

# Program Schedule

## *DRAFT*

The following program schedule has been composed to assist you in planning for our up-coming Annual Meeting in New Orleans. Strand Coordinators, Organizers and Presenters may recommend additional Organizers/Discussants for their scheduled sessions. Please send any requested revision to the program directly to the Annual Meeting Coordinator (dbz@sfu.ca). There may also be minor changes made to the program in the coming weeks and presenters are asked to check this draft document for errors. During the scheduling process, some requested presentation formats have been changed. This was unavoidable due to the size and scope of this year's event, and our desire to accommodate as many presentations as possible. Please note that the web version of the draft program is searchable by *name*, *institution* and *proposal id number*. Changes in scheduling will be difficult to accommodate and will only be considered under exceptional circumstances.

### *Specifically NARST Members Should:*

- Check their sessions to make certain that the information provided is accurate
- Check that they have not exceeded the LIMITS set by the NARST Board following membership approval
- Put their names forward to serve as session Discussants or Presiders if they wish to do so
- Respond to the AMC via e-mail with suggested program revisions by February 20<sup>th</sup>, 2002

## LIMITS

There are limits on the number of times that any person may be on the program as a paper presenter, a participant in an interactive session, presider or a discussant. **If you are over the limit on the number of times that you are involved in the program, please let us know for which presentations you would like your name to be included.**

1. A person may be **first author** of a paper presentation (single paper, paper in a multiple paper set, discussion group, round table, poster, symposium, or novel format) **only once** [but may be a co-author of other paper presentations].
2. A person may serve as a **presider/discussant only once**.
3. A person may be a paper **presenter** (see number 1 above) **no more than twice**.
4. Altogether, a person may be **on the program no more than four times** in the role of paper presenter, first author, or presider/discussant.

**NARST 2002 Annual Meeting**

**Saturday April 6<sup>th</sup>, 2002**  
**DAY AT A GLANCE**

<b>Session</b>	<b>Room</b>	<b>Time</b>
Exec. Board Meeting and Dinner	Boardroom X	2:00P-10:00P

**Sunday April 7<sup>th</sup>, 2002**  
**DAY AT A GLANCE**

<b>Session</b>	<b>Room</b>	<b>Time</b>
Pre-conference Workshops (2)	Rooms listed in schedule	8:30A-12:30P
Lunch	On your own	12:30A-1:00P
16 Concurrent Sessions	Rooms listed in schedule	1:00P-2:00P
Break	Exhibition Area	2:00P-2:30P
16 Concurrent Sessions	Rooms listed in schedule	2:30P-4:00P
Break	Exhibition Area	4:00P-4:30P
16 Concurrent Sessions	Rooms listed in schedule	4:30P-6:00P
Mentor/Mentee Orientation	Ballroom X	6:15P-7:15P
New Researchers Reception	Ballroom X	7:30P-8:30P
Teachers As Researchers Reception	Ballroom X	7:30P-8:30P
NARST Reception & Poster Session	Ballroom X	8:30P-10:30P

## NARST 2002 Annual Meeting

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8:30A–12:30P

Workshops

Sunday, April 7th

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Room A

### Pre-conference Workshop Number One

#### **Macro and Micro Methods in Research on the Teaching and Learning of Science**

Kenneth Tobin, University of Pennsylvania & Wolff-Michael Roth, University of Victoria

Participants are introduced to selected theoretical frameworks that are salient to our research on the teaching and learning of science. We provide examples of the ways in which theoretical frameworks illuminate fields of study and lead to methodologies that have evolved away from approaches to critical inquiry in the late 1990s. Among the specific topics addressed in the workshop are alternative ways to conceptualize teaching, learning and science, diversity within cultural settings, and the contradictions that are manifest in science education. Special attention is directed toward issues of grain size in research on the teaching and learning of science and the types of data resources that can be used in micro and macro analyses. Participants engage in activities associated with creating questions and foci for research from a variety of theories associated with cultural sociology, activity theory and critical/cultural psychology. Opportunities also are provided to analyze texts obtained from transcripts of classroom and interview data and to identify and analyze salient vignettes from videotapes of the teaching and learning of science. Issues of voice and identity of teachers, students, researchers and administrators are explored in relation to the writing of research and disseminating what is learned from research. Participants explore the uses of videotape and methodologies that foreground power relationships.

Room B

### Pre-conference Workshop Number Two

#### **Inquiring into One's Own Teaching Practices**

Supported in part by a grant from the Spencer Foundation Practitioner Research: Communication and Mentoring Program

Emily van Zee, University of Maryland, College Park; Deborah Roberts, Montgomery County Public Schools; Lisa Gioe-Cordi, District 15, New York; Christopher Horne, Frederick County Public Schools, Maryland; Elaine V. Howes, Teachers College, Columbia; Victoria Hunt, New York Public School #165; Christine Klein, St. Louis Science Center; Gerald H. Krockover, Purdue University; Sharon Nichols, East Carolina University; Patricia Roy, Mount Rainier Elementary School

What are you curious about in your classroom? How might you explore those issues? What data sources might be relevant? How might you interpret these data? For what purposes? This workshop is for preK-12 teachers, college faculty, and informal science educators who are interested in inquiring into their own teaching practices. The purpose of the workshop is to learn and refine ways to interpret data gathered in one's own classroom. Participants will work in small groups with facilitators who have had some experience in researching while teaching. Participants are encouraged to bring data such as videoclips, copies of student work, reflective journals etc. to share and discuss in the small groups. The workshop will close with a whole group discussion of issues that emerge in this type of research. Participants will receive copies of facilitators' self-studies and relevant resources. Participants who are willing to present data for discussion should send a summary of the focus of your inquiry, your setting, description of data you plan to present, and questions you might ask other participants in helping you to develop interpretations of your data.

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12:30P–1:00P

LUNCH

Sunday, April 7th

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## NARST 2002 Annual Meeting

1:00P–2:00P	Concurrent Sessions	Sunday, April 7th
<b>1.01</b>		Room A
<i>Special Session</i>		
<u>JRST Editorial Workshop (Invited Session, Sunday April 7<sup>th</sup>, 1:00P–2:00P)</u>		
<b>Discussion, Suggestions and Ideas for Manuscript Reviewers</b>		
Organizers: Dale Baker and Michael Piburn, JRST Co-editors, Arizona State University		
<b>1.02</b>		Room B
<i>Strand 04: Teacher Education (In-service)</i>		
<u>Invited Session 103280 (Novel Format, Sunday April 7<sup>th</sup>, 1:00P–2:00P)</u>		
<b>Learning How to Do Research While Learning How to Teach</b>		
Deborah Roberts, Oak View Elementary School		
<b>1.03</b>		Room C
<i>Strand 01 Learning: Student Conceptions and Conceptual Change</i>		
<u>Proposals 101215, 101222, 103651, 105415, 104918 (Round Table, Sunday April 7<sup>th</sup>, 1:00P–2:00P)</u>		
<b>Using Models, Concept Maps, Thinking Tag Technology, and Other Strategies to Enhance Students' Learning</b>		
Designing Model Parachutes in an Elementary Classroom: What Counts as Authentic Learning? Brenda Gustafson & Dougal Macdonald, University of Alberta		
Fostering Socio-Ecological Awareness: Using Thinking Tag Technology to Explore Values and Ethics Susan Yoon, Earl Woodruff, Kimberley Mackinnon & Gail Andrews, University of Toronto		
Contribution of Conceptual Change Texts and Concept Mapping to Students' Understanding of Acid Base Ozlem Cakir, Esen Uzuntiryaki & Ömer Geban, Middle East Technical University		
Facilitating Conceptual Change in Electricity Using a Conceptual Change Strategy Ömer Geban, Gamze Sönmez & Hamide Ertepinar, Middle East Technical University		
Students' Alternative Conceptions in Osmosis: Is a Cognitive Structure Identifiable? Debra Panizzon & John Pegg, University of New England		
<b>1.04</b>		Room D
<i>Strand 02 Learning: Classroom Contexts and Learner Characteristics</i>		
<u>Proposal 105499 (Novel Format, Sunday April 7<sup>th</sup>, 1:00P–2:00P)</u>		
<b>Constructing a Firm Foundation for Science Teaching and Learning in Inclusive Settings: A Novel Format Discussion of Research on Students with Special Needs</b>		
Eric Pyle, West Virginia University		
Marcia Feters, Western Michigan University		
Dawn Pickard, Oakland University		
Saleh Al-Abdulkareem, West Virginia University		
<b>1.05</b>		Room E
<i>Strand 03: Teaching</i>		
<u>Proposal 106227 (Multiple Paper Session, Sunday April 7<sup>th</sup>, 1:00P–2:00P)</u>		
<b>Describing and Promoting Effective Science Teaching and Learning Within Systemic Reform Initiatives</b>		
Versions of Effective Science Teaching and Learning Within an Australian Systemic Reform Project		

## NARST 2002 Annual Meeting

Russell Tytler, Deakin University & Bruce Waldrip, Latrobe University

Improving Science and Mathematics Education in Germany

Reindeers Duit, Manfred Prenzel, Helmut Geiser & Christian Ostermeier, University of Kiel

Exploring the Characteristics of Effective Teaching and Learning: A Study of Primary Science Classrooms

Patricia Murphy & Marian Davidson, The Open University

### 1.06

Room F

*Strand 04: Teacher Education (Pre-service)*

Proposals 103112, 103161 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 1:00P–2:00P)

#### **Pre-Service Teacher Education Novel Formats**

Turkish Pre-Service Science Teachers' Understanding of Science, Self Efficacy Beliefs and Attitudes

Ceren Tekkaya, Jale Cakiroglu, & Ozlem Ozkan, Middle East Technical University

Learning to Teach Inquiry-Based Lessons by Co-Teaching, Peer Teaching and Conducting Research

John Guidibaldi & Issaou Gado, Kent State University

Mirror to the self: Research as a Tool for Self-study

Nelofer Halai, OISE, University of Toronto

### 1.07

Room G

*Strand 04: Teacher Education (In-service)*

Proposal 105996 (Symposium Format, Sunday April 7<sup>th</sup>, 1:00P–2:00P)

#### **An Analysis of Alternately and Traditionally Certified Beginning Science Teachers' Problems**

Ayhan Karaman, et al. Florida State University

### 1.08

Room H

*Strand 05: Curriculum, Evaluation and Assessment*

Proposal 101411 (Symposium Format Sunday April 7<sup>th</sup>, 1:00P–2:00P)

#### **Investigating the Influence of National Science Education Standards: A Framework for Research**

Iris Weiss, Horizon Research, Inc.

Karen Hollweg, National Research Council

James Gallagher, Michigan State University

### 1.09

Room J

*Strand 06: Cultural, Social and Gender Issues*

Proposal 104883 (Symposium Sunday April 7<sup>th</sup>, 1:00P–2:00P)

#### **Equity and Urban School Science: Possibilities and Challenges**

Tracey Otieno, Department of Chemistry

Catherine Milne, University of Pennsylvania

Katheryn Scantlebury, University of Delaware

Kenneth Tobin, University of Pennsylvania

Laurie Hazelwood, William Penn High School

### 1.10

Room K

*Strand 07: Educational Technology*

Proposals 100851, 101103, 102174, 102454 (Interactive Poster Session, Sunday April 7<sup>th</sup>, 1:00P–2:00P)

#### **Interactive Posters on Selected Educational Technologies I**

Learning About Thermal Physics in a Microprocessor Based Laboratory

## NARST 2002 Annual Meeting

David Russell, Queensland University Of Technology; Keith Lucas, Indiana University & Campbell McRobbie, Queensland University of Technology

Development of Effective Undergraduate On-Line Learning Communities  
Marcy Towns, Laura Slocum, Ball State University & Theresa Zielinski, Monmouth University

Formative Evaluation of the Design and Development of a Web-Based Biology Curriculum: Year 1 Findings  
Alec Bodzin, Lehigh University; Betsy Price, Westminster College; Ward Cates, Lehigh University; Brad Williamson, High School East & Neil Campbell, University Of California – Riverside

An Action Research Study: Investigating the Effective Use of Computer Probe-Ware in High School Biology  
Nanette Marcum-Dietrich, Unionville High School

### 1.11

Room L

*Strand 03: Teaching*

Proposal 105919 (Multiple Paper Set Sunday April 7<sup>th</sup>, 1:00P–2:00P)

#### **Social Engagement and Social Studies of Teacher Practice**

Discussant: Christine Cunningham, Tufts University

Investigating Inquiry: Challenges, Trials, and Tribulations of Teachers and Students

Michael Barnet, Indiana University

The Construction of Knowledge in Preservice Curriculum Design

Daniel Meyer, Cornell University

Building Science Education Communities of Practice

Leanne Avery, Nancy Trautmann & Marianne Krasney, Cornell University

Designing System Dualities: Characterizing Online Community

James MaKinster, Sasha Barab & Rebecca Scheckler, Indiana University

### 1.12

Room M

*Strand 09: Informal Learning*

Proposals 106857, 103854, 105898 (Paper Session Grouped by Committee Sunday April 7<sup>th</sup>, 1:00P–2:00P)

#### **Student Perceptions And Science Learning**

Evaluation of Media Reports: Why Don't Students Use What They Know about Scientific Research

Connie Korpan, University of Alberta

City Schools and Natural Areas: Lessons from an Urban Environmental Education Initiative

Charles Rop, University of Toledo

The Relationship Between Prior Experiences and Engagements in Learning

Helene Soerensen & Lars Oestergaard, The Danish University of Education

### 1.13

Room N

*Strand 10: College Science Teaching*

Proposal 101418 (Novel Formats Sunday April 7<sup>th</sup>, 1:00P–2:00P)

#### **Inquiry in Doubt? - Have Them Act It Out:**

#### **Science Pedagogy Derived from the Dramatic Arts**

Gretta Berghammer & Leslie Jones, University of Northern Iowa

### 1.14

Room P

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 106598, 104939, 105471, 104365 (Interactive Poster Session Sunday April 7<sup>th</sup>, 1:00P–2:00P)

## NARST 2002 Annual Meeting

### Interactive Posters

Young Childrens' Metaconceptual Thinking Patterns for Testing Hypotheses with Simple Variables  
Hye-Eun Chu & Moon-Nam Lee, Danook University & Hyun-Ju Park, Chosun University

The Role of Macroscopic, Sub-Microscopic and Symbolic Representations in Chemical Explanations  
David Treagust, Gail Chittleborough & Thapelo Mamiala, Curtin University of Technology

Concept Learning Through Issue-Based Instruction  
Fang-Ying Yang, National Taiwan Normal University

Concept Maps: A Qualitative Research Tool for Investigating Primary Students' Science Learning  
Jennifer Taylor, Queen's University at Kingston

### 1.15

Room Q

*Special Session*

Science Education (Invited Session Sunday April 7<sup>th</sup>, 1:00P–2:00P)

**From Submission to Publication: A Guide To Publishing In The Journal: *Science Education***

Nancy Brickhouse, Editor, *Science Education*

### 1.16

Room R

*Strand 03: Teaching*

Proposal 107088 (Symposium Sunday April 7<sup>th</sup>, 1:00P–2:00P)

**Action Research: Involving Classroom-Relationship Studies and Professional Development Studies**

Avi Hofstein & Rachel Mamlok, Weizmann Institute of Science; John Penick & Karen Dawkins, North Carolina State University; Maxwell Dass, Appalachian State University

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2:00P–2:30P

BREAK

Sunday, April 7th

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Exhibition Area

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2:30P–4:00P

Concurrent Sessions

Sunday, April 7th

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### 2.01

Room A

*Special Session*

ICASE/NARST IC Symposium 2002 (Invited Symposium, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

**International Science Teacher Education Policy: Supply, Demand and Teacher Quality**

Chairs: Robin Groves (President ICASE)  
Sharon Lynch (Chair, NARST IC), The George Washington University,

Panelists:

Saouma Boujaoude, American University of Beirut, Lebanon

Judy Dori, MIT, discussing Israel

Yoshisuke Kumano, Shizuoka University, Japan

Ling Liang, La Salle University (Philadelphia, PA), discussing , People's Republic of China

Martina Nieswandt, University of Toronto, discussing Germany

Peter Okebukola, National Universities Commission, Nigeria

Leonie Rennie, Curtin University of Technology, Australia

Norm Thompson, University of Georgia, US, discussing Kenya

Emmett Wright, Kansas State University, USA

Discussants:

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Pamela Fraser-Abder, New York University, USA  
Angelo Collins, Knowles Science Teaching Foundation, USA

### 2.02

Room B

*Strand 04: Teacher Education (In-service)*

Proposal 103280 (Novel Format, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

#### **Collaborative Inquiry about Collecting and Interpreting Data in One's Own Classroom**

Emily Van Zee, University of Maryland College Park  
Deborah Roberts, Montgomery County Public Schools

### 2.03

Room C

*Strand 05: Curriculum, Evaluation and Assessment*

Proposal 102020 (Symposium Format, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

#### **Implementing Earth Systems Education Curricula: An International Perspective**

Victor Mayer, The Ohio State University  
Sylke Hlawatsch, University Of Kiel  
Maskazu Goto, National Institute for Educational Policy, Japan  
Hyonyong Lee, The Ohio State University  
Chun-Yen Chang, National Taiwan Normal University  
Chris King, Keele University, England

