers and from examples of teaching practice  
Lawrence Flick, Oregon State University; Teresa Wolfe, Oregon State University; Sue Ellen DeChenne, University of Nebraska  
Evaluation study presents teacher critical reflection with examples of specific practice and materials for integrating STEM in secondary education.

ID: 10217 | Enacting an evidence-based science curriculum: A middle school teacher's experience  
Rose M. Pringle, University of Florida; Cheryl McLaughlin, University of Florida; Myra Cordero, P.K. Yonge Developmental Research School  
This case study focuses on the shaping of science teaching practices during the process of enacting an evidence-based middle school science curriculum.

ID: 10195 | Indirect audience: Professional development and student achievement  
Claudia Khoury-Bowers, Kent State University at Stark  
This session focuses on how accountability pressures can direct researchers to generate policy-pleasing data (student achievement), while leaving the process of influence to be inferred.

Fri: 3:15  Room: Tarpon  Paper Set  Presider: Sami Kahn

ID: 10198 | Impact of Pilot Graduate Certificate Program on Informal Science Educators  
Lois A Ball, University of South Florida/ Doctoral candidate  
Qualitative study examined impact of pilot graduate certificate program on informal science educators. Participants reported increase in self-efficacy, professionalism, and career advancement in ISI community.

ID: 10214 | Transforming Science Teachers into District Science Leaders: Lessons Learned from the First Year of the LEADERS Program at The University of Toledo  
Janet L Struble, University of Toledo - LEADERS; Lisa A Brooks, The University of Toledo - LEADERS  
We investigated the domains of knowledge science teachers needed to become teacher leaders in project-based science and renewable energy in northwest Ohio.

Fri: 3:15  Room: Manatee  Paper Set  Presider: Karen Irving

ID: 10236 | Preparing Future Elementary Science Teachers as Mentors through e-Mentoring Programs  
Sharon Schleigh, East Carolina University; Eric Brunsell, University of Wisconsin OshKosh  
Examination of pre-service teachers' attitudes, NOS and perceptions of science teaching by engaging pre-service teachers as mentors in an interactional virtual science fair program.

ID: 10070 | Infusing Serious Educational Games to Train Science Teachers  
Leonard Annetta, George Mason University; Richard Lamb, George Mason University; Rebecca Cheng, George Mason University; David Vallett, George Mason University  
This paper presenting findings from research conducted on a Serious Educational Game developed to train initial licensure science teachers on classroom safety.

ID: 10108 | The Taxonomy of Characteristics of Hybrid Teacher Professional Development  
Ya-wen Cheng, University of Missouri; Deborah L Hanuscin, University of Missouri  
This paper proposes a taxonomy for characterizing types of hybrid (online and traditional) professional development, aligned with elements of best practice in professional development.
Fri: 3:15  Room: Salon A  Paper Set  Presider: Elizabeth Roland

ID: 10141  Get OUT! Preparing Preservice Candidates for Teaching Outdoors
Lisa A Gross, Appalachian State University; Jenni C Geib, Appalachian State University; Joy James, Appalachian State University
This presentation focuses on the elementary education candidates’ self-efficacy and attitudes toward teaching science in the outdoors as influenced by their formative environmental socialization experiences.

ID: 10143  The use of a novel science observation rubric in the development of pre-service teachers with the potential for evaluative purposes
Imelda Nava, UCLA; Jaime Park, UCLA; Mollie Appelgate, UCLA
I present a science observation rubric with preliminary results. Potential uses include: teacher development, evaluation of a group of teachers, a multiple measure.

ID: 10155  Evidence of Formative Assessment Skills in Pre-Service Teachers’ Lesson Plans
Melissa L Shirley, University of Louisville
This session describes a framework to identify aspects of formative assessment practice in lesson plans written and implemented by middle and secondary science pre-service teachers.

Fri: 3:15  Room: Salon B  Small Group Roundtable

ID: 12001  Elementary Science Methods Courses: Varying Contexts for Improving Conceptions of and Strategies for Teaching Nature of Science
Valarie L. Akerson, Indiana University; Meredith Park Rogers, Indiana University; Khemawadee Pongsanon, Indiana University; Ingrid Weiland, University of Louisville; Kader Bilican, Middle East Technical University
This session describes various elementary science methods contexts and the NOS conceptions and teaching strategies preservice teachers developed in those classes.

Fri: 3:15  Room: Salon C  Experimental Session

ID: 13001  “You want me to do what?!” Replacing traditional assessments with authentic digital artifacts in preservice elementary science teacher education
Deborah C. Smith, Pennsylvania State University; Leigh A. Haeffner, Penn State; Alicia M. McDiye, Penn State
Presenters will share how they modified assessments using iMovie and StudioCode to engage students in more authentic learning performances.

Fri: 3:15  Room: Salon D  Themed Paper Set  Presider: Bryan Nichols

ID: 14002  University Energy Education Curriculum Project: Infusing Energy Education Throughout Science Teacher Education
Jeffery S Townsend, Eastern Kentucky University; Billy Bennett, Eastern Kentucky University; Melinda Wilder, Eastern Kentucky University
Panelists share experiences in developing, implementing, and evaluating an innovative, comprehensive energy education initiative targeting preservice and inservice teacher professional development.
Fri: 3:15  Room: Salon E  Paper Set  Presider: Ronald Hermann

ID: 10024  |  Preservice Teachers’ Views of the Nature of Technology
Jerrid W Kruse, Drake University
This study investigated to what extent explicit/reflective instruction impacted preservice teachers’ views of the nature of technology. Idiosyncratic results indicate need for further research.

ID: 10020  |  Confusion Regarding the Natures of Science and Engineering: A Study of Middle School Students’ Conceptions
Crystal N. Bruxvoort, Calvin College; James Jadrich, Calvin College
This presentation will provide evidence for and outline probable causes of middle school students’ confusion related to the natures of science and engineering.

ID: 10049  |  Development of a Valid and Reliable Protocol for the Assessment of Early Childhood Students’ Conceptions of
Nature of Science and Scientific Inquiry
Judith S Lederman, Illinois Institute of Technology
The purpose of this study was to develop a valid and reliable protocol for assessing early childhood students’ conceptions of NOS and SI.

Fri: 3:15  Room: Salon F  Paper Set  Presider: Jennifer Forrester

ID: 10031  |  Effects of a Science Content Course on Elementary Pre-Service Teachers’ Attitudes and Understandings of
Teaching Science
Daniel J Bergman, Wichita State University
Discusses the design of an undergraduate science content course for elementary pre-service teachers and its impact on participants’ attitudes and understandings of science instruction.

ID: 10144  |  The Wholeness Approach: The Impact of an Integrated Instructional Approach on Elementary Pre-service
Teachers’ Conceptions of Plant-Related Processes
Stephen L Thompson, University of South Carolina
Researchers examined the impact of an instructional approach emphasizing integration of biological knowledge and processes on elementary pre-service teachers’ conceptions of plant-related processes.

ID: 10229  |  What Happened to the "Decline Effect"? Investigating Prospective Elementary Teachers’ Attitudes Towards
Science in an Innovative Science Course and Three Years Later
Catherine S. Martin-Dunlop, Morgan State University
In a pre-posttest design, the majority of scales on the Test Of Science-Related Attitudes revealed statistically significant differences. Three years later, scores were higher still.

