

The NARST logo is located in the top left corner. It consists of the word "NARST" in a green, sans-serif font, with a green curved line underneath it.

NARST

The background of the entire poster is a cosmic scene. It features a central globe with a black grid pattern, surrounded by swirling purple and blue nebulae and numerous bright stars. Two glowing white arcs, resembling orbits or light trails, curve around the globe.

2015

Annual International Conference

Hyatt Regency Chicago | Chicago, IL | **April 11-14**

*Becoming Next Generation Science Educators
in an Era of Global Science Education Reform*

NARST



2015

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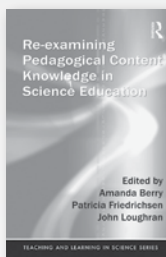
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NEW BOOKS



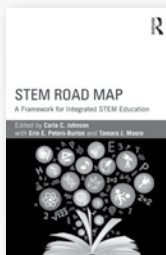
Handbook of Research on Science Education, Volume II

Edited by Norman Lederman, Sandra K. Abell



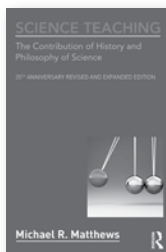
Re-Examining Pedagogical Content Knowledge in Science Education

Edited by Amanda Berry, Patricia Freidrichsen, John Loughran



STEM Road Map: A Framework for Integrated STEM Education

Edited by Carla C. Johnson with Erin E. Peters-Burton, Tamara J. Moore



Science Teaching, 20th Anniversary Revised and Expanded Edition

By Michael R. Matthews

NARST 2015

Annual International Conference

Hyatt Regency Chicago | Chicago, IL
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Becoming Next Generation Science Educators in an Era of Global Science Education Reform

ACKNOWLEDGMENTS

The following members of the Program Committee helped in preparing and editing the 2015 NARST Annual International Conference Program Book.

Valarie L. Akerson, President and Program
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William C. Kyle, Jr., Executive Director
Toni A. Sondergeld, NARST Scheduling Coordinator

Notes

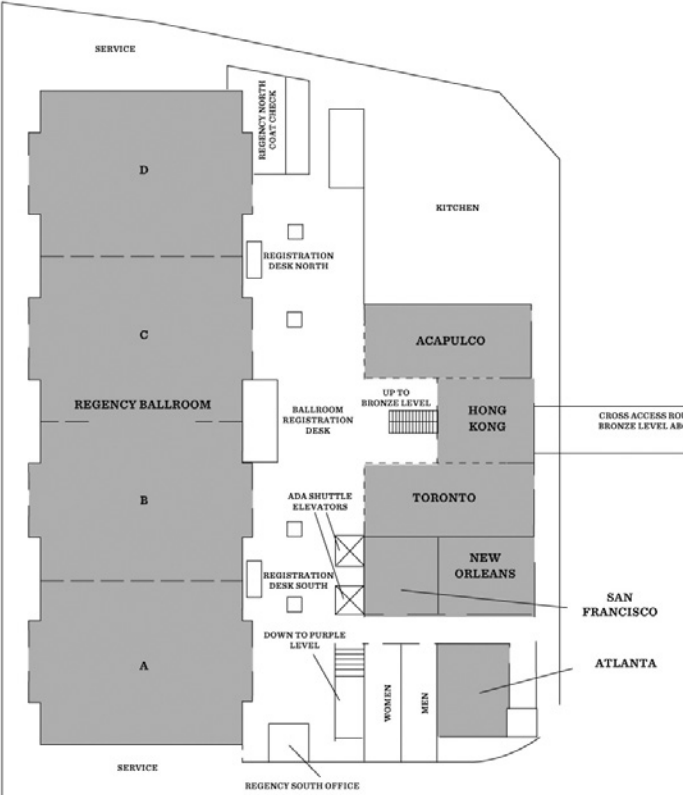
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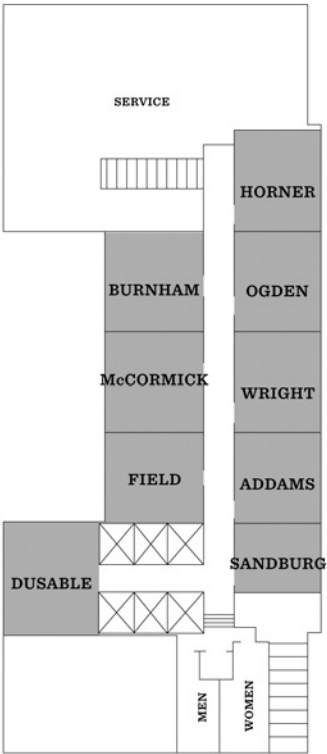
FLOOR PLANS

West Tower

Gold Level

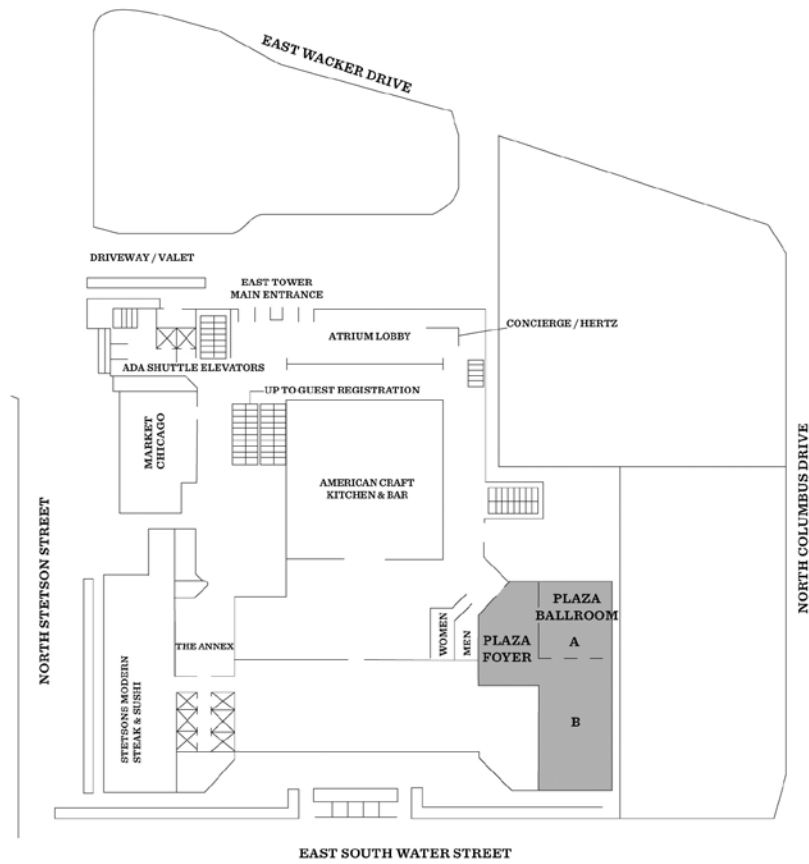


Silver Level



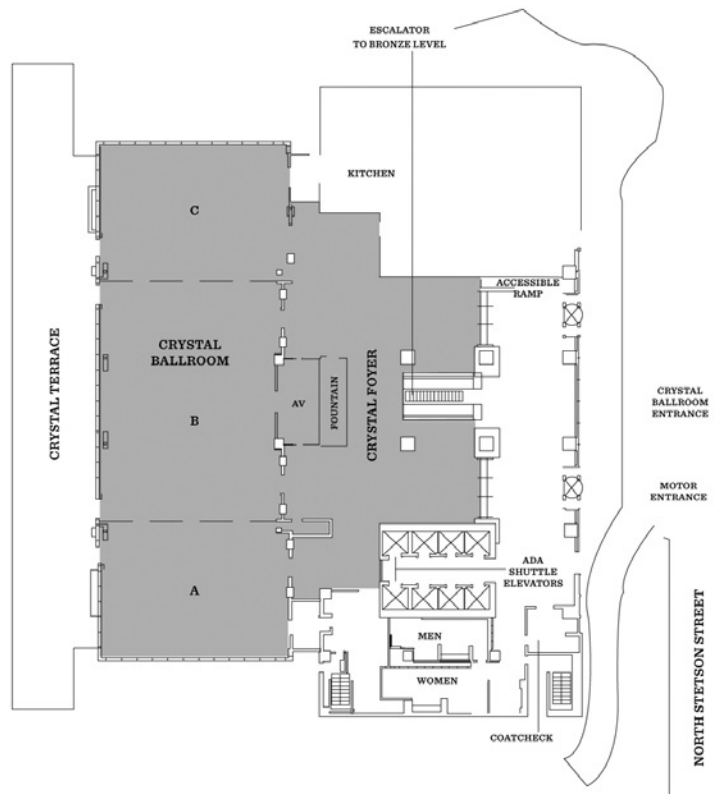
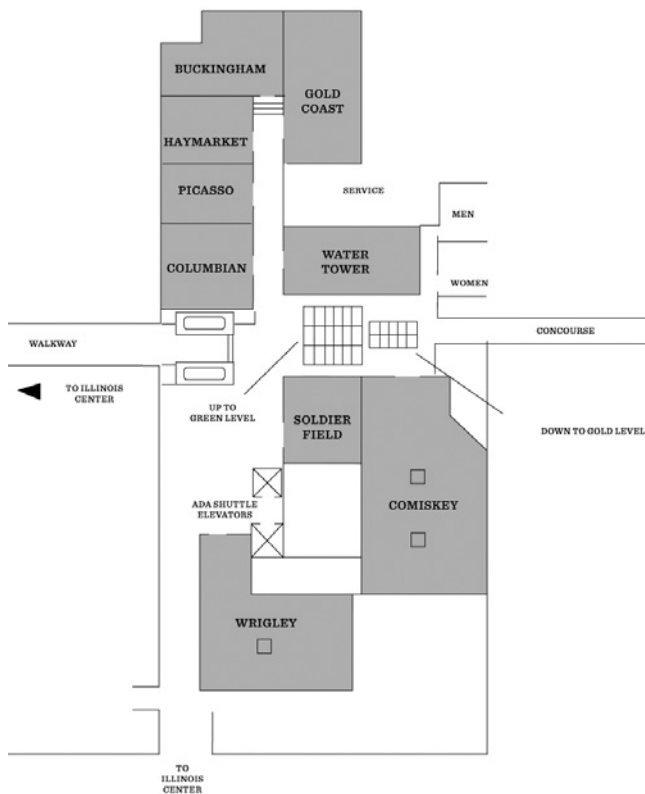
East Tower

Green Level



Bronze Level

Green Level



General Information

Information about NARST

The National Association for Research in Science Teaching was founded in 1928 for the purpose of promoting research in science education at all educational levels and disseminating the findings of this research in such ways as to improve science teaching and learning. The Association is incorporated as a non-profit corporation in the State of Minnesota. The official publication is the Journal of Research in Science Teaching. NARST encourages presentations of a wide variety of investigations in all aspects of science education, including action, historical, philosophical, ethnographic, experimental, and evaluative research studies. Reports of empirical research, critical reviews, and theoretical works are encouraged. In October 2010, to reflect the Association's growing international focus and membership, the Board approved referring to the Association by its acronym only. At the April 2011 Board Meeting, the tagline for the Association was approved by the Board. Thus, the Association's name and tagline is: NARST - A worldwide organization for improving science teaching and learning through research.

Research areas of interest to NARST members include curriculum development and organization, assessment and evaluation, learning theory, teacher education, programs for exceptional students (special needs and talents), equity studies, policy, and methods of teaching.

NARST Mission Statement

NARST is a worldwide organization of professionals committed to the improvement of science teaching and learning through research. Since its inception in 1928, NARST has promoted research in science education and the communication of knowledge generated by the research. The ultimate goal of NARST is to help all learners achieve science literacy. NARST promotes this goal by: 1) encouraging and supporting the application of diverse research methods and theoretical perspectives from multiple disciplines to the investigation of teaching and learning in science; 2) communicating science education research findings to researchers, practitioners, and policy makers; and 3) cooperating with other educational and scientific societies to influence educational policies. To learn more about NARST you may visit the Association's website at <http://narst.org/> and read the Bylaws approved by the membership in October 2008 at http://www.narst.org/about/NARST_bylaws.pdf.

Member Benefits

- Ten issues of the Journal of Research in Science Teaching (JRST) are published each volume year. JRST has been ranked as one of the highest quality educational journals according to studies published by War, Holland and Schramm (American Educational Research Journal) and Guba and Clark (Educational Researcher) for the American Educational Research Association (AERA). These authors identified JRST as clearly the top research journal in science education.
- The NARST Annual International Conference Program and Abstracts are available on the conference page of the NARST website.
- Members have access to E-NARST News, which is published twice a year and available on the NARST website.
- Website and Listserv, allowing access to further information about the Association. You may access this site at the following URL: <http://www.narst.org>. There is further information about subscribing to the listserv on this site.

Explanation of Program Session Formats

Paper Sessions Organized by the Program Committee

In a paper session, the presider introduces the presenters and monitors the time used for each presentation. All papers will be allotted 15 minutes for presentation, followed by approximately 5 minutes of questions or discussion. The presider and audience will use any time remaining in the session for additional discussion, general review, and suggestions for further research. Each presenter is expected to disseminate a paper during or immediately following the session, unless the paper is submitted voluntarily for inclusion in the e-version program link that will be password protected for conference attendees only [please note that while the program and abstracts will remain on the website permanently, the link for the manuscripts will only be live during the conference and for a period of up to 7 days prior to and following the conference).

Symposium

A symposium involves a panel of experts or stakeholders who examines a specific theme or issue. This format does not involve the presentation of individual papers. Therefore, individual papers and authors will not be listed under this format. Rather, the participants are listed as panel members. The proposer controls presentations, discussion, and questioning with the assistance of the presider or discussant (if designated). Discussion should promote the expression of similar or alternative viewpoints and theoretical positions. The proposer of the symposium is expected to disseminate a paper or a summary with references during or immediately following the session, unless the paper/summary is submitted voluntarily for inclusion in the e-version program link that will be password protected for conference attendees only [please note that while the program and abstracts will remain on the website permanently, the link for the manuscripts will only be live during the conference and for a period of up to 7 days prior to and following the conference).

Related Paper Set

This category accommodates, in a single session, three to five related research papers reporting several studies that originate from a common base of research. This format also allows for common elements of design or approach to be presented once rather than repetitively. The proposer and authors may determine the specifics of the session once it is accepted. For instance, those involved may opt for a formal presentation style or they may conduct their session in a more informal, discussion-oriented style. Each presenter is expected to disseminate a paper during or immediately following the session, unless a summary of the related paper set is submitted voluntarily for inclusion in the e-version program link that will be password protected for conference attendees only [please note that while the program and abstracts will remain on the website permanently, the link for the manuscripts will only be live during the conference and for a period of up to 7 days prior to and following the conference).

Interactive Poster Sessions

This format offers presenters the opportunity to display their work graphically in a traditional poster session format. Displays should fit on the 48" (long) x 36" (high) tri-fold boards provided and should include a brief abstract in large typescript. Each presenter must set up the display prior to the start of the Poster Session and then remove it promptly at the end of the Poster Session. Each presenter is expected to disseminate a paper during the session, unless a summary of the poster is submitted voluntarily for inclusion in the e-version program link that will be password protected for conference attendees only [please note that while the program and abstracts will remain on the website permanently, the link for the manuscripts will only be live during the conference and for a period of up to 7 days prior to and following the conference).

Guidelines for Meeting Presenters

- Go to the designated room at least 10 minutes early.
- Greet the presider/discussant.
- NARST provides the LCD and screen in each presentation room. NARST does not provide computers. You must have your own notebook computer or you may put your file on a USB flash drive in advance, in case you will be using another presenter's computer for your presentation.
- Check your understanding of the LCD projector and any other audiovisual equipment prior to the session.
- Keep presentation within the designated time limit.
- Invite audience comments and questions.
- If there is no presider assigned for your session, then presenters should keep time for each other.

Guidelines for Presiders and Discussants

We have accommodated most sessions with a presider, whose role is detailed below. For sessions without presiders, we are counting on the presenters to set aside time for discussion so that the audience participants can contribute to a discussion of the papers.

The role of the Presider includes:

- Arrive early at designated room and arrange furniture as per desires of presenters.
- Check and focus LCD projector.
- Check pronunciations of the names of the presenter and their institutions.
- With presenters, make a time plan, retaining the order of presenters in the program.
- Start session promptly.
- Introduce presenters and serve as timekeeper. Alert presenters when they have 5, 3, and 1 minute remaining. It is important to end each presentation within the agreed allocated time to ensure fairness to all presenters and in order to end the session on time. One suggestion that may be followed is if someone begins to exceed their allotted time, then it is appropriate to stand up and politely announce to the audience that you invite further discussion directly with the author(s) at the conclusion of the entire session.
- Facilitate discussion, assuring equitable involvement of audience members. Close session on time.

The role of the Discussant includes:

- Read papers before the session and have remarks prepared ahead of time.
- Perform presider duties as detailed above, if there is only a discussant for the session.
- After the presentation, make brief and cogent remarks on each paper with suggestions for future research.

Strand Key

- STRAND 1 – Science Learning: Understanding and Conceptual Change
- STRAND 2 – Science Learning: Contexts, Characteristics, and Interactions
- STRAND 3 – Science Teaching-Primary School (Grades preK-6): Characteristics and Strategies
- STRAND 4 – Science Teaching-Middle and High School (Grades 5-12): Characteristics and Strategies
- STRAND 5 – College Science Teaching and Learning (Grades 13-20)
- STRAND 6 – Science Learning in Informal Contexts
- STRAND 7 – Pre-service Science Teacher Education
- STRAND 8 – In-service Science Teacher Education
- STRAND 9 – Reflective Practice
- STRAND 10 – Curriculum, Evaluation, and Assessment
- STRAND 11 – Cultural, Social, and Gender Issues
- STRAND 12 – Educational Technology
- STRAND 13 – History, Philosophy, and Sociology of Science
- STRAND 14 – Environmental Education
- STRAND 15 – Policy

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2016 NARST Annual International Conference

The Program Chair invites NARST members and others to participate in the 2016 NARST Annual International Conference, and start planning next year's program proposals during the 2015 conference.

VENUE:

NARST 2016 Annual International Conference

Renaissance Baltimore Harborplace Hotel

Baltimore, MD, USA

April 14 - 17

THEME:

Toward Equity and Justice: Many Different Voices, Cultures, and Languages in Science Education Research for Quality Science Learning and Teaching

The mission of NARST is "to help all learners to achieve science literacy." With its inception in 1928, this organization has grown into a worldwide organization for enhancing science learning and teaching through research. With globalization, NARST, like many other educational organizations, must consider how educational research, theory, and policy can influence how the world addresses issues of equity and justice. This challenge is especially urgent at this time when science influences major concerns, such as human health, food production, clean water, and economic development in the world. It is critical that we have a world of citizens who can use their science knowledge and skills to make their world a better place in which to live and to pursue and be involved in STEM-related careers if they choose. To what extent does this belief apply if equity and justice are our goals given the meanings, unrealized potential, and continuing challenge of involvement in - and the commitment to - different voices, cultures, and languages in science education and the related research, theorizing, and policy-making?

The 2016 NARST Annual International Conference theme is a call to explore what it means to have different voices, cultures, and languages engaged in science education research. Ideally, NARST conference presenters and attendees will focus their attention, both locally and globally, in a collaborative manner on equity and justice as they relate to science education issues. Baltimore, Maryland is an appropriate place for the members of NARST to again connect and share their research about those who have been, who have not been, and are educationally marginalized, discounted, and denied so that all learners can experience equity and justice in science education. Quality science learning and teaching are the rights of every human being.

Please make your plans to participate in the 2016 NARST conference in Baltimore, Maryland with your various kinds of research presentations, workshops, symposia, and informal conversation with colleagues and others in 2016. We want educators from around the world to share with each other at this 2016 NARST conference.

SUBMISSION DEADLINE:

Proposals for the 2016 Annual International Conference are due by August 15, 2015. You must submit your proposal using the online proposal submission system. This deadline allows sufficient time for processing, reviewing and evaluating the many submitted proposals in a fair manner. By early-July 2015, the call for program proposals will appear on the NARST website.

CONFERENCE CHAIR:

Mary M. Atwater, President-Elect

Future Meeting Dates for NARST, NSTA, and AERA

2015

NARST Chicago, IL, April 11 - 14

AERA Chicago, IL, April 16 – 20

2016

NSTA Nashville, TN, March 31–April 3

AERA Washington, DC, April 8 - April 12

NARST Baltimore, MD, April 14 - 17

2015-2016 Strand Coordinators

Strand 1: Science Learning, Understanding, and Conceptual Change

John Shemwell, Lauren Barth-Cohen

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Megan Bang, Ananda Marin

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

Cassie Quigley, Alicia McDyre

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

Dante Cisterna, Hui Jin

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

Joseph Covert, Paul Baldwin

Strand 6: Science Learning in Informal Contexts

Jennifer DeWitt, Gary Holliday

Strand 7: Pre-service Science Teacher Education

Lucy Avraamidou, Eunjin Bang

Strand 8: In-service Science Teacher Education

Aaron Sickel, Sevgi Aydin Yuzuncu

Strand 9: Reflective Practice

Line Saint-Hilaire, Funmi Amosun

Strand 10: Curriculum, Evaluation, and Assessment

Jeff Nordine, Knut Neumann

Strand 11: Cultural, Social, and Gender Issues

Michelle Fleming, Angela Chapman

Strand 12: Educational Technology

Pavlo Antonenko, Richard Lamb

Strand 13: History, Philosophy and Sociology of Science

Judith S. Lederman, Ian Binns, Alison Meyers

Strand 14: Environmental Education

Deborah Tippins, Stacey Britton

Strand 15: Policy

Carla Johnson, Heidi Carlone

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Jamshidi, Arash	Larkin, Douglas	McGregor, Deb	Page, Heather
Jang, Hyewon	LeBlanc, Jennifer	McLoughlin, Eilish	Park Rogers, Meredith
Jang, Syh-Jong	Leblebicioglu, Gulsen	Medlin, Dorene	Parker, Carolyn
Jeffery, Tonya	Lederman, Norman	Mehl, Cathy	Parker, Loran
Jianxin, Yao	Lee, Carole	Melki, Christina	Patrick, Patricia
Jimenez, Juan	Lee, Christine	Menekse, Muhsin	Patterson, Lindsay
Jin, Hui	Lee, Eun Ju	Menon, Preetha	Pegg, Jerine
Johannsen, Bjørn	Lee, Eunmi	Mercan, Fatih	Pennock, Phyllis
Johnson, Matthew	Lee, Hyunju	Merritt, Joi	Perin, Suzanne
Jones, M. Gail	Lee, Judy	Mesa, Jennifer	Perry, Emily
Jones, Tamecia	Lee, Michele	Mikeska, Jamie	Peterman, Tana
Jurkiewicz, Melissa	Lee, Silvia Wen-Yu	Miles, Rhea	Peters-Burton, Erin
Kademian, Sylvie	Lee, Soonchun	Milford, Todd	Petty, Lori

Pimentel, Diane	Shanahan, Therese	Vanmali, Binaben	Zimmerman, Randi
Pitiporntapin, Sasithev	Shefner, Rachel	Vedder-Weiss, Dana	Zisk, Robert
Pitterson, Nicole	Shehab, Saadeddine	Verma, Geeta	Zoellick, Bill
Pitts, Wesley	Shemwell, Jonathan	Vezino, Beau	
Plankis, Brian	Shen, Ji	Vo, Tina	
Plummer, Julia	Sherwood, Carrie-Anne	Von Bergmann, HsingChi	
Pluta, William	Sheth, Manali	Waight, Noemi	
Potvin, Geoff	Shimek, Christine	Waldrip, Bruce	
Powell, Wardell	Shume, Teresa	Walker, Joi	
Price, Aaron	Siatras, Anastasios	Wallon, Robert	
Pruekpramool, Chaninan	Sickel, Aaron	Walpuski, Maik	
Purzer, Senay	Sikorski, Tiffanyrose	Wang, Hui-Hui	
Qureshi, Azhar	Silva Mangiante, Elaine	Wang, Jeremy	
Radoff, Jennifer	Simpson, Amber	Wang, Jianlan	
Ramnarain, Umesh	Singh, Mamta	Webb, Angela	
Raven, Sara	Siverling, Emilie	Webb, Aubree	
Rees, Carol	Smith, Mike	Weitzel, Holger	
Reid, Lisa	Smolek, Tamara	Wendt, Jillian	
Reid-Smith, Jennifer	Somsuk, Prapa	Wengrowicz, Niva	
Renaud-Grant, Chantelle	Sondergeld, Toni	Wessnigk, Susanne	
Restrepo Nazar, Christina	Song, Youngjin	West, Andrew	
Ricketts, Amy	Southerland, Sherry	Wheeler, Lindsay	
Riedinger, Kelly	Spindler, Matt	White, Francesca	
Rinehart, Ron	Spray, Jason	Whitworth, Brooke	
Rivera Maulucci, Maria	Staus, Nancy	Wiebke, Heidi	
Rodriguez, Idaykis	Stavrou, Dimitris	Wiggins, Benjamin	
Roehrig, Gillian	Stender, Anita	Wild, Andrew	
Rogat, Aaron	Stephenson, Jessica	Wilhelm, Jennifer	
Rollnick, Marissa	Strimaitis, Anna	Williams, Grant	
Ronan, Darcy	Stromholt, Shelley	Wilmes, Sara	
Rosales, Walter	Stuessy, Carol	Wilson, Rachel	
Roseler, Katrina	Stuhlsatz, Molly	Wingert, Kerri	
Ross, Danielle	Subramaniam, Karthigeyan	Wiseman, Dawn	
Ruchti, Wendy	Summers, Ryan	Witzig, Stephen	
Rudolph, Heather	Sung, Shannon	Wizner, Francine	
Ruggirello, Rachel	Suriel, Regina	Wong, Sissy	
Ruppert, John	Sussman, Joshua	Wood, Krista	
Ryu, Minjung	Swanson, Lauren	Woods-Townsend, Kathryn	
Sabel, Jaime	Swenson, Sandra	Woolcott, Geoff	
Sadler, Kim	Szyjka, Sebastian	Wright, Ann	
Sadler, Troy	Tal, Tali	Wyner, Yael	
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Sanchez-Tapia, Ingrid	Tekane, Rethabile	Yamaguchi, Etsuji	
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Sato, Takumi	Thummaphan, Phonraphee	Yarden, Anat	
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Schuchardt, Anita	Tretter, Thomas	Yeung, Yau-yuen	
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Schwartz, Renee	Tupper, Benjamin	Yin, Xinying	
Schwichow, Martin	Tutwiler, Michael	Yin, Yue	
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Seo, Kyungwoon	Van Duzor, Andrea	Zastavker, Yevgeniya	
Shah, Ashima	Van Horne, Katie	Zhang, Chunlei	

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1929 W. L. Eikenberry	1952 Betty Lockwood	1975 Robert E. Yager	1998 Audrey B. Champagne
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1947 Earl R. Glenn	1970 Willard D. Jacobson	1993 Emmett L. Wright	
1948 Ira C. Davis	1971 Paul D. Hurd	1994 Kenneth G. Tobin	
1949 Joe Young West	1972 Frank X. Sutman	1995 Dorothy L. Gabel	
1950 N. Eldred Bingham	1973 J. David Lockard	1996 Barry J. Fraser	

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(NARST created the position of Executive Secretary in 1975; the title was changed to Executive Director in 2003)

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 William G. Holliday 1980 – 1985
 Glenn C. Markle 1985 – 1990
 John R. Staver 1990 – 1995
 Arthur L. White 1995 – 2000
 David L. Haury 2000 – 2002
 John W. Tillotson 2002 – 2007
 William C. Kyle, Jr. 2007 – 2017

JRST Editors

J. Stanley Marshall 1963 – 1966
 H. Craig Sipe 1976 – 1968
 James T. Robinson 1969
 O. Roger Anderson 1970 – 1974
 David P. Butts 1975 – 1979
 James A. Shymansky 1980 – 1984
 Russell H. Yeany, Jr. 1985 – 1989
 Ronald G. Good 1990 – 1993
 William C. Kyle, Jr. 1994 – May 1999
 Charles W. (Andy) Anderson and James J. Gallagher August 1999 – 2001
 Dale R. Baker and Michael D. Piburn 2002 – 2005
 J. Randy McGinnis and Angelo Collins 2006 – 2010
 Joseph S. Krajcik and Angela Calabrese Barton 2011 – 2015
 Fouad Abd-El-Khalick and Dana L. Zeidler 2016 - 2020

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Ganiel, Uri	Lindauer, Ivo	Ritz, William	
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Gilmer, Penny	Mallinson, Jacqueline	Rose, Ryda	
Glynn, Shawn	Markle, Glenn	Schmidt, Donald	
Good, Ron	McCormack, Alan	Sequeira, Manuel	

NARST Award Winners

Distinguished Contributions to Science Education through Research Award

This award is presented at the Annual International Conference but is bestowed only when an outstanding candidate, or candidates, have been identified. It is given to recognize individuals who, through research over an extended period of time, have made outstanding and continuing contributions, provided notable leadership, and made a substantial impact in the area of science education.

Year	Awardee	Year	Awardee	Year	Awardee
1986	Anton E. Lawson	1999	Peter J. Fensham	2010	Reinders Duit
1987	Paul DeHart Hurd	2000	Jane Butler Kahle		Joseph Krajcik
1988	John W. Renner	2001	John K. Gilbert	2011	Norman Lederman
1989	Willard Jacobson	2002	Audrey B. Champagne	2012	Charles W. (Andy) Anderson
1990	Joseph D. Novak	2003	Barry J. Fraser		Larry Yore
1991	Robert L. Shrigley	2004	Robert E. Yager	2013	Dale R. Baker
1992	Pinchas Tamir		Paul Black	2014	Glen Aikenhead
1993	Jack Easley, Jr.	2005	John C. Clement		Richard Gunstone
1994	Marcia C. Linn	2006	David Treagust		Frances Lawrenz
1995	Wayne W. Welch	2007	Kenneth Tobin	2015	Richard A. Duschl
1996	Carl F. Berger	2008	Dorothy Gabel		Meshach Mobolaji Oggunniyi
1997	Rosalind Driver	2009	Peter W. Hewson		
1998	James J. Gallagher		Léonie Jean Rennie		
			Wolff-Michael Roth		

The Journal of Research in Science Teaching (JRST) Award

The JRST Award is given annually to the author or authors of the Journal of Research in Science Teaching article that is judged the most significant publication for that year.

Year	Awardee	Year	Awardee
1974	Donald E. Riechard and Robert C. Olson	1996	David F. Jackson, Elizabeth C. Doster, Lee Meadows, and Teresa Wood
1975	Mary Budd Rowe	1997	C.W.J.M. Klassen and P.L. Linjse
1976	Marcia C. Linn and Herbert C. Thier	1998	Julie Bianchini
1977	Anton E. Lawson and Warren T. Wollman	1999	Phillip M. Sadler
1978	Dorothy L. Gabel and J. Dudley Herron	2000	Allan G. Harrison, J. Grayson, and David F. Treagust
1979	Janice K. Johnson and Ann C. Howe	2001	Fouad Abd-El-Khalick and Norman G. Lederman
1980	John R. Staver and Dorothy L. Gabel (tie) Linda R. DeTure	2002	Andrew Gibert and Randy Yerrick
1981	William C. Kyle, Jr.	2003	Sofia Kesidou and Jo Ellen Roseman
1982	Robert G. Good and Harold J. Fletcher (tie) F. David Boulanger	2004	Jonathan Osborne, Sue Collins, Mary Ratcliffe, Robin Millar and Richard Duschl
1983	Jack A. Easley, Jr.	2005	Jonathan Osborne, Sibel Erduran and Shirley Simon
1984	Marcia C. Linn, Cathy Clement and Stephen Pulos	2006	Troy D. Sadler and Dana L. Zeidler
1985	Julie P. Sanford	2007	Jerome Pine, Pamela Aschbacher, Ellen Roth, Melanie Jones, Cameron McPhee, Catherine Martin, Scott Phelps, Tara Kyle and Brian Foley
1986	Anton E. Lawson		
1987	Russell H. Yeany, Kueh Chin Yap, and Michael J. Padilla	2008	Christine Chin
1988	Kenneth G. Tobin and James J. Gallagher	2009	Kihyun Ryoo and Bryan Brown
1988	(tie) Robert D. Sherwood, Charles K. Kinzer, John D. Bransford, Jeffrey J. Franks and Anton E. Lawson	2010	Helen Patrick, Panayota Mantzicopoulos, and Ala Samarapungavan
1989	Glen S. Aikenhead	2011	Daphne Minner, Jeanne Century, and Abigail Jurist Levy
1990	Richard A. Duschl and Emmett L. Wright	2012	Julie A. Luft, Jonah B. Firestone, Sissy S. Wong, Irasema Ortega, Krista Adams, and EunJin Bang
1991	E. P. Hart and I. M. Robottom		
1992	John R. Baird, Peter J. Fensham, Richard E. Gunstone, and Richard T. White	2013	Edys S. Quellmalz, Michael J. Timms, Matt D. Silberglitt, and Barbara C. Buckley
1993	Nancy R. Romance and Michael R. Vitale	2014	Janet Carlson, Stephen Getty, Susan Kowalski, Joseph Taylor and Christopher Wilson
1994	E. David Wong		
1995	Stephen P. Norris and Linda M. Phillips	2015	Matthew Kloser

The NARST Outstanding Paper Award

The NARST Outstanding Paper Award is given annually for the paper or research report presented at the NARST Annual International Conference that is judged to have the greatest significance and potential in the field of science education.

Year	Awardee
1975	John J. Koran
1976	Anton E. Lawson
1977	no award
1978	Rita Peterson
1979	Linda R. DeTure
1980	M. James Kozlow and Arthur L. White
1981	William Capie, Kenneth G. Tobin, and Margaret Boswell
1982	F. Gerald Dillashaw and James R. Okey
1983	William C. Kyle, Jr., James A. Shymansky, and Jennifer Alport
1984	Darrell L. Fisher and Barry J. Fraser
1985	Hanna J. Arzi, Ruth Ben-Zvi, and Uri Ganiel (tie) Russell H. Yeany, Kueh Chin Yap, and Michael J. Padilla
1986	Barry J. Fraser, Herbert J. Walberg, and Wayne W. Welch (tie)
1987	Robert D. Sherwood
1988	Barry J. Fraser and Kenneth G. Tobin
1989	James J. Gallagher and Armando Contreras
1990	Patricia L. Hauslein, Ronald G. Good, and Catherine Cummins
1991	Nancy R. Romance and Michael Vitale
1992	Patricia Heller, Ronald Keith and Scott Anderson
1993	Wolff-Michael Roth
1994	Wolff-Michael Roth and Michael Bowen
1995	Wolff-Michael Roth
1996	Nancy J. Allen
1997	no award
1998	Wolff-Michael Roth, Reinders Duit, Michael Komorek, and Jens Wilbers
1999	Lynn A. Bryan
2000	Joseph L. Hoffman and Joseph S. Krajcik
2001	Allan G. Harrison
2002	Carolyn Wallace Keys, Eun-Mi Yang, Brian Hand and Liesl Hohenshell
2003	Wolff-Michael Roth
2004	Joanne K. Olson (tie) Sharon J. Lynch, Joel Kuipers, Curtis Pyke and Michael Szesze
2005	Chi-Yan Tsui and David Treagust
2006	Leema Kuhn and Brian Reiser
2007	Eugene L. Chiappetta, Tirupalavanam G. Ganesh, Young H. Lee and Marianne C. Phillips
2008	Guy Ashkenazi and Lana Tockus-Rappoport
2009	Jrène Rahm
2010	Mark W. Winslow, John R. Staver, and Lawrence C. Sharmann
2011	Matthew Kloser
2012	Shelly R. Rodriguez and Julie Gess-Newsome
2013	Edward G. Lyon
2014	Ying-Chih Chen, Soonhye Park and Brian Hand
2015	Lori M. Ihrig, Michael P. Clough, and Joanne K. Olson

Outstanding Doctoral Research Award

This award is given annually for the Doctoral Research judged to have the greatest significance in the field of science education from among all theses and dissertations nominated this year for the award.

Year	Awardee	Major Professor
1992	René Stofflett	Dale R. Baker
1993	Julie Gess-Newsome	Norman G. Lederman
1994	Carolyn W. Keys	Burton E. Voss
1995	Jerome M. Shaw	Edward Haertel
1996	Christine M. Cunningham	William L. Carlsen
1997	Jane O. Larson	Ronald D. Anderson
1998	Kathleen Hogan	Bonnie K. Nastasi
1999	Fouad Abd-El-Khalick	Norman G. Lederman
2000	Danielle Joan Ford	Annemarie S. Palinscar
2001	Iris Tabak	Brian Reiser
2002	Mark Girod	David Wong
2003	Hsin-Kai Wu	Joseph Krajcik
2004	David L. Fortus	Ronald Marx and Joseph Krajcik
2005	Thomas Tretter	Gail M. Jones
2006	Stacy Olitsky	Kenneth Tobin
2007	Julia Plummer	Joseph S. Krajcik
2008	Victor Sampson	Douglas Clark
2009	Lei Liu	Cindy E. Hmelo-Silver
2010	Heather Toomey Zimmerman	Phillip Bell
2011	Jeffrey J. Rozelle	Suzanne M. Wilson
2011	Catherine Eberbach	Kevin Crowley
2012	Melissa Braaten	Mark Windschitl
2013	Lori Fulton	Jian Wang
2014	Daniel Birmingham	Angela Calabrese Barton and Anne-Lise Halvorsen
2015	Allison Godwin	Geoffrey Potvin

Early Career Research Award

The Early Career Research Award is given annually to the early researcher who demonstrates the greatest potential to make outstanding and continuing contributions to research in science education. The recipient will have received his/her Doctoral degree within five years of receiving the award.

Year	Awardee	Year	Awardee
1993	Wolff-Michael Roth	2004	Grady J. Venville
1994	Deborah J. Tippins	2005	Randy L. Bell
1995	Nancy B. Songer	2006	Heidi Carlone
1996	Mary B. Nakhleh	2007	Bryan A. Brown
1997	Peter C. Taylor	2008	Hsin-Kai Wu
1998	J. Randy McGinnis	2009	Troy D. Sadler
1999	Craig W. Bowen	2010	Thomas Tretter
	Gregory J. Kelly	2011	Katherine L. McNeill
2000	Angela Calabrese Barton	2012	Victor Sampson
2001	Julie A. Bianchini	2013	Alandeom W. Oliveira
2002	Alan G. Harrison	2014	Cory Forbes
2003	Fouad Abd-El-Khalick	2015	Benjamin C. Herman

Outstanding Master's Thesis Award

This award was established in 1995 to be given annually for the Master's Thesis judged to have the greatest significance in the field of science education. It was last awarded in 2002.

