



2011 NARST APRIL 3-6

Annual International Conference | Caribe Royale | Orlando, Florida

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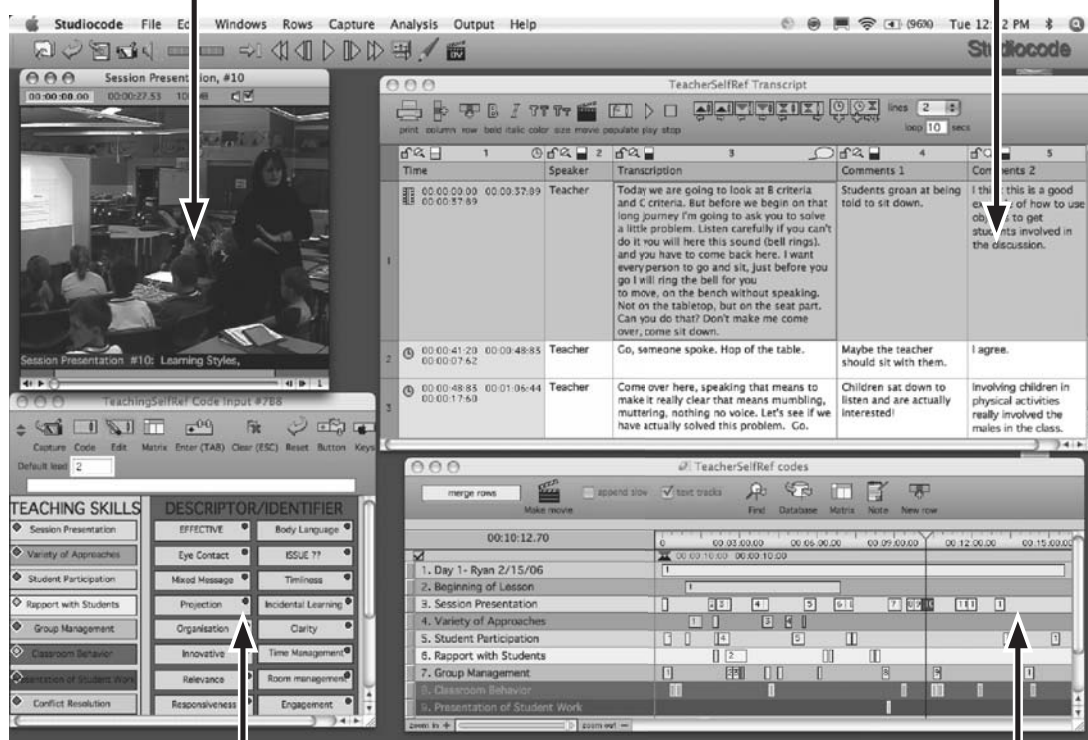
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ACKNOWLEDGMENTS

The following members of the Program Committee helped in preparing and editing the 2011 NARST Annual International Conference Program Book.

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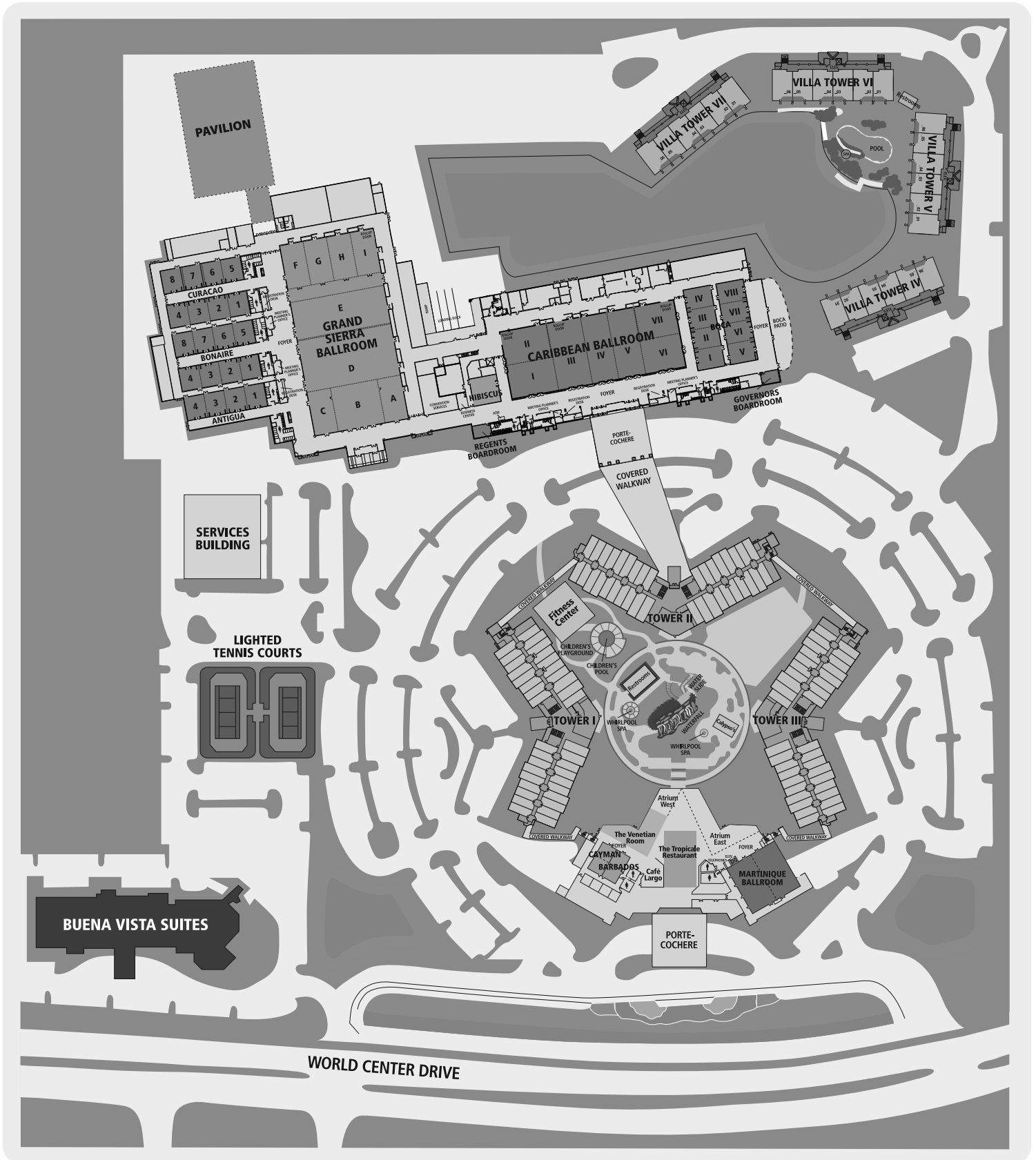
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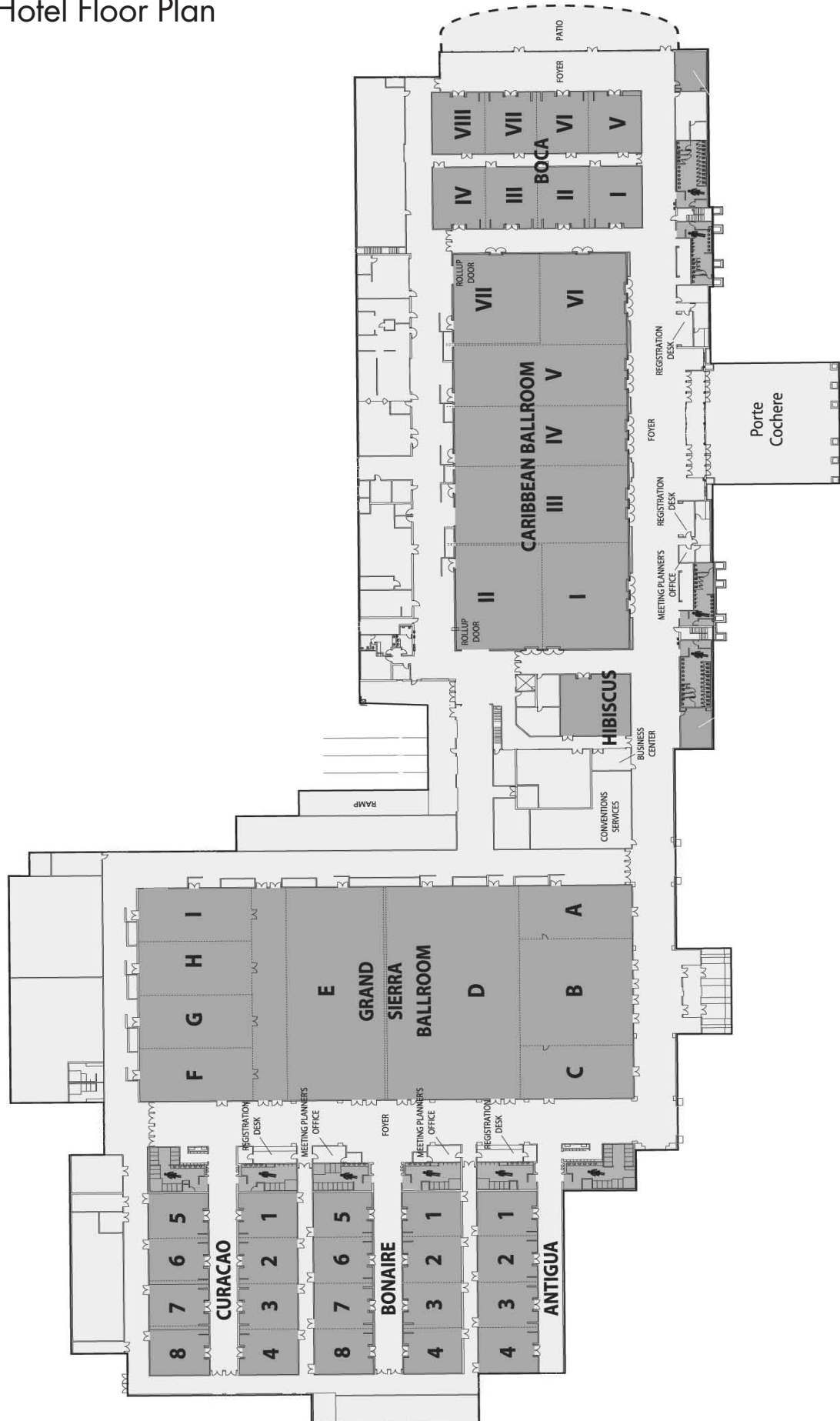
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Hotel Floor Plan



Convention Hotel Floor Plan





**Announcing a 2011 National Conference sponsored
by National Study of Education in Undergraduate
Science (NSEUS)***

Research Based Undergraduate Science Teaching: Investigating Reform in Classrooms

**June 19 – 21, 2011, Bryant Conference Center,
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The conference will focus on reforms in teaching undergraduate science and their short- and long-term impact on student outcomes. This highly interactive meeting combines presentations with time to interact and network with colleagues. We encourage you to plan to attend and participate. Register today at <http://nseus.org>.

If you currently are involved in research, or have future plans to conduct research in undergraduate science teaching, learning, and learning outcomes, consider submitting a proposal for the NSEUS 2011 Conference. We encourage you to send us your proposal abstract for consideration, for an individual research, action research paper, or larger group session and also to volunteer as a chair or discussant. Papers will be considered for publication as a chapter in the annual 2012 research volume *Research in Science Education (RISE)*, Information Age Publishers.

Information regarding the conference or submitting a proposal for presentation is available on the NSEUS web site <http://nseus.org>. A limited number of travel expense stipends are available to partially cover conference expenses for faculty presenting research papers related to the theme of the conference.

Dennis Sunal, Dean Zollman, Cheryl Mason and Cynthia Sunal, conference committee co-chairs.
For more information contact Dennis Sunal at dwsunal@bama.ua.edu



*The Conference is partially funded under the National Science Foundation Grant TPC 0554594. The project focuses on an examination of teaching in undergraduate science in the US and its impact on students. Opinions expressed in conference reports are those of the authors and do not necessarily reflect those of the Foundation.

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. 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

The National Association for Research in Science Teaching (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. The Journal 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.
- NARST Annual International Conference CD is distributed at the Annual International Conference. This volume includes a compiled list of abstracts (on CD-ROM) for the current Annual International Conference, plus copies of accepted papers submitted voluntarily by authors prior to the conference. Members attending the conference receive a copy on-site and the cost is included in their registration fee.
- E-NARST News describing recent developments in research and in the profession. E-NARST News provides opportunities to work with prominent people throughout the world on research projects and with affiliated organizations such as the National Science Teachers Association (NSTA), the Association for Science Teacher Education (ASTE), and the American Association for the Advancement of Science (AAAS). Our newsletter is now published online twice a year and posted to 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 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. The overall length of the paper sessions may vary based on the number of papers assigned to that session, but each paper within a particular session will observe the 15-minute presentation guideline. For example, four papers grouped together will be given a 90-minute time period, while two papers grouped together will be given a 45-minute time period for the overall session. This will optimize the grouping of papers by allowing strand coordinators to group papers based on similarity, rather than forcing the grouping of papers to fit a standard time block. Each presenter is expected to disseminate a paper during or immediately following the session, unless the paper is on the NARST 2011 CD, distributed as part of the program.

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 a summary of the symposium is on the NARST 2011 CD.

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 on the NARST 2011 CD.

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. Audience members will have approximately 90 minutes to circulate throughout the room to view the posters and interact with the presenters. Each presenter must set up the display prior to the start of the session and then remove it promptly at the end of the session. Each presenter is expected to disseminate a paper during the session, unless a summary of the poster is on the 2011 CD.

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. So, 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.

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.

Presider Roles

- 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.

Discussant Roles

- 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

A Special Thanks to our Sponsors and Exhibitors

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2012 Annual Conference Details

The Program Chair invites NARST members and others to plan to participate in the 2012 NARST Annual International Conference. You may wish to start planning next year's program proposals during this year's conference.

VENUE: JW Marriott Indianapolis, 10 S. West Street • Indianapolis, Indiana, USA

This new hotel opened in February 2011 as the largest JW Marriott in the world. The downtown Indianapolis hotel overlooks a gorgeous art-filled plaza. It is adjacent to the convention center and close to the White River State Park, the Indianapolis Zoo, many museums and within walking distance of the Circle Centre Mall with over 100 shopping, dining and entertainment options.

THEME: Re-Imagining Research in 21st Century Science Education for a Diverse Global Community

We encourage NARST members to align their proposals, wherever it is conceptually feasible, with the 2012 NARST theme that focuses on looking forward imaginatively, courageously, and comprehensively while engaging in science education research for a diverse, global community.

DATES: Sunday, March 25 – Wednesday, March 28, 2012

SUBMISSION DEADLINE: The Program Chair or designate must receive your program proposals for the 2012 Annual International Conference by August 15, 2011. The deadline allows sufficient time for processing, reviewing and evaluating the many proposals. In June 2011, the call for program proposals will appear on the NARST website.

Conference Chair: J. Randy McGinnis, President-Elect

Future Meeting Dates for NARST, NSTA, and AERA

2012

NSTA Indianapolis, IN March 29 – April 1

AERA Vancouver April 13 – 17

NARST Indianapolis March 24 – 28

2013

NSTA San Antonio, TX April 11 - 14

AERA Atlanta, GA April 11 - 15

NARST TBD

2010-11 Strand Coordinators

STRAND 1 Science Learning, Understanding, and Conceptual Change

Julia Plummer, Anat Yarden

STRAND 2 Science Learning: Contexts, Characteristics, and Interactions

Jennifer Eklund, Lisa A. Donnelly

STRAND 3 Science Teaching – Primary School (Grades preK-6)

Meredith Park Rogers, Rebecca Monhardt

STRAND 4 Science Teaching – Secondary School (Grades 5-12)

Daniella Dani, Anna Lewis

STRAND 5 College Science Teaching (Grades 13-20)

Sanjay Rebello, Linda Keen-Rocha

STRAND 6 Science Learning in Informal Contexts

Sandra Martell, Anita Welch

STRAND 7 Pre-service Science Teacher Education

Kristin Gunkel, Jennifer Wilhelm

STRAND 8 In-Service Science Teacher Education

Daniel Meyer, Nate Carnes

STRAND 9 Reflective Practice

Tom McConnell, Tang Wee Teo

STRAND 10 Curriculum, Evaluation, and Assessment

Joe Engemann, Ling Liang

STRAND 11 Cultural, Social, and Gender Issues

Maria Rivera, Geeta Verma

STRAND 12 Educational Technology

Keisha Varma, Reizelle Baretto

STRAND 13 History, Philosophy, and Sociology of Science

Sherry Southerland, Norm Lederman

STRAND 14 Environmental Education

Teddie Phillipson-Mower, Isha DeCoito

STRAND 15 Policy

Sarah Carrier, Andy Shouse

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 Schatzberg, Wendy
 Schaub, Elsa
 Schen, Melissa
 Schnittka, Christine
 Schussler, Elisabeth
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 Seimears, C. Matt
 Seker, Hayati
 Sen, Tapati
 Sengupta, Pratim
 Seo, Hae-Ae

Seung, Eulsun
 Shalome Odafe, Gideon
 Shanahan, Therese
 Shanahan, Marie-Claire
 sharkawy, azza
 Sharma, Ajay
 Shen, Ji
 Sherman, Ann
 Sherwood, Robert
 Shirley, Melissa
 Shwartz, Yael
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 Singer, Jonathan
 Siry, Christina
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 Smith, Mike
 Smith, Leigh
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 Subramaniam, Karthigeyan
 Sullivan, Amber
 Suskavcevic, Milijana
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 Szeto, Alan
 Taber, Keith
 Tal, Tali

Talanquer, Vicente
 Tan, Seng Chee
 Tanis Ozcelik, Arzu
 Tasar, Mehmet Fatih
 Teo, Tang Wee
 Thomas, Gregory
 Thomson, Norman
 Tippet, Christine
 Topçu, Mustafa Sami
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 Tran, Natalie
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 Trotman, Alicia
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 Witzig, Stephen
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 Yeo, Jennifer
 Yerdelen Damar, Sevda
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 1944 Florence G. Billig
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 1947 Earl R. Glenn
 1948 Ira C. Davis

1949 Joe Young West
 1950 N. Eldred Bingham
 1951 Betty Lockwood
 1952 Betty Lockwood
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 1963 Ellsworth S. Obourn
 1964 Cyrus W. Barnes
 1965 Frederic B. Dutton
 1966 Milton P. Pella
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 1968 John M. Mason
 1969 Joseph D. Novak

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 1974 Wayne W. Welch
 1975 Robert E. Yager
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 1979 James R. Okey
 1980 John W. Renner
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 1982 Stanley L. Helgeson
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 1985 Ertle Thompson
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 1990 William G. Holliday

1991 Jane Butler Kahle
 1992 Russell H. Yeany
 1993 Emmett L. Wright
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 1997 Thomas R. Koballa, Jr.
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 1999 Joseph S. Krajcik
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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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Glenn Markle	1985 – 1990
John Staver	1990 – 1995
Art White	1995 – 2000
David Haury	2000 – 2002
John Tillotson	2002 – 2007
William C. Kyle, Jr.	2007 – 2012

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
Ron Good	1990 – 1993
William C. Kyle, Jr.	1994 – May 1999
Charles A. 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 Krajcik and Angela Calabrese Barton	2011 – 2015

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*Denote first time Emeritus members

Aikenhead, Glen	Gunstone, Richard	Merzyn, Gottfried	Simmons, Ellen
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Appleton, Ken	Hann, Ann-Chin	Olstad, Roger	Smith Edward L.*
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Gorodetsky, Malka	McRobbie, Campbell	Sidenstick, William	

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

1986 Anton E. Lawson
1987 Paul DeHart Hurd
1988 John W. Renner
1989 Willard Jacobson
1990 Joseph D. Novak
1991 Robert L. Shrigley
1992 Pinchas Tamir
1993 Jack Easley, Jr.
1994 Marcia C. Linn
1995 Wayne W. Welch
1996 Carl F. Berger
1997 Rosalind Driver

Year Awardee

1998 James J. Gallagher
1999 Peter J. Fensham
2000 Jane Butler Kahle
2001 John K. Gilbert
2002 Audrey B. Champagne
2003 Barry J. Fraser
2004 Robert E. Yager
Paul Black
2005 John C. Clement
2006 David Treagust
2007 Kenneth Tobin
2008 Dorothy Gabel

Year Awardee

2009 Peter W. Hewson
Léonie Jean Rennie
Wolff-Michael Roth
2010 Reinders Duit
Joseph Krajcik
2011 Norman Lederman

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

1974 Donald E. Riechard and
Robert C. Olson
1975 Mary Budd Rowe
1976 Marcia C. Linn and
Herbert C. Thier
1977 Anton E. Lawson and
Warren T. Wollman
1978 Dorothy L. Gabel and
J. Dudley Herron
1979 Janice K. Johnson and
Ann C. Howe
1980 John R. Staver and
Dorothy L. Gabel (tie)
Linda R. DeTure
1981 William C. Kyle, Jr.
1982 Robert G. Good and
Harold J. Fletcher (tie)
F. David Boulanger
1983 Jack A. Easley, Jr.
1984 Marcia C. Linn,
Cathy Clement and
Stephen Pulos
1985 Julie P. Sanford
1986 Anton E. Lawson
1987 Russell H. Yeany,
Kueh Chin Yap, and
Michael J. Padilla
1988 Kenneth G. Tobin and
James J. Gallagher

Year Awardee

1988 (tie) Robert D. Sherwood,
Charles K. Kinzer,
John D. Bransford,
Jeffrey J. Franks and
Anton E. Lawson
1989 Glen S. Aikenhead
1990 Richard A. Duschl and
Emmett L. Wright
1991 E. P. Hart and
I. M. Robottom
1992 John R. Baird,
Peter J. Fensham,
Richard E. Gunstone, and
Richard T. White
1993 Nancy R. Romance and
Michael R. Vitale
1994 E. David Wong
1995 Stephen P. Norris and
Linda M. Phillips
1996 David F. Jackson,
Elizabeth C. Doster,
Lee Meadows, and
Teresa Wood
1997 C.W.J.M. Klassen and
P.L. Linjse
1998 Julie Bianchini
1999 Phillip M. Sadler
2000 Allan G. Harrison,
J. Grayson, and
David F. Treagust

Year Awardee

2001 Fouad Abd-El-Khalick and
Norman G. Lederman
2002 Andrew Gibert and
Randy Yerrick
2003 Sofia Kesidou and
Jo Ellen Roseman
2004 Jonathan Osborne,
Sue Collins,
Mary Ratcliffe,
Robin Millar and
Richard Duschl
2005 Jonathan Osborne,
Sibel Erduran and
Shirley Simon
2006 Troy D. Sadler and
Dana L. Zeidler
2007 Jerome Pine,
Pamela Aschbacher,
Ellen Roth,
Melanie Jones,
Cameron McPhee,
Catherine Martin,
Scott Phelps,
Tara Kyle and
Brian Foley
2008 Christine Chin
2009 Kihyun Ryoo and
Bryan Brown

Year Awardee

2010 Helen Patrick,
Panayota Mantzicopoulos,
and Ala Samarapungavan
2011 Daphne Minner,
Jeanne Century, and
Abigail Jurist Levy

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, Sharon J. Lynch, Joel Kuipers, Curtis Pyke and Michael Szesze
2005 Chi Yan Sui, David Treagust and Michael Szesze
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 Jène Rahm
2010 Mark W. Winslow, John R. Staver, and Lawrence C. Sharmann
2011 Matthew Kloser

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

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

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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E-NARST News Editor:	Jan van Driel	driel@iclon.leidenuniv.nl

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NARST Annual International Conference

Schedule at a Glance - 2011

Caribe Royale Orlando

Orlando, FL USA

	Event	Room
Saturday, April 2		
7:30 AM – 5:00 PM	NARST Executive Board Meeting #1	Antigua 1 and 2
2:00 PM – 5:00 PM	Conference Registration	Grand Sierra Registration North
Sunday, April 3		
7:30 AM – 12:00 PM	NARST Executive Board Meeting #2	Antigua 1 and 2
7:00 AM – 5:00 PM	Registration	Grand Sierra Registration North
8:00 AM – 12:00 PM	Pre-Conference Workshop #1: Equity and Ethics Committee Free Organizers: Geeta Verma and Regina E. Wragg Participants: Gillian U. Bayne, Nate Carnes, Sumi Hagiwara, Maria S. Rivera Maulucci, Felicia Moore Mensah, Jomo Mutegi, Wesley Pitts and Jerome M. Shaw Equity Internationally – Scholarship, Research, and Service for a Global Science Education Community	Curacao 1
8:00 AM – 12:00 PM	Pre-Conference Workshop #2: Publications Committee Free Angie Calabrese Barton, Joseph Krajcik, and Bob Geier Developing High Quality Reviews for the Journal of Research in Science Teaching	Curacao 3
8:00 AM – 12:00 PM	Pre-Conference Workshop #3: Research Committee Free Gavin Fulmer, Janice Earle, Kusum Singh, and Celeste Pea Developing a Competitive Educational Research Proposal for NSF's Division of Research on Learning	Curacao 4
8:00 AM – 12:00 PM	Pre-Conference Workshop #4: Research Committee \$25 registration Ravit Golan Duncan, Joseph Krajcik, David Fortus, Katherine McNeill, and Julia Plummer Developing and Assessing Learning Progressions in Science	Curacao 5
8:00 AM – 12:00 PM	Pre-Conference Workshop #5: Research Committee \$50 registration Kathleen Roth, Karen Givvin, Kathleen Schwille, Paul Numedahl, and Elaine Howes Videocase-based Lesson Analysis of Science Teaching to Support Teacher Learning: Experiencing Lesson Analysis and Mapping a Program of Research	Curacao 7
12:00 PM – 1:00 PM	Lunch (<i>on your own</i>)	
1:00 PM – 2:30 PM	Concurrent Session # 1	
2:45 PM – 4:00 PM	Concurrent Session # 2	

	Event	Room
4:00 PM – 4:30 PM	Break	
4:30 PM – 6:00 PM	Plenary Session # 1 Kalanithy Vairavamoorthy Head of the School of Global Sustainability University of South Florida, Tampa, FL (USA)	Grand Sierra E
6:00 PM – 7:00 PM	Mentor-Mentee Nexus	Antigua 3
7:00 PM – 9:30 PM	Presidential / Welcome Reception <i>(Appetizers served and cash bar)</i>	Grand Sierra Hall F, G, H & I

Monday, April 4

7:00 AM – 8:15 AM	Committee Meetings	
7:00 AM – 5:00 PM	Registration	Grand Sierra Registration North
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 <i>(Box lunch provided for 1st 100 attendees who sign up)</i>	Grand Sierra E
1:15 PM – 2:45 PM	Concurrent Session # 5	
2:45 PM – 3:15 PM	Break	
3:15 PM – 4:15 PM	Concurrent Session # 6A: Poster Session - even numbered posters	Grand Sierra D
4:15 PM – 5:15 PM	Concurrent Session # 6B: Poster Session - odd numbered posters	Grand Sierra D
5:30 PM – 6:30 PM	Graduate Student Forum	Grand Sierra F
6:30 PM – 7:30 PM	Graduate Student and Early Career Scholars <i>(Informal social - on your own)</i>	Poolside
6:30 PM – 8:30 PM	JRST Editorial Board Meeting/Reception <i>(Meeting open/ Reception by invitation)</i>	Grand Sierra G & H

Tuesday, April 5

7:00 AM – 8:15 AM	Committee Meetings	
7:00 AM – 5:00 PM	Registration	Grand Sierra Registration North
8:30 AM – 10:00 AM	Concurrent Session # 7	
10:00 AM – 10:30 AM	Break	
10:30 AM – 12:00 PM	Plenary Session #2: Tim Kasser Professor and Chair of Psychology Knox College, Galesburg, IL (USA)	Grand Sierra E
12:00 PM – 2:00 PM	Awards Luncheon	Grand Sierra Hall F, G, H & I
2:15 PM – 3:45 PM	Concurrent Session # 8	
4:00 PM – 5:30 PM	Concurrent Session # 9	

	Event	Room
5:45 PM – 6:45 PM	New Researcher and Junior Faculty Early Career Discussion	Grand Sierra F
6:00 PM – 8:00 PM	Springer (<i>By invitation only</i>)	Grand Sierra G
7:00 PM – 8:30 PM	Routledge / Taylor & Francis (<i>By invitation only</i>)	Grand Sierra H
7:00 PM – 9:00 PM	Equity Dinner Bahama Breeze Lake Buena Vista (<i>Maximum attendance: 90</i>) Dinner, including tax and gratuity, is \$35. Please note: You must register for this event with your Advance Conference Registration.	
8:00 PM – 10:30 PM	Social	Poolside

Wednesday, April 6

7:00 AM – 8:15 AM	Strand Meetings	
7:00 AM – 12:00 PM	Registration	Grand Sierra Registration North
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 (<i>on your own</i>)	
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	Antigua 1 and 2

PROGRAM

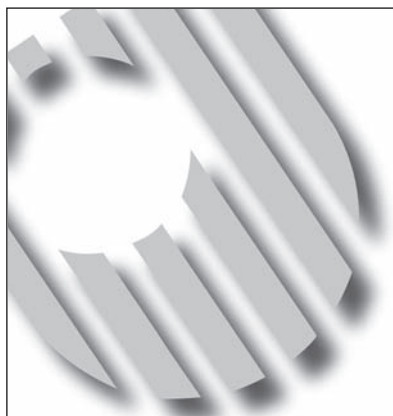
Saturday, April 2, 2011

NARST Executive Board Meeting Session #1

7:30am – 5:00pm, Antigua 1 & 2

Conference Registration

2:00pm – 5:00pm, Grand Sierra Registration North



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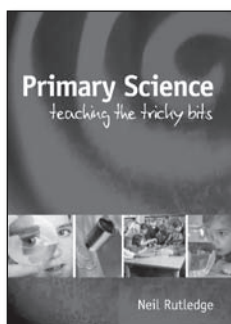
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This new edition offers a comprehensive overview of the major areas of research and scholarship in science education.

Each chapter summarizes the research work and evidence in the field, and discusses its significance, reliability and implications for the practice of science teaching.

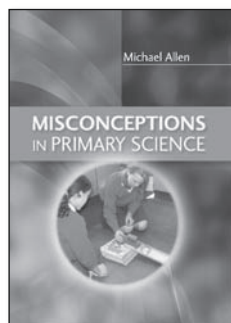
978-0-335-23858-3 256pp
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This book provides a combination of engaging, practical lesson ideas and subject knowledge to help you teach the trickiest parts of primary science.

This book explains the most difficult topics in a simple, non-technical style. It includes a range of accessible ideas, hints and tips with a focus on providing a skills-based, problem-solving approach to learning.

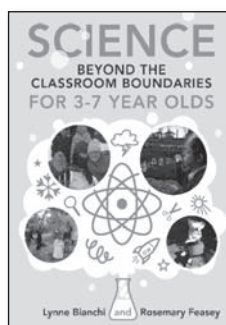
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This essential book offers friendly support and practical advice for dealing with the common misconceptions encountered in the primary science classroom.

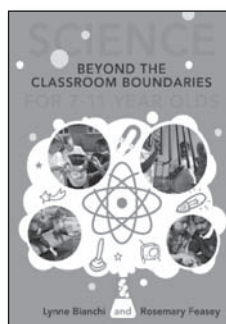
This handy book offers advice for teachers on how to recognise and correct such misconceptions.

978-0-335-23588-9 296pp
2010 \$42.00



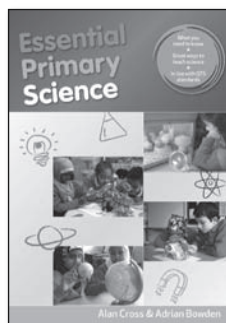
This truly innovative book supports primary schools in promoting the nature of pupil independence in choosing when and why to take their learning outside the classroom boundaries. This approach builds on the good practice begun in Foundation Stage.

978-0-335-24129-3 144pp
Sep-11 \$42.00



This book challenges the approach to science and technology in schools by reconsidering where scientific skills and concepts are taught, such as sound, forces, materials and light. This book encourages the shift of learning from indoors to outdoors.

978-0-335-24132-3 144pp
Sep-11 \$40.00



If you are teaching or learning to teach primary science, this is the toolkit to support you! Not only does it cover the essential knowledge and understanding that you need to know, it also offers over 200 great ideas for teaching primary science - so no more late nights thinking up creative new ways to teach key concepts!