Fri: 3:15  Room: Salon G  Paper Set  Presider: Tom Koballa

ID: 10130  |  Korean Students’ Perceptions of School Science in K-12 Classrooms and Understanding of the Nature of Science
Jee Kyung Suh, University of Iowa; Sae Yeol Yoon, University of Iowa; Soohnye Park, University of Iowa
The purpose of this study was to examine Korean students’ perceptions of school science and nature of science through students’ drawing and survey items.

ID: 10140  |  Native American Students’ Understanding of Geologic Time Scale: 4-8th grade students’ understandings of earth’s
history
Younkyeong Nam, University of Minnesota; Engin Karahan, University of Minnesota; Gillian H Roehrig, University of Minnesota; Tamara Moore, University of Minnesota
This study explores Native American (Ojibwa) students’ understanding of geologic time scale and its relations with human history.

ID: 10225  |  Comparing students’ understandings of evolution in an inquiry based and traditional class.
Robert J Humphrey, Cayuga Community College
Inquiry based and traditional, lecture instructional techniques were compared to determine which was more effective in helping students understand the concept of evolution.
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**Poster Session**

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**Award Lunch**

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**Board of Directors Meeting & Dinner**

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**AYE Conference Schedule Saturday, January 7, 2012**

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Saturday - January 7, 2011

7:00-8:00  Breakfast Banquet Foyer D-G
8:15-10:30 Embedded Workshop
8:15-10:30 Concurrent Poster Session in Salon D-G
10:45-12:30 Concurrent Sessions
12:30-2:00  Award Lunch in Salon D-G
5:00-9:00  Board of Director meeting & dinner
Embedded Workshop

Sat: 8:15  Room: Mandalay
ID: 21027  Fostering More Effective Use of the Learning Progressions in NSDL Science Literacy Maps
Ted Willard, AAAS Project 2061
The Science Literacy Maps freely available at NSDL.org can be used to help educators think through the flow of learning to improve teaching and learning.

Concurrent Poster Session

Sat: 8:15  Room: Salon D-G
ID: 11076  Investigating Elementary Teacher Candidates’ Level of Environmental Literacy in an STS-based Science Methods Course
Aidin Amirshokoohi, Fairfield University
This study explores the impact of an STS-based elementary science methods course on participants’ level of environmental literacy.
ID: 11089  Science teachers’ pedagogical conceptions of creativity and their impact on student creative performance in science
Allison Antink Meyer, Illinois Institute of Technology; Norman G. Lederman, Illinois Institute of Technology
This study was intended to inform a more nuanced understanding of manifestations of scientific creativity in line with scientific epistemology.
ID: 11050  The Praxis of Differentiated Instruction in Science and Math: Integrating research-based course content with internship experiences to develop a professional year course.
Anthony W Bartley, Lakehead University; Ann Kajander, Lakehead University; Jennifer Holm, Lakehead University
In its second year, this course goes beyond the regular methods content to enable our pre-service teachers to learn about and experience differentiated instruction.
ID: 11014  Designing Inquiry/Standards-Based Instruction and Assessment
Marsha BednarSKI, Central Connecticut State University
Focusing on science concepts presented in the standards to design instruction provides a way to address content knowledge weaknesses present in many elementary pre-service teachers.
ID: 11051  Assessing Elementary Preservice Teachers Science Content Knowledge to Improve one Science Education Program
Marsha BednarSKI, Central Connecticut State University; Jeff D Thomas, Central Connecticut State University
Elementary pre-service teachers have a limited understanding of science. Focusing on concept weaknesses in methods instruction and assignments can help build understanding of these concepts.
ID: 11086  Teaching evolution: Choices and consequences
Kimberly BiliCA, University of Texas at San Antonio
This poster presents four categories of instructional approaches that secondary level teachers employ when teaching biological evolution.
ID: 11035  Using a council of beings to ascertain student understanding of the relationship between sense-of-place and environmental sustainability
Margaret B. Bogan, Florida Gulf Coast University
Selected writing demonstrate sense of place, environmental attitude and needs for the future, using Seed’s concept of a council of beings.
ID: 11054  When Theory Meets Practice: Integrating Theories of Learning and Development into a Pre-service Science Teaching Course
Belle B Booker, University of North Carolina at Chapel Hill; Kris A Zorigian, zorigian@email.unc.edu
This presentation provides an example of how to infuse historical and contemporary theories of learning and development into a pre-service science teaching course.
ID: 11038 | **Student Teachers’ Approaches to Teaching Biological Evolution**
Lisa A Borgerding, Kent State University; Vanessa Klein, Kent State University; Rajlakshmi Ghosh, Kent State University; Al Eibel, Kent State University
This comparative case study follows three biology student teachers as they teach evolution to secondary students. Instructional approaches, attention to NOS, and concerns are highlighted.

ID: 11021 | **High School Students’ Interpretations of Cellular Transport Graphics**
Michelle Cook, Clemson University
This study examined how prior knowledge of cellular transport influenced how high school students viewed and interpreted graphic representations of this topic during classroom instruction.

ID: 11079 | **Culturally Responsive Teaching of Secondary Mathematics and Science Teachers**
Kathleen S Davis, University of Massachusetts Amherst; Sandy Madden, University of Massachusetts Amherst; Barbara Madeloni, University of Massachusetts Amherst; Amy Daniels, University of Massachusetts Amherst; Thomas Owen, University of Massachusetts Amherst; Hongjin Zhang, University of Massachusetts Amherst
Researchers examined teachers’ instruction and cultural responsiveness in 38 secondary mathematics/science classrooms across four high-needs school districts to aid their planning of preservice teacher education.

ID: 11037 | **Science Talk: Students’ Patterns of Interaction in a Chemistry Classroom**
Xeng de los Santos, CSU Long Beach; Susan Gomez Zwierp, CSU Long Beach; William J Straits, CSU Long Beach
We explore science talk between native English speakers and English learners in a secondary chemistry classroom. Emergent issues of authority and identity are discussed.

ID: 11081 | **Examining the Relationship Between In-service Teachers Science Content Knowledge, Self-efficacy, and Context Beliefs**
Cynthia CM Deaton, Clemson University; Michelle Cook, Clemson University
This study examined relationships between elementary and middle school teachers’ content knowledge about environmental science and self-efficacy beliefs and context beliefs about teaching science.

ID: 11018 | **Children’s Engineering Summer Institute of Rowan University**
Nancy K Delnairette, Rowan University; Issam H Abi-El-Mina, Rowan University
Children’s Engineering Summer Institute is a week long summer camp for elementary students in grades 3-5 providing project-based inquiry activities in the different STEM disciplines.

ID: 11026 | **The Evidence Game for Supporting Middle School Teachers in Introducing Scientific Argumentation to Middle School Science Students**
James D Ellis, University of Kansas; Janis A Bulgren, University of Kansas; Marilyn M Ault, University of Kansas; Bruce Frey, University of Kansas; Jana C Hare, University of Kansas
The Evidence Game, an NSF project to develop an on-line game to support middle-level science teachers in motivating and engaging students in scientific argumentation.

ID: 11067 | **Supports and barriers to teaching a blended science and english language development elementary program**
Gianna Filice, California State University Long Beach; Susan Gomez Zwierp, California State University Long Beach; William J Straits, California State University Long Beach
Professional development designed to assist teachers as they fuse their science and English Language Development instruction is examined. Supports and barriers to implementation are provided.

ID: 11009 | **Elementary Science Methods at the University of Delaware**
Danielle J Ford, University of Delaware
We discuss syllabi for two versions of our elementary science methods course: ‘traditional’ (block scheduled with education courses) and ‘reform’ (integrated with science courses).