### 2.04

Room D

*Strand 07: Educational Technology*

Proposal 106220 (Multiple Paper Set, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

#### **International perspectives on Web-based inquiry projects: WISE Partnerships**

A WISE Foundation: Researching the Impact of Inquiry and Technology on Students' Understandings of Science  
Douglas Clark, University of California, Berkeley

Implementing a Web-Based Curriculum in Science Classrooms: A Comparative Study of Teachers in Norway and the US  
Doris Jorde, University Of Oslo, Norway; Jim Slotta, University of California, Berkeley & Sonja Mork, Norwegian Science Teacher

Extending WISE to Norwegian Controversies: Can Wolves Find a Home in Norway?  
Wenche Erlien & Alex Strømme, The Norwegian University of Science and Technology; Doris Jorde, University of Oslo

Why WISE? Helping Physics Teachers to Use The Internet in a Different Way  
Roel Scheepens, University of Nijmegen, The Netherlands & Jim Slotta, University of California, Berkeley

### 2.05

Room E

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposal 103994 (Symposium, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

#### **The Laboratory in Science Education: Foundations for the 21<sup>st</sup> Century**

Vincent Lunetta, The Pennsylvania State University  
Avi Hofstein, The Weizmann Institute of Science  
Joseph Krajcik, The University of Michigan  
Kenneth Tobin, University of Pennsylvania

### 2.06

Room F

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*



## NARST 2002 Annual Meeting

Proposal 102657 (Multiple Paper Set, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

### **Video-Based Research on Teachers' and Students' Scripts in Physics Instruction**

Teaching Expertise and Teaching Scripts: Conditions for their Modification  
Reinders Duit, IPN At The University of Kiel

Teachers' Concepts and Teaching Strategies in Physics Instruction  
Helmut Fischler, Free University of Berlin

Patterns of Instruction in Physics Classrooms and its Implications for Students' Learning  
Hans Fischer, University of Dortmund

Constructivist Views of Teaching and Learning in Practice: Teachers' Views and Classroom Behaviour  
Tina Seidel, IPN At The University of Kiel

### **2.07**

Room G

*Strand 03: Teaching*

Proposal 103777 (Multiple Paper Session, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

### **Constructing Empowering Urban Science Education Practices: Stories from NYC Parents, Teachers, and Teacher Educators**

Collaborative Research for Success in Science with Urban English-Language Learners  
Angela Calabrese, Teachers College Columbia University

Urban Mothers Building Bridges Between School, Science, and Family  
Elaine Howes, Teachers College Columbia University

Teacher Stories and Beliefs about Science: A Life History, Narrative Inquiry Approach  
Sumi Hagiwara, Teachers College Columbia University

The Peace Corps Fellows in Urban Science Education Settings  
Maria Rivera Maulucci, NYC Public Schools & Keith Sheppard, Teachers College Columbia University

### **2.08**

Room H

*Strand 04: Teacher Education (Pre-service)*

Proposals 100935, 101082, 101754, 101334 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

### **Elementary Pre-Service Teachers: Beliefs and Efficacy**

Building Confidence in Pre-Service Science Teachers  
Joan Lindgren, Florida Atlantic University & Robert Bleicher, Indiana University

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Elementary Pre-Service Teachers' Beliefs about the Nature of Science and their Influence on Practice  
Patricia Bright & Larry Yore, University of Victoria

□

For Better or for Worse: The Impact of an Urban Site-Based Elementary Methods Course on Teacher Candidates  
Roberta Aram, Southwest Missouri State University

The Relationship between Teachers' Beliefs and the Science Teaching Environment of First-Year Elementary Teachers  
Annemarie Andersen, Robert Evans & Helene Sorensen, The Danish University Of Education

### **2.09**

Room J

*Strand 06: Cultural, Social and Gender Issues*

Proposal 104568 (Symposium, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

### **Professors, Protégés, Perspectives, and Practices: A Symposium on Mentoring New Faculty in Science Education**

## NARST 2002 Annual Meeting

Thomas Koballa, University of Georgia  
Mary Atwater, University of Georgia  
Malcolm Butler, University of Georgia  
Frank Crawley, East Carolina University  
Rhea Miles, East Carolina University  
Cheryl Mason, San Diego State University  
Donna Ross, San Diego State University  
Randy Yerrick, San Diego State University

### 2.10

Room K

*Strand 08: History, Philosophy and Epistemology*

Proposals 103749, 105800, 106682 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 2:30P-4:00P)

#### **Nature of Science and Teaching about Evolution**

Evolution: Differentiating between the Nature of Geology and Biology  
William Veal, The University of North Carolina At Chapel Hill

An Ordinal, Three-Dimensional Model for the Interaction of Evolution and Religion and its Application  
David Jackson, University Of Georgia

Exploring Relationships between Students' Facility with Natural Selection Based Explanations and their Ability to Adopt a Darwinian Perspective  
Sam Donovan, University of Wisconsin - Madison

### 2.11

Room L

*Strand 09: Informal Learning*

Proposal 102090 (Multiple Paper Set, Sunday April 7<sup>th</sup>, 2:30P-4:00P)

#### **Scientist-Teacher Partnerships: The NSF GK-12 Program In Action**

The NSF GK-12 Program in Hawaii: Ecology, Evolution, and Conservation Biology  
Donald Young, University of Hawaii

Case Studies from the Hawaii GK-12 Program  
Erin Baumgartner, University of Hawaii

Program Evaluation and Implications for the Practice of Informal Science  
Lorna Afaga, University of Hawaii

### 2.12

Room M

*Strand 10: College Science Teaching*

Proposals 106171, 105653 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 2:30P-4:00P)

#### **Selected Papers in College Science Teaching**

Improving Student Performance in Introductory College Biology and Chemistry using Conceptually-Based Models  
Nancy Romance, Florida Atlantic University ; Michael Vitale, East Carolina University; Geri Mayer, Jerry Haky & Robert Bleicher, Florida Atlantic University

A Longitudinal Study of the Effects of a LSC Project on Scientists' Teaching Practices and Beliefs  
Lena Ballone, Bowling Green State University; Charlene Czerniak, The University of Toledo & Jodi Haney, Bowling Green State University

### 2.13

Room N

## NARST 2002 Annual Meeting

*Strand 04: Teacher Education (In-service)*

Proposal 103231 (Multiple Paper Set, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

### **Science Co-Op: Addressing the Professional Development needs of Rural Elementary Teachers**

Modelling the Relationships of Classroom and Student Characteristics to Students' Achievement

James Shymansky, University Of Missouri - St. Louis; Larry Yore & John Anderson, University of Victoria

The Impact of Secondary-Elementary Partnerships on Teachers' Professional Development

Joanne Olson & Brian Hand, Iowa State University

De-Centralizing Profession Development -- Part I: Content and Effectiveness of ITV Sessions

Leonard Annetta & James Shymansky, University of Missouri - St. Louis

Decentralizing Professional Development—Part II: Delivering and Evaluating Multiple Summer Workshops

Susan Everett & Chai-Jung Chung, University of Iowa

### **2.14**

Room P

*Strand 05: Curriculum, Evaluation and Assessment*

Proposal 102832 (Symposium Format, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

### **Improving Effective Science Teaching and Learning in Australian Schools**

Annette Gough, Deakin University

Bruce Waldrip, La Trobe University

Russell Tytler, Deakin University

Geoff Beeson, Deakin University

Brian Sharpley, Deakin University

### **2.15**

Room Q

*Strand 04: Teacher Education (Pre-service)*

Proposal 102818 (Multiple Paper Set, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

### **A Program of Systemic Science Reform: P-16, Teacher Education, and In-Service Teacher Professional Development**

Interdepartmental Collaboration for Improvement of Science and Mathematics Instruction

Sharon Chambers, Gil Naizer, Keith West, & Glenda Love Bell, Texas A&M University-Commerce

The Effects of Inquiry-Based Science Learning by Pre-Service Teachers in an Integrated Science Course

Keith West & Glenda Love Bell, Texas A&M University-Commerce

Inquiry Science Professional Development Combined with a Science Summer Camp For Immediate Application

Gil Naizer & Glenda Love Bell, Texas A&M University-Commerce

A Professional Development Schools Model for an After-School Science Education Enhancement Program

Glenda Love Bell, Gil Naizer, Keith West, And Sharon Chambers, Texas A&M University-Commerce

### **2.16**

Room R

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposals 103518, 105954, 101446 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 2:30P–4:00P)

### **Reading, Writing and Learning Science**

Young Urban Children's Science Texts & Pictures: Emergent Understandings and Semiotic Representations

Maria Varelas & Christine Pappas, University Of Illinois At Chicago; Amy Rife, Alexander Hamilton Elementary School, Chicago; Anne Barry, Jungman Elementary School, Chicago

## NARST 2002 Annual Meeting

Writing in Science: Developing Learning Communities through the Publication of a Student Journal  
Isha Decoito & Maurice Digiuseppe, University of Toronto

Use of Popular Fiction and Nonfiction in Senior High Science Education  
Angela Morrow, University of Northern Colorado

\*\* additional paper?!

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4:00P–4:30P

BREAK

Sunday, April 7th

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Meet and dialogue with colleagues

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4:30P–6:00P

Concurrent Sessions

Sunday, April 7th

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### 3.01

Room A

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposal 104260 (Symposium, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **A Retrospective of Research on Students' Conceptions and its Applications in Educational Practice**

Peter Hewson, University of Wisconsin-Madison

Michael Beeth, The Ohio State University

Reinders Duit, University Of Kiel, Germany

Gertrude Hennessey, St. Ann's School, Stoughton, WI

Maria Jimenez-Aleixandre, University of Santiago De Compostela, Spain

### 3.02

Room B

*Strand 04: Teacher Education (In-service)*

Proposal 102412 (Symposium Format, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Quality Criteria for Teacher Education Practitioner Research**

Deborah Trumbull, Cornell University

John Loughran, Monash University

Amanda Berry, Monash University

Sandra Abell, University Of Missouri

Emily Van Zee, University of Maryland

### 3.03

Room C

*Strand 3: Teaching*

Proposal 104533 (Symposium, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Science Pedagogy for Our Children: Elementary Science Teaching in an Urban Elementary School**

Elaine Howes, Teachers College, Columbia University

Victoria Hunt, Teachers College, Columbia University and Public School 165

### 3.04

Room D

*Strand 03: Teaching*

Proposals 100858,102251, 100893 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Effective Teaching**

Cultivating Students Confidence in Learning to do Science through Dialogic Means

Benny Yung, University of Hong Kong & Kee Ping, Indiana University

Teaching and Assessing for Understanding: Managing the Accountability Dilemma

Adrienne Gibson, Cave Creek Unified School District

& John Wallace, Curtin University of Technology

## NARST 2002 Annual Meeting

Promoting Science Teachers' Development of Ideas about Guiding Student Investigations  
Ton Van Der Valk, Utrecht University; Harrie Broekman, Indiana University; Harrie Eijkelhof, Utrecht University

### 3.05

Room E

*Strand 04: Teacher Education (In-service)*

Proposals 100732, 104029, 104344, 104554, 106122 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Teachers' Re-framing Science Teaching as Reform-Based Instruction**

Daughters with Disabilities: Redesigning Science and Math Education for Girls with Disabilities  
Lynda Price, Temple University; Penny Hammrich, Indiana University & Graciela Slesaransky-Poe, Arcadia University

In Pursuit of Best Practice in Teaching

Etelvina Silva, Federal University of Vicosa & Jaya Earnest, Curtin University Of Technology

Teachers' Worldviews and Influences on Conceptions of Practice

Nancy Davis, Florida State University

The Perceptions and Experiences of Scientist-Science Teacher Teams in a Scientific Work Experience

Craig Wilson & Robert James, Texas A&M University

Pedagogical Awakenings: How Four Biology Teachers Came to Problematize Photosynthesis

Victoria Deneroff & William Sandoval, University of California, Los Angeles

### 3.06

Room F

*Strand 05: Curriculum, Evaluation and Assessment*

Proposal 103399 (Symposium Format, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Symposium on Leadership in Science Education: Where Will Our Future Leaders Come From?**

James Gallagher, Michigan State University

Charles Anderson, Michigan State University

Jane Butler Kahle, Miami University Of Ohio

Joellen Roseman, Project 2061, AAAS

Donald Duggan-Haas, Cornell University

### 3.07

Room G

*Strand 06: Cultural, Social and Gender Issues*

Proposal 104225 (Symposium, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Promoting Science and Literacy for Linguistically Diverse Elementary Students**

Okhee Lee, Julie Lambert, Aubrey Campbell, Peggy Cuevas, Rachael Deaktor, Juliet Hart, Marisela Ceballos, Emma Palomo & Susan Laurence, University of Miami

### 3.08

Room H

*Strand 07: Educational Technology*

Proposal 105429 (Multiple Paper Set, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Model-Based Teaching and Learning with Genetics Hypermodels**

Construction of Scientific Explanations in Introductory Genetics

Marie Bienkowski, Valerie Crawford, & Karen Hurst, SRI International

Classroom-Based Educational Research with Hypermodels

Mary Ann Christie, Concord Consortium

## NARST 2002 Annual Meeting

Scaffolding Model-Based Learning with Hypermodels  
Barbara Buckley, Janice Gobert & Paul Horwitz, Concord Consortium

Teachers' 'Technological' Pedagogy for using Hypermodels  
Joyce Schwartz & Mary Ann Christie, Concord Consortium

### 3.09

Room J

*Strand 08: History, Philosophy and Epistemology*

Proposals 102342, 104449, 104505 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Epistemological Issues in Science Education**

Toward a Research Agenda for Epistemological Studies in Science Education  
Gregory Kelly, University of California Santa Barbara & Richard Duschl, King's College London

From Reflection to Selection: Placing the "Standard Account" of Scientific Epistemology in Context  
John Rudolph, University of Wisconsin-Madison

Epistemological Assumptions and the New Face of Science Education  
Ali Sammel, University of Western Ontario & David Zandvliet, Simon Fraser University

### 3.10

Room K

*Strand 09: Informal Learning*

Proposal 106080 (Multiple Paper Set, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Latina Identity and Becoming a Scientist**

Crafting a Practice of Science in the Borderland: Stories of Hope, Empowerment, and Change  
Angela Barton Calabrese, Teachers College Columbia University

Creating Community-Based Science for Middle-School Urban Latinas  
Leslie Edwards, University of Colorado-Boulder

I Think Plants Can Feel Themselves Grow? and uses of the Imagination  
Cynthia Ballenger, Chèche Konnen Center, TERC

### 3.11

Room L

*Strand 10: College Science Teaching*

Proposal 106318 (Symposium, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Developing a Community of Inquiry**

Eleanor Abrams, University Of New Hampshire  
Roy Planalp, University Of New Hampshire  
John Tillotson, Syracuse University  
Karen Senge, Syracuse University  
Anneliese Mueller, University Of New Hampshire

### 3.12

Room M

*Strand 06: Cultural, Social and Gender Issues*

Proposals 100746, 102118, 104176, 103896 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Socio-Cultural Issues in the Early Childhood Setting**

The Sisters in Science Program: Barriers Broken and Lessons Learned  
Penny Hammrich, Temple University; Beverly Livingston, Indiana University; Greer Richardson, LaSalle University

## NARST 2002 Annual Meeting

Confronting the Strength of Elementary Students' Stereotypical Images of Scientists  
Gayle Buck & Diandra Leslie-Pelecky, University of Nebraska-Lincoln; Susan Kirby, Lincoln Public Schools

Listening to the Voices of Children: Promise Across Contexts, Across Cultures  
Richard Frazier, Central Missouri State University & Diana Beck, Knox College

Constructing Access to Science in Bilingual Elementary Classrooms  
John Reveles, Sabrina Tuyay & Gregory Kelly, University of California Santa Barbara

### 3.13

Room N

*Strand 05: Curriculum, Evaluation and Assessment*

Proposals 103819, 105660, 106738, 106759 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Selected Papers in Curriculum Evaluation and Assessment**

Using Project-Based Data in The Analysis of Television's Impact on Student Science Performance  
Fernando Espinoza, City University of New York

Development and Analysis of Environmental Issues Attitude Scale for 4th-8th Grade Students in Turkey  
Ozgul Yilmaz, William Boone & Hans Andersen, Indiana University

Teaching Science and School-Based Assessment in Sixth Grade Classrooms  
Sunethra Karunaratne, University of Peradeniya

Finding the Student Voice  
Chris Harrison, King's College London

### 3.14

Room P

*Strand 04: Teacher Education (In-service)*

Proposals 102272, 106367, 106941 105786, 107102 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

#### **Changing Knowledge and Beliefs in the Context of Partnerships**

Negotiating Expertise in Partnerships between Middle School Science Teachers and Graduate Fellows  
Tamara Nelson, University of Washington

Forming a Community of Science Educators through Multi-Channel Collaborations  
Regina Toolin, St. John's University & Peter Kindfield, Community School District 2