978-0-335-23461-5 328pp
2009 \$45.00

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Sunday, April 3, 2011

NARST Executive Board Meeting Session #2

7:30am – 12:00pm, Antigua 1 and 2

Pre-Conference Workshops

8:00am – 12:00pm

W1 Pre-Conference Workshop – Equity and Ethics**Committee Sponsored****Equity Internationally – Scholarship, Research, and Service for a Global Science Education Community**

8:00am – 12:00pm, Curacao 1

Geeta Verma, Georgia State University

Regina E. Wragg, University of South Carolina

Jerome M. Shaw, University of California, Santa Cruz

Gillian U. Bayne, Lehman College of the City University of New York

Nate Carnes, University of South Carolina

Sumi Hagiwara, Montclair State University

Maria S. Rivera Malucci, Barnard College

Felicia Moore-Mensah, Columbia University

Jomo W. Mutege, Indiana University -- Purdue University Indianapolis

Wesley Pitts, Lehman College of the City University of New York

W2 Pre-Conference Workshop – Publications**Committee Sponsored****Developing High Quality Reviews for the Journal of Research in Science Teaching**

8:00am – 12:00pm, Curacao 3

Angela M. Calabrese-Barton, Michigan State University

Joseph S. Krajcik, University of Michigan

Bob Geier, University of Michigan

Patti Bills, Michigan State University

Hayat Hokayem, Michigan State University

W3 Pre-Conference Workshop – Research Committee Sponsored**Developing a Competitive Educational Research****Proposal for NSF's Division of Research on Learning**

8:00am – 12:00pm, Curacao 4

Gavin W. Fulmer, National Science Foundation

Janice Earle, National Science Foundation

Kusum Singh, National Science Foundation

Celeste Pea, National Science Foundation

W4 Pre-Conference Workshop – Research**Committee Sponsored****Developing and Assessing Learning Progressions in Science**

8:00am – 12:00pm, Curacao 5

Duncan Ravit Golan, Rutgers University

Joseph S. Krajcik, University of Michigan

David Fortus, Weizmann Institute of Science

Katherine L. McNeill, Boston College

Julia D. Plummer, Arcadia University

W5 Pre-Conference Workshop – Research**Committee Sponsored****Videocase-based Lesson Analysis of Science Teaching to Support Teacher Learning:****Experiencing Lesson Analysis and Mapping a Program of Research**

8:00am – 12:00pm, Curacao 7

Kathleen Roth, BSCS

Meridith Bruozas, BSCS

Elaine Howes, BSCS

Paul Numedahl, BSCS

Kathleen Schwillie, National Geographic

Lunch – On Your Own

12:00pm – 1:00pm

Concurrent Session #1**1:00pm – 2:30pm****Presidential Sponsored Session****S1.1 Symposium – Inquiry to Practices: Data Modeling, Measurement and Representation in Children's Statistical/Probabilistic Reasoning in Maths/Sciences**

1:00pm – 2:30pm, Antigua 1

Presider:

Richard Duschl, Penn State University

Discussant:

Leona Schauble, Vanderbilt University

Presenters:

Cliff Konold, University of Massachusetts, Amherst

Richard Lehrer, Vanderbilt University

William A. Sandoval, UCLA

James Hammerman, TERC

Strand 1: Science Learning, Understanding and Conceptual Change

S1.2 Symposium – Examining Learning Progressions beyond Content: Strands of Scientific Proficiency

1:00pm – 2:30pm, Curacao 1

Presider:

Julia D. Plummer, Arcadia University, plummerj@arcadia.edu

Discussant:

Joseph S. Krajcik, University of Michigan

Presenters:

Julia D. Plummer, Arcadia University,
Ravit Duncan, Rutgers University
Christina V. Schwarz, Michigan State University
Philip Bell, University of Washington
Nancy B. Songer, University of Michigan

Strand 1: Science Learning, Understanding and Conceptual Change

S1.3 Related Paper Set - Pathways to Ecological Literacy: Developing a Biodiversity Learning Progression

1:00pm – 2:30pm, Bonaire 4

S1.3.1 Development of a Grade 6-12 Learning Progression for Biodiversity: an Overview of the Approach, Framework, and Key Findings

Laurel M. Hartley, University of Colorado Denver
Charles W. Anderson, Michigan State University
Alan Berkowitz, Cary Institute of Ecosystem Studies
John C. Moore, Colorado State University
Jonathon W. Schramm, Michigan State University
Scott E. Simon, University of California Santa Barbara

S1.3.2 The Understanding of Genetic Diversity in Student Accounts

Shawna K. McMahon, Colorado State University
John C. Moore, Colorado State University

S1.3.3 The Role of Heredity and Environment in Students' Accounts of Adaptation by Selection and Phenotypic Plasticity

Jennifer Doherty, Michigan State University
Charles W. Anderson, Michigan State University

S1.3.4 Using Complexity in Food Webs to Teach Biodiversity

Cornelia Harris, Cary Institute of Ecosystem Studies
Alan Berkowitz, Cary Institute of Ecosystem Studies

S1.3.5 Student Understanding of Species Diversity in Ecosystems

Brook J. Wilke, Michigan State University
Charles W. Anderson, Michigan State University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S1.4 Approaches to Exploring Teachers' Roles

1:00pm – 2:30pm, Curacao 2

Presider:

Allison Antink, Illinois Institute of Technology

S1.4.1 An Informal Educator and a Classroom Teacher's Perceived Roles during an Elementary Classroom Science Program

Ingrid S. Weiland, Indiana University, Bloomington, iweiland@indiana.edu
Kristin L. Cook, Indiana University, Bloomington

S1.4.2 Effect of Teacher Reasoning Ability on Student Learning

Jennifer L. Esswein, The Ohio State University, esswein.5@osu.edu
Jerome Mescher, Hilliard City Schools
Bruce R. Patton, The Ohio State University

S1.4.3 An Exploration of Teacher Involvement in County Science Fairs: Student Support and Curriculum Integration

Kathleen Fadigan, Pennsylvania State University, kxf24@psu.edu

S1.4.4 Teacher Hedging and the Tentative Nature of Science Inquiry Discussions

Huseyin Colak, Northeastern Illinois University, h-colak@neiu.edu
Alandeom W. Oliveira, State University of New York at Albany
Valarie L. Akerson, Indiana University
Khemmawadee Pongsanon, Indiana University
Abdulkadir Genel, Indiana University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S1.5 Related Paper Set - Strategies for Fostering Discussion for Model Based Learning in Science

1:00pm – 2:30pm, Bonaire 8

Presider:

John J. Clement, University of Massachusetts - Amherst

Discussant:

Philip H. Scott

S1.5.1 Multiple Levels of Discussion-based Teaching Strategies for Supporting Students

E. Grant Williams, University of Massachusetts - Amherst School District 18 - Fredericton, New Brunswick, Canada

S1.5.2 Comparative Case Studies of Discussion Strategies used in Dynamic Computer Simulation vs. Static Image-based Sessions

Norman Price, University of Massachusetts - Amherst

S1.5.3 Hands on Small-group vs. Whole-class use of Animations and Simulations: Comparative Case Studies in Projectile Motion

A. Lynn Stephens, University of Massachusetts – Amherst

S1.5.4 Discussion-based Strategies for use of Simulations and Animations in Middle and High School Science Classrooms

Abi Leibovitch, University of Massachusetts – Amherst

A. Lynn Stephens, University of Massachusetts – Amherst

Norman Price, University of Massachusetts - Amherst

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

S1.6 Elementary Teacher Content Knowledge

1:00pm – 2:30pm, Curacao 3

S1.6.1 Using Research-based, Inquiry Physics Experiences (RIPE) to Improve Pedagogy Practices and Improve Content Knowledge of K-3 Teachers

Stephen J. Van Hook, Penn State University, sjv11@psu.edu

Tracy L. Huziak-Clark, Bowling Green State University

S1.6.2 Increasing Science Teaching Efficacy Beliefs among Elementary Teachers through Content Knowledge Improvement

Hasan Deniz, University of Nevada Las Vegas, hasan.deniz@unlv.edu

Marykay Orgill, University of Nevada Las Vegas

Kristoffer R. Carroll, Clark County School District

S1.6.3 Impact of Teachers' Physics Content Knowledge on Quality of Teaching and Students' Achievement during the Transition between Elementary and Secondary School

Annika Ohle, University Duisburg- Essen, Annika.Ohle@uni-due.de

Hans E. Fischer, University Duisburg- Essen

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

S1.7 Strand Sponsored Session-Twenty First Century Skills: An International Perspective

1:00pm – 2:30pm, Curacao 4

Presenters:

Danielle Dani, Ohio University, dani@ohio.edu

Saouma B. Boujaoude, American University of Beirut

Sara Salloum, Long Island University

Anil Banerjee, Columbus State University

Rola Khishfe, American University of Beirut

Kenneth G. Tobin, City University of New York

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

S1.8 Biology Instruction and Assessment

1:00pm – 2:30pm, Curacao 5

Presider:

Janelle M. Bailey, University of Nevada, Las Vegas

S1.8.1 Classification of Undergraduate Alternative Conceptions of the Tricarboxylic Acid Cycle

Sara L. Johnson, The University of Southern Mississippi,

Sara.Johnson@usm.edu

Jill D. Maroo, The University of Southern Mississippi

S1.8.2 Learning Natural Selection in College Biology Courses: The Relationship Between Teaching Methods and Learning Gains

Tessa M. Andrews, Ecology Department, Montana State University,
andrews.tessa@gmail.com

Mary J. Leonard, Education Department, Montana State University

S1.8.3 Naturalistic Inquiry of Introductory Biology Faculty Instructional Practices

Omah M. Williams, Texas A&M University, owillia2@tamu.edu

Tim P. Scott, Texas A&M University

S1.8.4 The Effects of Argumentation via On-line Discussion in University Students' Informal Reasoning Regarding Genetic Engineering

Ying-Tien Wu, National Central University, Taiwan, ytwu@cl.ncu.edu.tw

Chin-Chung Tsai, University of Science and Technology, Taiwan

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

S1.9 Related Paper Set - Measuring Pedagogical Reform in Undergraduate Entry-Level Science Courses

1:00pm – 2:30pm, Bonaire 7

Presider:

Dean Zollman, Kansas State University

Discussant:

Cheryl L. Mason, San Diego State University

S1.9.1 Measuring Perceptions of the Learning Environment in Undergraduate Entry-Level Science Courses

Cynthia S. Sunal, University of Alabama

Dennis W. Sunal, University of Alabama

Erika M. Steele, University of Alabama

S1.9.2 Assessing Students' Reasoning across Disciplines in Entry-Level Science Courses

Mojgan Matloob Haghanikar, Kansas State University

Sytl Murphy, Kansas State University

S1.9.3 Measuring Outcomes of Undergraduate Science Reform on Inservice Teacher's Pedagogical Content Knowledge

Donna Turner, University of Alabama
Dennis W. Sunal, University of Alabama
Cynthia S. Sunal, University of Alabama

S1.9.4 The Impact of Reformed Undergraduate Science Courses on Elementary Teacher Self-Efficacy and Science Teaching Practices

Corinne H. Lardy, San Diego State University

Strand 6: Science Learning in Informal Contexts

S1.10 Life after High School: How Informal Science Impacts STEMS Careers

1:00pm – 2:30pm, Curacao 6

Presider:

Anita Welch, North Dakota State University

S1.10.1 Competitive Science Events and Academic Major Choice

Jennifer H. Forrester, The University of Wyoming, jforres5@uwyo.edu
M. Gail Jones, NC State University
Grant E. Gardner, East Carolina University

S1.10.2 Out-of-School Time Science Activities and their Association with Career Interest in STEM

John T. Almarode, University of Virginia, jta7z@virginia.edu
Katherine Dabney, University of Virginia
Jaimie L. Miller, Harvard-Smithsonian Center for Astrophysics
Zahra Hazari, Clemson University
Robert H. Tai, University of Virginia
Philip M. Sadler, Harvard-Smithsonian Center for Astrophysics

S1.10.3 Seeing Science as Part of Who You Are: Initial Impact of a STEM-focused Out-of-School Program

Patrik Lundh, SRI International
Melissa Koch, SRI International, melissa.koch@sri.com
Christopher J. Harris, SRI International

S1.10.4 I know what my Carbon Footprint is! Impact Analysis of a High-School

Ruchi T. Bhanot, SRI International, ruchi.bhanot@sri.com
Ann House, SRI International
Aisha Heredia, SRI International

Strand 7: Pre-service Science Teacher Education

S1.11 Developing Preservice Teachers' Science Teacher Identity

1:00pm – 2:30pm, Curacao 7

Presider:

April Luehmann, University of Rochester

S1.11.1 Examining the Impact of Online Blogging on Pre-service Teacher's Perceptions about their Development as Science Teachers

Ratna Narayan, Texas Tech University, ratna.narayan@ttu.edu
Lori L. Petty, University of Texas, Brownsville
Deniz Peker, Virginia Tech
Sungwon Chung, Texas Tech University

S1.11.2 Pre-service Elementary Science Teacher Identity Development through Blogging in Communities of Practice

Janice L. Anderson, University of North Carolina at Chapel Hill, anderjl@email.unc.edu
Julie E. Justice, University of North Carolina at Chapel Hill
Steven D. Wall, University of North Carolina at Chapel Hill
Kathleen Nichols, University of North Carolina at Chapel Hill
Jennifer Jones, University of North Carolina at Chapel Hill
Helen Crompton, University of North Carolina at Chapel Hill

S1.11.3 Combining Service Learning and Action Research for Preservice Science Teacher Education: Explorations of Learning

Carolyn S. Wallace, Auburn University, csw0013@auburn.edu

Strand 8: In-service Science Teacher Education

S1.12 Barriers to Change

1:00pm – 2:30pm, Curacao 8

Presider:

Anita Martin, University of Illinois

S1.12.1 Science Teachers' Perceptions of the Barriers to Classroom Implementation of Model-based Reasoning

Patrick Dowd, University of California, Davis, pfdowd@gmail.com
Lin Xiang, University of California, Davis
Connie Hvidsten, University of California, Davis
Cynthia Passmore, University of California, Davis

S1.12.2 Making It Work: Three Case Study Narratives from a Secondary Science Teacher Professional Development Program

James B. Cooper, Mississippi Academy for Science Teaching, Jackson State University, james.b.cooper@jsums.edu
Kristin Bass, Rockman et al.
Sarah Mushlin, Rockman et al.

S1.12.3 Results of a Two-year Study: Exploring the Relationship of Teachers' Pedagogical Discontentment to Changes in Practices for 28 Rural Science and Mathematics Teachers

Margaret R. Blanchard, North Carolina State University,
Meg_Blanchard@ncsu.edu

Jason W. Osborne, North Carolina State University
Jennifer L. Albert, North Carolina State University

S1.12.4 Teachers' Perceived Challenges and Barriers to Implementing High-Level, Inquiry-Based Curriculums

Darin S. Munsell, Illinois Institute of Technology, munsdar@iit.edu
Norman G. Lederman, Illinois Institute of Technology

Strand 10: Curriculum, Evaluation, and Assessment

S1.13 Strand Sponsored Session - Exploring Large-Scale Assessment: A Four-Nations Perspective

1:00pm – 2:30pm, Bonaire 1

Presenters:

David F. Treagust, Curtin University, d.treagust@curtin.edu.au
John O. Anderson, University of Victoria
Chorng-Jee Guo, National Changhua University of Education
Xiufeng Liu, State University of New York at Buffalo

Strand 10: Curriculum, Evaluation, and Assessment

S1.14 Related Paper Set - Measuring Teacher Inquiry Knowledge

1:00pm – 2:30pm, Bonaire 6

Discussant:

Jon E. Pedersen, University of Nebraska-Lincoln

S1.14.1 Development and Validation of an Instrument to Measure Teacher Knowledge of Inquiry

Gwen Nugent, University of Nebraska-Lincoln
Greg Welch, University of Nebraska-Lincoln
Jim Bovaird, University of Nebraska-Lincoln

S1.14.2 Teaching Scenarios as a Probing Tool: Teachers

Nam-Hwa Kang, Oregon State University

S1.14.3 A PCK Rubric to Measure Teachers

Julie Gess-Newsome, Northern Arizona University
April Gardner, BSCS

S1.14.4 Assessing Pedagogical Content Knowledge of Inquiry Science Instruction

David Schuster, Western Michigan University
William Cobern, Western Michigan University
Brooks Applegate, Western Michigan University

Strand 11: Cultural, Social, and Gender Issues

S1.15 African American Children and Science: Identity, Representation, and Implications for Science Education

1:00pm – 2:30pm, Bonaire 2

Presider:

Mary Atwater, University of Georgia

S1.15.1 Young African American Children Constructing Narrative Identities in an Urban Science-Literacy Classroom

Justine M. Kane, Wayne State University, jmkane@wayne.edu

S1.15.2 Curriculum as a Weapon for Combating Systemic Racism: A Description of Science Unit for Elementary African American Science Learners

Jomo W. Mutegi, Indiana University - IUPUI, jmutegi@iupui.edu

S1.15.3 Identify-A-Scientist: How Third Grade African American Students See Scientists

Leon Walls, University of Vermont, lwalls@uvm.edu

S1.15.4 Young Black Children and Science: Chronotopes of Narratives around their Science Journals

Maria Varelas, University of Illinois at Chicago, mvarelas@uic.edu
Justine M. Kane, Wayne State University
Wylie Caitlin Donahue, University of Cambridge

Strand 12: Educational Technology

S1.16 Strand Sponsored Session - Digital Games and Conceptual Change in Core Concepts

1:00pm – 2:30pm, Bonaire 3

Discussant:

Diane Ketelhut, Temple University

Presenters:

Douglas B. Clark, Vanderbilt University, doug.clark@vanderbilt.edu
Mario Martinez-Garza, Vanderbilt University
Jody Clarke-Midura, Harvard University
Jilliane Code, Harvard University
Brian C. Nelson, Vanderbilt University
Cynthia M. D'Angelo, University of Wisconsin
Nathan Holbert, Northwestern University
Uri Wilensky, Northwestern University
Kent J. Slack, Arizona State University
Pratim Sengupta, Vanderbilt University

Strand 15: Policy

S1.18 Perspectives of Science Education

Practitioners

1:00pm – 2:30pm, Antigua 2

Presider:

Sarah J. Carrier, North Carolina State University

S1.18.1 Development and Initial Validation of New Science and Mathematics Faculty Measures of Change, Self-Efficacy Beliefs and Organizational Culture

Abdulkadir Demir, Georgia State University, abdulcadir_d@yahoo.com

Lisa Martin-Hansen, Georgia State University

Chad Ellett, CDE Research Associates, Inc.

Judith Monsaas, University System of Georgia

Judy Awong-Taylor, Georgia Gwinnett College

Nancy Vandergrift, University of Georgia

Chuck Kutal, University of Georgia

S1.18.2 Voices from the Front Lines: Exemplary Science Teachers on Education Reform

Erin E. Peters-Burton, George Mason University, epeters1@gmu.edu

Wendy M. Frazier, George Mason University

S1.18.3 Principals Goals for Science Education

Todd L. Hutner, The University of Texas at Austin, thutner@gmail.com

Kimberly S. Lanier, The University of Miami

Sherry A. Southerland, The Florida State University

S1.18.4 Mediating Mixed Messages: An Exploratory Study of Urban Elementary Teachers' Personal Agency Beliefs in the Context of Comprehensive School Reform

Jessica Gale, Emory University, jdgale@emory.edu

Concurrent Session #2

2:45pm – 4:00pm

Administrative Symposium

S2.1 Developing High Quality Reviews for the Journal of Research in Science Teaching

2:45pm - 4:00pm, Antigua 1

Presider:

Bob Geier, University of Michigan

Presenters:

Angela M. Calabrese-Barton, Michigan State University, acb@msu.edu

Joseph S. Krajcik, University of Michigan

Patti Bills, Michigan State University

Hayat Hokayem, Michigan State University

Strand 1: Science Learning, Understanding and Conceptual Change

S2.2 Argumentation and Knowledge Construction

2:45pm – 4:00pm, Curacao 1

Presider:

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

S2.2.1 Science Learning and Argumentation:

How are they Related?

Hanife Hakyolu, hakyoluhanif@yahoo.com

Bekiroglu Feral Ogan

S2.2.2 Impact on Year 4 Student Conceptual Understanding of Force and Motion after Writing Letters to Year 11 Students

Ying-Chih Chen, University of Iowa, ying-chih-chen@uiowa.edu.tw

Brian M. Hand, University of Iowa

Leah McDowell, Seneca Valley School District, Pittsburgh, PA

S2.2.3 Kindergartners' Understandings about Seeds, Plants and Scientific Knowledge Building

Deborah C. Smith, The Pennsylvania State University, dcs27@psu.edu

Alicia M. Mcdyre, The Pennsylvania State University

S2.2.4 Characterizing Uncertainty Associated with Middle School Students' Scientific Arguments

Amy R. Pallant, The Concord Consortium, apallant@concord.org

Hee-Sun Lee, Tufts University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S2.3 Exploring Socio-Scientific Issues in the Science Classroom

2:45pm – 4:00pm, Curacao 2

Presider: Wesley Pitts, Lehman College

S2.3.1 What will Students Learn when Working with a Socio-Scientific Issues: Are Cell Phones Hazardous?

Britt Lindahl, britt.lindahl@hkr.se
Maria Rosberg

S2.3.2 Students and their Parents Speak Out on the Purposes of Learning Science in Middle School

Leigh K. Smith, Brigham Young University, leigh_smith@byu.edu
Pamela Cantrell, Brigham Young University
Erin Whiting, Brigham Young University
Erika Feinauer, Brigham Young University

S2.3.3 Evaluation of an Intervention to Improve Students' Use of Content Knowledge when Dealing with Socio-Scientific Issues

Italo Testa, Federico II University, Naples, Italy, italo@na.infn.it
Ester Salvato, Convitto Nazionale, Naples, Italy

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S2.4 Related Paper Set – Talking to Learn and Learning to Talk in Secondary Science

2:45pm – 4:00pm, Bonaire 8

S2.4.1 Developing the Teaching of Argumentation in School Science Departments

Shirley S. Simon, University of London
Andri Christodoulou, King's College London
Christina Howell-Richardson, King's College London
Katherine Richardson, University of London
Jonathan F. Osborne, Stanford University

S2.4.2 Argumentation by Design: A Study of Teachers' Capacity to Enact of Argumentation Activities Beyond the Classroom

Katherine Richardson, University of London
Ruth Amos, University of London

S2.4.3 Epistemic Features of Science Teachers' Talk During Argumentation Instruction

Andri Christodoulou, King's College London
Jonathan F. Osborne, Stanford University

S2.4.4 A Study of the Effect of Engaging in Argumentation on Students' Ability to Reason, their Understanding of the Nature of Science their Engagement with School Science

Jonathan F. Osborne, Stanford University
Shirley S. Simon, University of London
Andri Christodoulou, King's College London
Christina Howell-Richardson, King's College London
Katherine Richardson, University of London

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

S2.5 Science and Literacy

2:45pm – 4:00pm, Curacao 3

S2.5.1 Primary Grade Children

Sheryl L. Honig, Northern Illinois University, shonig@niu.edu

S2.5.2 Engineering Design and Literacy in a Bilingual Elementary Classroom

Kevin Carr, Pacific University, Oregon, kcarr@pacificu.edu
Elizabeth Schlessman, Lincoln Elementary School, Woodburn, OR

S2.5.3 Writing and Learning in Science: Connections between Elementary Teachers' Beliefs and Practice

Nicole J. Glen, Bridgewater State University, nglen@bridgew.edu

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

S2.6 Argumentation and the Nature of Science

2:45pm – 4:00pm, Curacao 4

Presider:

Irene U. Osisioma, California State University, Dominguez Hills

S2.6.1 Traversing the Divide between High School Students and Sophisticated Nature of Science: A Multi-pronged Approach

Tami Russell, The University of Tennessee Hardin Valley Academy/High School, russellt4@k12tn.net
Mehmet Aydeniz, The University of Tennessee

S2.6.2 Argumentation: Exploring Instructional Practices of Three Teachers, and their Students

Maria P. Evagorou, University of Nicosia, Cyprus, evagorou.m@unic.ac.cy
Lucy Avraamidou, University of Nicosia, Cyprus

S2.6.3 The Effect of Using Thought Experiments on Grade 8 Students' Physics Achievement and Views of Nature of Science

Saouma B. Boujaoude, American University of Beirut, boujaoud@aub.edu.lb
Garine Santourian, American University of Beirut

S2.6.4 The Relationship between Teachers' Pedagogical Content Knowledge and Beliefs of Scientific Argumentation on Classroom Practice

Amanda M. Knight, Boston College, knightam@bc.edu
Katherine L. McNeill, Boston College

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

S2.7 Contexts and Factors Influencing Students' Science Attitudes, Efficacy, and Interests 2:45pm – 4:00pm, Curacao 5

Presider:

Erika G. Offerdahl, North Dakota State University

S2.7.1 Depicting Chemistry Majors' Self-Perceptions in Learning Chemistry

Murat Kahveci, Canakkale Onsekiz Mart University, Turkey,
mkahveci@gmail.com

S2.7.2 Investigating College Students' Self-Efficacy, Interest, and Conceptual Change About Stars

Janelle M. Bailey, University of Nevada, Las Vegas, janelle.bailey@unlv.edu
Doug Lombardi, University of Nevada, Las Vegas
Gale M. Sinatra, University of Nevada, Las Vegas

S2.7.3 Homework, Motivation, and Achievement in a College Genetics Course

Matthew S. Planchard, University of Southern Mississippi,
matthew.planchard@eagles.usm.edu
Kristy L. Halverson, University of Southern Mississippi
Jill D. Maroo, University of Southern Mississippi
Timothy I. Mclean, University of Southern Mississippi

S2.7.4 Characterizing Self-Efficacy Opportunities in the Process of Modeling a Physical Phenomenon: A Study of Three Female Modeling Instruction Students

Vashti Sawtelle, Florida International University, vashti.sawtelle@gmail.com
Eric Brews, Florida International University
Renee Michelle Goertzen, Florida International University,
Department of Physics
Laird H. Kramer, Florida International University,
Department of Physics

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

S2.8 Epistemologies of Students and Teachers 2:45pm – 4:00pm, Bonaire 7

Presider:

Linda Keen-Rocha, University of Witwatersrand

S2.8.1 Collegiate Students' Epistemologies of the Role of Models in Precalculus Mathematics

Robert Melendy, George Fox University, rmelendy@georgefox.edu
Lawrence Flick, Oregon State University

S2.8.2 Relationships Between Students' Epistemology, Argumentation, and Conceptual Understanding in Biotechnology: A Case Study

Carina M. Rebello, University of Missouri, cp5xc@mail.mizzou.edu
Stephen B. Witzig, University of Missouri
Kemal Izci, University of Missouri
Marcelle A. Siegel, University of Missouri
Sharyn K. Freyermuth, University of Missouri

S2.8.3 Epistemological Beliefs & Teaching Practices of Science Faculty with Education Specialties

Tracie M. Addy, North Carolina State University, tmaddy@ncsu.edu
Patricia E. Simmons, North Carolina State University
Grant E. Gardner, North Carolina State University
Jennifer L. Albert, North Carolina State University

S2.8.4 Evolution Acceptance and Epistemological Views of College Biology Students

Lisa A. Donnelly, Kent State University, ldonnell@kent.edu
Elizabeth Shevock, Kent State University

Strand 6: Science Learning in Informal Contexts

S2.9 Strand Sponsored Symposium-Learning Technologies in Informal Contexts 2:45pm – 4:00pm, Curacao 6

Presider:

Sandra T. Martell, University of Wisconsin-Milwaukee

Discussant:

Reed Stevens, Northwestern University

Presenters:

Mark Chen, University of Washington
Alex Games, Michigan State University
Douglas B. Clark, Vanderbilt University
Alex Games, Michigan State University
Robb Lindgren, University of Central Florida
Debora B. Wisneski, University of Wisconsin-Milwaukee
Heather T. Zimmerman, Penn State University
Susan M. Land, Penn State University
Arlene De Strulle, National Science Foundation

Strand 7: Pre-service Science Teacher Education

S2.10 Learning Science Teaching Practices 2:45pm – 4:00pm, Curacao 7

Presider:

Jennifer Cartier, University of Pittsburgh

S2.10.1 Learning to Assess: Preservice Science Teachers' Learning about Classroom Assessment

Nam-Hwa Kang, Oregon State University,
kangn@science.oregonstate.edu

S2.10.2 Beginning Teachers' Development of Classroom Practice and Their Narratives of Practices toward Reform-Oriented Instruction

Hosun Kang, Michigan State University, kanghosu@msu.edu
Charles W. Anderson, Michigan State University

S2.10.3 The Influence of Curriculum-Independent Factors on Preservice Elementary Teachers' Adaptation of Science Curriculum Materials

Cory T. Forbes, University of Iowa, cory-forbes@uiowa.edu

S2.10.4 Elementary Preservice Teachers' Knowledge and Application of Science Vocabulary

Sarah J. Carrier, North Carolina State University, sarah_carrier@ncsu.edu

Strand 8: In-service Science Teacher Education

S2.11 Case Studies of Teacher Growth

2:45pm – 4:00pm, Curacao 8

Presider:

Martina Nieswandt, Illinois Institute of Technology

S2.11.1 Hiking Mt. Kilimanjaro: Personal and Professional Impacts on Female Elementary Teachers' Lives and Practice

Megan E. Mistler-Jackson, University of Colorado Denver,
meganmj@comcast.net

S2.11.2 Examining Real-world IT-immersion Teacher Education Experiences through the Lens of Two Teacher Roles

Cathlyn D. Styliniski, University of Maryland, cstyliniski@umces.edu
Caroline Parker, Educational Development Center
Carla McAuliffe, TERC

S2.11.3 Enhancing Teacher Knowledge and Pedagogical Reasoning: A case study of cooperating science teacher mentors

Shelly Rodriguez, The University of Texas at Austin,
shelly.rodriguez@austin.utexas.edu
Julie Gess-Newsome, Northern Arizona University
James Barufaldi, The University of Texas at Austin

Strand 8: In-service Science Teacher Education

S2.12 Related Paper Set - Impact of the Communication in English and Science Inquiry Project on Teachers and Students

2:45pm – 4:00pm, Antigua 2

S2.12.1 Improving Student Scientific Explanation Skills Through Research-based Professional Development

Nievita Bueno Watts, Arizona State University, nbueno@asu.edu
Dale R. Baker, Arizona State University
Gita Perkins, Arizona State University
Tapati Sen, Arizona State University
Dola Chaudhuri, Arizona State University
Michael G. Lang, Maricopa Community College

S2.12.2 Change in Implementation Practices of English and Science Teachers over Time

Tapati Sen, Arizona State University
Dale R. Baker, Arizona State University
Nievita Bueno Watts, Arizona State University
Gita Perkins, Arizona State University
Michael G. Lang, Maricopa Community College

S2.12.3 Scientific Explanations of Communication in English and Science Inquiry Project Students: Science vs English Comparison

Gita Perkins, Arizona State University
Dale R. Baker, Arizona State University
Tapati Sen, Arizona State University
Michael G. Lang, Maricopa Community College
Nievita Bueno Watts, Arizona State University

S2.12.4 The Relationship of Teacher Implementation of Professional Development to Student Scientific Explanations and Grades

Dale R. Baker, Arizona State University
Nievita Bueno Watts, Arizona State University
Tapati Sen, Arizona State University
Gita Perkins, Arizona State University
Dola Chaudhuri, Arizona State University
Michael G. Lang, Maricopa Community College

Strand 10: Curriculum, Evaluation, and Assessment

S2.13 Assessment in Chemistry

2:45pm – 4:00pm, Bonaire 1

Presider:

Yilmaz Kara, Karadeniz Technical University

S2.13.1 Evaluation of the National Educational Standards in Chemistry Education

Maik Walpuski, University of Osnabrueck Chemistry Education,
maik.walpuski@uos.de

S2.13.2 Identifying Chemistry Laboratory Safety Conceptions

Wendy E. Schatzberg, Western Washington University,
wendy.schatzberg@gmail.com
Baohui Zhang, Nanyang Institute for Education, Singapore

S2.13.3 Analysis of Teachers' Views on the Nature of Models in the Development of a New Model-based Course

Hui-Jung Chen, National Taiwan Normal University, Taiwan,
karen3117tw@gmail.com
Mei-Hung Chiu, National Taiwan Normal University, Taiwan

S2.13.4 Does Question Type, Content and Gender Influence Student Understanding as Demonstrated in an Entrance Examination?

Ross D. Hudson, Australian Council for Educational Research Curtin
University of Technology, hudson@acer.edu.au
David F. Treagust, Curtin University of Technology

Strand 10: Curriculum, Evaluation, and Assessment

S2.14 Symposium – Computer Model-Based Assessment of Learning Progression: Promises and Issues

2:45pm – 4:00pm, Bonaire 6

Presider:

Xiufeng Liu, University at Buffalo, SUNY

Discussant:

Erica Smith, University at Buffalo, SUNY

Presenters:

Noemi Waight, University at Buffalo, SUNY
Roberto Gregorius, Canisius College
Kristina Gillmeister, University at Buffalo, SUNY

Strand 11: Cultural, Social, and Gender Issues

S2.15 College Science Students: Attitudes, Beliefs, and Aspirations Related to Gender, Religion, Class and Ethnicity

2:45pm – 4:00pm, Bonaire 2

Presider: Janell N. Catlin, Teachers College, Columbia University

S2.15.1 Understanding Disadvantage: Comparing Motivation, Family Support, Preparation, and Income Characteristics of Minority and Non-Minority College Calculus Students

Charity N. Watson, Clemson University, charitw@clemson.edu
Philip M. Sadler, Harvard-Smithsonian Center for Astrophysics
Gerhard Sonnert, Harvard-Smithsonian Center for Astrophysics

S2.15.2 Stories of Persistence: How Class Shapes the Experiences of Female First-generation Students in Undergraduate Science

Rachel E. Wilson, The University of Georgia, rewilson@uga.edu
Julie M. Kittleson, The University of Georgia

S2.15.3 Creationism, Worldviews, and Existential Anxiety: An Ethnographic Perspective

David E. Long, Valdosta State University, delong@valdosta.edu

S2.15.4 What Type of Science Person are You? Gender & Race/Ethnicity Comparisons

Zahra Hazari, Clemson University, zahra@clemson.edu
Philip M. Sadler, Harvard Smithsonian Center for Astrophysics
Gerhard Sonnert, Harvard Smithsonian Center for Astrophysics

Strand 12: Educational Technology

S2.16 Dynamics of Supporting Learning Through Technologies

2:45pm – 4:00pm, Bonaire 3

Presider:

Taha Mzoughi, Kennesaw State University

S2.16.1 Learning and Social Dynamics in a Student Directed High School Virtual Reality Class

Teresa Morales, Iowa State University, tmorales@iastate.edu
Eunjin Bang, Iowa State University
Thomas Andre, Iowa State University

S2.16.2 Relationship between Students' and Teacher's Questions in an Online Forum

Seng-Chee Tan, National Institute of Education, Nanyang
Technological University, Singapore, sengchee.tan@nie.edu.sg
Lay-Hoon Seah, University of Melbourne

S2.16.3 Nature of Community in a Science Teachers' Virtual Community from a Community of Practice Perspective

Heather M. Worsham, University of Missouri, hmw7a5@mizzou.edu
Aaron J. Sickel, University of Missouri

S2.16.4 Using Web 2.0 Tools to Support Student Construction of Scientific Arguments

Jennifer L. Weible, Penn State University, jweible@gmail.com

Strand 13: History, Philosophy, and Sociology of Science

S2.17 Presidential Invited Session - Inquiry, Science Practices, and the Nature of Science

2:45pm – 4:00pm, Bonaire 4

Presider:

Richard Duschl, Penn State University

Discussant:

Gregory J. Kelly, Penn State University

Presenters:

Agustín Adúriz-Bravo, Universidad de Buenos Aires

Douglas Allchin, University of Minnesota

Barbara A. Crawford, Cornell University

Sibel Erduran, University of Bristol

Richard Grandy, Rice University

Renee Schwartz, Western Michigan University

Strand 14: Environmental Education

S2.18 Environmental Education in Practice

2:45pm – 4:00pm, Bonaire 5

Presider:

Kim Sadler, Middle Tennessee State University

S2.18.1 Exploring Environmental Education in Schools

Xavier E. Fazio, Brock University, xavier.fazio@brocku.ca

Douglas D. Karrow, Brock University

S2.18.2 Measuring the Effectiveness of the Ecology Disrupted Approach for Student Learning of Ecological Principles, Human Impact and the Nature of Science

Yael Wyner, City College of New York of the City University of New York, ywyner@ccny.cuny.edu

S2.18.3 Contradictions? What Contradictions?: Science Teachers do Environmental Education

Michael Tan, University of Toronto, mike.tan.lt@gmail.com

Erminia G. Pedretti, University of Toronto

S2.18.4 An Ethnographic Experience of a Place-based Learning Environment

Carlos Gustavo A. Ormond, Simon Fraser University, cormond@sfu.ca

David B. Zandvliet, Simon Fraser University

Susan Teed, Simon Fraser University

Break

4:00pm – 4:30pm

PL1 Plenary Session #1

New Urban Leaders for Sustainable Cities of the Future

4:30pm – 6:00pm, Grand Sierra E

Presider:

Dana L. Zeidler, University of South Florida

Keynote Presenter:

Kalanithy Vairavamoorthy, University of South Florida

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, Antigua 3

April Adams, Northeastern State University, adams001@nsuok.edu

Corinne Lardy, San Diego State University

Presidential/Welcome Reception

Social Event: All NARST members are welcome – free appetizers and cash bar

7:00pm – 9:30pm, Grand Sierra Hall F, G, H, & I

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Edited by **Julie A. Luft**

This virtual issue of the *Journal of Research in Science Teaching (JRST)*, with its focus on scientific inquiry, represents a commitment by two communities to bridge the research and practice gap: the community of science educators who craft the instruction that ensures student learning – the National Science Teachers Association (NSTA), and science education researchers who study classroom life in order to understand more about the process of teaching and learning – the National Association for Research in Science Teaching (NARST).

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East Lansing, Michigan

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Monday, April 4, 2011

Committee Meetings

7:00am – 8:15am

Awards Committee Chairs & Co-Chairs Meeting

7:00am – 8:15am, Curacao 1

Equity and Ethics Committee Meeting

7:00am – 8:15am, Curacao 2

External Policy and Relations Committee Meeting

7:00am – 8:15am, Curacao 3

Research Committee Meeting

7:00am – 8:15am, Curacao 4

Membership and Election Committee Meeting

7:00am – 8:15am, Curacao 5

International Committee Meeting

7:00am – 8:15am, Curacao 6

Program Committee Meeting

7:00am – 8:15am, Curacao 7

Publications Advisory Committee Meeting

7:00am – 8:15am, Curacao 8

Concurrent Session #3

8:30am – 10:00am

Presidential Sponsored Session

S3.1 Symposium - The Cyberlearning Research

Agenda: A View from NSF?