ID: 11043 | **Developing Science Teacher Inquiry Skills in an Online Teacher Education Program**
Frederick W Freking, University of Southern California
This poster will share successes and challenges as an online teacher education program develops curriculum that promotes inquiry based teaching practices.
ID: 11005 | History of Science for the Science Classroom: A Course for Secondary Preservice Teachers
Ron Gray, Oregon State University
This session will share the syllabus for a new course for preservice secondary science teachers designed to integrate the history of science and science pedagogy.

ID: 11075 | Science Education Studies in Natural Environments
Rita A. Hagevik, University of North Carolina at Pembroke; Jessica Horton, The University of Tennessee
The Science Education Studies in Natural course focuses on establishing a learning community onsite, with group and individual observational and empirical studies in nature.

ID: 11020 | Uses and Perceptions of Formative Assessment: Three Case Studies of African American Males in Introductory Chemistry
Rachelle A Haroldson, University of Minnesota
This study presents the cases of three African American male students in a high school chemistry course and their uses and perceptions of formative assessment.

ID: 11055 | Effects of Sustained Teacher Professional Development on the Classroom Science Instruction of Elementary School Teachers
Nancy Hauck, Utah State University; Kimberly Lott, Utah State University
This study examines the extent to which sustained teacher development in elementary science education affects instruction over a three-year time period.

ID: 11056 | Modeling the Learning Cycle: Integrated Science Content Courses for Elementary Preservice Teachers
Deb Hemler, Fairmont State University
Explicit learning cycle instruction, nature of science lessons using inquiry approaches, and project-based learning are all incorporated into this preservice integrated elementary science content course.

ID: 11068 | What role does discourse play in the elementary science classroom?
Jessica L Horton, University of Tennessee
Results will be presented on a survey given to elementary teachers on how discourse is used as part of their science instruction.

ID: 11082 | Elementary preservice teachers developing understandings of scientific modeling: Linking scientific modeling with inquiry
Barbara Hug, University of Illinois
Using data collected from a methods course integrating scientific modeling, we report preservice teachers'views about scientific modeling and models. We share the current syllabus.

ID: 11088 | What Makes Something Professional Development: Is it an institute, a course, a web-resource or something else?
Barbara Hug, University of Illinois; James Planey, University of Illinois
Using a curriculum development and teacher professional project, we discuss what makes a teacher institute, an online course, and a teacher website/resource all professional development.

ID: 11071 | It Takes a Village to Develop a Scientist: A HHMI Funded Project Working Across Multiple Science Disciplines to Teach and Inspire Students about Science and Research
Lori M Ihrig, Iowa State University; Craig Ogilvie, Iowa State University
The components, methods, and goals of a HHMI funded project to develop creative new ways to teach students science and inspire research will be presented.

ID: 11064 | Exploring the Hudson River to Learn Science and Science Pedagogy
Jenny D Inger, Bank Street College of Education
This syllabus highlights the experience of future/current middle school teachers in a science education course that connects scientific phenomena to their local environment.

ID: 11041 | Inquiry and Safety in an Introductory Science Methods Class: Introducing a Safety Wiki Wall
Karen E. Irving, Ohio State University; Cathryn S. Cheills, Ohio State University
Coupling face-to-face inquiry learning and teaching with a safety wiki provides new members of a preservice science teacher cohort with strategies for safe inquiry teaching.
ID: 11002 | Developing Primary/Elementary Teacher Candidates’ Practical Wisdom for Teaching Science
Goodnough C. Karen, Memorial University
In this study, the development of primary/elementary teacher candidates’ practical wisdom for teaching science was examined as candidates participated in a school-university partnership.

ID: 11072 | Developing a Reform-based Environmental Science Course for Elementary Pre-service Teachers and Non-Science Majors: components, challenges, and impact on the students
Mahsa Kazempour, Penn State Berks
The aim of this presentation is to share my syllabus for a reformed-based environmental science course I developed and the impact on the students

ID: 11084 | Investigating Issues in Earth Science through Informal Settings
Michelle L Klosterman, Wake Forest University
This presentation reports on an informal science learning course that was developed for pre-service teachers around concepts in Earth Science.

ID: 11069 | Links from professional development, to teacher beliefs and classroom practices, to high-stakes student achievement: Elementary and Middle Level Teachers and their Students.
Paul J Kuerbis, Colorado College; Joe Taylor, Biological Sciences Curriculum Study; Steve Getty, Biological Sciences Curriculum Study; Molly Stuhlsatz, Biological Sciences Curriculum Study; Marie Revak,
Presented are findings from two projects in Colorado, one with K-5 teachers and students (2000-08) and a second at the middle level (2008-11).

ID: 11012 | Evaluation of technology interventions within a science classroom
Richard Lamb, George Mason University; Len Annetta, George Mason University; Dave Vallet, George Mason University; Rebecca Cheng, George Mason University
Technology plays a pivotal role within the science education classroom; however, there are few targeted comparisons between technology types.

ID: 11008 | Student Motivation and Interests as Proxies for Forming STEM Identities
Hyonyong Lee, Kyungpook National University; Todd Campbell, Utah State University; Kyungsk Park, Kyungpook National University; Hyuksoo KWON, Kyungpook National University; Hyunil JUNG, Korea National University of Education; Heejin Oh, Kyungpook National University
This research investigated the motivation and interests of underrepresented students to better understand whether informal STEM learning experiences offer support for developing STEM identities.

ID: 11090 | Testing the Learning Progression of Scientific Modeling: Can First Graders use Scientific Modeling to Explain the States of Matter?
Kimberly H Lott, Utah State University
This poster presents a pilot study of a group of first graders using scientific modeling to explain the behaviors of solids, liquids and gases.

ID: 11024 | The Influence of Coach-Teacher Teams Inquiry Professional Development on Middle School Teachers’ Use of Inquiry Practices
Christine R Lotter, University of South Carolina; Jan Yow, University of South Carolina
This study investigated the influence of an inquiry professional development program teaming middle school teachers with school-based coaches on the teachers’ use of inquiry practices.

ID: 11063 | Richness, Recursion, Relations and Rigor - a vision for scientific inquiry
Paula A Magee, Indiana University - Indianapolis; Jane True, Decatur Discovery Academy, Indianapolis, IN; Natalie S Barman, Indiana University - Indianapolis
In this poster we will share the details of a scientific inquiry course and students’ understanding of the underlying principles that guide the course.