Partnerships between Science Teachers and Laboratory-Based Scientists: Delineating Best Practices  
Sandra Henderson, National Center for Atmospheric Research & Norman Lederman, Illinois Institute of Technology

Negotiating Necessary Science Content in Professional Development Experiences for Teachers  
Tom Thompson & Edith Gummer, Oregon State University

Teachers as Scientists: Three Professional Development Strategies  
Daniel Shepardson, Purdue University; Paul Adams, Fort Hays State University; Cheryl Shepherd-Adams, Hays High School & Gerald Krockover, Purdue University

### 3.15

Room Q

*Strand 07: Educational Technology*

Proposal 102755 (Symposium, Sunday April 7<sup>th</sup>, 4:30A–6:00P)

#### **New Technology-Supported Approaches to Science Learning and Teaching**

Kathleen Fisher, San Diego State University  
James Wandersee, Louisiana State University

## NARST 2002 Annual Meeting

Palma Longo, University of Massachusetts at Dartmouth

**3.16**

Room R

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposals 106703, 105016, 101558, 102370 (Paper Session Grouped by Committee, Sunday April 7<sup>th</sup>, 4:30P–6:00P)

### **Catering For Student Diversity**

Teaching Science Inquiry with Diverse Students

Mihye Won, Bertram Bruce & Margery Osborne, University of Illinois at Urbana-Champaign

Black Males' Self-Perceptions of Academic Ability and Gifted Potential in Advanced Science Classes

Barbara Rascoe, State University of New York At Buffalo

Constructing Dis/ability in Science

Wolff-Michael Roth, University Of Victoria

Understanding Student Learning Orientation: Problematizing a General Chemistry Classroom

Randall Spaid, Florida State University



## NARST 2002 Annual Meeting

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6:15P–7:15P

Orientation

Sunday, April 7th

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### **Mentor/Mentee Orientation**

Host: NARST Membership Committee, J. Randy McGinnis, Chair

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7:30P–8:30P

Receptions

Sunday, April 7th

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### **New Generation of Researchers' Reception**

Host: NARST Membership Committee,  
Guest Speaker: William G. Holliday, University of Maryland, College Park

### **Teacher as Researcher Reception**

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8:30P–10:30P

Social Event

Sunday, April 7th

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## **NARST Social and Poster Session**

### **Poster Sessions**

University Science Students as Facilitators of High School Inquiry-Based Learning (105268)  
Nancy Trautmann, Marianne Krasny, Leanne Avery & Christine Cunningham, Cornell University

Factors that Impede or Facilitate Implementation of the Washington Science Standards in a Kindergarten Curriculum (101621)  
Jose Rios, University Of Washington, Tacoma & Becky Buchanan, Jefferson Elementary School

An Elementary Teacher's Actions Research on Scaffolding Students in Talking Science (104358)  
Ya-Hui Lin & Wen-Hua Chang, National Taiwan Normal University

Design and Implementation of a Web-Based Environment to Support Biology Teacher Professional Development in Taiwan (103028)  
Kuo-Hua Wang, Shih-Chieh Huang, Wen-Hua Chang, Sua-Hua Lin & Shu-Wen Lee, National Changhua University Of Education

Curriculum Emphases Favored by High School Students in Taiwan (104001)  
Re-Ping Hu & Chen-Yung Lin, National Taiwan Normal University

Investigating Taiwanese High School Students' Scientific Literacy (104855)  
Chi-Chin Chin, Tunghai University; Hsiao-Lin Tuan, National Changhua University of Education; Chih-How Chen, Tunghai University

Exploring the Relations between Elementary Teachers' Role and their Perceptions Toward Assessment  
Shyang-Horng Shieh & Hsiao-Lin Tuan, National Changhua University of Education (104946)

An Analyses of Products and Processes of Students' Concept Mapping: Indicators of its use as an Assessment Tool for Science Service-Learning Experience (106276)  
Pamela Nagasawa, Mark Windschitl & Debbie Wiegand, University of Washington

Novel Discussion Section Activities for First-Year Chemistry Majors (100760)  
Jessica King, Illinois State University; William Hunter, Indiana University & Lisa Szczepura, Illinois State University

Collaboration on Doctoral Studies between South Africa and the United States (102524)  
Matthew Curtis & Peter Hewson, University of Wisconsin-Madison

Multicultural Science Classrooms: Attitudes, Self-Efficacy and Learning Environment Perceptions (103497)

## NARST 2002 Annual Meeting

Jill Aldridge & Barry Fraser, Curtin University of Technology

Drawing on the Voices of a Community to Create a Sustainable Science Education Future (103714)  
Sherry Nichols, East Carolina University

Navajo Parent Voices: Catalyst for Change (103763)  
Rebecca Monhardt, Utah State University

Preparing for Urban Science Classrooms by Community Immersion, Coteaching, and Cogenerative Dialogue (105863)  
Becky Ashe, West High School; Leslie Suters, Sherri Brown & Claudia Melear, University of Tennessee

The Science Teacher Website (104141)  
Mick Nott, Sheffield Hallam University

Museums and Systemic Reform: Exploring the Potential of a Large Scale Partnership (105625)  
Steven Rogg, Illinois Mathematics and Science Academy

Interpreting the Culture of Resistance to Biological Evolution (101145)  
Leslie Jones, University of Northern Iowa

Using a Computer Simulation to Teach Science Process Skills to College Biology Students (102153)  
Aimee Lee, Rosalina Hairston & Alan Niven, University of Southern Mississippi, Sherry Herron, Biological Sciences Curriculum Study

The Impact of Constructivist Teaching on Students' Perceptions of Teaching And Learning (104085)  
Wheijen Chang, Feng-Chia University

Moving Towards Change: A Qualitative Look at an Introductory Biology Lab (105436)  
Catherine Chen & Cristi Saylor, California State University, Long Beach

Putting Science in The Tool Pouch: Cognitive Apprenticeship and the Construction Trades (105646)  
Racca Ruggero, G. Michael Bowen, & Wolff-Michael Roth, University of Victoria

Developing a Learning unit on the Science-Technology-Environment-Peace-Society Approach (STEPS): Students' Cognitive Achievements and Attitudes toward Peace  
Mahmood Khalel, Technion, Israel

**NARST 2002 Annual Meeting**

**Monday April 8<sup>th</sup>, 2002**

**DAY AT A GLANCE**

<b>Session</b>	<b>Room</b>	<b>Time</b>
Cont. Breakfast For Com. Members	Foyer	6:45A-7:30A
12 Committee Meetings	Breakout Rooms	7:00A-8:15A
16 Concurrent Sessions.	Rooms listed in schedule	8:30A-10:00A
Break	Exhibition Area	10:00A-10:30A
Plenary Session #1	Rooms listed in schedule	10:30A-12P
Lunch	Ballroom	12:00P-1:00P
16 Concurrent Sessions	Rooms listed in schedule	1:00P-2:30P
Break	Foyer	2:30P-3:00P
16 Concurrent Sessions	Rooms listed in schedule	3:00P-4:00P
Break	Exhibition Area	4:00P-5:00P
Business Meeting	Boardroom	5:00P-6:00P
Past Pres., Etc. Reception	Ballroom	7:00P-8:30P
Social (FARSE & Boomers)	Ballroom	8:00P-Midnight

## NARST 2002 Annual Meeting

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7:00A–8:15A	Committee Meetings	Monday, April 8th
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Continental breakfast for committee members

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8:30A–10:00A	Concurrent Sessions	Monday, April 8th
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**4.01** Room A

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 104078, 101957, 100662, 100809 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

**Improving Students' Learning: Chemistry**

New Resources for Educational Enrichment: How a Non-Conventional Research Source Revealed Crucial Learning

Difficulties in The Israeli Chemistry Curriculum

Nirit Glazer, University Of Michigan; Avi Hofstein & Ziva Dov, The Weizmann Institute of Science

Students' Understanding of Acid, Base and Salt Reactions in Qualitative Analysis

Daniel Tan, Ngoh Goh & Lian Chia, National Institute of Education, Singapore & David Treagust, Curtin University of Technology

Relationships Between Selective Cognitive Variables and Students' Ability to Solve Chemistry Problems

Saouma Boujaoude, American University Of Beirut; Sara Salloum & Fouad Abd-El-Khalick, University of Illinois at Urbana Champaign

Investigating Students' Learning about Gases & Kinetic Theory Using Microcomputer-Based Labs (MBL)

Campbell McRobbie, Queensland University of Technology & Gregory Thomas, Indiana University

**4.02** Room B

*Strand 04: Teacher Education (In-service)*

Proposals 101852, 100984, 105982 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

**Action Research Strategies For Enhancing Praxis**

Enhancing STSE Praxis Through Action Research

Erminia Pedretti, Maurice Digioseppe, John Benze, Isha De Coito & Derek Hodson, University of Toronto

Teachers Journal Club: Bridging between the Dynamics of Biological Discoveries and the Biology Teachers

Anat Yarden, Weizmann Institute of Science, Gilat Brill, Indiana University & Hedda Falk, Weizmann Institute of Science

Formative Assessment Action Research: A Study of Teacher Learning by using Technology

Allan Feldman & Brenda Capobianco, University of Massachusetts

**4.03** Room C

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposal 103070 (Multiple Paper Set, Monday April 8<sup>th</sup>, 8:30A–10:00A)

**Argument In School Science**

Discussion and Argumentation in Elementary Science, Using Concept Cartoons as a Stimulus

Stuart Naylor, Brenda Keogh & Bee Downing, Manchester Metropolitan University

Enhancing the Quality of Argument in School Science

Shirley Simon, Institute Of Education; Sibel Erduran & Jonathan Osborne, King's College London

Scaffolding and Assessing Argumentation Processes in Science

## NARST 2002 Annual Meeting

Richard Duschl & Kirsten Ellenbogen, King's College London

### 4.04

Room D

*Strand 03: Teaching*

Proposal 101915 (Symposium, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **Dilemmas on Science Teaching: Perspective on Problems of Practice Symposium**

William Louden, Edith Cowan University

Vaile Dawson, Murdoch University

Norman Lederman, Illinois Institute Of Technology

Ken Tobin, University Of Pennsylvania

Catherine Milne, University Of Pennsylvania

Cathleen Loving, Texas A&M University

Noel Gough, Deakin University

### 4.05

Room E

*Strand 04: Teacher Education (Pre-service)*

Proposals 105940, 102391, 105394, 106332 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **Innovative Science Teacher Education Programs and Processes**

Interacting with Multimedia Cases: An Innovative Approach to Science Teacher Preparation

Jim Hewitt, Erminia Pedretti, & Larry Bencze, University of Toronto

Web-Based Portfolios within an Innovative Context: A Multifaceted Approach to Science Teacher Learning

Lucy Avraamidou & Carla Zembal-Saul, The Pennsylvania State University

Developmentally Responsive Curriculum to Promote Analytical Practice In Science Teacher Preparation

Gail Richmond & Charles Anderson, Michigan State University

Science Teacher Education for Student Enlightenment and Empowerment: Interwoven Procedural and Pedagogic Apprenticeships

John Bencze, University of Toronto & G. Michael Bowen, Lakehead University

### 4.06

Room F

*Strand 04: Teacher Education (In-service)*

Proposals 105359, 105961, 102475, 103672 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **Development of Teachers' Identities and Beliefs**

Teaching Portfolios, Reflection and Change in Novice Science Teachers

Margaret Doty, Teachers College, Columbia University

Development in the Self-Related Understandings of In-Service Teachers

Elizabeth Hancock & Alejandro Gallard, Florida State University

Teacher Development Through Collaborative Inquiry: Primary Teachers Enhance Their Practical Knowledge

Karen Goodnough, University of New Brunswick

High School and College Chemistry Teachers: Belief Systems That Influence Pedagogies

Barbara Short & William Hunter, Illinois State University

### 4.07

Room G

*Strand 05: Curriculum, Evaluation and Assessment*

Proposals 101327, 101831, 104428, 104652, 104337 (Paper Session Grouped by Committee, Mon. April 8<sup>th</sup>, 8:30A–10:00A)

## NARST 2002 Annual Meeting

### Assessment: Instrument Development and Implementation

The Evaluation of an Alabama In-Service and Outreach Program: Preliminary Findings  
Kimberly Lott, Auburn University

Development of Test-Items to Assess Students' Progress in Understanding the Nature of Science  
Eun Ah Lee & Seung Urn, Seoul National University, Korea

The Development of a Quantum Mechanics Visualization Instrument  
Erdat Cataloglu, Richard Robinett & Vincent Lunetta, The Pennsylvania State University

WYTIWYT Or It Had Better Be: Validity Issues in Science Classroom Assessment  
Edith Gummer, Oregon State University

Impact of Model-Centered Instruction on Student Learning  
Kalyani Raghavan, Mary Sartoris & Corinne Zimmerman, University of Pittsburgh

### 4.08

Room H

*Strand 06: Cultural, Social and Gender Issues*

Proposals 102293, 102608, 103504, 104267 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **Cultural Perspectives Influencing the Practice of Teaching**

Beginning Science Teachers' Successes and Struggles in Teaching Toward Equity  
Julie Bianchini, University Of California, Santa Barbara

Cultural Orientations and Science Teaching-Learning Process in a Japanese Elementary School  
Christiana Omoifo & Masakata Ogawa, Hiroshima University, Japan

Dilemmas Faced by Science Teachers Involved in Education Reform in a Transitional Society: A Case Study of Rwanda  
Jaya Earnest & David Treagust, Curtin University Of Technology

Elementary Science Educators as Pedagogy Experts in a Post-Secondary Science Education Reform Project  
Kathleen Davis, University Of Massachusetts

### 4.09

Room J

*Strand 03: Teaching*

Proposal 104526 (Symposium, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **Making Sense of Environmental Education in the Science Curriculum: Inside Stories**

Paul Hart, University of Regina

Kathy Nolan, University of Regina

Alison Sammel, University of Western Ontario

David Zandvliet, Simon Fraser University

### 4.10

Room K

*Strand 08: History, Philosophy and Epistemology*

Proposals 100634, 104540, 105478 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **K-12 Student Views and Learning about Nature of Science**

A Study of a Fourth Grade Teacher's Efforts to Teach Nature of Science  
Valarie Akerson, Indiana University, Fouad Abd-El-Khalick, University Of Illinois At Urbana-Champaign  
& Tina Banning, Prosser Heights Elementary School

The Role of NOS In Scientific Literacy: An Evaluation of the Science Learning Rationale  
Brian Cochrane, Rockhurst University

## NARST 2002 Annual Meeting

The Development of Conceptions of the Nature of Scientific Knowledge and Knowing in the Middle and High School Years:  
A Cross-Sectional Study  
Fouad Abd-El-Khalick, University of Illinois At Urbana-Champaign

### 4.11

Room L

*Strand 09: Informal Learning*

Proposals 104442, 104666, 101453 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **Scientific Meaning Making and Choice within Informal Environments**

Multiple Perspectives on Scientific Meaning Making in Informal Environments

Doris Ash, University of California, Santa Cruz; Kirsten Ellenbogen, King's College London; Maureen Callanan, University of California, Santa Cruz; Dirk Vom Lehn & Jonathan Osborne, King's College London

A Multi-Factor Investigation of Variables Affecting Free-Choice Science Learning

John Falk & Martin Storksdieck, Institute for Learning Innovation

The Impact of Multi-Visit Museum Programs on Young Children's Learning

David Anderson, Barbara Piscitelli, Michele Everett & Katrina Weier, Queensland University of Technology

### 4.12

Room M

*Strand 10: College Science Teaching*

Proposals 106423, 104995, 101761, 104295 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **The Role of Inquiry and Active Learning in College Science Courses I**

University and Community College Science Educators Join Together: Integrating Active Learning and Pedagogy

Donna Ross & Jeanne Weidner, San Diego State University

Teachers And Inquiry: Learning About Chemistry Through Inquiry

Sarah Lavan, Eugenia Koo & Catherine Milne, University of Pennsylvania

Three Summers of Authentic Earth Science Research: Implications for Teaching and Learning

Olga Jarrett & Pamela Burnley, Georgia State University

Inquiry and Technology in a Non-Majors Biology Laboratory

Phyllis Laine & Cynthia Geer, Xavier University

### 4.13

Room N

*Strand 04: Teacher Education (Pre-service)*

Proposals 105604, 106003, 102727, 106486 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **Learning to Teach Science through Field Experiences**

Student Teachers' Perspectives of their Co-Teaching/Co-Coaching Experiences

Susan Potter, Acadia University; G. Michael Bowen, Lakehead University & Wolff-Michael Roth, University Of Victoria

The First Year of Elementary Science Teaching: Participants' Perspectives on a "Best Case" Scenario

Deborah Smith, Woodcreek Elementary Science, Math and Technology Magnet School; Shinho Jang, Michigan State University; R. Smith, Lansing School District; Sara Latterman, Denver Public Schools & Juana Gonzalez, Red Cedar Elementary School

A Comparison Between Student Teaching in the United Kingdom and in the United States

Julie Westerlund, Southwest Texas State University; Kerry Ferguson, North Mesquite High School & Elissa Quintero, Bastrop Middle School