Year	Awardee	Major Professor
1995	Moreen K. Travis	Carol L. Stuessy
1996	Lawrence T. Escalada	Dean A. Zollman
1997	C. Theresa Forsythe	Jeffrey W. Bloom
1998	Reneé D. Boyce	Glenn Clark
1999	Andrew B. T. Gilbert	Randy K. Yerrick
2000	Rola Fouad Khishfe	Fouad Abd-El-Khalick
2002	Laura Elizabeth Slocum	Marcy Hamby Towns

Classroom Applications Award

The Classroom Applications Award was established in 1979. The award was given annually to authors whose papers were presented at the previous NARST Annual International Conference and judged to be outstanding in terms of emphasizing classroom application of research in science education. The award was last presented in 1991.

Year	Awardee(s)
1980	Livingston S. Schneider and John W. Renner (Five Equal Awards) Heidi Kass and Allan Griffiths Ramona Saunders and Russell H. Yeany Joe Long, James R. Okey, and Russell H. Yeany M. James Kozlow and Arthur L. White
1981	Dorothy L. Gabel, Robert D. Sherwood, and Larry G. Enochs (Four Equal Awards) Wayne Welch, Ronald D. Anderson, and Harold Pratt Mary Ellen Quinn and Carolyn Kessler P. Ann Miller and Russell H. Yeany
1982	Louise L. Gann and Seymour Fowler (Four Equal Awards) Dorothy L. Gabel and Robert D. Sherwood Thomas L. Russell Joseph C. Cotham
1983	Robert D. Sherwood, Larry G. Enochs, and Dorothy L. Gabel
1984	Mary Westerback, Clemencia Gonzales, and Louis H. Primavera (Four Equal Awards) Kenneth G. Tobin Hanna J. Arzi, Ruth Ben-Zvi, and Uri Ganiel Charles Porter and Russell H. Yeany
1985	Dan L. McKenzie and Michael J. Padilla (Three Equal Awards) Margaret Walkosz and Russell H. Yeany Kevin C. Wise and James R. Okey
1986	Sarath Chandran, David F. Treagust, and Kenneth G. Tobin (Four Equal Awards) Darrell L. Fisher and Barry J. Fraser Dorothy L. Gabel, Stanley L. Helgeson, Joseph D. Novak, John Butzow, and V. K. Samuel Linda Cronin, Meghan Tweist, and Michael J. Padilla
1987	Dorothy L. Gabel, V. K. Samuel, Stanley L. Helgeson, Sandra McGuire, Joseph D. Novak, and John Butzow
1988	Uri Zoller and Benn Chaim
1989	James D. Ellis and Paul J. Kuerbis
1990	Dale R. Baker, Michael D. Piburn, and Dale S. Niederhauser
1991	David F. Jackson, Billie Jean Edwards, and Carl F. Berger

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2014-2015

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President-elect	(17) Mary M. Atwater	University of Georgia	atwater@uga.edu
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(16) Gillian Roehrig	University of Minnesota	roehr013@umn.edu
(16) Jerome Shaw	University of California - Santa Cruz	jmlshaw@ucsc.edu
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NARST Liaison to NSTA	(15) Deborah Hanuscin	University of Missouri - Columbia	hanuscind@missouri.edu
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JRST Co-Editor	(20) Dana Zeidler	University of South Florida - Tampa Bay	zeidler@usf.edu
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Program/Scheduling Coordinator	Toni Sondergeld	Bowling Green State University	tonis519@aol.com

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NARST Annual International Conference

Schedule at a Glance - 2015

Hyatt Regency Chicago

Chicago, IL USA

Date/Time	Event	Room
Friday, April 10		
7:30 AM – 5:00 PM	NARST Executive Board Meeting #1	Plaza Ballroom
2:00 PM - 5:00 PM	Conference Registration	Grand Group Office
Saturday, April 11		
7:30 AM – 12:00 PM	NARST Executive Board Meeting #2	Plaza Ballroom
7:00 AM – 5:00 PM	Registration	Grand Group Office
<i>Please note:</i> You must register for the Pre-conference Workshops with your Advance Conference Registration. You may only register for one workshop.		
8:00 AM – 12:00 PM	Pre-Conference Workshop #1: Equity and Ethics Committee Free Maximum registration - 60	Grand B
	Title: Becoming Next Generation Science Educators in an Era of Global Science Education: An Equity Perspective	
	Organizers: Jerome Shaw, Enrique Lopez, Phillip Boda, Cassie Quigley, and Francesca White	
8:00 AM – 12:00 PM	Pre-Conference Workshop #2: Research Committee Free Maximum registration - 50	Columbus E F
	Title: Designing Adequately Powered Effectiveness Trials for Science Intervention Studies	
	Presenters: Jessaca Spybrook, Joe Taylor, and Susan Kowalski	
8:00 AM – 12:00 PM	Pre-Conference Workshop #3: Research Committee Free Maximum registration - 40	Wrigley
	Title: Videocase-Based, Analysis-of-Practice for Teacher and Student Learning: How To's from a 10-year Line of Research	
	Presenters: Jody Bintz, Connie Hvidsten, Kathleen Roth, Betty Stennett, and Christopher D. Wilson	
8:00 AM – 12:00 PM	Pre-Conference Workshop #4: Research Committee Free Maximum registration - 50	Columbus K L
	Title: Developing International Cross-Cultural Research Projects on Science Education	
	Presenters: Hsiao-Lin Tuan, Ling Liang, Sarah Barrett, Julia V. Clark, Saouma Boujaoude, Hsiao-Lan Sharon Chen, Mauricio Pietrocola, and Peter A. Okebukola	
8:00 AM – 12:00 PM	Pre-Conference Workshop #5: Research Committee Free Maximum registration - 30	Columbus I J
	Title: Key Challenges and Future Directions for Research on Scientific Argumentation	
	Presenters: Bryan Henderson, Katherine McNeill, Amanda Knight, Maria Pilar Jiménez-Aleixandre, Victor Sampson, Jonathan Osborne, Amelia Wenk Gotwals, Leema Berland, and Carla Zembal-Saul	

Date/Time	Event	Room
10:00 AM – 12:00 PM	Pre-Conference Workshop #6: Publication Advisory Committee Free Maximum registration - 60 Title: Submitting and Reviewing Proposals to NARST Strands Part A (10:00 AM – 11:00AM): Submitting Proposals to NARST Strands Presenters: Huann-shyang Lin, Huihui Kanahele-Mossman, and Alberto Rodriguez Part B (11:00 AM – 12 PM): Reviewing Proposals for NARST Strands Presenters: Huann-shyang Lin, Huihui Kanahele-Mossman, and Alejandro J. Gallard M.	Grand A
12:00 PM – 1:00 PM	Lunch	On your own
1:00 PM – 2:30 PM	Concurrent Session # 1	
2:45 PM – 4:15 PM	Concurrent Session # 2	
4:30 PM – 5:50 PM	Plenary Session # 1 Title: STEM Vital Signs Presenter: Linda P. Rosen, CEO, Change the Equation	Grand Ballroom CD South, EF
6:00 PM – 7:00 PM	Mentor-Mentee Nexus	Columbus K L
6:00 PM - 7:00 PM	Research Interest Groups (RIGs) Meetings Contemporary Methods for Science Education Research Continental and Diasporic Africa in Science Education (CADASE) Engineering Education Latino/a RIG (LARIG)	Columbus A B Columbus C D Columbus E F Columbus I J
7:00 PM – 9:30 PM	Presidential / Welcome Reception (Appetizers served and cash bar)	Grand Ballroom A - D

Sunday, April 12

6:00AM - 7:15AM	Mind and Sole (Off-site)* <i>*This event is not sponsored nor endorsed by NARST</i>	Hyatt Lobby
7:30 AM – 8:15 AM	Committee Meetings	
7:00 AM – 5:00 PM	Registration	Grand Group Office
8:30 AM – 10:00 AM	Concurrent Session # 3	
10:15 AM – 11:45 AM	Concurrent Session # 4	
12:00 – 1:00 PM	NARST Business Meeting (Box lunch provided for 1st 100 attendees who sign up)	Plaza Ballroom
12:00 PM – 1:00 PM	Lunch	On your own
1:15 PM – 2:45 PM	Concurrent Session # 5	
2:45 PM - 3:15 PM	Break	Grand Foyer
3:15 PM - 4:15 PM	Concurrent Session # 6A: Poster Session	Riverside East
4:15 PM - 5:15 PM	Concurrent Session # 6B: Poster Session	Riverside East
5:30 PM - 7:00 PM	Graduate Student Forum	Grand A
5:30 PM - 7:00 PM	Graduate Student Forum	Grand B
5:30 PM - 7:00 PM	Early Career Faculty Forum	Columbus I J
6:00 PM – 8:30 PM	JRST Editorial Team Meeting / Dinner Sponsored by Wiley-Blackwell (By invitation only)	Plaza Ballroom
6:00 PM – 7:30 PM	Reception: International Journal of Science and Mathematics Education Sponsored by Springer (By invitation only)	Randolph
7:00 PM - 8:00 PM	Graduate Student and Early Career Scholars Social* <i>*Informal social - on your own; this event is not sponsored by NARST</i>	Off-site: Chicago Houlihan's 111 E. Wacker Drive (adjacent to the Hyatt)

Date/Time	Event	Room
Monday, April 13		
7:00 AM – 8:15 AM	Committee Meetings	
7:00 AM – 5:00 PM	Registration	Grand Group Office
8:30 AM – 10:00 AM	Plenary Session #2: Title: Science Teacher Education in an Era of Science Education Reform: A Global Perspective Presiders/Discussants: Norman Lederman and Judith Lederman Illinois Institute of Technology, USA and Editors of Journal of Science Teacher Education Presenters: The first author on each paper representing each continent will contribute to the plenary session. Africa Meshach Ogunniyi, University of the Western Cape, South Africa Marissa Rollnick, University of Witwatersrand, Johannesburg, South Africa Asia Liu Enshan, Beijing Normal University, China Liu Cheng, Beijing Normal University, China Jian Wang, Beijing Normal University, China Australia David Treagust, Curtin University, Australia Jacinta Petersen, Notre Dame University, Australia Mihye Won, Curtin University, Australia Georgie Wynne, Catholic Education Office of Western Australia, Australia Europe Justin Dillon, University of Bristol, United Kingdom Virginie Albe, Ecole Normale Supérieure de Cachan, France Maria Evagorou, University of Nicosia, Cyprus Jouni Viiri, University of Jyväskylä, Finland North America Joanne Olson, Iowa State University, USA Todd Milford, University of Victoria, Canada Chris Ohana, Western Washington University, USA Christine Tippet, University of Ottawa, Canada South America Hernan Cofre, Pontificia Universidad Catolica de Valparaíso, Chile Germán Ahumada, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile Johanna Camacho, Universidad de Chile, Santiago, Chile Melina Furman, Universidad de San Andrés, Buenos Aires, Argentina Rómulo Gallego, Universidad Pedagógica Nacional de Bogotá, Colombia Corina González-Weil, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile & Centro de Investigación Avanzada en Educación, CIAE, Chile David Santibáñez, Universidad Católica Silva Henríquez, Santiago, Chile & Mathematics and Science Education Department, Illinois Institute of Technology, Chicago, USA Royman Pérez, Universidad Pedagógica Nacional de Bogotá, Colombia María E. Podesta, Universidad de San Andrés, Buenos Aires, Argentina Claudia Vergara, Universidad Alberto Hurtado, Santiago, Chile	Grand Ballroom CD South, EF

Date/Time	Event	Room
10:00 AM - 10:30 AM	Break	Grand Foyer
10:30 AM – 12:00 PM	Concurrent Session # 7	
12:15 PM – 2:15 PM	Awards Luncheon	Regency
2:30 PM – 4:00 PM	Concurrent Session # 8	
4:15 PM - 5:45 PM	Concurrent Session # 9	
6:30 PM – 9:00 PM	Equity Dinner Restaurant – Mystic Blue Cruise, Navy Pier Boarding begins at 6:30 PM (Maximum attendance: 85) Dinner, including tax and gratuity, is \$45. Please note: You must register for this event with your Advance Conference Registration. Tickets purchased for this event are not refundable. NOTE: Navy Pier is a 1.2 mile walk from the Hyatt. Complimentary shuttle service from the Hyatt to Navy Pier will depart at 5:30 and 6:00 (return service provided as well).	Off-site: Lake Michigan Cruise Mystic Blue Cruise, Navy Pier

Tuesday, April 14

7:00 AM – 8:15 AM	Strand Meetings	
7:00 AM – 12:00 PM	Registration	Grand Group Office
8:30 AM – 10:00 AM	Concurrent Session # 10	
10:15 AM - 11:45 AM	Concurrent Session # 11	
12:00 PM – 1:00 PM	Lunch	On your own
1:00 PM – 2:30 PM	Concurrent Session # 12	
2:45 PM - 4:15 PM	Concurrent Session # 13	
5:00 PM - 10:00 PM	NARST Executive Board Meeting #3	Plaza Ballroom



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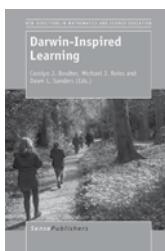
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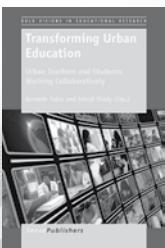
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Edited by Kenneth Tobin and Ashraf Shady



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I DO, AND I UNDERSTAND

Helping Young Children Discover
Science and Mathematics



Robert Louisell

with special guest chapters by
Stephen Hornstein and Peter Frost

I hear, and I forget.
I see, and I remember.
I do, and I understand.

*Ancient Asian Proverb.

Stop by the exhibit table to pick up a desk copy.

PROGRAM

Friday, April 10, 2015

**NARST Executive Board Meeting
Session #1
7:30am – 5:00pm, Plaza Ballroom**

**Conference Registration
2:00pm – 5:00pm, Grand Group Office**

Saturday, April 11, 2015

Conference Registration

7:00am – 5:00pm, Grand Group Office

NARST Executive Board Meeting Session #2

7:30am – 12:00pm, Plaza Ballroom

Pre-Conference Workshops**8:00am – 12:00pm****Pre-Conference Workshop—Equity and Ethics Committee Sponsored (Free – 60 participants max)**
Becoming Next Generation Science Educators in an Era of Global Science Education: An Equity Perspective

8:00am – 12:00pm, Grand B

Organizers:

Jerome Shaw, University of California, Santa Cruz
 Philip Boda, Columbia University
 Cassie Quigley, Clemson University
 Francesca White, Indiana University

Pre-Conference Workshop—Research Committee (Free – 50 participants max)***Designing Adequately Powered Effectiveness Trials for Science Intervention Studies***

8:00am – 12:00pm, Columbus EF

Presenters:

Jessica Spybrook, Western Michigan University
 Joe Taylor, Abt Associates Inc.
 Susan Kowalski, BSCS

Pre-Conference Workshop—Research Committee (Free – 40 participants max)***Videocase-Based, Analysis-of-Practice for Teacher and Student Learning: How To's from a 10-year Line of Research***

8:00am – 12:00pm, Wrigley

Presenters:

Jody Bintz, BSCS
 Connie Hvidsten, BSCS
 Kathleen Roth, Center for Excellence in Mathematics and Science Teaching (CEMaST), California State Polytechnic University (CPP)
 Betty Stennett, BSCS
 Christopher D. Wilson, BSCS

Pre-Conference Workshop—Research Committee (Free – 50 participants max)***Developing International Cross-Cultural Research Projects on Science Education***

8:00am – 12:00pm, Columbus KL

Presenters:

Hsiao-Lin Tuan, National Changhua University
 Ling Liang, LaSalle University
 Sarah Barrett, York University, Canada
 Julie V. Clark, NSF
 Saouma BouJaoude, American University of Beirut
 Hsiao-Lan Sharon Chen, National Taiwan Normal University
 Mauricio Pietrocola, University of San Paulo
 Peter A. Okebukola, Lagos State University, Nigeria

Pre-Conference Workshop—Research Committee (Free – 30 participants max)***Key Challenges and Future Directions for Research on Scientific Argumentation***

8:00am – 12:00pm, King's Columbus IJ

Presenters:

Bryan Henderson, Arizona State University
 Katherine McNeill, Boston College
 Amanda Knight, Boston College
 Maria Pilar Jiménez-Aleixandre, University of Santiago de Compostela, Spain
 Victor Sampson, University of Texas at Austin
 Jonathan Osborne, Stanford University
 Amelia Wenk Gotwals, Michigan State University
 Leema Berland, University of Wisconsin-Madison
 Carla Zembal-Saul, Pennsylvania State University

Pre-Conference Workshop—Publications Advisory Committee (Free – 60 participants max)***Submitting and Reviewing Proposals to NARST Strands***

10:00am – 12:00am, Grand A

Part A (10:00am – 11:00am): Submitting Proposals to NARST Strands**Presenters:**

Huann-shyang Lin, National Sun Yat-sen University
 Huihui Kanahale-Mossman, Ka Umeke Ka'eo
 Alberto Rodriguez, Purdue University

Part B (11:00am – 12:00pm): Reviewing Proposals for NARST Strands**Presenters:**

Huann-shyang Lin, National Sun Yat-sen University
 Huihui Kanahale-Mossman, Ka Umeke Ka'eo
 Alejandro J. Gallard M., Georgia Southern University

Lunch—On Your Own**12:00pm – 1:00pm**

Concurrent Session #1**1:00pm – 2:30pm**

Presidential Sponsored Session***Exploring Methodological Directions to Support a NGSS-Driven Research and Development Agenda***

1:00pm - 2:30pm, Comiskey

Discussants:

Valarie Akerson, Indiana University

Joseph Taylor, Abt Associates Inc.

Presenters:

Jonathan Osborne, Stanford

Sharon Lynch, George Washington University

Eileen Carlton Parsons, University of North Carolina, Chapel Hill

Dale Baker, Arizona State University

Jim Pellegrino, University of Illinois, Chicago

Strand 1: Science Learning, Understanding and Conceptual Change***Using Data and Evidence in Scientific Practices***

1:00pm - 2:30pm, Wrigley

Presider: Katherine Culp, Education Development Center, Inc.***How Learning During Scientific Observation can Influence Students' Reasoning with Evidence***

Thanh K. Le, University of Maine

Emily J. Silver, University of Maine

Jonathan T. Shemwell, University of Maine

Daniel K. Capps, University of Maine

Christine E. Voyer, Gulf of Maine Research Institute

Marie Daigle Thompson, University of Maine

Investigating Student Interpretation of Authentic Biological Data through Argumentation and Use of Models

Patricia Zagallo, University of Arizona

Raj Shah, University of Arizona

Shanice Meddleton, University of Arizona

Molly Bolger, University of Arizona

Sampling in the Wild: How Attention to Variation Supports Middle School Students' Sampling Practice

Michelle Cotterman, Vanderbilt University

Richard Lehrer, Vanderbilt University

Leona Schauble, Vanderbilt University/Peabody College

Functional Roles of Inscriptional Evidence in Children's Written Arguments about Socioscientific Issues

Sihan Xiao, University of California, Los Angeles

William A. Sandoval, University of California, Los Angeles

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

1:00pm - 2:30pm, Water Tower

Presider: Joao Fernandes, New University of Lisbon***Teaching "How-to" and "Why" – Does supporting Procedural Knowledge and Procedural Understanding Improve Inquiry Learning?***

Julia C. Arnold, RWTH Aachen University, Germany

Kerstin Kremer, RWTH Aachen University

Jürgen Mayer, Kassel University, Germany

Prompting Adolescents' Epistemic Beliefs in a Field-based Science Program: An Exploratory, Mixed Methods Study

Jiangyue Gu, Utah State University

Brian R. Belland, Utah State University

Investigating the Level of Relationship between Turkish Elementary Students' Personal Epistemologies and Self-regulated Learning

Muhammet Mustafa Alpaslan, Mugla Sitki Kocman University

Fatma Alpaslan

Contextual Effects on Student Reasoning: Physical Anthropology as an Alternative Discipline for Learning Biological Evolution

Elizabeth P. Beggrow, The Ohio State University

A Classroom Community of Practice and an Epistemic Frame within an Instantiation of Modeling-based Instruction

Todd Campbell, University of Connecticut

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Self-efficacy and Student Interests

1:00pm - 2:30pm, Grand Suite 5

Presider: Alandeom W. Oliveira, University at Albany, SUNY

Spark to Flame: Factors Influencing Students' Interest in Science

Christina S. Melki, Indiana University

Russell N. Balliet, Indiana University

Adam V. Maltese, Indiana University

Robert H. Tai, University of Virginia

John T. Almarode, James Madison University

Investigating the Relation of Self-Efficacy to Achievement and Engagement in Science by Considering Big-Fish-Little-Pond Effect

Yasemin Tas, Ataturk University

Sundus Yerdelen, Kafkas University

Nurcan Kahraman, Çanakkale Onsekiz Mart Üniversitesi

The Relations between Teachers and Parents' Messages and Adolescents' Self-Efficacy for Science Learning

Bat-Shahar Dorfman, Weizmann Institute of Science

David L. Fortus, Weizmann Institute Of Science

The Study Habits of Engineering Undergraduate students in India and USA: A Comparative Qualitative Analysis

Devasmita Chakraverty, University of Virginia

Kathan Shukla, University of Virginia

Assessing the Biology Learning Environment at a HBCU - Year 1 of a 5-Year Study

Catherine S. Martin-Dunlop, Morgan State University

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies Related Paper Set - Research on Engineering Education in the Elementary Grades

1:00pm - 2:30pm, Columbus GH

Presider: Gregory J. Kelly, Penn State University

Framing Engineering Practices in Elementary School Classrooms

Christine M. Cunningham, Museum of Science, Boston

Gregory J. Kelly, Penn State University

The Engineering Design Process as a Safe Place to Try Again: Perspectives on and Responses to Failure by Elementary Teachers and Students

Pamela S. Lottero-Perdue, Towson University

Engineering Design as a Disciplinary Discourse: An Exploration of Language Demands and Resources among Urban Elementary Students

Kristen B. Wendell, University of Massachusetts Boston

Patricia Paugh, University of Massachusetts Boston

Christopher G. Wright, University of Tennessee, Knoxville

Engineering Practices through Notebooking

Jonathan D. Hertel, Museum of Science, Boston

Christine M. Cunningham, Museum of Science, Boston

Gregory J. Kelly, Penn State University

Shifting Cultural Meanings of "Smartness" through Engineering in High-needs Elementary Classrooms

Heidi B. Carlone, University of North Carolina at Greensboro

Tess Hegedus, University of North Carolina at Greensboro

Megan Martin, University of North Carolina at Greensboro

Aundrea Carter, University of North Carolina at Greensboro

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

1:00pm - 2:30pm, Randolph

Presider: Erin M. Furtak, University of Colorado

Using Pedagogical Reasoning to Explicate Expert Practice that Aligns with National Teaching Standards

Stephen Keast, Monash University

Ian Mitchell, Monash University

Debra Panizzon, Monash University

Melissa Tham, Monash University

John Loughran, Monash University

Preservice Experiences on Science Teacher Attrition

Jonah B. Firestone, Washington State University-Tricities

Sissy S. Wong, University of Houston

Eunjin Bang, Iowa State University

Julie A. Luft, University of Georgia

Learning Progressions, Formative Assessment, and Professional Development: Results of a Longitudinal Study

Erin M. Furtak, University of Colorado
Katharina Kiemer, TUM School of Education
Vanessa de Leon, University of Colorado
Rebecca D. Swanson, University of Colorado, Boulder

Making a New High School Chemistry Teacher's Struggles with Classroom Assessment Visible

Kemal Izci, Necmettin Erbakan University
Marcelle Siegel, University of Missouri-Columbia

Practices for Whole Assessment Processes of Science Teachers: Exploring Collaboration in Communities of Practice

Heejung Min, Chongryang Middle School
Seoung-Hey Paik, Korea National University of Education

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

Related Paper Set - Designing Next Generation Post-Secondary Science Learning, Teaching, and Communication Experiences and Environments

1:00pm - 2:30pm, Columbus IJ

President: Sania Z. Zaidi, University of Michigan

Discussant: Philip Bell, University of Washington

Using Student Generated Explanations of Physical Chemistry Concepts, as well as a Peer-Review Process, to Explore Student Conceptual Understanding

Heidi Phillips, University of Michigan

A Designed Professional Development Program to Encourage Graduate Student Instructors to Use Active Learning in Chemistry Discussion Sections

Rachel A. Barnard, University of Michigan

RELATE: Improving Lay-Audience Science Communication among STEM Graduate Students Using a Practice-Based Model

Katherine E. Prater, University of Michigan
Elyse L. Aurbach, University of Michigan

Employing a Studio Model for Designers of Science Learning and Teaching Artifacts and Environments: Tinkering, Critique, and Dialogue

Leah A. Bricker, University of Michigan

Strand 6: Science Learning in Informal Contexts

Related Paper Set - Climate beyond the Curriculum: Learning about Climate Change in Informal Contexts

1:00pm - 2:30pm, Roosevelt

President: Noah Weeth Feinstein, University of Wisconsin-Madison

Climate Change in the Community: Reflections from a Sustainability Semester

Hannah K. Miller, Michigan State University
Elizabeth X. De Los Santos, Michigan State University
Charles W. Anderson, Michigan State University

Participatory Development and Evaluation of the WeatherBlur Citizen Science Project

Ruth Kermish-Allen, Island Institute
Karen Peterman, Karen Peterman Consulting
Christine Bevc, University of North Carolina

Toward Outsider Competence: Informed Assessments of Climate Science in Popular Media

Shusaku Horibe, University Of Wisconsin- Madison
Noah Weeth Feinstein, University of Wisconsin-Madison

A View from Practice: Exploring Adaptation in the Climate of Uncertainty Initiative

Patrick Hamilton, Science Museum of Minnesota

Coming to Grips (or Not): Using a Climate Change Simulation Game to Develop Systemic Understanding

David I. Waddington, Concordia University

Strand 6: Science Learning in Informal Contexts

Strand Sponsored Session - Translating Theory into Practice in Informal Settings

1:00pm - 2:30pm, Grand D North

President: Gary Holliday, University of Akron

Developing K-12 Inquiry Practices:

Tom J. McConnell, Ball State University
J. M. Shireen Desouza, Ball State University
Tolly Foster, Indianapolis Zoo
Michele Schiltan, Indianapolis Zoo

A Study of Theory to Practice in an Informal Science Learning Environment

Stephanie Bohr, John G. Shedd Aquarium
Susan Magdziarz, John G. Shedd Aquarium
Manda Smith, John G. Shedd Aquarium

Building a Collaborative Learning Research Agenda for UK Natural History Museums

Emma Pegram, Natural History Museum, London

Strand 7: Pre-service Science Teacher Education Teachers' Understandings of Science and Use of Student Representations

1:00pm - 2:30pm, Columbus KL

Presider: Jason Katzmann, University of Wyoming

Prospective Science Teachers' Understanding of Science and Engineering Practices

Stacey L. Carpenter, University of California - Santa Barbara
Ashley Iveland, University of California - Santa Barbara
Sungmin Moon, University of California - Santa Barbara
Sarah Hough, University of California - Santa Barbara
Julie A. Bianchini, University of California, Santa Barbara

Pre-service Teachers and Science: The Effect of Peer Instruction

Sally Blake, Flagler College
Barbara Blonder, Flagler College
Jeremy Krause, Flagler College
Candice Burkett, University of Illinois Chicago

Exploring Science Education Faculty Attitudes Toward Standardized Testing

Tyler L. St.Clair, Oregon State University
Jennifer Maeng, University of Virginia
Randy L. Bell, Oregon State University
Lindsay B. Wheeler, University of Virginia

An Action Research Study of Pre-Service Science Teachers' Use of Student Generated Representations

Jale Ercan, Gazi University
Mehmet F. Tasar, Gazi University

Strand 8: In-service Science Teacher Education Teachers' PCK and Content Knowledge Development

1:00pm - 2:30pm, Columbus EF

Presider: Sherry A. Southerland, Florida State University

Teachers' Retention of Discipline-Specific Scientific Content Knowledge throughout a 3-Year Professional Development Program

Renee M. Clary, Mississippi State University
Anastasia Elder, Mississippi State University
James Dunne, Mississippi State University
Svein Saebo, Mississippi State University
Debbie Beard, Mississippi State University
Charles Wax, Mississippi State University
Josh Winter, Mississippi State University
Deborah Tucker, Independent Science Education Consultant

Developing Biology Teachers' Pedagogical Content Knowledge (PCK) in Evolution: The Importance of a Professional Development Program at the University and at the Schools

Claudia Vergara, University Alberto Hurtado
Paulina Bravo González, Pontificia Universidad Católica de Valparaíso
Hernan Cofre, Pontificia Universidad Católica de Valparaíso

Science Teachers' Familiarity with, Interest in and Conceptual Knowledge of Basic Microbiology Concepts

Frackson Mumba, University of Virginia
Nastassia Jones, Philander Smith College
Vivien M. Chabalengula, University of Virginia

Mapping out the Growing Trends and the Crucial Structures of Biology Teachers' Pedagogical Content Knowledge

Chunlei Zhang, East China Normal University
Enshan Liu, Beijing Normal University

Examining Teachers' Curriculum Designs and their Evolved PCK in the Context of Modeling-Centered Inquiry

Marios Papaevripidou, University of Cyprus
Zacharias C. Zacharia, University of Cyprus

**Strand 10: Curriculum, Evaluation, and Assessment
Argumentation**

1:00pm - 2:30pm, Grand B

Presider: Molly Stuhlsatz, BSCS

DiALoG: A Practical Instrument Designed for the Assessment of Verbal Classroom Argumentation in Real Time

J. Bryan Henderson, Arizona State University
 Claire E. Fenton, University of California - Berkeley
 Katherine L. McNeill, Boston College
 P. David Pearson, University of California - Berkeley
 Jacqueline Barber, University of California - Berkeley

Construction of Rubrics to Evaluate Content in Students' Scientific Explanation Using Computerized Text Analysis

Kevin C. Haudek, Michigan State University
 Michele M. Weston, Michigan State University
 Rosa Moscarella, Michigan State University
 John Merrill, Michigan State University
 Mark Urban-Lurain, Michigan State University

Development of Framework for Assessing the Quality of Socioscientific Argumentation

Yeonjoo Ko, Ewha Womans University
 YunHee CHOI, soongmoon middle school
 Hyunju Lee, Ewha Womans University

Measuring High School Students' Ability to Construct and Critique Arguments in Ecology

Anna MacPherson, Stanford University

Strand 11: Cultural, Social, and Gender Issues

Strand Sponsored Symposium - Examining NGSS

Practices through Cultural, Social, and Gender Perspectives

1:00pm - 2:30pm, Grand Suite 3

Presenters:

Michelle A. Fleming, Wright State University
 Lisa Kenyon, Wright State University
 Bhaskar Upadhyay, University of Minnesota
 Brian Scott Fortney, Texas Tech University
 Reynee Kachur, University of Wisconsin Oshkosh
 Oliver Schinkten, Oshkosh Area School District Oshkosh, Wisconsin
 Angela Chapman, University of Texas - Pan American
 Anna R. Lewis, University of South Florida
 Samantha M Baker, Wright State University
 Kyle J. Phelps, Wright State University

Strand 11: Cultural, Social, and Gender Issues

Related Paper Set - De/Reconstructing (Re)evolutionary and Socially Just Places of Learning in Formal Science Classrooms

1:00pm - 2:30pm, Grand A

Discussants:

Felicia Moore Mensah, Columbia University
 Alberto Rodriguez, Purdue University

Promoting Youth Voice and Social Change in Science through Participatory Research: Challenges and Opportunities of an Emerging University-School Partnership

Sara E. Tolbert, University of Arizona
 Nicole Snook, Western Institute for Leadership Development
 Corey Knox, University of Arizona

Catalyst for (re)evolution? Critical and Culturally Relevant Pedagogy in Secondary Chemistry

Daniel Morales-Doyle, University of Illinois at Chicago

Introducing the "P5": An Inclusive and Transformative Framework for Science Literacy in Diverse Classrooms

Salina T. Gray, Stanford University

Supporting Teacher Inquiry to Construct Critical Science Pedagogies with Marginalized Urban Youth

Alejandra Frausto, Rudy Lozano Leadership Academy

Strand 11: Cultural, Social, and Gender Issues
Symposium - Reorganizing Contexts of Practice for Equitable Science Learning

1:00pm - 2:30pm, Gold Coast

Presiders:

Shelley Stromholt, University of Washington

Suzanne M. Perin, University of Washington

Discussant:

William R. Peniel, University of Colorado Boulder

Presenters:

Suzanne M Perin, University of Washington

Shelley Stromholt, University of Washington

Tammie Visintainer, University of California Berkeley

Ananda M. Marin, Northwestern University

Veronica Cassone McGowan, University of Washington

Carrie T. Tzou, University of Washington Bothell

Heather Toomey Zimmerman, Penn State University

Strand 13: History, Philosophy, and Sociology of Science
Science Literacy K-12 Education

1:00pm - 2:30pm, Columbus AB

Presider: Jason R. Wiles, Syracuse University

South African High School Learners' Views about Scientific Inquiry

Estelle Gaigher, University of Pretoria, South Africa

Norman G. Lederman, Illinois Institute of Technology

Judith S. Lederman, Illinois Institute of Technology

A Comparative Study of Students' Epistemological Beliefs about Biology, Chemistry and Physics

Sarah Halwany, Ontario Institute for Studies in Education (OISE)
 University of Toronto

Saouma B. BouJaoude, American University of Beirut

What do Scientists do? Students' Concepts about Scientists' Work and its Relation to Career Aspirations

Carolyn Frank, Leibniz Institute

Manuela Niethammer, University of Technology Dresden

GAENE (v.2.0): Further refinement of the Generalized Acceptance of Evolution Evaluation (GAENE)

Mike U. Smith, Mercer University School of Medicine

Scott W. Snyder, University of Alabama at Birmingham

The Past, Present, and Future of Learning Gardens for Scientific Literacy

Carrie A. Strohl, University of California

Strand 15: Policy

Policies and Political Contexts in an Era of Data-driven Decision-making

1:00pm - 2:30pm, Columbus CD

Presider: Carla C. Johnson, Purdue University

Assessing the Impact of a Statewide STEM Strategic Plan on Community STEM Awareness over Time

Toni A. Sondergeld, Bowling Green State University

Carla C. Johnson, Purdue University

Why Science Education Should Care about the Educational Data Movement

Kathryn Kirchgasler, University of Wisconsin-Madison

Melissa Braaten, University of Wisconsin-Madison

Sadie Barocas, University of Wisconsin-Madison

Christopher Bradford, University of Wisconsin-Madison

Revisiting the Coleman Report: Exploring School Effects on Scientific Literacy in PISA 2012 using Hierarchical Linear Modeling

Hye Sun You, The University of Texas at Austin

Cesar Delgado, University Of Texas at Austin

How do Formal Policy and Guiding Documents in Israel Explain Inquiry-based Learning?

Rachel Levin Peled, Technion

Tali Tal, Technion

Concurrent Session #2

2:45pm – 4:15pm

Administrative Sponsored Symposium

LARIG Admin Session

2:45pm - 4:15pm, Gold Coast

Presenters:

Regina Suriel, Valdosta State University

Rosa Deves, Universidad de Chile

Manuela Welzel-Breuer, University of Heidelberg,
Germany (ESERA President)

Blanca Nava, Head of Science Education, Veracruz, Mexico

Daniel Morales-Doyle, Social Justice High School, Chicago, IL

Sara Tolbert, University of Arizona

Ingrid Sanchez Tapia, University of Illinois, Chicago

Kim Gomez, UCLA

Alberto Rodriguez, Purdue University

Strand 1: Science Learning, Understanding and Conceptual Change

Alternative Conceptions and Competencies

2:45pm - 4:15pm, Grand B

Presider: Vaille Dawson, The University of Western Australia

Investigating the Development of a Learning Progression for Sea Level Rise, a Climate Change Impact

Wayne Breslyn, Montgomery County Public Schools

J. Randy McGinnis, University of Maryland

Emily Hestness, University of Maryland

Process Diagram for Cognitive Requirements and Activities on Solving Tasks in Physics

Bettina R. Kreiter, University of Duisburg-Essen, Germany

Heiko Krabbe, University Duisburg-Essen

Hans Ernst Fischer, University Duisburg-Essen

Identifying and Addressing Students' Alternative Conceptions about the Socioscientific Issue of Climate Change

Vaille Dawson, The University of Western Australia

Leonie J. Rennie, Curtin University

Eliciting Students' Tacit Conceptions through Artifact Driven Interviewing

Rory Glass, University at Albany - SUNY

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Related Paper Set - Elementary School Engineering:

Small Group Interactions and Learning

2:45pm - 4:15pm, Grand Suite 3

Cultivating Creative Practices in Elementary Engineering Classrooms

Theresa A. Hegedus, University of North Carolina at Greensboro

Epistemic Cycles in Elementary Engineering: Children's use of Outside Information during Small-group Design and Redesign

William S. Carlsen, Penn State University

Feedback from Failure: Teacher Discourse Moves in Reaction to Students' "Unsuccessful" Elementary Engineering Design Projects

Matthew Johnson, Penn State University

What does a Performance Assessment Capture and what does it Miss? Comparison of Students' Collaborative Engagement in Engineering Design Challenges with their Individual Performances on a Written Assessment

Cathy P. Lachapelle, Museum of Science

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies Assessing Young Learner's Science Thinking

2:45pm - 4:15pm, Roosevelt

Presider: Cory T. Forbes, University of Nebraska-Lincoln

How do Science Process Skills look like in Preschools? A First Study of Singaporean Children

Tang Wee Teo, Nanyang Technological University, Singapore

Yaw Kai Yan, Nanyang Technological University, Singapore

Mei Ting Goh, Nanyang Technological University, Singapore

Woei Ling Ong, Ministry of Education, Singapore

Assessing Young Children's Knowledge and Skills in Science

Mary E. Hobbs, University of Texas at Austin

Robert Williams, University of Texas

James P. Barufaldi, University of Texas at Austin

Elementary Teachers' Use of Life Science Content Knowledge to Inform Formative Assessment Instructional Decisions

Jaime L. Sabel, University of Nebraska-Lincoln
Cory T. Forbes, University of Nebraska-Lincoln
Leslie Flynn, University of Iowa

The Use of the Science Instructional Log to Understand Elementary Science Instruction

Elizabeth Greive, North Carolina State University
Sarah J. Carrier, North Carolina State University

Strand 4: Science Teaching--Middle and High School (Grades 5-12): Characteristics and Strategies
New Perspectives in Models and Modeling

2:45pm - 4:15pm, Grand A

Presider: Li Ke, Michigan State University

Multiple Perspectives on the Use of Models in Biology Lessons

Sonja Werner, LMU Munich
Christian Förtsch, LMU Munich
Lena von Kotzebue, LMU Munich
Birgit Jana Neuhaus, LMU Munich

Comparing Teachers' Implementation of a Lunar Modeling Lesson Using a Modified P-SOP Instrument

Mary Lamar, Eastern Kentucky University
Jennifer A. Wilhelm, University of Kentucky
Merryn Cole, University of Kentucky

Talking Modeling: Examining Science Teachers' Modeling-Related Discourse during a Model-Based Inquiry Unit

Ron Gray, Northern Arizona University
Allyson M. Rogan-Klyve, Oregon State University

Measuring the Effectiveness of Teaching Interventions Aimed at Supporting Students' Analogical Reasoning around Physical Models

Alison R. Miller, Columbia University
Kim Kastens, Education Development Center, Inc.