ID: 11059 | Elementary Girls and an Afterschool Engineering Group
Kristina Maruyama Tank, University of Minnesota
This presentation examines how three teachers involved in a summer professional development, implement new science standards through an afterschool group focused on girls and engineering.
| ID: 11083 | The Importance of Science Expos and Inquiry for the Middle School Student - A Case Study on Student Motivation  
*Kimberly A McLeod, Bank Street College of Education; Jenny D Ingber, Bank Street College of Education*  
Study attempts to determine the effect of project-based inquiry in science fairs on four specific motivational constructs: self-efficacy; task value beliefs; goal orientation; and affect. |
| ID: 11025 | Working with Rookies: A case study of Science Teacher Mentors and the impacts mentoring, face-to-face and online, had on their science instruction and self-efficacy  
*Thomas F Meagher, University of Minnesota*  
This case study of five Science Teachers Mentors, explores how their online relationships and experience impacted the mentor’s self-efficacy, science instruction and use of technology. |
| ID: 11070 | A Three Part Reflective Exercise for Generating Concept Specific Instructional Ideas  
*Daniel Z Meyer, Illinois Institute of Technology*  
We share an exercise for prompting teacher reflection on teaching science concepts. |
| ID: 11027 | African-American student involvement in science fair competitions  
*Rhea Miles L Miles, East Carolina University*  
African-American middle school students were participants of the Reach Up program in Eastern North Carolina to increase under-represented and under-served student participation in STEM-related activities. |
| ID: 11007 | Intelligent Game-based Learning Environments for Upper Elementary Science Education  
*James Minogue, North Carolina State University; Brad Mott, North Carolina State University; John Neifeld, North Carolina State University; Hiller Spies, North Carolina State University; Marc Russo, North Carolina State University; Robert Taylor, North Carolina State University; James Lester, North Carolina State University*  
This poster session will trace the development and testing of an intelligent game-based environment that promotes problem solving and science learning in upper elementary students. |
| ID: 11045 | Combating a Reasoning Thin Curriculum: Preservice Elementary Science Teachers’ Attention to Student Thinking  
*James Minogue, North Carolina State University; John Bedward, North Carolina State University*  
This poster session details work that employs deductive content analysis to explore preservice teachers’ cognition through the lens of the stage theory of teacher development. |
| ID: 11003 | Purposeful Microteaching on Standards in an ECE/Elementary Science/Math Methods Class  
*Patricia D Morrell, University of Portland*  
This presentation describes an assignment that combines peer teaching, microteaching, and inquiry with the national standards for mathematics and science. |
| ID: 11031 | Helping Teachers with Climate Change  
*Patricia D Morrell, University of Portland; Kari O’Connell, Oregon Natural Resource Education Program/Oregon State University*  
A year-long PD experience on climate change was designed to help teachers strengthen their own understanding about climate change and impact their classroom instruction. |
*Michael P Mueller, University of Georgia; Arthur J Stewart, Oak Ridge Associated Universities; Deborah J Tippins, University of Georgia; Rachel A Luther, University of Georgia; Xavier Fazio, Brock University; Doug Karrow, Brock University; Gillian Roehrig, University of Minnesota*  
This session provides guidance for school policy and legislation through a more holistic suite of indicators for science education and the impact of school science. |
| ID: 11092 | Undergraduate Science Methods Syllabus  
*Miriam Munck, Eastern Oregon University; Donna Rainboth, Eastern Oregon University*  
This poster presentation will highlight course outcomes and course assignments in a constructivist undergraduate science methods course syllabus. |
| ID: 11085 | Promoting the Use of Outdoor Learning Spaces by Elementary Preservice Teachers in a Science Methods Course  
*George E. O’Brien, Florida International University*  
The authors will describe several learner-centered, investigations which encompass on-campus outdoor place-based inquiry as a part of a science methods course for elementary preservice teachers. |
Using McKeon’s Modes of Thought for Analysis and Development of Elementary Science Methods Courses
Joanne K. Olson, Iowa State University
The structure of methods courses reflects the professor’s philosophical orientation. McKeon's work is used to provide a framework to design and analyze methods courses.

A Differentiated Approach to K-8 STEM Teacher Education
Carolyn A. Parker, Johns Hopkins University School of Education; Francine W. Johnson, The Johns Hopkins University School of Education
A novel STEM certificate program offered by the Johns Hopkins School of Education will be presented. The certificate’s integrated capstone course will be highlighted.

Benefits of Teaching Science Methods Courses Online
Scott Robinson, UH Manoa; Jon Yoshioka, UH Manoa
Are you planning to teach a science methods course online? Come to this session to learn what we have learned and share your ideas.

Baseline Results of a Conceptual Chemistry Inventory of College Chemistry Survey Course: Conservation of Matter and Symbolic Representation
Elizabeth A. E. Roland, Morehead State University; Zexia Barnes, Morehead State University
The study establishes a baseline of college-level conceptual knowledge of conservation of matter and symbolic representations before and after a chemistry survey course.

A Videocase-based, Analysis-of-Practice Syllabus for Elementary Science Methods Courses
Kathleen I. Roth, BSCS
This syllabus shows how topics typically addressed in elementary science methods courses can be taught in more integrated way through a videocase-based, analysis-of-practice approach.

A 5-Year Developmental Induction Program
Carol Ruff, Knowles Science Teaching Foundation; Michele Cheyne, Knowles Science Teaching Foundation; Zara Wolfe, Knowles Science Teaching Foundation
Explore a five-year cumulative induction plan that addresses the needs for beginning teachers, in a developmental way that is connected to practice.

IMPPACT Project Sub-Study: Factors of the School Environment and Teacher Satisfaction and Retention
Margaret A. Sadeghpour-Kramer, University of Iowa, IMPPACT Project
A study of teaching environment factors that need to match a teacher’s beliefs for him/her to be satisfied with teaching and stay in the profession.

Understanding Student’s Perspectives on Academic Success and Retention in a Science Degree Program
Georgianna L. Saunders, Missouri State University; Angela Strider, Missouri State University
Students report that these factors are important to success/retention in a science program: preparedness for college curriculum, study habits, course difficulty, and living-learning environment.

Colorization of Astronomical Images: Facilitating Creativity and an Interest in Science Through Technology
Sharon Schleigh, East Carolina University; Tim Messer, East Carolina University; Rhea Miles, East Carolina University; Maurice Smith, East Carolina University
Developing creativity through colorization to inspire and teach light concepts in middle-school-classrooms. Who has a creative mind and how does creativity influence success in science?

Promoting Student Inquiry in On-Line Teacher Preparation Programs: ESSEA Curriculum Modules
Stan M. Schmidt, Western Governors University
ESSEA modules combine science pedagogy and current science investigation to provide educators with resources and experience in conducting inquiry and problem based learning opportunities.

Sharing Efforts Resulting from NASA Faculty Institutes
Christine B. Shupla, Lunar and Planetary Institute; James T. McDonald, Central Michigan University; Jeff D. Thomas, Central Connecticut State University; Marsha Bednarski, Central Connecticut State University; Kate B. Follette, University of Arizona; Anthony Murphy, St. Catherine University; Eric Brunsell, University of Wisconsin, Oshkosh
FINESSE has conducted two-day faculty institutes for three years, regarding preservice Earth and space science education. FINESSE participants share resulting activities and programs.
**Development of Science Teacher Knowledge During an Alternative Certification Program: Synthesis of Findings Across Multiple Studies**

Aaron J Sickle, University of Missouri; Andrew B West, University of Missouri; Patricia Friedrichsen, University of Missouri; Mark J Volkmann, University of Missouri

We present findings across multiple studies that examined science teacher knowledge development during an alternative certification program.

**Situated Professional Development: Exploration in new contexts**

Jonathan E Singer, University of Maryland, Baltimore County; Jacqueline Krikorian, University of Maryland, Baltimore County; Julie Ross, University of Maryland, Baltimore County; Taryn Bayles, University of Maryland, Baltimore County

The purpose of this study was to further explore the robustness of a professional development that integrates the use of controlled practice.

**Classroom Instruction Observed from the Perspectives of Current Reform in Science Education: Revisiting the TIMSS Video Study with a Reform Lens**

Emma R Smith, Utah State University; Todd Campbell, Utah State University

This research focused on the extent to which reform minded teaching practices were evident in the TIMSS Video Study using the Reformed Teaching Observation Protocol.