## NARST 2002 Annual Meeting

Using a Science Museum to Mitigate Pre-Service Teachers' Resistance to Inquiry  
Barbara Spector & Ruth Burkett, University of South Florida

### 4.14

Room P

*Strand 05: Curriculum, Evaluation and Assessment*

Proposals 105492, 105681, 106402, 103147, 100830 (Paper Session Grouped by Committee, Mon. April 8<sup>th</sup>, 8:30A–10:00A)

#### **Assessment of Teacher and Community Programs**

A Rationale for Improving School Reform by Expanding Time for Science Teaching: Implications and Opportunities for Changing Curricular Policy and Practice in Elementary Schools

Michael Vitale, East Carolina University; Nancy Romance & Megan Dolan, Florida Atlantic University

A Study of the Effectiveness of a Preservice Teacher Evaluation Scheme

Sevinc Ongel, Yesim Capa & Paul Vellom, The Ohio State University

Critical Pedagogy and Inclusive Parent Programs: An Evaluation and Analysis of the Life Program

Sumi Hagiwara-Gupta, Angela Calabrese-Barton & Isobel Contento, Teachers College, Columbia University

Teaching to the Test: Teacher Dilemmas and Classroom Culture in the Environment of Testing

James Spellman, University Of Georgia

The Uses of Teacher-Written Cases in the Maryland Collaborative for Teacher Preparation

Randy McGinnis, University of Maryland, College Park

### 4.15

Room Q

*Strand 06: Cultural, Social and Gender Issues*

Proposals 102188, 102888, 101726, 104218 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **The Impact of Language on Culturally Diverse Students**

Learning the Language of Science: A Case Study of Second Language Learning in a Science Classroom

Elizabeth Franklin, University Of Northern Colorado & Gayle Buck, University of Nebraska-Lincoln

The Influence of Language on Eight Seventh and Eighth Grade Latinas' Science Classroom Experiences

Carolyn Parker, University of Maryland Baltimore County

Concept Mapping as a Method for Detecting Changes in Student Teachers' Conceptions

Richard Pomeroy, University of California, Davis

Instructional Intervention To Promote Science And Literacy For Linguistically Diverse Elementary Students

Okhee Lee, Aubrey Campbell, Peggy Cuevas, Rachael Deaktor & Juliet Hart, University of Miami

### 4.16

Room R

*Strand 10: College Science Teaching*

Proposals 104743, 103931, 103385 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 8:30A–10:00A)

#### **The Nature of Science in College Science Courses**

College Students' Views of the Nature of Science in Three General Education Courses

Josepha Kurdziel, University of Arizona

Effects of Changing College Level Science Courses to Reflect the National Science Standards on Undergraduates Science Knowledge: The Nature of Science

Dennis Sunal, Cynthia Sunal & Cheryl Sundberg, The University of Alabama; Mike Odell, University of Idaho; Jeanelle Bland, Eastern Connecticut University



## NARST 2002 Annual Meeting

Learning about the Nature of Science: An Explicit Instructional Approach for Freshman College Science Courses  
Lisa Kenyon, Texas A&M University at Galveston & Eugene Chiappetta, University of Houston

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10:00A–10:30A	BREAK	Monday, April 8th
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Meet and dialogue with colleagues

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10:30A–12:00P	Plenary	Monday, April 8th
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Plenary Session Number One: Marilyn Cochran-Smith, Boston College

### Research and Teacher Education: Making the Connection

In this keynote address, Marilyn Cochran-Smith will suggest that part of the current heightened attention to teacher quality and teacher preparation has to do with the perceived connection or lack of connection between research evidence and teacher education. Cochran-Smith will identify several major ways in which various political and professional groups are demanding and/or working toward a research basis for teacher education. Drawing on recent public policy documents, research studies, and government reports, she will sort out some of the different underlying assumptions of these differing approaches, identifying major initiatives in each area and discussing the implications for teacher education programs, research, and practice.

Marilyn Cochran-Smith is Professor of Education and Director of the Doctoral Program in Curriculum and Instruction at Boston College. An active researcher and participant in the national and international teacher education community, Cochran-Smith is immediate past Vice President of the American Educational Research Association (AERA) for Division K (Teaching and Teacher Education) and is the editor of *The Journal of Teacher Education*. Dr. Cochran-Smith is Chair of the AERA Publications Committee and serves on the editorial boards of several journals. Dr. Cochran-Smith is also a member of the advisory board for the Carnegie Foundation's program to document the scholarship of teaching and learning by K-12 teachers and teacher educators. She is co-chair of AERA's National Consensus Panel on Teacher Education, and is a member of the National Academy of Education's Committee on Teacher Education. Dr. Cochran-Smith has written award-winning articles and books on issues of diversity in teaching and teacher education as well as on teacher research in preservice education and professional development. Several of her recent publications, including those in *Teaching and Teacher Education*, *Educational Researcher*, and the *Educational Policy Analysis Archives* focus on outcomes and research evidence in teacher education as well as on competing agendas for teacher education reform.

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12:00P–1:00P	LUNCH	Monday, April 8th
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Editorial Board Luncheon, International Journal of Science Education (IJSE)  
(sponsored by Taylor and Francis Limited)

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1:00P–2:30P	Concurrent Sessions	Monday, April 8th
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#### 5.01

Room A

*Strand 04: Teacher Education (In-service)*

Proposals 105107, 106962, 106976, 101439, 107046 (Paper Session Grouped by Committee, Mon. April 8<sup>th</sup>, 1:00P–2:30P)

#### Researching Curriculum Implementation

Stories of Teaching Biotechnology: A Case Study of Volitional Curriculum Implementation

Susan Courson, Clarion University of Pennsylvania & Carla Zembal-Saul, The Pennsylvania State University

Issue-Oriented Elementary Science Leadership

## NARST 2002 Annual Meeting

Marcelle Siegel & Marlene Their, University of California At Berkeley  
Determining and Meeting the Perceived Instructional Needs of the Lateral Entry Science Teacher  
Grant Holley & Jack Wheatley, North Carolina State University

Using Research as a Lever For Action: The Earth Science Education Unit Experience in the UK  
Chris King, Keele University

Studies of Professional Development in Science and Mathematics Teaching: Nine Years of Curriculum in Taiwan  
Chorng-Jee Guo & Huey-Por Chang, National Changhua University of Education; Hsiu-Yueh Hsieh, National Tainan Teachers' College & Ru-Fen Yau, National Changhua University of Education

### 5.02

Room B

*Strand 04: Teacher Education (Pre-service)*

Proposals 104099, 106045, 106129, 106108 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Learning to Teach Science as Inquiry**

Laboratory Model for the Preparation of Future Science Teachers: A Situated Cognition Approach  
Aldrin Sweeney & Jeffrey Paradis, University of Central Florida

Pedagogical Content Knowledge in Implementing Inquiry: Expanding the Definition  
Janet Robinson, University of Kansas

Learning to Teach Physics through Inquiry: The Lived Experience of the Graduate Teaching Assistant  
Mark Volkman, University of Missouri & Marta Zgagacz, Purdue University

Scientific Research Experiences: Pre-Service Teachers' Ideas on Science and Teaching  
Penny Gilmer, Florida State University

### 5.03

Room C

*Strand 05: Curriculum, Evaluation and Assessment*

Proposal 102874 (Multiple Paper Set, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Greening the Curriculum: Bill Stapp's Ongoing Contribution to Meaningful Science Education**

Bill Stapp's Outstanding Contribution to Environmental and Science Education  
Arjen Wals, Wageningen University, The Netherlands

The Evolution of a Green Program in the US/Mexico Rio Grande Watershed  
Lisa Larocque, Project Del Rio, Las Cruces, NM, USA

G.R.E.E.N.: A Comparative Case Study of Watershed Education in Australia, South Africa, the US & Korea  
Karen Garfinkle, International Comparative Education, Stanford University, US

G.R.E.E.N. In Europe - Alive and Kicking  
Ulrich Bosler & Juergen Lehmann, Institute for Science Education, Germany; Kelly Teamey, King's College London

### 5.04

Room D

*Strand 06: Cultural, Social and Gender Issues*

Proposal 106304 (Symposium 90, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Exploring Sociocultural Tensions in Science Education through Narrative Research**

Diana Welty-Guerrero, East Carolina University

Sharon Nichols, East Carolina University

James Calkin, University of Georgia

Lorie Hammond, California State University-Sacramento

Jo Anne Ollerenshaw, University of Nebraska-Lincoln

## NARST 2002 Annual Meeting

5.05

Room E

*Strand 10: College Science Teaching*

Proposals 105275, 105758, 104841, 103014 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 1:00P–2:30P)

### **The Role of Technological & Representational Tools & Mental Models in College Science Courses**

Understanding Photosynthesis: Comparing Traditional and Technology Rich Inquiry Activities  
Robert Kuech, University Of Southern Maine & Gregg Zogg, University Of New England

Multiple Representations and their Role in Solving Ideal Gas Problems  
Sean Madden, Frontier Academy & Loretta Jones, University Of Northern Colorado

Constraints to the Development of First Year University Chemistry Students' Mental Models  
Gail Chittleborough, David Treagust & Mauro Mocerino, Curtin University of Technology

Integrating Information and Communication Technologies (ICT) in College Science Teaching  
Lina Macchiusi & Geoff Giddings, Curtin University of Technology

5.06

Room F

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposal 103546 (Multiple Paper Set, Monday April 8<sup>th</sup>, 1:00P–2:30P)

### **Improving Science Literacy through the use of Writing-To-Learn Strategies**

Learning to Write Like Scientists  
Carolyn Wallace, University Of Georgia

Roles of Hands-On Activities, Discussion, Reading and Writing in Constructing Biology Knowledge  
Marilyn Florence & Larry Yore, University Of Victoria

Effect of Multiple Writing Tasks on Year 10 Biotechnology Students' Understandings  
Carolyn Wallace, University Of Georgia & Brian Hand, Iowa State University

Using Writing-To-Learn Strategies: Improving Year 11 Students' Understandings of Stoichiometry  
Brian Hand, Liesl Hohenshell, Vaughn Prain & Eun-Mi Yang, Iowa State University

5.07

Room G

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposal 103098 (Multiple Paper Set, Monday April 8<sup>th</sup>, 1:00P–2:30P)

### **Evidence Based Practice in Science Education (EPSE)**

Using Diagnostic Assessment to Improve Students' Learning in Science  
Robin Millar & Vicky Hames, University of York,

Teaching Students 'Ideas-About-Science': Case Studies from the Classroom  
Jonathon Osbourne, King's College London; Mary Ratcliffe, University of Southampton & Hannah Bartholomew, King's College London

Evidence Based Practice in Science Education: Understanding the Researcher-User Interface  
Mary Ratcliffe, University of Southampton; Hannah Bartholomew, King's College London; Vicky Hames, University of York; Andy Hind & John Leach, University of Leeds; Robin Millar, University of York; Jonathon Osbourne, King's College London

5.08

Room H

## NARST 2002 Annual Meeting

### *Strand 03: Teaching*

Proposal 106514 (Symposium, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Urban Science Education as a Socially Transformative Force**

Sonya Martin, Cristobal Carambo, Anita Abraham, Linda Loman, & Rowhea Elmesky, University of Pennsylvania

### **5.09**

Room J

### *Strand 04: Teacher Education (Pre-service)*

Proposals 102517, 106143, 101012, 104610 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Sociological Perspectives in/on Teaching Science**

Teaching Socio-Scientific Issues in Classrooms

Virginie Albe & Laurence Simonneaux, ENFA

STS for Pre-Service Teachers: Does it Translate in the Classroom?

Janice Meyer, The University of Texas at Austin & Robert James, Texas A&M University

Novice Science Teachers' Understanding of the Nature of Science: An Action Research Project

Lawrence Scharmann, Kansas State University; Mike Smith, Indiana University & Mark James, Kansas State University

Knowing Eclipses (and) Eclipsing Knowing: Preservice Teachers' Experiences of Knowing (in) Science

Kathleen Nolan, University Of Regina

### **5.10**

Room K

### *Strand 05: Curriculum, Evaluation and Assessment*

Proposals 101460, 102062, 102468, 103322, 103861, (Interactive Poster Session, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Interactions between Student Outcomes and Curriculum I**

The Earth as System: A Topic for Integrated Science Education

Manfred Lang, IPN

Adapting Innovative Curriculum to Local Needs – An International Perspective

Rachel Mamlok, Weizmann Institute of Science; Charles Dershimer, David Fortus & Ron Marx, University of Michigan

Personal and Emotional Aspects of Change in a Science Education Reform Effort

Heidi Barker, University Of Colorado At Denver & Michalinos Zembylas, Michigan State University

Developing Scoring Rubrics for Elementary Science Portfolios and the Reliability of the Rubrics

Chan-Jong Kim & Mi Aee Choi, Chongju National University of Education; Seung-Urn Choe, Seoul National University

Teachers' Perceptions of the Washington State Essential Academic Learning Requirements in Science

Jose Rios, University Of Washington, Tacoma

### **5.11**

Room L

### *Strand 06: Cultural, Social and Gender Issues*

Proposal 101866 (Symposium, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Urban Science Education: Issues, Answers and Measures**

Janice Morrison, Friends School of Baltimore

Louis Rosenblatt, Park School; Co-Director, TIES

Jane Butler Kahle, Miami University of Ohio

Robert Yager, University of Iowa

Kenneth Tobin, University of Pennsylvania

### **5.12**

Room M

## NARST 2002 Annual Meeting

### *Strand 07: Educational Technology*

Proposals 106787, 100956, 103728, 101880 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Learning Environments and Technology**

Designing a Networked Sharing Construction Environment  
Sunny Lin, National Chiao Tung University & Chuen-Tsai Sun

Touching Viruses: The Impact of Haptic Experiences on Students' Attitudes and Concepts  
Gail Jones, University of North Carolina at Chapel Hill; Thomas Andre, Iowa State University; Dennis Kubasko, Russell Taylor & Richard Superfine, University of North Carolina at Chapel Hill

How Students Use Scientific Instruments to Create Understanding: CCD Spectrophotometers  
Eric Malina & Mary Nakhleh, Purdue University

Brain and Behaviour Goes Interactive: A CD-ROM and LAN Based Learning Resource for Neuroanatomy Students  
Joyce Nyhof-Young, Clinton Hunter, Liron Walsh, Nicole Nathan & Patricia Stewart, University Of Toronto

### **5.13**

Room N

#### *Strand 08: History, Philosophy and Epistemology*

Proposal 105366 (Symposium, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **International Perspectives on Research in Nature of Science: Finding Common Ground?**

Renee Schwartz, Oregon State University  
Norman Lederman, Illinois Institute of Technology  
Peter Dekkers, University of the North, South Africa  
Shiang-Yao Liu, Oregon State University  
Rola Khishfe, Illinois Institute of Technology  
Randy Bell, University of Virginia  
Fouad Abd-El-Khalick, University of Illinois

### **5.14**

Room P

#### *Strand 09: Informal Learning*

Proposals 104876, 102503, 103294, 103308 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Collaboration, Museums and Science Literacy**

Collaboration Among Formal/Informal Educators to Promote Science Literacy for Middle School Students  
Carmia Feldman, UC, Davis; Susan O'Hara, California State University, Sacramento; Maureen McMahon, California State University, Long Beach; Joyce Gutstein & Kandace Knudson, University of California, Davis

Giving Them What They Want: Factors Influencing the Development of a New Museum Outreach Program  
James Kisiel, Natural History Museum of Los Angeles County

Staff Perceptions of a Museum's Role in Communicating Science  
Léonie Rennie & Gina Williams-Pearse, Curtin University of Technology

Where's the Science?: Understanding the Form and Function of Workplace Science  
Peter Chin, Hugh Munby & Nancy Hutchinson, Queen's University

### **5.15**

Room Q

#### *Strand 10: College Science Teaching*

Proposals 102860, 101600, 101908, 102846 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **The Role of Diversity and Classroom Interactions in College Science Courses**

Science Classroom Environments and Associations with School Racial Diversity and Socio-Economic Status

## NARST 2002 Annual Meeting

Eric Bull, Los Arboles School; Darrell Fisher, Curtin University of Technology & Tony Rickards, The University of Western Australia

Science Student Identity Formation among High-Achieving Women of Color  
Angela Johnson, University of Colorado

An Application of the Questionnaire on Teacher Interaction and College and University Classroom Environment Inventory in a Multicultural Tertiary Context

Richard Coll, The University of Waikato; Neil Taylor, The University of Leicester; Darrell Fisher, Curtin University of Technology & Sadaquat Ali, The University of The South Pacific

A Multi-Level Model of Science Classroom Interactions

Darrell Fisher, Curtin University of Technology; Tony Rickards, The University of Western Australia & Michael Newby, California State University

### 5.16

Room R

*Strand 10: College Science Teaching*

Proposals 105751, 105702, 104694, 100942 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 1:00P–2:30P)

#### **Teaching and Learning in College Biology Courses**

Influences on Biology Students' Acceptance of Evolution

Julie Mayne & Georgianna Saunders, Southwest Missouri State University

Student Engagement and Performance in an Introductory Biology Course that Emphasizes Active Learning