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

Related Paper Set - Next Generation Course Transformation: Four Perspectives

2:45pm - 4:15pm, Columbus KL

Presider: Peter S. Garik, Boston University

Characterizing Student Interaction in a Learning Assistant Supported Biology Course: The Classroom as a Social Network

Robert M. Talbot, University of Colorado at Denver
Laurel Hartley, University of Colorado at Denver
Laurie Liddick, University of Colorado at Denver
Bryan Shao-Chang Wee, University of Colorado Denver

Teaching Quantum Concepts with an Activity-Based Hybrid Classroom Paradigm

Emily C. Allen, Boston University
Binyomin Abrams, Boston University
Dan Dill, Boston University

Peering through the Gate: The Impact of Near Peer Teachers on Student Grades and Satisfaction in Six Large Introductory Courses

Meredith M. Thompson, Boston University
Peter S. Garik, Boston University

The Learning Assistant Program as a Tool for Course Transformation

Geraldine L. Cochran, Rochester Institute of Technology
Scott V. Franklin, Rochester Institute of Technology

Strand 6: Science Learning in Informal Contexts
Hobbies and Citizen Science

2:45pm - 4:15pm, Water Tower

Presider: Jason Katzmann, University of Wyoming

Examining the Impact of Social Media in a Citizen Science Project

Renee M. Lyons, Clemson University
Michelle P. Cook, Clemson University
David White, Clemson University
Alex Chow, Clemson University
J.C. Chong, Clemson University
Roy Pargas, Clemson University

Where do they Fit? Astronomy and Birding Hobbyists in the STEM Learning Ecosystem

Elysa N. Corin, North Carolina State University
M. Gail Jones, North Carolina State University
Thomas Andre, Iowa State University
Gina Childers, North Carolina State University
Rebecca Hite, North Carolina State University

Participant Motivations, Goals, and Learning in a Large-Scale Informal Geoscience Education Program

Sharon Locke, Southern Illinois University Edwardsville
Georgia Bracey, Southern Illinois University Edwardsville
Rosey Morr, Southern Illinois University Edwardsville

Examining Science Identity in the Context of a Citizen Science Program in a Leisure Setting

Sue Magdziarz, John G. Shedd Aquarium
James F. Kiesel, California State University, Long Beach

Strand 7: Pre-service Science Teacher Education Teachers' Abilities, Reasoning, and Argumentation

2:45pm - 4:15pm, Comiskey

Presider: Kemal Izci, Necmettin Erbakan University

Do Pre-Service Elementary Teachers Learn to Make Evidence-Based Claims When Doing Inquiry-based Labs?

Rebekka Darner Gougis, Illinois State University
Janet F. Stomberg, Illinois State University
Elizabeth S. Quinn, Illinois State University

Effectiveness of Case-Based Learning Laboratory Instruction and Scientific Reasoning Ability on Science Preservice Teachers' Understanding of Some Science Concepts

Aylin Cam, Mugla Sitki Kocman University
Yusuf Sulun, Mugla University
Gökhan Güven, Mugla Sitki Koçman University

Cultivating Preservice Elementary Teachers' Ability to Learn How to Teach Science from Curriculum Materials

Etsuji Yamaguchi, Kobe University
Kyoko Kanbayashi, Kobe University

Enhancing Pre-service Science Teachers' Self-efficacy To Teach Science through Argumentation

Mehmet Aydeniz, The University of Tennessee
Zehra Ozdilek, Uludag University

Strand 7: Pre-service Science Teacher Education Teachers' Knowledge and Technology Use

2:45pm - 4:15pm, Randolph

Presider: Mary K. Nyaema, University of Iowa

Using PeerWise Online Collaborative Tool to Improve Physics Teacher-Candidates' Questioning Skills

Marina Milner-Bolotin, University of British Columbia
Heather A. Fisher, The University of British Columbia
Alexandra L. MacDonald, The University of British Columbia

Modeling Elementary Science Teachers' TPACK

Sevgi Aydin, Yuzuncu Yil University
Sevda Yerdelen-Damar, Yuzuncu Yil University
Yezdan Boz, Middle East Technical University

Modeling Relations of Attitudes towards Technology Use, Technology Competencies, Ownership, and Experiences to TPACK-Self Efficacy

Sevda Yerdelen Damar, Yüzüncü Yil University
Sevgi Aydin, Yuzuncu Yil University
Yezdan Boz, Middle East Technical University

Preservice Science Teachers' Capacity to Plan Using Technology in an Integrated Teacher Preparation Program

Aaron Kessler, University of Pittsburgh

Strand 8: In-service Science Teacher Education Pathways to Professional Growth for Inservice Teachers

2:45pm - 4:15pm, Columbus IJ

Presider: Andri Christodoulou, University of Southampton

Professional Identity Interactions and Triggers for Change: A Multiple Case Study of Teachers' Responses to Professional Development

Stephanie J. Hathcock, Oklahoma State University
Joanna K. Garner, Old Dominion University
Daniel L. Dickerson, Old Dominion University
Avi Kaplan, Temple University
Petros Katsioloudis, Old Dominion University

An Exploration of Science Coordinator Practices following Professional Development

Brooke A. Whitworth, Northern Arizona University
Jennifer Maeng, University Of Virginia
Randy L. Bell, Oregon State University

Expertise and Boundary Objects in Teacher-Scientist Partnerships: A Comparative Case Analysis

Jerine Pegg, University of Alberta

Marie-Claire Shanahan, University Of Calgary

Professional Learning Communities as 'Third Spaces': Bridging the Gap between Science Educational Research and Practice

Cheryl A. McLaughlin, University of Florida

Strand 9: Reflective Practice

Symposium - Living Authenticity in Science Education Research

2:45pm - 4:15pm, Columbus CD

Presider: Bronwen M. Cowie, University Of Waikato/WMIER

Presenters:

Jennifer D. Adams, Brooklyn College, CUNY

Christina Siry, University of Luxembourg

Carolina Castano, Australian Catholic University

Ralph Levinson, Institute of Education London

Michelle D. Brendel, University of Luxembourg

Bronwen M. Cowie, University of Waikato/WMIER

Strand 10: Curriculum, Evaluation, and Assessment
Assessment Strategies and Issues

2:45pm - 4:15pm, Grand D North

Presider: Gavin W. Fulmer, National Institute of Education

Involving Teachers in Developing Assessments Aligned with NGSS using a 7-Step Process

Chanyah Dahsah, Michigan State University &

Srinakharinwirot University

Jane J. Lee, Michigan State University

Angela H. DeBarger, George Lucas Educational Foundation

Daniel N. Damelin, The Concord Consortium

Joseph S. Krajcik, Michigan State University

Detecting Sources of Science Performance Differences in K-12 Classroom Assessments by Structural Equation Model

Ting Wang, University of Washington

Ross L Matsueda, University of Washington

Ming-Chih Lan, University of Washington

Min Li, University of Washington

The Impact of Treating Missing Values as "Incorrect" in Science Knowledge Assessment

David Buschhüter, University of Potsdam

William Boone, Miami University

Andreas Borowski, University of Potsdam

Misconception or Lack of Knowledge: Using Confidence to Enhance Measurement Validity in a Multi-tiered Assessment

Dannah L Schaffer, University of Missouri

William Romine, Wright State University

Lloyd H. Barrow, University of Missouri

Assessment in Science Literacy with Cultural Validity: Coping to Diversity and Equality

Carlos M. Garcia, Universidad de Guadalajara

Strand 10: Curriculum, Evaluation, and Assessment
STEM Integration

2:45pm - 4:15pm, Columbus GH

Presider: Maik Walpuski, University of Duisburg-Essen

Innovative Technology in Science Inquiry: Preparing Students for STEM

Elham Beheshti, Northwestern University

Josh Littenberg-Tobia, Boston College

Carolyn Staudt, Concord Consortium

STEM Integration in the Middle Grades:

A Study of Teacher Curriculum Development

Emilie A. Siverling, Purdue University

Corey A. Mathis, Purdue University

Tamara J. Moore, Purdue University

Aran W. Glancy, University of Minnesota

S. Selcen Guzey, Purdue University

Studying the Effects of Interventions across Multiple Content Areas: Solving Measurement Challenges

Molly Stuhlsatz, BSCS

Christopher Wilson, BSCS

Joseph A. Taylor, Abt Associates Inc.

Kathleen J. Roth, Cal Poly Pomona Foundation

Perceptions Related to the Exclusion of Geosciences in the Common U.S. Biology-Physics-Chemistry Progression

Alice (Jill) Black, Missouri State University

Strand 11: Cultural, Social, and Gender Issues
Symposium - Linguistically Diverse Learners and STEM Practices

2:45pm - 4:15pm, Grand Suite 5

Presenters:

Enrique Suarez, University of Colorado, Boulder
 Kerri Wingert, University of Washington
 Shakhnoza Kayumova, University of Georgia
 Annie Camey Kuo, University of Washington
 Carrie A. Strohl, University of California
 Susan G. Harper, University of Georgia
 Trish L. Stoddart, University of California, Santa Cruz
 Sara E. Tolbert, University of Arizona
 Preetha K. Menon, UC Santa Cruz
 Rachel Fisher, University of Arizona

Strand 12: Educational Technology
Educational Technology and Science Education

2:45pm - 4:15pm, Columbus AB

President: Noemi Waight, University at Buffalo

Comparing Primary School Students' Understanding and Actions When Experimenting with Physical and Virtual Manipulatives in Science

Zacharias C. Zacharia, University of Cyprus
 Marios Michael, University of Cyprus
 Georgios Olympiou, University of Cyprus
 Vasoula Papasozomenou, Acropolis Lyceum

Using Technology to Overcome Fundamental Literacy Constraints for Students with Learning Differences to Achieve Scientific Literacy

Clement V. Gomes, Teachers College, Columbia University
 Felicia Moore Mensah, Teachers College, Columbia University

Using Evidence for Civic Action from News Media with Multiple Perspectives

Eva Erdosne Toth, West Virginia University

Comparing Student Discourse and Actions when Using Simulations with and without Representations of Abstract Objects

Georgios Olympiou, University of Cyprus
 Zacharias C. Zacharia, University of Cyprus

Strand 14: Environmental Education
Environmental Discourse

2:45pm - 4:15pm, Columbus EF

President: Dorene R. Medlin, Albany State University

A Needs Assessment Study for the Development of an Environmentally-focused Professional Development Program

Erica Blatt, College of Staten Island, CUNY
 Eugenia Naro-Maciel, College of Staten Island, CUNY
 Edita O'Brien, College of Staten Island, CUNY

"I Walk with More Confidence": Understanding Ecological Mindfulness through Pre-service Elementary Teachers' Conceptions and Practices

Gretchen D. Perkins, University of Georgia
 Heather Rudolph, University of Georgia
 Young Ae Kim, University of Georgia
 Deborah Tippins, University of Georgia

Science Students' Conscientious Technology Designs to Address Socioscientific Issues

John Lawrence Bencze, University of Toronto
 Mirjan Krstovic, Peel District School Board

Plenary Session #1

STEM Vital Signs

4:30pm – 5:50pm, Grand Ballroom CD South, EF

President: Valarie Akerson, Indiana University

Keynote Presenter: Linda P. Rosen, CEO, Change the Equation

Evening/Social Events

Membership and Elections Committee

Sponsored Session

Mentor-Mentee Nexus

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

6:00pm – 7:00pm, Columbus K L

Presiders: Dale Baker, Arizona State University
Dan Dickerson, Old Dominion University

Research Interest Groups (RIGs) Meetings

Contemporary Methods for Science Education Research

The broad purpose of this RIG is to advance the mission of NARST by maintaining the rigor of science education studies, as well as promoting more standardized research practices across the organization such that we are better able to learn from and synthesize each other's work. The intent is that these outcomes will, in turn, allow us to keep advancing the field and maintain the relevance of our research to improving science teaching and learning. At the 2015 Business Meeting, the RIG members will engage in a series of exploratory planning discussions. The intended outcome of these discussions is to elaborate and clarify the RIG's mission, as well as identifying future speakers, future subcommittees, and interest in RIG leadership positions.

6:00pm – 7:00pm, Columbus A B

Presiders: Joseph Taylor, Abt Associates Inc.
Bina Vinmali, Arizona State University

The Continental and Diasporic Africa in Science Education RIG (CADASE)

The mission of CADASE is to support research in science education that will have a positive impact on the lives of children of African ancestry. This is accomplished by (a) encouraging science educators to engage in research aimed at meeting the needs of people of African ancestry; and (b) providing intellectual, professional, and personal space for science educators engaged in such research. At the 2015 business meeting, CADASE members will discuss five major items including: the development of CADASE website and community blog, ideas and activities to promote the vision and mission of the RIG for the next three years, update on

the special issue sponsored by CADASE, the initial planning for 2016 CADASE proposal to NARST, proposals on how to use funds donated to CADASE by NARST members.

6:00pm – 7:00pm, Columbus C D

Presiders: Irene Osisioma, CADASE RIG President-California State University, Dominguez Hills Carson California
Melody Russell, CADASE Steering Committee Chair- Auburn University, Alabama

Engineering Education RIG (ENE-RIG)

The purpose of the RIG in Engineering Education is to synergize research in science and engineering education, promote rigorous research in engineering education, and provide a collaboration and discussion space supporting intellectual and professional exchange and networking. At the 2015 Business Meeting, the RIG members will discuss the following items:
a) Updates on membership (60+ members), listserv, and development of a member directory; b) Discussion on revisions of NARST strands and how this may impact the ENE-RIG; c) Plans for collaborative paper sets, symposiums, and panels; and d) Updates on leadership team, roles, and budget.

6:00pm – 7:00pm, Columbus E F

Presiders: Senay Purzer, Purdue University

Latino/a RIG (LARIG)

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

6:00pm – 7:00pm, Columbus I J

President: Regina Suriel, LARIG Chair, Valdosta State University

Presidential/Welcome Reception

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

7:00pm – 9:30pm, Grand Ballroom A – D

Sunday, April 12, 2015

Mind and Sole (Off-Site)

This event is not sponsored or endorsed by NARST.

6:00am-7:15am, Hyatt Regency Chicago Lobby

Conference Registration

7:00am – 5:00pm, Grand Group Office

Committee Meetings

7:30am – 8:15am

Awards Committee Chairs & Co-Chairs Meeting

7:30am – 8:15am, Columbus AB

Equity and Ethics Committee Meeting

7:30am – 8:15am, Columbus CD

External Policy and Relations Committee Meeting

7:30am – 8:15am, Columbus EF

Research Committee Meeting

7:30am – 8:15am, Columbus GH

Membership and Election Committee Meeting

7:30am – 8:15am, Columbus IJ

International Committee Meeting

7:30am – 8:15am, Columbus KL

Program Committee Meeting

7:30am – 8:15am, Comiskey

Publications Advisory Committee Meeting

7:30am – 8:15am, Gold Coast

Concurrent Session #3

8:30am – 10:00am

Contemporary Methods for Science Education Research RIG Sponsored Session

***Prevailing Questions and Methods in Science Education:
An Analysis of the NARST Conference Program***

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

Presenters:

Binaben Vanmali, Arizona State University
Susan Kowalski, BSCS
Stanley Lo, University of California, San Diego
Susan O'Brien, Oregon State University
Molly Stuhlsatz, BSCS
Joseph Taylor, Abt Associates Inc.
Christopher Wilson, BSCS

International Committee Sponsored Session ***Understanding and Negotiating Non-participation in Science Learning: Is Science 'For Me' or Not?***

8:30am - 10:00am, Gold Coast

Presiders:

Hsiao-Lin Tuan, NARST, Taiwan
Manuela Welzel-Breuer, ESERA, Germany

Discussant: Jennifer Dewitt, King's College London, United Kingdom

Presenters:

Billy Wong, King's College London
Fredrik Jensen, University of Oslo
Ellen Karoline Henriksen, University of Oslo, Norway
Bjorn Friis Johannsen, University of Copenhagen, Denmark
Lars Ulriksen University of Copenhagen, Denmark Lene Moller
Madsen, University of Copenhagen, Denmark Henriette Tolstrup
Holmegaard, University of Copenhagen, Denmark
Emily Dawson, University College London, United Kingdom

Strand 1: Science Learning, Understanding and Conceptual Change

***Trends in Instructional Use of Visualizations
and Other Representations***

8:30am - 10:00am, Columbus GH

Presider: Susan Hawkins, Indiana University

Student Reasoning During Conceptual Physics Problem Solving with Visual Cues or Feedback

Elise Agra, Kansas State University
Mitchell Burkett, Kansas State University
John Hutson, Kansas State University
Lester C. Loschky, Kansas State University
N. Sanjay Rebello, Kansas State University

Supporting Representation-rich Problem-solving in High School Physics

Lyrice L. Lucas, University of Nebraska-Lincoln
Mark Shearer, Lincoln Public Schools
Elizabeth B. Lewis, University of Nebraska-Lincoln

Transforming Linguistically Diverse Students' Misconceptions about Matter and Energy Flow Using Visualizations

Emily Toutkoushian, University of North Carolina-Chapel Hill
Melody Kung, University of North Carolina-Chapel Hill
Kihyun (Kelly) Ryoo, University of North Carolina, Chapel Hill

Investigating High School Students' Visualization Competence of Matter

Hsin-Yi Chang, National Kaohsiung Normal University
Shi-Fang Tzeng, National Kaohsiung Normal University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

***Related Paper Set - Engaging Students in Scientific
Practices: The Role of Teachers in Providing Opportunities
for Student Learning***

8:30am - 10:00am, Grand Suite 3

Discussant: Leema Berland, University of Wisconsin-Madison

Analyzing Teacher Adaptations of Two Investigation-based Science Units: Teaching with the Goals of the NGSS in Mind

Sylvie M. Kademian, University of Michigan
Anna Maria Arias, University of Michigan
Elizabeth A. Davis, University of Michigan
Annemarie S. Palincsar, University of Michigan

Exploring Elementary Teachers' Knowledge and Practices for Model-based Science Instruction about the Water Cycle

Tina Vo, University of Nebraska-Lincoln
Cory T. Forbes, University of Nebraska-Lincoln
Laura Zangori, University of Nebraska-Lincoln
Christina V. Schwarz, Michigan State University

Encouraging Argument as the Connective Discourse of Scientific Practices

William A. Sandoval, University of California, Los Angeles
Sihan Xiao, University of California, Los Angeles
Elizabeth Redman, University of California - Los Angeles
Noel Enyedy, University of California - Los Angeles

Successes and Challenges Experienced by a Teacher and Her Students Engaging in Scientific Argumentation in a Sheltered English Immersion Classroom

Maria Gonzalez-Howard, Boston College
Katherine L. McNeill, Boston College

**Strand 4: Science Teaching--Middle and High School (Grades 5-12): Characteristics and Strategies
Related Paper Set - Science Teachers' Professional Knowledge: Structure, Development, and Relevance for Students' Learning Progress**

8:30am – 10:00am, Columbus CD

Presider: Jörg Großschedl, Leibniz Institute for Science and Mathematics Education

Discussant: Norman Lederman, Illinois Institute of Technology

The Professional Knowledge of Pre-Service Physics Teachers

Jochen Kröger, Leibniz Institute
Stefan Petersen, Leibniz Institute
Knut Neumann, Leibniz Institute

Measuring Topic Specific PCK of Electrochemistry in South African High School Chemistry Teachers across 4 Contexts: Similarities and Differences

Marissa S. Rollnick, Wits University
Elizabeth Mavhunga, University of Witwatersrand
Norman G. Lederman, Illinois Institute of Technology

Which Influence does Biology Teachers' Content-related Knowledge has on Students' Conceptual Knowledge Acquisition in Biology Education?

Daniela Mahler, Leibniz Institute
Jörg Großschedl, Leibniz Institute
Ute Harms, Leibniz Institute

Mathematics and Biology Teachers' Tacit Views of the Knowledge Required for Teaching: Varying Relationships between CK and PCK

Ronit Rozenszajn, Weizmann Institute
Anat Yarden, Weizmann Institute of Science

The Good, the Bad and the Ugly: Connections between Pre-service Science Teachers' Content Knowledge and Pedagogical Content Knowledge

Vanessa Kind, Durham University

**Strand 6: Science Learning in Informal Contexts
Symposium - Informal Science Education: Pedagogy and Epistemology**

8:30am - 10:00am, Randolph

Discussant: Phyllis Katz, University of Maryland

Presenters:

Patricia Patrick, Texas Tech University
Preeti Gupta, American Museum of Natural History
Jennifer Correa, New York Hall Of Science
Ayelet Baram-Tsabari, Technion - Israel Institute of Technology
Bruce V. Lewenstein, Cornell University
Leonie J. Rennie, Curtin University
Christine Howitt, Curtin University of Technology
Elaine Blake
Phyllis Katz, University of Maryland
Judith S. Lederman, Illinois Institute of Technology

**Strand 7: Pre-service Science Teacher Education
Related Paper Set - Preparing Teachers to Teach Socioscientific Issues: Global Concerns and Challenges**

8:30am - 10:00am, Grand D North

Can Pre-service Elementary School Teachers Teach Socioscientific Issues?

Maria Evagorou, University of Nicosia
Digna Couso, Crecim-Universitat Autònoma de Barcelona
Anna Garrido, Crecim-Universitat Autònoma de Barcelona

A Teacher-Researcher Collaboration for SSI-based Teaching and Learning

Troy Sadler, University of Missouri
Patricia J. Friedrichsen, University of Missouri-Columbia
Kerri Graham, Rock Bridge High School

Possibilities and Limitations from a Short Methods Course in Socioscientific Teaching

Jan Alexis Nielsen, University of Copenhagen
Robert H. Evans, University of Copenhagen

Preparing Australian Science Teachers to Teach Socioscientific Issues

Vaile Dawson, The University of Western Australia

Strand 8: In-service Science Teacher Education Inservice Science Teacher Education Reform

8:30am - 10:00am, Roosevelt

Presider: David F. Jackson, The University of Georgia

Supporting Large Scale Change in Science Education: What We Have Learned So Far

Arthur Eisenkraft, University of Massachusetts Boston
Ayana M. McCoy, University of Massachusetts Boston
Abigail Jurist Levy, Education Development Center, Inc.
Frances Lawrenz, University of Minnesota
Janna Kook, Education Development Center, Inc.
Barry J. Fishman, University of Michigan
Christian Fischer, University of Michigan
Chris Dede, Harvard University
Kim Frumin, Harvard University

After the Love (and Money) is Gone: Factors Sustaining Elementary Science Reform

David E. Long, George Mason University
Danielle M. Kittrell, George Mason University
Andrew J. Keck, George Mason University
Susan Poland, George Mason University
Cheryl O'Connor, George Mason University

The Role of the School Principal in K-12 Science Education Reform

Rachel Ruggirello, Washington University in St. Louis
Sonya N. Martin, Seoul National University

Teacher Community Structure and Rural Science Education Reform

Bill Zoellick, Schoodic Institute

Strand 8: In-service Science Teacher Education Research on Elementary Science Teacher Education

8:30am - 10:00am, Columbus AB

Presider: Christopher A. Bogiages, Knowles Science Teaching Foundation

Teachers Talking about Talk: What Elementary Science Teachers Identify as the Value and Barriers to Science Discourse Pedagogy

Kirstin C. Busch, Stanford University
Eric Berson, Stanford University
Anita Tseng, Stanford University
Hilda Borko, Stanford University
Jonathan Francis Osborne, Stanford University

The Effect of Professional Development on Elementary Teachers' Understanding and Implementation of Reforms-based Science Instruction

Randy L. Bell, Oregon State University
Jennifer Maeng, University of Virginia
Timothy Konold, University of Virginia
Brooke A. Whitworth, Northern Arizona University

Science Educational Computer Simulations and Elementary Science Teachers

Amanda L. Gonczi, University of Virginia
Jennifer Maeng, University of Virginia
Randy L. Bell, Oregon State University

Elementary Teachers' Mindsets: Does Situated Professional Development Promote Growth Mindedness?

Jennifer Maeng, University of Virginia
Amanda L. Gonczi, University of Virginia

Strand 9: Reflective Practice

Reflective Outcomes of Science Classroom Practice Teaching

8:30am - 10:00am, Columbus EF

Presider: Wesley Pitts, Lehman College, CUNY

Teachers' Reflective Practice as a Tool for Following the Development of their Sense of Ownership during a CPD Workshop

Avi Hofstein, Weizmann Institute of Science
Dvora Katchevitch, Weizmann Institute of Science
Malka Yayon, Weizmann Institute of Science
Rachel Mamlok-Naaman, Weizmann Institute of Science

Balancing Identities: Am I a Science Teacher Educator or an Environmental Educator?

Jenna Gatzke, Indiana University - Bloomington
 Gayle A. Buck, Indiana University
 Valarie L. Akerson, Indiana University

The Spectrum of Teacher Action Research Projects in Science Classrooms

Marissa Bellino, The Graduate Center, CUNY
 Jennifer Adams, Booklyn College- CUNY

Reflecting on Teaching a Science Course for Pre-Service Teachers

Victoria Deneroff, Georgia College & State University
 Rosalie Richards, Stetson University

Strand 10: Curriculum, Evaluation, and Assessment Symposium - A European Perspective on Inquiry Learning and Assessment in Science

8:30am - 10:00am, Comiskey

President: Richard A. Duschl, Penn State University

Presenters:

Gunnar Friege, Leibniz Universitaet Hannover
 Eilish McLoughlin, Dublin City University
 Peter Labudde, Paedagogische Hochschule FHNW
 Christine Harrison, King's College London
 Regula Grob, Paedagogische Hochschule FHNW

Strand 10: Curriculum, Evaluation, and Assessment Symposium - Curriculum Materials for NGSS: What the Science Education Research Community Can Do

8:30am - 10:00am, Wrigley

Discussant: Brian Reiser, Northwestern University

Presenters:

Jo Ellen Roseman, American Association for the Advancement of Science
 Joseph S. Krajcik, Michigan State University
 David L. Fortus, Weizmann Institute of Science
 Brian J. Reiser, Northwestern University

Strand 11: Cultural, Social, and Gender Issues Engagement in Science Learning

8:30am - 10:00am, Grand Suite 5

President: Sara E. Tolbert, University of Arizona

Underrepresented Students' Interests and how they Relate to Engineering

Morgan M. Hynes, Purdue University
 Avneet Hira, Purdue University
 Cole Joslyn, Purdue University

Influencing Urban Students' STEM Interest through Informal Experiences in Geosciences

Geeta Verma, University of Colorado Denver
 Jacqueline Leonard, University of Wyoming
 Joy B. Johson, University of Wyoming

Students' Perceptions of Science in Single-Sex and Coeducational Science Classes in the United States

Amber Simpson, Clemson University
 S. Megan Che, Clemson University
 William Bridges, Clemson University

From Beavers to Bigfoot: Design-based Science Learning in an Informal Culturally Relevant STEM Program

Melinda Howard, University of Idaho
 Anne Kern, University of Idaho

Understanding the Paradox of Chinese Learners: Insights from Research into Asian Chinese Science Learners

May Hung May Cheng, The Hong Kong Institute of Education
 Zhi Hong Wan, The Hong Kong Institute of Education

Strand 11: Cultural, Social, and Gender Issues Identity Development

8:30am - 10:00am, Water Tower

President: Justine M. Kane, Wayne State University

Lack of Opportunity, Achievement, and Choice? A Comparison of Math and Science Opportunity, Achievement, and Course Choice in Hispanic Males and Females

Stacy McCormack, Indiana University
 Adam V. Maltese, Indiana University

Understanding Student Perceptions About Physics: Finding Similarities and Differences Between Middle School Girls and Boys

Emily A. Dare, University of Minnesota
 Gillian Roehrig, University of Minnesota

Hispanic and White Students Perceptions of Scientists: Findings Using the Identify-a-Scientist (IAS) Instrument

Angela M Chapman, University of Texas - Pan American
 Leon Walls, University of Vermont

I am Not a Statistic: Identities of African American Males in Advanced Science Courses

Diane W. Johnson, North Carolina State University
 Margaret R. Blanchard, North Carolina State University

British Muslim Girls' Dis-identification with Science: A Case Study of one English High School

Spela Godec, King's College London

Strand 12: Educational Technology

Science Teacher Education with Technology

8:30am - 10:00am, Columbus KL

Presider: Noemi Waight, University of Buffalo

Implementing Technology and Visualization in Chemical Education: High and Middle School Science Teachers' Views

Shirly Avargil, Bar-Ilan University, Israel

Gabby Shwartz, Technion - Israel Institute of Technology

Orit Herscovitz, Technion, Israel Institute of Technology

Yehudit Judy Dori, Technion, Israel Institute of Technology

Science Teacher Selection and use of Technologies: Implications for Implementation of Reform Technologies and Understandings of Evolution of Technology

Noemi Waight, University at Buffalo

Ming Ming Chiu, Purdue University

Melinda Whitford, University at Buffalo

Beyond TPACK: Exploring a Science Teacher's Technological Pedagogical Content Belief System

Mehmet Demirbag, Uludag University

Ahmet Kilinc, Uludag University

A Teacher's Appropriation of Educational Technologies

Shulamit Kapon, Technion – Israel Institute of Technology

Strand 13: History, Philosophy, and Sociology of Science Socioscientific Issues

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

Presider: Sibel Erduran, University of Limerick

Nature of Science Views and Argumentation Skills in the Context of Socioscientific Issues

Rola Khishfe, American University of Beirut

Fahad S. Alshaya, King Saud University

Saouma B. BouJaoude, American University of Beirut

Nasser Mansour, University of Exeter

Khalid Alrudiyan, Ministry of Education, Saudi Arabia

Faith as Integral to Science! What Graduate Students "Saw" While Watching a Sci-Fi Film

John Y. Myers, University of Illinois at Urbana-Champaign

Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign

Jeanne Brunner, University of Illinois at Urbana-Champaign

Nature of Technology and Informed Socioscientific Decision-Making

Hyun Ok Lee, Ewha Womans University, Korea

Dana L. Zeidler, University of South Florida

Sang Wook Yi, Hanyang University, Korea

Exotic Snakes and Hysteria in Florida: The Influence of Internet Social Media on Public Perception of a Socioscientific Issue

Samantha R. Fowler, Florida Institute of Technology

Michael S. Grace, Florida Institute of Technology

Strand 15: Policy

Symposium - The STEM-ification of Science Education: Challenges for Policy and Practice in Neoliberal Times

8:30am - 10:00am, Columbus IJ

Discussant: Alberto Rodriguez, Purdue University

Presenters:

Alberto J. Rodriguez, Purdue University

Lyn Carter, Australian Catholic University

Lawrence Bencze, University of Toronto - Ontario Institute for Studies in Education

Matthew Weinstein, University of Washington - Tacoma

Chantal Pouliot, Université Laval

Ajay Sharma, University of Georgia

Michael Reiss, University of London

Deborah Tippins, University of Georgia

Concurrent Session #4

10:15am – 11:45am

Strand 1: Science Learning, Understanding and Conceptual Change

Exploring Relationships Between Argumentation and the Development of Disciplinary Content Knowledge

10:15am - 11:45am, Columbus GH

Presider: Maria Pilar Jimenez-Aleixandre, Universidade De Sa

Embedding NGSS Science Practices in Digital Game-Based Genetics Materials: Measuring Content Knowledge, Argumentation, and Motivation

Frieda Reichsman, The Concord Consortium

Christopher Wilson, BSCS

April L. Gardner, BSCS

Trudi Lord, The Concord Consortium

Coordinating Disciplinary Practices in Reasoning about Water Evaporation

Lama Jaber, Tufts University
Jessica Watkins, Tufts University
David Hammer, Tufts University

A Comparison of Student and Teacher Argumentation and Conceptual Understanding

Deborah Lan, Ohio State University
Cathi Mehl, Ohio State University
Hui Jin, Ohio State University

Strand 1: Science Learning, Understanding and Conceptual Change

Related Paper Set - Personally and Scientifically Meaningful Engagement in the Scientific Practices

10:15am - 11:45am, Grand D North

Presider: Yukie Toyama, University of California, Berkeley

Discussant: Charles Anderson, Michigan State University

Students' Increasing Sophistication in their Mechanistic Responses

JinHo Kim, University of California, Berkeley
Yukie Toyama, University of California, Berkeley
Christina Krist, Northwestern University
Karen Draney, University of California, Berkeley
Brian J. Reiser, Northwestern University
Josh Sussman, University of California, Berkeley

The Content Generality and Specificity of Mechanistic Reasoning Across Middle-school, Model-based Explanation Assessment Items

Christina V. Schwarz, Michigan State University
Christina Krist, Northwestern University
May Lee, Michigan State University
Yukie Toyama, University of California, Berkeley

Why Ask Why If You Don't Care?: Relating Students' Mechanistic Moves To Their Purpose For Engaging In The Scientific Investigation

Leema Berland, University of Wisconsin-Madison
Heather Milo, University of Wisconsin-Madison

Co-evolution of Personally and Scientifically Meaningful Engagement

Lisa Kenyon, Wright State University
Jeannette Manger, Wright State University

Students as Brokers of Meaningful Knowledge

Christina Krist, Northwestern University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Broadening the Scale: Learning and Capacity at Multiple Sites

10:15am - 11:45am, Comiskey

Presider: Erin E. Peters-Burton, George Mason University

Exemplar Inclusive STEM High School Curriculum and Instruction: Cross-Case Analysis of Eight Schools

Erin E. Peters-Burton, George Mason University
Sharon J. Lynch, The George Washington University
Edmund M. Han, The George Washington University
Ann House, SRI International

Comparing State-Mandated Outcomes of STEM and Traditional High Schools

Carol L. Stuessy, Texas A&M University
Niyazi Erdogan, Balikesir University
Dane Bozeman, Texas A & M University

Exploring Professional Relationships about Science within K-8 Schools

Lara Smetana, Loyola University Chicago
Julianne A. Wenner, University of Connecticut
John Settlage, University of Connecticut

Cross-Sectional Study of Illinois Students' Attitudes toward Science

Ryan Summers, University of Illinois at Urbana-Champaign
Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign

**Strand 3: Science Teaching--Primary School
(Grades preK-6): Characteristics and Strategies
*Symposium - Toward Building a Foundation for Teaching
and Learning in Elementary Science: Highlighting Six
NSF Projects***

10:15am - 11:45am, Columbus KL

Presenters:

Nancy Romance, Florida Atlantic University
Michael R. Vitale, East Carolina University
Lynn A. Bryan, Purdue University
Ala Samarapungavan, Purdue University
Annemarie Palinscar, University of Michigan
Jonathan Osborne, Stanford University
Hilda Borko, Stanford University
Deborah L. Hanuscin, University of Missouri-Columbia
Carolyn Staudt, Concord Consortium

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

Exploring the Development of Teaching Assistants

10:15am - 11:45am, Grand Suite 5

Presider: Muhsin Menekse, University of Pittsburgh

***How Students and Teaching Assistants Conceptualize the
Purpose of Undergraduate Science Laboratory Courses***

Stanley M. Lo, University of California, San Diego
Taylor R. Page, Northwestern University
Alyssa Haynes, Northwestern University
Shelby L. Hatch, Northwestern University
John C. Mordacq, Northwestern University

***Assessing a Professional Development for Teaching
Assistants in a Project-Based Guided Inquiry General
Chemistry Lab***

Lindsay B. Wheeler, University of Virginia
Jennifer L. Maeng, University of Virginia
Brooke A. Whitworth, Northern Arizona University

***Examining Biology Graduate Teaching Assistants'
Beliefs about Teaching and Learning***

Grant E. Gardner, Middle Tennessee State University
Tracie Addy, Quinnipiac University

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

Learning Theory

10:15am - 11:45am, Water Tower

Presider: Jason R. Wiles, Syracuse University

***Laboratory as Community: Equity and Efficacy
with Reformed Instructional Practices***

Joi P. Walker, Tallahassee Community College
Sherry A. Southerland, Florida State University
Victor D. Sampson, University of Texas at Austin
Patrick J. Enderle, University of Texas at Austin

***Flipped Classroom for Computer Science Undergraduates:
The Effect of In-class Team Problem Solving and Projects***

Yehudit Judy Dori, Technion-Israel Institute of Technology
Zehavit Kohen, Technion
Albert Meyer, Massachusetts Institute of Technology

***Does Self-Assessment Engage Students in
Metacognition? Challenges and Possibilities***

Michael A. Gilchrist, University of Tennessee
Mehmet Aydeniz, University of Tennessee
Ross Toedte, University of Tennessee

***More is Better: Student Centered Pedagogies Increase
Student Learning in a Large Enrollment Biology Class***

Deborah Donovan, Western Washington University
Georgianne Connell, Western Washington University

***Model Construction to Reveal Students' Conceptual
Knowledge Retrieval in College-level Biology***

Joseph Dauer, University of Nebraska - Lincoln
Tammy M. Long, Michigan State University