**Teacher Education and Mentoring Program—Embedding Professional Goal Modules during Student Teaching**

Jeff D Thomas, Central Connecticut State University

Student teachers participate in a mentoring and professional growth program that aligns with a new state-sponsored induction program for beginning teachers.

**An investigation into the utilization of a constructivist teaching strategy to improve geological content knowledge: Is there a relationship between intellectual development and content understanding?**

Orvil L. White, SUNY Cortland

An investigation into the utilization of a constructivist teaching strategy to improve geological content knowledge reveals a significant increase in content knowledge in education students.

**Twitter + Teaching K-8 Students: Revising an introductory secondary science teaching course**

Heather M Worsham, University of Missouri; Patricia J Friedrichsen, University of Missouri

Our revised introductory course focuses on recruiting prospective teachers. Our revisions include a cycle of planning, teaching and reflection; a teacher panel; and Twitter.

**An Interdisciplinary Human Biology, Health and First Aid Based Curricula For Elementary School Students**

Ann W Wright, Canisius College; Sue Dale Tunnicliffe, University of London

This poster will present children understandings of injury and first aid is base line conceptual knowledge on which further education about human biology and health.

**A Cross-National Study on the Sun- and Moon-Related Learning Experiences in Standards-Informed Elementary Science Curricula**

Li-Ling Yang, Roger Williams University; Kristina Soprano, Roger Williams University; Meredith L McAllister, Butler University

This study examines the depth, breadth and content of space science concepts in national science education standards and elementary science curricula in Taiwan and the US.

**Exploring a Chinese High School Chemistry Teacher’s Conceptual Understandings and Practical Interpretations of Formative Assessment**

Xining Yin, Indiana University-Bloomington; Gayle A Buck, Indiana University - Bloomington

This study explored a Chinese high school chemistry teacher’s transforming conceptual understandings and practice of formative assessment through collaborative action research with a post-secondary researcher.

**Promoting the literacy component of science and technology literacy in elementary teacher education courses**

Larry D Yore, University of Victoria; Christine D Tippett, University of Victoria

This presentation illustrates literacy experiences and assignments embedded into two elementary school science and technology curriculum and instruction courses at the University of Victoria.
ID: 11049 | **Fostering a virtual community of practice to improve elementary science teachers' inquiry teaching in China**
*Hongjin Zhang, University of Massachusetts-Amherst*
This study is to explore the relationship between a VCoP and elementary science teachers' view of SE's instruction and practice for inquiry teaching in China.

Sat: 10:45  Room: **Mangrove**

**Themed Paper Set**

ID: 14020 | **Multiple lenses on the development and implementation of teacher content and pedagogical content knowledge resulting from transformative professional development**
*Julie Gess-Newsome, Willamette University; Janet Carlson, BSCS*
Factors influencing teacher knowledge, practice, and student achievement are examined through quantitative measures, careful analysis of the intervention, and teacher interviews. Results are compared.

Sat: 10:45  Room: **Mangrove**

**Interactive Poster**

ID: 11060 | **Providing Elementary and Middle School Science Teachers with Content and Pedagogical Professional Development in an Online Environment: Are We There Yet?**
*Mary V Mawn, SUNY Empire State College; Kathleen S Davis, University of Massachusetts Amherst; Chris Emery, University of Massachusetts Amherst; Anita Greenwood, University of Massachusetts Lowell; Hyunju Lee, University of Massachusetts Amherst; Sumudu Lewis, University of Massachusetts Lowell; Michelle Scribner-MacLean, University of Massachusetts Lowell; Peter Shaughnessy, University of Massachusetts Amherst*
This interactive poster session investigates how online courses enable in-service science teachers to learn science content and improve their teaching skills through distance learning.

Sat: 10:45  Room: **Tarporn**

**Themed Paper Set**

ID: 14014 | **Building an Organism: Change in Program Structure, Teacher Knowledge and Affective Orientation over the Course of a Three Year Cohort Program**
*Daniel Z Meyer, Illinois Institute of Technology; Martina Nieswandt, Illinois Institute of Technology; Kathryn Race, Race & Associates, Ltd.; Judith Zawojewski, Illinois Institute of Technology; Margaret Kibilko, Illinois Institute of Technology; Joy Kubarek-Sandor, John G. Shedd Aquarium/Illinois Institute of Technology*
We present how a variety of goals and interests - internal and external - effected a cohort program over its three year implementation.

Sat: 10:45  Room: **Tarporn**

**Experimental Session**

ID: 13010 | **Including Children with Special Needs in Informal Science Learning Environments**
*Jennifer L Purcell-Coleman, University of Arkansas: College of Education and Health Professions; Lisa S Wood, University of Arkansas: College of Education and Health Professions; Cathy Wissehr, University of Arkansas: College of Education and Health Professions*
Rationales and strategies delivered through group activities for integration of children with special needs in informal science environments (outdoor education) with implications for curriculum development.
Sat: 10:45  Room: *Exec Conference*  **Paper Set**  Presider: Kory Bennett

**ID: 10184** | **Applying Piaget’s Logic of Meanings in the Science Classroom**

*Katherine A. Mangione, University of Central Missouri; Michael J Wavering, University of Arkansas, Fayetteville*

This paper presentation will describe Piaget’s logic of meanings and share how they can be used to analyze the reasoning students have about scientific principles.

**ID: 10168** | **Examining the Embedded Multimodal Representations in Students Writings**

*Nattida Promyod, University of Iowa; Mark McDermott, Wartburg College; Andy Cavagnetto, Binghamton University-SUNY; Brian Hand, The University of Iowa*

The idea of multimodal representations use impacts students' ability to integrate modes as well as their ability to understand science better.

**ID: 10228** | **Students’ Use of Covalent Bond Model to Represent Ionic Bonds: Insights from Particulate Drawing Task**

*Abdi-Rizak M Warfa, STEM Education Center, University of Minnesota; James Nyachwaya, STEM Education Center, University of Minnesota; Gillian Roehrig, STEM Education Center, University of Minnesota*

This paper discusses college students' use of covalent bond model to represent ionic bonds based on insights from open-ended particulate drawing task

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Sat: 10:45  Room: *Exec Conference*  **Experimental Session**

**ID: 13005** | **Using Case Based Scenarios as a Discussion Tool for Formative Assessment in Pre-Service Teacher Education**

*Amy E Bentz, Western Michigan University*

During this experimental session, case-based scenarios will be shared. The scenarios are designed to help identify pre-service science teachers use of formative assessment in teaching.

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Sat: 10:45  Room: *Salon B*  **Small Group Roundtable**

**ID: 12004** | **Supporting New STEM Teachers From Recruitment to Induction**

*Janice Meyer, Texas A&M University System; Gilbert Naizer, Texas A&M University - Commerce*

This session describes The Texas A&M University System’s statewide initiative to recruit, train and support mid-career professionals to become science, technology, engineering, and mathematics teachers.

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Sat: 10:45  Room: *Salon C*  **Themed Paper Set**  Presider: Elizabeth Roland

**ID: 14017** | **Using published scientific literature and citizen science research as a tool to embed high level reading and writing into K-12 science classrooms.**

*Michele H. Koomen, Gustavus Adolphus College*

This paper reports on professional development using citizen science research for K-12 science teachers where teachers learn to synthesize scientific literature into literacy activities.
Association for Science Teacher Education Mission Statement

The Association for Science Teacher Education (ASTE) promotes leadership and support for professionals involved in the education and development of teachers of science at all levels. ASTE advances practice and policy through scholarship, collaboration, and innovation in science teacher education across the world.