William Hoese, California Statue University, Fullerton & Stacey Weiss, Arizona State University

College Students' Beliefs, Alternate Conceptions, and Understanding of the Theory of Common Descent

Joyce Miller, Mount Vernon Nazarene College

Designing College Curriculum to Improve Learning in Chemistry & Biology

Robert Bleicher, Nancy Romance, Jerome Haky, Charles Carraher & Randy Brooks, Florida Atlantic University

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2:30P–3:00P

BREAK

Monday, April 8th

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Exhibition Area

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3:00P–4:00P

Concurrent Sessions

Monday, April 8th

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### 6.01

Room A

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 105688, 101047 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **The Effect of Micro and Macro Systemic Change on Students' Learning of Science**

A Study of the Effects of a Local Systemic Change Program on Student Achievement

Charlene Czerniak, The University of Toledo & Jodi Haney, Bowling Green State University

The Relationship between the Cognitive Development Levels of Seventh Grade Students and their Missouri Assessment Program Science Achievement Levels

Linda Lacy, Southwest Missouri State University; Betty Bitner, Indiana University & William Thomas, Southwest Missouri State University

## NARST 2002 Annual Meeting

### 6.02

Room B

*Strand 04: Teacher Education (Pre-service)*

Proposals 105037, 106724, 104897, 106339 (Round Table, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Preservice Teacher Education Roundtable I**

Pre-Service Teacher Efficacy Beliefs Regarding Science Teaching: A Comparison of USA and Turkey  
Jale Cakiroglu & Erdinc Cakiroglu, Middle East Technical University

Alternative Certification Programs: Voices of Participants  
Barbara Salyer, University of South Alabama

Helping Preservice Elementary Teachers Learn Authentic Science Inquiry Instruction  
Shu-Mey Yu, National Taichung Teacher College

Combining Coteaching with a Student-Emergent Science Curriculum  
Gale Seiler, Rutgers Universtiy - Newark

### 6.03

Room C

*Strand 07: Educational Technology*

Proposals 103644, 104701, 104862, 106248 (Interactive Poster Session, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Interactive Posters on Selected Educational Technologies II**

Integration of ICT within Science Teaching and Learning (Grades 5-10)  
Helen Finlayson, John Wardle, Sheffield Hallam University & Lawrence Rogers, Leicester University

Using Collaborative Technologies to Guide Pre-Service Teachers Beyond the Classroom Door  
Juanita Matkins, University of Virginia; Elizabeth Klein, State University of New York – Cortland & Starlin Weaver, Salisbury University

Conceptual Change in Students' Understanding of Atoms and Bonds after using Interactive Visualization Tools  
Haim Eshach, Technion & Peter Garik, Boston University

The Status of Web-Based Inquiry for Secondary School Chemistry  
Louise Shive, Alec Bodzin & Ward Cates, Lehigh University

### 6.04

Room D

*Strand 09: Informal Learning*

Proposals 102573, 106010, 100844 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Teacher and Student Perceptions, and Informal Learning Experiences**

Teachers' Perspectives of Why and How They Use the Resources of Informal Science Education Sites  
Christian Youker, University of Texas at Austin

Differences in Teachers' and Students' Museum Field-Trip Experiences  
Martin Storksdieck, Institute for Learning Innovation

\*\*\*additional paper?!

### 6.05

Room E

*Strand 06: Cultural, Social and Gender Issues*

Proposals 102405, 103903, 106955, 103021 (Interactive Poster Session, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **The Influence of Culture on Learning Science**

Uncovering Gender Differences in Science Achievement and Attitudes Towards Science in Jordanian Primary Pupils

## NARST 2002 Annual Meeting

Imfadi Abu-Hola, University of Jordan

Science Through Their Eyes: Children's Science Experiences in a Rural Mexican Community  
James Calkin & Lynn Bryan, University of Georgia

Drawings in Biology – From the Feminist Perspective  
Mercy Ogunsola-Bande, Sola Sangowawa & Ahmadu Bello University, Nigeria

Polynesian Way-Finding: A Successful Use of Non-Western Science in a Large College Science Course  
Harry Shipman, University of Delaware

### 6.06

Room F

*Strand 03: Teaching*

Proposals 102447, 101299, 106066 (Interactive Poster, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Describing Teacher Beliefs and Orientations I: An Interactive Poster Session**

Identifying Challenges Faced by Beginning Science Teachers through Portfolio-Based Assessment  
Julia Sherman, Michal Lomask & Robert Mcandrew, Connecticut State Department Of Education

Factors That Impact Teachers' Interpretations and Enactment of Reform Based Teaching Analysis  
Leigh Smith, Brigham Young University & Sherry Southerland, University of Utah

Teacher Driven Science Based Integration a View Through a Teacher Belief Lens  
Maureen McMahon, California State University, Long Beach; Susan O'Hara, California State University, Sacramento & William Holliday, University of Maryland

### 6.07

Room G

*Strand 05: Curriculum, Evaluation and Assessment*

Proposal 106745 (Symposium, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **New Assessment Practices Changing the Classroom Environment: The KMOFAP Project**

Paul Black, Chris Harrison, et.. al., King's College London

### 6.08

Room H

*Strand 05: Curriculum, Evaluation and Assessment*

Proposal 104484 (Multiple Paper Set, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Earth System Education in Germany**

Analysis of Students' Interests in System Earth  
Sylke Hlawatsch & Horst Bayrhuber, Institute of Science Education, Kiel/Germany

Students' Conceptions about System Earth - System Thinking in the Carbon Cycle Context  
Kristin Hildebrandt, Institute of Science Education, Kiel/Germany

### 6.09

Room J

*Strand 06: Cultural, Social and Gender Issues*

Proposal 105534 (Multiple Paper Session, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Sexualities in Science Education I – Negotiating Intersections of Identity And Knowledge**

Intersections of Sexuality, Science, and Attitudes  
Connie Nobles, Southeastern Louisiana University

Back to the Closet?: Negotiating Identities in the First Years of Teaching  
Steve Fifield, University of Delaware



## NARST 2002 Annual Meeting

Seasoned Science Teachers Tell Their Stories: Gay and Lesbian Issues and Concerns  
John Mascazine, The Ohio State University

### 6.10

Room K

*Strand 07: Educational Technology*

Proposal 104582 (Discussion Group, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Are Virtual Dissections as Good as the Real Thing?**

Shane Cavanaugh, Michigan State University

### 6.11

Room L

*Strand 10: College Science Teaching*

Proposals 102209, 102349, 102958 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **The Role of Inquiry and Active Learning in College Science Courses II**

Transformations from Traditional to Investigative Student-Active Introductory College Biology

Rosalina Hairston, Aimee Lee, Alan Niven, & Raymond Scheetz, University of Southern Mississippi; Sherry Herron, Biological Sciences Curriculum Study

Students' Perceptions of the Effectiveness of a Project-Based Curriculum in Structural Engineering

Julie Mills, University of South Australia & David Treagust, Curtin University of Technology

\*\*additional paper?!

### 6.12

Room M

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 106920, 101159, 106808, 106892 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Conceptual Change in Science Education: Making the Invisible Visible**

Invisible Conceptions: Understanding Ultraviolet and Infrared Radiation

Julie Libarkin, Anila Asghar, & Cynthia Crockett, Harvard-Smithsonian Center for Astrophysics

Process Based Studies of Conceptual Change

Claudia Von Aufschnaiter, University of Education at Ludwigsburg

A Study of the Science Conceptions of Elementary Pre-Service Teachers through Stories, Writing & Concepts

Ying-Feng Wang, National Taichung Teachers' College

Student Reasoning About an Animated Physics Demonstration: Race Results Versus Realistic Rolling

Thomas Koch, Jose Mestre, Robert Dufresne & William Leonard University of Massachusetts-Amherst

### 6.13

Room N

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposal 104736 (Symposium 60, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Learning and Mastering Chemistry Concepts on a Computational Visualization Environment**

Juan Moran, David Atkins, Lisa Bievenue & Terry Koker, National Center for Supercomputing Applications

### 6.14

Room P

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposal 105765 (Symposium, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **An Instructional Model Derived from Model Construction and Criticism Theory**

Maria Nunez-Oviedo, University of Massachusetts

## NARST 2002 Annual Meeting

John Clement, University of Massachusetts  
Mary Anne Rea-Ramirez, Hampshire College

### 6.15

Room Q

*Strand 10: College Science Teaching*

Proposals 102482, 105219, 102139 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **The Role of Mentors/TAs in College Science Courses**

What Defines Effective Chemistry Laboratory Instruction? A Student and TA Perspective  
Deborah Herrington & Mary Nakhleh, Purdue University

Faculty Journeys: Studying Change in College Science Teaching and Learning  
Stacy Wenzel, Maria Varelas & Kyungsoon Jeon, University of Illinois at Chicago; Nancy Grim, Chicago State University

FIRST: A Study of Science Faculty Professional Development in Teaching and Learning  
Diane Ebert-May & Tammy Long, Michigan State University; Jan Hodder, University of Oregon

### 6.16

Room R

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 102895, 102916 (Paper Session Grouped by Committee, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Improving Students' Learning: Earth Science**

Fifth Graders' Conceptual Understanding of Erosion: A Re-Analysis of a Preliminary Study  
James McDonald, Purdue University & Sandra Abell, University of Missouri

Students' Beliefs and Reasoning Strategies about Astrobiology Concepts  
Erika Offerdahl, Edward Prather & Timothy Slater, University of Arizona

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5:00P–6:00P

NARST Business Meeting

Monday, April 8th

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**All NARST Members are encouraged to attend**

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7:00P–8:30P

Past President's Reception

Monday, April 8th

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**NARST Board and Kluwer Publishing hosts this invited session honoring Past Presidents,  
Journal Editors, Executive Secretaries and Distinguished Awardees**

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8:00P–12:00A

Social

Monday, April 8th

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#### **NARST Social (Boomers)**

(cash bar)

#### **A View from the FARSE Side: How to Get Good**

You are cordially invited to attend the 2002 Fringe Association for Research in Science Education (FARSE) Conference. Certain to be tasteful and enlightening, this gathering allows participants to witness multiple interpretations of an idealized science education conference. Become part of the grand FARSE tradition and bring your camera. Session includes live music.

## **NARST 2002 Annual Meeting**

### **Presenters:**

Sue Doe-Nimm, Strand XIII Coordinator

Adam Johnston, FARSE Czar

John Settlage, Academic Satirist in Residence

Sherry Southerland, Chair of the Dazed and Confused Ad Hoc Committee

Ron Good, FARSE Laureate

Mike Smith, Crooner Extraordinaire

David Moss, Associate Dean, College of Clowns

Julie Kittleson, FARSE Fan Club, East Coast Chapter.

**NARST 2002 Annual Meeting**

**Tuesday April 9<sup>th</sup>, 2002  
DAY AT A GLANCE**

<b>Session</b>	<b>Room</b>	<b>Time</b>
Cont. Breakfast For Com. Members	Exhibition Area	6:45A-7:30A
12 Committee Meetings	Breakout Rooms	7:00A-8:15A
16 Concurrent Sessions	Rooms listed in schedule	8:30A-10:00A
Break	Foyer	10:00A-10:30A
Plenary Session #2	Ballroom	10:30A-12:00P
Awards Luncheon	Ballroom	12:00P-2:00P
16 Concurrent Sessions	Rooms listed in schedule	2:00P-3:30P
Break	Exhibition Area	3:30P-4:00P
16 Concurrent Sessions	Rooms listed in schedule	4:00P-5:00P
JRST Editorial Board Meeting	Boardroom X	6:00P-8:00P
Research Interest Groups (RIGS)	Rooms listed in schedule	8:00P-10:00P

## NARST 2002 Annual Meeting

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7:00A–8:15A

Committee Meetings

Tuesday, April 9th

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Continental breakfast for committee members

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8:30A–10:00A

Concurrent Sessions

Tuesday, April 9th

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### 7.01

Room A

*Strand 04: Teacher Education (In-service)*

Proposals 101705, 102307, 105821, 101922, 101250 (Paper Session Grouped by Committee, Tues. April 9th, 8:30A–10:00A)

#### **Strategies for Supporting Teachers' Knowledge of Reformed-Based Pedagogy**

A Paleontology Science Network Inquiry Consortium: Impact on Teacher Practice  
Michael Marlow & Joanna Wright, University of Colorado at Denver

To Promote "Inquiry-Based" Teaching, it Pays to use "Inquiry-Based" Training!  
Laurence Brown & Michal Lomask, Connecticut State Department of Education

Korean Science Teachers' Views of Science Inquiry Teaching  
Young-Shin Park, Oregon State University

Multimedia Cases and Science Teacher Development: A Focus on Professional Standards  
Robin Groves & John Wallace, Curtin University of Technology; William Loudon, Edith Cowan University

Science Fieldwork In Earth/Environmental Science Professional Development: A Case Study  
Daniel Dickerson & Karen Dawkins, North Carolina State University

### 7.02

Room B

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposal 101425 (Symposium, Tuesday April 9th, 8:30A–10:00A)

#### **Cognitive Acceleration- It Works, But How?**

Philip Adey, King's College London  
Grady Venville, Curtin University of Technology  
Anne Robertson, Hammersmith And Fulham  
Carolyn Yates, Cognitive Acceleration  
John And Gwen Hewitt, King's College London

### 7.03

Room C

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 102699, 103609, 104638, 107067 (Paper Session Grouped by Committee, Tuesday April 9th, 8:30A–10:00A)

#### **Selected Papers in Students' Conceptions and Conceptual Change**

Student Learning in Modeling Classrooms: Investigating the Lasting Impact of Understanding  
Cynthia Passmore & Jim Stewart, University of Wisconsin, Madison

Living Things: An Analysis of Understanding from Domain Specific and Domain General Perspectives  
Grady Venville, Edith Cowan University

A Test of Linkage between Laboratory Experience and Measured Achievement  
Leo Racich 3<sup>rd</sup>, University of Virginia

## NARST 2002 Annual Meeting

Application of Dual Situated Learning Model to Conceptual Change Involving Thermal Expansion  
Hsiao-Ching She, Institute of Education, National Chiao-Tung University

### 7.04

Room D

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposals 101747, 104204, 104155, 102531 (Paper Session Grouped by Committee, Tuesday April 9th, 8:30A–10:00A)

#### **Social Interaction and Group Effects**

Describing the Intersection of Personal and Group Knowledge Construction in a Third Grade Classroom  
Sherry Southerland, University of Utah; Julie Kittleson, University of Delaware & John Settlage, University of Utah

The Effects of Science Inquiry Experiments Emphasizing Social Interactions  
Byung-Soon Choi, Jo-Youn Kim, Suk-Kyoung Seong, Ae-Kyung Shin & Kuk-Tae Park, Korea National University of Education

The Contribution of Peer Group and Gender Image on Students' Identities as Physics Learners  
Gertraud Benke, IFF & Helga Stadler, University of Vienna

Impact of Two Debating Situations about a Controversial Scientific Issue on Students' Argumentation  
Laurence Simonneaux, ENFA

### 7.05

Room E

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposals 104407, 106983, 101593, 100774 (Paper Session Grouped by Committee, Tuesday April 9th, 8:30A–10:00A)

#### **Students' Scientific Thinking and Reasoning**

Alpha Wave Attenuation on Scientific Thinking  
Jo-Ok Lee, Ae-Kyung Shin, Yong-Ju Kwon & Byung-Soon Choi, Korea National University of Education

Reasoning in an Authentic Inquiry Context  
Brian White, University of Massachusetts Boston

The Process of Analogous Thinking and Learning  
Hannelore Schwedes & Roland Paatz, Universität Bremen, Germany

The MOLES-S: An Instrument for Investigating the Metacognitive Orientation of Science Classrooms  
Gregory Thomas, The University of Hong Kong

### 7.06

Room F

*Strand 03: Teaching*

Proposals 105443, 101509, 102384, 104008 (Paper Session Grouped by Committee, Tuesday April 9th, 8:30A–10:00A)

#### **Describing Teacher Beliefs and Orientations II**

Habits and Characteristics of the Caring Teachers: A Research Based Perspective  
Gary Varrella, George Mason University, Meta Van Sickle, University Of Charleston

Teachers Conceptions Teaching And Learning Science Via Images: Reflecting Upon Practice  
Eileen Parsons, NC State University

Constructivist Behaviors of Four New Science Teachers from a Program that Focuses on Student Centered Classrooms  
Lee Yuen Lew, The Ross School

Exploring the Science Teaching Orientations of Highly Regarded Secondary Biology Teachers  
Patricia Friedrichsen & Dana Thomas, The Pennsylvania State University

## NARST 2002 Annual Meeting

7.07

Room G

*Strand 03: Teaching*

Proposals 102160, 102762, 103420, 106717 (Paper Session Grouped by Committee, Tuesday April 9th, 8:30A–10:00A)

### **Selected Papers I: Science Teaching**

Science Inquiry: A Vision for Practice in the Twenty-First Century  
Connie Gabel, University of Colorado

Implementing Change within a School Science Department: Voices of Change  
Donna Rigano & Stephen Ritchie, James Cook University