**Strand 6: Science Learning in Informal Contexts
*STEM Out of School***

10:15am - 11:45am, Roosevelt

Presider: Robert H. Evans, University of Copenhagen

***Engineering Attitudes, Habits of Mind and Design
Awareness in a Fab Lab MakerSpace Summer Camp***

Aaron Price, Museum of Science and Industry, Chicago
Bryn Pernot, Museum of Science and Industry
Gloria A. Segovia, Museum of Science and Industry
Katherine Gean, Museum of Science and Industry

Research on Impacts of an Electrical Engineering Summer Program for High School Students

Monica Bugallo, Stony Brook University
Angela M. Kelly, Stony Brook University
Minsu Ha, Kangwon National University

Gender and Scientific Learning in a Design-Based Afterschool STEM Program

Jessica E. Schnittka, University of Colorado Denver
Christine Schnittka, Auburn University

Investigating Impacts of One-day Activities in an Extra-Curricular Learning Laboratory on Students' Interest and Attitudes

Matthias Streller, TU Dresden
Yael Schwartz, The Weizmann Institute Of Science

Strand 7: Pre-service Science Teacher Education Approaches to the Design of Methods Courses

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

Presider: Eilish McLoughlin, Dublin City University

A Disciplinary Practices-Oriented Rationale for Science and Science Education Faculty Collaboration in Pre-Service Methods Courses

Tiffanyrose Sikorski, George Washington University
Hartmut Doebel, George Washington University

Investigating Pre-Service Teachers' Science Teaching Self-Efficacy While Participating in Field Experiences at a Science Museum: A Mixed Methods Study

Ratna Narayan, University of North Texas, Dallas
Lori Petty, University of Mary Hardin Baylor

Enhancing Science and Mathematics Teacher Education in Regional Australia: Evaluating an Enhancement Module for Science Pre-service Teachers

Geoff Woolcott, Southern Cross University

Strand 7: Pre-service Science Teacher Education Cultural and Equity Perspectives to Teacher Preparation

10:15am - 11:45am, Randolph

Presider: Nazan U. Bautista, Miami University

Training Next Generation American and Cambodian Science Teachers Through Cultural Exchange

Gail L. Dickinson, Texas State University
Maureen Lemke, Texas State University
David Ford, Royal University of Phnom Penh
Heather Galloway, Texas State University

Urban vs. Suburban Institutions: Preparing Science Teachers for Culturally Diverse Classrooms

Jacqueline Theresa McDonnough, Virginia Commonwealth University
Juanita Jo Matkins, College of William & Mary
Molly Madden Henschel, Virginia Commonwealth University

Preservice Secondary Science Teachers Multicultural Perspectives about Students and Subject Matter

Sara P. Raven, Kent State University
Lisa A. Borgerding, Kent State University

Developing Professional Pre-Service Science Learning Communities Through Equity Focused Practice-Based Teaching

Imelda L. Nava, UCLA

Strand 8: In-service Science Teacher Education Strand Sponsored Symposium - The Handbook of Research on Science Education: Implications for Inservice Teacher Education

10:15am - 11:45am, Columbus CD

Presenters:

Norman G. Lederman, Illinois Institute of Technology
Charlene M. Czerniak, University of Toledo
Carla C. Johnson, Purdue University
Dana L. Zeidler, University of South Florida
Angela Calabrese Barton, Michigan State University
Edna Tan, University of North Carolina-Greensboro
Tara O'Neill, University of Hawaii-Manoa
Per-Olof Wickman, Stockholm University
Barbara Crawford, University of Georgia
Julie Luft, University of Georgia

Strand 8: In-service Science Teacher Education Investigating Teacher and Student Outcomes in Science Education Initiatives

10:15am - 11:45am, Gold Coast

Presider: Kemal Izci, Necmettin Erbakan University

Pairing Lesson Analysis with Constructivism: Designing and Studying an Online Energy Course for Teachers

Susan M. Kowalski, BSCS
Betty L. Stennett, BSCS
Mark Bloom, BSCS
Anne L. Westbrook, BSCS
Pamela G. Van Scotter, BSCS

Teacher Pedagogical Framing in the Context of Teaching Climate Change

Anita Roychoudhury, Purdue University
Daniel P. Shepardson, Purdue University
Andrew Hirsch, Purdue University
Jignesh Mehta, Purdue University

Technology Implementation, Affect, and Assessment Scores: A Three-Year Study with 2300 Underrepresented Middle School Students

Margaret R. Blanchard, North Carolina State University
Catherine E. LePrevost, North Carolina State University
Dell Tolin, North Carolina State University
Kristie S. Gutierrez, North Carolina State University

Evaluation of an Inquiry Professional Development Program: Student and Chemistry Teacher Outcomes

Stephanie B. Philipp, Miami University
Deborah Herrington, Grand Valley State University
Ellen J. Yezierski, Miami University

Strand 8: In-service Science Teacher Education Symposium - Models of Practice-Based Professional Development in Support of Next Generation Science Standards

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

Presider: Erin M. Furtak, University of Colorado

Discussant: Scott McDonald, The Pennsylvania State University

Presenters:

Tana J. Peterman, University of Washington
Sara C. Heredia, University of Colorado, Boulder
William R. Penuel, University of Colorado
Angela H. DeBarger, George Lucas Educational Foundation
Andrew W. Shouse, University of Washington
Jessica J. Thompson, University of Washington
Karin Lohwasser, University of Washington

Strand 10: Curriculum, Evaluation, and Assessment Nature of Science / Philosophy of Science

10:15am - 11:45am, Columbus IJ

Presider: Avi Hofstein, The Weizmann Institute of Science

Characterizing Assessments Using the Three-Dimensional Learning Assessment Protocol (3D-LAP)

James T. Laverty, Michigan State University
Sonia M. Underwood, Michigan State University
Melanie M. Cooper, Michigan State University
Marcos D. Caballero, Michigan State University
Diane Ebert-May, Michigan State University
Joseph S. Krajcik, Michigan State University
Cori Fata-Hartley, Michigan State University
Rebecca L. Matz, Michigan State University
Lynmarie Posey, Michigan State University
Sarah Jardeleza, Michigan State University

Exploring the Role of Facet-Based Items in Next Generation Science Assessment

Reina Fujii, SRI International
Angela Debarger, George Lucas Educational Foundation
Anna Werner, SRI International
Cynthia D'Angelo, SRI International
Mingyu Feng, SRI International
Kevin McElhaney, SRI International
Bowye Gong, SRI International

Construction and Validation of the Views of Nature of Science-D (VNOS-D) Rubric

Julie Angle, Oklahoma State University
Sally Fenska, Oklahoma State University

Large Scale Hands-on Assessment of Experimental Competence in the Science Classroom

Andrea Moeller, University Trier
Doris Schmidt, University Trier
William Boone, Miami University

Developing Scientific Literacy And Supporting Post-Compulsory Science Participation: A Comparative Analysis Using National Data

Matt Homer, University of Leeds
Jim Ryder, University of Leeds

Strand 11: Cultural, Social, and Gender Issues Transformative Learning as Equitable Science Practices

10:15am - 11:45am, Grand Suite 3

Presider: Dorene R. Medlin, Albany State University

Acting for the Common Good: Incorporating Real Life Scenarios in Science Education; Lessons from Venezuela

Majd Zouda, University of Toronto
Tomo Nishizawa
John Bencze, University of Toronto

Uncovering Sciencemindedness: Reality Pedagogy, Hip-Hop, & Urban Science Education

Christopher Emdin, Teachers College Columbia University
Edmund S. Adjapong, Teachers College, Columbia University

Transitioning into Science Education: A Transformative Self-Study and Reflexive Approach to Understanding Equity

Francesca A. White, Indiana University
Gayle A. Buck, Indiana University

Assessment Practices and Scientific Identities in an Agroecology Course: A Case Study

Christopher D. Murakami, University of Missouri-Columbia
Marcelle Siegel, University of Missouri-Columbia

Engineering Rainbows and Unicorns: A Critique of the Next Generation Science Standards

Alberto J. Rodriguez, Purdue University

Strand 13: History, Philosophy, and Sociology of Science
Strand Sponsored Symposium - International Perspectives about the Nature of Science

10:15am - 11:45am, Wrigley

Presenters:

Judith S. Lederman, Illinois Institute of Technology
William F. McComas, University of Arkansas
Meshach Ogunniyi, University of the Western Cape, South Africa
Kathy Saunders, University of Waikato, New Zealand
Hernan L. Cofré Mardones, Universidad Catolica de Valparaiso, Chile
Irene Neumann, Leibniz Institute, Germany
M. Fatih Tasar, Gazi Universitesi, Turkey
Shiang-Yoo Liu, National Taiwan Normal University

Strand 14: Environmental Education
Culturally Embedded Environmental Education

10:15am - 11:45am, Columbus EF

Presider: Michelle Cotterman, Vanderbilt University

'Women Are the Saviors': Exploring Gender Issues in Environmental Resource Management

Cassie Quigley, Clemson University
S. Megan Che, Clemson University
Stella Achieng, University of Nairobi
Sarah Liaram, Maasai Mara National Preserve

Influence of Nollywood Film on Students' Learning Outcomes on Global Warming and Ozone Layer Depletion

Michael Aho, Lagos State University
Peter A. Okebukola, Lagos State University
Olatunde Lawal Owolabi, Lagos State University

Rural Science Education: Promoting Environmental Awareness Through Informal Science Education

Stanton G. Belford, Martin Methodist College
Melody Russell, Auburn University

Designing an Environmental Science Curriculum in Bhutan

Sameer Honwad, University of New Hampshire
Shivaraj Bhattarai, Royal Thimpu College, Bhutan

NARST Business Meeting

Box lunch provided for 1st 100 attendees who sign up.
12:00pm – 1:00pm, Plaza Ballroom

Lunch—On Your Own

12:00pm – 1:00pm

Concurrent Session #5

1:15pm – 2:45pm

Program Committee Sponsored Session *Symposium – NARST Proposal Submission and Review Process*

1:15pm - 2:45pm, Columbus CD

Presiders:

Valarie L. Akerson, Indiana University
Mary M. Atwater, University of Georgia

Presenters:

Heidi B. Carlone, University of North Carolina, Greensboro
Michelle A. Fleming, Wright State University
Carla C. Johnson, Purdue University
Judith S. Lederman, Illinois Institute of Technology
Toni A. Sondergeld, Bowling Green State University
Cassie Quigley, Clemson University

International Committee Sponsored Session *Promoting Cross-Culture Science Education Research*

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

Presider: Hsiao-Lin Tuan, National Changhua University of Education, Taiwan

Enhancing Science Teachers' Learning of Argumentation in Rwanda

Sibel Erduran, University of Limerick, Ireland
Ebru Kaya, Bogazici University, Turkey
Pinar Seda Cetin, Abant Izzet Baysal University, Turkey
Audrey O'Grady, University of Limerick, Ireland
Keelin Leahy, University of Limerick, Ireland
Alphonse Uworwabayeho, University of Rwanda, Rwanda
Vedaste Mutarutinya, University of Rwanda, Rwanda

Re-Capturing Pedagogical Practice in Science Classroom from a Cross-cultural Comparative Perspectives

Chao-Ti Hsiung, National Taipei University of Education, Taiwan
Hsiao-Lan Sharon Chen, National Taiwan Normal University, Taiwan
Joerg Ramseger, Freie University of Berlin, Germany
Russell Tytler, Deakin University, Australia
Mark Hackling, Edith Cowan University, Australia

The Science Education for Diversity Project: An International Collaborative Research Project

Saouma BouJaoude, American University of Beirut

Strand 1: Science Learning, Understanding and Conceptual Change

Related Paper Set - Lowering the Threshold - New Approaches to Teaching and Learning Evolution

1:15pm - 2:45pm, Columbus EF

Presiders:

Lena A. E. Tibell, Linköping University
Ute Harms, Leibniz Institute (IPN)

A Criteria Catalogue Covering Multiple Evolutionary Aspects Including Threshold Concepts for Assessment of Animations Explaining Evolution

Gustav Bohlin, Linköping University
Jennifer Härting, Leibniz Institute (IPN)
Ute Harms, Leibniz Institute (IPN)
Lena A. E. Tibell, Linköping University

The Impact of Understanding Randomness in the Comprehension of Evolution

Ute Harms, Leibniz Institute (IPN)
Ann-Christin Lühr, Leibniz Institute (IPN)
Jennifer Härting, Leibniz Institute (IPN)

A Novel Computer Application for Teaching Evolutionary Mechanisms: Visual Analogies of Randomness and Natural Selection

Andreas C. S. Göransson, Linköping University
Jörgen Stenlund, Örebro University
Lena A. E. Tibell, Linköping University

How Are Conceptions of Adaptation Expressed in Different Representational Modes?

Daniel Orraryd, Linköping University
Lena A. E. Tibell, Linköping University

Learning Evolution Using Worked Examples and Considering Students' Prior Biological Knowledge

Charlotte Neubrand, Leibniz Institute for Science and Mathematics Education (IPN)
Ute Harms, Leibniz Institute for Science and Mathematics Education (IPN)

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Issues of Argumentation in Science Learning

1:15pm - 2:45pm, Columbus AB

Presider: Brian M. Hand, University of Iowa

The Influence of One Teacher's Framing and Instructional Actions on Students' Scientific Argumentation

Jennifer Schellinger, The Florida State University
Shannon Gooden, The Florida State University
Jonathon Grooms, The Florida State University
Martin Bremer, The Florida State University
Victor D. Sampson, The University of Texas at Austin
Patrick J. Enderle, The University of Texas at Austin

Promoting Elementary School Students' Attitude toward Science and Argumentation through a Science Inquiry Intervention

Zuway-R Hong, National Sun Yat-Sen University, Taiwan
Hsiang-Ting Chen, National SunYat-sen University, Taiwan
Hsin-Hui Wang, National SunYat-sen University, Taiwan
Ting-Yi Tsai, National SunYat-sen University, Taiwan
Ying-Yan Lu, National SunYat-sen University, Taiwan

The Impact of Argument-Based Classroom Teaching on Student Multimodal Competency

Nurcan Keles, University of Iowa
Mark A. McDermott, University of Iowa
Brian M. Hand, University of Iowa

How Does Argumentation from Data Differ when Students Work with Real vs. Virtual Experiments?

Tobias Ludwig, Humboldt University of Berlin
Burkhard Priemer, Humboldt University of Berlin

Scrutinizing the Positions of Students and Teacher in Argumentation in a High School Physics Classroom

Jianlan Wang, Florida International University
Gayle A. Buck, Indiana University

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies Examining Power and Relationships among Young Science Learners

1:15pm - 2:45pm, Randolph

Presider: Li Ke, Michigan State University

The Discursive Construction of Relationships Between Science and Fantasy-Magic-play in an Elementary Classroom

Elaine S. França, Centro Pedagógico (1-9 grades school) -
Universidade Federal de Minas Gerais
Luiz Gustavo F. Franco Silveira, Universidade Federal de Minas Gerais
Vanessa Capelle, Universidade Federal de Minas Gerais
Danusa Munford, Universidade Federal de Minas Gerais

Mediating Hierarchies in a Science Specialist Model: Science Culture in Urban Elementary Schools

Darcy M. Ronan, Teachers College, Columbia University
Felicia Moore Mensah, Teachers College, Columbia University

Every Day, Every Child: Investigating Models of Science Specialization among Elementary Teachers

Joseph A. Brobst, Western Washington University
Kimberly Markworth, Western Washington University

Talk and Power: Changing our Dynamics

Elizabeth W. Edmondson, Virginia Commonwealth University

Exploring Young Childrens' Views of Creativity in Science: Perspectives from an English Primary Classroom

Deb J. McGregor, Oxford Brookes University

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

1:15pm - 2:45pm, Columbus IJ

Presider: Mehmet Aydeniz, The University of Tennessee

Implementing RRI Aspects in the Classroom

Yael Schwartz, The Weizmann Institute of Science
Emil Eidin, Weizmann Institute of Science
Maria Evagorou, University of Nicosia
Ameri Tenckhoff, Innovation in Learning Institute
Sonia Hertzner, Innovation in Learning Institute
Tony Sherborne, Sheffield Hallam University
Jorn Nyberg, Vestfold University College
Harald Bjar, Vestfold University College

SCM: Measuring Students' Interest Within and Beyond the Formal Science Classroom

Brady Michael Jack, National Sun Yat-sen University, Taiwan
Ling Lee, National Sun Yat-sen University, Taiwan
Kuay-keng Yang, National Sun Yat-sen University, Taiwan
Huann-shyang Lin, National Sun Yat-sen University, Taiwan

Two Roles for the Crosscutting Concept in Supporting Students' Learning in a NGSS Focused Unit

Sarah J. Fick, Wake Forest University

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

Culture of Science: Attitudes, Beliefs, and Understandings

1:15pm - 2:45pm, Roosevelt

Presider: David F. Treagust, Curtin University

***Using Issue Analysis to Promote Climate Change Literacy:
The Case of a Non-majors Science Course***

Amy Trauth-Nare, University of Delaware

Steven Prentice, Towson University

Cynthia Ghent, Towson University

***Boosting Students' Attitudes and Knowledge About
Evolution Sets Them Up for Success in College Biology***

Benjamin E. Carter, Syracuse University

Lynn M. Infanti, Christian Brothers Academy, Syracuse, NY

Jason R. Wiles, Syracuse University

***Student Epistemologies in Majors' and Non-Majors'
Biology Courses***

Katherine N. Mollohan, The Ohio State University

Lin Ding, The Ohio State University

***Examining College Students' Beliefs about NOS,
Scientific Reasoning, Religiosity, and Understanding
and Acceptance of Evolution***

Ann M.L. Cavallo, The University of Texas at Arlington

Stephanie Gutierrez, The University of Texas at Arlington

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

Instructional Practices - Collaboration and Development

1:15pm - 2:45pm, Comiskey

Presider: Shiyu Liu, Pennsylvania State University

***Constructing 'Authentic' Science: Results from a
University-High School Collaboration Integrating
Digital Storytelling and Social Networking***

Stacy Olitsky, Saint Joseph's University

Elizabeth A. Becker, Saint Joseph's University

Joe Montcalmo, Saint Joseph's University

Ignacio Jayo, Tennent High School

Phillip Vinogradov, Tennent High School

***Engaging in Self-Study to Support Collaboration
between Two-Year Colleges and Universities***

Andrea Gay Van Duzor, Chicago State University

Geraldine L. Cochran, Rochester Institute of Technology

Mel S. Sabella, Chicago State University

***A Motivational Approach to Examining Reasons Why
STEM Faculty Engage in Teaching Professional Development***

Jennifer Collins, Oregon State University

Jana L. Bouwma-Gearhart, Oregon State University

***The Impact of Group Work on Junior Secondary
Science Learning***

Dennis Fung, The University of Hong Kong

**Strand 6: Science Learning in Informal Contexts
*Informal Science Learning Out of Doors***

1:15pm - 2:45pm, Water Tower

Presider: Deborah L. Bailey, Oregon State University

***Community-Based STEM: An Environmental Science
Education Partnership in a Large Midwestern City
Dean J Grosshandler, University of Illinois at Chicago***

Alejandro Grajal, Chicago Zoological Society

Jo-Elle Mogerman, Chicago Zoological Society

Michael Howard, Illinois Dept. of Natural Resources and Eden
Place Nature Center

Lisa-Anne DeGregoria Kelly, Chicago Zoological Society

David P. Becker, Chicago Zoological Society

***Dividing Attention Participation to Support
Informal Learning***

Aubin StClair, University of Southern Mississippi

Kristy L. Halverson, University of Southern Mississippi

Aimee K. Thomas, Loyola University New Orleans

Carrie J. Boyce, The University of Southern Mississippi

The Effect of Youth Gardening on Perceptions of Science

Deborah L. Bailey, Oregon State University

John H. Falk, Oregon State University

***"How Much Nature" Is There in Field Trips
in Natural Environment?***

Nirit Lavie Alon, Technion

Tali Tal, Technion

**Strand 7: Pre-service Science Teacher Education
*Teachers' Practices, Self-Regulation, and Assessment***

1:15pm - 2:45pm, Grand Suite 5

Presider: David F. Jackson, The University of Georgia

***Science Methods Course Influences on Early Childhood
Preservice Teachers' Evolving Self-Efficacy about
Equitable Science Teaching***

Eun Young Lee, University of North Texas

Karthigeyan Subramaniam, University of North Texas

Pamela Harrell, University of North Texas

The Role of Pre-Service Science Teachers' Achievement Goal Orientation and Gender in Prediction of Self-Regulation

Solmaz Aydin, Kafkas University
Sündüs Yerdelen, Kafkas University

Using Case Method to Explicitly Teach Formative Assessment in Preservice Teacher Education

Amy E. Bentz, Western Michigan University
William W. Cobern, Western Michigan University

Supporting Secondary Science Pre-Service Teachers in Developing Ambitious Lesson Planning Practices

Danielle K. Ross, Northern Arizona University

Strand 8: In-service Science Teacher Education Supporting Teachers for STEM Implementation

1:15pm - 2:45pm, Columbus KL

Presider: Meredith A. Park Rogers, Indiana University

Supporting Middle School Teachers' Implementation of STEM Design Challenges

Tamara Holmlund Nelson, Washington State University Vancouver
Kristin Lesseig, Washington State University Vancouver
David Slavit, Washington State University Vancouver
Cathleen Kennedy, Education Research Consultant, KAC Group
Ryan Seidel, Washington State University Vancouver

Challenges and Successes: Understanding Middle School Physical Science Teachers' Experiences with STEM Integration

Gillian Roehrig, University of Minnesota
Emily A. Dare, University of Minnesota
Joshua A. Ellis, University of Minnesota
Tamara J. Moore, Purdue University
Selcen Guzey, Purdue University

Professional Development through STEM Integration: How Early Career Math and Science Teachers Respond to Experiencing Integrated STEM Tasks

Christopher A. Bogiages, Knowles Science Teaching Foundation
Rachael Brown, Penn State Abington
Joyce Lin, Knowles Science Teaching Foundation

Instructional Coaching Support to Science Teachers for the Implementation of STEM Integrated Curriculum

Tasneem Anwar, University of Minnesota
Gillian Roehrig, University of Minnesota

Strand 10: Curriculum, Evaluation, and Assessment Curriculum and Assessment

1:15pm - 2:45pm, Grand Suite 3

Presider: Eilish McLoughlin, Dublin City University

The Impact of Prior Knowledge and Self-efficacy on Students' Performance in the Virtual Environment

Xiaoyang Gong, University of Maryland
Bradley W. Bergey, Dalhousie University
Diane Jass Ketelhut, University of Maryland
Kelly Mills, University of Maryland
Ashley N. Coon, University of Maryland

Using Model-Based Reasoning to Achieve Curricular Coherence in High School Biology

Candice Guy, University of California, Davis
Julia Svoboda Gouvea, Tufts University
Chris Griesemer, University of California, Davis
Cynthia Passmore, University of California-Davis

Singaporean Secondary Science Teachers' Conceptions of Assessment

Gavin W. Fulmer, National Institute of Education (Singapore)
Kelvin H. K. Tan, National Institute of Education (Singapore)
Iris C. H. Lee, Singapore Ministry of Education

Incorporating Practice into Content: The Field Testing of the Scientific Decision-making Unit

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

Science education from a European perspective: Results from the International PROFILES Curricular Delphi Study

Claus Bolte, Freie Universitaet Berlin
Marlies Gauckler, Freie Universitaet Berlin

Strand 10: Curriculum, Evaluation, and Assessment Physics and Chemistry Education

1:15pm - 2:45pm, Columbus GH

Presider: Cari F. Herrmann Abell, AAAS/Project 2061

Data-Driven Inquiry: High School Chemistry Teachers' Use of Classroom Assessments

Jordan Harshman, Miami University
Ellen J. Yeziarski, Miami University

***Validating a Learning Progression for the Energy Concept:
An Interview Study-based Method***

Susanne Wessnigk, Leibniz Institute (IPN) Kiel
Knut Neumann, Leibniz Institute (IPN) Kiel

***Measuring Knowledge of Acids and Bases as Continuous
and Categorical Constructs toward Understanding
Concept Progression***

Amber Todd, Wright State University
William L. Romine, Wright State University

***Assessment Policy in the Current Senior Physics
Curriculum Documents of Mainland China and Hong Kong***

May Hung May Cheng, The Hong Kong Institute of Education
Zhi Hong Wan, The Hong Kong Institute of Education

***The Force Concept Inventory–Impact of Context and
Response Format***

Hendrik Haertig, IPN - Leibniz-Institut
Naturwissenschaften U. Mathematik

**Strand 12: Educational Technology
*Digital Gaming in Science Education***

1:15pm - 2:45pm, Grand D North

Presider: Richard L. Lamb, Washington State University

***Examination of Latent Class Profile Transition Analysis
of K-12 students STEM Career Selection Moderated via
Serious Educational Games***

Richard L. Lamb, Washington State University
David B. Vallett, University of Nevada Las Vegas
Len Annetta, George Mason University
Kaylan Petrie, Washington State University
Rebecca Cheng, George Mason University
Marina Shapiro, George Mason University
Ben Matthews, George Mason University

***The Influence of Serious Educational Game Design
on Student Interest in STEM***

David B. Vallett, University of Nevada Las Vegas
Richard L. Lamb, Washington State University
Len Annetta, George Mason University
Rebecca Cheng, George Mason University
Marina Shapiro, George Mason University
Ben Matthews, George Mason University

***Immersive Multi-user Virtual Environments Support
Development of Modeling Practices in Ecosystem Science***

Amy M. Kamarainen, Harvard University
Shari Jackson Metcalf, Harvard University
Tina Grotzer, Harvard University
Chris Dede, Harvard University

***The Earthquake Engineering Game: Synthesizing Instruction
and Game Design for 21st Century Science Learning***

Abigail C. Perkins, Texas A&M University
Carol L. Stuessy, Texas A&M University

**Strand 13: History, Philosophy, and Sociology of Science
*Symposium - The Past, Present and Possible Future of
HPS-informed Science Education Research***

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

Presider: Michael R. Matthews, University of New South Wales

Presenters:

Jonathan F. Osborne, Stanford University
Norman G. Lederman, Illinois Institute of Technology
Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign
Michael P. Clough, Iowa State University
Kostas Kampourakis, University of Geneva
Mike U. Smith, Mercer University
Gregory J. Kelly, Penn State University
Sherry A. Southerland, Florida State University
Erin E. Peters-Burton, George Mason University
Wendy Sherman-Heckler, Otterbein College

Strand 15: Policy

***Related Paper Set - From Policy to the Classroom:
Studying the Enactment of the NGSS Vision***

1:15pm - 2:45pm, Gold Coast

Presider: Mary Kay Stein, University of Pittsburgh

Discussant: Christian Schunn, University of Pittsburgh

***Examining Developing Teaching Practices at the Intersection
of Content and Practice in Middle School Science***

Britte H. Cheng, SRI International
Savitha Moorthy, SRI International
Cynthia M. D'Angelo, SRI International
Reina Fujii, SRI International
Tiffany Leones, SRI International
Bowye Gong, SRI International
Jeremy Fritts, SRI International
Carrie D. Allen, University of Colorado - Boulder
Carrie-Anne Sherwood, University of Michigan
Christopher J. Harris, SRI International

Quality of Science Instruction during the Enactment of NGSS-Aligned, Cognitively Demanding Science Tasks

Miray Tekkumru Kisa, University of Pittsburgh

Mary Kay Stein, University of Pittsburgh

Christian D. Schunn, University of Pittsburgh

Leveraging Professional Development to Design and Enact NGSS-aligned Materials in Uncertain Policy Contexts

Carrie D. Allen, University of Colorado - Boulder

Samuel Severance, University of Colorado - Boulder

William R. Penuel, University of Colorado Boulder

Implementing Science Practices: STEM Teaching Improvement or Policy Churn?

Andrew W. Shouse, University of Washington

Kerri Wingert, University of Washington

Break

2:45pm – 3:15pm, Grand Foyer

Concurrent Session #6

All strand poster sessions.

3:15pm – 5:15pm

Poster Session A

3:15pm – 4:15pm, Riverside East

Strand 1: Science Learning, Understanding and Conceptual Change

Poster Session A

3:15pm – 4:15pm, Riverside East

A1. Have Astronauts Visited Neptune? Student Ideas about How Astronomers Study the Solar System

Christopher Palma, The Pennsylvania State University

Julia Plummer, The Pennsylvania State University

KeriAnn Rubin, The Pennsylvania State University

Alice Flarend, The Pennsylvania State University

Yann Shiou Ong, The Pennsylvania State University

Scott McDonald, The Pennsylvania State University

A3. Tensions between Conceptual and Metaconceptual Learning with Models

Michele J. Mann, University of Texas Austin

Cesar Delgado, University of Texas at Austin

Walter M. Stroup, University of Texas at Austin

Anthony J. Petrosino, University of Texas at Austin

A5. High School Students' Conception and Conceptual Definition in Heat Transfer

Eugene Lim, National Institute of Education, NTU Singapore

Hye-Eun Chu, Nanyang Technological University

Daniel Kim Chwee Tan, National Institute of Education

A7. A Plausible Model? Refutation Texts Foster the Connection between Critical Evaluation, Plausibility, and Knowledge

Robert W. Danielson, University of Southern California

Neil Young, University of California, Irvine

Doug Lombardi, Temple University

A9. A Learning Progression on Chemical Reactions

Katrin Weber, University of Duisburg-Essen

Markus Emden, University of Education Schwaebisch Gmuend

Elke Sumfleth, University of Duisburg-Essen

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster Session A

3:15pm – 4:15pm, Riverside East

A11. Bringing Expert Computational Practices into High School Science Classrooms

Elham Beheshti, Northwestern University

David Weintrop, Northwestern University

Kai Orton, Northwestern University

Michael Horn, Northwestern University

Kemi Jona, Northwestern University

Laura Trouille, Northwestern University

Uri Wilensky, Northwestern University

A13. Digital Mapping Technology in Elementary Grades: Effects on Spatial Reasoning and Higher-Level Thinking Processes

May Jadallah, Illinois State University

Tzu-Jung Lin, Ohio State University

Sean Mullins, Illinois State University

Joel Studebaker, Illinois State University

Jonathan Thayn, Illinois State University

Alycia M. Hund, Illinois State University

A15. Learning with Scientific Texts: Subject-Specific Instructions to Support Student's Text Comprehension

Meike Rous, University of Duisburg-Essen
Martin Linsner, University of Duisburg-Essen
Angela Sandmann, University of Duisburg-Essen

A17. Face-To-Face Collaboration, Online Forums, and Physics Reasoning Around a Digital Game in the Classroom

Grant W. Van Eaton, Vanderbilt University
Douglas B. Clark, Vanderbilt University
Blaine E. Smith, University of Miami

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

3:15pm – 4:15pm, Riverside East

A19. Leisure Friendly Intervention, Pupils' Attitude and Achievement in Basic Science

Olatunde Lawal Owolabi, Lagos State University
Peter A. Okebukola, Lagos State University
Olugbenga G. Akindoju, Lagos State University
Olukayode Akinrolabu, Lagos State University

A21. Integrating Science and Technology: The Role of Teachers' Knowledge and Confidence

Lori A. Fulton, University of Hawaii at Manoa
Seungoh Paek, University of Hawaii at Manoa
Jon Yoshioka, University of Hawaii at Manoa

A23. Using Mobile Inquiry Learning to Enhance Primary School Students' Conceptual Understanding in Science

Charalambia A. Lazaridou, University of Cyprus
Zacharias C. Zacharia, University of Cyprus
Lucy Avraamidou, University of Nicosia, Cyprus

A25. Science as Experience, Exploration, and Experiments: Elementary Teachers' Notions of "Doing Science"

Ashley N. Murphy, West Virginia University
Melissa J. Luna, West Virginia University
Malayna Bernstein, West Virginia University

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

3:15pm – 4:15pm, Riverside East

A27. Measuring Science Instructional Practice: A Survey Tool for the Age of NGSS

Kathryn N. Hayes, California State University, East Bay
Christine Lee, California State University East Bay
Sara J. Dozier, Alameda County Office of Education
Jeffery Seitz, California State University, East Bay
Rachelle DiStefano, California State University, East Bay
Dawn O'Connor, Alameda County Office of Education

A29. A Cross-Cultural Comparison of US and Korean Science Teachers' Perceptions and Approaches towards Misconceptions

Kyungwoon Seo, University of Iowa
Soonhye Park, University Of Iowa
Aeran Choi, Ewha Womans University

A31. Improving At-Risk Students' Attitudes toward Science and Science Instruction with Inquiry-Based Science Activities

Sarah Watt, Miami University
Nazan U. Bautista, Miami University

A33. How Teachers Negotiated the Meaning of NGSS through Participation in a Professional Learning Community

Ellen Barnett, University of Missouri
Patricia J. Friedrichsen, University of Missouri-Columbia

A35. Second Career Science Teachers Reflections on the NGSS Science Practices

Allison Antink-Meyer, Illinois State University
Ryan Brown, Illinois State University

A37. The Impact of Science Teachers' Orientations on their Understanding and Implementation of Interdisciplinary Science Inquiry

Erica L. Smith, State University of New York at Buffalo
Xiufeng Liu, State University of New York At Buffalo (SUNY)

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

Poster Session A

3:15pm – 4:15pm, Riverside East

A39. Developing, Supporting, and Sustaining a National Professional Developer Network to Enhance Undergraduate Biology Education

April Cordero Maskiewicz, Point Loma Nazarene University
Gili Marbach-Ad, University of Maryland
Deborah Allen, University of Delaware
Susan Elrod, California State University Fresno
Karen Sirum, Bowling Green State University
Gordon Uno, University of Oklahoma

A41. Professional Development for Biology Graduate Teaching Assistants: Status, Challenges and Needs

Gili Marbach-Ad, University of Maryland
 Elisabeth Schussler, University of Tennessee
 Kristen Miller, The University of Georgia
 Miriam Ferzli, North Carolina State University
 Quentin D. Read, University of Tennessee

A43. Undergraduate Students' Sources and Perceptions of Scientific Information

Sanlyn Buxner, University of Arizona
 Chris D. Impey, University of Arizona
 James Romine, University of Arizona
 Megan Nieberding, University of Arizona

A45. Essential Features and Benefits of Undergraduate Research Experiences: Perspectives of Student Researchers and Practicing Scientists

Joseph A. Harsh, James Madison University
 Russell N. Balliet, Indiana University
 Adam V. Maltese, Indiana University
 Robert H. Tai, University of Virginia

A47. Experiential Learning in the Plant Sciences through Augmented Reality

Selcen Guzey, Purdue University
 Thomas Michaels
 Eric Watkins

A49. College Students' Perspectives and Reasoning about Over-The-Counter and Internal Health Monitoring Devices

Eva Erdosne Toth, West Virginia University
 Paula Witt-Enderby, Duguesne University
 Joey Fama, West Virginia University

**Strand 6: Science Learning in Informal Contexts
Poster Session A**

3:15pm – 4:15pm, Riverside East

A51. Minority Engagement in Science Hobbies: Discussion of Social Barriers, Motivation Influencing Science Self-efficacy and Identity

Rebecca Hite, North Carolina State University
 M. Gail Jones, North Carolina State University
 Thomas Andre, Iowa State University
 Gina Childers, North Carolina State University
 Elysa N. Corin, North Carolina State University

A53. Night at the Museum: Learning to Teach in an Informal Setting

Stacey Britton, University of Mississippi
 Qiang (Andy) Cheng, University of Mississippi
 Renee Hill-Cunningham, University of Mississippi
 Amber Carpenter-McCullough, University of Mississippi

A55. Improving Interest and Self-Concept in Science through Indoor Urban Farming

Amie K. Patchen, Boston College
 Janet Lorden, STEM Garden Institute
 Lin Zhang, Providence College
 Mike Barnett, Boston College

A57. It Takes a Village to Raise a Scientist: An After-School Urban Partnership

Carolyn A. Parker, The John Hopkins University
 Yolanda Abel, The Johns Hopkins University
 Audrey Moshfeghian, The Johns Hopkins University

A59. Experiment-Based Science Learning in a Mobile Laboratory

Mustafa Erol, University of Bozok
 Ugur Buyuk, University of Erciyes
 Nagihan Tanik, University of Erciyes

A61. Me? A Scientist: A Next Generation of Students Internalizing Their Identities as Scientists

Lauren M. Shea, University of California, Irvine
 Therese B. Shanahan, University of California - Irvine
 Stacey Freeman, University of Arizona

A63. Characterizing the Development of Students' Ability to Ask Questions in a Merged Formal/ Informal Program

Tom Bielik, Weizmann Institute of Science
 Anat Yarden, Weizmann Institute of Science

**Strand 7: Pre-service Science Teacher Education
Poster Session A**

3:15pm – 4:15pm, Riverside East

A65. The Will of the Ancestors Phase II: Sociocultural Understandings in Teacher Preparation and Science Education.