AETS/ASTE Presidents

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<td>Jerry C. Horn</td>
</tr>
<tr>
<td>1981-83</td>
<td>James P. Barufaldi</td>
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<td>1983-84</td>
<td>Ron W. Cleminson</td>
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<td>1984-85</td>
<td>Thomas P. Evans</td>
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<td>1985-86</td>
<td>Marvin Druger</td>
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<td>1986-87</td>
<td>Robert K. James</td>
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<td>1987-88</td>
<td>Joyce Swartney</td>
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<td>1988-89</td>
<td>William C. Ritz</td>
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<td>1989-90</td>
<td>Floyd Mattheis</td>
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<td>1990-91</td>
<td>Gwendolyn Henderson</td>
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<td>1991-92</td>
<td>Roger Olstad</td>
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<td>1992-93</td>
<td>Catherine G. Yeotis</td>
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<td>1993-94</td>
<td>Peter A. Rubba</td>
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<td>1994-95</td>
<td>Norman G. Lederman</td>
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<td>1995-96</td>
<td>James D. Ellis</td>
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<td>1996-97</td>
<td>Paul J. Kuerbis</td>
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<td>1997-98</td>
<td>William E. Baird</td>
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<td>Lawrence Flick</td>
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<td>1999-00</td>
<td>John R. Staver</td>
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<tr>
<td>2000-01</td>
<td>Julie Gess-Newsome</td>
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<td>2001-02</td>
<td>Molly Weinburgh</td>
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<td>2002-03</td>
<td>John Penick</td>
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<td>2003-04</td>
<td>Herb Brunkrhorst</td>
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<td>2004-05</td>
<td>Julie Luft</td>
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<td>2005-06</td>
<td>Patricia Simmons</td>
</tr>
</tbody>
</table>
### 2011 ASTE Leadership Team

#### BOARD OF DIRECTORS

#### OFFICERS

President Randy Bell, University of Virginia randybell@virginia.edu 2013  
President Elect John, Tillotson Syracuse University jwtiltot@syr.edu 2014  
Past President Meta, Van Sickle College of Charleston vansicklem@cofc.edu 2012

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Senior Board Member Joanne Olson, Iowa State University jkolson@iastate.edu 2012  
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Board Member Al Bodzin Lehigh, University amb4@lehigh.edu 2013  
Board Member Kate Popejoy, University of North Carolina at Charlotte kate.popejoy@uncc.edu 2013  
Board Member Lisa Martin-Hansen, Georgia State University lmartinhansen@gsu.edu 2014  
Board Member Michael Clough, Iowa State University mclough@iastate.edu 2014

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Executive Director Eugene Wagner, University of Pittsburgh executivedirector@theaste.org 2012  
Bob Hollon, starting 1-7-12 University of Wisconsin-Eau Claire executivedirector@theaste.org 2017  
Dir. Electronic Services Eugene Wagner, University of Pittsburgh des@theaste.org 2012  
John Rhea, starting 1-7-12 University of Virginia des@theaste.org, john.c.rhea@gmail.com 2015

#### REGIONAL DIRECTORS ON BOARD

Senior Regional Rep Kathy Trundle, Ohio State University trundle.1@osu.edu 2012  
Regional Representative Richard Hechter, University of Manitoba hechter@cc.umanitoba.ca 2013  
Regional Representative Judith Morrison, Washington State University jmorriso@tricity.wsu.edu

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<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Year</th>
<th>Name</th>
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<tr>
<td>1970-71</td>
<td>John Montean</td>
<td>2006-07</td>
<td>Kathy Norman</td>
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<td>1971-72</td>
<td>Paul Westmeyer</td>
<td>2007-08</td>
<td>Janice Koch</td>
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<td>1972-73</td>
<td>Ronald D. Anderson</td>
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<td>Warren Dibase</td>
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<td>1973-74</td>
<td>Robert E. Yager</td>
<td>2009-10</td>
<td>Jon Pedersen</td>
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<td>1974-75</td>
<td>David P. Butts</td>
<td>2010-11</td>
<td>Meta Van Sickle</td>
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<td>1975-76</td>
<td>Jacob Blankenship</td>
<td>2011-12</td>
<td>Randy Bell</td>
</tr>
</tbody>
</table>
ASTE 2012

STANDING COMMITTEES

AWARDS COMMITTEE
Board Member (Chair) Brenda Capobianco, Purdue University bcapo@purdue.edu 2012
(SOP: Co-Chairs + 6 members) Board Member (Co-Chair) Judith Morrison, Washington State University jmorriso@tricity.wsu.edu 2014
Member at Large Nazan U. Bautista, Miami University (ohio) uludagmu@muohio.edu 2014
Member at Large Catherine Martin, PCERE cmartin@pcere.org 2014
Member at Large William Straits, California State University Long Beach wstraits@csulb.edu 2014
Member at Large Erica Brownstein, Capital University ebrownst@gmail.com 2012
Member at Large Robbie McCarty, Southwest Oklahoma St University Robbie.mccarty@swosu.edu 2012
Member at Large Jeff Thomas, Central Connecticut State University thomasj@ccsu.edu 2013
Equity Member Maria Rivera Maulucci, Barnard College mriveram@barnard.edu 2013
Graduate Student Member Lori Ihrig, Iowa State University Ihrig@iastate.edu 2012

LONG RANGE CONFERENCE COMMITTEE
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2011 Conf. Chair George Davis, Minnesota State University - Moorhead davisd@mnstate.edu 2012
2011 Conf. Co-chair Gillian Roehrig, University of Minnesota roehr013@umn.edu 2012
2011 Conf. Program Chair Bob Hollon, University of Wisconsin - Eau Claire
executivedirector@theaste.org
2012 Conf. Chair Dana Zeidler, University of South Florida Zeidler@usf.edu 2012
2013 Conf. Chair Meta Van Sickle, College of Charleston vansicklem@cofc.edu 2012
Member at Large Nate Carnes, University of South Carolina ncarnes@sc.edu 2012
Member at Large Jeanne Grier, CSU-Channel Islands grier@csuci.edu 2012
Appointed Member Eugene Wagner, University of Pittsburgh executivedirector@theaste.org 2012
Equity Member Lisa Martin-Hansen, Georgia State University lmartin@gsu.edu 2013
Graduate Student Member Corinne Lardy, San Diego State University corinne_lardy@yahoo.com 2011

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Member Rebecca Schneider, University of Toledo rebecca.schneider@utoledo.edu 2012
Member James McDonald, Central Michigan University mcdon1jt@cmich.edu 2012
Member Erica Brownstein, Capital University ebrownst@capital.edu 2013
Equity Member Sharon Dotger, Syracuse University sdotger@syr.edu 2012

EQUITY COMMITTEE
Board Member (Chair) Lisa Martin-Hansen, Georgia State University lmartin@gsu.edu 2014
(SOP: Chair + 9 members) Member at Large Tina Cartwright, Marshall University
tina.cartwright@marshall.edu 2014
Member at Large Tiffany Wild, Ohio State University wild.13@osu.edu 2014
Member at Large Rita Hagevik, University of Tennessee rhagevik@utk.edu 2014
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Member at Large Patricia Freitag, Senior Researcher patfreitag@comcast.net 2012
Member at Large Maria Rivera Maulucci, Barnard College mriveram@barnard.edu 2013
Member at Large Andrea Freed, University of Maine Farmington andrea.freed@maine.edu 2013
Member at Large Bobbie Jeanpieirre, University of Central Florida bjeanpie@mail.ucf.edu 2012
Graduate Student Member Amy Moreland, The University of Texas at Austin
amy_moreland@mail.utexas.edu 2011