Decisions and Dilemmas During an Initial Implementation of an Inquiry-Oriented Genetics Unit  
Marissa Echevarria, University Of California

A New Face for Urban Science Education  
Rowhea Elmesky, University Of Pennsylvania

7.08

Room H

*Strand 04: Teacher Education (Pre-service)*

Proposal 101824 (Symposium, Tuesday April 9th, 8:30A–10:00A)

### **The Dictator, the Expert, and the Political Activist: The Influence of Power Relationships on Inquiry Science Implementation in The Secondary Classroom**

Hedy Moscovici, et. al. California State University - Dominguez Hills

7.09

Room J

*Strand 04: Teacher Education (Pre-service)*

Proposals 102671, 100928, 107053, 103434 (Paper Session Grouped by Committee, Tuesday April 9th, 8:30A–10:00A)

### **Studying Science Teachers and Teacher Educators in Multiple Contexts**

Longitudinal Study of Science Education Position Announcements at Carnegie Institutions  
Lloyd Barrow, University of Missouri

Science with a Global Perspective: A Team Teaching Approach for Preservice Elementary Teachers  
Toni Kirkwood, Florida Atlantic University & Robert Bleicher, Indiana University

Science Standards Survey: What Georgia's Science Teachers Tell Us  
Letty Bridges, State University of West Georgia & Genell Harris, University of South Carolina Spartanburg

Preparing New Science Teachers for Urban Classrooms: Consensus within an Expert Community  
John Settlage, University of Utah

7.10

Room K

*Strand 05: Curriculum, Evaluation and Assessment*

Proposals 101768, 102734, 105149, 107074, 106395 (Paper Session Grouped by Committee, Tues. April 9th, 8:30A–10:00A)

### **Discipline Specific Assessment in Science and Engineering**

Limited Ways That High School Biology Texts Enhance the Learning Environment for Students  
Lori Kurth & Jo Ellen Roseman, Project 2061, American Association for the Advancement of Science

Effects of End-Of-Course Testing on Biology Curriculum in Two States  
Julie Westerlund, Southwest Texas State University & Leslie Upson, University of Georgia at Athens

## NARST 2002 Annual Meeting

Engineering Theory: A Conversational Bridge between Theoreticians and Practitioners in Discussion of Curriculum Development and Implementation as used in the DASH Program  
Francis Pottenger III, University of Hawaii; Yeon-A Son, Korean Educational Development Institute (KEDI); Yang-Rak Lee & Joo-Hoon Kim, Korea Institute of Curriculum & Evaluation (KICE)

“Ionizing Radiation, Uses and Biological Effects” - A Thematic Module For 11th Grade Students: Academic Achievements and Creativity

Michal Nachshon & Lazarowitz Reuven, Technion, Israel

General Studies Curriculum in Hong Kong: Does it Enhance Children's Science Learning?  
Wing-Mui Winnie, The Hong Kong Institute of Education

### 7.11

Room L

*Strand 06: Cultural, Social and Gender Issues*

Proposal 105562 (Multiple Paper Session, Tuesday April 9th, 8:30A–10:00A)

#### **Sexualities in Science Education II – Troubling and Transcending Heteronormativity in the Curriculum**

What Is The "Science"? And Who Are The "All"?  
William Letts, Charles Sturt University

Encountering and Combating Homophobia and Heterosexism in Science Methods Texts  
Kathy Greene, Beloit College & Lisa Loutzenheiser, University of British Columbia

Queering High School Biology Textbooks and Pedagogy  
Vicky Snyder & Francis S. Broadway, University of Akron

### 7.12

Room M

*Strand 06: Cultural, Social and Gender Issues*

Proposals 101936, 106150, 105569, 106871 (Paper Session Grouped by Committee, Tuesday April 9th, 8:30A–10:00A)

#### **Access and Success for Non-Traditional Participants in Tertiary Programs**

What Is In It For Me?: Science in a University Access Program  
Wanja Gitari, TYP-UT

What Does It Mean To Be A "Woman In Physics"?: Women and their Identities in Learning Physics  
Li-Ling Tsai, University of British Columbia

Persistence and Success: The Science Career Development of African American College Students  
Melody Russell, Georgia State University

Female and Male Differences in Observed and Perceived Experiences in a College Calculus Course  
Panganienia Burns & John Staver, Kansas State University

### 7.13

Room N

*Strand 07: Educational Technology*

Proposal 103826 (Multiple Paper Set, Tuesday April 9th, 8:30A–10:00A)

#### **Inquiry-Based Projects for Learning in Earth Science**

Learning-For-Use in Earth Science: Kids as Climate Modelers  
Daniel Edelson, Gabrielle Matese, Virginia Pitts, Christina Salierno & Bruce Sherin, Northwestern University

Inquiry Learning through Students' East-West Coast Collaboration  
Janice Gobert, The Concord Consortium; Jim Slotta, UC-Berkeley & Amy Pallant, The Concord Consortium



## NARST 2002 Annual Meeting

A Standards-Based Curriculum (Earthcomm): Does it Really Work?  
Do-Yong Park, Florida International University & Michael Smith, American Geological Institute

Features of Virtual Environments that Contribute to Learners' Understanding of Earth Science  
William Winn, Mark Windschitl & Ruth Fruland, University of Washington

### 7.14

Room P

*Strand 08: History, Philosophy and Epistemology*

Proposal 102258 (Symposium, Tuesday April 9th, 8:30A–10:00A)

#### **Project ICAN: A Teacher Enhancement Project to Promote Teachers' and Students' Knowledge of Scientific Inquiry and Nature of Science**

Norman Lederman, Illinois Institute of Technology

Renee Schwartz, Oregon State University

Judith Lederman, Illinois Institute of Technology

Lee Matthews, Illinois Institute of Technology

Rola Khishfe, Illinois Institute of Technology

### 7.15

Room Q

*Strand 09: Informal Learning*

Proposals 106549, 101061, 103588, 101978 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 8:30A–10:00A)

#### **Student Learning at Science Fairs, Olympiads, and Museums**

The Process of Science Inquiry in a Science Fairs

Chin Cheng Chou & Mei-Hung Chiu, National Taiwan Normal University

Students at a Science Centre: What They Do and What They Learn

Agostinho Botelho, University of Lisbon & Ana Morais, Indiana University

Science and Technology Extension in Schools: CREST and the Olympiads

Janet Davies, Massey University & Bev France, Auckland College of Education

What the Turtle Means to Elementary Students in a Science Museum

Hui-Fen Kao, National Museum of Natural Science

### 7.16

Room R

*Strand 10: College Science Teaching*

Proposals 104456, 106024, 105877, 106969 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 8:30A–10:00A)

#### **The Role of Pedagogical Elements, Reading, and Writing in College Science Courses**

A Teaching Intervention for Reading Laboratory Experiments in College Level Introductory Chemistry

Kristine Kirk, College of Notre Dame; William Holliday & William Schafer University of Maryland, College Park; William Harwood, Indiana University

Teaching and Learning as a Symbiotic Relationship: Journal Entries as Extended Conversations

Valerie Vander Vliet, Lewis University

Science Skills Center: Teaching Study Skills in Context

Kathryn Sorensen & Carol Pottorff, American River College

What Course Elements Correlate with Improvement on Tests in Introductory Newtonian Mechanics?

Elsa-Sofia Morote & David Pritchard, MIT

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10:00A–10:30A

BREAK

Tuesday, April 9th

## NARST 2002 Annual Meeting

Exhibition Area

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10:30A–12:00P	Plenary	Tuesday, April 9th
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Plenary Session Number Two: David C. Berliner, Arizona State University

### **How the ignorance of the business community hurts education**

The recent increased interest into educational matters by the business community impedes our ability to improve education. Examples of how that happens are given, followed by a discussion of how business has contributed to a loss of social capital and a rise in poverty, two factors that do dramatically impact America's educational systems.

\*\*biosketch

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12:00P–2:00P	AWARDS LUNCHEON	Tuesday, April 9th
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Your badge will serve as your ticket

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2:00P–3:30P	Concurrent Sessions	Tuesday, April 9th
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#### **8.01**

Room A

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposal 100991 (Symposium, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

#### **Design-Based Science and Student Learning**

David Fortus, University of Michigan

R. Charles Dershimer, Indiana University

Rachel Mamlok, Weizmann Institute of Science

Ronald Marx, University of Michigan

#### **8.02**

Room B

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 105303, 106269, 106773, 100949 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

#### **The Effect of Using Nature of Science as a Promoter for Students' Learning**

What is Nature?, What is School Science? And are They Related?

Page Pulver, University of Colorado at Boulder

The Influence of Mindmapping on the Science Achievement of Grade 8 Students

Issam Abi-El-Mona & Fouad Abd-El-Khalick, University of Illinois at Urbana-Champaign

Using the History of Science to Challenge Students' Ideas about the Inheritance of Acquired Traits

Luli Stern, Technion - IIT

The Impact of Infusing the Interactive Historical Vignettes into High School Science Instruction on Students' Views of the Nature of Science

Ke-Sheng Chan, The University of Texas at Austin

#### **8.03**

Room C

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposals 105177, 104421, 101586, 101523 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

## NARST 2002 Annual Meeting

### Learning Science through Inquiry

Scaffolded Inquiry Investigations: Investigating Students' Scientific Practices  
Barbara Hug, University of Michigan

Representational Tools are Pivotal for Students Learning Science through Inquiry  
Jennifer Cartier & Cynthia Passmore, University of Wisconsin-Madison

Nurturing The Inquiry Disposition: Cross-Case Analysis of Two Inquiry-Rich Primary-Grade Cultures  
Susan McWilliams, South Dakota State University

Fostering Scientific Literacy in the Elementary Classroom: A Case Study  
David Moss, University of Connecticut

### 8.04

Room D

*Strand 03: Teaching*

Proposals 104302, 104932, 102741, 105723 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

#### **Describing Teacher Beliefs and Orientations III**

Factors Which Influence Texas Biology Teachers' Decisions to Emphasize Fundamental Concepts of Evolution  
Kim Bilica, The State University of New York at Buffalo & Gerald Skoog, Texas Tech University

Case Study of an Exemplary Elementary Science Teacher  
Huey-Lien Kao, National Pingtung Teachers College & Ming-Chou Su, Tajen Institute of Technology

Comparing Three Attitude Behavior Theories for Predicting Science Teacher Intentions  
Michaela Zint, University of Michigan

Elementary Teachers Beliefs Regarding the Teaching and Learning of Science Five Years Later  
Karen Levitt, Duquesne University

### 8.05

Room E

*Strand 03: Teaching*

Proposals 104477, 105170, 105233, 106059 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

#### **Selected Papers II: Science Teaching**

Exploration into the Science Teaching Belief Structure of an Exceptional Kindergarten Teacher  
Gregory Potter, California State University, Long Beach

Developing Pedagogical Content Knowledge in Pre-Service Early Childhood Teachers  
April Adams, Northeastern State University & Elizabeth Ethridge, University of South Florida at Sarasota-Manatee

Context Beliefs of Lead Teachers: Implications for Secondary Science Reform  
Claudia Khourey-Bowers, Kent State University-Stark & Richard Dinko, Stark County Schools

Elementary School Science Fairs: Valuable or Valid/Both or Neither  
Helen Cook & Catherine Matthews, University of North Carolina

### 8.06

Room F

*Strand 04: Teacher Education (Pre-service)*

Proposal 104575 (Multiple Paper Set, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

#### **Science as a Cultural Performing Art: Preparing New Teachers to do Science**

Views of Science Teachers One -Three Years After a Preservice Inquiry-Based Research Course

## NARST 2002 Annual Meeting

Leslie Suters, Claudia Melear & Leslie Hickok, The University of Tennessee

The Enculturation of Pre-Service Teachers into the World of Research Astronomy  
John Wilson & Ed Lucy, Georgia State University

Preservice Secondary Science Teacher Apprenticeship Experience with Scientists  
Sherri Brown & Claudia Melear, The University of Tennessee

The Transformative Experiences of a Scientist Instructor with Teacher Candidates  
Terry Lashley & Leslie Hickok, University of Tennessee

### 8.07

Room G

*Strand 04: Teacher Education (Pre-service)*

Proposal 104512 (Symposium, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

#### **Navigating Our Roles in a New Context: Building a Secondary Science Teacher Preparation Program**

Vicente Talanquer, Debra Tomanek, Ingrid Novodvorsky, & Tim Slater, University of Arizona

### 8.08

Room H

*Strand 04: Teacher Education (In-service)*

Proposals 102489, 100900, 105541, 103483, 107018 (Paper Session Grouped by Committee, Tues. April 9<sup>th</sup>, 2:00P–3:30P)

#### **Enhancing Teachers' Knowledge of Learning**

Strategies Enabling Critical Analysis of Learning  
Donna Sterling, George Mason University

United Arab Emirates Science Education Teachers' Assessment Regarding Constructivist Practice  
Ali Al Negbi, United Arab Emirates & Nagib Balfakih, Indiana University

The Effects of a Professional Development Program for Physics Teachers  
Mee-Kyeong Lee, Korea Institute of Curriculum and Evaluation

Improving Science Teaching through Teacher Development Group: A Case Study of Elementary Teachers  
Sheau-Wen Lin, National Pingtung Teachers College

Self Efficacy and Outcome Expectancy on Teaching in Indiana & India  
Shireen Desouza, Ball State University & William Boone, Indiana University

### 8.09

Room J

*Strand 05: Curriculum, Evaluation and Assessment*

Proposals 105387, 105730, 106255, 101124, 105058 (Interactive Poster Session, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

#### **Interactions between Student Outcomes and Curriculum II**

Novice Elementary Teachers' Planning and Enactment of Educative Science Curricula  
Debra Petish & Elizabeth Davis, University of Michigan

Fifth Grade Students' Process Skills and Attitudes: A Comparison of Outcomes of a Research-Based Science Program and an Activity-Centered Traditional Science Program  
Carolyn Maidon & Jack Wheatley, North Carolina State University

Assessing Student Learning in an Urban Science Class: Can Tests Measure What Students Truly Know?  
Kristin Nagy, Barbara Hug & Phyllis Blumenfeld, University of Michigan

Léonard Rivard, Collège Universitaire De Saint-Boniface  
Discursive Competencies of Secondary French-Immersion Students' Summary Writing in Science

## NARST 2002 Annual Meeting

**8.10**

Room K

*Strand 06: Cultural, Social and Gender Issues*

Proposals 103217, 105527, 105079, 104757 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

### **Indigenous Voices in the Conceptualization of Instruction**

Social and Conceptual Movements in Students of Cree Ancestry: Implications for Science Instruction  
Dawn Sutherland, University of Winnipeg

Cross-Cultural Education of Geoscience Professionals: Indigenous Earth Sciences Project Conferences  
Eric Riggs & Dawn Riggs, San Diego State University

Language And Stories: A Dakota Pre-Service Teacher's and a Professor's World-Views Teaching Science  
Jo Anne Ollerenshaw, University of Nebraska-Lincoln

Science Education Researchers as Orthographers and Lexographers: Creating a Voice for Indigenous Language  
Norman Thomson, Marla Scott & Susie Whipple, University of Georgia

**8.11**

Room L

*Strand 07: Educational Technology*

Proposals 103595, 101355, 104470 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

### **Technology In Science Teaching**

Learning Environment, Teaching Strategies and the Implementation of a Grade 11 Online Nuclear Physics Program  
Barry Fraser & Jill Aldridge, Curtin University of Technology; Kath Murray, Barb Combs & David Proctor, Sevenoaks Senior College, Australia

A Review of Balancing Chemical Equations Using Computers  
David Kumar, Florida Atlantic University

The Impact of an Instructional Strategy Using Computer Simulations on Inquiry Skills in Chemistry  
Samia Khan, University Of Massachusetts; Neil Stillings, Hampshire College; John Clement, University Of Massachusetts;  
Loel Tronsky, Hampshire College

**8.12**

Room M

*Strand 08: History, Philosophy and Epistemology*

Proposals 100802, 102965, 106430 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

### **Science/Technology/Society, Science Studies, and Nature of Science**

Science/Technology Studies and the Challenges for Science Educators  
Michalinos Zembylas, Michigan State University

Investigating the Crossroads of Socio-scientific Issues, the Nature of Science, and Critical Thinking  
Troy Sadler, F. Chambers & Dana Zeidler, University of South Florida

Science Studies, Situatedness and Instructional Design in Science Education: A Summary and Critique  
Wendy Mccann, Kent State University

**8.13**

Room N

*Strand 09: Informal Learning*

Proposal 104162 (Multiple Paper Set, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

### **Learning through Environmental Education: Formal Thinking in Informal Settings?**

## NARST 2002 Annual Meeting

Questioning the Role of Sense of Place in Environmental Education  
Anneliese Mueller, University Of New Hampshire

Decision Making Capability of High School and University Science Students in STES-Oriented Education  
Orit Herscovitz, Haifa University-Oranim

Knowledge and Attitudes of Israeli Pre-Service Teachers about the Environment and EE  
Tali Tal, Israel Institute of Technology

Founders of Environmental Education: Narratives of the Australian EE Movement  
Annette Gough, Deakin University