Cecilia Andrews, Kashunamiut School District
 Flora Ayuluk, Kashunamiut School District
 Megan Marquis, University of Alaska Anchorage
 Irasema Ortega, University of Alaska-Anchorage
 Neva Mathias, Kashunamiut School District, Chevak Alaska

A67. Huddle Up: Enactment of Coteaching in Science Classes

Kathryn Scantlebury, University of Delaware
 Kyle Chismar, Redding Middle School
 Kaitlin Craig, Redding Middle School
 Matthew Juck, Middletown High School
 Susan Gleason

A69. Elementary and Secondary Pre-service Teachers' Science Content Knowledge and Conceptions of Nature of Science

Tonya D. Jeffery, Texas A&M University - Corpus Christi
 Cherie A. Mccollough, Texas A&M University - Corpus Christi
 Kim Moore, Texas A&M University - Corpus Christi

A71. Fostering Pre-service Teachers' Professional Vision in Primary School Science Classes

Cornelia Sunder, Westfälische Wilhelms-Universität Münster
 Maria Todorova, Westfälische Wilhelms-Universität Münster
 Kornelia Möller, Westfälische Wilhelms-Universität Münster

A73. What are Science Teachers? The Identity Discourse of Preservice and Inservice Teachers

Pei-Ling Hsu, University of Texas at El Paso
 Angelica Monarrez, University of Texas at El Paso

A75. Teaching SSL at Primary School: Insights and Challenges from a Pre-service Teacher Education Program in Spain

Digna Couso, Crecim-Universitat Autònoma de Barcelona
 Anna Garrido, Crecim-Universitat Autònoma de Barcelona

A77. Exploring Prospective Middle-School Teachers' Knowledge and Beliefs about Engineering Design and Its Teaching

Dongmei Zhang, The University of Georgia
 Barbara A. Crawford, The University of Georgia

A79. Emerging Understandings of Assessment: Pre-service Elementary Teachers in a Science Methods Course

Sara Nelson, Iowa State University
 Eunjin Bang, Iowa State University

**Strand 8: In-service Science Teacher Education
 Poster Session A**

3:15pm – 4:15pm, Riverside East

A81. Conditions that Support Lesson Study for Integrating NGSS in Science Classrooms

Christine Lee, California State University East Bay
 Kathryn N. Hayes, California State University East Bay
 Rachelle DiStefano, California State University East Bay
 Jeffery Seitz, California State University East Bay
 Dawn O'Connor, Alameda County Office of Education

A83. Science Teachers' Perceptions of the Evaluation of their Professional Development Programs

Saeed Alshamrani, King Saud University Saudi Arabia
 Nasser Mansour, University of Exeter
 Saeed Alghamedi, Juf University Saudi Arabia
 Abdulwali H. Aldahmash, King Saud University Saudi Arabia
 Saed Sabah, The Hashemite University, Jordan

A85. Designing a Measure of Teacher Belief about Student Ability to Engage in Scientific Argumentation

Rebecca Katsh-Singer, Boston College
 Amanda M. Knight, Boston College
 Maria Gonzalez-Howard, Boston College
 Katherine L. McNeill, Boston College

A87. The Impact of a Multi-level Genomics PD Program on HS, Community College, and University Faculty

Caren Gough, Stony Brook University
 Amy Nisselle, Cold Spring Harbor Laboratory
 Minsu Ha, Kangwon National University
 Ross H. Nehm, SUNY Stony Brook

A89. Research Experiences for Teachers: Engineering Applications in Science and Math Classrooms

Jessica Stephenson, Virginia Tech
 Brenda R. Brand, Virginia Tech University
 Christopher Williams, Virginia Tech

A91. Social-Cognitive Reform Information Processing Typologies (S-CRIPT): A Model for Understanding Teacher Change

Daniel M. Alston, Clemson University
 Jeff C. Marshall, Clemson University
 Eric McKibben, Clemson University

**A93. Professional Development Programs:
Teacher's Perceptions**

Hiya Almazroa, Princess Noura University
Abdulrahman A. Aloraini, Ministry of Education
Fahad S. Alshaya, King Saud University

**A95. Using the Views about Science Inquiry Questionnaire
as a Reflective Tool to Impact Teaching Practice**

Jennifer C. Parrish, Middle Tennessee State University
Stephen A. Bartos, Middle Tennessee State University
Kim Cleary Sadler, Middle Tennessee State University

Strand 9: Reflective Practice

Poster Session A

3:15pm – 4:15pm, Riverside East

**A97. Finding Ways to Contribute: Helping Undergraduate
Students Realize Their Agency in Learning Physics**

Sanaz Farhangi, New York University

**A99. Reflective Practices and Challenges in Being
a Teacher-researcher**

Konstantinos Alexakos, Brooklyn College-CUNY

Strand 10: Curriculum, Evaluation, and Assessment

Poster Session A

3:15pm – 4:15pm, Riverside East

**A101. Designing Scoring Rubrics that Address
Crosscutting Concepts in Science**

Kevin W. McElhaney, SRI International
Angela H. DeBarger, George Lucas Educational Foundation
Cynthia M. D'Angelo, SRI International
Christopher J. Harris, SRI International
Kavita L. Seeratan, SRI International
Tina M. Stanford, SRI International

**A103. Justifying Predictions: Connecting Use
of Educative Curriculum Materials to Students'
Engagement in Science Practices**

Anna Maria Arias, University of Michigan
John-Carlos Marino, University of Michigan
Elizabeth A. Davis, University of Michigan
P. Sean Smith, Horizon Research, Inc.
Annemarie S. Palincsar, University of Michigan

**A105. Development of an Instrument to Measure
Teachers' Perceptions of Nanotechnology Teaching
and Professional Development**

Kuohua Wang, National Changhua University of Education
Shu-Fen Lin, National Changhua University of Education
Jun-Yi Chen, National Chiayi University
Kun-Yi Shih, National Changhua University of Education
Huey-Por Chang, Open University of Kaohsiung

**A107. Clicker Score Trajectories and Concept
Inventory Scores as Predictors of Student Success
in Science Courses**

Un Jung Lee, Stony Brook University
Gena C. Sbeglia, Stony Brook University
Minsu Ha, Kangwon National University
Stephen J. Finch, Stony Brook University
Ross H. Nehm, SUNY Stony Brook

**A109. A Case Study in the Evaluation of Alignment
to NGSS using the EQuIP Rubric**

Bernard J. Koch, AAAS/Project 2061
Sarah J. Glassman, George Mason University
George E. De Boer, AAAS/Project 2061
Jo Ellen Roseman, AAAS/Project 2061

**A111. A Discipline-Based Framework for the Force
Concept to Inform Learning Progressions Research
and Development**

Irene Neumann, Leibniz-Institute
Daniel Laumann, Westfaelische Wilhelms-Universitaet Muenster
Gavin W. Fulmer, National Institute of Education
Ling L. Liang, La Salle University

**A113. Validation of New Biology Instruments that
Assess Three Aspects of Science Proficiency**

Anna M. Strimaitis, Florida State University
Patrick J. Enderle, Florida State University
Jonathon Grooms, Florida State University
Victor D. Sampson, Florida State University

A115. A Design Framework on Assessing Modeling Practices

Ji Shen, University of Miami
Charles Xie, Concord Consortium
Bahadır Namdar, Recep Tayyip Erdogan University

**A117. Science and Engineering Practices Coverage
in K-12 Engineering Curricula**

Sonia A. Bendjemil, University of Virginia
Vivien M. Chabalengula, University of Virginia
Frackson Mumba, University of Virginia

Strand 11: Cultural, Social, and Gender Issues

Poster Session A

3:15pm – 4:15pm, Riverside East

A119. Science Education in the Borderlands: An Examination of Science Readiness for Latina/o Learners in Texas

Jennifer K. LeBlanc, Texas A&M University
Dane Bozeman, Texas A & M University
Carol L. Stuessy, Texas A&M University
Abiola Farinde
Kaitlin Stone, College Station I. S. D.

A121. The Effect of Quorums in Biology, Chemistry, and Physics on Student Performance and Interest

Zahra Hazari, Florida International University
Geoff Potvin, Florida International University
Allison F. Godwin, Purdue University
Tyler Scott, Northwestern College
Leidy Klotz, Clemson University

A125. The Unbearable Lightness of School Science: A Mixed Methods Study of Three Different Gender-based High Schools in South Korea

EunJin Bang, Iowa State University
Yohan Hwang, Kyungpook National University
Sissy S. Wong, University of Houston
Inkyu Jeong, Sukji High School, South Korea
Youngjin Song, University of Northern Colorado

A129. Broadening Participation in the Biological Sciences: Understanding Recruitment Initiatives from Students' Perspective

Cheryl A. McLaughlin, University of Florida
Gil Nelson, Florida State University
Shari Ellis, Florida Museum of Natural History

A131. Tensions in the Enactment of Formative Assessment: A Case Study in a High-School Chemistry Classroom

Dante Cisterna, Pontifical Catholic University of Chile
Amelia Wenk Gotwals, Michigan State University

Strand 12: Educational Technology

Poster Session A

3:15pm – 4:15pm, Riverside East

A133. Individual Differences/Moderators of Science Content via 21st Century Skill Acquisition using Serious Educational Games

Kaylan B. Petrie, Washington State University
Richard L. Lamb, Washington State University
David B. Vallett, University of Nevada Las Vegas
Leonard Annetta, George Mason University
Rebecca Cheng, George Mason University
Marina Shapiro
Ben Matthews

A135. A Potential Future in Education: The Application of Intelligent Systems in Teacher Education

Andy Cavagnetto, Washington State University
Richard Lamb, Washington State University
Brian French, Washington State University
Lijun Yin, Binghamton University
Olusola Adesope, Washington State University
Matthew Taylor, Washington State University

A137. Using Mobile Technologies to Facilitate Student-to-teacher Questioning in a Large Undergraduate Astronomy Course

Stephen R. Burgin, Old Dominion University
Helen Crompton, Old Dominion University
Kristen H. Gregory, Old Dominion University
Declan G. De Paor, Old Dominion University
Raleta Summers, Old Dominion University

A139. Using a Computer Game to Introduce Scientific Explanations to Students

Robert C. Wallon, University of Illinois
Chandana Jasti, University of Illinois
Hillary Z. Lauren, University of Illinois
Barbara Hug, University of Illinois

A141. Using Mobile Apps to Support Scientific Practices in Middle School

Kelly M. Mills, University of Maryland
Uma Natarajan, University of Massachusetts, Boston
Diane Jass Ketelhut, University of Maryland

A143. Designing Cooperative Online Learning Tools for Middle School Science: Lessons Learned from Three Exploratory Studies

Fatima E. Terrazas Arellanes, University of Oregon
Alejandro J. Gallard, Georgia Southern University
Emily D. Walden, University of Oregon

A145. Pre-service Teachers' Understanding of Design Technology: Modeling Oriented Assessment (MOA) for Enhancing the Feasibility of STEM

Young Ae Kim, University of Georgia
Deborah J. Tippins, The University of Georgia

**Strand 13: History, Philosophy, and Sociology of Science
Poster Session A**

3:15pm – 4:15pm, Riverside East

A147. The Estonian Stakeholders' Views about the Level of Students' Scientific Literacy and the Support of New Estonian Competence-based Science Education Curriculum

Anne Laius, University of Tartu
Aveliis Post
Miia Rannikmaa, University of Tartu

A149. Improving Students' Understanding of Nature of Science through Reflective-contextualized Socioscientific Issues Instruction

Yoonsook Chung, Ewha Womans University
Sung-Won Kim, Ewha Womans University

**Strand 14: Environmental Education
Poster Session A**

3:15pm – 4:15pm, Riverside East

A151. Testing a Curriculum Designed to Build Students' Understanding of Action at an Attentional Distance

Maleka D. Gramling, Harvard University
Daniel E Oh, Harvard University
Kasia Derbiszewska, Harvard University
Lynneth Solis, Harvard University
Tina Grotzer, Harvard University

A153. Investigating Student Reasoning about Agency in Ecosystems Science

Megan M. Powell, Harvard University
Tina Grotzer, Harvard University
Amy M. Kamarainen, New York Hall of Science
Shari Jackson Metcalf, Harvard University

A155. Merging Digital Storytelling with Science and Environmental Education: A Longitudinal Case Study with Promising Results

Brian J. Plankis, Indiana University Purdue University Indianapolis
Ashley Poloha, Pasadena Memorial High School

A157. Educating the Next Generation of Elementary Teachers: Fostering Preservice Teachers' Pro-environmental Engagement

Lyn Carter, Australian Catholic University
Jenny L. Martin, Australian Catholic University

Strand 15: Policy

Poster Session A

3:15pm – 4:15pm, Riverside East

A159. Science Teacher Certification, Access to Science, and Student Learning in an Urban Setting

Michelle R. Turner-Edwards, Stony Brook University
Angela M. Kelly, Stony Brook University
Keith Sheppard, Stony Brook University

A161. A Case of High School Earth and Space Science Education in the Great Plains

Elizabeth B. Lewis, University of Nebraska-Lincoln
Jia Lu, University of Nebraska-Lincoln
Megan Van Alstine, University of Nebraska-Lincoln

A163. Taiwanese Policymakers' and Science Teachers' Perspectives on Science Education Reform in Confucian Learning Cultures

Ying Syuan Huang, McGill University
Anila Asghar, McGill University

Poster Session B

4:15pm – 5:15pm, Riverside East

Strand 1: Science Learning, Understanding and Conceptual Change

Poster Session B

4:15pm – 5:15pm, Riverside East

B2. Students' Self-efficacy in Possessing Perspectives and Competences for Developing Scientific Literacy for Success in Future Careers

Kerti Ait, Tartu University
Jack Holbrook, Tartu University
Miia Rannikmäe, Tartu University

B4. 5th Grade Korean Students' Decision-making on Animal Testing: Patterns of Responses to Anomalous Data

Hwayeon Lee, Korea National University of Education
Nam-Hwa Kang, Korea National University of Education

B6. Community College Students Making Sense of Cosmology Visualizations

Zoe E. Buck, University of California Santa Cruz

B8. Meaningful Conceptual Learning in Engineering-Oriented Teacher Professional Development: A Conceptual Framework

Baki Cavlazoglu, Texas A&M University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster Session B

4:15pm – 5:15pm, Riverside East

B10. The Quality of Online Graduate Science Courses: Voices from Students and Instructors

Sanghee Choi, University of North Georgia
April Nelms, University of North Georgia
Chantelle A. Renaud-Grant, University of North Georgia

B12. Exploring the Relation between Learners' Beliefs in Science Reading and the Science Text Understanding

Fang-Ying Yang, National Taiwan Normal University
Cheng-Chieh Chang, National Taiwan Ocean University

B14. Empirical-based Model to Explain the Impact of Science Classes on Students' Career Choice

Nina Bertels, Freie Universitaet Berlin
Claus Bolte, Freie Universitaet Berlin

B16. Characterizing Changes to Students' Motivation in Science in Schools That Serve Low SES Communities

Israel Touitou, Weizmann Institute of Science
David L. Fortus, Weizmann Institute of Science

B18. Reading Problems Faced by Students Studying Science in a Foreign Language

Nada Radwan, King's College London
Saouma B. BouJaoude, American University of Beirut

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

Poster Session B

4:15pm – 5:15pm, Riverside East

B20. A Neuroscience Approach to Teaching K-1 Students about the Senses

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

B22. The Role of Epistemic Orientation and Pedagogical Content Knowledge in the Practice of Teaching Science

Jee Kyung Suh, University of Iowa
Soonhye Park, University of Iowa

B24. Translating Elementary STEM Integration into Classroom Practice

Tamara J. Moore, Purdue University

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

Poster Session B

4:15pm – 5:15pm, Riverside East

B28. How a Teacher's Personal Epistemology of Science Influences the Science Practice Students Learn

David Stroupe, Michigan State University

B30. Learning by Collaborative Design: Curriculum Design and Content Knowledge of a Mentor Teacher

Tamara J. Heck, Michigan State University

B32. Using Observational Measures and Value-Added Measures to Examine Secondary Science Teachers' Instruction

Jamie N. Mikeska, ETS

B34. The Portrayal of the Evolution of the Horse in Textbooks and Implications for Teacher Preparation

Paul Davies, University of London

B36. A Multispatial Analysis of Representation Creation while Teaching with a Digital Learning Game

Grant W. Van Eaton, Vanderbilt University

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

Poster Session B

4:15pm – 5:15pm, Riverside East

B38. How Undergraduate STEM Students Conceptualize the Problem-Solving Process: A Visual Card Sorting Approach

Pavlo D. Antonenko, University of Florida

Kent J. Crippen, University of Florida

Lauren Eutsler, University of Florida

B40. Impact of Technology-Infused Learning Environments on College Professors' Instructional Decisions and Practices

Chamathca P. Kuda-Malwathumullage, University of Iowa

Soonhye Park, University of Iowa

Renee S Cole, University of Iowa

B42. Student Learning about Evolution in a Misconception-Focused vs. Traditional Undergraduate Biology Class

Gena C. Sbeglia, Stony Brook University

Minsu Ha, Kangwon National University

Ross H. Nehm, SUNY Stony Brook

B44. Nanotechnology for All: Examining Students' Motivation and Learning Outcomes in a Massive Online Open Course

Miri Barak, Technion, Israel Institute of Technology

Abeer Watted, Technion, Israel Institute of Technology

B46. Upper Level Biology Majors' Epistemologies

Katherine N. Mollohan, The Ohio State University

Lin Ding, The Ohio State University

B48. Variation in Students' Epistemological Changes and their Relationship with Conceptual Learning Gains in Introductory Physics

Lin Ding, The Ohio State University

**Strand 6: Science Learning in Informal Contexts
Poster Session B**

4:15pm – 5:15pm, Riverside East

B50. Size and Scale of the Solar System: Middle School Students' Learning at a Discovery Centre

Marina Pitts, Willetton Senior High School

Grady J. Venville, University Of Western Australia

B52. The Effect of Formal-Informal Instruction of Energy Concepts on African-American Students' Science Achievement and Application

Shamarion G. Grace, Flint Community Schools

Jazlin Ebenezer, Wayne State University

B54. Informal Science Educators' Enactment of Goals with Preschool Audiences

Michele Crowl, Penn State University

Julia Plummer, Pennsylvania State University

B56. Communicative Patterns of Cogenerative Dialogues between High School Students and Scientists

Anna C. Barbosa, The University of Texas at El Paso

Pei-Ling Hsu, University of Texas at El Paso

B58. General and Contextual Science Knowledge among Parents of Hearing Impaired Children

Ayelet Baram-Tsabari, Technion - Israel Institute of Technology

Sophie Shauli, Technion - Israel Institute of Technology

B60. Serendipitous Engagement in Science: A Family Ethnographic Study

Dana Vedder-Weiss, Ben-Gurion University of the Negev and Tel-Aviv University, Israel

B62. "We're Education Students, Make Sure you Write that Down. This isn't Biology class!"

Catherine Scott, Coastal Carolina University

Strand 7: Pre-service Science Teacher Education

Poster Session B

4:15pm – 5:15pm, Riverside East

B64. Fostering Pre-service Teacher Attention and Response to Student Ideas

Kathleen Cruet, University of Wisconsin-Madison

Leema Berland, University of Wisconsin-Madison

B66. Investigating the Development of Secondary Science Methods Students' Orientations and Practices toward Teaching Science.

Stephen B. Witzig, University of Massachusetts Dartmouth

Todd Campbell, University of Connecticut

B68. An Exploratory Investigation of K-8 Pre-Service Teachers' Science Pedagogical Preferences

Selcuk Sahingoz, Western Michigan University

William W. Cobern, Western Michigan University

B70. Preparing Elementary Pre-service Teachers to Teach Socioscientific Argumentation: From Theory to Practice

Maria Evagorou, University of Nicosia

B72. Preservice Elementary Science Teachers' Ideas about Engineering

Mandy Biggers, Penn State University

B74. Heuristic Teaching of Variable-Based Investigation Planning To Science Pre-Service Teachers in the Upper Primary Years

Annemarie Hattingh, University of Cape Town

B76. Exploring Social and Environmental Discourse in Science Curricula across Political Landscapes

Christina A. Phillips-MacNeil, York Region District School Board

B78. Informal Science Approaches to Teacher Preparation: Beginning Elementary Teachers' Ideas about Science Teaching and Learning

Lucy Avraamidou, University of Nicosia, Cyprus

B80. Exploring Pre-service Secondary Science Teachers' Perceptions about Scientific Models

Eunmi Lee, DePaul University

B82. Preparing Science Teachers to be Effective Educators: The Noyce Pathway to Science Program

Andre M. Green, The University of South Alabama

Strand 8: In-service Science Teacher Education

Poster Session B

4:15pm – 5:15pm, Riverside East

B84. Learning Reform-based Science Instruction: Results from a Statewide Professional Development Program for Beginning Science Teachers

Shannon L. Dubois, University of Virginia

Jennifer L. Maeng, University of Virginia

Randy L. Bell, Oregon State University

B86. Teachers-as-Designers: Promoting Teacher Professional Development to Advance Inquiry Learning in the Outdoors Using Mobile Technologies

Keren S. Levy, Technion

Tali Tal, Technion

Yael Kali, University of Haifa

B88. Lesson Study Inspired Professional Development for Science Teachers

Morten F. V. Lundsgaard, University of Illinois

Chris P. Cummings, University of Illinois

B90. Increasing the Impact of a Large Urban School District in Science Through Teacher Professional Development

Donald Wink, University of Illinois at Chicago

Dean Grosshandler, University of Illinois at Chicago

B94. Science Teachers' Practices of Constructing Arguments against Skeptical Theories on Climate Change

Asli Sezen-Barrie, Towson University

Nicole Shea, University of Delaware

B96. Urban Science Teachers' Beliefs, Perceptions and Implementation of CCSS for ELA/Literacy within Interdisciplinary Science Inquiry

Michelle R. Eades-Baird, University at Buffalo

Xiufeng Liu, State University of New York at Buffalo

Bhawna Chowdhary, State University of New York at Buffalo

B98. Argumentation-in-Practice: Using Action Research to Develop Argumentation Practices in a Secondary Science Classroom

Andri Christodoulou, University of Southampton

Strand 9: Reflective Practice**Poster Session B**

4:15pm – 5:15pm, Riverside East

B100. A Poster of the Model for Socio-culturally Relevant Instructional Practice

Olufunmilayo I. Amosun, University of the Western Cape

Strand 10: Curriculum, Evaluation, and Assessment**Poster Session B**

4:15pm – 5:15pm, Riverside East

B102. Examining Secondary Science Teachers' Formative Assessment Practices in Biology Instruction When Using Computer-based Interactive Modules

Melissa A. Jurkiewicz, University of Nevada

J. Steve Oliver, The University of Georgia

Georgia Hodges, University of Georgia

B104. Engineering Design Process Skills Coverage in K-12 Science Curricula

Vivien M. Chabalengula, University of Virginia

Frackson Mumba, University of Virginia

Sonia A. Bendjemil, University of Virginia

B106. Using Rasch Measurement to Validate the Instrument for Evaluating Secondary Chemistry Classroom Teaching and Learning

Peng He, Northeast Normal University (China)

Changlong Zheng, Northeast Normal University (China)

Xiufeng Liu, State University of New York At Buffalo (SUNY)

B108. Creating Early Elementary Assessments for the Next Generation Science Standards

Jenny D. Ingber, Bank Street College of Education

Christopher Lazzaro, Columbia University

B110. Fostering and Assessing Model-based Learning of Human Body Systems through Simulation-Based Investigations

Barbara C. Buckley, WestEd

Daniel Brenner, WestEd

B112. Scientific Literacy and Interdisciplinarity Measured by Multidimensional Test and Concept Mapping

Priit Reiska, Tallinn University

Katrin Soika, Tallinn University

B114. Knowledge of Assessment of Chemistry Teachers

Carmen Fernandez, Universidade de São Paulo

Marina A. Tacoshi, High School teacher

B116. The "Noise" In, and Of Representations: An Analysis of General Chemistry Textbooks

James M. Nyachwaya, North Dakota State University

Merry Gillaspie, Wartburg College

B118. Using Rasch Model to Estimate and Compare Undergraduate Students' Chemistry Competency across Different Classes that Adopt Mastery Learning

Shannon Sung, Spelman College

Lisa Hibbard, Spelman College

Strand 11: Cultural, Social, and Gender Issues**Poster Session B**

4:15pm – 5:15pm, Riverside East

B120. Identifying Sociocultural Challenges of Arabic-speaking ESL Students in Secondary Science

Gihan Fradi, Wayne State University

David Grueber, Wayne State University

B122. Esperanza's Persistence in the Face of Adversity

Michele J. Mann, University of Texas Austin

Jair J. Aguilar, University of Texas Austin

B124. Research Experiences for Students with Disabilities: Changing Perceptions

Loran Carleton Parker, Purdue University

Wilella Burgess, Purdue University

B126. Appropriating Scientific Vocabulary by College Students with Diverse Ethno-linguistic Backgrounds in Chemistry Laboratories

Ruth B. Cink, Auckland University of Technology, New Zealand

Youngjin Song, University of Northern Colorado

B128. Training Next Generation Science Educators for a Culturally Relevant Teacher Education Program

Meshach Mobolaji Ogunniyi, University of the Western Cape

B130. Addressing Pre Service Teachers' Readiness to Teach in Increasingly Diverse Classrooms

Mary K. Nyaema, University of Iowa

B132. Gender Differences in Students' Motivational Beliefs and Science Achievement over Grades in Taiwan

Pey-Yan Liou, National Central University

B134. Challenging Master Narratives: Using Counterstorytelling to Transform Research on Racial Inequities in the Science Doctorate

Senetta Bancroft, Grand Valley State University

Nidaa Makki, University of Akron

**Strand 12: Educational Technology
Poster Session B**

4:15pm – 5:15pm, Riverside East

B136. Measuring Semantic Similarity in Written Text: Applications to Learning and Assessment

Jianfu Chen, Stony Brook University

Minsu Ha, Kangwon National University

Ross H. Nehm, SUNY Stony Brook

B138. Does Displaying the Real-time Voting Results affect Students' Conceptual Learning Outcomes in Clicker-integrated Science Classrooms?

Yu-Ta Chien, National Taiwan Normal University

Chun-Yen Chang, National Taiwan Normal University

B140. Is it Real? Students' and Teachers' Perceived Perceptions of Virtual Presence during a Remote Microscopy Investigation

Gina Childers, North Carolina State University

M. Gail Jones, North Carolina State University

B142. Facebook Platform for Learning Chemistry and for Developing Teachers' TPACK

Ron Blonder, Weizmann Institute of Science

Shelley Rap, Weizmann Institute of Science

B144. Assessment Item "Cover Stories", Semantic Similarity, and Successful Computerized Scoring of Open-ended Text

Minsu Ha, Kangwon National University

Ross H. Nehm, SUNY Stony Brook

B146. Designing Learning Games with Augmented Reality: Science Student Teachers' Learning Outcomes

Miri Barak, Technion, Israel Institute of Technology

Shadi Asakle, Technion- Israel Institute of Technology

B148. Investigation the Effects of Computer Assisted 5E Learning Approach on the Instruction of Cell Division and Reproduction

Yilmaz Kara, Karadeniz Technical University

**Strand 13: History, Philosophy, and Sociology of Science
Poster Session B**

4:15pm – 5:15pm, Riverside East

B150. Student Attitudes toward Biotechnology: Deconstructing a Construct to Develop a Comprehensive Instrument

Grant E. Gardner, Middle Tennessee State University

Angelique Troelstrup, Middle Tennessee State University

B152. Inquiry and Valuing in Science Education based on John Dewey's Perspective

Eun Ah Lee, University of Texas at Dallas

**Strand 14: Environmental Education
Poster Session B**

4:15pm – 5:15pm, Riverside East

B154. Primary Education Teachers' Management of Inner Contradictions in the Building of an Agroecological Learning Environment

Arnau Amat, Universitat de Vic - Universitat Central de Catalunya

Mariona Espinet, Universitat Autònoma de Barcelona, Catalonia, Spain

B156. H2Oklahoma: Valuable Learning or Costly Play?

Julie A. Thomas, University of Nebraska

Nicole Colston, Oklahoma State University

B158. Value Beyond the Standards: A Case Study of a Prairie Restoration Environmental Education Project

Teresa J. Shume, Minnesota State University Moorhead

B160. Teaching Environmental Sustainability Using a Place-based Watershed Modeling Application

Nanette I. Marcum-Dietrich, Millersville University

Strand 15: Policy

Poster Session B

4:15pm – 5:15pm, Riverside East

B162. Operationalizing Metrics of Persistence and On-Track in the STEM Pipeline Using the National Clearinghouse Database

Eric N. Wiebe, North Carolina State University

Landon LaPorte, North Carolina State University

Evening/Social Events

Membership and Elections Committee Sponsored Session Graduate Student Sponsored Session

The Graduate Student Forum aims to provide a place for collaboration based on existing strand topics. The attendees will be able to collaborate with other graduate student members based on their research interests. Attendees will have the opportunity to select multiple strands. This valuable collaboration will foster communication and networking opportunities for the Graduate Students as they develop their research. Scholars from each stand will serve as a host to the collaborative strand table.

5:30pm – 7:00pm, Grand A and Grand B

Presiders:

Jaime Sabel, University of Nebraska

Jodi Devonshire, University of Missouri-St. Louis

Membership and Elections Committee Sponsored Session Early Career and Junior Faculty Early Career Discussion

This session is particularly designed for the early career, junior faculty who need support during the first years of their academic career. The focus will be a panel discussion with experienced faculty who can guide junior faculty through important issues that pertain to the tenure process and other issues. Discussion topics include, but are not limited to: publications, research in the new position, collaboration with different colleges within the university setting, teaching loads, the tenure and promotion process, etc.

We invite all junior faculty interested in this topic to join us.

5:30pm – 7:00pm, Columbus IJ

Presiders:

Christopher G. Wright, The University of Tennessee

Brooke Whitworth, Northern Arizona University

JRST Editorial Team Meeting/Dinner

By invitation only – Sponsored by Wiley-Blackwell

6:00pm-8:30pm, Plaza Ballroom

Reception: International Journal of Science and Mathematics Education

Reception by invitation – Sponsored by Springer

6:00pm – 7:30pm, Randolph

Graduate Student and Early Career Scholars Social

Informal Social – On Your Own (This event is not sponsored by NARST)

7:00pm – 8:00pm, Off-Site: Chicago Houlihan's, 111 E. Wacker Drive (Adjacent to the Hyatt)



Pioneering Science Education Research

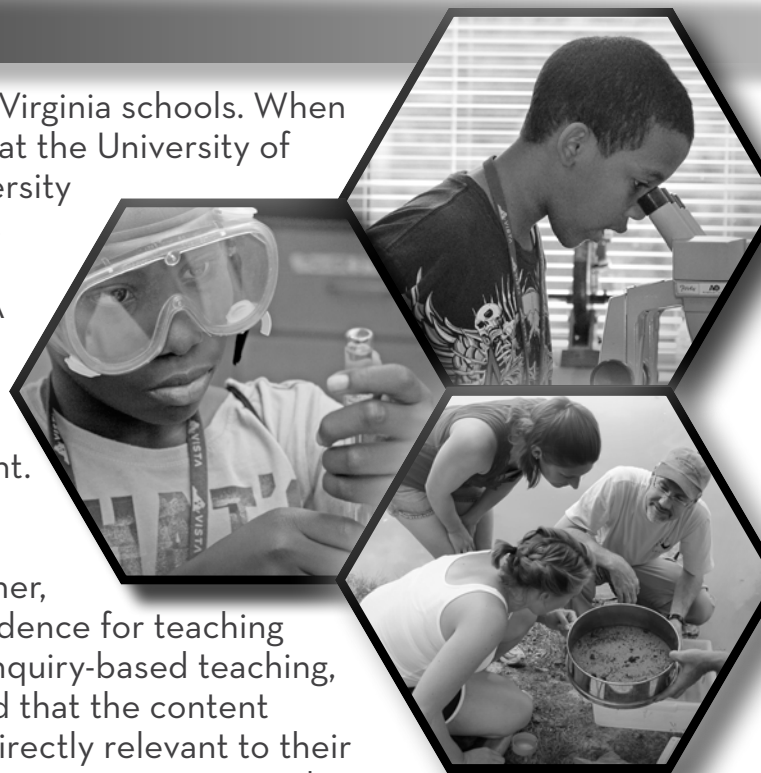
The Virginia Initiative for Science Teaching and Achievement (VISTA) is a multi-year scale-up program to validate prior research on elementary, secondary and programmatic supports for science education (Sterling and Frazier 2010; Frazier and Sterling 2009). Funded by a U.S. Department of Education Investing in Innovation grant, VISTA works with K-12 teachers to help them harness the potential of every student through hands-on, problem-based learning (PBL).

The professional development programs VISTA employs are empowering hundreds of science educators to use a more active style of teaching to engage students in the classroom and beyond. This innovative PBL approach to science teaching shows teachers how to create “real world” student scientists. Students work to solve issues that are relevant not only to their communities but to the future of our world - issues like how to create a more energy independent state or clean up a local river.

VISTA Works!

VISTA has already made measurable impact in Virginia schools. When researchers from the external evaluation team at the University of Virginia’s Curry School and Oregon State University analyzed student achievement data, the results showed that economically disadvantaged students of teachers who participated in VISTA professional development achieved a 14-point increase in scaled test scores as compared to students in the control group whose teachers did not receive VISTA professional development.

Other research showed that VISTA impacts teachers’ beliefs and classroom practices. Further, teachers’ science content knowledge and confidence for teaching science increases by doing hands-on science, inquiry-based teaching, and problem-based learning. Teachers reported that the content and strategies they learned from VISTA were directly relevant to their classroom instruction and would help them improve instruction in the upcoming year.



**Visit the VISTA booth at NARST today or
vista.gmu.edu for more information!**

Monday, April 13, 2015

Conference Registration

7:00am – 5:00pm, Grand Group Office

Committee Meetings

7:00am – 8:15am

Outstanding Doctoral Research Award Committee Meeting

7:00am – 8:15am, Grand A

Early Career Research Award Committee Meeting

7:00am – 8:15am, Grand B

Distinguished Contributions through Research Award Committee Meeting

7:00am – 8:15am, Grand D North

Equity and Ethics Committee Meeting

7:00am – 8:15am, Columbus CD

External Policy and Relations Committee Meeting

7:00am – 8:15am, Columbus EF

Research Committee Meeting

7:00am – 8:15am, Columbus GH

Membership and Election Committee Meeting

7:00am – 8:15am, Columbus IJ

International Committee Meeting

7:00am – 8:15am, Columbus KL

Program Committee Meeting

7:00am – 8:15am, Comiskey

Publications Advisory Committee Meeting

7:00am – 8:15am, Gold Coast

Plenary Session #2

Science Teacher Education in an Era of Science Education Reform: A Global Perspective

8:30am – 10:00pm, Grand Ballroom CD South, EF

President:

Valarie Akerson, Indiana University

Discussants:

Norman Lederman, Illinois Institute of Technology,

Editor of Journal of Science Teacher Education

Judith Lederman, Illinois Institute of Technology,

Editor of Journal of Science Teacher Education

NOTE: First author listed will be presenter for group.