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Board Member (Co-Chair) Michael Clough, Iowa State University mclough@iastate.edu 2014
(SOP: Chair + 6 members) Board Member, (Co-Chair) Joanne Olson Iowa State University
 jkolson@iastate.edu
Executive Director Eugene Wagner, University of Pittsburgh executivedirector@theaste.org 2012
Member at Large Daniel Meyer, Illinois Institute of Technology thomasjed@ccsu.edu 2013
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Member at Large Debbie Jackson, Cleveland State University d.jackson1@csuohio.edu 2014
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Member at Large Jerrid Kruse, Drake University jerridkruse@gmail.com 2014
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Past President (2-years out) Warren DiBase, University of North Carolina-Charlotte wjdbias@uncc.edu
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Member at Large Paul Jablon, Lesley University pjablon@lesley.edu 2013
Member at Large Barbara Spector, University of South Florida specor@coedu.esf.edu 2012
Member at Large Elaosi Vhumuk, WittsSchool of Education elaosi.vhurumuku@wits.ac.za 2013
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Graduate Student Member Brittany, Garvin University of South Carolina garvinb@mailbox.sc.edu 2011

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(SOP: Chair + 12 members) Annual Meeting (Co-chair) Dana Zeidler, University of South Florida
zeidler@coedu.esf.edu 2012
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Regional Rep. to Board Judith Morrison, Washington State University TriCities jmorriso@tricity.wsu.edu 2014
International Region Norman Thomson, University of Georgia thomson@uga.edu
Mid-Atlantic Region Kathy Trundle, Ohio State University trundle.1@osu.edu 2012
Southeast Region Michael Mueller, University of Georgia mmueller@uga.edu 2013
Northeast Region Al Bodzin Lehigh, University amb4@lehigh.edu 2012
North Central Region Mark A. Minger, St. Cloud State University maminger@stcloudstate.edu 2013
Southwest Region Gil Nazer, Texas A&M University Gilbert_nazer@tamu-commerce.edu 2013
Northwest Region Judith Morrison, Washington State University TriCities jmorriso@tricity.wsu.edu 2014
Far West Region Ron Hughes, CSU Bakersfield rhughes@csub.edu 2013
Equity Member Rhea Miles, East Carolina University milesr@ecu.edu 2011
Graduate Student Member Pat Doney, University of Georgia patdoney@uga.edu 2011

FORUMS
Environmental Education Mark Bloom, Texas Christian University M.Bloom@tcu.edu
Graduate Student Mark Ryan, University of Arkansas rmwalker@uark.edu
Inclusive Science Education Michele Hollingsworth-Koomen, Gustavas Adolphus College
mhkoomen@gac.edu
Valerie Sundby, DO-IT/Univ. of Washington vsundby@u.washington.edu
Policy and Gov. Relations Joseph Shane, Shippensburg University jwshan@ship.edu
Regina Toolin, University of Vermont rtoolin@uvm.edu
Seniors as Resources for Science,
Education Cathy Yeotis, Wichita State University cathy.yeotis@wichita.edu
George Davis, Minnesota State University davisg@mnstate.edu
William Baird, Auburn University Bairdwe@auburn.edu
Technology Education Joanne Olson ,Iowa State University jkolson@iastate.edu
Women in Science Educ. Katie Brkich, Georgia Southern University ecobeagl@yahoo.com
Susan Stratton, SUNY Cortland Susan.Stratton@cortland.edu

REPRESENTATIVES TO AFFILIATES
NSTA (President 3yr term even) John Tillotson, Syracuse University jwtillot@syr.edu 2014
CSSP (President 3yr term odd) Meta Van Sickle, College of Charleston vansickle@cofc.edu 2012
Triangle Coalition (Pres-elect) Randy Bell, University of Virginia randybell@virginia.edu 2013

PUBLICATIONS/EDITORIAL BOARDS
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Co-editor John Staver, Purdue University jstaver@purdue.edu 2013
Co-editor Lynn Bryan, Purdue University labryan@purdue.edu 2013
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Associate Editor Anita Roychoudhury, Purdue University aroychou@purdue.edu 2013
Associate Editor Daniel Shepardson, Purdue University dshep@purdue.edu 2013

JESE/ESE
Editor Deborah Hanuscin, hanuscind@missouri.edu Deborah Hanuscin 2015

ASTE NEWSLETTER EDITOR
Editor Todd Campbell, Utah State University Todd.campbell@usu.edu 2012

CITE
Section Editor Rebecca Schneider, University of Toledo rebecca.schneider@utoledo.edu 2013
AETS/ASTE
AWARDS

OUTSTANDING SCIENCE EDUCATOR OF THE YEAR (AWARD I)

1973 Gerald Krockover, Purdue University
1974 No Award Given
1975 Vincent Lunetta, University of Iowa
1976 No Award Given
1977 No Award Given
1978 Harold Jaus, University of Illinois-Chicago
1979 Roger W. Bybee, BSCS
1980 Anton Lawson, Arizona State University
1981 William R. Capie, University of Georgia
1982 James Dudley Herron, Purdue University
1983 Charles R. Coble, East Carolina University
1984 John Penick, University of Iowa
1985 James Barufaldi, University of Texas
1986 Lawrence F. Lowery, University of California
1987 William C. Kyle, Jr., Purdue University
1988 Barry Fraser, Curtin University of Technology, Australia
1989 Cherl Mason, San Diego State University
1990 Patricia Simmons, University of Georgia
1991 J. Preston Prather, University of Virginia
1992 Sandra Abell, Purdue University
1993 Bonnie Shapiro, University of Calgary

1998-2011

1998 William F. McComas, University of Southern California
1999 Patricia Simpson, St. Cloud State University
2000 Wolf-Michael Roth, University of Victoria
2001 John Settlage, Cleveland State University
2002 No Award Given
2003 Ronald Bonnstetter, University of Nebraska (10+ yrs); Michael Clough, Iowa State University (<10 yrs)

2004-2011

2004 No Award Given
2005 Larry Yore, University of Victoria, Canada (10+ yrs); Joanne Olson, Iowa State University (<10 yrs)
2006 Penny J. Gilmer, Florida State University (10+ yrs); John W. Tillotson, Syracuse University (<10 yrs)
2007 James A. Shymansky, University of Missouri-St. Louis (10+ yrs); G. Nathan Carnes, University of South Carolina (<10 yrs)
2008 Kathryn Scantlebury, University of Delaware (10+ yrs); Kathy Cabe Trumble, The Ohio State University (<10 yrs)
2009 Julie A. Luft, Arizona State University (10+ yrs)
2010 Randy L. Bell, University of Virginia (<10 yrs)
2011 Julie Gess-Newsome, Northern Arizona University

OUTSTANDING MENTOR (AWARD II)