8:30am – 10:00am, Antigua 1

Presider:

Troy D. Sadler, University of Florida

Janet Kolodner, National Science Foundation,

jkolodne@nsf.gov

Nancy B. Songer

Chris Quintana

External Policy Committee & Strand 15: Policy
Sponsored Session

S3.2 Symposium - Exploration and Critique of the
NRC's New Conceptual Framework for Science
Education Standards

8:30am – 10:00am, Antigua 2

Presider:

Andrew Shouse, University of Washington

Discussants:

Charles W. Anderson, Michigan State University

Nancy W. Brickhouse, University of Delaware

George E. Deboer, American Association for the Advancement
of Science

Presenters:

Heidi Schweingruber, National Research Council

Sharon Lynch, George Washington University

Elizabeth A. Davis, University of Michigan

Sarah J. Carrier, North Carolina State University

Strand 1: Science Learning, Understanding and
Conceptual Change

S3.3 Learning Science in High School and College

8:30am – 10:00am, Curacao 1

Presider:

Janelle M. Bailey, University of Nevada, Las Vegas

S3.3.1 What Is More Effective - Learning With
Worked-Out Examples Alone Or In Pairs?

Iris Mackensen-Friedrichs, IPN -Leibniz Institute for Science and

Mathematics Education Kiel, Germany, mackensen@ipn.uni-kiel.de

Markus Luecken, IPN -Leibniz Institute for Science and Mathematics

Education Kiel, Germany

Alexandra Schautz, University of Hildesheim Germany

S3.3.2 Navigating Deep Time: Landmarks from
the Big Bang to the Present

Cesar Delgado, The University of Texas at Austin,

cesar_delgado@austin.utexas.edu

S3.3.3 Increasing Inferential Comprehension of
Science Texts Using Elaborative Interrogative
Study Questions

William G. Holliday, University of Maryland, holliday@umd.edu

Cynthia A. Ghent, Towson University

Stephen D. Cain, Montgomery College

Janice M. Bonner, College of Notre Dame of Maryland

Strand 2: Science Learning: Contexts, Characteristics and Interactions
S3.4 Context and Learning Environment
8:30am – 10:00am, Curacao 2

Presider:

Noemi Waight, University at Buffalo

S3.4.1 Analyzing Influences of a Real-life Context Compared to a Subject-related Context on Students' Interest and Achievement

Eva Kölbach, eva.koelbach@uni-due.de
 Elke Sumfleth

S3.4.2 Employing a Culturally-based Context as a Means to Science Agency: Snow Snakes and STEM

Brant G. Miller, University of Idaho, mill3770@umn.edu
 Gillian H. Roehrig, University of Minnesota

S3.4.3 Relationship Between Pre-Service Elementary Science Teachers' Argumentation Quality About Climate Change and Epistemic Belief Levels

Erdinc Isbilir, Middle East Technical University, isbilir@metu.edu.tr
 Hamide Ertepinar, Middle East Technical University
 Jale Cakiroglu, Middle East Technical University

S3.4.4 Multimedia Text-Synergy: A Pedagogy to Bridge Adolescents and School Science Literacies

Kok-Sing (Kenneth) Tang, University of Michigan, koksing@umich.edu
 Stephen Tighe, Lake Orion High School
 Elizabeth Moje, University of Michigan

Strand 2: Science Learning: Contexts, Characteristics and Interactions
S3.5 Symposium – Supporting Elementary and Middle School Students in Developing, Using, and Refining Scientific Models
8:30am – 10:00am, Antigua 3

Presider:

Christina V. Schwarz, Michigan State University

Presenters:

Brian J. Reiser, Northwestern University
 Andres Acher, Northwestern University
 Lisa Kenyon, Wright State University
 Hamin Baek, Michigan State University
 Michele Nelson, University of Michigan
 Yael Bamberger, University of Michigan
 James A. Hagerty, University of Michigan
 Li Zhan, Michigan State University
 Jing Chen, Michigan State University

Strand 3: Science Teaching--Primary School (Grades preK-6): Characteristics and Strategies
S3.6 Teaching/Learning Science from Multiple Perspectives
8:30am – 10:00am, Curacao 3

Presider:

Deborah J. Tippins, University of Georgia

S3.6.1 Examining Culturally Responsive Teaching Practices over Three Enactments of a Personally Consequential Elementary Science Unit

Christopher J. Harris, SRI International, christopher.harris@sri.com
 Patrik Lundh, SRI International
 Hannah Lesk, SRI International
 Liliana Ructinger, SRI International
 Carlin Llorente, SRI International
 William R. Penuel, SRI International
 Carrie Tzou, University of Washington, Bothell
 Philip Bell, University of Washington

S3.6.2 Dramatic Science: Using Theatrical Techniques to Teach Primary (or Elementary) Science

Debbie J. McGregor, University of Wolverhampton,
debmcmgregor@btinternet.com

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

S3.7 Investigations of Science Teachers' Knowledge and Beliefs

8:30am – 10:00am, Curacao 4

Presider:

Toni A. Sondergeld, University of Toledo

S3.7.1 Comparison of Pre-Service and In-Service Teachers' Content Knowledge and Pedagogical Content Knowledge in Chemistry

Oliver Tepner, University of Duisburg-Essen Chemistry Education,
oliver.tepner@uni-due.de
 Sabrina Witner, University of Duisburg-Essen Chemistry Education

S3.7.2 Physics Teachers' Content Knowledge and Pedagogical Content Knowledge: Developing Test Scales and Measuring the Relation

Sophie Kirschner, University of Duisburg-Essen, Germany,
sophie.kirschner@uni-due.de
 Andreas Borowski, University of Duisburg-Essen, Germany
 Hans E. Fischer, University of Duisburg-Essen, Germany

S3.7.3 Autonomy and Self-Determination**Theory in Different Contexts: A Comparison of Middle School Science Teachers' Motivation and Instruction in China and the United States**

Laura E. Robertson, East Tennessee State University, lerobert@ncsu.edu
M. Gail Jones, North Carolina State University

S3.7.4 Linking Expert Science Teachers Values with their Practice

Deborah J. Corrigan, Monash University, debbie.corrigan@monash.edu
Rebecca Cooper, Monash University
Stephen Keast, Monash University
Donna King, Queensland University of Technology

Strand 5: College Science Teaching and Learning (Grades 13-20)**S3.8 Mentoring and Development of Graduate Students**

8:30am – 10:00am, Curacao 5

Presider:

Hye-Eun Chu, Kansas State University

S3.8.1 Understanding Student Evaluations of their Doctoral Advisors

Geoffrey Potvin, Clemson University, gpotvin@clemson.edu
Mark D. Harmon, Clemson University
Robert H. Tai, Curry School of Education University of Virginia

S3.8.2 What Students and Graduate Programs Can Do to Reduce Doctoral Completion Times

Geoffrey Potvin, Department of Engineering & Science Education,
and Department of Mathematical Sciences Clemson University,
gpotvin@clemson.edu
Adam V. Maltese, Indiana University
Joseph A. Harsh, Indiana University
Robert H. Tai, Curry School of Education University of Virginia

S3.8.3 Characterizing Strategies Used by Graduate Students in Field Ecology for Coping with Research Challenges

Mika Leon-Beck, The Hebrew University of Jerusalem,
mikabeck@gmail.com
Jeff Dodick, Science Teaching Center, The Hebrew
University of Jerusalem

S3.8.4 Faculty Mentor-Graduate Student Coauthoring: The Precursors, Processes, and Outcomes of 'Scholarly Bricklaying'

Michelle A. Maher, University of South Carolina,
mmaher@mailbox.sc.edu
Briana E. Timmerman, University of South Carolina
David F. Feldon, University of Virginia
Denise Strickland, University of Virginia

Strand 6: Science Learning in Informal Contexts**S3.9 Outcomes and Outreach: Bridging the Gap in Informal Science Education**

8:30am – 10:00am, Curacao 6

Presider:

Susannah K. Sandrin, Arizona State University

S3.9.1 The Enduring Effect of Formal Science Learning on Adult Informal Science Learning

Jon D. Miller, University of Michigan, jondmiller@umich.edu

S3.9.2 Factors Contributing to Adult STEM Knowledge

John H. Falk, Oregon State University, falkj@science.oregonstate.edu

S3.9.3 Experiences with the Informal Science Education Program's Transformation from Documenting Outputs to Measuring Outcomes

John P. Wells, Westat, johnwells@westat.com
Gary Silverstein, Westat

S3.9.4 Exploring Impacts of Professional Development for Informal Science Educators

James Kiesel, California State University, Long Beach, jkiesel@csulb.edu
Susan Magdziarz, Crystal Cove Alliance
Maria Grant, California State University, Fullerton
Donna Ross, San Diego State University
Amy Cox-Petersen, California State University, Fullerton

Strand 7: Pre-service Science Teacher Education**S3.10 Preparing Teachers to Teach Diverse Learners**

8:30am – 10:00am, Curacao 7

Presider:

Felicia Moore-Mensah, Columbia University

S3.10.1 Preparing Preservice Elementary Teachers to Teach Science in Culturally Relevant Ways

Neporcha Cone, Northern Kentucky University, neporcha@yahoo.com

S3.10.2 Developing Pre-Service Elementary Teachers' Capacity to Design Science Instruction for English Language Learners

Meredith E. Houle, San Diego State University, mhoule@mail.sdsu.edu
Michelle Nolasco, San Diego State University

S3.10.3 Preservice Teachers' Uptake and Understanding of Funds of Knowledge in Elementary Science

David S. McLaughlin, Susquehanna University, mclaughlind@susqu.edu
Angela M. Calabrese-Barton, Michigan State University

Strand 7: Pre-service Science Teacher Education**S3.11 Topics in Physics & Space Science****8:30am – 10:00am, Bonaire 7****Presider:**

Bruce R. Patton, The Ohio State University

S3.11.1 Investigating Elementary Education and Physical Therapy Majors' Perceptions of an Inquiry-Based Physics Content CourseJohn M. Hilton, Delaware Technical & Community College,
jhilton1@dtcc.edu**S3.11.2 Teaching and Learning through a Project-based Unit Implemented with Future STEM Educators: A Design Study**

Jennifer A. Wilhelm, University of Kentucky, jennifer.wilhelm@uky.edu

S3.11.3 Integrating Pedagogy and Content in an Undergraduate Physics Course: What was Learned?Danielle B. Harlow, University of California at Santa Barbara,
dharlow@education.ucsb.edu

Lauren H. Swanson, University of California at Santa Barbara

Hilary A. Dwyer, University of California at Santa Barbara

Julie A. Bianchini, University of California at Santa Barbara

Strand 8: In-service Science Teacher Education**S3.12 Symposium - Supporting teachers in****teaching science as inquiry: What is the evidence for effective professional development?****8:30am – 10:00am, Curacao 8****Presider:**

Daniel K. Capps, Cornell University

Discussants:

Jan H. Van Driel, University of Leiden, The Netherlands

Judith S. Lederman, Illinois Institute of Technology

Presenters:

Barbara A. Crawford, Cornell University, bac45@cornell.edu

Daniel K. Capps, Cornell University

Julie A. Luft, Arizona State University

Norman G. Lederman, Illinois Institute of Technology

Aik Ling Tan, National Institute of Education in Singapore

Siew-Lee Shirley Lim, National Institute of Education in Singapore

Daniel P. Shepardson, Purdue University

Okhee Lee, University of Miami

John Loughran, Monash University in Australia

Strand 9: Reflective Practice**S3.13 Reflection on Teaching Context****8:30am – 10:00am, Bonaire 6****Presider:**

Ratna Narayan, Texas Tech University

S3.13.1 Problematizing Reflection: Constructing a Cross-Cultural Researcher-Teacher LensTang Wee Teo, University of Illinois, Urbana-Champaign,
teo2@illinois.edu**S3.13.2 The Examination of The Third Space: A Self-Study**

Dashia Magee, The College of New Jersey, dmagee@tcnj.edu

S3.13.3 Visualizing, Investigating & Remembering: Modelling a Critical Place-Based Science Education

Sheliza Ibrahim-Khan, Nipissing University, shelizai@nipissingu.ca

S3.13.4 Technology and Teacher Self-Reflection: Professional Development in the 21st Century

Dino Sossi, Teachers College, Columbia University in the City of New York, dino_sossi@yahoo.com

Janell N. Catlin, Teachers College, Columbia University in the City of New York

Denise Wynn

Margaret Hood

Strand 10: Curriculum, Evaluation, and Assessment**S3.14 Assessment with Secondary and Postsecondary Students****8:30am – 10:00am, Bonaire 1****Presider:**

Todd Milford, University of Victoria

S3.14.1 Closing the Feedback Loop: Assessment in an Introductory Physics Course for Non-Majors

Nilay Muslu, University of Missouri, nilaymuslu@mail.mizzou.edu

Deborah Hanuscin, University of Missouri

S3.14.2 Science Curriculum Reform in Senior Secondary Education in the Netherlands:**A Comprehensive and Longitudinal Evaluation Study**

Wilma Kuiper, University of Utrecht / Netherlands Institute for Curriculum Development, wkuiper@slo.nl

Elvira Folmer, Netherlands Institute for Curriculum Development

Wout Ottevanger, Netherlands Institute for Curriculum

Development / Vrije University Amsterdam

Lucia Bruning, Netherlands Institute for Curriculum Development

S3.14.3 Formative Interactions in Learning to Teach Science

Pernilla K. Nilsson, Halmstad University, Sweden, pernila.nilsson@hh.se

S3.14.4 Using Discussion in Online and Traditional College Courses

Houbin Fang, University of Southern Mississippi,

Houbinfang@yahoo.com

Kristy L. Halverson, University of Southern Mississippi

Stephanie P. Williams, University of Southern Mississippi

Xiaolan Li, University of Southern Mississippi

Strand 11: Cultural, Social, and Gender Issues

S3.15 Cultural and Linguistic Diversity and Science Teaching: National and International Contexts

8:30am – 10:00am, Bonaire 2

Presider:

Mercy Ogunsola-Bandele, Adamawa State University

S3.15.1 Perceptions of Socio-Cultural Challenges and Opportunities in Science Education in Africa

Peter A. Okebukola, University of Science and Technology, Ifaki-Ekiti,

Nigeria, pokebukola@yahoo.com

Olatunde Owolabi, Lagos State University, Ojo, Lagos, Nigeria

S3.15.2 Novelization: Countering Cultural Centralization and the Unitary Language of Science Education

Michiel Van Eijck, Eindhoven University of Technology,

m.w.v.eijck@tue.nl

Wolff-Michael Roth, University of Victoria

S3.15.3 Teaching Science for Democratic Reconstruction in Rural South Africa

Gale Seiler, McGill University, gale.seiler@mcgill.ca

S3.15.4 The Multiple Voices of Agency: Multilingual Science Classrooms for Pre-service Science Teachers

Lizette Ramos, Universitat Autònoma de Barcelona,

silvializette.ramos@uab.cat

Mariona Espinet, Universitat Autònoma de Barcelona

Strand 12: Educational Technology

S3.16 Attitudes, Perceptions and Beliefs Influencing Educational Technology

8:30am – 10:00am, Bonaire 3

Presider:

Yilmaz Kara, Karadeniz Technical University

S3.16.1 Employing Pedagogical Design Principles for Initiating Distance Learning: STEM Students' Attitudes and Preferences

Rania Farraj, Technion-Israel Institute of Technology,

rania1r2@technion.ac.il

Miri Barak, Technion-Israel Institute of Technology

Yehudit Judy Dori, Technion-Israel Institute of Technology

S3.16.2 Innovative Information and Communication Technology Systems to Facilitate Student Learning: A Smart University Classroom in Taiwan

Chia-Li Debra Chen, National Taiwan Normal University,

debra@ntnu.edu.tw

Yueh-Hsia Chang, National Taiwan Normal University

Chun-Yen Chang, National Taiwan Normal University

S3.16.3 Modeling of Student Perceptions of Learning in Connected Science Classrooms: How to Facilitate Learner-Centered Environments

Soon C. Lee, The Ohio State University, lee.3552@osu.edu

Karen E. Irving, The Ohio State University

Douglas T. Owens, The Ohio State University

Stephen J. Pape, University of Florida

Melissa L. Shirley, University of Louisville

S3.16.4 Examining Students' Online Searching Strategies and Searching Patterns in Terms of Different Scientific Epistemological Beliefs

Chung-Yuan Hsu, National Taiwan University of Science and

Technology, Taiwan, jackohio@gmail.com

Huei-Tse Hou, National Taiwan University of Science and

Technology, Taiwan

Meng-Jung Tsai, National Taiwan University of Science and

Technology, Taiwan

Chin-Chung Tsai, National Taiwan University of Science and

Technology, Taiwan

Strand 13: History, Philosophy, and Sociology of Science

S3.17 Argument and Socio-scientific Issues

8:30am – 10:00am, Bonaire 4

Presider:

Renee Schwartz, Western Michigan University

S3.17.1 On the Functional Roles of Science in Socio-scientific Discussions

Jan Alexis Nielsen, University of Southern Denmark, jan@imada.sdu.dk

S3.17.2 Currents in STSE Education: Mapping a Complex Field, Forty Years On

Erminia G. Pedretti, University of Toronto,

erminia.pedretti@utoronto.ca

Joanne Nazir, Ontario Institute for Studies in Education,

University of Toronto

S3.17.3 Using Socioscientific Issues to Enhance Reflective Judgment in High School Students

Brendan E. Callahan, Ferris State University, brendancallahan@ferris.edu

Dana L. Zeidler, University of South Florida

Jeffrey Orasky, University of South Florida

Bryan H. Nichols, University of South Florida

Karey Burek, University of South Florida

S3.17.4 Argument and Explanation: A Necessary Distinction?

Alexis D. Patterson, Stanford University, alexisd@stanford.edu
Jonathan F. Osborne, Stanford University

Strand 14: Environmental Education

S3.18 Expanding EE Understanding Through Technology and Assessment

8:30am – 10:00am, Bonaire 5

Presider:

Carol B. Brandt, Virginia Polytechnic Institute and State University

S3.18.1 Assessing the Effect of Systems Simulations on Systems Understanding in Undergraduate Environmental Science Courses

Heather J. Skaza, University of Nevada-Las Vegas, hjskaza@hotmail.com
Krystyna A. Stave, University of Nevada-Las Vegas
Kent J. Crippen, University of Nevada-Las Vegas

S3.18.2 Investigating the Impact on Student Learning and Outdoor Science Interest through Modular Serious Educational Games

Elizabeth Folta, SUNY-College of Environmental Science and Forestry, wildlife.educator@gmail.com
Leonard A. Annetta, George Mason University
Rebecca Cheng, George Mason University
Richard Lamb, Campbell University
Shawn Y. Holmes, NC State University

S3.18.3 An Examination of Nonformal Environmental Educators' Technology Use to Promote Earth and Environmental Science Learning

Tamara E. Pepper, Lehigh University, tep205@lehigh.edu
Alec M. Bodzin, Lehigh University

S3.18.4 Longitudinal Analysis of Student Responses: Insights Gained Regarding Instrument Quality and Ecological Concept Development

Elsa Schaub, University of Arizona, eschaub@email.arizona.edu
Bruce Johnson, University of Arizona
Sanlyn Buxner, University of Arizona

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

Awards Committee Sponsored Session

S4.1 Symposium – Setting out in Science Education Research

10:15am – 11:45am, Antigua 1

Presider:

Xiufeng Liu, University at Buffalo, SUNY

Presenters:

Thomas R. Tretter, University of Louisville
Heather Toomey Zimmerman, Pennsylvania State University

External Policy Committee & Strand 15: Policy Sponsored Session

S4.2 Symposium – The Development of New Science Standards Aligned with NRC's Framework

10:15am – 11:45am, Antigua 2

Presider:

Sharon Lynch, George Washington University

Discussants:

Stephen Pruitt, Achieve
Joseph S. Krajcik, University of Michigan
Janice Earle, National Science Foundation
Francis Eberle, National Science Teachers Association
Andrew Shouse, University of Washington
Elizabeth A. Davis, University of Michigan
Sarah J. Carrier, North Carolina State University
Jerome M. Shaw, University of California Santa Cruz

Strand 1: Science Learning, Understanding and Conceptual Change

S4.3 Scientific Reasoning in the Life Sciences

10:15am – 11:45am, Curacao 1

Presider: Deborah C. Smith, The Pennsylvania State University

S4.3.1 Models as Epistemic Anchors: How Model-based Inquiry Can Create Epistemic Demand

Julia Svoboda, Georgia Institute of Technology, jsvoboda3@gatech.edu
Cynthia Passmore, University of California, Davis

S4.3.2 Helping Students Learn More Expert Framing of Complex Causal Dynamics in Ecosystems Using EcoMUVE

Tina A. Grotzer, Harvard Graduate School of Education, Tina_Grotzer@pz.harvard.edu
Shane Tutwiler, Harvard Graduate School of Education
Amy Kamarainen, Harvard Graduate School of Education
Shari Metcalf, Harvard Graduate School of Education
Chris Dede, Harvard Graduate School of Education

S4.3.3 Supporting Students in Developing Explanatory Models of Natural Selection

Brian J. Reiser, Northwestern University, reiser@northwestern.edu

S4.3.4 Under the Microscope: A Study of Lab-based Instruction in Biology

Gillian Puttick, TERC, gilly_puttick@terc.edu

Brian Drayton, TERC

Meaghan Donovan, TERC

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S4.4 English Language Learners in the Science Classroom

10:15am – 11:45am, Curacao 2

Presider:

Carol L. Stuessy, Texas A&M University

S4.4.1 The Use of Evaluative Questions to Shift ELL Student Engagement in a Secondary Science Classroom

Traci S. Baizer, University of Washington, tracibaizer@hotmail.com

S4.4.2 Changing Perceptions about Science for Underrepresented Students through an Authentic Inquiry-based Investigation

Xenia Meyer, University of California, Berkeley, xenia.meyer@berkeley.edu

Barbara A. Crawford, Cornell University

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

S4.5 Understanding Student Ideas

10:15am – 11:45am, Curacao 3

Presider:

Suna Ryu, UCLA

S4.5.1 Preschool Children's Views about Science and Scientists: Findings from an Innovative Research Instrument

Mia Dubosarsky, University of Minnesota, dubo0053@umn.edu

S4.5.2 Understanding Elementary Students Knowledge of Health and Wellness

Ann W. Wright, Canisius College, wrighta@canisius.edu

Sue Tunnicliffe, University of London

S4.5.3 An Exploration of Upper Elementary Students' Storyboarded Conceptions of Magnetism

James Minogue, North Carolina State University,

james_minogue@ncsu.edu

John C. Bedward, North Carolina State University

Eric N. Wiebe, North Carolina State University

Lauren Madden, Science Education North Carolina State University

Mike Carter, North Carolina State University

Zebetta King, Swift Creek Elementary School

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

S4.6 New Programs and Resources for Middle and High School Science Teaching

10:15am – 11:45am, Curacao 4

Presider:

N. Sanjay Rebello, Kansas State University

S4.6.1 Analysis of Teaching Resources for Implementing an Interdisciplinary Approach in the K-12 Classroom

Morgan B. Yarker, University of Iowa, morgan-c-brown@uiowa.edu

Soonhye Park, University of Iowa

S4.6.2 Identifying and Replicating Successful Teacher Practices in Urban Science Education

Christopher Emdin, Teachers College, Columbia University,

ce2165@columbia.edu

S4.6.3 Teachers' Implementation of Digital Media and Inquiry Teaching Strategies Following Online Professional Development

Lauren B. Goldenberg, Education Development Center,

lgoldenberg@edc.org

Scott Strother, Education Development Center

Alice Anderson, Education Development Center

Camille Ferguson, Education Development Center

Marian Pasquale, Education Development Center

S4.6.4 Accelerating Achievement in Math and Science in Gifted Urban Students (AAMSUS): A Project-based; Guided Inquiry Program and the Nature of Science

Andrea R. Milner, Adrian College, amilner@adrian.edu

Toni A. Sondergeld, The University of Toledo

Laurence J. Coleman, The University of Toledo

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

S4.7 Developing Scientific Research Skills in Undergraduates

10:15am – 11:45am, Curacao 5

Presider:

Leila Amiri, University of South Florida

S4.7.1 The Impact of the Owens Ready Bridge on Student Preparation, Interest, and Confidence

Tracy L. Huziak-Clark, Bowling Green State University, thuziak@bgsu.edu
 Staaden Moira Van, Bowling Green State University
 Anne Bullerjahn, Owens Community College

S4.7.2 Undergraduate Science Research and the Nature of Science: Is Opening the Door to Understanding Enough?

Lara B. Pacifici, Kennesaw State University, lpacifici@kennesaw.edu

S4.7.3 A Comparison of Two-year and Four-year College Students' Undergraduate Research Experiences

Jeffrey S. Carver, West Virginia University, Jeffrey.Carver@mail.wvu.edu
 Roger House, William Rainey Harper College
 William J.F. Hunter, Illinois State University
 Gregory Ferrence, Illinois State University

S4.7.4 Improving Undergraduate Life Science Students' Rhetorical Consciousness of Research Articles

Lacum Edwin B. Van, University of Groningen, e.b.van.lacum@rug.nl
 Martin J. Goedhart, University of Groningen
 Miriam A. Ossevoort, University of Groningen

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

S4.8 Strategies for Improving Student Learning in Biology

10:15am – 11:45am, Bonaire 7

Presider:

Toth Eva Erdosne, West Virginia University

S4.8.1 Explaining the Visible with the Invisible: Students' Conceptual Representations of the Genetic Origin of Variation

Speth Elena Bray, Saint Louis University, espth@slu.edu
 Matthew Dirnbeck, Saint Louis University
 Paul Le, Saint Louis University
 Jennifer L. Momsen, North Dakota State University
 Tammy M. Long, Michigan State University
 Sara A. Wyse, Bethel University

S4.8.2 A Mental Mobile: Using Branch Rotation to Solve the Puzzle, Are these Trees the Same?

Jill D. Maroo, University of Southern Mississippi, Jill.Maroo@eagles.usm.edu
 Kristy L. Halverson, University of Southern Mississippi

S4.8.3 Microevolution and Macroevolution: Ne'er the Twain Shall Meet?

Kefyn M. Catley, Western Carolina University, kcatley@wcu.edu
 Laura R. Novick, Vanderbilt University

S4.8.4 Understanding Evolution and Evidentiary Support

Carrie J. Boyce, University of Southern Mississippi, carrie.boyce@eagles.usm.edu
 Kristy L. Halverson, University of Southern Mississippi

Strand 6: Science Learning in Informal Contexts

S4.9 Museums as an Extension of the Classroom: Lessons Learned

10:15am – 11:45am, Curacao 6

S4.9.1 A Conceptual Framework for Designing Educational Museum Experiences

Marianne F. Mortensen, University of Copenhagen, Denmark, mm@ind.ku.dk

S4.9.2 Investigating different kinds of learning from interactive science exhibits

Leonie J. Rennie, Curtin University, lrennie@curtin.edu.au
 Rosemary S. Evans, Curtin University

S4.9.3 Understanding Teacher Intentions for Field Trips to a Museum of Natural History

Peggy L. Preusch, Smithsonian National Museum of Natural History, ppreusch422@gmail.com

S4.9.4 The Medium is the Message: Unraveling the Publics' Responses to Body Worlds

Erminia G. Pedretti, OISE, University of Toronto, erminia.pedretti@utoronto.ca
 Michelle Dubek, OISE, University of Toronto
 Susan Jagger, OISE, University of Toronto

Strand 7: Pre-service Science Teacher Education

S4.10 Preparing Teachers for Diverse Schools

10:15am – 11:45am, Curacao 7

Presider:

Gail Richmond, Michigan State University

S4.10.1 Attributes that Shape Science and Math Preservice Teachers' Commitment to Teach in Under-resourced Schools

Athena R. Ganchorre, University of Arizona, athenag@u.arizona.edu
Debra Tomanek, The University of Arizona

S4.10.2 Cultural Bumps: An International Cross-cultural Strategy used with Preservice Science Teachers during Field Placement

Shawn Y. Holmes, North Carolina State University,
shawn_holmes@ncsu.edu
Jamila S. Simpson, North Carolina State University

S4.10.3 Readiness for Diverse Environments: Measuring Pre-service Science Teachers' Confidence about Teaching in High-Need Schools

Juanita Jo Matkins, College of William & Mary, jjmatk@wm.edu
Jacqueline T. McDonnough, Virginia Commonwealth University
Kevin D. Goff, College of William & Mary
Kathryn E. Ottolini, College of William & Mary
Colleen P. Riesbeck, College of William & Mary

S4.10.4 Investigating Changes in Preservice Secondary Science Teachers' Conceptions About the Pedagogical Implications of Student Diversity

Douglas B. Larkin, Montclair State University, doug.larkin01@gmail.com

Strand 8: In-service Science Teacher Education

S4.11 Elementary Science Teachers

10:15am – 11:45am, Curacao 8

Presider:

Irene U. Osisioma, California State University, Dominguez Hills

S4.11.1 An Interpretive Case Study of how an Elementary Science Teacher uses Science Notebooks During Science Instruction

Lori L. Petty, University of Texas - Brownsville, lori.petty@utb.edu
Ratna Narayan, Texas Tech University

S4.11.2 From Professional Development to the Classroom: A Case Study of a 3rd Grade Teacher's Implementation of the Learning Cycle

Deepika Menon, University of Missouri, dm2qc@mail.mizzou.edu
Deborah Hanuscin, University of Missouri

S4.11.3 Rethinking Professional Development in Elementary Science: Teacher Leadership for Sustainable Change in Science Education

Milijana Suskavcevic, Rice University, milijana@rice.edu
Lisa Webber, Rice University

Strand 8: In-service Science Teacher Education

S4.12 Professional Development and Policy

10:15am – 11:45am, Bonaire 8

Presider:

Mary Oliver, The University of Western Australia

S4.12.1 How Much Professional Development is Needed to Effect Positive Gains in K-6 Student Achievement

James A. Shymansky, University of Missouri-St. Louis,
jshymansky@umsl.edu
Tzu-Ling Wang, National Hsinchu University of Education
Leonard A. Annetta, George Mason University
Larry D. Yore, University of Victoria
Susan A. Everett, University of Michigan-Dearborn

S4.12.2 An Exploratory Study of the In-Service Professional Development Needs of Botswana Secondary School Agriculture Teachers: Implication for Policy and Practice.

Kgomotso Mabusa, University of Nottingham, UK,
ttxkm11@nottingham.ac.uk
Leonard R. Newton, University of Nottingham, UK

S4.12.3 Fostering Teacher Development to a Tetrahedral Orientation in the Teaching of Chemistry

Rick Wiebe, St. James-Assiniboia School Division, rwiebe@sjsd.net
Brian E. Lewthwaite, University of Manitoba
Harvey Peltz, River East Transcona School Division

Strand 10: Curriculum, Evaluation, and Assessment

S4.13 Conceptual Learning

10:15am – 11:45am, Bonaire 1

S4.13.1 Middle-schoolers' Learning about Photosynthesis and Cellular Respiration: A Mixed Methods Study

Kathryn F. Drago, University of Michigan, kdrago@umich.edu

S4.13.2 STEM Learning and Scientific Reasoning

Lei Bao, The Ohio State University Department of Physics and College of Teaching and Learning, bao.15@osu.edu
Jing Han, The Ohio State University
Kathy Koenig, Wright State University
Tianfang Cai, Beijing Jiaotong University

S4.13.3 Investigating Students' Understanding of Energy Transformation, Energy Transfer, and Conservation of Energy Using Standards-Based Assessment Items

Cari F. Herrmann-Abell, AAAS / Project 2061, cabell@aaas.org
George E. Deboer, AAAS / Project 2061

S4.13.4 Managing Threats to Validity in Experimental Tests of Education Interventions Data and Evidence from a Large, Cluster-Randomized Trial (CRT) of a High School Science Intervention

Stephen R. Getty, Biological Sciences Curriculum Study,
SGetty@BSCS.org
Christopher D. Wilson, Biological Sciences Curriculum Study
Joseph A. Taylot, Biological Sciences Curriculum Study
Susan M. Kowalski, Biological Sciences Curriculum Study

Strand 11: Cultural, Social, and Gender Issues

S4.14 Gender, Socially, and Culturally Responsive Science Pedagogies: Bridging the Gaps between Students and Science

10:15am – 11:45am, Bonaire 2

Presider:

Irasema B. Ortega, Arizona State University

S4.14.1 The Case for Using Social and Emotional Learning to Enhance STEM Learning: Project STEMSEL

Obed Norman, Morgan State University, obednorman@verizon.net
Sylvester McKay, Morgan State University

S4.14.2 Descriptive Analysis of Gender-related Motivating Factors for Girls and Boys in High-needs Middle Schools

Eunmi Lee, DePaul University, yjsmom@gmail.com

S4.14.3 Bridging the Gender Gap: Equality vs. Equity

Jaimie L. Miller, Harvard University, jlmiller@cfa.harvard.edu
Gerhard Sonnert, Harvard University
Zahra Hazari, Clemson University
Philip M. Sadler, Harvard University

S4.14.4 Development, Validation and Preliminary Use of the Culturally Congruent Instruction Survey

Regina C. Sievert, Salish Kootenai College, wenonah@centurytel.net
Joan Lafrance, Mekinak Consulting
Rod Brod, Professor Emeritus, the University of Montana

Strand 11: Cultural, Social, and Gender Issues

S4.15 Related Paper Set - Investigating Diverse Girls' Identities and Identity Trajectories in Science 10:15am – 11:45am, Bonaire 6

S4.15.1 Becoming (Less) Scientific in the Figured Worlds of School Science Learning: A Longitudinal Study of Girls' Identities

Heidi B. Carlone, University of North Carolina
Julia Kimmel, University of North Carolina
Cassi Lowder, University of North Carolina
Jean Rockford, University of North Carolina
Catherine Scott, University of North Carolina

S4.15.2 Urban Girls' Identity Trajectories through the Participation between Figured Worlds

Hosun Kang, Michigan State University
Angela M. Calabrese-Barton, Michigan State University
Edna Tan, Michigan State University
Juanita Bautista Guerra, Michigan State University

S4.15.3 Girls and Science: Urban Middle School Girls' Perspectives, Positioning and Activism in Science when Conversations about Identity and Discrimination are Explicitly Nurtured

April Luehmann, University of Rochester
Rachel Chaffe, University of Rochester

S4.15.4 Out of School Figured Worlds and Urban Girls' Engagement with Science

Angela M. Calabrese-Barton, Michigan State University
Edna Tan, Michigan State University
Hosun Kang, Michigan State University
Juanita Bautista Guerra, Michigan State University

Strand 12: Educational Technology

S4.16 Examining the Effect of Traditional and Non-traditional Educational Technologies 10:15am – 11:45am, Bonaire 3

Presider:

Miri Barak, Technion- Israel Institute of Technology

S4.16.1 Transforming and Enhancing the Learning and Teaching of Senior Biology via Digital Technologies

Wilhelmina S. Van Rooy, Australian Catholic University, Australia,
wilhelmina.vanrooy@mq.edu.au
John Hedberg, Macquarie University, Australia
Peter Freebody, The University of Sydney, Australia
Kim Nichols, University of Queensland, Australia

S4.16.2 The effect of Computer Simulation on Students' Conceptual Understanding of Electric Circuits

Saed Sabah, saed_sabah@yahoo.com

S4.16.3 Student Learning in Science Simulations: Design Features That Promote Learning Gains

Michael Timms, WestEd, mtimms@wested.org

Kathleen Scalise, University of Oregon

Anita Moorjani, WestEd

Lakisha Clark, University of Oregon

Karen Holtermann, UC Berkeley

Shawn Irvin, University of Oregon

S4.16.4 Effectiveness of Computer Simulations in the Teaching/Learning of Physics

Aklilu Tilahun Tadesse, Arba Minch University, aklilu_tt@yahoo.com

Tesfaye Tilahun, Addis Ababa University

Tadesse Mesfin, Addis Ababa University

Strand 13: History, Philosophy, and Sociology of Science

S4.17 Changes in Students' Epistemologies

10:15am – 11:45am, Bonaire 4

Presider:

Sibel Erduran, University of Bristol

S4.17.1 What Changes Undergraduate Students' Perception of the Tentative and Creative Nature of Science?