Presenters:

Africa

Meshach Ogunniyi, University of the Western Cape, South Africa

Marissa Rollnick, University of Witwatersrand, Johannesburg, South Africa

Asia

Liu Enshan, Beijing Normal University, China

Liu Cheng, Beijing Normal University, China

Jian Wang, Beijing Normal University, China

Australia

David Treagust, Curtin University, Australia

Jacinta Petersen, Notre Dame University, Australia

Mihye Won, Curtin University, Australia

Georgie Wynne, Catholic Education Office of Western Australia, Australia

Europe

Justin Dillon, University of Bristol, United Kingdom

Virginie Albe, Ecole Normale Supérieure de Cachan, France

Maria Evagorou, University of Nicosia, Cyprus

Jouni Viiri, University of Jyväskylä, Finland

North America

Joanne Olson, Iowa State University, USA

Todd Milford, University of Victoria, Canada

Chris Ohana, Western Washington University, USA

Christine Tippet, University of Ottawa, Canada

South America

Hernan Cofre, Pontificia Universidad Catolica de Valparaiso, Chile
Germán Ahumada, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile

Johanna Camacho, Universidad de Chile, Santiago, Chile

Melina Furman, Universidad de San Andrés, Buenos Aires, Argentina

Rómulo Gallego, Universidad Pedagógica Nacional de Bogotá, Colombia

Corina González-Weil, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile

David Santibáñez, Universidad Católica Silva Henríquez, Santiago, Chile

Royman Pérez, Universidad Pedagógica Nacional de Bogotá, Colombia

María E. Podesta, Universidad de San Andrés, Buenos Aires, Argentina

Claudia Vergara, Universidad Alberto Hurtado, Santiago, Chile

Break

10:00am – 10:30am, Grand Foyer

Concurrent Session #7

10:30am – 12:00pm

Equity and Ethics Committee Sponsored Session

Symposium - Jhumki Basu Scholars Symposium:

Curriculum, Assessment, and Learning Environments to Enhance Science Teaching and Learning

10:30am - 12:00pm, Columbus EF

Presenters:

Devarati Bhattacharya, University of Minnesota, Minneapolis

Ying-Chih Chen, Arizona State University

Helen Douglass, University of Colorado, Denver

Tam'ra-Kay Francis, University of Tennessee, Knoxville

Brittany A. Garvin, University of South Carolina

Amal Ibourk, Michigan State University

Shiyu Liu, The Pennsylvania State University

Kathryn A. Stofer, University of Florida

Ibrahim H. Yeter, Texas Tech University

Membership and Election Committee Sponsored Session

Admin Symposium - The Future of NARST Leadership: YOU

10:30am - 12:00pm, Columbus GH

Presenters:

Pauline W.U. Chinn, University of Hawaii at Manoa

Lynn A. Bryan, Purdue University

Strand 1: Science Learning, Understanding and Conceptual Change

Toward a More Comprehensive Theory of Modeling Instruction

10:30am - 12:00pm, Grand A

Presider: David F. Treagust, Curtin University

Benchmark Lessons: Integrating Modeling with Games for Learning Physics

Kara Krinks, Vanderbilt University

Pratim Sengupta, Vanderbilt University

Douglas B. Clark, Vanderbilt University

Students' Views of Model Evaluation and Change of Models In Different Science Context

Silvia Wen-Yu Lee, National Changhua University of Education

Hsin-Kai Wu, National Taiwan Normal University

Hsin-Yi Chang, National Kaohsiung Normal University

Mismatches between Represented Science Content and Unmet Expectations as a Mechanism of Model Revision

Lauren Barth-Cohen, University of Miami

Michael C. Wittmann, University of Maine

Fostering Meta-Modeling Knowledge in Consideration of Domain-Specific Knowledge

Anja Czeskleba, University of Duisburg-Essen

Philipp Schmiemann, University of Duisburg-Essen

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Representations, Models and Reasoning

10:30am - 12:00pm, Water Tower

Presider: Folashade Afolabi, Tshwane University of Technology, Pretoria South Africa

Information Processing from different Representations in Biology – Students' Abilities and Strategies

Kathrin Ziepprecht, University of Kassel

Julia Schwanewedel, Leibniz

Jürgen Mayer, University of Kassel

Design Heuristics to Enable Students Productive Use of Evidence in K-12 Classrooms

Katherine L. McNeill, Boston College

Leema Berland, University of Wisconsin-Madison

Evaluating a Science Claim versus Making Decisions: Effect of Goals on High School Students' Requests for Evidential and Explanatory Information

Jacqueline Wong, UCLA

William A. Sandoval, University of California, Los Angeles

Children's Engineering Design: More than Mere Science

Mijung Kim, University of Alberta

Wolff-Michael Roth, University of Victoria

Examining Student Collaboration and Knowledge Building Through the Use of A Synchronous, Tablet-Based Science App

Carrie-Anne Sherwood, University of Michigan

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

Instructional Approaches and Student Outcomes

10:30am - 12:00pm, Grand Suite 5

Presider: Irene U. Osisioma, California State University, Dominguez Hills

Teaching Physics in Our High School Classrooms

Dennis W Sunal, University of Alabama

Cynthia Szymanski Sunal, University of Alabama

John Dantzler, University of Alabama

Donna P. Turner, University of Alabama

James W. Harrell, University of Alabama

Mogan D. Aggawal, Alabama A&M University

Marilyn Stephens, University of Alabama

Exploring the Impacts of Interaction with Indigenous Craftsmen on Senior Secondary School Students' Achievement in Physics

Irene U. Osisioma, California State University, Dominguez Hills

Peter A. Okebukola, Lagos State University, Nigeria

Hakeem Akintoye, Lagos State University, Nigeria

Grace Njoku, Lagos State University, Nigeria

Solomon Aragbede, Lagos State University, Nigeria

Yinka Orulebaja, Lagos State University, Nigeria

The Potential of Ambitious Instruction for Fostering Science for All: A Comparative Case Study

Anna M. Strimaitis, Florida State University

Sherry A. Southerland, Florida State University

Jonathon Grooms, Florida State University

Patrick J. Enderle, Florida State University

Victor D. Sampson, Florida State University

Cognitive Activation in Biology Lessons

Christian Förtsch, LMU Munich

Sonja Werner, LMU Munich

Lena von Kotzebue, LMU Munich

Birgit Jana Neuhaus, LMU Munich

Lack of Physics Teachers

Isaac Buabeng, University of Canterbury

Lindsey Conner, University of Canterbury

David Winter, University of Canterbury

Strand 4: Science Teaching--Middle and High School**(Grades 5-12): Characteristics and Strategies*****Socio-scientific Issues in Science Education***

10:30am - 12:00pm, Grand Suite 3

Presider: Wardell Anthony Powell, Polk County Public Schools***Data Explorations in Ecology: Students' Understanding of Variability and Use of Data in Environmental Citizenship***

Alan R. Berkowitz, Cary Institute of Ecosystem Studies

Cornelia Harris, Cary Institute of Ecosystem Studies

Tobias Irish, Cary Institute of Ecosystem Studies

Enhancing Korean Middle School Students' 21st Century Skills through Collective Intelligence based SSI Instruction

Yunhee Choi, Soongmoon Middel School, Seoul, South Korea

Yeonjoo Ko, Ewha Womans University

Hyunju Lee, Ewha Womans University

The Derivation of an Instructional Model and Design Processes for Socioscientific Issues-based Teaching

Troy D. Sadler, University of Missouri

Patricia J. Friedrichsen, University of Missouri-Columbia

Kerri Graham, Rock Bridge High School

The Relationship Between Moral Sensitivity and SSI Reasoning

Eunhang Lee, Ewha Womans University

Dana L. Zeidler, University of South Florida

Younglan Chung, Ewha Womans University

Impact of Emotive Reasoning on Students' Integration of Scientific Considerations on Decision- Making about Socioscientific Issues

Wardell Anthony Powell, University of South Florida

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

10:30am - 12:00pm, Roosevelt

Presider: Miri Barak, Technion, Israel Institute of Technology***Designing for Retention of Engineers with Curriculum Reform in General Chemistry***

Kent J. Crippen, University of Florida

Treavor H. Boyer, University of Florida

Chang-Yu Wu, University of Florida

Philip J. Brucat, University of Florida

Maria Korolev, University of Florida

Trisha de Torres, University of Florida

Marykay Orgill, University of Nevada, Las Vegas

Comparison of Intended Engineering Majors at 2-and 4-year Institutions: Backgrounds, High School Experiences, and Goals

Allison F. Godwin, Purdue University

Geoff Potvin, Florida International University

Zahra Hazari, Florida International University

Leidy Klotz, Clemson University

Novel Makerspace Internship: How Culture Supports Engineering Student Creativity and Initiative

Thomas R. Tretter, University of Louisville

Stephanie B. Philipp, Miami University

Cindy Harnett, University of Louisville

Graduate Engineers Teaching Authentic Science in Secondary Science Classrooms

Jaclyn K. Murray, University of Georgia

Barbara A. Crawford, University of Georgia

Instructor Goals and Practices Related to STSE (Science, Technology, Society and the Environment) in the Teaching of Undergraduate Engineering Students

Lisa Romkey, University of Toronto

Strand 6: Science Learning in Informal Contexts
Informal Science Experiences of Young Children and Families

10:30am - 12:00pm, Comiskey

Presider: Josephine Desouza, Ball State University

"The Map Don't Help": Disadvantaged Families Experiences of Visiting A Science Museum

Emily Dawson, King's College London

Louise Archer, King's College London

Billy Wong, University of Roehampton

Amy Seakins, King's College London

Jennifer Dewitt, King's College London

A Kids'-Eye View of Interest in the Zoo

Alexandra M. Burris, Indiana University

Adam V. Maltese, Indiana University

Parent Chaperone-Student Interactions during a Field Trip to an Informal Science Education Camp

Kelly A. Riedinger, David Heil & Associates, Inc.

Amy R. Taylor, University of North Carolina Wilmington

Preschool-Age Children Engaged in Science Practices through Astronomy Experiences at a Museum

Julia Plummer, Pennsylvania State University

Strand 8: In-service Science Teacher Education
Related Paper Set - Testing the Consensus Model of Effective PD: Analysis of Practice and the PD Research Terrain

10:30am - 12:00pm, Grand B

Presider and Discussant: Hilda Borko, Stanford University

Testing the Consensus Model of Effective PD: A Videocase-based, Analysis-of-Practice Program

Kathleen J. Roth, California State Polytechnic University, Pomona

Nicole I. Z. Wickler, California State Polytechnic University, Pomona

Science Teachers Learning from Lesson Analysis (STeLLA): An RCT Study Comparing Analysis-of-Practice PD and Content Deepening PD

Joseph A. Taylor, Abt Associates Inc.

Christopher Wilson, BSCS

Kathleen J. Roth, California State Polytechnic University, Pomona

Findings from the STeLLA Line of Research Expand the Consensus Model of Effective PD

Connie Hvidsten, BSCS

Jody Bintz, BSCS

Paul Numedahl, BSCS

Kathleen J. Roth, California State Polytechnic University, Pomona

Expanding the STeLLA Professional Development Terrain: Testing Scalability and Sustainability

Betty Stennett, BSCS

Christopher Wilson, BSCS

Susan M. Kowalski, BSCS

Nicole I. Z. Wickler, California State Polytechnic University, Pomona

Kathleen J. Roth, California State Polytechnic University, Pomona

Strand 10: Curriculum, Evaluation, and Assessment
Engineering

10:30am - 12:00pm, Columbus AB

Presider: Shannon H. Sung, Spelman College

Learning Science through an Engineering Curriculum

Selcen Guzey, Purdue University

Tamara J. Moore, Purdue University

Gillian Roehrig, University of Minnesota

Michael Harwell, University of Minnesota

Alison Phillips, Research Assistant

Mario Moreno, Research Assistant

Scalable Approaches to Modeling and Engineering in High School Biology

Kathy Lea Malone, The Ohio State University

Anita Schuchardt, University of Pittsburgh

Christian D. Schunn, University of Pittsburgh

Student-Oriented Meta-Assessment in a Project-Based Systems Engineering Course

Niva Wengrowicz, Technion

Yehudit Judy Dori, MIT

Dov Dori, Technion

An Engineering and Science Framework for Teaching K12 Bioenergy Concepts: A Delphi Consensus Study

Brian Hartman, Oregon State University

Kimi Grzyb, Oregon State University

Katharine G. Field, Oregon State University

Teaching Basic Nanotechnology Concepts in the Context of Nanotechnology Applications: Results of a Delphi Study

Ron Blonder, The Weizmann Institute of Science

Sohair Sakhnini, The Weizmann Institute of Science

**Strand 11: Cultural, Social, and Gender Issues
Language and Linguistics**

10:30am - 12:00pm, Columbus KL

Presider: Muhammad Abd Hadi Bunyamin, University of Minnesota

Next Generation Science Learning for English Language Learners: Identifying Some Dilemmas of Practice

Savitha Moorthy, SRI International

Angela H. DeBarger, George Lucas Educational Foundation

Yves Beauvineau, Culturally Responsive Science Pedagogies

STEM Against All Odds: Cases of Access, Opportunity, and Persistence Among Recently Arrived, Low-Income, Urban Immigrant English Language Learners

Jeremy Heyman, Columbia University

Christopher Emdin, Columbia University

Science: A Mechanism for Making Classroom Discourse Accessible to Emerging Bilinguals

Enrique Suarez, University of Colorado, Boulder

Valerie K. Otero, University of Colorado, Boulder

Supporting Science Learning in Linguistically Diverse Classrooms using Multimodal Tasks: An Exploratory Study

Preetha K. Menon, UC Santa Cruz

**Strand 12: Educational Technology
Educational Technology in the Secondary and Post Secondary Environment**

10:30am - 12:00pm, Gold Coast

Presider: Michael S. Tutwiler, Harvard

Technology Use in Post-Secondary STEM Courses: Findings and Implications from a Meta-Analysis

Rana M. Tamim, Zayed University

Eugene Borokhovski, Concordia University

Robert M. Bernard, Concordia University

Richard F. Schmid, Concordia University

Physics Students' Social Media Learning Behaviours and Connectedness

Rachel Moll, Vancouver Island University

Wendy Nielsen, University of Wollongong

Cedric Linder, Uppsala University

Students' Learning Trajectories in Developing Explanatory Models: Exploring Adaptive Scaffolding of Interactions with Online Science Simulations

David E. Brown, University of Illinois Urbana-Champaign

Robb Lindgren, University of Illinois Urbana-Champaign

Learning Affordances related to Participation-in and Observation-of Particle Simulations: Hints from Seemingly Off-task Talk

Elon Langbeheim, Arizona State University

Sharona T. Levy, University of Haifa

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

10:30am - 12:00pm, Randolph

Presider: Michael R. Matthews, University of New South Wales

Eminent Scientists and Extended Peer Communities in a period of Post-normal Science

Dorothy V. Smith, La Trobe University

Pamela J. Mulhall, Monash University

Christina E. Hart, La Trobe University

Richard F. Gunstone, Monash University (retired)

Critical Contextual Empiricism and the Uptake of Change in Evolution Textbooks

Linda C. Fuselier, University of Louisville

Kasi Jackson, West Virginia University

Rachel Stoiko, West Virginia University

Physics Education Research and Mixed Methods Research Then and Now: Establishing a Symbiotic Relationship

Jonathan Engelman, University of Cincinnati

Lindsay Owens, University of Cincinnati

Ideology and Interdisciplinary Science Education Reform: An Althusserian Critique

Benjamin Allen, University of Tennessee, Knoxville

Strand 14: Environmental Education***Environmental Literacies***

10:30am - 12:00pm, Grand D North

President: Dorene R. Medlin, Albany State University***Student and Pre-service Teacher Thinking about the Relationship between Ecology, Environmental Issues and Daily Life***

Yael Wyner, City College of New York, CUNY

Erica Blatt, College of Staten Island, CUNY

Edita O'Brien, College of Staten Island, CUNY

Jessica Genter, City College of New York, CUNY

Environmental-related Literacies Specified in the NGSS: Students' Attitudes, Knowledge and Concerns

Leslie Neitzer, Southern Illinois University

Vivien M. Chabalengula, University of Virginia

Frackson Mumba, University of Virginia

A Comparison Study of the Environmental Literacy Plans in Tennessee and North Carolina

Karena M. Ruggiero, University of Tennessee

Barry W. Golden, University of Tennessee

Encouraging Environmental Literacy in Elementary Classrooms: Challenges and Opportunities

Sarah J. Carrier, North Carolina State University

Kathryn T. Stevenson, North Carolina State University

Latent Path Model Assessing Relationship Between Epistemological Beliefs and Environmental Literacy

Gokhan Ozturk, Texas A&M University

Strand 15: Policy***STEM Schools in the NGSS Era: Components, Impacts, and Policy Implications***

10:30am - 12:00pm, Columbus CD

President: Sharon J. Lynch, George Washington University***Critical Components of Inclusive STEM High Schools: Instrumental Variables Revisited, Rethought, and Re-envisioned***

Sharon J. Lynch, George Washington University

Erin E. Peters-Burton, George Mason University

Tara Behrend, George Washington University

Edmund M. Han, George Washington University

Michael Ford, George Washington University

Nancy Spillane, George Washington University

Courteney Coyne, George Washington University

Ann House, SRI International

Examining Inclusive STEM Schools' Role in College and Career Readiness of Students: A Multi-group Analysis

Niyazi Erdogan, Balikesir University

Carol L. Stuessy, Texas A&M University

Dane Bozeman, Texas A&M University

Policy Implications from Social Network Typologies of STEM-Themed Urban Schools

Julianne A. Wenner, University of Connecticut

John Settlage, University of Connecticut

NGSS Implementation Resources: Averting Blind Spots

Zoubeida R. Dagher, University of Delaware

Sibel Erduran, University of Limerick

Awards Luncheon**12:15pm – 2:15pm, Regency Ballroom**

Concurrent Session #8

2:30pm – 4:00pm

Research Committee Sponsored Session

Symposium - CADASE Admin Session: Re-enacting Culturally Relevant Science Education: Lessons from the Chicago Grassroots Curriculum Taskforce Project
2:30pm - 4:00pm, Columbus IJ

Presiders:

Irene U. Osisioma, California;
Melody Russell, Auburn University,

Discussants:

Malcolm Butler, University of Central Florida
Neporcha Cone, Kennesaw State University
Obed Norman, Morgan State University
Femi Otulaja, University of the Witwatersrand, South Africa

Presenters:

Anton Miglietta, Chicago Grassroots Curriculum Taskforce
Cecily Relucio Hensler, Chicago Grassroots Curriculum Taskforce
Alejandra Frausto, Rudy Lozano Leadership Academy

Strand 1: Science Learning, Understanding and Conceptual Change

Topics in Learning Progressions

2:30pm - 4:00pm, Columbus GH

Presider: Molly Bolger, University of Arizona

Quantitative Reasoning Learning Progressions in Environmental Science: Rasch Analysis and Student Learning

Jennifer H. Forrester, University of Wyoming
Robert L. Mayes, Georgia Southern University
Kent Rittschof, Georgia Southern University
Jennifer Christus, University of Wisconsin-Oshkosh
Franzi Peterson, University of Wyoming

Using a Learning Progression to Compare the Feedback Loop Reasoning of Elementary Students in the US and Lebanon

Hayat Hokayem, Texas Christian University
Hui Jin, Ohio State University
Sahar K. Alameh, University of Illinois Urbana Champagne
Hagop A. Yacoubian, Haigazian University

Analyzing Effectiveness of Scaffolding to Promote Argumentation and Conceptual Understanding in an Electronic Science Notebook

Courtney Behrle, North Carolina State University
Eric N. Wiebe, North Carolina State University
Angela Shelton, North Carolina State University

Strand 1: Science Learning, Understanding and Conceptual Change

Using Representations for Teaching and Learning

2:30pm - 4:00pm, Gold Coast

Presider: Grady J. Venville, University of Western Australia

Sensing Science: Assessing K-2 Students Readiness for Reasoning with Kinetic Models of Heat

Carolyn Staudt, Concord Consortium
Elham Beheshti, Northwestern University
George Forman
Nathan Kimball, Concord Consortium
Jamie Broadhead

Examining the Use of Multiple and Multimodal Representations on Students Science Knowledge Development and Retention

Heidi Wiebke, Indiana University
Meredith A. Park Rogers, Indiana University
Susan Hawkins, Indiana University
Jared R. Allen, Indiana University
What Recent Research on Diagrams Suggests About Learning With Rather than Learning from Visual Representations
Christine D. Tippet, University of Ottawa
Larry Dean Yore, University of Victoria

Embodied Cognition as a Framework for Designing and Analysing External Representations to Teach Science

Kai Niebert, University of Zurich

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Related Paper Set - Material Practice and Materiality: Too Long Ignored in Science Education and Possibly the NGSS?

2:30pm - 4:00pm, Randolph

Using Spacetime-mattering to Engage Science Education with Matter and Material Feminism

Kathryn Scantlebury, University of Delaware
Anita Hussenius, Uppsala University, Centre for Gender Research
Kristina Andersson, Centre for Gender Research, Uppsala University
Annica Gullberg, University of Gävle
Anna T. Danielsson, Uppsala University

The Materiality of Materials and Artefacts Used in Science Classrooms

Bronwen M. Covie, University Of Waikato/WMIER
Kathrin Otrell-Cass, Aalborg University

The Material Object and Patterns of Attention in Science Learning

Shirley A. Simon, University of London
Paul Davies, University of London

The Material Object and Patterns of Attention in Science Learning

David Heywood, Manchester Metropolitan University

The Materiality of Scientific Instruments and Why it Might Matter to Science Education

Catherine E. Milne, New York University

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies Practices and Beliefs from Teachers inside the Classroom

2:30pm - 4:00pm, Columbus KL

Presider: Edward G. Lyon, Arizona State University

New Content, Strategies, and Tools, Oh My!: Preschool Teachers Navigate Innovations to Promote Science Learning

Marion Goldstein, EDC/Center for Children and Technology
Ximena Dominguez, SRI International
Regan Vidiksis, EDC/Center for Children and Technology
Ashley Lewis Presser, EDC/Center for Children and Technology
Danae Kamdar, SRI International
Christine Zanchi, WGBH Educational Foundation
Courtney Blackwell, Northwestern University

Examining the Relationship of Beginning Elementary Teachers' Beliefs and Practice

Sarah J. Carrier, North Carolina State University
Daniell DiFrancesca, North Carolina State University
Elizabeth Greive, North Carolina State University

A Case Study on Science Teaching Practices and Teacher Perspectives in an Early Childhood Setting

Ayse Busra Ceviren, Istanbul Sabahattin Zaim University
Devrim Guven, Bogazici University

Teacher Practices that Support Student Learning of Science Content and Practice

Joi Merritt, Arizona State University

Voices from the Classroom: Elementary Teachers Talk about their Science Related Instructional Choices

Elisebeth Boyer, Ohio State University

Strand 4: Science Teaching--Middle and High School (Grades 5-12): Characteristics and Strategies Related Paper Set - Affordances and Constraints of Learning Progressions for Informing Teachers' Reasoning

2:30pm - 4:00pm, Grand Suite 5

Presider: Alicia C. Alonzo, Michigan State University

Discussant: Erin M. Furtak

Using Learning Progressions to Support Pre-Service Physics Teachers' Noticing

Claudia von Aufschnaiter, Justus Liebig University Giessen
Alicia C. Alonzo, Michigan State University
Sophie Kirschner, Justus Liebig University Giessen

Physics Teachers' Use of LP-Based Assessment Information to Reason about Student Ideas and Instructional Responses

Alicia C. Alonzo, Michigan State University
Andrew Elby, University of Maryland

Using a Learning Progression as a Tool to Inform a Physics Teacher's Practice

Elizabeth X. de los Santos, Michigan State University
Deano Smith, Greenhills School

Using LP-Based Assessment Results in the Physics Classroom: A Teacher's Perspective

Alexander Robinson, Thornapple Kellogg High School

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

2:30pm - 4:00pm, Grand Suite 3

Presider: Patricia S. Dunac, Fayette County Schools

Influence of Physics Teachers' Professional Knowledge on Cognitive Activation in Classroom and on Students' Outcomes

Eva Cauet, University Duisburg-Essen
Sven C. Liepertz, RWTH Aachen University
Andreas Borowski, University of Potsdam
Hans Ernst Fischer, University Duisburg-Essen

Teachers' Professional Knowledge of Experiments and Models, Their Teaching, and Students' Learning Outcome

Martina Strübe, University of Duisburg-Essen Chemistry Education
Oliver Tepner, University of Regensburg, Germany
Elke Sumfleth, Universitaet Duisburg-Essen

Can Teachers' Beliefs and Instructional Practices Effectively Predict Science Achievements of Middle School Students?

Ming-Chih Lan, University of Washington
Hongyan Newton, University of Washington
Min Li, University of Washington

Teacher Knowledge and Student Attitudes in Context-Based Science Education

Erik Barendsen, Radboud University Nijmegen and Open University of the Netherlands
Ineke Henze, Delft University of Technology

Investigating the Alignment of Science Teaching Orientations to Instruction on Evolution among Secondary Teachers

Margaret M. Lucero, Santa Clara University

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

Research Experiences - Mentoring

2:30pm - 4:00pm, Roosevelt

Presider: Stacey L. Carpenter, University of California - Santa Barbara

Mentoring Relationships Contribute to the Long-Term Academic and Career Outcomes of Undergraduate Researchers

Megan F. Campanile, Illinois Institute of Technology
Norman G. Lederman, Illinois Institute of Technology
Eric M. Brey, Illinois Institute of Technology

Dynamic Mentoring: Changing Mentoring Styles in a Summer Research Experience for Undergraduates

Gareth Wyatt, University of South Florida
Allan Feldman, University of South Florida

Examining Mentoring of Undergraduate Science Researchers in Undergraduate-Postgraduate-Faculty Triads

Melissa L. Aikens, University of Texas at Austin
Erin L. Dolan, University of Texas at Austin

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

Research Experiences

2:30pm - 4:00pm, Columbus AB

Presider: Peter A. Okebukola, Lagos State University

Undergraduate Research Students' Knowledge of Scientific Methods: Overall Trend and Individual Differences

Omolola Adedokun, Purdue University
Loran Carleton Parker, Purdue University
Wilella Burgess, Purdue University
Dorothy Teegarden, Purdue University

Development of a Performance-Based Measure to Assess the Scientific Thinking Skills of Undergraduate Researchers

Joseph A. Harsh, James Madison University
Adam V. Maltese, Indiana University
John Esteb, Butler University
Mikaela Schmitt-Harsh, Carleton College

Effects of Authentic Research on Undergraduate Biology Student Achievement

Brandon S. Diamond, University of Miami

Strand 6: Science Learning in Informal Contexts

Informal Science Experiences in an International Context

2:30pm - 4:00pm, Grand B

Presider: Che-Yu Kuo, National Taiwan Normal University

Comparing the Effect of Media on Measures of Scientific Literacy between Taiwanese and Chinese Students

Michael S. Tutwiler, Harvard
Pei-Ling Lin, University of Essex
Baojun Yao, Jiangxi Normal University
Chun-Yen Chang, National Taiwan Normal University

Developing Scientific Literacy during International STEM Camp Programs

Judith S. Lederman, Illinois Institute of Technology
Stephen A. Bartos, Middle Tennessee State University
Allison Antink-Meyer, Illinois State University

From Interest to Inquiry: Leveraging Student Interest to Teach Science Practices in Kenya

Anne E. Leak, University of California, Santa Barbara
Alexis Farag, University of California, Santa Barbara
Danielle B. Harlow, University of California, Santa Barbara

Student Learning Experiences: Influences on High School Teachers' Science Pedagogy in Kenya

Samson Madera Nashon, University of British Columbia
David Anderson, University of British Columbia
Elizabeth Namazzi, University of British Columbia

Strand 7: Pre-service Science Teacher Education
Preservice Teachers' Subject Knowledge

2:30pm - 4:00pm, Columbus EF

Presider: Christopher A. Bogiages, Knowles Science Teaching Foundation

Content Knowledge for Teaching in NGSS Oriented Classrooms

Leonora Kaldaras, Michigan State University

Gail Richmond, Michigan State University

Joyce M. Parker, Michigan State University

Content Knowledge and Formative Assessment Integration in a Life Sciences Methods Course for Preservice Teachers

Jaime L. Sabel, University of Nebraska-Lincoln

Cory T. Forbes, University of Nebraska-Lincoln

Laura Zangori, University of Nebraska-Lincoln

The Inner Structure of Prospective Physics Teachers' Pedagogical Content Knowledge

Yvonne Gramzow, University of Paderborn

Josef Riese, University of Paderborn

Peter Reinhold, University of Paderborn

A Learning Progression for Preservice Elementary Teachers' Subject Matter Knowledge of Energy

Jingjing Ma, Texas Christian University

Channa N. Barrett, Texas Christian University

Strand 8: In-service Science Teacher Education
Teachers' Readiness for NGSS

2:30pm - 4:00pm, Grand D North

Presider: Sherry A. Southerland, Florida State University

Negotiating Transition to the NGSS: Findings from a K-8 Professional Learning Project

Andy R. Cavagnetto, Washington State University

Chad Gotch, Washington State University

Olusola Adesope, Washington State University

Judy Morrison, Washington State University

Kathy Baldwin, Eastern Washington University

James Marr, Washington State University

Georgia Boatman, Educational Service District 123, Pasco WA

Teachers Grappling with NGSS and Common Core: Empirically Examining Lesson Study Teams

Christine Lee, California State University East Bay

Rich Hedman, California State University, Sacramento

Kathryn N. Hayes, California State University East Bay

Dawn O'Connor, Alameda County Office of Education

Jeffery Seitz, California State University East Bay

Rachelle DiStefano, California State University East Bay

Taking Steps towards the NGSS: Scientists and Science Educators Designing Standards-based Science Courses for Teachers

Jennifer Mesa, University of West Florida

Rose M. Pringle, University of Florida

Natalie King, University of Florida

Operationalizing Elementary Teachers' Understanding of and Readiness for Teaching within the Context of the Next Generation Science Standards

Gustave E. Nollmeyer, Eastern Washington University

Arthur Bangert, Montana State University

Designing for Culturally Responsive Next Generation Science Educators

Julie C. Brown, University Of Minnesota

Kent J. Crippen, University of Florida

Strand 9: Reflective Practice

Reflections on Students Conceptions, Reasoning and Understanding in Science

2:30pm - 4:00pm, Water Tower

Presider: Olufunmilayo I. Amosun, University of the the Western Cape

Investigating Secondary School and Junior College Students' Conceptual Explanations in Heat Transfer

Eugene Lim, National Institute of Education, NTU Singapore

Hye-Eun Chu, Nanyang Technological University

Daniel Kim Chwee Tan, National Institute of Education

Context and Constraints on Noticing in Classrooms of Early Career Science Teachers

Benjamin K. Campbell, University of Georgia

Ryan S. Nixon, University of Georgia

Julie A. Luft, University of Georgia

Using Next Generation Science Standards (NGSS): A Self-Study in Secondary Science, Engineering, and Mathematics Classes

Arthur F. Corvo, Teachers College - Columbia University

Felicia Moore Mensah, Teachers College, Columbia University

Pre-service Elementary Teachers' Attention and Pedagogical Reasoning through Video-based Reflection

Youngjin Song, University of Northern Colorado
Hye-Gyoung Yoon, Chuncheon National University of Education

**Strand 10: Curriculum, Evaluation, and Assessment
*Next Generation Science Standards (NGSS)***

2:30pm - 4:00pm, Comiskey

Presider: Hendrik Haertig, IPN - Leibniz-Institut

Investigating Change in Classroom Instruction of Scientific Practices, Crosscutting Concepts, and Core Ideas

Rebecca L. Matz, Michigan State University
James T. Laverty, Michigan State University
Sarah E. Jardeleza, Michigan State University
Claire M. Morrison, Michigan State University
Zachary D. Nusbaum, Michigan State University
Sonny A. Ly, Michigan State University
Diane Ebert-May, Michigan State University
Joseph S. Krajcik, Michigan State University
Marcos D. Caballero, Michigan State University
Melanie M. Cooper, Michigan State University

Supporting Next Generation Science Teaching and Learning with Curriculum Materials: Results from an Efficacy Study

Christopher J. Harris, SRI International
William R. Penuel, University of Colorado
Angela H. DeBarger, George Lucas Educational Foundation
Savitha Moorthy, SRI International
Cynthia M. D'Angelo, SRI International
Joseph S. Krajcik, Michigan State University

A Curriculum Model for Integrating the Three NGSS Dimensions and Utilizing Published Biology Data

Nicola C. Barber, University of Utah
Martin M. Fernandez, American Association for the Advancement of Science
Jo Ellen Roseman, American Association for the Advancement of Science
Louisa A. Stark, University of Utah

Comparative Analysis of Three Methods of Minimizing Bias Implications for NGSS Assessment Validity and Fairness

Christiana Nkechi Omoifo, University of Benin
Njideka D. Okomah, University of Benin/NABTEB

**Strand 11: Cultural, Social, and Gender Issues
*Undergraduate STEM Success***

2:30pm - 4:00pm, Columbus CD

Presider: Dorene R. Medlin, Albany State University

Motivation Factors Affecting Career Choice of Senior Women and Undergraduates in Information and Systems Engineering

Hagit Refaeli Mishkin, Technion, Israel Institute of Technology
Niva Wengrowicz, Technion
Dov Dori, Technion
Yehudit Judy Dori, Technion-Israel Institute of Technology

Finding a Way to Belong: Negotiating Gender at University STEM Study Programmes

Lene Møller Madsen, University of Copenhagen
Henriette T. Holmegaard, University of Copenhagen
Lars Ulriksen, University of Copenhagen, Denmark

Ethnography of a College Physics Classroom: Identifying Gender Bias and Investigating Pedagogical Interventions

Diane C. Jammula, Columbia University

**Strand 12: Educational Technology
*Tools in Educational Technology***

2:30pm - 4:00pm, Grand A

Presider: Robert H. Evans, University of Copenhagen

3D Printing Technology as an Educational Tool for Seventh Grade Students: Do Affordances Outweigh Constraints?

William J. McConnell, Old Dominion University
Daniel L. Dickerson, Old Dominion University
Petros Katsioloudis, Old Dominion University

A Self-Regulated Technology-enhanced Environment for Learning Skills in Science

Tali N. Shapiro, Weizmann Institute of Science
Bat Sheva Eylon, Weizmann Institute of Science
Zahava Scherz, Weizmann Institute of Science

Use of an Online Learning Environment to Enhance Experiences of Youth in Engineering Design Processes

Engin Karahan, University of Minnesota
Hui-Hui Wang, University of Minnesota

Concurrent Session #9

4:15pm – 5:45pm

Presidential Sponsored Session

Symposium - An Unconference on Engineering Education: Gearing Up for New Era of Global Science Education Reform

4:15pm - 5:45pm, Columbus KL

Presenters:

Valarie L. Akerson, Indiana University
Senay Purzer, Purdue University
Muhsin Menekse, University of Pittsburgh
Kristina Tank, Iowa State University

Equity and Ethics Committee Sponsored Session

Symposium - Learning Science for Social Justice: Voices from the Field

4:15pm - 5:45pm, Wrigley

Presenters:

Daniel Morales-Doyle, University of Illinois at Chicago
David Segura, University of Illinois at Chicago
Esmeralda Villegas, DePaul University

Administrative Sponsored Session

Symposium - Publishing Research for Practitioner

Audiences: Tips and Strategies

4:15pm - 5:45pm, Water Tower

Presenters:

Deborah Hanuscin, University of Missouri
Julie Luft, University of Georgia
Victor Sampson, The University of Texas at Austin
Joanne K. Olson, Iowa State University

Strand 1: Science Learning, Understanding and Conceptual Change

Examples in Modeling Instruction

4:15pm - 5:45pm, Columbus GH

Presider: Cesar Delgado, University of Texas at Austin

Learning Inheritance through Modeling in Middle School Life Science Classes

Ronald W. Rinehart, Rutgers University
Moraima Castro-Faix, Rutgers University
Ravit Golan Duncan, Rutgers University
Clark A. Chinn, Rutgers University

Studying the Impact of a Design Intervention on 3rd-Grade Students Model-Based Explanations for Water Systems

Cory T. Forbes, University of Nebraska-Lincoln
Laura Zangori, University of Nebraska-Lincoln
Christina V. Schwarz, Michigan State University
Tina Vo, University of Nebraska-Lincoln

Leveraging Mathematical Models in an Integrated Biology and Engineering Curriculum Enhances Student Learning

Anita Schuchardt, University of Pittsburgh
Christian D. Schunn, University of Pittsburgh

Exploring 3rd-Grade Students' Model-Based Explanations about the Interactions between Plant Processes and the Hydrosphere

Laura Zangori, University of Nebraska-Lincoln
Cory T. Forbes, University of Nebraska-Lincoln

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Learning and Discursive Practices

4:15pm – 5:45pm, Columbus CD

Presider: Shiyu Liu, Pennsylvania State University

Joint Engagements with Media that Supports Preschool Science Talk and Practices

Carlin Llorente, SRI International
Savitha Moorthy, SRI International
Ximena Dominguez, SRI International
Elizabeth Christiano, SRI International
Laura Pinkerton, SRI International

Characterizing Shifts in Selena's Talk: A Study of Students' Discursive Participation in Afterschool Science Club

Minjung Ryu, Purdue University
Tiffanyrose Sikorski, George Washington University

Fostering the Emergence of More Equitable Teacher/Student Dialogue Patterns During Science Inquiry

Carol A. Rees, Thompson Rivers University
Wolff-Michael Roth, University of Victoria

Case Study of an Urban Elementary Teacher's Planning for Scientific Discourse

Elaine M. Silva Mangiante, Salve Regina University

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

The Power of Words in Science Learning

4:15pm - 5:45pm, Grand D North

Presider: Mark Urban-Lurain, Michigan State University

An Exploratory Study of How College Students Make Sense of Cancer in Writing-to-Learn Activities

Meena M. Balgopal, Colorado State University

Paul Laybourn, Colorado State University

Alison M. Wallace, Minnesota State University Moorhead

Ellen Brisch, Minnesota State University Moorhead

Computerized Lexical Analysis of Students' Written Responses for Diagnosing Conceptual Understanding of Energy

Mark Urban-Lurain, Michigan State University

Mihwa Park, Michigan State University

Kevin Haudek, Michigan State University

Standardizing the Methodology of Textbook Content Analysis

Andrea M.K. Bierema, Michigan State University

Renee S. Schwartz, Georgia State University

What Discursive Patterns Lead to a Highest Quality of Argumentation Mechanism In a Biochemistry classroom?