### 8.14

Room P

*Strand 10: College Science Teaching*

Proposals 101663, 103203, 103413, 104631 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

**Conceptual Understanding And Meaningful Learning In College Science Courses**

Drawing Conclusions: A Quick Assessment of Student Understanding through Concept Map Evaluation  
Rebekah Nix, Curtin University of Technology & Cynthia Ledbetter, The University of Texas At Dallas

Enhancing the Construction of Understanding by using Peer Facilitation  
Cheryl Thompkins, North Carolina Central University

Disposition Toward – And Critical Thinking of College Science Students  
Uri Zoller & David Ben-Chaim, Haifa University, Oranim

Guiding Hypothesis Construction and Evaluation in College Chemistry  
Neil Stillings, Hampshire College; Samia Khan & John Clement, University of Massachusetts

### 8.15

Room Q

*Strand 07: Educational Technology*

Proposal 103301 (Symposium, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

**Technological Literacy or Technological Infatuation: Examining Appropriate Roles of Technology in Science Education**

Lawrence Flick, Oregon State University

Randy Bell, University of Virginia

Edith Gummer, Oregon State University

Joseph Krajcik, University of Michigan

Jon Pedersen, University of Oklahoma

Robert Sherwood, Vanderbilt University

### 8.16

Room R

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposal 103623 (Symposium, Tuesday April 9<sup>th</sup>, 2:00P–3:30P)

**Chemical Education: Towards Research-Based Practice**

John Gilbert, The University of Reading

James Wandersee, Louisiana State University

Allan Harrison, University of Central Queensland

Rosaria Justi, Universidade De Minas Gerais, Brazil

William Veal, The University of North Carolina at Chapel Hill

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3:30P–4:00P

BREAK

Tuesday, April 9th

Exhibition Area

## NARST 2002 Annual Meeting

4:00P–5:00P	Concurrent Sessions	Tuesday, April 9th
<b>9.01</b>		Room A
<i>Strand 08: History, Philosophy and Epistemology</i>		
<u>Proposals 103602, 103784 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)</u>		
<b>Nature of Science in Pre-Service Teacher Education</b>		
Prospective Science Teachers' Conceptions about the Nature of Science Sufen Chen, National Tsing Hua University & Dorothy Gabel, Indiana University-Bloomington		
The Influence of an Instructor's Nature of Science Beliefs on Science Methods Instruction Kathryn Buss, William Newman Jr. & Mariana Martini, Purdue University		
<b>9.02</b>		Room B
<i>Strand 04: Teacher Education (In-service)</i>		
<u>Proposal 103868 (Symposium Format, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)</u>		
<b>Policy Challenges in an Urban Systemic Initiative Context Involving Multiple Partnerships</b>		
Marianne Barnes, University of North Florida Carolyn Girardeau, Duval County Public Schools Ruth Senftleber, Duval County Public Schools		
<b>9.03</b>		Room C
<i>Strand 01 Learning: Student Conceptions and Conceptual Change</i>		
<u>Proposals 105240, 100725, 101383 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)</u>		
<b>Reading, Writing, and Discourse: Their Effect on Students' Learning of Science</b>		
Writing and Development of Scientific Reasoning in the Context of Inquiry Projects Anita Roychoudhury, The Ohio State University		
Head Start on Science and Communication: A Content Based Literacy Development Program Evelyn Klein, Lasalle University & Penny Hammrich, Indiana University		
"You've Got Mail!: Outcomes for Students Using a Multidisciplinary Approach to Science Education Susan Barkdoll, California State University, San Bernardino		
<b>9.04</b>		Room D
<i>Strand 01 Learning: Student Conceptions and Conceptual Change</i>		
<u>Proposals 104106, 102972, 106822 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)</u>		
<b>Intersecting Cultures and Science Education</b>		
Students' Perceptions and Patterns of Transition in Science Learning in Two Non-Western Cultures Masakata Ogawa & Christiana Omoifo, Hiroshima University		
Developing Problem Solving and Decision Making Abilities Through STS Anil Banerjee, Purdue University Calumet		
Science and Religion Ideas of Postgraduate Science Students and Practicing Teachers in South Africa Lorna Holtman, University of The Western Cape, & Ron Good, Louisiana State University, Baton Rouge		
<b>9.05</b>		Room E

## NARST 2002 Annual Meeting

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposals 104778, 103378, 100886 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

### **Discourse and Interaction in Science Classrooms**

An Examination of the Discourse Patterns Used in a Design-Based Science Classroom

Charles Dershimer, University of Michigan; David Fortus & Ronald Marx, University of Michigan; Rachel Mamlok, Weizmann Institute of Science

Did They Learn and Interact Equally? A Study of Learning Opportunities in a Small Group

Jin-Ju Huang, Hung Kang Institute of Technology

Analysing Interpersonal Behaviour in Science Classrooms: Associations between Students' Perceptions

Myint Swe Khine, Nanyang Technological University, Singapore & Darrell Fisher, Curtin University of Technology

### **9.06**

Room F

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposals 100669, 101278, 104120, 102839, 101068 (Interactive Poster Session, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

### **Classroom Contexts and Learner Characteristics**

Identifying Better Secondary Teachers using Teacher-Student Interactions

Bruce Waldrup, La Trobe University & Darrell Fisher, Curtin University of Technology

Differences between Boys' and Girls' Perceptions of Science Teachers' Interpersonal Behaviour

Rowena Scott & Darrell Fisher, Curtin University Of Technology

The Development of a Questionnaire for Assessing Students' Motivation Toward Science Learning

Hsiao-Lin Tuan, Chi-Chin Chin, Tunghai University & Shyang-Horng Shieh, National Changhua University

Revisiting Science Laboratory Instruction: A Developing Country Perspective

Sing Huat Poh & Geoff Giddings, Curtin University of Technology

Lilian Pozzer & Wolff-Michael Roth, University of Victoria

Towards a Pedagogy of Photographs in High School Biology Textbooks

### **9.07**

Room G

*Strand 03: Teaching*

Proposals 106115, 103035, 106990 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

### **Issues in Teaching Science**

Science History as a Means to Teach Nature of Science Concepts

Justin Lonsbury & James Ellis, University of Kansas

Can Students Develop Meta Concepts for Particle Representation

Silke Mikelskis-Seifert & Helmut Fischler, Free University of Berlin

Inductive Influence of Related Quantitative and Conceptual Problems

David Pritchard, MIT; Phillip Dukes, U. Texas; Elsa-Sofia Morote, MIT

### **9.08**

Room H

*Strand 04: Teacher Education (Pre-service)*

Proposals 105548, 101313, 105373 (Interactive Poster Session, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)



## NARST 2002 Annual Meeting

### Studying Pre-Service Science Teachers' Learning

Analysis of Student Intern Interactions in On-Line Discussions of Problems of Authentic Practice  
Susan Butler, North Carolina State University

A Study of Influences of Elementary Science Teaching Method Courses on Turkish Elementary Education  
Lutfalla Turkmen, Kocatepe Afyon, University Usak Teachers College & Ronald Bonnstetter, University of Nebraska, Lincoln

Focusing the Pedagogical Content Knowledge Constructed by Preservice Teachers  
Matthew Miller, South Dakota State University & Mary Nakhleh, Purdue University

### 9.09

Room J

*Strand 04: Teacher Education (Pre-service)*

Proposals 106416, 106654, 107095, 107109 (Round Table, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

#### **Preservice Teacher Education Roundtable II**

Learning Science and Learning about Learning Science  
Aletta Zietsman, Western Michigan University

Sustaining the Effects of a Preservice Science Teaching Self-Efficacy Intervention into Inservice  
Jennifer Jay, University of Missouri-Kansas City

Teaching Science, Doing Science: The Restructuring of an Elementary Science Sequence  
Melanie Reap, Winona State University

A Focus for Collaboration: Developing and Implementing Science and Mathematics Performance Assessment Tasks  
Judith Morrison, Washington State University; Valarie Akerson, Indiana University; Amy McDuffie, Washington State University

### 9.10

Room K

*Strand 05: Curriculum, Evaluation and Assessment*

Proposal 103091 (Multiple Paper Set, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

#### **Towards a Theory of Implementation for Developing Countries**

Towards a Theory of Curriculum Implementation for Developing Countries  
John Rogan, University of Pretoria

A Profile of Implementation of Innovation in Action  
Diane Grayson, University of South Africa

### 9.11

Room L

*Strand 10: College Science Teaching*

Proposal 107144 (Symposium, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

#### **The Hidden Earth: Visualization of Geologic Features and Their Subsurface Geometry Spatial Visualization in College-level Introductory Geology Courses**

Michael Piburn, Arizona State University

### 9.12

Room M

*Special Session Sponsored by the Membership Committee*

(Symposium Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

## NARST 2002 Annual Meeting

### Transition from Graduate Student to Junior Faculty

Presider: Joseph F. Engemann, Brock University

Discussant: Jeff Bloom: Entering the Community of Researchers

Moderator: Carol Brandt, University of New Mexico

Panelists: Nedra J. Davis, Kim Bilica, April Luehmann, Donna Ross, Hedy Moscovici, James T. McDonald

### 9.13

Room N

*Strand 07: Educational Technology*

Proposals 106661, 102923 (Novel Formats, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

#### Selected Novel Format Sessions

A Study of Changes in Attitude Towards Science in a Technology Based College Science Classroom

Rena Faye Norby, Black Hills State University

Distance Education as a Tool for Professional Development of Rural Teachers

Joan Whitworth, Morehead State University

### 9.14

Room P

*Strand 08: History, Philosophy and Epistemology*

Proposal 105506 (Symposium, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

#### Moral and Ethical Issues in Science Education: Is There a Voice for Research, Policy & Practice?

Dana Zeidler et al., University Of South Florida

### 9.15

Room Q

*Strand 04: Teacher Education (In-service)*

Proposals 105996, 103448, 104022 (Multiple Paper Session Grouped by Committee Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

#### Selected Papers in Teachers' Inservice Education

An Analysis of Alternately and Traditionally Certified Beginning Science Teachers' Problems

Ayhan Karaman, et al. Florida State University

Improving Elementary Science Teachers' PCK

Ching-Yi Chang, National Pingtung Teachers College

The Development of Knowledge about Teaching the Nature of Science: A Follow-Up Study

Jing-Ru Wang, National Pingtung Teachers College & Helen Gerretson, University of Northern Colorado

### 9.16

Room R

*Strand 10: College Science Teaching*

Proposals 102804, 102902 (Paper Session Grouped by Committee, Tuesday April 9<sup>th</sup>, 4:00P–5:00P)

#### Elementary Teacher Preparation in College Science Courses

Geology Content Courses for Prospective Elementary Teachers: Collaboration for Reform

Jenice Goldston, Monica Clement & Jacqueline Spears, Kansas State University

Teaching Future K-8 Teachers the Language of Newton: A Collaborative Study of Change in Physics Teaching

Carol Briscoe & Chandra Prayaga, University of West Florida

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6:00P–8:00P

JRST Editorial Board Meeting

Tuesday, April 9th

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8:00P–10:00P

Research Interest Groups (RIGs)

Tuesday, April 9th

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**NARST 2002 Annual Meeting**

**Wednesday April 10<sup>th</sup>, 2002  
DAY AT A GLANCE**

<b>Session</b>	<b>Room</b>	<b>Time</b>
Cont. Breakfast For Com. Members	Foyer	6:45A-7:30A
12 Committee Meetings	Breakout Rooms	7:00A-8:15A
16 Concurrent Sessions.	Rooms listed in schedule	8:30A-10:00A
Break	Exhibition Area	10:00A-10:30A
16 Concurrent Sessions	Rooms listed in schedule	10:30A-12:00P
NARST Executive Board Meeting	Boardroom	12:30P-4:30P

## NARST 2002 Annual Meeting

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7:00A–8:15A	Committee Meetings	Wednesday, April 10th
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Continental breakfast for committee members

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8:30A–10:00A	Concurrent Sessions	Wednesday, April 10th
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### 10.01

Room A

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 106612, 102776, 101089, 101026, 106675 (Paper Session Grouped by Committee, Wed. April 10<sup>th</sup>, 8:30A–10:00A)

#### **Improving Students' Learning: Ecology and Environmental Science**

Children's Conceptions about Decay

Shu-Mey Yu & Su-Fang Lin, National Taichung Teacher College

Students' Reflections on Understandings of Ecological Processes: Extension of a Longitudinal Study

Gustav, Helldén, Kristianstad University

Canadian and Taiwanese Grade 5 Children's Environmental Behaviors, Perceptions and Conceptions

Hsin-Ping Huang, Indiana University & Larry Yore, University of Victoria

Student Perceptions of the Relative Contributions of Human Activities and Nature to Global Warming

Diane Schweizer, University of California, Santa Barbara

An Analysis of Students' Conceptual Understandings of Science after Participating in a Marine Science Course

Julie Lambert, University of Miami

### 10.02

Room B

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 106885, 101544, 103700, 104799 (Paper Session Grouped by Committee, Wednesday April 10th, 8:30A–10:00A)

#### **Exploring Conceptual Change**

Effect of Instruction on Students' Understanding of Electric Current Concept using Conceptual Change Texts at 6th Grade

Bugrahan Yalvac, The Pennsylvania State University

Cognitive Acceleration through Science Education in Grade 2

Natasha Wilson, Philip Adey & Justin Dillon, King's College London

Application of Recommendations for Conceptual Change Instruction by a High School Science Teacher

Michael Beeth, Gyoungho Lee & Hyeoksoon Kwon, The Ohio State University

Using Conceptual Change Texts Accompanied by Concept Mapping to Address Misconceptions

Ozgul Yilmaz, Indiana University; Omer Geban & Mehmet Ozden, Middle East Technical University

### 10.03

Room C

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposals 103630, 106906, 103455, 100795 (Paper Session Grouped by Committee, Wednesday April 10th, 8:30A–10:00A)

#### **Learning Concepts and Competences**

## NARST 2002 Annual Meeting

Explanations in High School Chemistry: Perspectives from Teachers, Textbooks and Students  
Thapelo Mamiala, David Treagust & Gail Chittleborough, Curtin University of Technology

High School Students' Conceptions of Acids and Bases, and their Conceptual Ecologies  
Hyun-Ju Park & Suk-Jin Yun, Chosun University

The Role of Genetics in Students' Understandings of Evolution  
Frances Rowe, Edgewood College & James Stewart, University of Wisconsin-Madison

Development of Environmental Competences: A Longitudinal Study in Primary School  
Maria-Pilar Jimenez-Aleixandre, University of Santiago De Compostela & Ramon Lopez-Rodriguez, Indiana University

### 10.04

Room D

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposals 103574, 102944, 104092, 101208 (Paper Session Grouped by Committee, Wednesday April 10th, 8:30A–10:00A)

#### **Science Learning Environments**

Outcomes-Based, Technology-Rich Science Learning Environments: Assessing Students' Perceptions  
David Wood, Sevenoaks Senior College; Jill Aldridge, Barry Fraser & Darrell Fisher, Curtin University of Technology

Looking Inside: A Cross Case Analysis of the Complexity, Balance, and Flow of Urban Secondary Science  
Carol Stuessy, Texas A&M University & Andrea Foster, University of Houston

Assessing and Improving the Teaching and Learning Environment in High School Biology Classrooms  
Cindy Moss & Barry Fraser, Curtin University of Technology

How Do Science Teachers and Students Perceive Differently Toward Laboratory Learning Environments?  
Chin-Chung Tsai, National Chiao Tung University

### 10.05

Room E

*Strand 03: Teaching*

Proposal 102993 (Multiple Paper Set, Wednesday April 10th, 8:30A–10:00A)

#### **Physics Education and the Construction of Advantage: Four Case Studies**

Discussant: Gaalen Erickson, University of British Columbia

Common Intentions and Uncommonly Good Teaching: Reproduction of Educational Advantage at Hillview HS  
William Loudon, Edith Cowan University

Teaching as Culture: Understanding the Physics Classroom  
Helen Wildy, Edith Cowan University

Performance and Worship: Understanding the Liturgy of Teaching and Learning Physics  
John Wallace, Curtin University of Technology

Teacher Expertise and Explanatory Frameworks in a Successful Physics Classroom  
David Geelan, University of Alberta

### 10.06

Room F

*Strand 04: Teacher Education (Pre-service)*

Proposal 105198 (Multiple Paper Set, Wednesday April 10th, 8:30A–10:00A)

#### **Examining Prospective Teachers' Understandings of Scientific Inquiry & Modelling**

## NARST 2002 Annual Meeting

Organizer: Carla Zemal-Saul, The Pennsylvania State University  
Discussant: Joseph Krajcik, The University of Michigan

Engaging Prospective Science Teachers in Building, Testing, and Teaching about Models  
Barbara Crawford & Michael Cullin, The Pennsylvania State University

Learning Science through Argumentation: Prospective Teachers' Experiences in an Innovative Context  
Danusa Munford & Carla Zemal-Saul, The Pennsylvania State University

Supporting Prospective Elementary Teachers in Developing Scientific Explanations  
Leigh Anne Haefner, Carla Zemal-Saul & Lucy Avraamidou, The Pennsylvania State University

### 10.07

Room G

*Strand 04: Teacher Education (In-service)*

Proposals 101999, 104806, 102216, 107081 (Paper Session Grouped by Committee, Wednesday April 10th, 8:30A–10:00A)

#### **Beginning Science Teachers and Classroom Culture**

Influences on Classroom Practice and Beliefs of Beginning Secondary Science and Mathematics Teachers: Teacher Preparation or School Culture?