Nazan U. Bautista, Miami University, uludagn@muohio.edu

Elisabeth E. Schussler, University of Tennessee - Knoxville

Kimberly A. Haverkos, Miami University

Melanie A. Link-Perez, University of Oklahoma

S4.17.2 Views on the Nature of Science - Results from Large-scale Assessment of Students' Competencies

Kerstin Kremer, Justus-Liebig-University Giessen,

Kerstin.H.Kremer@didaktik.bio.uni-giessen.de

Irene Neumann, Leibniz Institute for Science and

Mathematics Education, Kiel

Hans E. Fischer, University of Duisburg-Essen

Jürgen Mayer, University of Kassel

S4.17.3 Practical Epistemologies of High School Students Participating in a Research Apprenticeship

Stephen R. Burgin, University of Florida, sburgin@ufl.edu

Troy D. Sadler, University of Florida

Rachael D. Griffin, University of Florida

S4.17.4 Comparative Case Studies of the Development of Third Graders' Conceptions of Nature of Science: Student Understandings after a Year of Instruction

Valarie L. Akerson, Indiana University, vakerson@indiana.edu

Vanashri Nargund, Indiana University

Ingrid S. Weiland, Indiana University

Khemawaddee Pongsanon, Indiana University

Strand 14: Environmental Education

S4.18 Exploring Environmental Literacy and Future Green Career Interest

10:15am – 11:45am, Bonaire 5

Presider:

Deborah J. Tippins, University of Georgia

S4.18.1 Going Green: Exploring Career Decision Making of Canadian Youth

Oksana Bartosh, Directions Evidence and Policy Research,

ksenia_brt@yahoo.com

Charles Ungerleider, Directions Evidence and Policy Research

Isabelle Eaton, Directions Evidence and Policy Research

Terri Thompson, Directions Evidence and Policy Research

S4.18.2 Students Environmental Attitudes: Links With Interest in Environmental-Related Topics, Out-of-School Activities and the Future Job

Hebel Florence Le, IUFRM Université Lyon 1/ICAR ENS Lyon,

florence.le-hebel@ens-lyon.fr

Pascale Montpied, ICAR ENS Lyon

Valerie Fontanieu, INRP Lyon

S4.18.3 What Do Eighth Grade Students Know About Energy Resources?

Alec M. Bodzin, Lehigh University, amb4@lehigh.edu

S4.18.4 Contours of Environmental Action in Science Education: A Critical Discourse Analysis of Middle Grade Science Textbooks

Ajay Sharma, University of Georgia, ajay@uga.edu

Cory Buxton, University of Georgia

S4.18.5 Promoting Global Sustainability: How do Students View the Ocean after an Ocean Literacy-focused Curriculum Program?

Meghan E. Marrero, U.S. Satellite Laboratory, mmarrero@us-satellite.net

NARST Business Meeting

Box lunch provided for 1st 100 attendees who sign up.

12:00pm – 1:00pm, Grand Sierra E

Concurrent Session #5

1:15pm – 2:45pm

Awards Committee Sponsored Session

S5.1 Symposium - Distinguished Contributions in Research

1:15pm – 2:45pm, Antigua 1

President:

Philip H. Scott, University of Leeds, UK.

Presenters:

Joseph S. Krajcik, University of Michigan

Reinders Duit, IPN, Leibniz Institute of Science Education,
University of Kiel, Germany

Strand 1: Science Learning, Understanding and Conceptual Change

S5.2 Developing and Using Graphs in the Physical Sciences

1:15pm – 2:45pm, Curacao 1

President: David Fortus, Weizmann Institute Of Science

S5.2.1 Intuitive Rules – a Suggestion for an Additional Explanation of Misconceptions in Reading and Forming Kinematic Graphs

Haim Eshach, Ben Gurion University of the Negev, heshach@gmail.com

S5.2.2 Using Eye-tracking to Examine Learning in a Multimedia Simulation: The Importance of Visual Transitions

Catherine E. Milne, New York University, cem4@nyu.edu

Jan Plass, New York University

Bruce Homer, Graduate Center, City University of New York

Trace Jordan

Paul O'Keefe, New York University

Ruth Schwartz, New York University

Yoo Kyung Chang, New York University

S5.2.3 Assessing Students' Graphing Skills in a Context-Based Chemistry Module

Shirly Avargil, Technion, Israel Institute of Technology,

shirly.avargil@gmail.com

Orit Herscovitz, Technion, Israel Institute of Technology;

Ort Braude College

Yehudit Judy Dori, Technion, Israel Institute of Technology

S5.2.4 Characterizing Students' Use of Graphs in Introductory Physics with a Graphical Analysis Epistemic Game

Elizabeth Gire, University of Memphis, egire@memphis.edu

Dong-Hai Nguyen, Kansas State University

N. Sanjay Rebello, Kansas State University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S5.3 Science Learning: Focusing on Student Communication and Dialogue

1:15pm – 2:45pm, Curacao 2

President:

Bruce Waldrup, Monash University

S5.3.1 How does the Complexity of Students' Communication Influence the Learning Outcome?

Rebecca Knobloch, University of Duisburg-Essen,

rebecca.knobloch@uni-due.de

Maik Walpuski, University of Osnabrueck

S5.3.2 Mixed Analysis of Student Relations Using Network Physics and Communities of Practice

Jesper Bruun, University of Copenhagen, Department of Science Education, jbruun@ind.ku.dk

S5.3.3 Towards an Interlanguage of Talking Science - Exploring Scientific Literacy through Analysis of Students Talk

Clas Olander, University of Gothenburg, Sweden, clas.olander@gu.se

S5.3.4 An Analysis of Whole-class Dialogue after Elementary Science Students Present their Claim and Evidence

Matthew J. Benus, The University of Iowa, matthew-benus@uiowa.edu

Yarker B. Morgan, The University of Iowa

Brian M. Hand, The University of Iowa

Lori A. Norton-Meier, University of Louisville

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S5.4 Symposium - Socio-scientific Issues in Science Classrooms: Teaching, Learning and Research

1:15pm – 2:45pm, Bonaire 8

Presenters:

Troy D. Sadler, University of Florida, tsadler@coe.ufl.edu

Michelle L. Klosterman, Wake Forest University

Dana L. Zeidler, University of South Florida

Scott Applebaum, University of South Florida

Maria P. Evagorou, University of Nicosia, Cyprus

Shirley S. Simon, Institute of Education London

Ruth Amos, Institute of Education London

Jennifer L. Eastwood, University of Florida

Tali Tal, Technion - Israel Institute of Technology

Yael Kali, Technion - Israel Institute of Technology

Vaile Dawson, Curtin University

**Strand 3: Science Teaching--Primary School
(Grades preK-6): Characteristics and Strategies**
**S5.5 Related Paper Set - Promoting and Examining
Teacher Attention to Student Thinking in Science
Classrooms**

1:15pm – 2:45pm, Curacao 3

Presider:

Rosemary S. Russ, Northwestern University

**S5.5.1 Resolving Underspecification: Using
Teachers' Existing Strategies to Refine the
Meaning of Attending to Student Thinking**

Valerie Otero, University of Colorado at Boulder

**S5.5.2 Teacher Attention Leading to Student
Inquiry: Case Study of an Emergent 5th Grade
Magnetism Unit**

Colleen Gillespie, University of Maryland, College Park

**S5.5.3 Promoting Generative Inquiry: The
Importance of Attention and Responsiveness to
Multiple Aspects of Classroom Activity**

Lama Jaber, University of Maryland, College Park
 Jennifer Richards, University of Maryland, College Park
 Luke Conlin, University of Maryland, College Park
 David Hammer, Tufts University

**S5.5.4 Supporting Elementary Teachers Learning
to See Students' Thinking in the Science
Classroom**

Melissa J. Luna, Northwestern University

**S5.5.5 Testing a Conceptual Framework for
Science Teacher Learning Programs: The Student
Thinking Lens**

Kathleen Roth, BSCS

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

S5.6 Images of Science in the Classroom

1:15pm – 2:45pm, Curacao 4

Presider:

Todd Milford, University of Victoria

S5.6.1 Images of Science in School Curriculum

Seema Rivera, SUNY Albany, SR681696@albany.edu

S5.6.2 Best Practice in Middle School Science

Alandeom W. Oliveira, State University of New York at Albany,
 aoliveira@albany.edu

Kristen C. Wilcox, State University of New York at Albany
 Janet Angelis, State University of New York at Albany
 Arthur N. Applebee, State University of New York at Albany
 Vincent Amodeo, State University of New York at Albany
 Michele A. Snyder, State University of New York at Albany

**S5.6.3 Developing an Operational Model of
Inquiry-Based Teaching: Teacher Roles and
Pedagogies**

Gillian Kidman, Queensland University of Technology, Australia,
 g.kidman@qut.edu.au

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

**S5.7 Symposium - Climate Education: Research,
Perspective, and Issues**

1:15pm – 2:45pm, Antigua 2

Presider:

Anita Roychoudhury, Purdue University, aroychou@purdue.edu

Discussant:

William Cobern, Western Michigan University

Presenters:

Daniel P. Shepardson, Purdue University
 Devdutta Niyogi, Purdue University
 Andrew Hirsch, Purdue University
 Bruce R. Patton, The Ohio State University
 Soyoung Choi, Purdue University
 Yukiko Maeda, Purdue University

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

S5.8 Retention & Graduate Student Development

1:15pm – 2:45pm, Curacao 5

Presider:

Andrea R. Milner, Adrian College

**S5.8.1 An Exploratory Study of the Relationship
Between STEM Graduate Students Teaching
Orientations and Teaching Practices**

Joanna A. Gilmore, University of South Carolina, jagilmor@mailbox.sc.edu
 Michele Kelly

**S5.8.2 Professional Development in College
Science Teaching**

Aimée K. Thomas, The University of Southern Mississippi,
 aimee.thomas@usm.edu

S5.8.3 Perceptions of Teaching Training and Department Climate Among US and International STEM Graduate Teaching Assistants

Sue Ellen Dechenne, University of Nebraska-Lincoln,
sdechenne2@unlserve.unl.edu

S5.8.4 Engaging Diverse STEM Students in Transformative Learning

Larry D. Burton, Andrews University, burton@andrews.edu
David N. Mbungu, Andrews University
John F. Stout, Andrews University

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

S5.9 Assessment and Analysis of Undergraduates' Principled Reasoning About Biological Processes 1:15pm – 2:45pm, Bonaire 7

S5.9.1 Exploring Undergraduates' Understanding of Photosynthesis Using Diagnostic Question Clusters

Joyce Parker, Michigan State University
Merle Heidemann, Michigan State University
Mark Urban-Lurain, Michigan State University
Brett Merritt, Michigan State University
John Merrill, Michigan State University
Amy Lark, Michigan State University
Charles W. Anderson, Michigan State University
Gail Richmond, Michigan State University

S5.9.2 Undergraduates' Struggles to Trace Information in Genetics

Merle Heidemann, Michigan State University
Amy Lark, Michigan State University
Joyce Parker, Michigan State University

S5.9.3 Students' Use of Spatial and Temporal Scale in their Explanations of Biological Phenomena

Jonathon Schramm, Michigan State University
Charles W. Anderson, Michigan State University

S5.9.4 Moving Across Scales: Using Lexical Analysis to Reveal Student Reasoning About Photosynthesis

Casey Lyons, Michigan State University
Shauna Jones, Michigan State University
Rosa Moscarella, Michigan State University
John Merrill, Michigan State University
Mark Urban-Lurain, Michigan State University

S5.9.5 Principled Reasoning and Conceptual Change: The Interplay Between Theory, Research and Practice

Mark Urban-Lurain, Michigan State University

Strand 6: Science Learning in Informal Contexts

S5.10 Science Outside the Classroom Walls

1:15pm – 2:45pm, Curacao 6

Presider:

Terence P. McClafferty, Curtin University

S5.10.1 The Zoo Acuity Model: Depicting Students' Knowledge of Zoos

Patricia Patrick, Texas Tech University, trish.patrick@ttu.edu

S5.10.2 Why so Hard? Gaining Insights from School Teachers and Informal Science Education Staff Regarding Teacher use of ISE Resources

James Kisiel, California State University, Long Beach, jkisiel@csulb.edu

S5.10.3 Closing the Gap: Teachers' Perceptions of Informal Science

Joy Kubarek-Sandor, Illinois Institute of Technology, John G. Shedd Aquarium, jkuba@sheddaquarium.org

S5.10.4 Connecting Fieldtrip Learning to a School-based Ecology Unit: Using Socio-cultural Theory to Design and Study Learning Across Settings

Heather Toomey Zimmerman, Pennsylvania State University, heather@psu.edu
Jennifer L. Weible, Pennsylvania State University

Strand 7: Pre-service Science Teacher Education

S5.11 Preservice Teacher Beliefs & Attitudes

1:15pm – 2:45pm, Curacao 7

Presider:

Carolyn S. Wallace, Auburn University

S5.11.1 The Intuitive Curriculum: Why Biology Teachers Tend to Shy Away from Philosophical and Social Issues

Arne Dittmer, University of Hamburg, arne.dittmer@erzwiss.uni-hamburg.de

S5.11.2 Longitudinal Research on the Impact of Pre-Service Programs on Secondary Science Teachers' Beliefs and Practices

John W. Tillotson, Syracuse University, jwtilot@syr.edu
Monica J. Young, Syracuse University
Robert E. Yager, University of Iowa
John E. Penick, North Carolina State University

S5.11.3 Epistemological Views of Pre-Service Science Teachers: Role of A Pre-Service Science Teacher Education Course

Saiqa Azam, University of the Punjab, Lahore, Pakistan,
sazam@ucalgary.ca

S5.11.4 Elementary Pre-service teachers' Attitude Towards Biotechnology Processes

Frackson Mumba, Southern Illinois University Carbondale, IL,
frackson@siu.edu
Vivien M. Chabalengula, Southern Illinois University Carbondale, IL
Jonathan Chitiyo, Southern Illinois University Carbondale, IL

Strand 8: In-service Science Teacher Education

S5.12 Teacher Practice

1:15pm – 2:45pm, Curacao 8

Presider:

Tamara E. Pepper, Lehigh University

S5.12.1 Citizen Science Research and Teachers: Understanding the Process and Implementation into the Classroom

Michele J. Hollingsworth Koomen, Gustavus Adolphus College,
mkoomen@gac.edu

S5.12.2 Science Teachers' Orientations, Practices, Professional Development, and Intentions Regarding Project-Based Science focused on Sustainable Energy

Lisa A. Brooks, The University of Toledo, lisa.brooks2@utoledo.edu
Charlene M. Czerniak, The University of Toledo

S5.12.3 Teacher Knowledge of Practice Generated through Professional Experimentation with Model-based Reasoning

Rich Hedman, Sacramento State University Interim Director,
Mathematics and Science Education Center, hedmanrd@csus.edu
Cynthia Passmore, University of California, Davis Associate Professor

Strand 9: Reflective Practice

S5.13 Reflection on Science Content Teaching

1:15pm – 2:45pm, Bonaire 6

Presider:

Liesl M. Hohenshell, University of Wisconsin-Whitewater

S5.13.1 We Should Hardly Be Surprised That The Theory of Evolution Remains So Controversial...

Leslie Sandra Jones, Valdosta State University, lesliesj@valdosta.edu

S5.13.2 An Instructor's Reflective Journey of Implementing a Thematic Approach to Teaching Nature of Science in a Pre-Service Education Biology Course

Sarah J. Krajewski, Western Michigan University,
sarahkrajewski@yahoo.com
Renee Schwartz, Western Michigan University

S5.13.3 Analog Modeling of Earth Processes: A Case Study in Multidisciplinary, Guided Inquiry Science and Mathematics Education

Laura Serpa, University of Texas at El Paso, lserpa@utep.edu
Olga Kosheleva, University of Texas at El Paso,
Milijana Suskavcevic, Rice University

S5.13.4 An Integrative Model for Exploring the Development of Science Teachers' Personal Practical Knowledge

Chorng-Jee Guo, National Changhua University of Education,
pfcjguo@cc.ncue.edu.tw
Ping-Tun Huang, National Changhua University of Education
Li-Jeng Wu, National Changhua University of Education

Strand 10: Curriculum, Evaluation, and Assessment

S5.14 Large-Scale Assessment and Curriculum Reform

1:15pm – 2:45pm, Bonaire 1

Presider:

Mercy Ogunsola-Bandele, Adamawa State University

S5.14.1 The Impact of an Innovative Science Curriculum on Students' Attitudes towards School Science

Indira C. Banner, University of Leeds, i.banner@education.leeds.ac.uk
Jim Ryder, University of Leeds
Jim Donnelly, University of Leeds

S5.14.2 Developing Instructionally Sensitive Assessment: Lessons Learned about the Manipulation of Close and Proximal Item Characteristics

Maria Araceli Ruiz-Primo, University of Colorado Denver,
maria.ruiz-primo@ucdenver.edu
Min Li, College of Education, University of Washington
Deanna Sands, University of Colorado Denver
Kellie Willis, College of Education, University of Washington
Michael Giamellaro, University of Colorado Denver
Margaret Anny Jones, University of Colorado Denver
Jennifer Feehan, University of Colorado Denver

S5.14.3 Mathematical and Non-Mathematical Requirements in Upper Secondary School Physics Graduation Tests

Felix Schoppmeier, University of Duisburg-Essen,
felix.schoppmeier@uni-due.de
Andreas Borowski, University of Duisburg-Essen
Hans E. Fischer, University of Duisburg-Essen

Strand 11: Cultural, Social, and Gender Issues

S5.15 Inservice Teacher and Preservice Teachers' Attitudes towards Science and Children: Innovative Theoretical and Methodological Approaches 1:15pm – 2:45pm, Bonaire 2

Presider:

Regina Suriel, University of Georgia

S5.15.1 Science Teachers' Views on Cultural Diversity: Contributions from Anthropology

Katemari Rosa, Columbia University, katemari@gmail.com
Felicia Moore-Mensah, Columbia University

S5.15.2 Nano-biotechnology Literacy for Sustainability in an International Context: Preparing the Public by Educating Teachers

Toth Eva Erdosne, West Virginia University, eva.toth@mail.wvu.edu
Graham Meadow Sherrill, West Virginia University
Brittany Witherspoon, West Virginia University
Jennifer Trythall, West Virginia University

S5.15.3 Negotiating Emotions in Becoming a Social Justice Science Teacher

Maria S. Rivera Maulucci, Barnard College, Columbia University,
mriveram@barnard.edu

S5.15.4 People and Places: The Use of Portraiture for Understanding Context in Science Classrooms

Cassie F. Quigley, Clemson University, cassieq@clemson.edu
Amy Trauth-Nare, Indiana University
Nicole Beeman-Cadwallader, Indiana University

Strand 12: Educational Technology

S5.16 Integrating Commercial Technologies into Teaching

1:15pm – 2:45pm, Bonaire 3

Presider:

Vanessa D.I. Pfeiffer, University of Duisburg-Essen

S5.16.1 Integrating Geospatial Technologies in an Inquiry Energy Unit with Urban Middle School Students

Violet Kulo, Lehigh University, violet.kulo@lehigh.edu
Alec M. Bodzin, Lehigh University

S5.16.2 Google Earth: How Are Teachers Using This Virtual Globe and How Can They Be Further Supported?

Rebecca R. Deutscher, University of California at Berkeley,
rrdeutscher@berkeley.edu

S5.16.3 Electronic Interactions in Science Classrooms at no Cost: Google Voice as a Formative Assessment Tool

Brian C. Baldwin, Kean University, brian@bcbaldwin.com

Strand 13: History, Philosophy, and Sociology of Science

S5.17 Symposium - Objectivity in Science and the Study of Pseudoscience in Education 1:15pm – 2:45pm, Bonaire 4

Presider:

Ron Good, Louisiana State University

Presenters:

Michael R. Matthews, University of New South Wales
Norman G. Lederman, Illinois Institute of Technology
Judith S. Lederman, Illinois Institute of Technology
Catherine M. Koehler, Illinois Institute of Technology
Larry D. Yore, University of Victoria

Strand 14: Environmental Education

S5.18 Science Teacher Education as a Context for Environmental Literacy Improvement 1:15pm – 2:45pm, Bonaire 5

Presider:

Maria Ferreira, Wayne State University

S5.18.1 Satisfaction of Pre-service Science Teachers' Basic Psychological Needs While Solving an Environmental Problem

Guliz Karaarslan, Agri Ibrahim Cecen University, Middle East Technical University, kguliz@metu.edu.tr
Hamide Ertepinar, Middle East Technical University
Semra Sungur, Middle East Technical University

S5.18.2 How Do Pre-Service Science Teachers Perceive Local and Non-Local Environmental Problems?

Busra Tuncay, Giresun University, tbusra@metu.edu.tr
Ozgul Yilmaz-Tuzun, Middle East Technical University

S5.18.3 Exploring Prospective Science Teachers' Epistemological Beliefs regarding Learning in the Domain of Environment

Elif Adibelli, Middle East Technical University, elif@metu.edu.tr
Ozgul Yilmaz-Tuzun, Middle East Technical University

S5.18.4 Environmental Knowledge, Attitudes, and Awareness of Pre-Service Teachers and Faculty

Bruce Johnson, University of Arizona, brucej@email.arizona.edu
Deborah Barca, University of Arizona
Dennis Rosemartin, University of Arizona

Break

2:45pm – 3:15pm

Concurrent Session #6
All strand poster sessions.
3:15pm – 5:15pm

Poster Session A

3:15pm – 4:15pm, Grand Sierra D

Strand 1: Science Learning, Understanding and Conceptual Change
S6A.1 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.1.1 Improving Student Understanding of ‘Size and Scale’ through a Variation Theory Approach

Su Swarat, Northwestern University, s-swarat@northwestern.edu

Denise Drane, Northwestern University

Greg Light, Northwestern University

S6A.1.2 Investigating 6th Grade Students’ Causal Reasoning in Biodiversity

Hayat Hokayem, MSU, alhokaye@msu.edu

Gotwals Amelia Wenk, MSU

S6A.1.3 Chinese and Australian Grade 6 Children’s Conceptual Understanding of Science

Ying Tao, University of Western Australia, taoy03@student.uwa.edu.au

Mary Oliver, University of Western Australia

Grady Venville, University of Western Australia

S6A.1.4 The Development of Learners’ Attitudes Towards Different Natural Scientific Subjects - A Longitudinal Study

Alexandra Pleus, Humboldt-University Berlin, Germany,

alexandra.pleus@biologie.hu-berlin.de

Zu Belzen Annette Upmeyer, Humboldt-University Berlin

S6A.1.5 Triangulating America’s Science Literacy

Adam V. Maltese, Indiana University, amaltese@indiana.edu

S6A.1.6 Interpretive Discussion of Text in Physics

Shulamit Kapon, University of California Berkeley, and Tel Aviv

University, shulamit.kapon@berkeley.edu

S6A.1.7 Sound Transmission: Fourteen old Students’ Conceptions and Learning from a Teaching-Learning Sequence

Eva West, Eva.West@ped.gu.se

Anita Wallin

S6A.1.8 Modelling-based Knowledge Building - The Case of a Blind Student

Rosaria Justi, Universidade Federal de Minas Gerais Education,

rjusti@ufmg.br

Nilmar B. Mozzer, Universidade Federal de Minas Gerais Education

S6A.1.9 Confirmation for Increased Attention to Four Core Areas of Evolution Understanding: Observations from Classroom Instruction

Margaret M. Lucero, University of Texas at Austin,

mmlucero@mail.utexas.edu

Anthony J. Petrosino, University of Texas at Austin

Nate K. Mcvaugh, University of Texas at Austin

Jeffrey Birchfield, University of Texas at Austin

Strand 2: Science Learning: Contexts, Characteristics and Interactions
S6A.2 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.2.1 Interactions between Classroom Discourse, Teacher Questioning, and

Julie B. Smart, Presbyterian College, jbsmart@presby.edu

Jeff C. Marshall, Clemson University

S6A.2.2 Effectiveness of Virtual Laboratories in Terms of Learning Environment, Attitudes, and Achievement among High School Genetics Students

Rachel R. Oser, Curtin University of Technology, Australia,

rachel.oser@gmail.com

Barry J. Fraser, Curtin University of Technology, Australia

S6A.2.3 The Complex Nature of Physics and Engineering Students’ Academic and Social Networks in Higher Education

Jonas Forsman, Uppsala University, jonas.forsman@fysik.uu.se

Rachel F. Moll, Vancouver Island University

Staffan Andersson, Uppsala University

Cedric Linder, Uppsala University

S6A.2.4 Investigating the Influences of 5th Graders’ Learning Motivation on Dissolution Conceptual Change

Hung-Chih Yen, Sinping Elementary School, Taichung, Taiwan,

R.O.C., hungchih.yen@gmail.com

Hsiao-Lin Tuan, National Changhua University of Education,

Changhua, Taiwan, R.O.C.

S6A.2.5 Exploring the Structural Relationships between Taiwan University Students' Conceptions of Learning Biology and Epistemological Beliefs toward Biology

Liang Jyh-Chong, National Taiwan University of Science and Technology, aljc@mail.ntust.edu.tw

Chin-Chung Tsai, National Taiwan University of Science and Technology

Guo-Li Chiou, National Chiao Tung University

S6A.2.6 An Aptitude-Treatment-Interaction Study: Effect of Interaction Between Inquiry-Teaching and Field-Dependency on Physics Achievement and Attitude

Hanife C. Sen, Yuzuncu Yil University, Middle East Technical University, hanifecan.sen@gmail.com

Ali Eryilmaz, Middle East Technical University

Shahin Mine Gokce, TED Ankara College, Middle East Technical University

S6A.2.7 Influences of a STEM Mentoring Program on Underachieving Middle School Students

Robbie L. Higdon, Clemson University Clemson, SC, rhigdon@clemson.edu

S6A.2.8 Investigating the Creation of a Community of Physics Learners

Renee Michelle Goertzen, Florida International University, rgoertze@fiu.edu

Eric Brewe, Florida International University

Laird H. Kramer, Florida International University

S6A.2.9 Investigating Minority Student Participation in an Authentic Science Research Experience

Stephanie D. Preston, sdp163@psu.edu

S6A.2.10 Teacher Interactions with Technology: The Comparison of Two Teachers' Discursive Practices Web-based Science Environment

Alicia M. Trotman, Michigan State University, trotmana@msu.edu

Michelle Williams, Michigan State University

Matthew Koehler, Michigan State University

S6A.2.11 Children in Science Fairs: Interviews with Parents on the Family Experience

G. Michael Bowen, Mount Saint Vincent University, gmbowen@yahoo.com

John L. Bencze, OISE/University of Toronto

Dianne Fraser, Mount Saint Vincent University

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

S6A.3 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.3.1 Research and Documentation of 4 year-old Understanding of Science

Judith A. Burton, Wooten Elementary, jahburton@yahoo.com

S6A.3.2 Student Ideas about the Science of Sound Before and After Engineering-Design-Based Instruction

Kristen B. Wendell, Tufts University, kristen.bethke@tufts.edu

Hee-Sun Lee, Tufts University

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

S6A.4 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.4.1 Teachers' Understandings About Organs and Organ Systems in Frogs and Pigs

Patricia Patrick, Assistant Professor @ Texas Tech University, trish.patrick@ttu.edu

S6A.4.2 Argument-Based Inquiry Approach to Teaching 7th Grade Science in Korea

Aeran Choi, Kent State University, aeran-choi@hotmail.com

Jeonghee Nam, Pusan National University

Eulsun Seung, Indiana State University

S6A.4.3 Nature of Science (NOS) and On-line Biological Simulations

Katrina Roseler, Florida State University, kr09e@fsu.edu

S6A.4.4 Interactions Between Teachers' Existing PCK and Novel Content Knowledge

Emily D. Wischow, Purdue University, emily.wischow@gmail.com

Lynn A. Bryan, Purdue University

George M. Bodner, Purdue University

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

S6A.5 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.5.1 The Pedagogical Content Knowledge of University Chemistry Professors Teaching Stoichiometry

Kira Padilla, UNAM, kira@unam.mx

Andoni Garritz, Faculty of Chemistry, UNAM

S6A.5.2 High School Preparation for Success in College Science Courses: South Korean Student and Teacher Perspectives

Miyoung Hong, Korea Institute for Curriculum & Evaluation, myhong@kice.re.kr

Nam-Hwa Kang, Oregon State University

Joo-Ah Kim, Yonsei University

S6A.5.3 Comparing Outcomes of Traditional Cookbook Versus Single-Question, Open-Ended Undergraduate Biology Lab

Matthew J. Kloser, Stanford University School of Education, mkloser@stanford.edu

Sara Brownell, Stanford University Biology Department

S6A.5.4 Undergraduate Non-science Majors' Descriptions and Interpretations of a Scientific Data Visualization

Sandra Swenson, CUNY, sswenson@jjay.cuny.edu

S6A.5.5 The Relationship Between Epistemological Beliefs and Problem Solving in Physics

Wendi N. Wampler, Purdue University, wamplerw@purdue.edu

Lynn A. Bryan, Purdue University

Mark P. Haugan, Purdue University

S6A.5.6 Preparing Future Scientists and Engineers to Assess the Ethical Implications of Their Work in Nano-Biotechnology

Toth Eva Erdosne, West Virginia University, eva.toth@mail.wvu.edu

Kasi J. Jackson, West Virginia University

Brittany Witherspoon, West Virginia University

Strand 6: Science Learning in Informal Contexts

S6A.6 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.6.1 Pedagogic Understandings of Science Summer Camp Leaders

A. Leo Macdonald, St. Francis Xavier University, lxmacdon@stfx.ca

Ann Sherman, University of New Brunswick

S6A.6.2 A Case Study of the Interaction on Science Activities Between Parents and Children in Taiwan

Yi-Ting Cheng, National Changhua University of Education, tonia0213@gmail.com

Huey-Por Chang, National Changhua University of Education

S6A.6.3 Attitudes towards Science and Technology among General Education Development Students

Casey Fisher, Southern Illinois University Carbondale, mweenechabalengula@excite.com

Vivien M. Chabalengula, Southern Illinois University Carbondale

Frackson Mumba, Southern Illinois University Carbondale

S6A.6.4 An Evaluation of the Impact of an Electronic Field Trip on Students' Perceptions of Scientists

Mary E. Varghese, Purdue University, mvarghes@purdue.edu

Kristin A. Hetzel, Purdue University

Omolola A. Adedokun, Purdue University

Loran C. Parker, Purdue University

Wilella D. Burgess, Purdue University

Jamie L. Loizzo, Purdue University

Joseph P. Robinson, Purdue University

S6A.6.5 A Youth-Directed Science Café: Impacts on Teen Participants

Susan Foutz, Institute for Learning Innovation, foutz@ilinet.org

Michelle Hall, Science Education Solutions, Inc

Jessica Luke, Institute for Learning Innovation

Michael Mayhew, Synoptic LLC and Science Education Solutions, Inc.

Strand 7: Pre-service Science Teacher Education

S6A.7 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.7.1 Teacher Candidates' Exploration of Teaching Science for Social Justice with Elementary Students: Toward a Critical Science Pedagogy

Julie L. Haun-Frank, Old Dominion University, jhaun@odu.edu

Catherine E. Matthews, The University of North Carolina at Greensboro

Melony Allen, The University of North Carolina at Greensboro

S6A.7.2 Explicit versus Implicit Teaching: Pre-service Elementary Teachers' Peer Teaching Lessons on Inquiry Process Skills

Byoung Sug Kim, Roosevelt University, bkim@roosevelt.edu
Eun Kyung Ko, National-Louis University

S6A.7.3 A Further Exploration of Factors Related to Acceptance of Evolutionary Theory among Turkish Preservice Biology Teachers

Hasan Deniz, University of Nevada Las Vegas, hasan.deniz@unlv.edu
Irfan Yilmaz, Dokuz Eylul University, Izmir Turkey
Faruk Cetin, Dokuz Eylul University, Izmir Turkey

S6A.7.4 Using Problems of Practice to Approximate Teaching in a Pre-service Methods Course

David J. Grueber, Wayne State University, grueber@wayne.edu
Nonye M. Alozie, Wayne State University
Mary O. Dereski, Wayne State University

S6A.7.5 Examining Progress in Recruitment, Preparation and Induction of Pre-service Teachers in the NSF Noyce Program

Ann M.L. Cavallo, The University of Texas at Arlington, cavallo@uta.edu
Gregory Hale, The University of Texas at Arlington
James Epperson, The University of Texas at Arlington
Ramon Lopez, The University of Texas at Arlington

S6A.7.6 A Co-er and Pap-ers Unit on Electricity for Preservice and In-service Elementary Teachers

Saiqa Azam, University of Calgary, sazam@ucalgary.ca

S6A.7.7 Investigating Teachers' Understandings of the Nature of Science (NOS) and Developing a NOS Assessment Questionnaire

Eunmi Yang, Stonehill College, eyang@stonehill.edu
Michelle Jaques, Stonehill College
Virginia Epps, University of Wisconsin-Whitewater

S6A.7.8 Developing PCK Beyond the Methods Course: Exploring the Use of Science Specific Mentors with Elementary Student Teachers

Meredith A. Park Rogers, Indiana University - Bloomington, mparkrog@indiana.edu

S6A.7.9 Promoting an Argument Structure in Elementary School Classrooms

Reizelie Barreto-Espino, Towson University, rbarreto@towson.edu
Carla Zembal-Saul, The Pennsylvania State University

S6A.7.10 Contrast of the Science Teaching Practices of Two Pre-service Early Childhood Educators

Deirdre Englehart, UCF Daytona Campus, dengleha@mail.ucf.edu

Strand 8: In-service Science Teacher Education

S6A.8 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.8.1 Professional Identity Development of Beginning Elementary Teachers of Science: A Comparative Case Study

Phyllis Katz, University of Maryland, pkatz15@gmail.com
J. Randy McGinnis, University of Maryland
Kelly Riedinger, University of Maryland
Scott J. Dantley, Coppin State University
Gili Marbach-Ad, University of Maryland
Rebecca Pease, University of Maryland
Amy Dai, University of Maryland
Lori Jusiewicz, University of Maryland

S6A.8.2 Using Lesson Study to Understand How Elementary Science Teachers Translate Social Constructivist Learning Theory into Practice

Apisata Juntaraprasert, Kasetsart University, Bangkok, Thailand, japisata@hotmail.com
Vantipa Roadrangka, Kasetsart University, Bangkok, Thailand
Deborah J. Tippins, The University of Georgia, Athens, GA

S6A.8.3 Comparison of Science, Social Studies and Ethics Teachers' Understanding

Jungsook Yoo, Ewha Womans University, jsyoo@ewhain.net
Sung-Youn Choi, Ewha Womans University
Hyunju Lee, Ewha Womans University

S6A.8.4 Teachers' Experiences on Inquiry Teaching Learning: From the Perceptions of 10 Experienced Junior-high Science Teachers

Chung-Hsien Tseng, National Changhua University of Education, csj268@ms.kkjh.cyc.edu.tw
Hsiao-Lin Tuan, National Changhua University of Education
Chi-Chin Chin, National Taichung University

S6A.8.5 Navigating with Content Driven Literacy in the Secondary School Classroom: A Case Study of Three Teachers Approaches from Their Second Year Teaching

Jessica F. Riccio, Teachers College, Columbia University, riccio@tc.edu

S6A.8.6 Professional Development Program Boosts Science Teaching Practices among Head-Start Teachers on an American-Indian Reservation

Mia Dubosarsky, University of Minnesota, dubo0053@umn.edu
Gillian H. Roehrig, University of Minnesota
Ann Mogush-Mason, University of Minnesota
Barb Murphy, University of Minnesota
Stephan Carlson, University of Minnesota

S6A.8.7 Impact of School Experiences on Beliefs about the Nature of Science: Two Case Studies on Persisting Secondary Science Teachers

Sissy S. Wong, University of Houston, sissywong@uh.edu
 Irasema B. Ortega, Arizona State University
 Julie A. Luft, Arizona State University
 Jonah B. Firestone, Arizona State University
 Krista L. Adams, Arizona State University

Strand 9: Reflective Practice

S6A.9 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.9.1 A Story About How A Novice Science Teacher Became An Expert Science Teacher In Taiwan

Hsin-Jung Dai, Pingtung County Chung-Hsiao Elementary School,
sir641286@yahoo.com.tw
 Jing-Ru Wang, National Pingtung University of Education

S6A.9.2 Engaging Urban Pre-service Teachers in Meaningful Reflective Practices Through Video Analysis and Peer Feedback

Irene U. Osisioma, California State University, Dominguez Hills,
iosisioma@csudh.edu
 Mercy Ogunsola-Bande, Adamawa State University,
 Adamawa Nigeria

S6A.9.3 The Influence of Collaborative Action Research on Chemistry Teacher Beliefs

Katrin Vaino, University of Tartu, katrin.vaino@ut.ee
 Jack Holbrook, University of Tartu

Strand 10: Curriculum, Evaluation, and Assessment

S6A.10 Poster Session A

3:15pm – 4:15pm, Grand Sierra D

S6A.10.1 Using Many Facet Rasch Measurement to Evaluate Judges, Examinees, and Items: An Example Using the ESTAM

Jeffery S. Townsend, Eastern Kentucky University,
scott.townsend@eku.edu
 William J. Boone, Miami University

S6A.10.2 Discussion as a Meaning-making Practice: Variations in the Enactment of Discussions in Science Classrooms

Monica (Mon-Lin) Ko, Northwestern University,
monlinko2008@u.northwestern.edu
 Brian J. Reiser, Northwestern University

S6A.10.3 Research-Based Multidisciplinary Science Instructional Materials for Grade 8: A Tool to Promote Equity?