Annabel N. D'Souza, Graduate Center, CUNY

Wesley Pitts, Lehman College, CUNY

Strand 6: Science Learning in Informal Contexts

Learning Processes in Informal Contexts

4:15pm - 5:45pm, Grand A

Presider: Benjamin L. Tupper, University of Michigan

Learning about Human Biological Systems with an Online, Casual Game

Katherine Gean, Museum of Science and Industry, Chicago

Aaron Price, Museum of Science and Industry, Chicago

Claire G Christensen, University of Illinois at Chicago

Bryn Pernot, Museum of Science and Industry, Chicago

Gloria A. Segovia, Museum of Science and Industry, Chicago

Patricia L. Ward, Museum of Science and Industry, Chicago

Steven Beasley, Museum of Science and Industry, Chicago

Visualizing the Tree of Life: Learning around an Interactive Visualization of Biological Data in Museums

Michael Horn, Northwestern University

Brenda Phillips, Boston University

E. Margaret Evans, University of Michigan

Florian Block, Harvard University

Judy Diamond, University of Nebraska--Lincoln

Chia Shen, Harvard University

Mutual Processes of Learning during Family Visits to the Zoo

Chagit E. Tishler, Ben-Gurion University of the Negev

Orit Ben Zvi Assaraf, Ben-Gurion University of the Negev ISRAEL

Michael N Fried, Ben-Gurion University of the Negev ISRAEL

Reading Popular Science Texts and Textbooks: Evidence of a Performance Convergence Phenomenon

Rogério G. Nigro, GEPEC

Strand 7: Pre-service Science Teacher Education

Preservice Teachers Developing Science Identities

4:15pm - 5:45pm, Columbus AB

Presider: David Stroupe, Michigan State University

Developing Science Identities: Exploring Influences in a Teacher Preparation Program

Daniel Birmingham, Loyola University Chicago

Lara Smetana, Loyola University Chicago

Elizabeth Coleman, University of North Carolina at Charlotte

Is Agency Enough? When Pre-service Teacher Candidate's Designated Identity Overrides Teacher Preparation and Support

Angela D. Kolonich, Michigan State University

Gail Richmond, Michigan State University

Navigating Emotions and Identity: Learning to Teach Science in a High Needs Setting

Karen Rose, Florida State University

Sherry A. Southerland, Florida State University

Strand 8: In-service Science Teacher Education

Effect of Professional Development Activities on Teachers' Knowledge and Practice

4:15pm - 5:45pm, Randolph

Presider: Marissa S. Rollnick, Wits University

Evidence of Teachers Enacting Science Practices in their Classrooms Following an Authentic Science Professional Development

Barbara A. Crawford, University of Georgia
Jaclyn Murray, University of Georgia
Alexandria Mazur, Michigan State University
Daniel K. Capps, University of Maine
Dongmei Zhang, University of Georgia
James Ammons, University of Georgia
Robert Idsardi, University of Georgia

Science Teachers' Understandings of Science Practices: The Effect of an Environmental Engineering Research Experience

Dilek Ozalp, University of South Florida
Allan Feldman, University of South Florida

Embedding Formative Assessment in Classroom Practice: Connections between Professional Development and High-School Chemistry Classrooms

Dante Cisterna, Pontifical Catholic University of Chile
Amelia Wenk Gotwals, Michigan State University

A Collaborative Approach to Delivering Science Teaching Methods Suitable for Addressing Diverse Large Classrooms

Rekha B. Koul, Curtin University of Technology
Vaille Dawson, University of Western Australia

Making Science Authentic, Local, and Relevant: Evaluation of CityEco Teacher Professional Development Design and Impact

Sheron Mark, Loyola Marymount University

Strand 8: In-service Science Teacher Education Examining Science Teacher Leadership

4:15pm - 5:45pm, Comiskey

Presider: Julie C. Brown, University of Minnesota

Tracking Emergence and Development of Entrepreneurial Teacher Leaders in Science Teaching and Learning Networks

Matthew M. Schroyer, University of Illinois
Fouad Abd-El-Khalick, University of Illinois
Anita M. Martin, University of Illinois
Caroline Haythornthwaite, University of British Columbia

From New Teacher to Peer Leader: Exploring Teacher Practice in an Online Induction Program

Joshua A. Ellis, University of Minnesota
Samuel J. Polizzi, Kennesaw State University
Gillian H. Roehrig, University of Minnesota
Gregory T. Rushton, Kennesaw State University

High School Science Teachers' Enactment of Instructional Leadership for School Improvement

Stacy A. Wenzel, Loyola University Chicago
Megan E. Deiger, Loyola University Chicago
Jonya A. Leverett, Loyola University Chicago

Teacher Leadership Identity Development Process: A Multiple Case Study

Somnath Sinha, University of Missouri-Columbia
Deborah L. Hanuscin, University of Missouri-Columbia

Supporting Science Teachers in Seeing Themselves and the System from a Leadership Perspective

Brett Criswell, University of Kentucky
Greg Rushton, Kennesaw State University

Strand 10: Curriculum, Evaluation, and Assessment Symposium - Building an Integrated Understanding of Energy through K-12 Teaching

4:15pm - 5:45pm, Gold Coast

Presider: Joseph S. Krajcik, Michigan State University

Discussant: David Fortus, Weizmann

Presenters:

Knut Neumann, Leibniz Institute (IPN)
Sascha Bernholt, Leibniz Institute (IPN)
David L. Fortus, Weizmann Institute
Ute Harms, Leibniz Institute (IPN)
Joseph S. Krajcik, Michigan State University
Yaron Lehari, The Hebrew University of Jerusalem
Jeffrey Nordine, San Antonio Children's Museum
Sebastian T. Opitz, Leibniz Institute (IPN)
Ilka Parchmann, Leibniz Institute (IPN)
Ulrike Wernecke, Leibniz Institute (IPN)

Strand 11: Cultural, Social, and Gender Issues
Race, Language, and Science Practices

4:15pm - 5:45pm, Roosevelt

Presider: Malcolm B. Butler, University of Central Florida

Using Research-Practice Partnerships to Support Equity-focused Implementation of NGSS In and Out of School

Philip L. Bell, University of Washington

Megan Bang, University of Washington

Angela Calabrese-Barton, Michigan State University

William R. Penuel, University of Colorado

Erin M. Furtak, University of Colorado

Felicia Moore Mensah, Teachers College, Columbia University

Shirin Vossoughi, Northwestern University

Carol D Lee, Northwestern University

Confronting Barriers to Inclusivity: Planning and Implementing an Accessible Geoscience Field Course for Students with Disabilities

Christopher Atchison, University of Cincinnati

Anthony Feig, Central Michigan University

Brett Gilley, University of British Columbia

Alison Stokes, University of Plymouth

Julie Hendricks, University of Cincinnati

Supporting Students in High School Science Classrooms for Students with Sensory and Orthopedic Disabilities

Dale R. Baker, Arizona State University

Lisa Lacy, Arizona State University

Cean Colcord, Arizona State University

Heather Pacheco-Guffrey, Bridgewater State University

Critical Race Theory Critique of Next Generation of Science Standards

Eileen R. Carlton Parsons, University of North Carolina at Chapel Hill

Dana Thompson Dorsey, University of North Carolina at Chapel Hill

Peer Support and the African American Scientist: Using Critical Race Theory to Explore Science Success

Shari Watkins, University of Delaware

Strand 11: Cultural, Social, and Gender Issues
Teacher Practices

4:15pm - 5:45pm, Columbus IJ

Presider: Emily Dawson, University College London

Comparison of Pedagogical Content Knowledge between US and Korean Science Teachers

Soonhye Park, University of Iowa

Kyungwoon Seo, University of Iowa

Jee Kyung Suh, University of Iowa

Aeran Choi, Ewha Womans University

Science in an Indigenous School: Insight into Teacher Beliefs about Science Inquiry

Azra Moeed, Victoria University of Wellington, New Zealand

Craig Rofe, Victoria University of Wellington, New Zealand

Dayle Anderson, Victoria University of Wellington, New Zealand

Rex Bartholomew, Victoria University of Wellington, New Zealand

Multicultural Elements in a Science Teacher Education Program: The Viewpoints from its Graduates

Muhammad Abd Hadi Bunyamin, University of Minnesota

Bhaskar Upadhyay, University of Minnesota

Increasing Levels of Achievement for Black Science Students: Learning from the Experiences of Effective Teachers

Tonjua B. Freeman, University of Central Florida

Mary M. Atwater, University of Georgia

Doing Better: A Cross-Case Analysis towards a Framework for Equitable Science Pedagogy

Manali J. Sheth, Iowa State University

Strand 12: Educational Technology

Using Technology to Capture Student Learning

4:15pm - 5:45pm, Columbus EF

Presider: Georgia Hodges, University of Georgia

Leveraging Technology to Measure Student Learning during Inquiry Based Virtual Case Studies in Introductory Biology

Georgia Hodges, University of Georgia

J. Oliver, University of Georgia

Sophia Jeong, University of Georgia

Allan Cohen, University of Georgia

Yoonsung Jang, University of Georgia

Tom Robertson, University of Georgia

David Ducrest, Interactive Science in 3D

IVE-based Science Assessment: Multiple-Choice versus Free Response Student Performance in Diverse School Environments

Kelly M. Mills, University of Maryland
 Ashley N. Coon, University of Maryland
 Uma Natarajan, University of Massachusetts, Boston
 Diane Jass Ketelhut, University of Maryland
 Xiaoyang G. Gong, University of Maryland
 Brian C. Nelson, Arizona State University

Capturing Changes in Children's Computer Programming Ability While Playing Scratch

Taylor Martin, Utah State University, Active Learning Lab
 Phil Janisiewicz, Angile Dynamics
 Kevin Close, Utah State University, Active Learning Lab

The Redundancy Principle of Multimedia Learning in a Next Generation Science Classroom: Measuring Learning Outcomes

Robert C. Wallon, University of Illinois at Urbana-Champaign

Strand 13: History, Philosophy, and Sociology of Science Pre-Service Education

4:15pm - 5:45pm, Grand Suite 5

Presider: Allison Antink-Meyer, Illinois State University

Investigation of Pre-service biology teachers' Conceptions about Theories, Laws, and Models

Bianca Reinisch, Freie Universität Berlin
 Dirk Krüger, Freie Universität Berlin

Relationship between Pre-Service Teachers' Views of Nature of Science and Study Subjects

Suat Celik, Ataturk University
 Faik O. Karatas, Karadeniz Technical University

How do Pre-Service Biology Teachers Explain the Origin of Biological Traits? : A Philosophical Analysis

Kostas Kampourakis, University of Geneva

Strand 14: Environmental Education

Conceptual Models in Environmental Education

4:15pm - 5:45pm, Grand Suite 3

Presider: Patricia Patrick, Texas Tech University

Exploring Preservice Teacher's Mental Models of the Environment and the Influence of EE-centered Methods Courses

Amy Trauth-Nare, University of Delaware
 Michelle Nappi, Towson University

Modeling the Relationships among Pre Service Science Teachers' Cultural Environmental Bias, Nature Relatedness and Energy Related Behaviors

Birgul Cakir, Middle East Technical University
 Ozgul Yilmaz-Tuzun, Middle East Technical University

Comparing Students' Mental Models Before and After a PowerPoint or Field Work Experience (Experiential Learning)

Patricia Patrick, Texas Tech University
 Sara Jose, Texas Tech University

Strand 15: Policy

Symposium - Connections in Two Directions: Building Relationships Between PCK Research and Science Education Policy Initiatives

4:15pm - 5:45pm, Grand B

Presider: Jan H. Van Driel, Leiden University

Presenters:

Amanda K. Berry, Leiden University
 Janet Carlson, Stanford University
 Patricia J. Friedrichsen, University of Missouri-Columbia
 Vanessa Kind, Durham University
 Pernilla Nilsson, Halmstad University
 Jan H. Van Driel, Leiden University

Evening/Social Events

Equity and Ethics Committee Sponsored Outing

Equity Dinner (Maximum Attendance: 85)

6:30pm – 9:00pm, Off-Site

Lake Michigan Cruise

Mystic Blue Cruise, Navy Pier

Boarding begins at 6:30pm

Dinner, including tax and gratuity, is \$45.

Please note: You must register for this event with your Advance Conference Registration. Tickets purchased for this event are not refundable.

NOTE: Navy Pier is a 1.2 mi walk from the Hyatt. Complimentary shuttle service from the Hyatt to Navy Pier will depart at 5:30 and 6:00 (return service provided as well).

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center for advancement of
informal science education



A Cooperative Agreement with the
National Science Foundation Advancing
Informal STEM Learning Program

INFORMALSCIENCE.ORG

An online community and collection of Informal STEM
Learning projects, evaluation, and research resources.

- **Join our Community:** share your work with the field, receive timely information from CAISE, engage in group conversations, and find potential collaborators.
- **Search and Browse:** our collection of Informal STEM Learning resources. Guide your search with tags such as learning environment, content, and audience.
- **Make the Case:** access exemplars and evidence that portray the quality, variety, and impact of Informal STEM Learning experiences.



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Tuesday, April 14, 2015

Conference Registration

7:00am – 12:00pm, Grand Group Office

Strand Meetings

7:00am – 8:15am

Informal meet and greet with strand coordinators. Ask questions and give your opinion about strand policies as well as the direction you would like to see the strand headed.

Strand 1: Science Learning, Understanding and Conceptual Change

Meeting—7:00am – 8:15am, Columbus AB

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Meeting—7:00am – 8:15am, Columbus CD

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

Meeting—7:00am – 8:15am, Columbus EF

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

Meeting—7:00am – 8:15am, Columbus GH

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

Meeting—7:00am – 8:15am, Columbus IJ

Strand 6: Science Learning in Informal Contexts

Meeting—7:00am – 8:15am, Columbus KL

Strand 7: Pre-service Science Teacher Education

Meeting—7:00am – 8:15am, Comiskey

Strand 8: In-service Science Teacher Education

Meeting—7:00am – 8:15am, Gold Coast

Strand 9: Reflective Practice

Meeting—7:00am – 8:15am, Grand A

Strand 10: Curriculum, Evaluation, and Assessment

Meeting—7:00am – 8:15am, Grand B

Strand 11: Cultural, Social, and Gender Issues

Meeting—7:00am – 8:15am, Grand D North

Strand 12: Educational Technology

Meeting—7:00am – 8:15am, Grand Suite 3

Strand 13: History, Philosophy, and Sociology of Science

Meeting—7:00am – 8:15am, Grand Suite 5

Strand 14: Environmental Education

Meeting—7:00am – 8:15am, Randolph

Strand 15: Policy

Meeting—7:00am – 8:15am, Roosevelt

Concurrent Session #10

8:30am – 10:00am

International Committee Sponsored Session

Current Directions of Research in Science Education from Australia and New Zealand

8:30am - 10:00am, Grand D North

Discussant: David F. Treagust, Curtin University

Science Beyond the Classroom: Real, Messy and Value-laden

Léonie J Rennie, Curtin University

Pursuing Different Forms of Learning Science through Innovative Curriculum Implementation

Deborah Corrigan, Monash University

Debra Panizzon, Monash University

Greg Lancaster, Monash University

Developing Students' Futures Thinking through Science

Cathy Bunting, University of Waikato

Alister Jones, University of Waikato

Culminating Exhibitions and Performances as Compelling Opportunities for Science Learning and Assessment

Bronwen Cowie, University of Waikato

Judy Moreland, University of Waikato

Edward Glynn, University of Waikato

Re-examining Pedagogical Reasoning as Means of Identifying Science Teacher Expertise

Stephen Keast, Monash University

Debra Panizzon, Monash University

John Loughran, Monash University

Ian Mitchell, Monash University

Strand 1: Science Learning, Understanding and Conceptual Change

Motivation, Interest, Attitudes, and Self-Efficacy

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

Presider: Steven McGee, Northwestern University

Disguising Physics: The Effects of Contextual Features on Students' Motivation and Performance

Marcela Pozas, University of Koblenz-Landau

Patrick Löffler, Graduate School Teaching & Learning Processes

Wolfgang Schnotz, University of Koblenz-Landau

Alexander Kauertz, University of Koblenz-Landau

The Impact of Text Genre on Science Learning in an Authentic Science Learning Environment

Steven McGee, Northwestern University

Amanda M. Durik, Northern Illinois University

Jess K. Zimmerman, University of Puerto Rico

Longitudinal Changes in Students' Attitudes towards Natural Sciences during Transition to Secondary School

Alexandra Moormann, Humboldt-Universität zu Berlin

Annette Upmeyer Zu Belzen, Humboldt-Universität zu Berlin

Explaining Students' Choices of Post-Compulsory Chemistry

Maik Walpuski, University of Duisburg-Essen

Carolin Huelsmann, University of Duisburg-Essen

Effects of Key Facets of Motivation and Self-Regulation on Students' Conceptual Understandings on Electric Current

Hüseyin İnaltun, Gazi University

Salih Ates, Gazi University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Chemistry Education in Context

8:30am - 10:00am, Columbus CD

Presider: Wondimu Ahmed, The University of Akron

Group Interactions Contributing to Differential Opportunities for Learning in a General Chemistry Studio Learning Environment

Melinda Z. Kalainoff, United States Military Academy

Grace A. Neff, California Polytechnic State University

Danielle Boyd Harlow, University of California at Santa Barbara

The Effect of Contextual Instruction on Students'

Motivation: A Study for Making it Relevant

Ceyhan Cigdemoglu, Atılım University

Omer Geban, Middle East Technical University

Predictors of Students' Meta-affective Inclinations in Chemistry Tasks

Esen Uzuntiryaki-Kondakci, Middle East Technical University

Zubeyde D. Kirbulut, Harran University

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

8:30am - 10:00am, Roosevelt

Presider: Sarah J. Carrier, North Carolina State University

Taking Science to the Outdoors

Tali Tal, Technion

Kara Haas, Michigan State University

Irene Bayer, Michigan State University

Joseph S. Krajcik, Michigan State University

Katherine L. Gross, Michigan State University

Dramatizing the Authentic Research of a Local Scientist to Urban Elementary Students through Professional Theatre

Stephen R. Burgin, Old Dominion University

Jenifer Alonzo, Old Dominion University

Victoria Hill, Old Dominion University

Family Learning Opportunities and Research in Science and Engineering

Amanda M. Gunning, Mercy College

Meghan E. Marrero, Mercy College

Zoila Tazi, Mercy College

Curriculum Planning and Enactment in Elementary Science: Beyond Fidelity of Implementation

Mandy Biggers, Penn State University

Cory T. Forbes, University of Nebraska-Lincoln

Community Based Engineering: An approach for Teaching and Learning in Urban Elementary Classroom Environments

Tejaswini S. Dalvi, University of Massachusetts, Boston

Kristen B. Wendell, University of Massachusetts, Boston

**Strand 4: Science Teaching--Middle and High School
(Grades 5-12): Characteristics and Strategies**
***Related Paper Set - Leveraging the Epistemic Dimensions
of Scientific Practice to Support Student's Meaningful
Engagement in Modeling***

8:30am - 10:00am, Columbus KL

Discussant: David Stroupe, Michigan State University

***A Comparative Longitudinal Case Study of the Use of
Scientific Modeling in the Pedagogical Practice of Two
Fifth-Grade Science Teachers***

Joshua M. Rosenberg, Michigan State University

Christina V. Schwarz, Michigan State University

Silvia Wen-Yu Lee, National Changhua University of Education

Mete Akcaoglu, Georgia Southern University

***Using Interactive Reflective Science Notebooks to
Supporting Students Use of Modeling***

Jeannette Manger, Wright State University

Lisa Kenyon, Wright State University

***Examining the Teacher's Role in Supporting Elementary
Students' Meaningful Engagement in Scientific Modeling***

Li Ke, Michigan State University

Christina V. Schwarz, Michigan State University

Gail Richmond, Michigan State University

***Learning to Support Students' Epistemic Agency and
Meaningful Engagement in Modeling***

Abraham Lo, Northwestern University

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

***Related Paper Set - Teacher Pedagogical Content
Knowledge and Uses of Learning Progression-Based
Curricula in Teaching Environmental Science Literacy***

8:30am - 10:00am, Grand Suite 5

President: Alan R. Berkowitz, Cary Institute of Ecosystem Studies

Discussant: Alicia C. Alonzo, Michigan State University

***Using Learning Progression Frameworks to Inform
Instruction in Environmental Science: Teachers' Efforts
to Move Their Students Up Levels***

Nissa Yestness, Colorado State University

Tobias Irish, Cary Institute of Ecosystem Studies

Julie A. Bianchini, University of California, Santa Barbara

Jiwon Kim, Michigan State University

LaTisha Hammond, George Washington University

Stacey Carpenter, University of California - Santa Barbara

Katherine Nilsen, University of California, Santa Barbara

Sylvia D. Parker, University of Wyoming

Alan R. Berkowitz, Cary Institute of Ecosystem Studies

***Learning Progressions in Environmental Science:
The Impact of a Professional Development on
Teacher Practice***

Tobias Irish, Cary Institute of Ecosystem Studies

Alan R. Berkowitz, Cary Institute of Ecosystem Studies

Sylvia D. Parker, University of Wyoming

Jennifer H. Doherty, University of Washington

Michele Johnson, University of California, Santa Barbara

Nissa Yestness, Colorado State University

Bess Caplan, Cary Institute of Ecosystem Studies

Laurel Hartley, University of Colorado Denver

Francis N. Clapp, Colorado State University

John C. Moore, Colorado State University

***Science Learning Progressions, Discourse,
and Teacher Pedagogical Content Knowledge***

Shandy Hauk, WestEd and University of Northern Colorado

Kitty Roach, University of Northern Colorado

Nissa Yestness, Colorado State University

Joyce Kaser, WestEd

Alan R. Berkowitz, Cary Institute of Ecosystem Studies

John C. Moore, Colorado State University

***Teacher Pedagogical Content Knowledge
for Using Learning Progressions***

Kristin L. Gunckel, University of Arizona

Beth A. Covitt, University of Montana

Aubrey Cano, University of California, Santa Barbara

Ivan Salinas, University of Arizona

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

Reasoning and Problem-Based Learning in Physics

8:30am - 10:00am, Grand Suite 3

Presider: Luke D. Conlin, Stanford University

Perceptual Salience Influencing Undergraduate Students' Reasoning Resources on Introductory Physics Problems

Xian Wu, Kansas State University

Tianlong Zu, Kansas State University

Elise Agra, Kansas State University

N. Sanjay Rebello, Kansas State University

Investigating a New Approach in Undergraduate Physics Labs: Problem Based Cooperative Learning

Shane D. Bergin, School of Physics, Trinity College Dublin

Colette Murphy, Trinity College Dublin

Aoibhinn N. Ni Shuilleabhain, Trinity College Dublin

Reasoning, Epistemology and Content Learning in College-level Introductory Physics

Lin Ding, The Ohio State University

Katherine N. Mollohan, The Ohio State University

Strand 6: Science Learning in Informal Contexts ***Shifting Paradigms in Informal Science Institutions***

8:30am - 10:00am, Gold Coast

Presider: Maritza Macdonald, American Museum of Natural History

Looking Back and Forward: Body Worlds as a Reflection of the Changing Science Centre

Michelle Dubek, University of Ontario Institute of Technology

Susan Jagger, Monmouth College

Erminia G. Pedretti, University of Toronto

Impact of an Education Program in a Natural History Museum on Novice Learners' Evolution Knowledge and Creationism Beliefs

Kerstin Kremer, RWTH Aachen University

Anne Ahrens, Gymnasium Himmelsthür, Hildesheim

Julia C. Arnold, RWTH Aachen University

Transferring Cutting-Edge Research to Museum Learning Environments: Science in the Making versus Ready-Made Science

Marianne Achiam, University of Copenhagen

Bjørn F. Johannsen, University of Copenhagen

Museum Exhibits and Curriculum Theory: Reflections from Autobiographical Writing

Ana Maria Navas Iannini, CTL-OISE-University of Toronto

Strand 7: Pre-service Science Teacher Education ***Preservice Teachers' Knowledge and Noticing***

8:30am - 10:00am, Water Tower

Presider: Jamie N. Mikeska, ETS

Measuring Biological Knowledge and Personal Traits of Pre-service Biology Teachers

Yvonne Schachtschneider, University of Duisburg-Essen

Vanessa Pfeiffer, University of Duisburg-Essen

Silvia Wenning, University of Duisburg-Essen

Angela Sandmann, University of Duisburg-Essen

Shifts in Preservice Teachers' Noticing: A Cognitive Apprenticeship Model for Methods Courses Ideas

Dawnmarie Ezzo, Michigan State University

Amelia Wenk Gotwals, Michigan State University

Preservice and Inservice Physics Teachers' Noticing and Teaching Modeling

Nam-Hwa Kang, Korea National University of Education

Preservice Teachers Noticing Students' Scientific Thinking in Teaching Rehearsals

Amanda Benedict-Chambers, Missouri State University

Strand 8: In-service Science Teacher Education ***Related Paper Set - Transcending National Contexts: Cross-National and Comparative Science Education Research***

8:30am - 10:00am, Columbus EF

Presider: Julie A. Luft, University of Georgia

Discussant: Peter Hewson, University of Wisconsin-Madison

Helping Me Swim: Beginning Teachers' Reflections on Support in South Africa and the United States

Rene R. Toerien, University of Cape Town

Shannon L. Dubois, University of Virginia

Peter W. Hewson, University Of Wisconsin-Madison

Julie A. Luft, University of Georgia

Beginning Science Teachers' Views and Enactments of Formative Assessment in South Africa and the US

Melissa A. Jurkiewicz, University Of Nevada

Rene R. Toerien, University of Cape Town

Julie A. Luft, University of Georgia

Peter W. Hewson, University Of Wisconsin-Madison

Policy and Instruction: A Study of South African and United States Beginning Science Teachers

Shannon L. Dubois, University of Virginia

Rene R. Toerien, University of Cape Town

Julie A. Luft, University of Georgia

Peter W. Hewson, University Of Wisconsin-Madison

Science Knowledge for Teaching of Beginning Teachers in South Africa and the United States

Ryan S. Nixon, University of Georgia

Rene R. Toerien, University of Cape Town

Julie A. Luft, University of Georgia

Peter W. Hewson, University Of Wisconsin-Madison

Strand 10: Curriculum, Evaluation, and Assessment Symposium - The Use of Adapted Primary Literature in Secondary Schools: From Theory to Practice

8:30am - 10:00am, Randolph

Presenters:

Anat Yarden, Weizmann Institute of Science

Moriah Ariely, Weizmann Institute of Science

Isabel Braun, University of Freiburg

Matthias Nueckles, University of Freiburg

Mesa B. Davis, Georgia State University

Kadir Demir, Georgia State University

Galia Zer-Kavod, Weizmann Institute of Science

Jonathan Francis Osborne, Stanford University

Linda M. Phillips, University of Alberta

Strand 11: Cultural, Social, and Gender Issues Symposium - Culture, Language, Practices, Place in STEM Education: Indigenous and Place-based Approaches from Pacific and Americas

8:30am - 10:00am, Columbus GH

Discussant: Steven Semken, Arizona State University

Presenters:

Pauline W. U. Chinn, University of Hawaii - Manoa

Steven C. Semken, Arizona State University

Irasema Ortega, University of Alaska-Anchorage

Tara B. O'Neill, University of Hawaii

Flora Ayuluk, Kashunsmint School District

Sandra C. Londono, ASU

Megan Bang, University of Washington

Huihui Kanahele-Mossman, Ka Umeke Kaeo

Sharon Nelson-Barber, WestEd

David B. Zandvliet, Simon Fraser University

Strand 12: Educational Technology

Cognitive and Metacognitive Support Tools

8:30am - 10:00am, Columbus AB

Presider: Corey E. Brady, Northwestern University

Computational Thinking in the Science Classroom: Preliminary Findings from a Blended Curriculum

David Weintrop, Northwestern University

Kai Orton, Northwestern University

Michael S Horn, Northwestern University

Elham Beheshti, Northwestern University

Laura Trouille, Northwestern University

Kemi Jona, Northwestern University

Uri Wilensky, Northwestern University

Visualizing Energy and Matter Transformations for Linguistically Diverse Students

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

Kristin Bedell, University of North Carolina, Chapel Hill

Adding Computational Thinking to your Science Lesson: What Could it Look Like?

Jennifer L. Albert, NC State University

Strand 12: Educational Technology

RP-Set – Science Needs a Marketing Make-Over: Playful Learning in Formal and Informal Science Education

8:30am - 10:00am, Wrigley

Discussant: Len Annetta, George Mason University

Presenters:

Denise M. Bressler, Learning Edge Ventures

Alec M. Bodzin, Lehigh University

Stephen Slota, University of Connecticut

Heather Toomey Zimmerman, Penn State University

Susan M. Land, Penn State University

Dana Atwood-Blaine, University of Kansas

Douglas W. Huffman, University of Kansas

Len Annetta, George Mason University

Strand 14: Environmental Education***Environmental Research in Post-Secondary Education***

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

Presider: Lene Møller M. Madsen, University of Copenhagen***Expressions of Dynamic and Cyclical Thinking among University Students in the Context of Earth Systems***

Orit Ben Zvi Assaraf, Ben-Gurion University of the Negev Israel

Or Batzri, Ben Gurion University of the Negev, Israel

Nir Orion, Weizmann Institute of Science

Carmit Cohen, The Dead Sea-Arava Science Center (DSASC)

Impact of Socioscientific Issues Instruction on Students' Conceptions about Contentious Greater Yellowstone Area Environmental Issues

Benjamin C. Herman, University Of South Florida

Mark Newton, University of South Florida

Dana L. Zeidler, University of South Florida

Determining Essential Components of a College-level Bioenergy Curriculum Using the Delphi Technique

Kimi Grzyb, Oregon State University

Brian Hartman, Oregon State University

Katharine G. Field, Oregon State University

Learning about Resilience and Systems: A Case Study of a Natural Resource Management Student

Anne Marie Casper, Colorado State University

Meena M. Balgopal, Colorado State University

Maria E. Fernandez-Gimenez, Colorado State University

Strand 15: Policy***Elementary Science Education in the Context of Contemporary Educational Policies***

8:30am - 10:00am, Columbus IJ

Presider: Sherry A. Southerland, Florida State University***Changing Elementary Teaching Roles: Teacher Specialization in the Wake of the STEM Movement***

Susan Poland, George Mason University

Kristofer Pachla, George Mason University

Amanda Luh, George Mason University

David E. Long, George Mason University

Title I Status, the Accountability Movement, and Time for Science in Elementary Schools

Cheryl O'Connor, George Mason University

Andrew J. Keck, George Mason University

David E. Long, George Mason University

Supporting Elementary and Middle School STEM Education: A Literature Review

Ashley Chiu, Museum of Science and Industry, Chicago

Aaron Price, Museum of Science and Industry, Chicago

Elsie Ovrahim, Museum of Science and Industry, Chicago

Pedagogical Choice in Elementary Science Education: Testing Explanatory Variables

Kathryn N. Hayes, California State University, East Bay

Concurrent Session #11**10:15am – 11:45am*****Publications Advisory Committee Sponsored Session Symposium - New Horizons for the Journal of Research in Science Teaching***

10:15am - 11:45am, Water Tower

Presenters:

Fouad Abd-El-Khalick, University of Illinois

Dana L. Zeidler, University of South Florida

Administrative Sponsored Session Symposium - Characterizing Quality Research in Engineering Education

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

Presenters:

Marie-Claire Shanahan, University of Calgary

Cathy Lachapelle, Museum of Science, Boston

Strand 1: Science Learning, Understanding and Conceptual Change***Emerging Issues in Conceptual Change***

10:15am - 11:45am, Grand Suite 5

Presider: Mehmet Aydeniz, The University of Tennessee***The Use of Metacognitive Tools to Support Model Development in High School Physics***

Katherine S. Wade, Coretta Scott King Young Women's Leadership Academy

Abdulkadir Demir, Georgia State University

Azhar M. Qureshi, Georgia State University

Ozden Sengul, Georgia State University

Facial Microexpression State decision Tree for Conceptual-Conflict Based Conceptual Change

Mei-Hung Chiu, National Taiwan Normal University
Yuh-Ru Yu, National Taiwan Normal University
Hongming L. Liaw, National Taiwan Normal University
Chin-Cheng Chou, National Taipei University of Education

Theoretical and Practical Implications of Implicit Learning for Science Education and Conceptual Change

Jeremy Y. Wang, University of Minnesota
Keisha Varma, University of Minnesota

Concepts, Conceptual Metaphor and the Study of Conceptual Change

Tamer G. Amin, American University of Beirut

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Related Paper Set - Ag-STEM: Re-Emphasizing Agriculture Connections with STEM for Contextualized Teaching and Learning

10:15am - 11:45am, Columbus GH

STEM in an Agricultural Context: Exploring Interdisciplinary Collaboration

Matt Spindler, Virginia Tech

Utilizing a Delphi Study to Establish The Teaching Resources Needed For an Ideal Post-Secondary Applied STEM (Agricultural Mechanics) Learning Laboratory

J. Chris Haynes, University of Wyoming
Bart E. Gill, Delaware Department of Education
Ryan Anderson, Iowa State University

What does Ag-STEM Mean for Me? Perceptions of Teachers and 4-H Agents

Hannah Scherer, Virginia Tech

Do they See a Connection? Public Definitions of Science and Agriculture

Kathryn A. Stofer, University of Florida
Milton G. Newberry III, University of Florida

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

STEM, STEAM, and Literacy: Learning from Practice

10:15am - 11:45am, Columbus EF

Presider: Jamie N. Mikeska, ETS

Building a Successful University and School Partnership for STEAM Education: Lessons from the Trenches

Bhaskar Upadhyay, University of Minnesota
Kara Coffino, University of Minnesota
John Alberts, Austin Public Schools
Andrew M. Rummel, University of Minnesota

STEM Program Characteristics in an Elementary School.

Richard L. Lamb, Washington State University
Rebekah Lamb, Washington State University
Kaylan Petrie, Washington State University

The Importance of STEM Education in the Elementary Grades: Learning from Preservice Teachers' Perspectives

Lauren Madden, The College of New Jersey
James Beyers, The College of New Jersey
Steve O'Brien, The College of New Jersey

Design-Based Research Approach for Integrating Science and Literacy in Elementary Classrooms

Xavier Fazio, Brock University
Tiffany L. Gallagher, Brock University

Examining Language Expectations and Supports during Elementary Science Instruction.

Karl G. Jung, University of Minnesota

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

Symposium - Developing, Refining, and Sustaining the Next Generation of Responsive Science Teaching

10:15am - 11:45am, Comiskey

Presenters:

Angela Calabrese-Barton, Michigan State University
Leema Berland, University of Wisconsin-Madison
Melissa Braaten, University of Wisconsin-Madison
Paul Hutchison, Grinnell College
Hosun Kang, University of California Irvine
Daniel Levin, University of Maryland
Melissa Luna, West Virginia University
Rosemary Russ, University of Wisconsin-Madison
Christina V. Schwarz, Michigan State University
Jessica J. Thompson, University of Washington

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

Instructional Practices - Biology

10:15am - 11:45am, Columbus AB

Presider: Stephanie B. Philipp, Miami University

Evaluating a Network of Scientists and Educational Specialists Developing Standards for Experimental Design in Biology

Yue Yin, University of Illinois at Chicago

Nancy J. Pelaez, Purdue University

Stephanie Gardner, Purdue University

Trevor R. Anderson, Purdue University

The Effect of Engaging Science Programs on Undergraduates' Educational Experiences

Zehavit Kohen, Technion

Dan Perlman, Brandeis University

Yehudit Judy Dori, Technion-Israel Institute of Technology

Doctoral Biology Training and Proposed Threshold Concepts

Christopher Rates, University of Virginia

David Feldon, Utah State University

The PCK of Biology Faculty at Large Research Institutions

Kathleen Hill, Bethany College

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

Relevance and Self-Efficacy in STEM Learning

10:15am - 11:45am, Randolph

Presider: Dorene R. Medlin, Albany State University

How do STEM Students Find Relevance in their Learning?

Yun-Hsin Chen, Olin College of Engineering

Margaret Lidrbauch, Olin College of Engineering

Robert Siegel, Olin College of Engineering

Yevgeniya V. Zastavker, Olin College of Engineering

Jonathan Stolk, Olin College of Engineering

Alexander Dillon, Olin College of Engineering

Michael Gross, Wake Forest University

***Describing Undergraduate STEM Teaching Practices:
A Comparison of Instructor Self-Report Instruments***

Cody T. Williams, Western Michigan University

Emily M. Walter, Western Michigan University

Charles R. Henderson, Western Michigan University

Andrea L. Beach, Western Michigan University

Validation of Students' Assessment of Their Learning Gains Instrument for Assessing Perceptions in Chemistry Classes

Venkat R. Vishnumolakala, Curtin University

David F. Treagust, Curtin University

Daniel Southam, Curtin University

Mauro Mocerino, Curtin University

Assessing Multinational Interest in STEM Triggers of Interest

Adam V. Maltese, Indiana University

Heidi A. Ross, Indiana University

Shenghai Dai, Indiana University

Relationships between Mathematics Self-Efficacy and Abilities for First Year Engineering Students with Poor Mathematics Preparation

Gustavo Moran, Clemson University

Lisa C. Benson, Clemson University

**Strand 6: Science Learning in Informal Contexts
Symposium - When the Informal Becomes Formal in the
Higher Education Preparation of Science Teachers**

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

Presiders:

David Silvermail, University of Southern Maine

Maritza Macdonald, American Museum of Natural History

Presenters:

David Silvermail, University of Southern Maine

Maritza Macdonald, American Museum of Natural History

Amy Johnson, University of Southern Maine

Julie Contino, American Museum of Natural History

Natasha Cooke-Nieves, American Museum of Natural History

Angela M. Kelly, Stony Brook University

Preeti Gupta, American Museum of Natural History

Harriet Fayne, Lehman College, CUNY

Maria Rivera, Barnard College

Jamie Wallace, American Museum of Natural History

Denton Ebel, American Museum of Natural History

**Strand 7: Pre-service Science Teacher Education
Symposium - Defining and Understanding Scientific
Practices Pre-Service Science Teacher Education**

10:15am - 11:45am, Columbus CD

Discussant: Carla Zembal-Saul, Penn State University

Presider: Sibel Erduran, University of Limerick

Presenters:

Sibel Erduran, University of Limerick
Deniz Saribas, Istanbul Aydin University
Ebru Z. Mugaloglu, Bogazici University
Ebru Kaya, Bogazici University
Zoubeida R. Dagher, University of Delaware
Gaye Ceyhan, Bogazici University, Istanbul-Turkey

**Strand 8: In-service Science Teacher Education
Innovative Approaches to Assessing and Supporting
Science Teacher Knowledge, Beliefs, and Practice**

10:15am - 11:45am, Grand Suite 3

Presider: Eilish McLoughlin, Dublin City University

**Conceptual Storylines: Examining Teachers' Criteria
for Evaluating Lessons**

Deborah L. Hanuscin, University of Missouri
Eun Ju Lee, University of Missouri
Kelsey Gillstrom, University of Missouri
Annie Arnone, University of Missouri
Zandra de Araujo, University of Missouri

**Development of a Coding System and Instruments for
Assessing the Quality of Instructional Behaviors**

Peng He, Northeast Normal University (China)
Changlong Zheng, Northeast Normal University (China)
Xiufeng Liu, State University of New York At Buffalo (SUNY)

**Effects of Fidelity of Implementation on
Elementary Science Teachers' Implementation
of Engineering Practices**

Brenda M. Capobianco, Purdue University
Jacqueline DeLisi, Education Development Center, Inc

**Using Conjecture Mapping in Formative Assessment:
Supporting ELL Teachers' Teaching Argumentation
Practices in Science Classrooms**

Suna Ryu, University of California, Los Angeles

William A. Sandoval, University of California, Los Angeles

**Strand 8: In-service Science Teacher Education
Related Paper Set - Findings from Federally Funded STEM
Professional Development Programs: Effective Practices
for the Next Generation**

10:15am - 11:45am, Gold Coast

STEM Around US

Sally Pardue, Tennessee Technological University

Martha Howard, Tennessee Technological University

**For Your Informational Text: Exploring, Evaluating, and
Writing with Common Core Collaborations Starring
Librarians and Teachers**

Julie Stepp, Tennessee Technological University

**From Earth to Space with STEM: Professional
Development for Grades 4-7 Math and Science Teachers**

Leslie A. Suters, Tennessee Technological University

Shaping Early STEM Learning in Grades K-2

Jane E. Baker, Tennessee Tech University

Strand 9: Reflective Practice

**Symposium - When Chemistry Education Researchers
Met a New Paradigm: A Graduate Seminar Reflects on
Embodied Cognition**

10:15am - 11:45am, Columbus KL

Presiders:

Dor Abrahamson, University of California, Berkeley

Sharona T. Levy, University of Haifa

Discussant: Joseph Krajcik, Michigan State University

Presenters:

Elon Langbeheim, Arizona State University

Ran Peleg, University of Haifa

Asnat Zohar, University of Haifa

Strand 10: Curriculum, Evaluation, and Assessment
Related Paper Set - Rigorous Approaches to Assess Science and Engineering Learning

10:15am - 11:45am, Roosevelt

Presiders:

K. Anna Douglas, Purdue University

Senay Purzer, Purdue University

The Development of NanoSurvey through Argument Based Validity

Oguz Hanoglu

K. Anna Douglas, Purdue University

Heidi Diefes-Dux, Purdue University

Krishna Madhavan

Use of Rasch Measurement to Examine Fair Assessment of Information Literacy

K. Anna Douglas, Purdue University

Vivian G Alexander

Senay Purzer, Purdue University

Michael Fosmire

Developing an Engineering Design Assessment Using Think-Aloud Interviews Subject/Problem

Meltem Alemdar, Georgia institute of technology

Jeremy Lingle, Georgia Institute of Technology

Roxanne A. Moore, Georgia Institute of Technology

Stefanie A. Wind, Georgia Institute of Technology

Performance Assessment of Engineering Design Using Process Analytics Based on CAD Software

Charles Xie, Concord Consortium

Saeid Nourian, Concord Consortium

Shiyan Jiang, University of Miami

Rigorous Approaches to Assess Science and Engineering Learning

Senay Purzer, Purdue University

K. Anna Douglas, Purdue University

Strand 11: Cultural, Social, and Gender Issues
Symposium - Identity Research and its Relation to Becoming Next Generation Science Learners and Educators

10:15am - 11:45am, Wrigley

Discussant: Justine Kane, Wayne State University

Presenters:

Gillian U. Bayne, Lehman College of the City University of New York

Heidi B. Carlone, The University of North Carolina at Greensboro

Felicia Moore Mensah, Columbia University

Stacy Olitsky, Saint Joseph's University

Tara O'Neill, University of Hawaii at M noa

Joseph L. Polman, University of Colorado Boulder

Jrène Rahm, Université de Montréal, Canada

Gale Seiler, Iowa State University

Beth Warren, Chèche Konnen Center at TERC

Aerin Benavides, The University of North Carolina at Greensboro

Tess Hegedus, The University of North Carolina at Greensboro

Lacey Huffling, The University of North Carolina at Greensboro

Catherine Matthews, The University of North Carolina at Greensboro

Terry Tomasek, Elon University

Elizabeth Menig, University of Illinois at Chicago

Maria Varelas, University of Illinois at Chicago

Danny B. Martin, University of Illinois at Chicago

Marcie Gutierrez, Chicago Public Schools

Edna Tan, University of North Carolina at Greensboro

Angela Calabrese Barton, Michigan State University

Cynthia Graville, Saint Louis University

Engida Gebre, University of Colorado Boulder

Audrey Lachaine, Université de Montréal, Canada

Viviane Boucher, Université du Québec à Montréal (UQAM)

Ann S. Rosebery, Chèche Konnen Center at TERC

Eli Tucker-Raymond, Chèche Konnen Center at TERC

Joan Brunetta, Chèche Konnen Center at TERC

Strand 12: Educational Technology
Scaffolding Strategies and Frameworks

10:15am - 11:45am, Columbus IJ

President: Josephine Desouza, Ball State University

Technology Scaffolds of Teamwork Coordination in Collaborative Problem Solving

Pavlo D. Antonenko, University of Florida

Kent J. Crippen, University of Florida

Lauren Eutsler, University of Florida

Comparing Linear vs. Hypermedia Online Learning Environments to Bridge Curricular Requirements and Students' Questions

Ayelet Baram-Tsabari, Technion - Israel Institute of Technology

Hani Swirski, Technion - Israel Institute of Technology

Supporting Argumentation Practices with Knowledge Organization via Student-generated Multiple External Representations

Bahadır Namdar, Recep Tayyip Erdogan University
Ji Shen, University of Miami

Scaffolding Argumentation in Science Classrooms

Tugba Keser, Trakya University

Strand 14: Environmental Education

Climate Change

10:15am - 11:45am, Grand D North

President: Jennifer H. Forrester, University of Wyoming

An Investigation of Science Educators' Views of Role and Responsibility for Climate Change Education

J. Randy McGinnis, University of Maryland
Robert C. McDonald, University of Maryland
Emily Hestness, University of Maryland
Wayne Breslyn, Montgomery County Public Schools

Pre-service Teachers' Understanding of the Atmosphere Related Environmental Problems

Harika Ozge Arslan, Yuzuncu Yil University
Ceyhan Cigdemoglu, Atilim University

Scientific Reasoning about Global Climate Change: A Grounded Theory Study

Shiyu Liu, The Pennsylvania State University
Frances Lawrenz, University of Minnesota

Is Anyone Learning About Climate Change? The extent of Climate Change in Science Standards

Barry Golden, University of Tennessee

Lunch—On Your Own

12:00pm – 1:00pm

Concurrent Session #12

1:00pm – 2:30pm

Strand 1: Science Learning, Understanding and Conceptual Change

Related Paper Set - Related Poster Session: Learning Pathways to Environmental Science Literacy

1:00pm - 2:30pm, Wrigley

President: Beth A. Covitt, University of Montana

Discussant: Christina Schwarz, Michigan State University

Defining Common Elements of Environmental Science Literacy Learning

John C. Moore, Colorado State University
Charles W. Anderson, Michigan State University
Alan R. Berkowitz, Cary Institute of Ecosystem Studies
Beth A. Covitt, University of Montana
Kristin L. Gunckel, University of Arizona
Laurel Hartley, University of Colorado Denver
Jennifer H. Doherty, University of Washington
Hui Jin, Ohio State University
Michele Johnson, University of California, Santa Barbara
Christina V. Schwarz, Michigan State University

A Learning Progression-Based Biodiversity Teaching Unit: Investigating the impact of Teacher Knowledge and Implementation Fidelity on Student Learning

Laurel Hartley, University of Colorado Denver
Jennifer H. Doherty, University of Washington
Cornelia Harris, Cary Institute Of Ecosystem Studies
John C. Moore, Colorado State University
Alan R. Berkowitz, Cary Institute of Ecosystem Studies
Charles W. Anderson, Michigan State University

Learning about Water Flow as a Result of Learning Progression-Based Instruction

Beth A. Covitt, University of Montana
Kristin L. Gunckel, University of Arizona
Ivan Salinas, University of Arizona

Student Learning of Local Tree Diversity and the Concept of Common Ancestry

Yael Wyner, City College of New York
Jennifer H. Doherty, University of Washington

Environmental Science Literacy: The Role of Quantitative Reasoning

Robert Mayes

How Do Students Construct Explanations at Different Levels of an LP?