1997 John Penick, University of Iowa
1998 Hans Anderson, Indiana University
1999 Norman Lederman, Oregon State University
2000 Robert K. James, Texas A & M University
2001 Robert E. Yager, University of Iowa
2002 Walter S. Smith, Ball State University
2003 Larry Enoch, Oregon State University
2004 Catherine Yeotis, Wichita State University
2005 Sandra Abell, University of Missouri-Columbia
2006 Tom Koballa, University of Georgia
2007 Kenneth Tobin, Graduate Center of the City University of New York
2008 Dana Zeidler, University of South Florida
2009 Kathryn Scantlebury, University of Delaware
2010 Gerry Saunders, Unity College
2011 Al Bodzin, Lehigh University
<table>
<thead>
<tr>
<th>Year</th>
<th>Title</th>
<th>Authors</th>
</tr>
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<tbody>
<tr>
<td>1981</td>
<td><em>Wait-time and Learning in Science,</em></td>
<td>Kevin Tobin, Western Australia Institute of Technology and William Capie, University of Georgia</td>
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<td>1983</td>
<td><em>The Disadvantaged Majority: Science Education for Women,</em></td>
<td>Jane Butler Kahle, Purdue University</td>
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<td>1984</td>
<td><em>Training Science Teachers to Use Better Teaching Strategies,</em></td>
<td>Russell H. Yeany and Michael J. Padilla, University of Georgia</td>
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<tr>
<td>1985</td>
<td><em>Using Research to Improve Science Teaching Practice,</em></td>
<td>Kenneth Tobin, Western Australian Institute of Technology</td>
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<td>1986</td>
<td><em>Active Technology for Higher Cognitive Level Learning in Science,</em></td>
<td>Kenneth Tobin, William Capie, and Antonio Bettencourt, University of Georgia</td>
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<tr>
<td>1987</td>
<td><em>Training Teachers to Teach Effectively in the Laboratory,</em></td>
<td>Pinchas Tamir, The Hebrew University</td>
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<td>1988</td>
<td><em>What Can Be Learned From Investigations of Exemplary Teaching Practice,</em></td>
<td>Kenneth Tobin, Florida State University</td>
</tr>
<tr>
<td>1990</td>
<td><em>Helping Students Learn How to Learn: A View from a Teacher-Researcher,</em></td>
<td>Joe Novak, Cornell University</td>
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<tr>
<td>1992</td>
<td><em>Teacher Development in Microcomputer Usage in K-12 Science,</em></td>
<td>James D. Ellis, BSCS</td>
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<tr>
<td>1993</td>
<td><em>Understanding and Assessing Hands-On Science,</em></td>
<td>Lawrence Flick, Washington State University</td>
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<tr>
<td>1994</td>
<td><em>Teaching Evolution: Designing Successful Instruction,</em></td>
<td>Lawrence Scharmann, Kansas State University</td>
</tr>
<tr>
<td>1995</td>
<td><em>Using Visits to Interactive Science and Technology Centers,</em></td>
<td>Museums, Aquaria and Zoos to Promote Learning in Science, Leonie Rennie and Terrence McClafferty</td>
</tr>
<tr>
<td>1996</td>
<td><em>General Biology: Creating a Positive Learning Environment for Elementary Education Majors,</em></td>
<td>Larry Scharmann and Ann Stanheim-Smith, Kansas State University</td>
</tr>
<tr>
<td>1997</td>
<td><em>Empowering Science Teachers: A Model for Professional Development,</em></td>
<td>Ann Howe, University of North Carolina at Raleigh and Harriet Stubbs, North Carolina State University</td>
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<tr>
<td>1999</td>
<td><em>A Dynamical Systems Based Model of Conceptual Change,</em></td>
<td>Andrew Hurford, Haskell Indian Nations University</td>
</tr>
<tr>
<td>2000</td>
<td><em>Teachers and Technology: A Case Study From an Implementation,</em></td>
<td>Lawrence Flick, Washington State University</td>
</tr>
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</table>
2003 Teacher Student Construction in Middle School Life Science, Maria Nunez-Oviedo, University of Massachusetts-Amherst, Mary Ann Rea-Ramirez, Hampshire College, John Clement and Mary Jane Else, both of, University of Massachusetts-Amherst

2004 ‘I Be Bangin’!
Understanding How Urban African American Youth Can Sustain Agency Across

2005 Culturalized Science Instruction: Exploring Its Influence upon Black and White Students’ Achievement, Eileen Parsons, North Carolina State University

2006 No Award given

2007 Narrative of Community: Visualizing Culturally Relevant Science Pedagogy Through the Identities of Black Middle School Teachers, M. Jenice Goldston and Sharon E. Nichols, The University of Alabama


2009 Exploring Multiple Outcomes: Using Cogenerative Dialogues and Co-teaching in a Middle School Science Classroom, Nicole K. Grimes, The Graduate Center, The City University of New York

2010 Daniel J. Bergman, Wichita State University

2011 A Mixed Methods Study of Mid-Career Science Teachers: The Growth of Professional Empowerment Amy Moreland, The University of Texas at Austin, and Mary Hobbs, The University of Texas at Austin

INNOVATIONS IN TEACHING SCIENCE TEACHERS (AWARD IV)

1990 A Reflective Approach to Science Methods Courses for Preservice Elementary Teachers, Dorothy Rosenthal, California State University-Long Beach
<table>
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<th>Year</th>
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<th>Authors</th>
<th>Institution</th>
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<tr>
<td>1991</td>
<td>Enhancing Science and Mathematics Teaching, Kenneth Tobin, Nancy Davis, Kenneth Shaw, and Elizabeth Jakubowski, Florida State University</td>
<td>Wright, and Linda Ramey-Gassert, Kansas State University</td>
<td>Education Course on the Internet, Janice Koch and Michael Barriere, Hofstra University</td>
</tr>
<tr>
<td>1993</td>
<td>Reconstructing Science Teacher Education Within Communities of Learners, Deborah Tippins, University of Georgia, Sharon Nichols, Florida State University, and Kenneth Tobin, Florida State University</td>
<td>1999 No Award Given</td>
<td>2004 An Inquiry-based Laboratory Lesson to Construct an Understanding of Earth’s Seasons, Paul Ashcraft, Clarion University and Susan Courson, Clarion University</td>
</tr>
<tr>
<td>1994</td>
<td>No Award Given</td>
<td>2000 Professional Development Programs for Elementary Science Teachers: An Analysis of Teacher Self-Efficacy Beliefs and The Professional Development Model, Tracy J. Posnanski, University of Wisconsin-Milwaukee</td>
<td>2005 No Award given</td>
</tr>
<tr>
<td>1995</td>
<td>Science for Early Adolescence Teachers (Science FEAT): A Program for Research and Learning, Samuel Spiegel, Angelo Collins, and Penny J. Gilmer, Florida State University</td>
<td>2001 Empowering Teachers as Researchers and Inquirers, Anne M. (Amy) Cox-Petersen, California State University, Fullerton</td>
<td>2006 No Award given</td>
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<tr>
<td></td>
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<td>2008 A Case Study of Fifth Grade Teachers’ Changes in</td>
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Methodology During a Two-Year Timeframe,
Anita Martin and Brian Hand, University of Iowa

2009  Learning to Teach
Science Through Collaboration:
Coteaching and
Cogenerative Dialogue in Elementary Science
Methods Courses,
Christina Siry,
University of Luxembourg, Nicole
Lowell, Elizabeth
Zawatski,
Manhattanville College

2010  Susan Gomez-Zwiep
and William J. Straits,
California State
University, Long Beach

2011  Descriptive Inquiry in the Throes of Learning to Teach: Can
Prospective Teachers Learn to Teach and Study their Teaching Closely? Michele
Koomen, Gustavus Adolphus College and Jamie Mitchell,
Gustavus Adolphus College

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