Susan M. Kowalski, BSCS, skowalski@bscs.org
 Janet Carlson, BSCS
 Scotter Pamela Van, BSCS
 Betty Stennett, BSCS

S6A.10.4 Using the Force Concept Inventory to Measure High School Students' Learning Progression of Forces

Gavin W. Fulmer, National Science Foundation, gfulmer@nsf.gov
 Ling L. Liang, La Salle University
 Xiufeng Liu, University at Buffalo

S6A.10.5 Understanding the Impact of Formative Assessment Strategies on First Year University Students' Conceptual Understanding of Chemical Concepts

Mehmet Aydeniz, The University of Tennessee, maydeniz@utk.edu
 Aybuke Pabuccu, Abant Izzet Baysal University, Bolu, Turkey

S6A.10.6 The Development of Practical Course Work for Prospective Science Teachers' Pedagogical Content Knowledge

Koichi Furuya, Professor, Hokkaido University of Education, Japan,
furuya@asa.hokkyodai.ac.jp

S6A.10.7 Global Sustainability and Public Understanding of Science: Using Socioscientific Issues to Assess Environmental Literacy

Tali Tal, Technion, rtal@technion.ac.il
 Anat Aabramovitch, Technion

S6A.10.8 Surveying Ocean Literacy: Instrument Development and Validation

Joo Chung, Lawrence Hall of Science University of California,
 Berkeley
 Kristin Nagy Catz, University of California, Berkeley, knc@berkeley.edu
 Rena Dorph, Lawrence Hall of Science University of California,
 Berkeley

S6A.10.9 Integrating Science Simulations into Curricula and Assessment Systems

Matt D. Silbergitt, WestEd, msilber@wested.org
 Barbara C. Buckley, WestEd

S6A.10.10 How Do Elementary School Science Textbooks Present The Nature Of Science?

Marianne Phillips, University of Houston,
marianne.phillips@tamusa.tamus.edu
 Julie Vowell, University of Houston
 Young Lee, University of Houston

Strand 11: Cultural, Social, and Gender Issues**S6A.11 Poster Session A**

3:15pm – 4:15pm, Grand Sierra D

S6A.11.1 Connecting School Science Learning with At-home Activities: Documenting Learning through a Science Backpack Program

Carrie Tzou, University of Washington Bothell, tzouct@u.washington.edu
 Elyse Litvack, Maple Elementary School, Seattle School District

S6A.11.2 The Intersection of Ethnicity and Gender in STEM Undergraduate Experiences: A Case Study

Roxanne Hughes, Florida State University, hughes@magnet.fsu.edu

S6A.11.3 Comparison of 15-Years Old and Upper-Secondary Schools Students' Occupational Expectations and Extrinsic Motivation to Learn Science

Imbi Henno, imbi.henno@tlu.ee
 Maarja Lond
 Priit Reiska

S6A.11.4 Story-telling and Writing: A Platform for Cultural Exchange between Science and Everyday Ways of Knowing

Xenia Meyer, University of California, Berkeley, xenia.meyer@berkeley.edu
 Barbara A. Crawford, Cornell University

S6A.11.5 Navigating Inquiry and Academic Language in Classrooms with ELLs: A Longitudinal Study of two Beginning Secondary Science Teachers

Irasema B. Ortega, Arizona State University, iortegac@asu.edu
 Sissy S. Wong, University of Houston
 Sarah Newcomer, Arizona State University
 Jonah B. Firestone, Arizona State University
 Krista L. Adams, Arizona State University
 Julie A. Luft, Arizona State University

S6A.11.6 Grade Nine Students' Interests towards Learning Science at School and its Relationship with their Future Career Choices

Moonika Teppo, University of Tartu, Estonia, moonika.teppo@ut.ee
 Miia Rannikmäe, University of Tartu, Estonia

Strand 12: Educational Technology**S6A.12 Poster Session A**

3:15pm – 4:15pm, Grand Sierra D

S6A.12.1 Crystal Island-Uncharted Discovery: An Intelligent Game-based Learning Environment

James Minogue, North Carolina State University, james_minogue@ncsu.edu
 Bradford Mott, North Carolina State University
 Hiller Spires, North Carolina State University
 John Neitfeld, North Carolina State University
 Marc Russo, North Carolina State University
 Jonathan Rowe, North Carolina State University

S6A.12.2 Interactive Whiteboard use in Two High-tech Science Classrooms: Technology Adoption and Integration

Rena Stroud, TERC, rena_stroud@terc.edu
 Brian Drayton, TERC
 Joni Falk, TERC

S6A.12.3 Making and Moving Ideas: Students Using XO Laptops to Create, Discover, and Share Ideas

Anne E. Emerson, University of California, Santa Barbara, aemerson@education.ucsb.edu
 Danielle B. Harlow, University of California, Santa Barbara
 Alyssa Krier

S6A.12.4 Study the Effectiveness of Interactive Whiteboard in Facilitating Junior High School Students' Biology Learning

Kai-Ti Yang, National Taiwan Normal University, biokaty@gmail.com
 Tzu-Hua Wang, National HsinChu University of Education
 Mei-Hung Chiu, National Taiwan Normal University

Strand 13: History, Philosophy, and Sociology of Science**S6A.13 Poster Session A**

3:15pm – 4:15pm, Grand Sierra D

S6A.13.1 Young Children's Images of a Scientist: Revisiting the Draw-A-Scientist Test

Tiffany R. Lee, University of Washington, tlee13@u.washington.edu

S6A.13.2 The Superconductivity Centennial: A Very 'Cool' Subject for Teaching the Nature of Science

Mehmet F. Tasar, Gazi Universitesi, mftasar@gmail.com

Strand 14: Environmental Education**S6A.14 Poster Session A**

3:15pm – 4:15pm, Grand Sierra D

S6A.14.1 Environmental Education in Pre-Service Teacher Preparation

Scott A. Ashmann, University of Wisconsin-Green Bay,
ashmanns@uwgb.edu

S6A.14.2 Middle School Students' Decisions about Global Endangered Species Management Dilemmas

Meena M. Balgopal, Colorado State University,
Meena.Balgopal@colostate.edu
Lynn Gilbert, Conrad Ball Middle School
Pam Breitbarth, Conrad Ball Middle School
Alison M. Wallace, Minnesota State University Moorhead

S6A.14.3 Exploring the World: Comparing Student Learning in Environmental and Science Inquiry Programs

Oksana Bartosh, Directions Evidence and Policy Research Group,
ksenia_brt@yahoo.com
Jolie Mayer-Smith, University of British Columbia
Margaret Tudor, Pacific Education Institute
Linda Peterat, University of British Columbia

S6A.14.4 Combining Environmental Education and Integrated STEM Instruction: A Model and Case Study

Daniel L. Dickerson, Old Dominion University, ddickers@odu.edu
Patti Horne, Averett University
Stephanie Hathcock, Old Dominion University
Eileen Hofmann, Old Dominion University
Laura Nelson, Portsmouth Public Schools

S6A.14.5 Indicators for Environmental Literacy: Local vs. Global Knowledge

Tali Tal, Technion, rtal@technion.ac.il
Einat Peled, Technion

S6A.14.6 Ecological Sustainability and Place-based Learning: A Model of Education for Transformative Experiences

Julie Singleton, Texas A&M, jsingle47@yahoo.com

Strand 15: Policy**S6A.15 Poster Session A**

3:15pm – 4:15pm, Grand Sierra D

S6A.15.1 Ohio Biology Teacher Licensure Requirements: Implications for Evolution Instruction

Lisa A. Donnelly, Kent State University, ldonnell@kent.edu
Vanessa Klein, Kent State University

Poster Session B

4:15pm – 5:15pm, Grand Sierra D

Strand 1: Science Learning, Understanding and Conceptual Change**S6B.1 Poster Session B**

4:15pm – 5:15pm, Grand Sierra D

S6B.1.1 Electric Current Mental Models of Japanese and U.S. students

David Henry, Buffalo State College, henryd@buffalostate.edu
Michael Jabot, SUNY Fredonia
Koichi Furuya, Hokkaido University of Education

S6B.1.2 Facilitating Synthesis Problem Solving with Conceptual Scaffolding in Introductory Physics

Lin Ding, The Ohio State University, ding.65@osu.edu

S6B.1.3 Association Between Belief and Conception of Evolution

Heeyoung Cha, Korea National University of Education,
hycha@knue.ac.kr
Yangsuk Heo, Pohang Idong High School
Minsu Ha, The Ohio State University
Seulae Ku, Korea National University of Education
Hyemin Park, Korea National University of Education
Soon-nam Lee, Korea National University of Education

S6B.1.4 Examining Student Writings of Argument-Based Inquiry Approach

Saeyeol Yoon, University of Iowa, saeyeol-yoon@uiowa.edu
Jeffrey Perkins, University of Iowa
Nattida Promyod, University of Iowa
Claudia P. A. Mendez, University of Iowa
Brian M. Hand, University of Iowa

S6B.1.5 High School Students' Interpretations of Cellular Transport Graphics

Michelle Cook, Clemson University, mcook@clemson.edu

S6B.1.6 Interpreting Probabilistic Causal Outcomes in Science: A Microgenetic Study of Sixth Graders' Patterns of Reasoning

Tina A. Grotzer, Harvard Graduate School of Education,
Tina_Grotzer@pz.harvard.edu

Shane Tutwiler, Harvard Graduate School of Education
Leslie Duhaylongsod, Harvard Graduate School of Education
Molly Levitt, Harvard Graduate School of Education
Erika Spangler, Harvard Graduate School of Education

S6B.1.7 Exploration of Using Narrative to Scaffold Levels of Representation in a Multimedia Simulation for Introductory High School Chemistry

Catherine E. Milne, New York University, cem4@nyu.edu

Jan Plass, New York University
Bruce Homer, City University of New York
Trace Jordan, New York University
Ruth Schwartz, New York University
Mubina Khan, New York University
Dixie Ching, New York University
Yoo Kyung Chang, New York University

S6B.1.8 Cross-cultural Comparison of SI-native and Imperial-native Students' Understanding of Size and Scale

Cesar Delgado, The University of Texas at Austin, cesar_delgado@
austin.utexas.edu

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S6B.2 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.2.1 Investigating Students' Strengths and Weaknesses in the Area Scientific Inquiry

Manja Erb, erb@chemie.fu-berlin.de
Claus F. Bolte, Prof.

S6B.2.2 Epistemology and Personality Traits as Predictors of Scientific Reasoning Ability

Gavin W. Fulmer, gavinfulmer@hotmail.com

S6B.2.3 Towards Improving the Measurement of Quality of Argument Using Toulmin's Framework: A Methodological Contribution

Maria P. Evagorou, University of Nicosia, Cyprus,
evagorou.m@unic.ac.cy
Jonathan F. Osborne, Stanford University

S6B.2.4 Blending Physical and Virtual Manipulatives in Physics

Georgios G. Olympiou, University of Cyprus, olympiog@ucy.ac.cy
Zacharias C. Zacharia, University of Cyprus

S6B.2.5 Teacher's Views on Science, Teaching Science, and Their relationship to Argumentation Norms in a Classroom

Suna Ryu, UCLA, sunaryu@ucla.edu

S6B.2.6 Young Children Do Not Hold the Classic Earth's Shadow Misconception to Explain Lunar Phases

Jennifer A. Wilhelm, University of Kentucky, jennifer.wilhelm@uky.edu

S6B.2.7 Nature of Science Communication in Teacher Personal Pronouns

Alandeom W. Oliveira, State University of New York at Albany,
aoliveira@albany.edu

S6B.2.8 Investigating Discursive Practices Utilized Students and their Teacher in a Freshman-Level High School Science Course

Lauren H. Swanson, UC Santa Barbara, lhoneycutt@education.ucsb.edu
Julie Bianchini, University of California, Santa Barbara

S6B.2.9 Examining How Elementary Students Generate Inferences When Reading Informational Science Texts and Interpreting Scientific Data

Jamie N. Mikeska, Michigan State University, mikeskaj@msu.edu

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

S6B.3 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.3.1 Making the Invisible Visible: Exploring Science Literacy through Creation of Non-fiction Science Picture Books

Yovita N. Gwekwerere, Laurentian University,
ygwekwerere@laurentian.ca
Jan Buley, Laurentian University

S6B.3.2 Exploring Primary Teachers' Epistemological Understandings and Dilemmas of School Science Lab Practices

Sun-Kyung Lee, Seoul National University, sunlee@snu.ac.kr
Myeong-Kyeong Shin, Gyeongin National University of Education
Gyuho Lee, Seoul National University

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

S6B.4 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.4.1 The Relationship between Nature of Science Understandings and Science Self-efficacy Beliefs of Sixth Grade Students

Beth Allyn Parker, Georgia State University, eap1961@comcast.net
 Geeta Verma, University of Colorado Denver
 Lisa Martin-Hansen, Georgia State University
 Ray Hart, Georgia State University

S6B.4.2 Fostering Transfer of Learning in 9th Grade Chemistry Lessons using the Scientific Method as an Example

Susanne Bley, Humboldt-Universität zu Berlin, Germany,
 ruediger.tiemann@chemie.hu-berlin.de
 Rüdiger D. Tiemann, Humboldt-Universität zu Berlin, Germany

S6B.4.3 A Critical Analysis of Force and Motion Unit at a Newly Reformed Science and Technology Curriculum

Mehmet C. Ayar, Texas A&M University, mehmetayar@tamu.edu
 Bugrahan Yalvac, Texas A&M University

S6B.4.4 Developing the TPACK of Secondary Science Teachers using the Interactive Whiteboard and Peer Coaching

Syh-Jong Jang, Chung-Yuan Christian University, jang@cycu.edu.tw

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

S6B.5 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.5.1 How Do Students' Approaches to Learning Science Relate to Their Ability to Ask Good Questions?

Erika G. Offerdahl, North Dakota State University,
 erika.offerdahl@ndsu.edu
 Lisa M. Montplaisir, North Dakota State University

S6B.5.2 Teaching Quantum Physics: Impact on Learning Using a Representational Approach

Bruce G. Waldrip, Monash University, bruce.waldrip@monash.edu
 Promovendus Abdurrahman, Indonesia University of Education

S6B.5.3 A Longitudinal Perspective of Gender Differences in STEM Undergraduate Research Experiences

Joseph A. Harsh, Indiana University, Science Education,
 jharsh@indiana.edu
 Adam V. Maltese, Indiana University, Science Education
 Robert H. Tai, University of Virginia, The Curry School of Education

S6B.5.4 Boring, Cool, Enjoyable, Dull: Students' Interest during Analytical Chemistry Laboratory Activities

Martina Nieswandt, Illinois Institute of Technology, mnieswan@iit.edu
 Linnea Garrett, Illinois Institute of Technology

S6B.5.5 A Phenomenological Study of Non-science majors' Perceptions of Evolution

Emily M. Walter, University of Missouri, emw2n4@mail.mizzou.edu
 Patricia M. Friedrichsen, University of Missouri

S6B.5.6 Students' Perceptions about Their Learning Experience through a Process-oriented Chemistry Laboratory Curriculum

Eulsun Seung, Indiana State University, esseung@gmail.com
 Beverly Pestel, Indiana State University

Strand 6: Science Learning in Informal Contexts

S6B.6 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.6.1 Content Related Social Interactions during Professional Development at an Informal Science Institution

Gary M. Holliday, Illinois Institute of Technology, ghollida@iit.edu
 Judith S. Lederman, Illinois Institute of Technology
 Norman G. Lederman, Illinois Institute of Technology

S6B.6.2 An Examination of Visitor Responses and their Meaning Making of the Von Hagens' Body Worlds Exhibition

Susan Jagger, OISE/University of Toronto, sjagger@utoronto.ca
 Michelle Dubek, OISE/University of Toronto
 Erminia G. Pedretti, OISE/University of Toronto

S6B.6.3 Difficult Diological Concepts in Media Coverage

Carl-Johan Rundgren, Linköping University, Sweden,
 carl-johan.a.rundgren@liu.se
 Rundgren Shu-Nu Chang, Linköping University, Sweden
 Chun-Yen Chang, National Taiwan Normal University, Taiwan
 Yuen-Hsien Tseng, National Taiwan Normal University, Taiwan

S6B.6.4 Interactive Museum Workshop in Cell Biology Positively Impacts Nurses' Knowledge of Molecular Medicine

Kathleen M. Vandiver, Massachusetts Institute of Technology,
kathymv@mit.edu

Catherine Ricciardi, Massachusetts Institute of Technology

Amanda N. Gruhl, Massachusetts Institute of Technology

Robin Meisner, MIT Museum

Jonathan M. Bijur, MIT Museum

Charles Shubert, Massachusetts Institute of Technology

Ivicta Ceraj, Massachusetts Institute of Technology

Lourdes Aleman, Massachusetts Institute of Technology

S6B.6.5 Expanding the Depth of Informal Learning with Mixed Reality at Science Centers

Robb Lindgren, University of Central Florida, lindgren@mail.ucf.edu

Eileen Smith, University of Central Florida

J. Michael Moshell, University of Central Florida

Strand 7: Pre-service Science Teacher Education

S6B.7 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.7.1 Evolution in Elementary Methods: A Practical Instrument Shows Attitudinal Change is Possible (but Tricky)

Bryan H. Nichols, University of South Florida, bryanhnichols@gmail.com

S6B.7.2 Analysis of Preservice Science Teachers' Understanding of NOS and Warrants on Socioscientific Issues

Kader Bilican, Ataturk University, Erzurum, Turkey, bkader@metu.edu.tr

Yasemin Ozdem, Gaziosmanpasa University, Tokat, Turkey

S6B.7.3 Impact of a Methods Course on Pre-Service Elementary Teachers with Negative Attitude and Low Self-Efficacy

Mahsa Kazempour, Penn State Berks, muk30@psu.edu

S6B.7.4 Prospective Elementary Teachers Enjoy Science: Orientations and Experiences that Influence their Development

Lucy Avraamidou, University of Nicosia, avraamidou.l@unic.ac.cy

Maria P. Evagorou, University of Nicosia

S6B.7.5 Understanding Aspects of Pre-service Teacher Questioning Skills

Stephanie B. Philipp, University of Louisville,

stephanie.philipp@louisville.edu

Melissa L. Shirley, University of Louisville

S6B.7.6 Preservice Teachers' Understanding and Implementation of Inquiry: Initial Findings from a Longitudinal Study

Liesl M. Hohenshell, University of Wisconsin-Whitewater,

hohenshl@uww.edu

S6B.7.7 Preservice Elementary Teachers' Learning about the Five Essential Features of Classroom Inquiry

Mandy Biggers, University of Iowa, mandy-biggers@uiowa.edu

Cory T. Forbes, University of Iowa

S6B.7.8 Student-teachers' Primary vs. Secondary Research Influences on Socioscientific Actions

John L. Bencze, OISE, University of Toronto, larry.bencze@utoronto.ca

Erin Sperling, OISE, University of Toronto

S6B.7.9 A Tool to Measure Planning-With-Curriculum Practices of Pre-Service Elementary Science Teachers

Jennifer Cartier, University of Pittsburgh, jcartier@pitt.edu

Leslie Lancaster, University of Pittsburgh

Ellice Forman, University of Pittsburgh

Linda Deafenbaugh, University of Pittsburgh

Strand 8: In-service Science Teacher Education

S6B.8 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.8.1 Impact of an Immersion Course on K-8 In-service Teachers' Understanding of Implementing Reformed Teaching Practices

Margaret D. Nolan, Boston University, noland@mersd.org

Peter Garik, Boston University

Charles Winrich, Boston University

Donald Derosa, Boston University

Andrew Duffy, Boston University

Manher Jariwala, Boston University

Russell Faux, Davis Square Research Associates

Nicholas Gross, Boston University

Bennett Goldberg, Boston University

Glenn Stevens, Boston University

S6B.8.2 Supporting Elementary Teachers' Evaluation and Adaptation of Science Curriculum Materials: The PIESC3 Professional Development Model

Cory T. Forbes, University of Iowa, cory-forbes@uiowa.edu

Kimberly Gasaway, Davenport Community Schools

Mandy Biggers, University of Iowa

Laura Zangori, University of Iowa

S6B.8.3 A Comparison of Exemplary Biology, Chemistry, Earth Science, and Physics Teachers' Goals, Enactment, and Conceptions of Inquiry

Wayne G. Breslyn, University of Maryland, College Park,
wbreslyn@yahoo.com

J. Randy McGinnis, University of Maryland, College Park

S6B.8.4 Improving Indigenous Schools: Effectiveness of a Field-based Professional Development Program in Rural Schools

Terence P. McClafferty, Curtin University, Perth, Western Australia,
terry.mcclafferty@curtin.edu.au

S6B.8.5 Science Teachers' Initial Conceptions of 21st Century Skills and Their Implementation in Grade 3-8 Classrooms

Augusto Z. Macalalag, Stevens Institute of Technology,
augusto.macalalag@stevens.edu

Christian Jurado, Stevens Institute of Technology

S6B.8.6 Impact of a New Master's Program for K-8 Teachers on Their Knowledge and Practices

Yasemin Copur, ycopur2@illinois.edu

Hatun Zengin

Barbara Hug

S6B.8.7 Using Physics Education Research Literature in Teacher Professional Development

Charles Winrich, Boston University, cwinrich@bu.edu

Peter Garik, Boston University

Margaret D. Nolan, Boston University

Yann Benétreau-Dupin, Boston University

Andrew Duffy, Boston University

Arthur Eisenkraft, University of Massachusetts - Boston

Luciana Garabayo, University of Texas - El Paso,

Department of Philosophy

Nicholas Gross, Boston University

Manher Jariwala, Boston University

Russell Faux, Davis Square Research Associates

S6B.8.8 Qualitative Indicators of Successful Induction: Case Studies of Three Beginning Secondary Science Teachers' Induction Experiences

Angela W. Webb, University of North Carolina at Greensboro,
awwebb@uncg.edu

Strand 9: Reflective Practice

S6B.9 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.9.1 An Elementary School Teacher's Reflection on Implementing Constructivist Instruction in Science Classroom

Kuo-Chung Hsu, Jhungjing Primary School, Kaohsiung, Taiwan,
shukuochung@hotmail.com

Jing-Ru Wang, National Pingtung University of Education,
Pingtung, Taiwan

S6B.9.2 Avenues for Chemistry Teachers' Reflection: Comparing a Video Annotation Tool to Written Journals

Youngjin Song, University of Northern Colorado,
youngjin.song@unco.edu

Steve J. Oliver, University of Georgia

Strand 10: Curriculum, Evaluation, and Assessment

S6B.10 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.10.1 Multimodal Generative Learning Theory: A New Model of Evaluating Representations of Science Principles

Suzanne M. Donnelly, Longwood University, donnellysm@longwood.edu

S6B.10.2 Teaching and Learning Concepts of Scientific Evidence: A Design-based Research and Development Study

Susan Kirch, New York University, susan.kirch@nyu.edu

Kara Naidoo, New York University

Anna Stetsenko, CUNY Graduate Center

Catherine E. Milne, New York University

S6B.10.3 Pilot-testing the Astrobiology in Secondary Classrooms (ASC) Curriculum: Focusing Upon Diverse Students and Teachers

De La Rubia Leigh S. Arino, Tennessee State University Nashville,
TN, leigh.arinodelarubia@gmail.com

Todd P. Gary, Tennessee State University

Susan Kuner, Topaz Canyon Group, LLC

Doug Robinson, Dragonfly Enterprises, Inc.

Judy Butler, Dragonfly Enterprises, Inc.

S6B.10.4 The Case of the Missing Sun: An Analytical View of Water Cycle Representations

Dane L. Schaffer, University of Missouri-Columbia,

dlszh3@mail.missouri.edu

Lloyd H. Barrow, University of Missouri-Columbia

S6B.10.5 Persistent Student Difficulties in Understanding the Particulate Nature of Matter

David F. Treagust, Curtin University of Technology,
d.treagust@curtin.edu.au

Julianne Crowley, Curtin University of Technology

Mauro Mocerino, Curtin University

A.L. Chandrasegaran, Curtin University

S6B.10.6 Computerized Formative Assessment in Secondary Science: Toward a Customised, Individualized Learner-centred Program of Learning

James F. Law, Curtin University, famlaw@xtra.co.nz

David F. Treagust, Curtin University of Technology

S6B.10.7 Students' Alternative Conceptions About Alternative Energy

I. Poh-Ai Cheong, Universiti Brunei Darussalam,

irene.cheong@ubd.edu.bn

Hih Hardimah Hj Mohd Said, Universiti Brunei Darussalam

Marlizayati Hj Johari, Universiti Brunei Darussalam

David F. Treagust, Curtin University of Technology

S6B.10.8 Students' Understanding of Light Propagation and Visibility of Objects in Different Contexts in Singapore and Korea

Hye-Eun Chu, Nanyang Technological University, Singapore,

hyeeun.z@nie.edu.sg

David F. Treagust, Curtin University of Technology

Alexander Kauertz, Weingarten University of Education

S6B.10.9 Cognitive Accessibility Levels of Turkish Level Determination Examination: Living Things and Life Learning Area

Yilmaz Kara, yilmazkaankara@yahoo.com

Strand 11: Cultural, Social, and Gender Issues

S6B.11 Poster Session B

4:15pm – 5:15pm, Grand Sierra D

S6B.11.1 Re-presenting Gender Differences in Science Achievement

Kathryn Scantlebury, University of Delaware, kscantle@udel.edu

Jane Kahle, Miami University

Yue Li, Miami University

Constance Blasie, University of Pennsylvania

S6B.11.2 Equitable Written Assessments for English Language Learners: How Scaffolding Helps

Somnath Sinha, University of Missouri, ssqh9@mail.mizzou.edu

Marcelle A. Siegel, University of Missouri

Deepika Menon, University of Missouri

Nattida Promyod, University of Iowa

Cathy Wissehr, University of Arkansas

Kristy L. Halverson, University of Southern Mississippi

S6B.11.3 The Influence of Teacher-Scientist Partnerships on Urban Middle School Students' Science Learner Characteristics

Rommel J. Miranda, Towson University, Rmiranda@towson.edu

S6B.11.4 How Do Minorities within the Minority Identify with Science and Engineering? A Focus on Middle School Students' Identity Negotiations Regarding Science

Kristen Molyneaux, University of Wisconsin, Madison,

molyneaux@magnet.fsu.edu

Roxanne Hughes, Florida State University/National High Magnetic Field Laboratory

S6B.11.5 How Parent and Child Gender Influences Children's Attitudes and Problem Solving Skills in Science

Susannah K. Sandrin, Arizona State University,

Susannah.Sandrin@asu.edu

Katherine J. Short-Meyerson, University of Wisconsin - Oshkosh

S6B.11.6 Street Medicine: A Case Study of Articulations of Technoscience, Education, Inquiry, and Social Justice in Non-school Settings

Matthew Weinstein, University of Washington-Tacoma,

mattheww@u.washington.edu

S6B.11.7 Effect of Culture on High-School Students' Question-Asking Ability Resulting from an Inquiry-Oriented Chemistry Laboratory

Iyad M. Dkeidek, Weizmann Institute of Science,

iyad.dkeidek@weizmann.ac.il

Rachel Mamluk-Naaman, Weizmann Institute of Science

Avi Hofstein, Weizmann Institute of Science

S6B.11.8 Collaborating to Transform Urban Science Education: Theory and Methods

Kenneth G. Tobin, CUNY, ktobin@gc.cuny.edu

Strand 12: Educational Technology**S6B.12 Poster Session B**

4:15pm – 5:15pm, Grand Sierra D

S6B.12.1 Analysis of Greenhouse Effect Simulation Implementation in 8th Grade Science CourseEdward C. Cohen, Rutgers University, ecohen@pway.org

Timothy Zimmerman, Rutgers University

S6B.12.2 Children Learning Technological Design and Engaging in Problem Solving with an ALERT Robot

Katherine Nilsen, University of California, Santa Barbara,

knilsen@education.ucsb.edu

Danielle B. Harlow, University of California, Santa Barbara

S6B.12.3 Leveraging on Interactive Animation to Facilitate Student Science-Process Skill Learning

Yu-Ta Chien, National Taiwan Normal University, Taipei,

Taiwan, danmg0722@yahoo.com.tw

Chun-Yen Chang, National Taiwan Normal University, Taipei, Taiwan

S6B.12.4 Prediction and Explanation as Design Mechanics in Conceptually-Integrated Digital Games to Help Players Articulate the Tacit Understandings they Build Through GameplayDouglas B. Clark, Vanderbilt University, doug.clark@vanderbilt.edu

Mario Martinez-Garza, Vanderbilt University

Brian C. Nelson, Arizona State University

Kent J. Slack, Arizona State University

Cynthia M. D'Angelo, University of Wisconsin

Strand 13: History, Philosophy, and Sociology of Science**S6B.13 Poster Session B**

4:15pm – 5:15pm, Grand Sierra D

S6B.13.1 The Nature of Scientific Laws in Biology and Chemistry: Implications for Science Curriculum and InstructionZoubeida R. Dagher, University of Delaware, zoubeida@udel.edu

Sibel Erduran, University of Bristol

S6B.13.2 Cross-Cultural Epistemological Orientations to Socioscientific IssuesDana L. Zeidler, University of South Florida, USA, zeidler@usf.edu

Mitch Ruzek, University of South Florida, USA

Wardell A. Powell, University of South Florida, USA

Jeff Orasky, University of South Florida, USA

Scott Applebaum, Palm Harbor University High School, USA

Chi-Chin Chin, National Taichung University, Taiwan

Shu-Sheng Lin, National Chiayi University, Taiwan

Cedric Linder, Uppsala University, Sweden & University of the Western Cape, South Africa

Anne Linder, Uppsala University, Sweden

Mark Herbert, University of the Western Cape, South Africa

Strand 14: Environmental Education**S6B.14 Poster Session B**

4:15pm – 5:15pm, Grand Sierra D

S6B.14.1 Crafting a Balanced Message: Negotiating the Values and Goals of Climate Scientists Engaged in Outreach

Elizabeth M. Walsh, University of Washington College of Education,

ewalsh2@u.washington.edu

Philip Bell, University of Washington College of Education

S6B.14.2 Families Visiting an Environmental Center: Understanding Ecological Relationships

Heather Toomey Zimmerman, Pennsylvania State University,

heather@psu.edu

Lucy R. McClain, Pennsylvania State University

Li-Chun Wang, Pennsylvania State University

Sameer Honwad, Rutgers, The State University of New Jersey

S6B.14.3 Embedding Education for Sustainability into Pre-Service Primary Teacher EducationLyn C. Carter, Australian Catholic University, lyn.carter@acu.edu.au

Caroline J. Smith

Phil C. Clarkson

S6B.14.4 Girls and Going Green: Adolescent Girls and Their Understandings of Environmental IssuesKimberly A. Haverkos, Miami University, haverkka@muohio.edu

Nazan U. Bautista, Miami University

S6B.14.5 Development of an Urban Environmental and Geoscience Place-based Curriculum Using Cogenerative Dialogue

Amy E. Defelice, City University of New York Graduate Center &

Brooklyn Academy of Science and the Environment,

amyferguson3@hotmail.com

Jennifer D. Adams, Brooklyn College-CUNY

Ishmael Akahoho, Brooklyn Academy of Science and the Environment

Strand 15: Policy**S6B.15 Poster Session B****4:15pm – 5:15pm, Grand Sierra D****S6B.15.1 Whose Nature is It?: Exploring The Nature of Engineering in Science Education**

Catherine M. Koehler, Illinois Institute of Technology, ckoehler@iit.edu

S6B.15.2 Retaining Public High School Science Teachers: Current Practices and ChallengesSara Spikes, Texas A&M University, sspikes@neo.tamu.edu

Evening/Social Events

Membership and Elections Committee**Sponsored Session****Graduate Student Forum**

The Graduate Student Forum aims to guide and encourage beginning researchers by discussing various problems that may arise, e.g. when completing the dissertation or searching for a position. Attendees of the forum are given the opportunity to question a panel of experienced colleagues on all matters of academic interest.