Nissa Yestness

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Socio-scientific Dimensions and Science Learning

1:00pm - 2:30pm, Roosevelt

Presider: David Stroupe, Michigan State University

Science Literacy as an Approach to Engaging Young People in Improving their Health Behaviours

Andri Christodoulou, University of Southampton

Kathryn S. Woods-Townsend, University of Southampton

Keith M. Godfrey, University of Southampton

Marcus M. Grace, University of Southampton

Janice B. Griffiths, University of Southampton

Mark A. Hanson, University of Southampton

Hazel M. Inskip, University of Southampton

Eliciting Students' Understanding of River Geography and Socioscientific Issues through a Critical Response Protocol

Senenge T. T. Andzenge, University of Minnesota

Engin Karahan, University of Minnesota

Devarati Bhattacharya, University of Minnesota

Gillian Roehrig, University of Minnesota

Reflective Judgment and Argumentation Skills of Preservice Teachers in a Socioscientific Issues-Based Laboratory Inquiry Course

Dilek Karisan, Yuzuncu Yil University

Ozgul Yilmaz-Tuzun, Middle East Technical University

Dana L. Zeidler, University of South Florida

Attitudes and Language Use in Group Discussions on Socio-scientific Issues

Mats G. Lindahl, Linnaeus University

Anne-Mari Folkesson, Linnaeus University

Talking Climate Science - How Teachers Frame Climate Change in the Classroom & Why It Matters

Kirstin C. Busch, Stanford University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Symposium - A Research-Practice Partnership towards

Agentic Science Learning: Advancing Elementary

Students' Science Learning and Practice-Linked Identities

1:00pm - 2:30pm, Columbus CD

Discussant: Leah Bricker, University of Michigan

Presenters:

Kari Shutt, University of Washington

Andrew Morozov, University of Washington

Phonraphee Thummaphan, University of Washington

Robert Abbott, University of Washington

Giovanna Scalone, University of Washington

Amy Winstanley, Bellevue School District

Nancy Vye, University of Washington

Leslie Herrenkohl, University of Washington

Angie DiLoreto, Bellevue School District

Leah A. Bricker, University of Michigan

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Symposium - Designing Programs that Engage, Motivate, and Interest Youth to Pursue STEM Careers: NSF-Funded ITEST Projects

1:00pm - 2:30pm, Columbus IJ

Presider: Amie Patchen, Boston College

Discussant: Sarita Pillai, Education Development Center, Inc

Presenters:

Javed Khan, Tuskegee University

Marcia Rossi, Alabama State University

Fan Wu, Tuskegee University

Ruth Kermish-Allen, Island Institute

Karen Peterman

Suzanne MacDonald, Island Institute

Jacqueline DeLisi, Education Development Center, Inc

Mike Barnett, Boston College

Sarita Pillai, Education Development Center, Inc

Amie Patchen, Boston College

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

Physics

1:00pm - 2:30pm, Grand B

Presider: Shane Bergin, School of Physics

Content Knowledge of Future Physics Teachers

Florian Gigl, University Duisburg-Essen

Simon Zander, University Duisburg-Essen

Andreas Borowski, University of Potsdam

Hans Ernst Fischer, University Duisburg-Essen

The Change Process in a College Physics Faculty's Conceptions and Practices on Teaching for Conceptual Change

William A. Stoll, Georgia State University

Abdulkadir Demir, Georgia State University

Bulent Cavas, Dokuz Eylul University

Pinar Huyuguzel Cavas, Ege University

The Persistence of Men and Women in Upper Level Physics using Survival Analysis

Idaykis Rodriguez, Florida International University

Geoff Potvin, Florida International University

Laird Kramer, Florida International University

Student Behaviors and Discourse within an On-Line Group Homework Forum in an Introductory Physics Class

James F. Kiesel, California State University, Long Beach

Brandon Kawata, California State University, Long Beach

Strand 6: Science Learning in Informal Contexts

Related Paper Set - The Role of Informal Experiences in Supporting STEM Interest

1:00pm - 2:30pm, Grand A

Presider: John H. Falk, Oregon State University

Discussants:

Christina Restrepo, Michigan State University

Day Greenberg, Michigan State University

Deborah Bailey, Oregon State University

Emily Dawson, King's College London

Jennifer Dewitt, King's College London

Jennifer Wyld, Oregon State University

Louise Archer, King's College London

Lynn Dierking, Oregon State University

Myunghwan Shin, Michigan State University

Nancy Staus, Oregon State University

Comparing Different Approaches to Measuring STEM-Related Interests

Julie Cafarella, University of Colorado Boulder

William R. Penuel, University of Colorado

Nancy Staus, Oregon State University

Jennifer Wyld, Oregon State University

Deborah L. Bailey, Oregon State University

Lynn D. Dierking, Oregon State University

John H. Falk, Oregon State University

Documenting Early Adolescent Youth's Long-Term STEM Interest and Engagement Pathways

Lynn D. Dierking, Oregon State University

John H. Falk, Oregon State University

Nancy Staus, Oregon State University

Jennifer Wyld, Oregon State University

Deborah L. Bailey, Oregon State University

William R. Penuel, University of Colorado

Authoring Identity Pathways among Youth from Non-Dominant Backgrounds through Engineering for Sustainable Communities

Angela Calabrese-Barton, Michigan State University

Christina Restrepo, Michigan State University

Myunghwan Shin, Michigan State University

Day Greenberg, Michigan State University

Edna Tan, University of North Carolina at Greensboro

Science Museum Field Trips and Their Contribution to Developing Interest and Science Capital

Amy Seakins, King's College London

Jennifer Dewitt, King's College London

Emily Dawson, King's College London

Louise Archer, King's College London

Foundations of Science Interest Development in Young Children

Scott Pattison, Oregon Museum of Science and Industry

Lynn D. Dierking, Oregon State University

Strand 7: Pre-service Science Teacher Education Socioscientific Issues, Argumentation and Teacher Preparation

1:00pm - 2:30pm, Grand Suite 5

Presider: Maria Evagorou, University of Nicosia

Preservice Science Teachers' First Experiences with Socio-scientific Discourse: The Problems and Possible Solutions

Umit Demiral, Ahi Evran University

Tezcan Kartal, Ahi Evran University

Ahmet Kilinc, Abant Izzet Baysal University

Preservice Science Teachers' Socioscientific Issues-Based Teaching Practices in a Science Methods Course

Mustafa S. Topcu, Yildiz Technical University
Abdulkadir Genel, Mugla Sitki Kocman University

Relating Preservice Teachers' Knowledge of Scientific Practices, Epistemic Aims and Values, and Self-Efficacy

Janelle M. Bailey, Temple University
Doug Lombardi, Temple University

Supporting Elementary Students to Construct Evidence-Based Claims: Learning during a Practice-Based Science Methods Course

Anna Maria Arias, University of Michigan
Elizabeth A. Davis, University of Michigan

***Strand 8: In-service Science Teacher Education
Examining Science Teachers' Beliefs and Attitudes***

1:00pm - 2:30pm, Randolph

Presider: Jazlin Ebenezer, Wayne State University

Science Teachers' Beliefs about the Practices of Science as they Relate to Classroom Teaching

Kirby Browning, Florida State University
Anna M. Strimaitis, Florida State University
Jennifer Schellinger, FSU
Shannon Gooden, Florida State University
Sherry A. Southerland, Florida State University

Construct Validity and Reliability Measures of Scores from the Science Teachers' Pedagogical Discontentment (STPD) Scale

Murat Kahveci, Canakkale Onsekiz Mart University
Ajda Kahveci, Çanakkale Onsekiz Mart University
Nasser Mansour, University Of Exeter
Maher M Alarfaj, King Faisal University

Self-efficacy Beliefs for Teaching Physics – Development and Validation of a New Test Instrument

Claudia Meinhardt, Martin-Luther-Universität Halle-Wittenberg
Thorid Rabe, Martin-Luther-Universität Halle-Wittenberg
Olaf Krey, Martin-Luther-Universität Halle-Wittenberg

Revealing Folk Theories of Scientific Knowledge through Conversations about a Multi-Dimensional Learning Progression

Rajendra Chattergoon, University of Colorado, Boulder

***Strand 8: In-service Science Teacher Education
Related Paper Set - Working towards Change:
Supporting In-service Teachers' Enactment of NGSS***
1:00pm - 2:30pm, Grand Suite 3

Text-based Inquiry for Scientific Modeling

Mon Lin Ko, University of Illinois Chicago
Willard Brown, WestEd
Cynthia Greenleaf, WestEd
Susan R. Goldman, University of Illinois Chicago

Noticing Students' Thinking and the NGSS Practices in Student Artifacts

Melissa Luna, West Virginia University
Sarah Selmer, West Virginia University
James A. Rye, West Virginia University

Video Club as a Context for Shifting Discourse about Scientific Practices

Heather J. Johnson, Vanderbilt University
Michelle Cotterman, Vanderbilt University

Teachers' Instructional Strategies that Support Literacy as a Scientific Practice

Kirsten K. Mawyer, University of Hawaii

***Strand 10: Curriculum, Evaluation, and Assessment
K-8 Education***

1:00pm - 2:30pm, Water Tower

Presider: Joi Merritt, Arizona State University

Supporting Preschool Scientists: Designing Innovative Curricular Tools to Support Early Science Teaching and Learning

Ximena Dominguez, SRI International
Marion Goldstein, EDC
Elica Sharifnia, SRI International
Daisy Rutstein, SRI International
Regan Vidiksis, EDC
Christine Zanchi, WGBH

Multilevel Assessment of Interest in Health Careers at the Middle School Level: Introducing the AIMS

William L. Romine, Wright State University
Amber Todd, Wright State University
William R. Folk, University of Missouri

Using Rasch Modeling to Explore Students Understanding of Elementary School Ideas about Energy

Cari F. Herrmann Abell, AAAS/Project 2061

George E. De Boer, AAAS/Project 2061

They Can Do It! Designing Curricula to Support Kindergarteners' Learning of Science

Amelia Wenk Gotwals, Michigan State University

Tanya Wright, Michigan State University

Strand 10: Curriculum, Evaluation, and Assessment Symposium - Designing Assessments Aligned with Current Science Education Reforms

1:00pm - 2:30pm, Comiskey

Presider: Marcia C. Linn, University of California-Berkeley

Discussant: Jonathan Osborne, Stanford University

Presenters:

Edys S. Quellmalz, WestEd

Helen Zhihui Zhang, Boston College

Hsin-Yi Chang, National Kaohsiung Normal University

Anna MacPherson, Stanford University

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

Libby Gerard, University of California, Berkeley

Barbara C. Buckley, WestEd

Matt Silbergitt, WestEd

Strand 11: Cultural, Social, and Gender Issues Symposium - An International Perspective on Decolonizing Research Methodologies in Science Education

1:00pm - 2:30pm, Grand D North

Presider: Alberto J. Rodriguez, Purdue University

Discussant: Christina Siry, University of Luxembourg

Promoting Participant-Owned Science Education Research: Lessons From Experiences in Brazil, Ireland and Sweden.

Isabel Martins, Federal University of Rio de Janeiro, Brazil

Karim Hamza, Stockholm University, Sweden

Colette Murphy, Trinity College Dublin, Ireland

Communicating Through Silence: Examining the Unspoken and the Unsaid in Discussions about Science

Katheryn Scantlebury, University of Delaware

Anita Hussenius, Uppsala University

Annica Gullberg, Gavle University

Anna Danielsson, Uppsala University

Can we Capture "Everything"? Questioning what is Left out in the Research Process

Jana Maria Hilgers, University of Luxembourg

Colonial Research Funding Policies and Practices and their Impact on the Advancement of Science Education in the USA

Alberto J. Rodriguez, Purdue University, USA

Strand 12: Educational Technology Educational Technology and Enactment

1:00pm - 2:30pm, Columbus KL

Presider: Dorene R. Medlin, Albany State University

Benefits of an Online Video Competition for Participants, Community Members, and the Public

Rena Stroud, TERC

Joni Falk, TERC

Synergy: How Generic and Content-Specific Scaffolds Support Quality of Students' Explanations

Ibrahim Delen, Usak University, Turkey

Joseph S. Krajcik, Michigan State University

Inferences on Enacted Understandings: Using Embodied Interactive Simulations to Examine Emerging Understandings of Science Concepts

Robb Lindgren, University of Illinois Urbana-Champaign

Michael Tscholl, University of Wisconsin Madison

Investigating Preservice Teacher Learning to Facilitate Inquiry-Based Science Instruction in a Mixed-Reality Classroom

Nazan U. Bautista, Miami University

Vanashri J. Nargund-Joshi, New Jersey City University

Strand 12: Educational Technology Symposium: Big Data and Learning Analytics: A New Frontier in Science and Engineering Education Research

1:00pm - 2:30pm, Columbus GH

Discussant: Janet Kolodner, Georgia Tech

Presenters:

Hee-Sun Lee, University of California, Santa Cruz

Saeid Nourian, Concord Consortium

Kyle R. Cheney, WPI

Raha Moussavi, Worcester Polytechnic Institute

Janice Gobert, Worcester Polytechnic Institute

Charles Xie, Concord Consortium

Gey-Hong Gweon, University of California, Santa Cruz

James Lester, North Carolina State University

Eric N. Wiebe, North Carolina State University

**Strand 13: History, Philosophy, and Sociology of Science
In-Service Education**

1:00pm - 2:30pm, Gold Coast

Presider: Bridget K. Mulvey, Kent State University

The Impact of a Biology Teacher Professional Development Program on Nature of Science Understanding and Knowledge of NOS Instructional Strategies

Hernan Cofre, Pontificia Universidad Católica de Valparaíso

Jose M. Pavez, Pontificia Universidad Católica de Valparaíso

Claudia Vergara, University Alberto Hurtado

David Santibáñez, Universidad Católica Silva Henríquez, Chile

Special Education Teachers' Initial Inquiry and Nature of Science Teaching Experiences

Bridget K. Mulvey, Kent State University

Jennifer Chiu, University of Virginia

Rajlakshmi Ghosh, Kent State University

Randy L. Bell, Oregon State University

Uganda Science Teacher Educators' Views on Nature of Scientific Theories, Observations and Inferences

Robert E. Kagumba, Western Michigan University

William W. Cobern, Western Michigan University

Renee S. Schwartz, Georgia State University

Changing Elementary Teachers' Motivational Beliefs about Teaching Nature of Science

Elif Adibelli, University of Nevada, Las Vegas

Hasan Deniz, University of Nevada, Las Vegas

How In-service Science Teachers Integrate History and Nature of Science in Elementary Science Courses

Esme Hacieminoglu, Necmettin Erbakan University

Strand 15: Policy

Policy in Context: Intersections with Critical Networks, Actors and Practices

1:00pm - 2:30pm, Columbus AB

Presider: Gavin W. Fulmer, National Institute of Education

Supporting Newly Hired Teachers of Science: Attaining Teacher Professional Standards

Julie A. Luft, University of Georgia

Shannon Dubois, The University of Virginia

Ryan Nixon, University of Georgia

Benjamin Campbell, University of Georgia

At the Policy-Research Interface: Usefulness of Social Network Analysis in Identifying and Selecting Key Stakeholders

Jesper Bruun, Department of Science Education

Robert H. Evans, University of Copenhagen

Jens Dolin, University of Copenhagen

Teacher Responses to Science Content in an Externally Driven Curriculum Reform: A Perspective from Turkey

Fatih C. Mercan, Bogazici University

Science Coordinators: An Important Leadership Group

Elizabeth W. Edmondson, Virginia Commonwealth University

**Concurrent Session #13
2:45pm – 4:15pm**

Strand 1: Science Learning, Understanding and Conceptual Change

Research on Learning in Biology

2:45pm - 4:15pm, Columbus GH

Presider: Sherry A. Southerland, Florida State University

The Use of Disciplinary Core Ideas and Contexts in Biology Lessons

Katharina Nachreiner, Ludwig-Maximilians-University Munich

Michael Spangler, Ludwig-Maximilians-University Munich

Birgit J. Neuhaus, Ludwig-Maximilians-University Munich

Using Scaffolding to Build Phylogenetic Trees with High School Students

Julie Bokor, University of Florida

Jacob Landis, University of Florida

Kent J. Crippen, University of Florida

Exploring Students' Evolutionary Explanations across Natural, Sexual, and Artificial Selection Scenarios

Minsu Ha, Kangwon National University

Ross H. Nehm, SUNY Stony Brook

Mexican Nahua Students Learning about Natural Selection: The Role of Teleological Reasoning

Ingrid M. Sanchez-Tapia, University of Illinois, Chicago (UIC)

Strand 1: Science Learning, Understanding and Conceptual Change

Poster Symposium - Learning Progression-Based Systems to Support Environmental Science Literacy

2:45pm - 4:15pm, Columbus IJ

Presider: Charles W. Anderson, Michigan State University

Discussant: William Penuel, University of Colorado Boulder

Presenters:

Charles W. Anderson, Michigan State University

Jennifer H. Doherty, University of Washington

Elizabeth X. De Los Santos, Michigan State University

Joyce M. Parker, Michigan State University

Allison L. Freed, Michigan State University

Wendy R. Johnson, Michigan State University

Hannah K. Miller, Michigan State University

Daniel Gallagher, Seattle Public Schools

Beth Covitt

Jenny Dauer

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Identity and Disciplinary Engagement

2:45pm - 4:15pm, Columbus KL

Presider: Jianlan Wang, Florida International University

Can Laughter Be The Best Medicine For Breaking Barriers To Students' Under-Achievement In Science?

Michael Ige, Lagos State University, Lagos, Nigeria

Peter A. Okebukola, Lagos State University

Olatunde Lawal Owolabi, Lagos State University

Sunday Banjoko, Lagos State University

Bunmi Ademola, Lagos State University

Innocent Ezedimbu, Lagos State University

Franklin Onowugbeda, Lagos State University

Cheta Ezeani, Lagos State University

Mariam Faniyu, Lagos State University

Blessing Abu, Lagos State University

Toward Understanding the Relationship between the Learning Progression of Energy and Scientific Disciplines

Mihwa Park, Michigan State University

Xiufeng Liu, State University of New York At Buffalo (SUNY)

Joseph A. Johnson, Edinboro University of Pennsylvania

Peer Support of Identity Exploration in a Conversation about STEM Choices

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

and Tel-Aviv University, Israel

Avi Kaplan, Temple University

Promoting Productive Disciplinary Engagement in an Engineering Design Task

Chandan Dasgupta, University of Illinois at Chicago

Tom Moher, University of Illinois at Chicago

Transforming the Typical: Relationships among High School Chemistry Students' Perceptions of a Constructivist Learning Environment, Prototype Match, and Science-Related Career Expectations

Andrew Wild, Stanford University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Related Paper Set - Discourse Practices across Science Education Contexts

2:45pm - 4:15pm, Grand A

Presider: Gregory J. Kelly, Penn State University

Discussant: Maria Varelas, University of Illinois at Chicago

Exploring Kindergarten Girls' Identities-In-Practice through Discourse

Alicia McDyre, Penn State University

Carla Zembal-Saul, Penn State University

Gregory J. Kelly, Penn State University

Maria Varelas, University of Illinois at Chicago

Arguing from Evidence in an English/Spanish Dual Language Middle School Science Classroom

Peter R. Licon, Penn State University

Gregory J. Kelly, Penn State University

Teacher Candidates' Meaning Making of Ambitious Science Teaching in Secondary Teacher Education

Arzu Tanis Ozcelik, Penn State University

Scott McDonald, Pennsylvania State University

Studying Students' Emotional Response to Ecological Crises through Discourse

Elizabeth Hufnagel, University of Pittsburgh

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

2:45pm - 4:15pm, Columbus IJ

Presider: Xiang Chen, People's Education Press

***Conceptualizing a Core Set of Secondary Science
Teaching Practices for English Learners***

Edward G. Lyon, Arizona State University

Sara E. Tolbert, University of Arizona

Jorge Solis, University of Texas at San Antonio

Trish L. Stoddart, University of California, Santa Cruz

George C. Bunch, University of California, Santa Cruz

***An Investigation of Chinese Teachers' Inquiry-oriented
Classroom Discourse***

Hui Jin, Ohio State University

Xin Wei, People's Education Press

Qiancheng Peng, People's Education Press

Hayat Hokayem, Texas Christian University

***How Literacy Integration Contributes to the
Understanding of Scientific Practices through Reading
Combined Text Genres***

Mesa B. Davis, Georgia State University

Abdulkadir Demir, Georgia State University

***Building Students' Written Scientific Explanations
through Explicit Disciplinary Literacy Instruction***

Gde Buana S. Putra, National Institute of Education

Kok-Sing Tang, National Institute of Education

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

Engineering Teams and Problem-Solving

2:45pm - 4:15pm, Grand D North

Presider: Senay Purzer, Purdue University

***The Role of Question, Conflict, and Reasoning Episodes
on Engineering Team Performance***

Muhsin Menekse, University of Pittsburgh

Senay Purzer, Purdue University

Douglas D. Stouch, University of Pittsburgh

Felicia R. Bixler, University of Pittsburgh

***Using Discourse Analysis and Self-Reflection to Improve
Undergraduate Engineering Team Experiences***

Aditi Joshi, Olin College of Engineering

Allison Tau, Cooper Union for the Advancement of Science
and Art

Ryan Eggert, Olin College of Engineering

Yevgeniya V. Zastavker, Olin College of Engineering

Veronica Darer, Wellesley College

***Relationships between Engineering Students' Future
Time Perspectives and Their Problem Solving Processes***

Catherine D. McGough, Clemson University

Adam Kirn, University of Nevada, Reno

Lisa C. Benson, Clemson University

**Strand 7: Pre-service Science Teacher Education
*Symposium - Handbook on Research in Science
Education: Implications for Preservice Science Teacher
Education***

2:45pm - 4:15pm, Columbus AB

Presesider: Norman G. Lederman, Illinois Institute of Technology

***Student Conceptions and Conceptual Change:
Three Overlapping Phases of Research***

Tamer G. Amin, American University of Beirut

Carol L. Smith, University of Massachusetts-Boston

Marianne Wiser, Clark University

Learning Science Outside of School

Léonie J. Rennie, Curtin University of Technology

***Gender Matters: Building on the Past, Recognizing
the Present, and Looking Toward the Future***

Kathryn Scantlebury, University of Delaware

English Learners in Science Education

Cory A. Buxton, University of Georgia

Okhee Lee, New York University

Special Needs and Talents in Science Learning

J. Randy McGinnis, University of Maryland

Sami Kahn, University of South Florida

***Culturally Responsive Science Education for Indigenous
and Ethnic Minority Students***

Elizabeth McKinley, University of Auckland

Mark J. S. Gan, University of Auckland

Discourse Practices in Science Learning and Teaching

Gregory J. Kelly, Pennsylvania State University

Promises and Challenges of Using Learning Technologies to Promote Student Learning of Science

Joseph S. Krajcik, Michigan State University
Kongju Mun, Michigan State University

Scientific Practices and Inquiry in the Science Classroom

Jonathan Osborne, Stanford University

Research on Teaching and Learning of Nature of Science

Norman G. Lederman, Illinois Institute of Technology
Judith S. Lederman, Illinois Institute of Technology

Precollege Engineering Education

Christine M. Cunningham, Museum of Science, Boston
William S. Carlsen, Pennsylvania State University

Science Teacher Attitudes and Beliefs: Reforming Practice

M. Gail Jones, North Carolina State University
Megan Leagon, North Carolina State University

Strand 7: Pre-service Science Teacher Education Inquiry, Epistemic Beliefs, and Argumentation

2:45pm - 4:15pm, Water Tower

Presider: Rosemary Russ, University of Wisconsin

An Adaptation Study of the Epistemic Beliefs Inventory with Turkish Pre-service Science Teachers

Busra Tuncay-Yüksel, Giresun University
Ozgul Yilmaz-Tuzun, Middle East Technical University
Dana L. Zeidler, University of South Florida

Supporting Responsive Teaching Practices through Pedagogical Argumentation

Rosemary Russ, University of Wisconsin
Leema Berland, University of Wisconsin
Melissa Braaten, University of Wisconsin

Practical Considerations: Elementary Preservice Teachers' Uses of Principle-based Inquiry in Planning and Teaching Science

Martha M. Canipe, University of Arizona
Kristin L. Gunckel, University of Arizona

Strand 7: Pre-service Science Teacher Education Preservice Teachers' Views about the Nature of Science and Scientific Inquiry

2:45pm - 4:15pm, Grand Suite 3

Presider: Robert H. Evans, University of Copenhagen

Developing Pre-Service Science Teachers' NOS Views: Using Blogs as A Platform for Reflection

Sinan Ozgelen, Mersin University
Hatice Sancar Tokmak, Mersin University
Lutfi Incikabi, Kastamonu University

Preservice Special Education Teachers' Views on Scientific Inquiry

Rajlakshmi Ghosh, Kent State University
Lisa A. Borgerding, Kent State University

An Analysis of Preservice Elementary Teachers' Understanding of Inquiry-based Science Learning and Teaching

Carole K. Lee, University of Maine at Farmington
Marilyn Shea, University of Maine at Farmington

Changing Preservice Science Teachers' Views of NOS: Why Some Conceptions May be More Easily Altered

Gunkut Mesci, Western Michigan University
Renee S. Schwartz, Georgia State University

Strand 7: Pre-service Science Teacher Education Teachers' PCK and Understandings of Science Teaching

2:45pm - 4:15pm, Columbus EF

Presider: Julie M. Kittleson, University of Georgia

The Relationship between Preservice Teacher Self-regulation and PCK

Aysegul Tarkin, Yuzuncu Yil University
Esen Uzuntiryaki-Kondakci, Middle East Technical University
Fatma Nur Akin, College of Education, Middle East Technical University
Betul Demirdogen, Bulent Ecevit University
Sevgi Aydin, Yuzuncu Yil University

Using Practice-based Pedagogy to Support Elementary Teacher Candidates' Understandings of Science Teaching

Julie M. Kittleson, University of Georgia
Janna Dresden, University of Georgia
Laura B. Schneider, University of Georgia
Julianne A. Wenner, University of Connecticut

The Impact of Socialization on Beginning Science

Teachers' Pedagogical Decision Making and Science Instruction

Lori M. Ihrig, University of Iowa
 Joanne K. Olson, Iowa State University
 Michael P. Clough, Iowa State University

Prospective Science Teachers' PCK Development through Reformed Modern Physics Course at a College of Education

Jungsook Yoo, Ewha Womans University
 Kevin Insik Hahn, Ewha Womans University

Strand 8: In-service Science Teacher Education Symposium - Supporting Teachers in Teaching Scientific Practices: Designing In-person and Digital Learning Environments for Teachers

2:45pm - 4:15pm, Columbus CD

President: Katherine L. McNeill, Boston College

Presenters:

Suzanna Loper, Lawrence Hall of Science
 Jonathan Francis Osborne, Stanford University
 Eric Berson, Stanford University
 Brian J. Reiser, Northwestern University
 Jean Moon, Tidemark Institute
 Sarah Michaels, Clark University
 Cynthia Passmore, University of California-Davis
 Arash Jamshidi, University of California, Davis
 Laura Shafer, University of California, Davis

Strand 8: In-service Science Teacher Education Supporting Teachers for Inquiry Practice

2:45pm - 4:15pm, Grand Suite 5

President: Dorene R. Medlin, Albany State University

Impact of a Summer Institute and Instructional Coaching on Teacher and Student Science Inquiry Practice

Gwen Nugent, University of Nebraska
 Gina Kunz, University of Nebraska
 Jon E. Pedersen, University of Nebraska-Lincoln
 James A. Houston, University of Nebraska-Lincoln
 Soonchun Lee, Wichita State University
 LinLin Luo, University of Nebraska-Lincoln
 Irina Kalutskaya, University of Nebraska-Lincoln
 Brandi Berry, University of Nebraska-Lincoln
 ChaoRong Wu, University of Nebraska-Lincoln

Coaching for Sustainability: Distance-Based Peer Coaching Science Inquiry

Soonchun Lee, Wichita State University
 Gwen Nugent, University of Nebraska
 Gina Kunz, University of Nebraska
 James A. Houston, University of Nebraska-Lincoln

Teaching Reform-Based Science as Argument: Use by Veteran Supervising Teachers

Kathy Peno, University of Rhode Island
 Elaine Silva Mangiante, University of Rhode Island

Inquiry Instructional Practice in Middle School Science Classes: Applying Vroom's VIE Theory of Motivation

Daniel M. Alston, Clemson University
 Jeff C. Marshall, Clemson University

Strand 8: In-service Science Teacher Education Teachers' Epistemic Beliefs and Views of Nature of Science

2:45pm - 4:15pm, Randolph

President: Barbara A. Crawford, The University of Georgia

Assessing Teachers' Competencies in Teaching Nature of Scientific Knowledge Through Educational Critical Scenarios

Cigdem Han Tosunoglu, Marmara University
 Serhat Irez, Marmara University
 Nihal Dogan, Abant Izzet Baysal University
 Yalcin Yalaki, Hacettepe University
 Gultekin Cakmakci, Hacettepe University
 Eda Erdas, Kastamonu University
 Zekai Berk Altiner

Investigation of the Link between Continuing Professional Development (CPD) Programs and Students' NOS Views

Ferah Ozer, Abant Izzet Baysal University
 Nihal Dogan, Abant Izzet Baysal University
 Yalcin Yalaki, Hacettepe University
 Serhat Irez, Marmara University
 Gultekin Cakmakci, Hacettepe University

Structural, Epistemic and Conceptual Aspects of Science Teachers' Argumentation in the Context of Biological Evolution

Ezgi Yesilyurt, Middle East Technical University
 Jale Cakiroglu, Middle East Technical University
 Ceren Oztekin, Middle East Technical University

Interaction of Teacher Understanding and Misconceptions Regarding Scientific Inquiry and Nature of Science

Yue Li, Miami University

Kyle Cox, Mason City Schools

Sarah B. Woodruff, Miami University

Exploring a Science Teacher's Epistemic Belief System and Socioscientific Discourse: The Relationships and the Barriers

Arzu Sonmez, Abant Izzet Baysal University

Ahmet Kilinc, Abant Izzet Baysal University

Strand 11: Cultural, Social, and Gender Issues
Related Paper Set - Examining University Engineering Equity Efforts to Engage Underrepresented Learners

2:45pm - 4:15pm, Grand B

Presider: Noemi Waight, SUNY-UB

Discussant: Randy Yerrick, SUNY- UB

Celebrating Seventeen Years of Success—Or Was It?: Looking More Deeply and Closely at Measures of Success

Nelson Rivera, SUNY-UB

Ming Chiu, Purdue

Randy K. Yerrick, SUNY- UB

Steven Ciccarelli, RIT

Michael Parthum, RIT

William Leonard, RIT

Noemi Waight, University at Buffalo

STEM, Who's it for?": Partnerships, Dropouts, and Identity Throughout the Formation of STEM Programs for Marginalized Urban Youth

Monica Ridgeway, SUNY-UB

Tiffany Nyachae, SUNY-UB

Randy K. Yerrick, SUNY- UB

Fenice Boyd, SUNY-UB

Megan Whelan, University at Buffalo

Filling the STEM Pipeline: Factors Influencing College Major Selection in the City Scholars Program

Michael Eastman, RIT

Jeanne Christman, RIT

George Zion, RIT

Randy K. Yerrick, SUNY- UB

Noemi Waight, SUNY-UB

Latina and Black Female Engagement in STEM and Health Career Opportunity Programs

Megan Whelan, SUNY-UB

Randy K. Yerrick, SUNY- UB

Strand 11: Cultural, Social, and Gender Issues
Symposium - International Perspectives on Multilingual Contexts in Science Education Research and Practice

2:45pm - 4:15pm, Gold Coast

Presenters:

Sonya N. Martin, Seoul National University, Republic of Korea

Philip Clarkson, Australian Catholic University, Australia

Mariona Espinet, Universitat Autònoma de Barcelona, Catalonia, Spain

Laura Valdes-Sanchez, Universitat Autònoma de Barcelona, Catalonia, Spain

Lizette Ramos, University of Guadalajara, Mexico

Sara Wilmes, University of Luxembourg, Luxembourg

Jennifer Park, Seoul National University, Republic of Korea

Alejandro J. Gallard, Georgia Southern University, USA

Hye-Eun Chu, Nanyang Technological University, Singapore

Strand 12: Educational Technology
Educational Technology in the Elementary Setting

2:45pm - 4:15pm, Comiskey

Presider: Cathy Bunting, University of Waikato

Investigating the Influence of Haptic Technology on Upper Elementary Students' Reasoning about Sinking & Floating

James Minogue, North Carolina State University

David Borland, The University of North Carolina at Chapel Hill

Marc Russo, North Carolina State University

Shengyen T. Chen, North Carolina State University

Ryan Grady, North Carolina State University

Digital Science Notebooks as a Means for Assessing Student Understanding Through Drawing and Writing

Angela Shelton, North Carolina State University

Eric N. Wiebe, North Carolina State University

Peter A. Smith, North Carolina State University

Courtney Behrle, North Carolina State University

Evening Events

NARST Executive Board Meeting #3

5:00pm – 10:00pm, Plaza

In an effort to reduce paper consumption and promote environmental awareness, NARST has decided to exclude Abstracts from this year's paper program. You may find all Abstracts posted in the online program on the NARST website at www.narst.org and on the Conference CD included with the program. We hope that you will have a positive NARST Annual International Conference experience while supporting our sustainable practices.

Abstracts

When a presentation has greater than 5 authors, only the first 5 authors are indexed in accordance with the Publication Manual of the American Psychological Association (6th Edition).

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