5:30pm – 6:30pm, Grand Sierra F

Jomo W. Mutegi, Indiana University, Indianapolis, jmutegi@iupui.edu

Kathryn F. Drago, University of Michigan

JRST Editorial Board Meeting/Reception**Meeting open/Reception by invitation****6:30pm – 8:30pm, Grand Sierra G & H**

Graduate Student and Early Career Scholars**Informal Social****6:30pm – 7:30pm, Poolside**

Tuesday, April 5, 2011

Committee Meetings

7:00am – 8:15am

NARST Outstanding Paper Award Committee
Selection Meeting

7:00am - 8:15am, Curacao 1

Outstanding Doctoral Research Award Selection
Committee Meeting

7:00am - 8:15am, Bonaire 1

JRST Award Selection Committee Meeting

7:00am - 8:15am, Bonaire 2

Early Career Research Award Selection Committee
Meeting

7:00am - 8:15am, Bonaire 3

Distinguished Contributions in Research Award
Committee Meeting

7:00am - 8:15am, Bonaire 4

Equity and Ethics Committee Meeting

7:00am – 8:15am, Curacao 2

External Policy and Relations Committee Meeting

7:00am – 8:15am, Curacao 3

Research Committee Meeting

7:00am – 8:15am, Curacao 4

Membership and Election Committee Meeting

7:00am – 8:15am, Curacao 5

International Committee Meeting

7:00am – 8:15am, Curacao 6

Program Committee Meeting

7:00am – 8:15am, Curacao 7

Publications Advisory Committee Meeting

7:00am – 8:15am, Curacao 8

Concurrent Session #7

8:30am – 10:00am

The Equity and Ethics Committee Sponsored
Session

S7.1 Jhumki Basu Scholars Symposium: Global
Sustainability and Public Understanding of
Science -- The Role of Science Education in the
International Community

8:30am – 10:00am, Antigua 1

Presider:

Mamta Singh, Martin University

Discussant:

Lisa Martin-Hansen, Georgia State University

Presenters:

Tapati Sen, Arizona State University

Ashraf Shady, Queens College, CUNY

Reizelie Barreto-Espino, Towson University

**Strand 1: Science Learning, Understanding and
Conceptual Change**

S7.2 Interventions Supporting Student Learning
in the Physical Sciences

8:30am – 10:00am, Curacao 1

Presider:

Shulamit Kapon, University of California Berkeley

S7.2.1 Comparing the Effects of Sequencing of
Physical and Virtual Manipulatives on Student
Learning and Confidence

Adrian Carmichael, Kansas State University, carmichaelam@gmail.com

Jacquelyn J. Chini, Kansas State University

Elizabeth Gire, University of Memphis

N. Sanjay Rebello, Kansas State University

Sadhana Puntambekar, University of Wisconsin, Madison

S7.2.2 The Effect of Metaconceptual Teaching
Activities on High School Students' Understanding
of States of Matter

Zubeyde Demet Kirbulut, Middle East Technical University,
kirbulut@metu.edu.tr

Omer Geban, Middle East Technical University

S7.2.3 Progressions of Students' Mental
Models of Magnetism

David Sederberg, Purdue University, dsederbe@purdue.edu

Anna-Leena Latvala, University of Jyväskylä

Anssi Lindell, University of Jyväskylä

Lynn A. Bryan, Purdue University

Jouni Viiri, University of Jyväskylä

S7.2.4 Comparing Benefits of Hypertext Exploration versus Virtual Experimentation on Students' Analysis of Physical Experiments

Jacquelyn J. Chini, Kansas State University, jackiehaynicz@gmail.com
 Adrian Carmichael, Kansas State University
 Elizabeth Gire, University of Memphis
 N. Sanjay Rebello, Kansas State University
 Sadhana Puntambekar, University of Wisconsin, Madison

Strand 1: Science Learning, Understanding and Conceptual Change

S7.3 Symposium - Learning Progressions - German and Swiss Studies on Models of Competence Development

8:30am – 10:00am, Bonaire 4

Presider:

Reinders Duit, IPN Kiel

Discussant:

Joseph S. Krajcik, University of Michigan

Presenters:

Sascha Bernholt, IPN Kiel
 Ilka Parchmann, IPN Kiel
 Knut Neumann, IPN Kiel
 Hans E. Fischer, University Duisburg-Essen
 Andrea Möller, University of Vechta
 Jürgen Mayer, University of Kassel
 Susanne Metzger, Zurich University of Teacher Education
 Peter Labudde, University of Applied Sciences Northwestern Switzerland

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S7.4 Exploring Varying Approaches to Inquiry

8:30am – 10:00am, Curacao 2

Presider: Georgia W. Hodges, University of Georgia

S7.4.1 Models of Students Learning in Different Inquiry Settings Influenced by Teachers PCK

Klaara Kask, researcher, PhD, klaara.kask@ut.ee
 Miia Rannikmäe, professor
 Jack Holbrook, professor

S7.4.2 The Separation of Lab and Class in Middle School Science

Phillip M. Stewart, Teachers College, Columbia University, pms2127@columbia.edu
 Ann E. Rivet, Teachers College, Columbia University
 Alissa Berg, Teachers College, Columbia University

S7.4.3 Guided Inquiry as Appropriate Instructional and Learning Method for Science Knowledge Retention in Elementary Students

Bhaskar Upadhyay, University of Minnesota, bhaskar@umn.edu
 Kristina Maruyama-Tank, University of Minnesota
 Brian Fortney

S7.4.4 The Effects and Moderators of Inquiry-Based Instruction in Taiwan - A Meta-Analysis

Jing-Ru Wang, National Pingtung University of Education, mail100@mail.npue.edu.tw
 Sheau-Wen Lin, National Pingtung University of Education
 Huey-Lien Kao, National Pingtung University of Education
 Kuo-Chung Shu, Chuang Ching Elementary School
 Hsin-Jung Tai, Chung Hsiao Elementary School

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S7.5 Symposium - Young People's Engagement in Scientific Argumentation: The Importance of Context, Curriculum, and Developmentally Appropriate Expectations

8:30am – 10:00am, Bonaire 8

Discussant:

Brian J. Reiser, Northwestern University

Presenters:

Tiffany R. Lee, University of Washington, tlee13@u.washington.edu
 Kari Shutt, University of Washington
 Giovanna Scalone, University of Washington
 Leah A. Bricker, University of Washington
 Nancy Vye, University of Washington
 John D. Bransford, University of Washington
 Philip Bell, University of Washington
 Nancy L. Salgado, University of Washington

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

S7.6 Building Scientific Explanations

8:30am – 10:00am, Curacao 3

Presider:

Rogers Meredith A. Park, Indiana University

S7.6.1 Elementary Students' Enhanced Epistemic Understanding through the Appropriation of Argumentation Norms

Suna Ryu, UCLA, sunaryu@ucla.edu

S7.6.2 Explaining Explanations: Teachers' Verbal Scaffolds Associated with Three Elementary Grades Students' Building of Scientific Explanation

Nancy B. Songer, University of Michigan, songer@umich.edu
 Ashima Mathur, University of Michigan
 Sarah Fick, University of Michigan

S7.6.3 Students' Negotiation of Claims and Evidence Through Online and In-Class Discussions

Aeran Choi, Kent State University, aeran-choi@hotmail.com
 Brian M. Hand, University of Iowa
 Lori A. Norton-Meier, University of Louisville

S7.6.4 A Comparison of Teaching Strategies for Promoting Argumentation in Elementary Science

Elizabeth Redman, University of California, Los Angeles,
elizabeth.redman@gmail.com

William A. Sandoval, University of California, Los Angeles

Noel Enyedy, University of California, Los Angeles

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

S7.7 Knowledge and Strategies for the Life Sciences

8:30am – 10:00am, Curacao 4

Presider:

Toth Eva Erdosne, West Virginia University

S7.7.1 Teaching About Behaviour: Beyond Choice Chambers

Jenny Lewis, CSSME, University of Leeds,
j.m.lewis@education.leeds.ac.uk

Indira C. Banner, CSSME, University of Leeds

S7.7.2 Mapping Out the Integration of the Components of Pedagogical Content Knowledge (PCK) for Teaching Photosynthesis and Heredity

Soonhye Park, University of Iowa, soonhye-park@uiowa.edu

Ying-Chih Chen, University of Iowa

S7.7.3 A Beginning Biology Teacher's 3-Year Journey in Learning to Teach Natural Selection through Inquiry

Aaron J. Sickel, University of Missouri, ajsrhc@mail.missouri.edu

Patricia M. Friedrichsen, University of Missouri

S7.7.4 A Regional Study of the Prevalence of Biological Evolution-related Misconceptions in Secondary School Biology Teachers

Tony B. Yates, Oklahoma Baptist University, tony.yates@okbu.edu

Edmund A. Marek, University of Oklahoma

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

S7.8 Faculty & Instructor Professional Development

8:30am – 10:00am, Curacao 5

Presider:

Abdulkadir Demir, Georgia State University

S7.8.1 Measuring and Replicating Science and Mathematics Faculty Perceptions of Traditional and Reformed Teaching and Learning Practices over Time

Chad Ellett, CDE Research Associates, Inc., cderesearch@att.net

Abdulkadir Demir, Georgia State University

Chad Ellett, Georgia State University

Judith Monsaas, University System of Georgia

Judy Awong-Taylor, Georgia Gwinnett College

Nancy Vandergrift, University of Georgia

Chuck Kutal, University of Georgia

S7.8.2 The Impact of Disciplinary Teaching and Learning Center Activities on Faculty Professional Development

Gili Marbach-Ad, University of Maryland, gilim@umd.edu

Kathryn L. Schaefer, University of Maryland

Katerina V. Thompson, University of Maryland

S7.8.3 Defining the Readiness of High School Students to Pursue First Year University Physics

Umesh D. Ramnarain, University of Johannesburg, uramnarain@uj.ac.za

Strand 6: Science Learning in Informal Contexts

S7.9 Tell Me a Story: Using Narratives in Informal Science Education

8:30am – 10:00am, Curacao 6

Presider:

John H. Falk, Oregon State University

S7.9.1 Pupils' Responses to Cues from the Natural World: Studies in Two cultures Using Multiple Analytic Perspectives

Sue Tunnicliffe, University of London, lady.tunnicliffe@me.com

Michael J. Reiss, University of London

Carol Boulter, University of London

Sandra Selles, Universidade Federal Fluminense, Rio de Janeiro

S7.9.2 Using Stories to Scaffold Students in Science Centers

Mai Murmann, Copenhagen University, maij@experimentarium.dk

S7.9.3 Changes in Scientific Attitudes and Beliefs by Participants in an Astronomy Citizen Science Project

Aaron Price, AAVSO/Tufts University, aaronp@aavso.org

Hee-Sun Lee, Tufts University

S7.9.4 Beyond Earth: Fostering Native Science Knowledge at Multiple Cultural/Geographical Sites in Informal Settings

Tim R. Young, University of North Dakota, tim.young@und.edu
 Mark Guy, University of North Dakota
 Kerry Hartman, Fort Berthold Community College
 Randy Phelan, Fort Berthold Community College
 Kathy Froelich, Sitting Bull College
 Linda Different Cloud-Jones, Sitting Bull College

Strand 7: Pre-service Science Teacher Education

S7.10 Preservice Teacher Self Efficacy

8:30am – 10:00am, Curacao 7

S7.10.1 Preservice Teachers' Sentiments, Attitudes, Concerns and Self-Efficacy about Inclusive Education: Validation of SACIE Scale

Mustafa Cansiz, Artvin Coruh University, mustafacansiz@gmail.com
 Nurcan Turker, Ataturk University

S7.10.2 How Would they Know? Developing Elementary Preservice Teachers

Tina J. Cartwright, Marshall University, johnson516@marshall.edu
 Suzi Smith, Marshall University

S7.10.3 Correlates of Elementary Preservice Teachers' Science Teaching Efficacy Beliefs

Pamela Cantrell, Brigham Young University, pamela_cantrell@byu.edu
 James A. Cantrell, Utah Valley University
 Michael R. Patch, Utah Valley University

Strand 7: Pre-service Science Teacher Education

S7.11 Topics in Science, Technology, Society, and the Environment

8:30am – 10:00am, Bonaire 7

Presider:

Deborah J. Corrigan, Monash University

S7.11.1 Impact of an STS-Oriented Methods Course on Prospective Teachers' Level of Environmental Literacy

Aidin Amirshokoohi, Fairfield University, aamirshokoohi@fairfield.edu

S7.11.2 An Exploration of Preservice Science Teachers' Written Argumentation about the Global Climate Change Issue

Dilek Karisan, Yuzuncu Yil University, dilekkarisan@gmail.com
 Mustafa S. Topcu, Yuzuncu Yil University

S7.11.3 Using Citizen Science as a Framework for Teaching Pre-Service Secondary Science Teachers: How does Understanding Emerge?

Stacey A. Britton, University of Georgia, biolady24@yahoo.com
 Deborah J. Tippins, University of Georgia
 Melissa Freeman, University of Georgia

S7.11.4 Case Studies: Addressing Socioscientific Issues in a Teacher Education Course

Isha Decoito, York University, IDeCoito@edu.yorku.ca
 Maurice Diguisepe, University of Ontario Institute of Technology

Strand 8: In-service Science Teacher Education

S7.12 Related Paper Set - Professional Development Models to Support Teachers to Teach Nature of Science and Inquiry

8:30am – 10:00am, Curacao 8

Presider:

Anil C. Banerjee, Columbus State University

S7.12.1 Project ICAN: A Program to Enhance Teachers and Students' Understandings of Nature of Science and Scientific Inquiry

Norman Lederman, Illinois Institute of Technology
 Judith Lederman, Illinois Institute of Technology

S7.12.2 Project Guided Inquiry: Effect of Guided Inquiry and Traditional Instruction on Student Understanding of Chemistry Concepts and Science as Inquiry in High Schools

Anil C. Banerjee, Columbus State University

S7.12.3 Teacher Professional Development through Student-Teacher-Scientist Partnerships

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

S7.12.4 Engaging Teachers in Authentic Science Research: What Impacts Classroom Practice?

Renee' Schwartz, Western Michigan University

Strand 9: Reflective Practice

S7.13 Teacher Learning through Reflection

8:30am – 10:00am, Bonaire 6

Presider:

Tamara Holmlund Nelson, Washington State University Vancouver

S7.13.1 How does Reflection on Inquiry and Practice-teaching Result in Changes in Teacher Pedagogical Theories?

Ralph E. Spraker, South University, rspraker@southuniversity.edu
 Christine Lotter, University of South Carolina
 Gregory R. Rushton, Kennesaw State University

S7.13.2 Teachers' Perspectives of Professional Learning Communities in the Schools

Sarah W. Robert, North Carolina State University,
sarahwrobert@gmail.com
M. Gail Jones, North Carolina State University
Laura E. Robertson, North Carolina State University

S7.13.3 Developing Preservice Science Teachers in Video-Centered Communities of Practice

Ron Tinsley, Richard Stockton College of New Jersey,
ron.tinsley@stockton.edu
Kimberly Lebak, Richard Stockton College of New Jersey

S7.13.4 Helping Preservice Teachers Find Meaningful Engagement in Scientific Inquiry: A Self-study of Relational Teacher Education

Amy Trauth-Nare, Indiana University Bloomington,
amtrauth@indiana.edu
Gayle A. Buck, Indiana University Bloomington
Nicole Beeman-Cadwallader, Indiana University Bloomington

Strand 10: Curriculum, Evaluation, and Assessment

S7.14 Selecting Evolution

8:30am – 10:00am, Bonaire 1

Presider:

Mehmet Aydeniz, The University of Tennessee

S7.14.1 Comparative Efficacy of Two Computer-Assisted Scoring Tools for Evolution Assessment

Minsu Ha, The Ohio State University, ha.101@osu.edu
Ross H. Nehm, The Ohio State University

S7.14.2 Design and Research of an Evolution and Medicine High School Curriculum Intervention

Paul M. Beardsley, BSCS, pbeardsley@bscs.org
Molly A.M. Stuhlsatz, BSCS
Mark Bloom, BSCS
Anne L. Westbrook, BSCS
Rebecca A. Kruse, BSCS

S7.14.3 A Conceptual Analysis of the Conceptual Inventory of Natural Selection: Improving Diagnostic Utility through within Item Analysis

Erin Marie Furtak, University of Colorado at Boulder,
erin.furtak@colorado.edu
Deborah L. Morrison, University of Colorado at Boulder
Heidi Iverson, University of Colorado at Boulder
Michael J. Ross, University of Colorado at Boulder

S7.14.4 Assessing Middle and High School Students' Understanding of Evolution with Standards-based Items

Jean C. Flanagan, AAAS Project 2061, jflanaga@aaas.org
Jo Ellen Roseman, AAAS Project 2061

Strand 11: Cultural, Social, and Gender Issues

S7.15 Persistence and Success in the STEM Pipeline

8:30am – 10:00am, Bonaire 2

Presider:

Gillian U. Bayne, Lehman College of the City University of New York

S7.15.1 Evaluating an Intervention to Support Undergraduate Women in STEM Majors

Barbara A. Burke, California State Polytechnic University, Pomona,
baburke@csupomona.edu
Dennis W. Sunal, University of Alabama, Tuscaloosa
Cynthia V. Sunal, University of Alabama, Tuscaloosa

S7.15.2 The Current Influences on Women's Persistence in STEM fields at the Undergraduate Level

Roxanne Hughes, Florida State University/National High Magnetic Field Laboratory, hughes@magnet.fsu.edu

S7.15.3 STEM Graduate Students' Multiple Identities: How Can I Be Me and Be a Scientist?

Josephine A. Gasiewski, UCLA, joski@ucla.edu
Minh C. Tran, UCLA
Felisha Herrera, UCLA

S7.15.4 A Survey of the Scientific Epistemological Views of College Students: Assessing the Impact of an Implicit Curriculum in Science Education

Leigh S. Arino De La Rubia, Tennessee State University Nashville,
leigh.arinodelarubia@gmail.com
John Mark Hunter, Tennessee State University Nashville

Strand 12: Educational Technology

S7.16 Modeling and Video Tools in Science Education

8:30am – 10:00am, Bonaire 3

Presider:

Jacqueline McLaughlin, The Pennsylvania State University

S7.16.1 A Study of Modeling-based Teaching with Computer Simulation Inquiry

Jen-Chin Lin, National Kaohsiung Normal University, Taiwan,
jclin@nknuc.nknu.edu.tw
Jeng-Fung Hung, National Kaohsiung Normal University, Taiwan

S7.16.2 I just Want to Make It Work: Examining Students' Programming Actions Impeding Productive Model-based Inquiry

Lin Xiang, School of Education, University of California,
Davis, lxiang@ucdavis.edu

Cynthia Passmore, School of Education, University of California,
Davis

S7.16.3 Practicality in Virtuality: Finding Student Meaning in Video Game Education.

Timothy M. Barko, University of Florida, tim.barko@ufl.edu

Troy D. Sadler, University of Florida

S7.16.4 Investigating the Role of Video to Support Student Understanding of the Nature of Scientific Work

Kasey McCall, University of Michigan, kaseyl@umich.edu

Leeann M. Sutherland, University of Michigan

Namsoo Shin, University of Michigan

Strand 14: Environmental Education

S7.17 Sociocultural Perspectives in Environmental Education

8:30am – 10:00am, Bonaire 5

President:

Heather Toomey Zimmerman, Pennsylvania State University

S7.17.1 Using Informal Reasoning to Consider Trade-offs and Resolve Dilemmas

Meena M. Balgopal, Colorado State University,

Meena.Balgopal@colostate.edu

Alison M. Wallace, Minnesota State University Moorhead

Steve Dahlberg, White Earth Tribal and Community College

S7.17.2 Same Curriculum - Different Cultures: Same Knowledge and Attitudes Concerning Socioscientific Issues?

Aviva Klieger, Beit Berl Academic College, aviva@yavin-yeda.com

Tili Wagner, Beit Berl Academic College

Alon Fragman, Beit Berl Academic College

S7.17.3 A Sociocultural Investigation of the Goals for the Environmental Science Course: Teacher and Student Perspectives

Erica Blatt, College of Staten Island, erica.blatt@unh.edu

Strand 15: Policy

S7.18 Standards and Accountability for Science Teaching

8:30am – 10:00am, Antigua 2

President:

Todd L. Hutner, The University of Texas at Austin

S7.18.1 Science Standard Specificity and the Increasing Targets of Formative Assessments in High School Chemistry

Carlos C. Ayala, Sonoma State University, carlos.ayala@sonoma.edu

Andrea Chase, Sonoma State University

S7.18.2 The Scientific Theory of... Lessons Learned from Florida's 2008 Science Standards Adoption

Lance E. King, Florida State University, king@bio.fsu.edu

Sherry A. Southerland, Florida State University

S7.18.3 The Accountability Variable: Science Achievement and Differing Methods of Accountability in the United States

Eugene Judson, Eugene.Judson@asu.edu

Break

10:00am – 10:30am

PL2 Plenary Session #2

10:30am – 12:00pm, Grand Sierra E

Human Identity & Environmental Challenges

President: J. Randy McGinnis, University of Maryland

Keynote Presenter: Tim Kasser, Knox College

Awards Luncheon

12:00pm – 2:00pm, Grand Sierra Hall F, G, H, & I

Concurrent Session #8

2:15pm – 3:45pm

Equity and Ethics Sponsored Session

S8.1 Symposium - Thinking Globally, Acting Locally – Initiatives to Improve Science Learning for All

2:15pm – 3:45pm, Antigua 1

President:

Sumi Hagiwara, Montclair State University

Presenters:

Nirmala Ramlakhan, University of Central Florida

Mika Munakata, Montclair State University

Ken Wolff, Montclair State University

Mary Lou West, Montclair State University

Judith Lombana, Museum of Science and Industry, Tampa, Florida

Doris Ash, University of California, Santa Cruz

Jrene Rahm, Universes de Montreal

Strand 1: Science Learning, Understanding and Conceptual Change

S8.2 Uncovering Students' Ideas in Science 2:15pm – 3:45pm, Curacao 1

Presider:

David F. Treagust, Curtin University

S8.2.1 U.S. and Colombian Students' Conceptions about Effects of Global Warming on Animals: A Cross-Cultural Study

Ingrid M. Sanchez, University of Michigan School of Education,
ingridsa@umich.edu

S8.2.2 Consistency of Students' Ideas about the Concept of Rate across Different Contexts

Behzat Bektasli, Hacettepe University, belizbektasli@gmail.com
Gultekin Cakmakci, Hacettepe University

S8.2.3 Applying Cognitive Science to Assessment of Evolution Education

John E. Opfer, The Ohio State University, opfer.7@osu.edu
Ross H. Nehm, The Ohio State University
Judith S. Ridgway, The Ohio State University
Katherine Mollohan, The Ohio State University
Elizabeth Perrin, The Ohio State University

S8.2.4 The Earth as a Cosmic Body: Conceptual Understandings and Spatial Ability of Elementary/Middle Preservice Teachers

Alice (Jill) A. Black, Missouri State University, ablack@missouristate.edu

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S8.3 Argumentation and Reasoning 2:15pm – 3:45pm, Curacao 2

Presider:

Vincent Amodeo, University at Albany

S8.3.1 Embodied Experiences as a Resource for Children's Mechanistic and Mathematical Reasoning in an Engineering Curriculum

Molly S. Bolger, Vanderbilt University, molly.bolger@vanderbilt.edu
Paul J. Weinberg, Vanderbilt University
Marta A. Kobiela, Vanderbilt University
Robert J. Rouse, Vanderbilt University
Richard Lehrer, Vanderbilt University

S8.3.2 Seeing the Invisible: Body Semiotics of Knowing and Learning Science/Mathematics

Sungwon Hwang, Nanyang Technological University, Singapore,
sungwon.hwang@nie.edu.sg
Michael Wolff-Roth, University of Victoria, Canada

S8.3.3 Trends in Research on Argumentation: Content Analysis of Science Education Journals

Sibel Erduran, University of Bristol, United Kingdom,
Sibel.Erduran@bristol.ac.uk
Yasemin Ozdem, Middle East Technical University, Turkey
Jee Young Park, Seoul National University, Korea

S8.3.4 Understanding the Challenges Faced by 6th Grade Turkish Science Students While Developing Written Arguments

Fatma Caner, canerfatma@gmail.com
Mehmet Aydeniz

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

S8.4 Related Paper Set - Teaching Evolution to Young Children: Rethinking Pedagogy and Possible Understandings

2:15pm – 3:45pm, Curacao 3

Presider:

Kathleen E. Metz, University of California, Berkeley

S8.4.1 Instruction and Student Outcomes Through the Lens Of Pedagogical Design Principles and Learning Progression

Kathleen E. Metz, University of California, Berkeley

S8.4.2 So What Happens in the Classroom? Analysis of a Prototype Activity Structures to Support Reasoning About Natural Selection

Stephanie Sisk-Hilton, San Francisco State University
Eric Berson, University of California, Berkeley

S8.4.3 Iterative Design of Visual Representations to Support Young Children

Nicole Wong, University of California, Berkeley

S8.4.4 Teleological, Personification, and Essence-Transformationist Challenges: Impact of the Instruction on Children

Uyen Ly, University of California, Berkeley

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

S8.5 Scientific Inquiry in the Classroom and the Field

2:15pm – 3:45pm, Curacao 4

Presider:

Jaimie Miller-Friedmann, Harvard University

S8.5.1 Inquiry based Science and Technology Enrichment Program for Female Middle School Students

Hanna Kim, DePaul University, hkim13@depaul.edu

S8.5.2 Linking Pedagogy to Practice: Improving Student Motivation and Academic Performance in STEM Courses Through Inquiry-Based Instruction

Amanda D. Wimpey, Palmetto High School Mathematics,

WimpeyM@anderson1.k12.sc.us

Lisa C. Benson, Clemson University

Carol H. Wade, Clemson University

S8.5.3 Using Discrepant Events as Science Demonstrations to Promote Engagement and Develop Meaningful Student-Led Inquiry Investigations

Vincent Mancuso, Brighton Central School District-

Rochester, NY, vince_mancuso@bcsd.org

S8.5.4 Teaching and Learning in the Urban Wild: Teachers Leading Field Investigations with Secondary School Students

Amanda P. Jaksha, University of Arizona, College of Education,

ajaksha@email.arizona.edu

Christopher J. Harris, Center for Technology in Learning,

SRI International

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

S8.6 Collaborative Learning in College Science Courses

2:15pm – 3:45pm, Curacao 5

S8.6.1 Student Interactions and Approaches to Studying in Self-Formed Study Groups

Karen Christian, University of Arizona, christik@email.arizona.edu

Vicente Talanquer, University of Arizona

S8.6.2 The Effect of Collaborative Group Testing on the Performance and Perceptions of Students in a Biotechnology Course for Non-Majors

Tina M. Roberts, University of Missouri, robertsti@missouri.edu

Carina M. Rebello, University of Missouri

Stephen B. Witzig, University of Missouri

Marcelle A. Siegel, University of Missouri

Sharyn K. Freyermuth, University of Missouri

Kemal Izci, University of Missouri

S8.6.3 Collaborative Activities, Discourse and Self-Reported Learning of Students Working on Ill-Structured Capstone Projects

Nasser M. Juma, Kansas State University, mhuninas@phys.ksu.edu

Elizabeth Gire, University of Memphis

Brian Washburn, Kansas State University

Kristan Corwin, Kansas State University

N. Sanjay Rebello, Kansas State University

S8.6.4 Self-Directed Learner Development Through Project-Based Learning Environment: A Comparative Study of Engineering and Physics Courses

Jennifer A. Simonovich, F. W. Olin College of Engineering,

jennifer.simonovich@students.olinc.edu

Emily Towers, F. W. Olin College of Engineering

Yevgeniya V. Zastavker, F. W. Olin College of Engineering

Strand 6: Science Learning in Informal Contexts

S8.7 Towards Increased Understanding of Epistemology and Cognition in Informal Science Education

2:15pm – 3:45pm, Curacao 6

Presider:

Martin Storksdieck, National Research Council

S8.7.1 Shooting Stars and Matching Games: Audiences' Understanding of Scientific Terms and Concepts in a Planetarium

Jean Creighton, University of Wisconsin-Milwaukee Planetarium,

jean@gravity.phys.uwm.edu

Sandra T. Martell, University of Wisconsin

S8.7.2 Socio-Cognitive Scaffolding in the Studio: Informal STEM Learning and Identity

Carol B. Brandt, Virginia Polytechnic Institute and State University,

cbbrandt@vt.edu

Andrea Motto, Virginia Polytechnic Institute and State University

Christine Schnittka, University of Kentucky

Michael A. Evans, Virginia Polytechnic Institute and State University

Brett D. Jones, Virginia Polytechnic Institute and State University

S8.7.3 The Development and Use of a Concept Mapping Assessment Tool with Young Children on Family Visits to a Live Butterfly Exhibit

Jennifer Mesa, University of Florida, uloa@ufl.edu

Linda Cronin-Jones, University of Florida

S8.7.4 Learning in an Informal Context: An Epistemological Perspective

Marshall Karen Benn, Professor, karen.marshall@montgomerycollege.edu

Strand 7: Pre-service Science Teacher Education
S8.8 Elements of Science Content and Methods Courses

2:15pm – 3:45pm, Curacao 7

Presider:

Deborah C. Smith, The Pennsylvania State University

S8.8.1 Unpacking what Makes an Elementary Science Methods Course Practice-oriented

Ashima Mathur, University of Michigan, amath@umich.edu

S8.8.2 Idealization versus Reality in Elementary Science Methods Instruction: A Statewide Analysis

Carole K. Lee, University of Maine Farmington,
yuen111222@hotmail.com

William F. McComas, University of Arkansas

S8.8.3 A Study on a Metacognitively Oriented Learning Environment in a Science Laboratory Course

Birgul Cakir, Agri Ibrahim Cecen University Middle East Technical
University, cbirgul@metu.edu.tr

Hamide Ertepinar, Middle East Technical University

Ozgul Yilmaz-Tuzun, Middle East Technical University

Strand 7: Pre-service Science Teacher Education
S8.9 Topic-Specific Content Knowledge and Pedagogical Content Knowledge

2:15pm – 3:45pm, Bonaire 7

Presider:

Eunmi Lee, DePaul University

S8.9.1 Exploring the Pre-Service Science and Technology Teachers' Technological Pedagogical Content Knowledge (TPCK) and Classroom Practices Involving the Topic of Photosynthesis and Cellular Respiration

Zehra Kaya, Firat University, Elazig-Turkey, sualpk@yahoo.com

Osman N. Kaya, Firat University, Elazig-Turkey

Omer Yilayaz, Firat University, Elazig-Turkey

Selcuk Aydemir, Firat University, Elazig-Turkey

Didem Karakaya, Firat University, Elazig-Turkey

S8.9.2 Development of Pre-service Chemistry Teachers' Pedagogical Content Knowledge for Teaching Nature of Science

Betul Demirdogen, Zonguldak Karaelmas University,
dbetul@metu.edu.tr

Esen Uzuntiryaki, Middle East Technical University

S8.9.3 Pre-service Elementary Teachers'

Misconceptions about Change and Constancy

Charlotte A. Otto, University of Michigan-Dearborn, cotto@umich.edu

Susan A. Everett, University of Michigan-Dearborn

Strand 8: In-service Science Teacher Education

S8.10 Collaboration and Mentoring

2:15pm – 3:45pm, Curacao 8

Presider:

Toth Eva Erdosne, West Virginia University

S8.10.1 Addressing Elementary Teacher Misconceptions in Science and Supporting Peer Learning through Curriculum Mapping

Michael Giamellaro, University of Colorado, Denver,

michael.giamellaro@email.ucdenver.edu

Ruiz-Primo Maria Araceli, University of Colorado, Denver

Min Li, University of Washington, Seattle

Ming-Chih Lan, University of Washington, Seattle

S8.10.2 Science Teacher Induction and Student Achievement in Science: Is There a Link?

Toni Ivey, Oklahoma State University, toni.ivey@okstate.edu

Carol L. Stuessy, Texas A&M University

Dane Bozeman, Texas A&M University

Tori Hollas, Texas A&M University

S8.10.3 Revisiting Vygotsky's Zone of Proximal Development in the context of In-service Science Teacher Education

Colette Murphy, Queen's University Belfast, c.a.murphy@qub.ac.uk

Kathryn Scantlebury, University of Delaware

Strand 8: In-service Science Teacher Education

S8.11 Teaching in Multicultural Settings

2:15pm – 3:45pm, Bonaire 8

Presider:

Cynthia Passmore, University of California, Davis

S8.11.1 The Road to Culturally Relevant Science: Exploring How Teachers Navigate Change in Pedagogy

Carla C. Johnson, University of Cincinnati, carla.johnson@uc.edu

Virginia Jennings, Utah State University

Tammy Miller, University of Cincinnati

S8.11.2 Job-embedded Professional Development for Urban Elementary Teachers: Lessons Learned from Year One of a Multi-year School-university Partnership

Jeffrey C. Nordine, Trinity University, jnordine@trinity.edu

Patricia Norman, Trinity University

S8.11.3 Secondary Science Teachers' Translation of Professional Development through Affinity – and Institution-identity

Elizabeth B. Lewis, University of Nebraska-Lincoln, ebl@unlserve.unl.edu

Strand 9: Reflective Practice

S8.12 Related Paper Set – Meta-reflecting on the Realities of Curriculum and Teaching: Stories from Singapore

2:15pm – 3:45pm, Bonaire 6

Presider: Tang Wee Teo, University of Illinois

S8.12.1 Meta-reflecting on the Realities of Curriculum and Teaching: Stories from Singapore

Aik-Ling Tan, National Institute of Education

S8.12.2 Two Mirrors Facing Each Other

Lee-Jiun Karen Ng, St Theresa's Convent

S8.12.3 Finally Someone is Listening

Lay Khim, Jasmine Tan, Greendale Primary School

S8.12.4 From Personal and Private Reflection to Dialogic Reflection

Song Ling Yong, Henry Park Primary School

S8.12.5 Developing a Deeper Appreciation through Teaching

Guohui Ng, St Theresa's Convent

Strand 10: Curriculum, Evaluation, and Assessment

S8.13 Scientific Inquiry Instruction and Assessment

2:15pm – 3:45pm, Bonaire 1

Presider:

Senay Purzer, Purdue University

S8.13.1 Examining the Effect of Inquiry-Based Teaching on Students' Motivation, Science Self-Efficacy, and Science Achievement

Nai-En Tang, University of Missouri, naientang@gmail.com

Lloyd H. Barrow, University of Missouri

Chia-Lin Tsai, University of Missouri

S8.13.2 Teachers' Cumulative Curriculum Implementation Experience, Fidelity of Implementation, and Student Learning

Hee-Sun Lee, Tufts University, University of California, Berkeley, heesun.lee@tufts.edu

Ou L. Liu, Educational Testing Service

Keisha Varma, University of Minnesota

Marcia C. Linn, University of California, Berkeley

S8.13.3 Modeling and Assessing Scientific Methods

Nicole Wellnitz, Institute of Biology Education,

nicole.wellnitz@uni-kassel.de

Jürgen Mayer, Institute of Biology Education

S8.13.4 Comparative Analysis of Two Inquiry Observational Protocols: Striving to Understand the Quality of Inquiry-based Instruction

Jeff C. Marshall, Clemson University, marsha9@clemson.edu

Julie B. Smart, Presbyterian College

Christine Lotter, University of South Carolina

Strand 11: Cultural, Social, and Gender Issues

S8.14 Students and Science: Attitudes and Participation in Discursive Practices

2:15pm – 3:45pm, Bonaire 2

Presider:

Katie L. Brkich, University of Florida

S8.14.1 The Science Student Role: Exploring its Creation and Enactment through Interaction

Marie-Claire Shanahan, University of Alberta, mcshanahan@ualberta.ca

Robert Bechtel, University of Alberta

Gregory Henkelman, University of Alberta

S8.14.2 Reproduction of Inequalities in the Teaching and Learning of Science

Anna Jobér, ESERA, anna.jober@mah.se

S8.14.3 Challenges of Korean Immigrant Students in Science Classroom Participation

Minjung Ryu, University of Maryland-College Park, mryu@umd.edu

S8.14.4 'There is no Chance for Personal Development in it'. Why Students Choose not to Study Science at Universities

Henriette T. Holmegaard, University of Copenhagen,

htholmegaard@ind.ku.dk

Lars Ulriksen, University of Copenhagen

Lene M. Madsen, University of Copenhagen

Strand 12: Educational Technology**S8.15 Use of Technology Artifacts as Means of Knowledge Construction****2:15pm – 3:45pm, Bonaire 3****Presider:**

Houbin Fang, University of Southern Mississippi

S8.15.1 Taking Drawing Digital: Using Student-generated Drawings to help Students Learn about Molecules

Jennifer L. Albert, North Carolina State University,

jennifer_albert@ncsu.edu

Eric N. Wiebe, North Carolina State University

S8.15.2 Show Me the Evolution! Assessing Effectiveness of a New Teaching Resource

Anastasia Thanukos, University of Berkeley

Lauren Kendall, University of North Carolina at Chapel Hill

S8.15.3 Co-Constructing Knowledge Artifacts for Understanding the Physiology of Human System Diseases

Vanessa L. Peters, University of Michigan, vlpeters@umich.edu

S8.15.4 Hands-on Activities and the Use of Video Clips for Learning How to Identify Fish Species in an Aquarium

Vanessa D.I. Pfeiffer, University of Duisburg-Essen, Germany,

vanessa.pfeiffer@uni-due.de

Katharina Scheiter, Knowledge Media Research Center,

Tuebingen, Germany

Angela Sandmann, University of Duisburg-Essen, Germany

Sven Gemballa, University of Tuebingen, Germany

Strand 13: History, Philosophy, and Sociology of Science**S8.16 Strand Sponsored Symposium - Applying Research in the Science Classroom: An Overview of Approaches to Teaching Nature of Science**
2:15pm – 3:45pm, Bonaire 4**Presenters:**

Norman G. Lederman, Illinois Institute of Technology

Sherry A. Southerland, Florida State University

Strand 14: Environmental Education**S8.17 Socio-scientific Issues: Addressing Controversy, Ethics, and Decision-making through the Environment****2:15pm – 3:45pm, Bonaire 5****Presider:**

Maurice DiGiuseppe, University of Ontario Institute of Technology (UOIT)

S8.17.1 Fostering Decision-Making Competence in Socio-Scientific Issues Concerning Sustainable Development: An Intervention Study

Helge Gresch, hgresch@uni-goettingen.de

Marcus Hasselhorn

Susanne Bögeholz

S8.17.2 The Effects of Argumentation and Traditional-Based Courses on Preservice Science Teachers' Knowledge about Climate Change Issue and Attitudes towards Environment

Mustafa S. Topcu, Yuzuncu Yil University, msamitopcu@gmail.com

Dilek Karisan, Yuzuncu Yil University

S8.17.3 Analyzing Yorktown's GloFish® Ethics: EcoJustice through Socioscientific Issues (SSI)

Michael P. Mueller, University of Georgia, mmueller@uga.edu

Dana L. Zeidler, University of South Florida

S8.17.4 Turning Citizen Science on it's Head: Exploring the Philosophy of Connecting People and Nature

Jenkins L. Lynda, Dalton State College, ljenkins@daltonstate.edu

Michael P. Mueller, University of Georgia

Strand 15: Policy**S8.18 Policy Implementation****2:15pm – 3:45pm, Antigua 2****Presider:**

Sharon Lynch, George Washington University

S8.18.1 Policy Implications for Virginia Initiative for Science Teaching and Achievement: Investing in Innovation (i3) Grant

Donna R. Sterling, George Mason University, dsterlin@gmu.edu

Wendy M. Frazier, George Mason University

Juanita Jo Matkins, College of William and Mary

Jacqueline T. McDonnough, Virginia Commonwealth University

Randy L. Bell, University of Virginia

S8.18.2 Science Teacher Retention: Examining a Link between Deprofessionalization and Dissatisfaction for Teachers

Georgia W. Hodges, University of Georgia,

georgia.hodges@gmail.com

Steve J. Oliver, University of Georgia

Deborah J. Tippins, University of Georgia

Concurrent Session #9

4:00pm – 5:30pm

Equity and Ethics Committee Sponsored Session

S9.1 Poster Symposium - Moving the Equity

Agenda Forward: Equity Research, Practice, and Policy in Science Education

4:00pm – 5:30pm, Antigua 3

Presiders:

Julie A. Bianchini, University of California, Santa Barbara

Valarie L. Akerson, Indiana University

Angela M. Calabrese-Barton, Michigan State University

Okhee Lee, University of Miami

Alberto J. Rodriguez, San Diego State University

Presenters:

George E. Deboer, American Association for the Advancement of Science

Sherry A. Southerland, Florida State University

Nancy W. Brickhouse, University of Delaware

Alejandro Gallaard

Sonya Martin

Beth Wassel

Kathryn Scantlebury, University of Delaware

Bhaskar Upadhyay, University of Minnesota

Gayle A. Buck, Indiana University

Leon Walls, University of Vermont

Cassie F. Quigley, Clemson University

Miyoun Lim

Edna Tan

Bryan Brown

Emily J. Kang

Maria S. Rivera Malucci, Barnard College

Felicia Moore-Mensah, Columbia University

Gail Richmond, Michigan State University

Discussants:

Michael J. Reiss, University of London

Lyn C. Carter, Australian Catholic University

Tali Tal, Technion University in Israel

Mei Hung, National Taiwan Normal University

Melina Furman, University of San Andres

Strand 1: Science Learning, Understanding and Conceptual Change

S9.3 Related Paper Set - Learning Progression for Carbon-transforming Processes in Socio-ecological Systems

4:00pm – 5:30pm, Curacao 1

Discussant: Joseph S. Krajcik, University of Michigan

S9.3.1 Cohesion and Consistency in Students'

Accounts of Carbon-transforming Processes

Hui Jin, Ohio State University, jinhui2009@gmail.com

Charles W. Anderson, Michigan State University

S9.3.2 The Role of Informal Discourses in Students' Accounts of Carbon-transforming Processes

Hamin Baek, Michigan State University

Charles W. Anderson, Michigan State University

S9.3.3 Argumentation in Students' Accounts of Carbon-transforming Processes

Onyancha Kennedy, Michigan State University

Charles W. Anderson, Michigan State University

S9.3.4 Developing Reliable and Valid Assessment Items to Assess K-12 Students' Learning Progression of Carbon Cycling

Jing Chen, Michigan State University

Yongsang Lee, University of California, Berkeley

Jinnie Choi, University of California, Berkeley

Karen Draney, University of California, Berkeley

Charles W. Anderson, Michigan State University

S9.3.5 The Effects of Teaching Materials and Teachers' Approaches on Student Learning about Carbon-transforming Processes

Li Zhan, Michigan State University

Dante Cisterna, Michigan State University

Jennifer Doherty, Michigan State University

Yongsang Lee, University of California, Berkeley

Karen Draney, University of California, Berkeley

Charles W. Anderson, Michigan State University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S9.4 Students' Perceptions

4:00pm – 5:30pm, Curacao 2

S9.4.1 The Role of Emotional Factors in Building Public Scientific Literacy and Engagement with Science

Huann-Shyang Lin, National Sun Yat-sen University,
huannlin@faculty.nsysu.edu.tw
Zuway-R Hong, National Sun Yat-sen University

S9.4.2 Linking Students' Conceptions of Learning Science with their Metacognition and Science Learning Achievement in Taiwan

Min-Hsien Lee, National Taiwan University of Science and Technology, mhlee@mail.ntust.edu.tw
Chin-Chung Tsai, National Taiwan University of Science and Technology
Chun-Yen Chang, National Taiwan Normal University

S9.4.3 Pupils' Perceptions About The Efficient School

Mónica Baptista, Instituto de Educação da Universidade de Lisboa,
mlmbaptista@gmail.com
Ana M. Freire, Instituto de Educação da Universidade de Lisboa

S9.4.4 A Structural Model of High School Students' Conceptions of Learning Science, Approaches to Learning Science and their Science Self-Efficacy

Guo-Li Chiou, National Chiao Tung University, Taiwan,
glchiou@mail.nctu.edu.tw
Jyh-Chong Liang, National Taiwan University of Science and Technology, Taiwan
Min-Hsien Lee, National Taiwan University of Science and Technology, Taiwan
Chin-Chung Tsai, National Taiwan University of Science and Technology, Taiwan

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

S9.5 Strategies that Promote Student Learning

4:00pm – 5:30pm, Curacao 4

Presider:

Mehmet Aydeniz, The University of Tennessee

S9.5.1 The Evolution of Classroom Physics Knowledge in Relation to Certainty and Uncertainty

Andree Tiberghien, UMR ICAR, France,
andree.tiberghien@univ-lyon2.fr
David Cross, UMR ICAR, France
Gérard Sensevy, University of Bretagne Occidentale, France

S9.5.2 Illuminating the Relationship between Inquiry Science Instruction and Student Learning: Results from Three Case Studies

Jacqueline R. Delisi, Education Development Center, Inc.,
jdelisi@edc.org
Katherine L. McNeill, Boston College
Daphne D. Minner, Education Development Center, Inc

S9.5.3 The Effectiveness of Epistemologically and Metacognitively Stimulated Learning Cycle Method on 10th Grade Students' Physics Achievement

Sevda Yerdelen-Damar, yerdelen@metu.edu.tr
Ali Eryilmaz

S9.5.4 The Role of Science Writing Heuristic Approach on Students' Conceptual Understanding in Chemistry

Sevgi Kingir, Selcuk University, kingirsevgi@gmail.com
Omer Geban, Middle East Technical University
Murat Gunel, Ahi Evran University

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

S9.6 Influencing Students' Reasoning & Development of Expertise

4:00pm – 5:30pm, Curacao 5

Presider:

Taha Mzoughi, Kennesaw State University

S9.6.1 Investigating the Effects of Solving Synthesis Problems in Introductory Physics Courses

Lin Ding, School of Teaching and Learning, The Ohio State University, ding.65@osu.edu

S9.6.2 Physics as a Community of Practice: A Qualitative Interview Study of Three University Physics Professors

Idaykis Rodriguez, Florida International University, irod020@fiu.edu
Eric Brews, Florida International University
Laird H. Kramer, Florida International University

S9.6.3 Effects of Visual Attentional Cueing on Beginner Problem Solvers in Physics

Tanner Stevens, University of Minnesota, steve461@umn.edu
Adrian Carmichael, Kansas State University
Adam Larson, Kansas State University
Elizabeth Gire, University of Memphis
Lester Loschky, Kansas State University
N. Sanjay Rebello, Kansas State University

S9.6.4 Scientific Reasoning and Conceptual Knowledge in a College Inquiry Physics Course

Omer Acar, Kocaeli University, acarok@gmail.com
Bruce R. Patton, Ohio State University

Strand 6: Science Learning in Informal Contexts

S9.7 Science Under the Stars: Insights from Science Camps

4:00pm – 5:30pm, Curacao 6

S9.7.1 The Role of Informal Science Program on Middle School Students' Perceptions of Science and Engineering

Pat Dixon, National High Magnetic Field Laboratory,
pdixon@magnet.fsu.edu
Roxanne Hughes, Florida State University/National High
Magnetic Field Laboratory
Kristen Molyneaux, University of Wisconsin, Madison

S9.7.2 Lessons Learned in Summer Camp: Learning Paths of Three Campers

Lauren Madden, North Carolina State University, lomadden@gmail.com
John C. Bedward, North Carolina State University
Eric N. Wiebe, North Carolina State University
Claudia R. Benitez-Nelson, University of South Carolina

S9.7.3 Middle School Students' Identity Development as Learners of Science at an Informal Science Education Camp

Kelly Riedinger, University of Maryland, College Park, krieding@umd.edu

Strand 7: Pre-service Science Teacher Education

S9.8 Preservice Teachers' Developing Science Teaching Practice

4:00pm – 5:30pm, Curacao 7

Presider:

Yovita N. Gwekwerere, Laurentian University

S9.8.1 Examining the Content and Nature of Preservice Teachers' Early Field Experiences: A Schematic Framework Approach

Karthigeyan Subramaniam, University of North Texas,
karthigeyan.subramaniam@unt.edu

S9.8.2 A Long Term Investigation of Science Teacher Resilience

Patricia A. Doney, University of Georgia, patdoney@uga.edu

S9.8.3 Using Third Generation of Cultural-Historical Activity Theory (CHAT) as a Data Analysis Framework to Explain Novice Teachers' Learning to Teach Science

Ozcelik Arzu Tanis, The Pennsylvania State University, axt252@psu.edu
Asli Sezen, The Pennsylvania State University
Scott P. McDonald, The Pennsylvania State University
Gregory J. Kelly, The Pennsylvania State University

Strand 7: Pre-service Science Teacher Education

S9.9 Related Paper Set - Promoting Effective Science Teaching for English Learners: Testing a Model of Pre-Service Teacher Training

4:00pm – 5:30pm, Bonaire 7

Discussant:

Okhee Lee, University of Miami

S9.9.1 Empirical Foundations of ESTELL Pedagogy with Exemplars of Practice

Jerome Shaw, University of California, Santa Cruz

S9.9.2 Meaningful Collaboration: Establishing a Science Methods Course with a Focus on English Learners in Three Different Universities

Alberto Rodriguez, San Diego State University
Meredith Houle, San Diego State University
Isabel N. Quita, San Francisco State University
Alie Victorine, San Jose State University

S9.9.3 ESTELL Professional Development

Cathy Zozakiewicz, San Diego State University
Sara Tolbert, University of California Santa Cruz

S9.9.4 Pre-Service Teacher Efficacy and Practices with Responsive Science Pedagogy for English Learners

Marco A. Bravo, Santa Clara University
Jorge L. Solís, University of California Santa Cruz
Eduardo Mosqueda, University of California Santa Cruz

Strand 8: In-service Science Teacher Education

S9.10 Impacting Teacher Practice

4:00pm – 5:30pm, Curacao 8

Presider:

Bongani D. Bantwini, Kennesaw State University

S9.10.1 Teachers-as-Learners: Characterizing the Relations between Theory and Practice through Teachers' Questions

Shaharabani Yael Furman, Weizmann Institute of Science,
yaelsha@gmail.com
Anat Yarden, Weizmann Institute of Science - Department of
Science Teaching

S9.10.2 Factors Affecting District Officials' Capacity to Provide Effective Support in the Implementation of Natural Science Curriculum Reforms in South Africa

Bongani D. Bantwini, Kennesaw State University,
bbantwin@kennesaw.edu

S9.10.3 Smarter Science: A Framework for Implementing Inquiry in the Science and Technology Classroom

Maurice Diguiseppe, University of Ontario Institute of Technology,
maurice.diguiseppe@uoit.ca
Isha Decoito, York University
Xavier E. Fazio, Brock University

Strand 10: Curriculum, Evaluation, and Assessment

S9.11 Socioscientific Issues and the Nature of Science

4:00pm – 5:30pm, Bonaire 1

S9.11.1 Non-Science Majors Perceptions of Integrating SSI Instruction into High School Curricula

John C. Parr, University of Southern Mississippi,
john.parr@eagles.usm.edu
Nasser Syed, University of Southern Mississippi
Kristy L. Halverson, University of Southern Mississippi

S9.11.2 Quantifying Informal Science Educators' Beliefs about Pesticide Risk: Development of the Pesticide Risk Belief Inventory

Catherine E. Leprevost, North Carolina State University,
celeprev@ncsu.edu
Margaret R. Blanchard, North Carolina State University
Julia F. Storm, North Carolina State University
Gregory Cope, North Carolina State University

S9.11.3 Towards Critical and Emancipatory Science & Technology Education: A Theoretical Framework

John L. Bencze, OISE, University of Toronto, larry.bencze@utoronto.ca
Steven J. Alsop, York University, Toronto
Erin Sperling, OISE, University of Toronto

S9.11.4 Assessing Understanding about Nature of Science in Historical Contexts

Irene Neumann, Leibniz Institute for Science and Mathematics Education, ineumann@ipn.uni-kiel.de
Gary M. Holliday, Illinois Institute of Technology
Hans E. Fischer, University of Duisburg-Essen
Alexander Kauertz, University of Education - Pädagogische Hochschule Weingarten
Judith S. Lederman, Illinois Institute of Technology
Norman G. Lederman, Illinois Institute of Technology

Strand 12: Educational Technology

S9.12 Technology Instruction and Implementation Across Contexts

4:00pm – 5:30pm, Bonaire 3

Presider:

Wilhelmina S. Van Rooy, Australian Catholic University

S9.12.1 Student Perceptions of Learning and Engagement with Scientific Concepts through Serious Educational Game (SEG) Development

Brandi Thurmond, North Carolina State University, bnthurmo@ncsu.edu
Shawn Y. Holmes, North Carolina State University
Leonard A. Annetta, George Mason University
Elizabeth Foltz, SUNY-ESF
Matthew Sears, Hillside New Tech High School
Rebecca Cheng, George Mason University
Brandy Bowling, North Carolina University

S9.12.2 Models of Instruction for Technology-enhanced Whole-class Inquiry

Jennifer L. Maeng, University of Virginia, jlc7d@virginia.edu
Bridget K. Mulvey, University of Virginia
Randy L. Bell, University of Virginia

S9.12.3 Metric or English Spatial Scales?: An International Comparison of Teachers Concepts

M. Gail Jones, North Carolina State University, Gail_Jones@ncsu.edu
Manuela Paechter, University of Graz
Grant E. Gardner, East Carolina University
Chiung-Fen Yen, Providence University
Amy Taylor, University of North Carolina at Wilmington
Thomas R. Tretter, University of Louisville

S9.12.4 A Review of the Research on Successful Implementation of Technology to Teach Science

Rebecca M. Krall, University of Kentucky, rebecca.krall@uky.edu
David A. Slykhuis, James Madison University

Strand 13: History, Philosophy, and Sociology of Science

S9.13 History and the Science Curriculum

4:00pm – 5:30pm, Bonaire 4

Presider:

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

S9.13.1 The Preparation Process of Historical Materials Depending on the New Turkish Biology Curriculum

Çiçek Dilek Bakanay, Marmara University, Turkey, cicekdilek@yahoo.com
Serhat Irez, Marmara University, Turkey
Hayati Seker, Marmara University, Turkey

S9.13.2 A Role for Science Education in the International Community: Exhibiting the Scientific Roots of the European Enlightenment

Michael R. Matthews, School of Education, University of New South Wales, m.matthews@unsw.edu.au

S9.13.3 A Content Analysis of Historical Information Aligned With Physics Curriculum

Burcu G. Guney, burcugulay.guney@yahoo.com
Hayati Seker

S9.13.4 Constructing Historical Instructional Materials: The Case for Secondary Level Chemistry Curriculum in Turkey

Serhad S. Barutcuoglu, Marmara University, serhat1983@gmail.com
Ajda Kahveci, Canakkale Onsekiz Mart University
Hayati Seker, Marmara University

Strand 14: Environmental Education

S9.14 Related Paper Set - Innovative Teaching and Learning in Environmental Issues: An Emphasis on Thinking about Complexity

4:00pm – 5:30pm, Bonaire 5

S9.14.1 Theoretical Foundations and Applications of an Action-oriented Learning Cycle for Teaching Environmental Issues

Shiang-Yao Liu, National Taiwan Normal University, Taiwan,
liusy@ntnu.edu.tw

S9.14.2 Problem Framing as a Starting Point for Active Participation on the Debate of Environmental Issues

Chuan-Shun Lin, National Kaohsiung Normal University, Taiwan
Shiang-Yao Liu, National Taiwan Normal University, Taiwan

S9.14.3 Promoting Systems Thinking through an Environment Course

Ting-Li Cheng, National Kaohsiung Normal University, Taiwan
Shiang-Yao Liu, National Taiwan Normal University, Taiwan

S9.14.4 The Quality of Students' Argumentation in a Socio-environmental Debate Activity

Uy-Len Lin, National Kaohsiung Normal University, Taiwan
Li-Ting Cheng, National Kaohsiung Normal University, Taiwan
Jeng-Fung Hung, National Kaohsiung Normal University, Taiwan

S9.14.5 An Exploration of Students' Reading Strategies in Texts of Environmental Issues

Sung-Tao Lee, Naval Academy, Taiwan
Fu-Pei Hsieh, Kuang-Hua Primary School, Kaohsiung, Taiwan
Yen-Wen Lin, An-Chao Primary School, Kaohsiung, Taiwan

Strand 14: Environmental Education

S9.15 Strand Sponsored Session – Science Education as One Context for Education for Sustainable Development (ESD) and Environmental Education (EE)

4:00pm – 5:30pm, Antigua 2

Presider:

Teddie Mower, University of Louisville

Presenters:

Teddie Mower, University of Louisville, t0phil01@louisville.edu
David B. Zandvliet, Simon Fraser University
Annette Gough, RMIT University, Australia
Noel Gough, La Trobe University, Australia
Pauline W. U. Chinn, University of Hawaii
Justin Dillon, King's College London, United Kingdom

Evening/Social Events

Membership and Elections Committee Sponsored Session
New Researcher 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.

5:45pm – 6:45pm, Grand Sierra F

Julie A. Luft, Arizona State University, julie.luft@asu.edu
Reizelie Barreto-Espino, Towson University

IJSME Editorial Board Meeting

By Invitation

5:45pm – 6:45pm, Curacao 8

Publisher Reception – Springer

By Invitation

6:00pm – 8:00pm, Grand Sierra G

Publisher Reception – Routledge/Taylor & Francis

By Invitation

7:00pm – 8:30pm, Grand Sierra H

Equity and Ethics Committee Sponsored Dinner

7:00pm – 9:00pm, Bahamas Breeze Lake Buena Vista

Dinner, including tax and gratuity, is \$35.

NOTE: You must have previously registered for this event with your Advance Conference Registration.

Social

Light snacks served and cash bar

8:00pm – 10:30pm, Poolside

Wednesday, April 6, 2011

Strand Meetings

7:00am – 8:15am

Strand 1: Science Learning, Understanding and Conceptual Change

Meeting – 7:00am – 8:15am, Curacao 1

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Meeting – 7:00am – 8:15am, Curacao 2

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

Meeting – 7:00am – 8:15am, Curacao 3

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

Meeting – 7:00am – 8:15am, Curacao 4

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

Meeting – 7:00am – 8:15am, Curacao 5

Strand 6: Science Learning in Informal Contexts

Meeting – 7:00am – 8:15am, Curacao 6

Strand 7: Pre-service Science Teacher Education

Meeting – 7:00am – 8:15am, Curacao 7

Strand 8: In-service Science Teacher Education

Meeting – 7:00am – 8:15am, Curacao 8

Strand 9: Reflective Practice

Meeting – 7:00am – 8:15am, Bonaire 1

Strand 10: Curriculum, Evaluation, and Assessment

Meeting – 7:00am – 8:15am, Bonaire 2

Strand 11: Cultural, Social, and Gender Issues

Meeting – 7:00am – 8:15am, Bonaire 3

Strand 12: Educational Technology

Meeting – 7:00am – 8:15am, Bonaire 4

Strand 13: History, Philosophy, and Sociology of Science

Meeting – 7:00am – 8:15am, Bonaire 5

Strand 14: Environmental Education

Meeting – 7:00am – 8:15am, Bonaire 6

Strand 15: Policy

Meeting – 7:00am – 8:15am, Bonaire 7

Concurrent Session #10

8:30am – 10:00am

International Committee Sponsored Session

S10.1 Related Paper Set - Exemplary Research in Science Education from Australia and New Zealand that Fosters Engagement and Understanding

8:30am – 10:00am, Antigua 1

Presider:

Sibel Erduran, University of Bristol, United Kingdom

Discussant:

Alister Jones, The University of Waikato, New Zealand,
ajones@waikato.ac.nz

S10.1.1 Expert Science Teachers Notions of Scientific Literacy

Deborah J. Corrigan, Monash University, Australia,
debbie.corrigan@monash.edu

Rebecca Cooper

Stephen Keast

S10.1.2 From Chaos to Small Steps and Manageable Chunks: Supporting Australian Science Teachers Transform their Pedagogy to Teach Thinking Skills

Mary Oliver, University of Western Australia, Australia,
mary.oliver@uwa.edu.au

Grady Venville

Philip Adey

S10.1.3 Increasing Teachers' Content Knowledge about the Mining and Mineral Processing Industries by Interacting with Scientists

Dianne Nichols, Education Queensland, Australia, dnich25@eq.edu.au

Dan Churach

Darrell Fisher

S10.1.4 Fostering Parent and Whanau Engagement with Children's Learning: A Strategy to Enhance Children's Science Learning

Bronwen Cowie, The University of Waikato, New Zealand,
bcowie@waikato.ac.nz

Kathrin Otrell-Cass

Ted Glynn

Helena Kara

Strand 1: Science Learning, Understanding and Conceptual Change

S10.2 Related Paper Set - Becoming Experts in Science and the Role of Culture and Context
8:30am – 10:00am, Curacao 1

S10.2.1 Horizontal and Vertical Learning Dimensions of Urban Youth Investigating Energy Efficiency

Takumi C. Sato, Michigan State University, tsato@msu.edu
Angela M. Calabrese-Barton, Michigan State University

S10.2.2 Vanilla, Strawberries, & School Garden: I Can Show how to Pollinate the Flowers

Nancy Albrecht, University of Minnesota
Bhaskar Upadhyay, University of Minnesota

S10.2.3 Connecting Environmental Issues to Youths' Place-making in Mapping Activities

Giovanna Scalone, University of Washington
Philip Bell, University of Washington

S10.2.4 Saving Energy Means Saving a lot more Moolah!: The role of Economic and Scientific Discourses in Youths' Involvement in the Change a Light, Change Michigan

Shari Rose, Michigan State University
Angela M. Calabrese-Barton, Michigan State University

S10.2.5 Scaffolding Identity and Expertise Development

Shelley Stromholt, University of Washington

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S10.3 Influences on the Biology Classroom
8:30am – 10:00am, Curacao 2

Presider:

Allan Feldman, University of South Florida

S10.3.1 Framing Evolution Discussion Intellectually

Kristin L. Cook, Indiana University, kshockey@indiana.edu
Alandeom W. Oliveira, State University of New York
Gayle A. Buck, Indiana University

S10.3.2 Factors Potentially Influencing Student Acceptance of Biological Evolution

Jason R. Wiles, Syracuse University & McGill University, jwiles01@syr.edu

S10.3.3 Pleasing Others and Mastery Goals as Predictors of Biology Students' Individual Science Interest

Martina Nieswandt, Illinois Institute of Technology, mnieswan@iit.edu

S10.3.4 Does Whole-Class Talk Influence the Students' Learning in Biology Education?

Julia Rixius, Biology Education, julia.rixius@lrz.uni-muenchen.de
Birgit J. Neuhaus, Biology Education

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

S10.4 Teachers Learning from Instruction Practice
8:30am – 10:00am, Curacao 4

Presider:

Anne L. Kern, University of Idaho

S10.4.1 Effect of Student Learning on Science Teachers' Teaching: The Case of a Form 3 Science Class in Kenya

Samson M. Nashon, University of British Columbia, samson.nashon@ubc.ca
David Anderson, University of British Columbia

S10.4.2 Factors influencing Secondary Science Teachers' use of Popular Media: The Complexities of Instructional Practice

Michelle L. Klosterman, Wake Forest University, klosteml@wfu.edu
Troy D. Sadler, University of Florida

S10.4.3 A Method to Reconstruct Content and Content Specific Criteria of Video-Documented Science Instruction

Maja Brückmann, University of Kiel, Germany, mbrueckmann@gmail.com
Reinders Duit, IPN Kiel

S10.4.4 The Value of Self Study in Learning to Teach New Topics in Chemistry: Case Studies from South Africa

Marissa Rollnick, Wits University, South Africa, marissa.rollnick@wits.ac.za

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

S10.5 Learning in Biology, Biotechnology & Nature of Science

8:30am – 10:00am, Curacao 5

S10.5.1 Building the BIKE: Development and testing of the Biotechnology Instrument for Knowledge Elicitation (BIKE)

Stephen B. Witzig, University of Missouri, sbwitzig@mail.mizzou.edu
 Carina M. Rebello, University of Missouri
 Marcelle A. Siegel, University of Missouri
 Sharyn K. Freyermuth, University of Missouri
 Kemal Izci, University of Missouri
 Bruce A. McClure, University of Missouri

S10.5.2 Differential Understandings of Nature of Science Among Undergraduate Biology Students

Elisabeth E. Schussler, University of Tennessee - Knoxville,
 eschussl@utk.edu

S10.5.3 Benefits Observed in the Research Laboratory Setting Don't Always Generalize to the Classroom Setting

Cheryl C. Berg, Arizona State University, cheryl.berg@asu.edu
 Dale R. Baker, Arizona State University

S10.5.4 What's in a Word: Student Conceptions of and Learning About 'Allele'

Jennifer L. Momsen, North Dakota State University,
 jennifer.momsen@ndsu.edu
 Sara A. Wyse, Bethel University
 Tammy M. Long, Michigan State University
 Speth Elena Bray, St. Louis University

Strand 6: Science Learning in Informal Contexts

S10.6 Symposium - Science Cafés: Lessons Learned and New Directions for Research

8:30am – 10:00am, Curacao 6

Presider:

Susan Foutz, Institute for Learning Innovation

Discussant:

Martin Storksdieck, The National Academies,
 Board on Science Education

Presenters:

Katey Ahmann, North Carolina Museum of Natural Sciences
 Michelle Hall, Science Education Solutions, Inc
 Wendy Hansen, Pacific Science Center
 Julie Mcnalley, Pacific Science Center
 Christine Reich, Museum of Science, Boston
 Menna Selvakumar, Pacific Science Center

Strand 7: Pre-service Science Teacher Education

S10.7 Pedagogical Content Knowledge of Preservice Teachers

8:30am – 10:00am, Curacao 7

Presider:

Frederick Freking, USC Rossier School of Education

S10.7.1 The Connection between Content Knowledge and Pedagogical Content Knowledge in Groups of Pre-service and In-service Physics Teachers

Andreas Borowski, University Duisburg-Essen,
 andreas.borowski@uni-due.de
 Sophie Kirschner, University Duisburg-Essen
 Hans E. Fischer, University Duisburg-Essen

S10.7.2 Examining Pre-service Non-Experienced Secondary Science Teachers' Pedagogical Content Knowledge

Nadya Rizk, American University of Beirut, ngr03@aub.edu.lb
 Saouma B. Boujaoude, American University of Beirut

S10.7.3 Use of a Venn Diagram to Introduce Pedagogical Content Knowledge to Pre-Service Elementary Teachers

Susan A. Everett, University of Michigan-Dearborn,
 everetts@umd.umich.edu
 Charlotte A. Otto, University of Michigan-Dearborn

Strand 7: Pre-service Science Teacher Education

S10.8 Raising Performance Expectations for Novice Teachers: The Promise of Pedagogical Tools and Core Practices

8:30am – 10:00am, Bonaire 7

Discussant:

Sherry A. Southerland, Florida State University

Presenters:

Mark Windschitl, University of Washington, mwind@uw.edu
 Jessica Thompson, University of Washington
 Melissa Braaten, University of Washington
 David Stroupe, University of Washington
 Elizabeth Wright, University of Washington

Strand 8: In-service Science Teacher Education

S10.9 Online Learning

8:30am – 10:00am, Curacao 8

Presider:

Lisa A. Brooks, The University of Toledo

S10.9.1 Teachers' Professional Development via Distance Learning - Literature Review and Steps towards Implementation

Orit Herscovitz, Technion - Israel Institute of Technology Ort
Braude College, orither@technion.ac.il
Zvia Kaberman, Technion - Israel Institute of Technology
Yehudit Judy Dori, Technion - Israel Institute of Technology

S10.9.2 Examining the Student Impact Following an Online Professional Development Course for High School Biology Teachers

Scott Strother, Education Development Center, sstrother@edc.org
Lauren B. Goldenberg, Education Development Center

S10.9.3 Classroom Implementation and Student Engagement in an Online Inquiry Involving Scientists as Mentors

Carol L. Stuessy, Texas A&M University at College Station,
c-stuessy@tamu.edu
Laura Ruebush, Texas A&M University at College Station
Cheryl Ann Peterson, Texas A&M University at College Station
Julia Johnston, Texas A&M University at College Station
Tori Hollas, Texas A&M University at College Station

Strand 8: In-service Science Teacher Education S10.10 Related Paper Set - Teacher Entrepreneurial Leadership for Transforming Science Teaching and Learning

8:30am – 10:00am, Bonaire 8

S10.10.1 [MSP]: The Partnership's Conceptual Framework and Approach

Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign,
fouad@illinois.edu
Anita Martin, University of Illinois at Urbana-Champaign
Ryan Summers

S10.10.2 From Procedural Change to Substantive Innovation: Science Teachers and the Entrepreneurial Mindset

Jeanne Koehler, University of Illinois at Urbana-Champaign
Liora Bresler, University of Illinois at Urbana-Champaign
Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign

S10.10.3 Learning, Leadership, and Innovation in Science Teaching as Manifested in Teachers' Social Networks

Wei Gao, University of Illinois at Urbana-Champaign
Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign
Caroline Haythornthwaite, University of British Columbia

S10.10.4 A Framework for Catalyzing Innovation for Student, Class, and School Impact as Manifested by the Actions of Entrepreneurial Teacher Leaders

Raymond Price, University of Illinois at Urbana-Champaign
Janet Gaffney, University of Illinois at Urbana-Champaign

Strand 10: Curriculum, Evaluation, and Assessment

S10.11 Science, Language, and Literacy 8:30am – 10:00am, Bonaire 1

Presider:

Gavin W. Fulmer, National Science Foundation

S10.11.1 Student Learning Gains: Results from a PD Program which Incorporated Language Development Strategies in Science

Lauren M. Shea, University of California, Irvine, LShea@uci.edu
Therese B. Shanahan, University of California, Irvine

S10.11.2 Lexical Ambiguity in Evolutionary Discourse: Implications for Teaching, Learning, and Assessment

Meghan A. Rector, The Ohio State University, rector.43@osu.edu
Ross H. Nehm, The Ohio State University
Minsu Ha, The Ohio State University

S10.11.3 Development and Validation of Instrument to Measure Scientific Literacy for the 21st Century

Kyunghee Choi, Ewha Womans University, khchoi@ewha.ac.kr
Sung-Won Kim, Ewha Womans University
Hyunju Lee, Ewha Womans University
Kongju Mun, Ewha Womans University
Sung-Youn Choi, Ewha Womans University
Joseph S. Krajcik, University of Michigan
Namsu Shin, University of Michigan

S10.11.4 Assessing Scientific Literacy: Content Knowledge, Skills, and Contextualization

Cathy L. Farrar, University of Missouri-St. Louis, farrarcac@gmail.com
Jennifer M. Hope, University of Missouri-St. Louis

Strand 11: Cultural, Social, and Gender Issues**S10.12 Students and Science: Issues of Cultural Capital**

8:30am – 10:00am, Bonaire 2

Presider:

Barbara A. Burke, Cal Poly Pomona University

S10.12.1 Shelter Design: Problem Solving Lesson Using a Culturally Relevant STEM Topic

Younkyeong Nam, University of Minnesota, younkyeong@gmail.com

Mi Sun Park, University of Minnesota

Young Rae Kim

Gillian H. Roehrig, University of Minnesota

Tamara Moore, University of Minnesota

S10.12.2 Urban Fifth Graders Connecting Geoscience to their Spaces and Places

Katie L. Brkich, University of Florida, ecobeagl@yahoo.com

S10.12.3 What Inuit Students Have to Say about Science Teaching and Learning

Brian E. Lewthwaite, University of Manitoba, Lewthwaite@xtra.co.nz

Barbara Mcmillan, University of Manitoba

Rebecca Hainnu, Qikiqtani School Operations

S10.12.4 Silencio en Ciencia: A Longitudinal Case Study of Julio's Silencing in School Science

Jean Rockford, The University of North Carolina, j_rockfo@uncg.edu

Heidi B. Carlone, The University of North Carolina at Greensboro

Strand 12: Educational Technology**S10.13 Symposium - Video Analysis to Support Teacher Learning: Approaches, Impact, Challenges, and Gaps**

8:30am – 10:00am, Bonaire 3

Presider:

Kathleen Roth, BSCS, kroth@bscs.org

Discussant:

Robert Hollon, University of Wisconsin, Eau Claire

Presenters:

Karen B. Givvin, University of California, Los Angeles (UCLA)

Carla Zembal-Saul, Pennsylvania State University

Maria S. Rivera Maulucci, Barnard College

Strand 13: History, Philosophy, and Sociology of Science**S10.14 Nature of Science and Science Teachers**

8:30am – 10:00am, Bonaire 4

Presider:

Lisa Martin-Hansen, Georgia State University

S10.14.1 Developing Inservice Teachers' Views of NOS and Inquiry: Immersion in Authentic and Relevant Paleontological Research

Barbara A. Crawford, Cornell University, bac45@cornell.edu

Daniel K. Capps, Cornell University

Maya Patel, Cornell University

Robert Ross, Paleontological Research Institution in Ithaca, New York

S10.14.2 Understanding Pre-Service Teachers' Frameworks for Perceiving the Risks of New Technologies

Grant E. Gardner, East Carolina University, gardnerg@ecu.edu

M. Gail Jones, North Carolina State University

Sarah W. Robert, North Carolina State University

S10.14.3 Developing Prospective Teachers' Ideas about Scientific Models in a Science Content Course

Renee Schwartz, Western Michigan University, r.schwartz@wmich.edu

Brandy Skjold, Western Michigan University

S10.14.4 Experienced Science Teachers' NOS Teaching Practices and Associated Factors Accounting for Those Practices

Benjamin C. Herman, University of South Florida, bcherman@usf.edu

Michael P. Clough, Iowa State University

Joanne K. Olson, Iowa State University

Strand 14: Environmental Education**S10.15 Symposium - Place-based Education in the Urban Environmental Context: What Have We Learned as Science Educator and Scientists about Engaging Urban Students in Environmental Studies?**

8:30am – 10:00am, Bonaire 5

Presider:

Jennifer D. Adams, Brooklyn College-CUNY

Presenters:

Rebecca Boger, Brooklyn College-CUNY

Kimberly Handle, Brooklyn College-CUNY

Kendall Eskine, The Graduate Center-CUNY

Jesse John, Brooklyn College-CUNY

Adam Johnson, The Graduate Center-CUNY

Michael Magee, The Graduate Center-CUNY

Sheila Nightingale, The Graduate Center-CUNY

Reena Rahi, The Graduate Center-CUNY

Amy Ferguson, Brooklyn Academy of Science and the Environment and The Graduate Center-CUNY

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

International Committee Sponsored Session

S11.1 Symposium - NARST's LSEP and

SAARMSTE's 2010 Research School

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

Presiders:

Bill Kyle, University of Missouri-St.Louis, USA

Sibel Erduran, University of Bristol, United Kingdom

Presenters:

Marissa Rollnick, Witwatersrand University, South Africa

Mariana G. Hewson, Synthesis Consulting in Healthcare and Education

Julie A. Luft, Arizona State University, USA

Eduardo F. Mortimer, Universidade Federal de Minas Gerais, Brazil

Audrey Msimanga, Witwatersrand University, South Africa

Simasiku Siseho, University of the Western Cape, South Africa

Washington Dudu, Witwatersrand University, South Africa

Linda Keen-Rocha, Witwatersrand University, South Africa

Strand 1: Science Learning, Understanding and Conceptual Change

S11.2 Related Paper Set - Implications of Research

on K-12 Student and Teacher, and Undergraduate Apprenticeships for Science Teaching and Learning

10:15am – 11:45am, Curacao 1

Presider:

Troy D. Sadler, University of Florida

S11.2.1 WYDIWYL: What do High School Students Really Learn through Research Apprenticeships?

Gail Richmond, Michigan State University, gailr@msu.edu

Troy D. Sadler, University of Florida

S11.2.2 Take 10 Teachers, Add 2 Scientists, Stir in the National Reform Goals, and Let Marinate for 6 Weeks

Margaret R. Blanchard, North Carolina State University

Victor D. Sampson, Florida State University

S11.2.3 Authentic to Whom? A comparison of two different models for Research Experiences for Teachers

Barry Golden, Florida State University

Sherry A. Southerland, Florida State University

S11.2.4 Student Learning in a Research Experience for Undergraduates Program

Allan Feldman, University of South Florida

Dilek Ozalp, University of South Florida

Sarah Johnstone, University of South Florida

S11.2.5 What Happens when you Engage Teachers and Children in Authentic Paleontological Work?

Barbara A. Crawford, Cornell University

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S11.3 Students' Attitudes

10:15am – 11:45am, Curacao 2

Presider:

Lawrence Flick, Oregon State University

S11.3.1 Conceptual and Methodological Issues in the Measurement of Attitudes Towards Science

Michael R. Kotowski, University of Tennessee, Knoxville,

mkotowski@utk.edu

Mehmet Aydeniz, University of Tennessee, Knoxville

S11.3.2 Adolescents' Declining Motivation to Learn Science: Inevitable or not?

David Fortus, Weizmann Institute of Science,

david.fortus@weizmann.ac.il

Dana Vedder-Weiss, Weizmann Institute of Science

S11.3.3 Teaching and Learning Physics: The Impact of Classroom Management on Student Achievements

Katharina Fricke, University of Duisburg-Essen (Germany),

katharina.fricke@uni-due.de

Hans E. Fischer, University of Duisburg-Essen (Germany)

S11.3.4 Students' Interest in Chemistry - Today and Twenty Years Ago

Wolfgang K. Graeber, University of Kiel, Germany,

wgraeber@ipn.uni-kiel.de

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

S11.4 Conceptual Reasoning and Problem Solving in Physics

10:15am – 11:45am, Curacao 5

Presider:

Grant E. Gardner, East Carolina University

S11.4.1 Using Students' Rating of Problem Similarity to Assess Course-integrated Contrasts and Compare Activities

Frances A. Mateycik, Penn State Altoona, fam13@psu.edu

Sean T. Elward, Penn State Altoona

S11.4.2 Students' Understanding of Mathematical Integration in Physics Problems Using Graphical and Algebraic Representations

Dong-Hai Nguyen, Kansas State University

N. Sanjay Rebello, Kansas State University

Elizabeth Gire, University of Memphis

S11.4.3 Comparing Physics Content and Representations across Four Introductory College Physics Textbooks

Suzanne M. Donnelly, Longwood University, donnellysm@longwood.edu

S11.4.4 Prior Knowledge and Reflective Reasoning: To What Extent Do College Science Students' Preconceptions Bias Their Reasoning Processes as They Solve Conceptual Physics Problems?

Ava A. Zeineddin, Wayne State University, eb8533@wayne.edu

Strand 6: Science Learning in Informal Contexts

S11.5 Maximising the Impact of Science Outreach on Students' Attitudes Towards Science and Careers in Science

10:15am – 11:45am, Curacao 6

Discussant: Leonie Rennie, Curtin University of Technology

S11.5.1 Student and Teacher Feedback on a Science Careers Outreach Program: An 'Alignment' Perspective

Sophia Bickford, University of Western Australia,
bickfs01@student.uwa.edu.au

Nancy Longnecker, University of Western Australia
Grady Venville, University of Western Australia

S11.5.2 The Impact of a Science Careers Outreach Program on Students: An 'Identity' Perspective

Grady Venville, University of Western Australia
Nancy Longnecker, University of Western Australia
Leonie Rennie, Curtin University of Technology

S11.5.3 The Olympiad Informal Science Experience: A 'Passion' Perspective

Mary Oliver, University of Western Australia
Grady Venville, University of Western Australia

S11.5.4 Evaluating School Focused Science Outreach: An 'Impact' Perspective

Kira Husher, The University of Newcastle
John O'Connor, The University of Newcastle
Sid Bourke, The University of Newcastle
Adrian Page, The University of Newcastle

Strand 7: Pre-service Science Teacher Education

S11.6 Preservice Teachers Conceptions and Perceptions of Science Practices and Curriculum

10:15am – 11:45am, Curacao 7

Presider:

Meredith A. Park Rogers, Indiana University

S11.6.1 Concept-Focused Inquiry (CFI): Using a Theory of Instruction to Enhance Understanding of Constructivist-based Teaching

Austin M. Hitt, Coastal Carolina University, amhitt@coastal.edu
Denise B. Forrest, Coastal Carolina University

S11.6.2 Who Has Control Over the Science Curriculum?

Felicia Moore-Mensah, Columbia University,
moorefe@tc.columbia.edu
Tara O'Neill, University of Hawaii, Manoa

S11.6.3 Pre-service Elementary Teachers' Conceptions of Inquiry: Classroom Scenarios vs. Classroom Observations

Youngjin Song, University of Northern Colorado,
youngjin.song@unco.edu
Nam-Hwa Kang, Oregon State University
Teresa M. Higgins, University of Northern Colorado

Strand 8: In-service Science Teacher Education

S11.7 Teachers and Inquiry

10:15am – 11:45am, Curacao 8

Presider:

Peter Meyerson, College of Education & Human Services

S11.7.1 Reflections on Self Classroom Videos and Student's Perceptions

An-Shun Yu, National Changhua University of Education,
ncueanshun@gmail.com
Kun-Yi Shih, National Changhua University of Education
Hsin-Chuan Ho, National Changhua University of Education
Kuo-Hua Wang, National Changhua University of Education

S11.7.2 The Effect of Professional Development on Teachers' Beliefs and Pedagogical Content Knowledge for Scientific Argumentation

Katherine L. McNeill, Boston College, kmcneill@bc.edu
Amanda M. Knight, Boston College

S11.7.3 The Uses of Student Learning Data in Collaborative Teacher Inquiry

Tamara H. Nelson, Washington State University Vancouver,
tnelson1@vancouver.wsu.edu
David Slavitt, Washington State University Vancouver
Angie Deuel, Washington State University Vancouver

Strand 10: Curriculum, Evaluation, and Assessment
S11.8 Related Paper Set - Employing Sociocultural Frameworks In Program Evaluation Design: Exploring The Challenges And Benefits For Internal And External Evaluation.

10:15am – 11:45am, Bonaire 1

Discussant:

Yushaneen Wilson, University of Pennsylvania

S11.8.1 One Person's Internal Evaluation is Another's Design Study: What Internal Evaluation Brings to Professional Education Programs in Science

Sonya N. Martin, Drexel University, sonya.martin@drexel.edu

Catherine E. Milne, New York University

S11.8.2 Facilitating Responsive Science Teacher Education: Professional Development as Embedded in Teachers' Everyday Practices and Concerns

Christina Siry, University of Luxembourg

S11.8.3 The Role of e-Portfolios in Documenting Teacher Leadership

Rachel Ruggirello, Washington University in St. Louis

S11.8.4 Program and Policy Changes for Teachers' Professional Development Based on Evaluation Data

Jane Butler Kahle, Miami University

Kathryn Scantlebury, University of Delaware

Yue Li, Miami University

Strand 11: Cultural, Social, and Gender Issues

S11.9 Students' Attitudes toward and Aspirations in Science: Ethnicity, Religion, and Gender Effects

10:15am – 11:45am, Bonaire 2

Presider:

Cassie F. Quigley, Clemson University

S11.9 .1 (Re)thinking the Influence of Social Class: Science-related Career Aspirations amongst Minority Ethnic Students aged 11-14 in England

Billy Wong, King's College London, billy.b.wong@kcl.ac.uk

S11.9.2 An Investigation of Boys' and Girls' Affective Learning in Science and Big-Five Traits

Zuway-R Hong, National Sun Yat-sen University,

a3803429@ms49.hinet.net

Huann-Shyang Lin, National Sun Yat-sen University

S11.9.3 Science-related Aspirations among Elementary School Children: Modeling Early Influences

Jennifer Dewitt, King's College London, jennifer.dewitt@kcl.ac.uk

Jonathan F. Osborne, Stanford University

Louise Archer, King's College London

Justin Dillon, King's College London

Beatrice Willis, King's College London

Billy Wong, King's College London

S11.9.4 Muslim Students' Conceptions of Evolution

Anila Asghar, McGill University, anila.asghar@mcgill.ca

Saouma B. Boujaoude, American University of Beirut

Jason R. Wiles, Syracuse University

Brian Alters, McGill University

Strand 14: Environmental Education

S11.10 Symposium – Theorizing Inquiry, Science Education, and Professional Development from Indigenous Hawaiian and Aboriginal Taiwanese Perspectives

10:15am – 11:45am, Bonaire 5

Presider:

Pauline W. U. Chinn, University of Hawaii at Manoa

Discussant:

Huei Lee, National Dong Hwa University, Hualien, Taiwan

Presenters:

Alyson Barrows, University of Hawaii at Manoa

Huihui Kanahale-Mossman, University of Hawaii at Manoa

Michelle M. Kapana-Baird, University of Hawaii at Manoa

Sabra Kauka, University of Hawaii at Manoa

Gandharva M. Ross, University of Hawaii at Manoa

Kellie Kong, University of Hawaii at Manoa

Chung-Fen Yen, Providence University, Taichung, Taiwan

Su-Fen Lin, Providence University, Taichung, Taiwan

Lunch – On Your Own

12:00pm – 1:00pm

Concurrent Session #12

1:00pm – 2:30pm

Publications Advisory Committee

Sponsored Session

S12.1 Symposium - Managing the Digital Intellectual Life(stream) of a 21st Century Science Education Scholar

1:00pm – 2:30pm, Antigua 1

Presider:

Carla Zembal-Saul, Penn State University

Presenters:

Scott P. McDonald, Penn State University

Eric N. Wiebe, North Carolina State University

Strand 1: Science Learning, Understanding and Conceptual Change

S12.2 Related Paper Set - Metacognition in Science Education: Theory and Practice

1:00pm – 2:30pm, Curacao 1

Discussant:

Larry Yore, University of Victoria

S12.2.1 Overview and Discussion of the Forthcoming Book Metacognition in Science Education: Trends in Current Research

Anat Zohar, Hebrew University, msazohar@mscc.huji.ac.il

S12.2.2 Metacognition and a Naive View of Reading Science

Stephen P. Norris, University of Alberta

Linda M. Phillips, University of Alberta

S12.2.3 A Metacognitive Tool and Its Effect on Complex Questions Posed by High School Chemistry Majors

Yehudit J. Dori, Technion, Israel Institute of Technology

Orit Herscovitz, Technion, Israel Institute of Technology

Osnat Eldar, Weizmann Institute of Science

Miky Ronen, Holon Institute of Technology

Bat-Sheva Eylon, Weizmann Institute of Science

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S12.3 Related Paper Set - Contemporary Perspectives on Genetics Learning: Environments for Supporting Student Learning of Genetics and Scientific Practices

1:00pm – 2:30pm, Curacao 2

S12.3.1 Characterizing Conceptual Dependencies in the Development of Students' Understandings of Classical and Molecular Genetics

Duncan Ravit Golan, Rutgers University, ravit.duncan@gse.rutgers.edu

Nicole Shea, Rutgers University

S12.3.2 Problem-solving in an Authentic Learning Environment: The use of Bioinformatics Tools and Databases for Learning Genetics and Biotechnology

Yossy Machluf, Weizmann Institute of Science

Carmit Shpalter, Weizmann Institute of Science

Orna Dahan, Weizmann Institute of Science

Amir Mitchell, Weizmann Institute of Science

Anat Yarden, Weizmann Institute of Science

S12.3.3 Examining Student Understanding of the Genome Sciences: Supporting Connections Between Science and Everyday Life

Katie Van Horne, University of Washington

Hiroki Oura, University of Washington

Andrew W. Shouse, University of Washington

Philip Bell, University of Washington

S12.3.4 Learning Genetics of Human Behavior and Disease Through Exploring Real Scientific Data

Hiroki Oura, University of Washington

Katie Van Horne, University of Washington

Andrew W. Shouse, University of Washington

Philip Bell, University of Washington

S12.3.5 Using Professional Development to Support Classroom Discussions in Genetics and Genomics: Getting Students Talking

Nonye Alozie, Wayne State University

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

S12.4 Related Paper Set - Examinations of the Beliefs of Teachers: Exploring a Complex Construct

1:00pm – 2:30pm, Curacao 4

S12.4.1 Relationships between Physics Teachers' Beliefs about Nature of Science, their General Educational Beliefs, and Self Reported Teaching Behaviour Purpose and Theoretical Framework

Nelleke A.H. Belo, ICLON Leiden University, nbelo@iclon.leidenuniv.nl

Jan H. Van Driel, ICLON Leiden University

Nico Verloop, ICLON Leiden University

S12.4.2 Exploring the Beliefs of Persisting Secondary Science Teachers in General Induction Programs: A Longitudinal Study

Sissy Wong, University of Houston

Julie Luft, Arizona State University

S12.4.3 Context Based Science Education: Chemistry Teachers' Knowledge and Beliefs, and their Students' Learning Outcomes

Ineke Henze, ILS Radboud University

S12.4.4 Beliefs of Beginning Secondary Science Teachers Over Five Years: Stability and Change

Julie Luft, Arizona State University

Sissy Wong, University of Houston

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

S12.5 Learning Chemistry & Measurement Skills 1:00pm – 2:30pm, Curacao 5

Presider:

Peter Meyerson, College of Education & Human Services

S12.5.1 Heuristic Reasoning: How do Students Make Decisions in Chemistry?

Vicente Talanquer, University of Arizona, vicente@u.arizona.edu

Lakeisha McClary, University of Arizona

S12.5.2 Measuring Volume of Tree: A Problem-driven, Modeling-based Lesson for Preservice Science Teachers

Ji Shen, University of Georgia, jishen@uga.edu

S12.5.3 College Students' Understanding of the Particulate Nature of Matter Across Reaction Types

James M. Nyachwaya, University of Minnesota, Twin Cities, nyach002@umn.edu

Gillian H. Roehrig, University of Minnesota, Twin Cities

Anne L. Kern, University of Idaho

Nathan Wood, North Dakota State University

Jamie Schneider, University of Wisconsin, River Falls

Abdi-Rizak Mohamed, University of Minnesota, Twin Cities

S12.5.4 Exploring Alternative Conceptions on Molecular Geometry in Postsecondary Chemistry Education

Caroline Cormier, Université de Montréal, caroline.cormier.1@umontreal.ca

Jesús Vázquez-Abad, Université de Montréal

Strand 7: Pre-service Science Teacher Education

S12.6 Preservice Teachers' Learning of Scientific Practices

1:00pm – 2:30pm, Curacao 7

Presider:

Cory T. Forbes, University of Iowa

S12.6.1 Qualities of Pre-Service Teachers' Classroom Questioning

Melissa L. Shirley, University of Louisville, melissa.shirley@louisville.edu

Stephanie B. Philipp, University of Louisville

S12.6.2 Approximations of Practice in an Elementary Science Methods Course: Preservice Teachers Learning to Teach Investigations

Michele Nelson, Graduate Student, University of Michigan, mishmash@umich.edu

Elizabeth A. Davis, Associate Professor of Science Education, University of Michigan

S12.6.3 Providing a Conductive Learning Environment in Content Courses for Elementary Pre-service Teachers' Understanding of Scientific Modeling

James A. Hagerty, University of Michigan, haijs@umich.edu

Jean P. Krisch, University of Michigan

Elizabeth A. Davis, University of Michigan

Strand 7: Pre-service Science Teacher Education

S12.7 Preservice Teachers' Understandings and Perceptions of the Nature of Science

1:00pm – 2:30pm, Bonaire 7

Presider:

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

S12.7.1 Just Bare-Bones Facts: STEM Career-Switchers' Perceptions the Role of the Nature of Science in Science Education

Marjee Chmiel, George Mason University, muchmiel@gmail.com

Erin E. Peters Burton, George Mason University

S12.7.2 Facilitating Preservice Teachers Understanding of Nature of Science Using Japanese Lesson Study

Amy V. Mcdowell, Douglas County Schools, Georgia, agilbert76@yahoo.com

Geeta Verma, Georgia State University

Lisa Martin-Hansen, Georgia State University

S12.7.3 Investigating Elementary Pre-service Teachers' Understanding of Science in Our Everyday Lives through Student-created Videos

Blakely K. Tsurusaki, blakely.tsurusaki@gmail.com

John Lockhart

S12.7.4 Exploring the Use of Lesson Study to Develop Elementary Preservice Teachers' PCK for NOS

Khemmawadee Pongsanon, Indiana University, kpongsan@indiana.edu

Valarie L. Akerson, Indiana University

Meredith A. Park Rogers, Indiana University

Ingrid S. Weiland, Indiana University

Strand 8: In-service Science Teacher Education**S12.8 Teacher Beliefs**

1:00pm – 2:30pm, Curacao 8

Presider:

Mehmet Fatih Tasar, Gazi Universitesi

S12.8.1 Sociocultural Contexts of Science Teachers' Beliefs and Practices: Teachers' Perspective

Nasser Mansour, University of Exeter, n.mansour@ex.ac.uk

S12.8.2 School and Teacher Factors as Contributors to the Effectiveness of an Elementary-Level Professional Development Program

Dina Drits, University of Utah, dina.drits@utah.edu

Louisa Stark, University of Utah

S12.8.3 Exploring the Role of Context in Shaping Indian Science Teachers' Orientations

Vanashri Nargund-Joshi, Indiana University, Bloomington,

vnargund@indiana.edu

Meredith Nargund, Indiana University, Bloomington

S12.8.4 The Impact of Research Experience for Teachers (RET) Professional Development Programs on Teacher Beliefs and Practice

Patrick Enderle, The Florida State University, pje07@fsu.edu

Katrina Roseler, The Florida State University

Barry Golden, The Florida State University

Sherry A. Southerland, The Florida State University

Strand 10: Curriculum, Evaluation, and Assessment**S12.9 Related Paper Set - Impact of Educative Materials and Transformative Professional Development on Teachers' PCK, Practice, and Student Achievement**

1:00pm – 2:30pm, Bonaire 1

Discussant:

April L. Gardner, BSCS

S12.9.1 Impact of Educative Materials and Transformative Professional Development on Teachers' Pedagogical Content Knowledge

Janet Carlson, BSCS, jcarlson@bscs.org

April L. Gardner, BSCS

S12.9.2 The Measurement of Pedagogical Content Knowledge and Its Relationship to Teacher Practice

April L. Gardner, BSCS

Molly A.M. Stuhlsatz, BSCS

S12.9.3 Using HLM to Examine Relationships Among Teachers' Pedagogical Content Knowledge, Practice, and Student Achievement

Christopher D. Wilson, BSCS

Joseph A. Taylor, BSCS

S12.9.4 Teacher Explanations for Changes in Pedagogical Content Knowledge

Sharon Cardenas, Northern Arizona University

Julie Gess-Newsome, Northern Arizona University

Barbara A. Austin, Northern Arizona University

Strand 11: Cultural, Social, and Gender Issues**S12.10 Symposium - Theoretical and Empirical Analyses of Social Capital and Networking in Science Education: From Global to Local**

1:00pm – 2:30pm, Curacao 3

Discussant:

Kenneth G. Tobin, The Graduate Center of CUNY, ktobin@gc.cuny.edu

Presenters:

Chan-Jong Kim, Seoul National University

Mariona Espinet, Universitat Autònoma de Barcelona, Catalonia, Spain

Sonya N. Martin, Drexel University

Christina Siry, University of Luxembourg

Konstantinos Alexakos, Brooklyn College, CUNY

Rowhea Elmesky, Washington University

Strand 11: Cultural, Social, and Gender Issues**S12.11 Teachers' and Students' Attitudes towards Science and Teaching**

1:00pm – 2:30pm, Bonaire 2

Presider:

Nievita Bueno Watts, Arizona State University

S12.11.1 Compounding Variables: Positionality of African American Girls as Science Learners

Rose M. Pringle, University of Florida, rpringle@coe.ufl.edu

Thomasenia Adams, University of Florida

Circie West-Olatunji, University of Florida

S12.11.2 Building a Scientific Identity in the Figured Worlds of Kindergarten Science

Alicia M. Mcdyre, The Pennsylvania State University University Park,

axd252@psu.edu

Deborah C. Smith, The Pennsylvania State University University Park

S12.11.3 The Effects of Becoming a Science Focus School in Regards to Urban, Low SES, African American Girls' Emotional Engagement with Science

Gayle A. Buck, Indiana University, gabuck@indiana.edu

Kristin L. Cook, Indiana University

Cassie F. Quigley, Clemson University

S12.11.4 Discourse of Science: Helping English Language Learners with Speaking, Reading, and Writing

Molly H. Weinburgh, Texas Christian University, m.weinburgh@tcu.edu
Cecilia Silva, Texas Christian University

Strand 13: History, Philosophy, and Sociology of Science

S12.12 Strategies to teach Nature of Science 1:00pm – 2:30pm, Bonaire 4

Presider:

Allan Feldman, University of South Florida

S12.12.1 Impact of a Pure vs. Applied Science Immersion Experiences on Preservice Teachers' View of NOS

Pongprapan Pongsophon, Kasetsart University, Thailand, feduppp@ku.ac.th
William F. McComas, University of Arkansas

S12.12.2 Using Mainstream Films to Teach Nature of Science and Scientific Inquiry to Preservice Elementary Teachers

Mark Bloom, Texas Christian University, m.bloom@tcu.edu
Ian C. Binns, Louisiana State University
Catherine M. Koehler, Illinois Institute of Technology

S12.12.3 The Application of Nature of Science Understandings into Unfamiliar Contexts: Is It Possible?

Rola Khishfe, American University of Beirut, rk19@aub.edu.lb
Mohammed Estaiteyeh

S12.12.4 Emergent Understandings of Scientific Creativity in the Secondary Science Classroom Context: Implications for Both Research and Practice

Allison Antink, Illinois Institute of Technology, aantink@iit.edu

Concurrent Session #13 2:45pm – 4:15pm

Strand 1: Science Learning, Understanding and Conceptual Change

S13.1 Related Paper Set - Moving Language in Science Research Forward: Interpretative Frameworks, Research Procedures, and Pedagogical Issues to Reposition Literacy in Scientific Literacy 2:45pm – 4:15pm, Curacao 1

Presider:

Larry D. Yore, University of Victoria

Discussant:

Zhihui Fang, University of Florida

S13.1.1 Going Beyond 'Science Literacy for All' as a Slogan to a Cognitive Model: Introduction

Larry D. Yore, University of Victoria

S13.1.2 Changing from Users to Producers of Multimodal Texts: A Theoretical Framework Based on Cognition, Metacognition, Semiotics, and Systemic Functional Linguistics

Christine D. Tippet, University of Victoria

Robert J. Anthony, University of Victoria

S13.1.3 Attachment, Embeddedness, and Integration: Levels of Cohesiveness in Multimodal Writing Tasks and Impact on Student Learning in Science

Mark McDermott, Wartburg College

Brian Hand, University of Iowa

S13.1.4 The Theoretical Basis and the Cognitive, Linguistic and Pedagogical Advantages of Code Switching in Multilingual Classrooms of South Africa to Address the 3-Language Problem (home, school and science)

Mary Grace Villanueva, University of Iowa

Paul Webb, Nelson Mandela Metropolitan University

S13.1.5 Functional Linguistics, Language Tasks and Strategies, and Science Inquiry Using the 5E Approach

Susan Gomez-Zwiep, California State University, Long Beach

William Straits, California State University, Long Beach

Lauren Shea, University of California, Irvine

Therese Shanahan, University of California, Irvine

Strand 2: Science Learning: Contexts, Characteristics and Interactions

S13.2 Science Learning in Authentic Contexts: The Impact of Place and Voice on Rural Students' Experiences

2:45pm – 4:15pm, Curacao 2

Discussant:

Angela M. Calabrese-Barton, Michigan State University

Presider:

April L. Luehmann, University of Rochester

S13.2.1 Eliciting, Identifying and Utilizing Rural High School Students' Funds of Knowledge in the Service of Science Learning in their Backyard

Ellen M. Lloyd, University of Rochester, ellenmlloyd@hotmail.com

S13.2.2 Eliciting and Activating Funds of Knowledge in an Environmental Science Community College Classroom

John VanNiel, University of Rochester

S13.2.3 Using Place-Based Pedagogy in a High-Stakes Biology High School Course

Peter Saracino, University of Rochester

S13.2.4 The Use of Exotic Spaces and Experiences to Inspire and Inform Rural Students' Construction of Personal Science Stories

Joseph A. Henderson, University of Rochester

April L. Luehmann, University of Rochester

Brian Bailey, Nazareth College

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

S13.3 Symposium - What Works When and How: Investigating Capacity Building in a Large Scale STEM Education Reform Program

2:45pm – 4:15pm, Curacao 4

Presenters:

Susan Yoon, University of Pennsylvania, yoonsa@gse.upenn.edu

Lei Liu, University of Pennsylvania

Jorge Santiago-Aviles, University of Pennsylvania

Sao-Ee Goh, University of Pennsylvania

Dorothea Lasky, University of Pennsylvania

Betty Chandy, University of Pennsylvania

Joyce Wang, University of Pennsylvania

Kira Baker-Doyle, Pennsylvania State University

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

S13.4 Scientific Literacy & Societal Issues in Science Instruction

2:45pm – 4:15pm, Curacao 5

Presenter:

Geoffrey Potvin

S13.4.1 Exploring Genetic Literacy: How Undergraduate Science Majors Reason About Authentic Genetic Dilemma

Nicole Shea, Rutgers University, nlefur@eden.rutgers.edu

Ravit Duncan, Rutgers University

Celeste Stephenson, Rutgers University

S13.4.2 Conceptually Eleven?: The Disconnect between Expectations and Undergraduate Conceptual Understanding in Earth and Related Sciences

Julie Libarkin, Michigan State University, libarkin@msu.edu

Anila Asghar, McGill University

S13.4.3 Measuring the Use of Science Content During Socioscientific Issues Negotiation: The SSI-Q

Samantha R. Fowler, Clayton State University,

samanthafowler@clayton.edu

Dana L. Zeidler, University of South Florida

S13.4.4 Participation in an Interdisciplinary, Socioscientific Issues-Based Human Biology Major and Understanding of Scientific Inquiry

Jennifer L. Eastwood, University of Florida, jleastwood@coe.ufl.edu

S13.4.5 Scientific Literacy of Undergraduate Students Enrolled in Science Faculties

Bulent Cavas, Dokuz Eylul University, Izmir, Turkey,

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Yasemin Ozdem, Gaziosmanpasa University, Tokat, Turkey

Pinar H. Cavas, Ege University, Izmir, Turkey

Jale Cakiroglu, Middle East Technical University, Ankara, Turkey

Hamide Ertepinar, Middle East Technical University, Ankara, Turkey

Strand 7: Pre-service Science Teacher Education

S13.5 Symposium - Engaging Pre-service Teachers in Multiple Modal Learning as Animation

Creators: International Perspectives on Using Slowmotion

2:45pm – 4:15pm, Bonaire 7

Presenter:

Allan Feldman, University of Southern Florida, USA

Discussant:

Brian Gravel, Tufts University, USA

Presenters:

Garry F. Hoban, University of Wollongong, Australia,

ghoban@uow.edu.au

Wendy Nielsen, University of Wollongong, Australia

Gillian Kidman, Queensland University of Technology, Australia

Pernilla K. Nilsson, Halmstad University, Sweden

Stephen Keast, Monash University, Australia

Rebecca Cooper, Monash University, Australia

Calee Bullard, Monash University, Australia

Denis Jablonski, Southern Oregon University, USA

Strand 8: In-service Science Teacher Education
S13.6 Teacher Beliefs and Self-efficacy

2:45pm – 4:15pm, Curacao 8

Presider:

Lawrence Flick, Oregon State University

S13.6.1 Effect of the SUN Project Workshop on Teacher Self-Efficacy

Ann Batiza, Milwaukee School of Engineering, batiza@msoe.edu

Mary Gruhl, Gruhl Education Consultants LLC

Eric Hagedorn, University of Texas, El Paso

Bo Zhang, University of Wisconsin - Milwaukee

Tim Herman, Milwaukee School of Engineering

Dave Nelson, University of Wisconsin-Madison

S13.6.2 The Achilles' Heel of Science Inquiry in Elementary Classrooms: Teachers' Beliefs and Dilemmas

Mijung Kim, National Institute of Education, mijung.kim@nie.edu.sg

Aik-Ling Tan, National Institute of Education

Frederick Talaue, National Institute of Education

S13.6.3 A National Study of Elementary Teachers Science Inquiry Professional Development, Knowledge, and Instructional Practice

Gwen C. Nugent, University of Nebraska-Lincoln, gnugent@unl.edu

Jon E. Pedersen, University of Nebraska-Lincoln

Sue Ellen Dechenne, University of Nebraska-Lincoln

Fran Chumney, University of Nebraska-Lincoln

Greg Welch, University of Nebraska-Lincoln

S13.6.4 Elementary Teachers' Beliefs about Lesson Sequencing

Barbara Austin, Northern Arizona University, baa49@nau.edu

Nena Bloom, Northern Arizona University

Sandie Grinnell, Mount Elden Middle School

Jane Kirkley, Northern Arizona University

Strand 8: In-service Science Teacher Education
S13.7 Nature of Science

2:45pm – 4:15pm, Bonaire 8

Presider:

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

S13.7.1 Understanding Science: Improving instruction on the nature and process of science

Anastasia Thanukos, University of California Museum of

Paleontology, thanukos@berkeley.edu

Molly A.M. Stuhlsatz, BSCS

Judy Scotchmoor, University of California Museum of Paleontology

S13.7.2 New Directions: A New Set of Analyses of How Beginning Teachers Change Their Understanding of NOS

Jonah B. Firestone, Mary Lou Fulton Teachers College, Arizona State University, jonah.firestone@gmail.com

Charles Weeks, Arizona State University

Sissy S. Wong, University of Houston

Krista L. Adams, Arizona State University

Irasema B. Ortega, Arizona State University

Julie A. Luft, Arizona State University

S13.7.3 Lasting Impact: Teachers' Report of How Professional Development in Modeling Has Influenced Their Teaching

Connie Hvidsten, School of Education, University of California, Davis, cjhvidsten@ucdavis.edu

Cynthia Passmore, School of Education, University of California, Davis

S13.7.4 Inquiry-based Instruction in Science Classrooms: Is it Happening?

Daniel K. Capps, Cornell University, dkc39@cornell.edu

Barbara A. Crawford, Cornell University

Strand 10: Curriculum, Evaluation, and Assessment

S13.8 Related Paper Set - Learning Engineering, Engineering to Learn

2:45pm – 4:15pm, Bonaire 1

Presider:

Senay Purzer, Purdue University

S13.8.1 Engineering in the National and State Standards

Senay Purzer, Purdue University

Johannes Strobel, Purdue University

Heidi Diefes-Dux, Purdue University

S13.8.2 Not Your Typical Chair-ity Case: STEM Integration as a Means for Engineering Design

Tamara J. Moore, University of Minnesota

Gillian H. Roehrig, University of Minnesota

Hui-Hui Wang, University of Minnesota

Mi Sun Park, University of Minnesota

S13.8.3 Engineering-design-based Science, Science Content Learning, and Science Attitudes in the Elementary Grades

Kristen Bethke Wendell, Tufts University

Amber Kendall, Tufts University

Merredith Portsmore, Tufts University

Christopher Wright, Tufts University

Linda Jarvin, Tufts University

Chris Rogers, Tufts University

S13.8.4 Parachutes and Solar Ovens: An Evaluation of Engineering Units for Elementary School

Cathy Lachapelle, Museum of Science, Boston

Christine Cunningham, Museum of Science, Boston

S13.8.5 Who Should Learn Engineering? A Case Study of One Teacher's Disparate Teaching Approach with Lower-achieving Students

Christine G. Schnittka, University of Kentucky

Strand 11: Cultural, Social, and Gender Issues

S13.9 Symposium - Ecosystems of Science Across Borders

2:45pm – 4:15pm, Bonaire 2

Presenters:

Sumi Hagiwara, Montclair State University, hagiwaras@mail.montclair.edu

Janell N. Catlin, Teachers College, Columbia University

Tara O'Neill, University of Hawaii - Manoa

Felicia Moore-Mensah, Columbia University

Meghan E. Marrero, U.S. Satellite Laboratory

Jessica F. Riccio, Columbia University

Jonathan Gerlach, Hillsborough County Public Schools

Bhaskar Upadhyay, University of Minneapolis

Kristina Maruyama-Tank, University of Minneapolis

Nancy Albrecht, University of Minneapolis

NARST Executive Board Meeting #3

5:00pm – 10:00pm, Antigua 1 and 2

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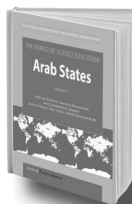
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Stephen M. Ritchie (Ed.), *Queensland University of Technology*



Handbook of Research in Arab States
Saouma Boujaoude, *American University of Beirut* and
Zoubeida R. Dagher (Eds.) *University of Delaware*



Handbook of Research in Asia
Jew Jin Lee (Ed.), *National Institute of Education Singapore*



The Culture of Science Education: Its History in Person; **Kenneth Tobin**, *City University of New York* and **Wolff-Michael Roth (Eds.)** *University of Victoria, Canada*
The Culture of Science Education: Its History in Person was written for science educators with an interest in the history of science education as it is experienced as lived culture. The book is intended as a reference book for scholars and as



Urban Science Education for the Hip-Hop Generation ; **Christopher Emdin**, *Teachers College -Columbia University*. The book utilizes autobiography, outcomes of research studies, theoretical explorations, and accounts of students' experiences in schools to shed light on the causes for the lack of educational achievement of urban youth from the hip-hop generation.

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Abstracts

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