Nancy Edick, Sheryl McGlamery & Jarene Fluckiger, University of Nebraska at Omaha

The Intersection of Intentions and Reality: Beginning Science Teachers in Culturally Diverse Schools

Julie Luft, Nancy Patterson, Gill Roehrig & Barbara Austin, University of Arizona

The Transition from Pre-Service to Induction: Meeting the Needs of all Secondary Science Teachers

Gillian Roehrig & Julie Luft, University of Arizona

Recruitment and Retention in Science and Mathematics

Sheryl McGlamery & William Austin, University Of Nebraska At Omaha

### 10.08

Room H

*Strand 05: Curriculum, Evaluation and Assessment*

Proposals 103364, 103840 (Paper Session Grouped by Committee, Wednesday April 10th, 8:30A–10:00A)

#### **Reform in Science Education**

It's Coming...Engineering in the K-12 Science Curriculum: What Role Will Science Education Researchers Play?

Christine Cunningham, Tufts University

Validation and Use of a Classroom Observation Instrument to Assess Reformed Teaching in Science & Mathematics

Daiyo Sawada, University of Alberta & Michael Piburn, Arizona State University

Curriculum Reform of Science Education in Chinese Primary and Secondary Schools

Lei. Wang & Lingli Su, Beijing Normal University

### 10.09

Room J

*Strand 06: Cultural, Social and Gender Issues*

Proposals 102930, 101579, 102195, 106136 (Paper Session Grouped by Committee, Wednesday April 10th, 8:30A–10:00A)

#### **CASTING THE POSTMODERN GAZE BACK ON THE MODERNIST DOMAIN**

Reversing the Objective: Adding Guinea Pig Pedagogies

Matthew Weinstein, Kent State University

How Transformative is Sociotransformative Constructivism? Utilizing Critical Ethnography

Andrew Gilbert, New Mexico State University

## NARST 2002 Annual Meeting

Discursive Identity Development as Product of Discourse Appropriation in Science Classrooms  
Bryan Hilton-Brown, University of California, Santa Barbara

Border Crossings: Collaborative Research on a Cross-Cultural Science Curriculum in Higher Education  
Carol Brandt, University of New Mexico

### 10.10

Room K

*Strand 06: Cultural, Social and Gender Issues*

Proposals 105912, 106101, 105849 (Paper Session Grouped by Committee, Wednesday April 10th, 8:30A–10:00A)

#### **Science in the Cities: Sociocultural Issues and Urban Education**

Assessment and Urban Elementary Students: Determining Conceptual Understanding in Science  
Amy Cox-Petersen, California State University, Fullerton & Joanne Olson, Iowa State University

Students as Researchers: Agency and the Breaching of Inequities in Urban Science Education.  
Kenneth Tobin, University of Pennsylvania

Thin Coherence and Weak Boundaries: Enacting School Science Culture in an Urban Magnet School  
Stacy Olitsky & Catherine Milne, University of Pennsylvania

### 10.11

Room L

*Strand 08: History, Philosophy and Epistemology*

Proposals 101166, 101530, 106479 (Paper Session Grouped by Committee, Wednesday April 10th, 8:30A–10:00A)

#### **Science Texts, Images of Science, and Teaching About Nature of Science**

A Reconstruction of Structure of the Atom and its Implications for General Physics Textbooks  
María Rodríguez & Mansoor Niaz, Universidad De Oriente

Arguments, Contradictions, Resistances and Conceptual Change in Students' Understanding of Atomic Structure  
Mansoor Niaz, Damaris Aguilera, Arelys Maza & Gustavo Liendo, Universidad De Oriente

Images of Science and Scientists in Children's Science Biographies  
Zoubeida Dagher & Danielle Ford, University of Delaware

### 10.12

Room M

*Strand 06: Cultural, Social and Gender Issues*

Proposals 104785, 106290, 107172 (Paper Session, Wednesday April 10th, 8:30A–10:00A)

#### **Novel Formats**

Urban Girls' Perception of School Science, Scientists and Careers in Science  
Tracy Huziak & Anita Roychoudhury, The Ohio State University

Elementary Learning Communities in Science That Challenge Current Concepts of Equity  
Paula Lane, University of North Carolina at Chapel Hill

Pathways to Teaching Science for Diversity and Understanding in Diverse Classrooms: Using Socially Transformative Constructivism as a Tool for Teacher Professional Development  
Alberto Rodriguez, New Mexico State University

Border Crossing into School Science and the Contiguity Learning Hypothesis  
Meshach Ogguniyi, University of Western Cape

### 10.13

Room N

## NARST 2002 Annual Meeting

*Strand 10: College Science Teaching*

103980 (Multiple Paper Set, Wednesday April 10th, 8:30A–10:00A)

### **The Pennsylvania State University Biology Project Part I: Assessing Undergraduate Learning in Web-Based Biology Instruction**

Discussant: W. Joseph Priestley, Pennsylvania State University

The Penn State Biology Project: Development of the Program  
Richard Cyr, Pennsylvania State University

The Penn State Biology Project: Designing the Tutorials  
C. Hayes, Pennsylvania State University

The Penn State Biology Project: The Professor as Student  
Richard Cyr, Pennsylvania State University

### **10.14**

Room P

*Strand 10: College Science Teaching*

103693 (Multiple Paper Set, Wednesday April 10th, 8:30A–10:00A)

### **Conceptions of Scientific Inquiry: Voices from the Front**

Discussant: Valarie Akerson, Indiana University

If Inquiry Is So Great, Why Isn't Everyone Doing It?  
William Harwood, Indiana University

Scientists' Conceptions of Scientific Inquiry: Frontline Perspectives  
Rebecca Reiff, Indiana University

Scientists' Conceptions of Scientific Inquiry: Emerging Patterns  
Teddie Phillipson, Indiana University

### **10.15**

Room Q

*Strand 03: Teaching*

Proposal 104190 (Symposium, Wednesday April 10th, 8:30A–10:00A)

### **Teacher Development for an Interdisciplinary Approach to the Modelling of Dynamic Systems**

Elwin Savelsbergh, Universiteit Utrecht

Koos Kortland, Universiteit Utrecht

Ad Mooldijk, Universiteit Utrecht

Gjalt Prins, Universiteit Utrecht

René Westra, Universiteit Utrecht

### **10.16**

Room R

*Strand 04: Teacher Education (Pre-service)*

Proposals 105282, 105583, 100837 (Interactive Poster Session, Wednesday April 10th, 8:30A–10:00A)

### **Learning to Teach Science as Inquiry**

Inquiry-Based Pedagogy within an Interdisciplinary Orientation: A Story from Prospective Elementary Teacher Education  
Katherine Wieseman, Western State College

Engaging Student Teachers with Long-Term Science Inquiry Projects: Improving Science Skill Competencies  
G. Michael Bowen, Lakehead University & J. Lawrence Bencze, University of Toronto



## NARST 2002 Annual Meeting

Scaffolding an Understanding of Inquiry in Pre-Service Teachers through Independent Investigations  
Mark Windschitl, University of Washington

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10:00A–10:30A

BREAK

Wednesday, April 10th

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Exhibition Area

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10:30A–12:00P

Concurrent Sessions

Wednesday, April 10th

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### 11.01

Room A

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 106199, 104519, 105555, 107151 (Paper Session Grouped by Committee, Wednesday April 10th, 10:30A–12:00P)

#### **Learning Science Using the Nature of Science Lens**

Does Apprenticeship Yield a Deeper Understanding of the Nature of Science?  
Gail Richmond, Michigan State University

How Do Students' Views of Nature of Science Change?  
Rola Khishfe & Norm Lederman, Illinois Institute Of Technology

Conceptual Ecologies and their Influence on Nature of Science Conceptions  
Adam Johnston, Weber State University & Sherry Southerland, University Of Utah

Ninth-Grade Students' Developing Ideas About What It Means to Practice Science  
Andrea Barton, University of Wisconsin

### 11.02

Room B

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 105226, 105597, 104330, 104036, 101229 (Paper Session Grouped by Committee, Wed. Apr. 10th, 10:30A–12P)

#### **Improving Students' Learning: Physics**

Urban Students' Understanding of the Particulate Nature of Matter  
Revital Tal, Technion - Israel Institute of Technology & Phyllis Blumenfeld, University of Michigan

Reflections on Pedagogical Content Knowledge Based on Student Understanding of the Particulate Nature of Water  
Robert Kruckeberg, Pace University

Phenomenographic Study in Elementary Science on the Topic of Light, Shadows and Vision  
Lydia Murmann & Hannelore Schwedes, University of Bremen

Changes Made in Teaching an Inquiry Based College Physical Science Class as a Result of Research  
Rudy Sirochman, The University of Southern Mississippi & James Lilly, Xavier University of New Orleans

Conceptual Change in Physics through the use of Computer Simulations and Inquiry-Based Experiments  
Zacharias Zacharia, Columbia University

### 11.03

Room C

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposal 106360 (Multiple Paper Set, Wednesday April 10th, 10:30A–12:00P)

#### **Exploring the Dynamics of Instructional Interactions: Shared Dynamics in Varied Contexts**

## NARST 2002 Annual Meeting

Instructional Dynamics in Three Widely Varied Contexts with the Same Materials and Instructor  
Dean Grosshandler, University of Illinois at Urbana-Champaign

Supporting Learning: The Role of Innovation and Purpose in Inquiry Based Learning  
Brian Pianfetti & David Brown, University of Illinois at Urbana-Champaign

Recognizing and Recovering from Snags in Instructional Interactions  
David Brown, University of Illinois At Urbana-Champaign

### 11.04

Room D

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposal 105114 (Multiple Paper Set, Wednesday April 10th, 10:30A–12:00P)

#### **Issues in Project-Based Science: Designing Environments and Enacting Reform**

Discussant: Charlene Czneriak, The University Of Toledo

An Overview of Project-Based Science

Scott Lewis, Florida International University & Charlene Czneriak, The University of Toledo

Design Issues for Project-Based Science Learning Environments in Schools

Joseph Polman, University of Missouri-St. Louis

Exploring the Role of Curriculum Materials to Support Teachers In Science Education Reform

Rebecca Schneider, University of Toledo

Project-Based Science Curricula: Achieving National Standards in Urban Systemic Reform

Ann Rivet & Robert Geier, University of Michigan

### 11.05

Room E

*Strand 05: Curriculum, Evaluation and Assessment*

Proposals 103875, 106052, 106570 (Discussion Group, Wednesday April 10th, 10:30A–12:00P)

#### **Science Education: Student and Teacher Perspectives**

Comparing Apples and Oranges: Using the NSES as a Tool When Assessing Scientific Understandings

Valerie Talsma, University Of Pittsburgh

Evaluating Professional Development with Student Data: Challenges and Successes for Project ESTT

Carol Fletcher, James Barufaldi, Lowell Bethel & Joel Blasingame, University of Texas at Austin

Seeking to Influence Elementary Pre-service Teachers' Views on Science Teaching

Nathan Carnes, University of South Carolina

### 11.06

Room F

*Strand 06: Cultural, Social and Gender Issues*

Proposals 103721, 106283, 105870, 105590 (Paper Session Grouped by Committee, Wednesday April 10th, 10:30A–12:00P)

#### **Deciphering the Interactions of Racial/Ethnic Difference and Gender**

Perceptions, Practices and Policy: Creating a Voice for Gender and Cultural Differences

Pamela Fraser-Abder, New York University

Different Educations Across Race and Gender: Comparing the Educational Experiences of 10th Graders

Robert Tai, Curry School of Education

Equity of Input in Science Classrooms: Have Interactions Changed in Twenty Years?

Molly Weinburgh, Georgia State University

## NARST 2002 Annual Meeting

Science Education and Islam  
Ozgur Taskin, Indiana University

### 11.07

Room G

*Strand 06: Cultural, Social and Gender Issues*

Proposals 101649, 103735, 104848, 105513 (Paper Session Grouped by Committee, Wednesday April 10th, 10:30A–12:00P)

#### **Gendered Perspectives of Interest and Motivation**

The Image of Science and its Relationship to Young Women's Interest in Science  
Judith Paolucci, University Of Rhode Island

Cultural Issues and Science: A Gender and Science-Interest Investigation  
William Cobern, Western Michigan University

Engagement in Science Learning among At-Risk Girls: Sense of Self and Internal Motivational Factors  
Jessica Thompson & Mark Windschitl, University Of Washington

Examining the Voices and Experiences of Science Teachers as Researchers on Feminist Pedagogy  
Brenda Capobianco, University of Massachusetts Amherst

### 11.08

Room H

*Strand 07: Educational Technology*

Proposals 105100, 106178, 104659 (Paper Session Grouped by Committee, Wednesday April 10th, 10:30A–12:00P)

#### **Technology and Learning in Science**

Do Computational 3-D Modeling Technologies Support Student Learning?  
John Hansen, Michael Barnett & James Mckinster, Indiana University; Thomas Keating, Boston University

The Relationship Between Computer Availability and Science Achievement  
Meichun Wen, John Alspaugh & Lloyd Barrow, University Of Missouri - Columbia

Comparison of Modeling Practices Between Experienced & Novice Learners Using a Dynamic Modeling Tool  
Baohui Zhang, Hsin-Kai Wu, Eric Fretz & Elizabeth Davis, University Of Michigan

### 11.09

Room J

*Strand 07: Educational Technology*

Proposals 101376, 102013, 104386 (Paper Session Grouped by Committee, Wednesday April 10th, 10:30A–12:00P)

#### **Technology in Teacher Education**

Developing Understandings: Web-Based Learning and Critical (Self) Reflection in Teacher Education  
Peter Taylor, Curtin University of Technology; David Geelan, University of Alberta & Martin Dougiamas, Curtin University of Technology

Using an Online Learning Environment to Develop Learning Cycle Lesson Planning Skills  
Cheryl Sundberg, University of Alabama; Kathy Trundle, The Ohio State University; Judy Geisen, Lea Accalogoun & Dennis Sunal, University of Alabama

Technology In Pre-Service Science Methods Courses: Promises and Hurdles  
Noemi Waight, Fouad Abd-El-Khalick & David Brown, University of Illinois at Urbana-Champaign

### 11.10

Room K

*Strand 09: Informal Learning*

## NARST 2002 Annual Meeting

Proposals 100739, 101264, 105716, 105772 (Interactive Poster Session, Wednesday April 10th, 10:30A–12:00P)

### **Science in the Neighborhood, in the Field, and at Work**

Sisters in Sport Science: Literacy Development in Science and Math through the Vehicle of Sports  
Beverly Livingston, Temple University; Penny Hammrich, Indiana University; Greer Richardson, Lasalle University & Green Sloan, Temple University

Cognitive Outcomes of a Field Experience for Third and Fourth Graders  
Patricia Morrell, University of Portland & Jeffrey Morrell, Oregon State University

The Neighborhood Nestwatch Program: Sense of Place and Science Literacy in a Citizen Science Project  
Celia Evans, Paul Smiths College; Eleanor Abrams, University of New Hampshire; Peter Marra, Karin Roux & Robert Reitsma, Smithsonian Environmental Research Center

Preparing College Science Majors for Service Learning in Middle Schools  
Georgianna Saunders & Kathy Shade, Southwest Missouri State University

### **11.11**

Room L

*Strand 10: College Science Teaching*

Proposals 102804, 102902 (Paper Session Grouped by Committee, Wednesday April 10th, 10:30A–12:00P)

### **Elementary Teacher Preparation in College Science Courses**

Geology Content Courses for Prospective Elementary Teachers: Collaboration for Reform  
Jenice Goldston, Monica Clement & Jacqueline Spears, Kansas State University

Teaching Future K-8 Teachers the Language of Newton: A Collaborative Study of Change in Physics Teaching  
Carol Briscoe & Chandra Prayaga, University of West Florida

### **11.12**

Room M

*Strand 10: College Science Teaching*

Proposals 102510, 101894, 102643 (Paper Session Grouped by Committee, Wednesday April 10th, 10:30A–12:00P)

### **Teaching and Learning in College Chemistry Courses**

The "Chemistry Mafia": The Social Structure of Chemistry Majors In Lab  
Dawn Del Carlo, Montclair State University & George Bodner, Purdue University

The Development of the Chemistry Attitudes and Experiences Questionnaire (CAEQ)  
Jacinta Dalgety, Richard Coll & Alister Jones, The University of Waikato

Reconceptualising the Structure of a College Chemistry Course for More Effective Teaching  
Marilou Gallos, Curtin University of Technology; Euwe Van Den Berg, University of San Carlos; David Treagust, Curtin University of Technology

### **11.13**

Room N

*Strand 01 Learning: Student Conceptions and Conceptual Change*

Proposals 103609, 102881, 102720, 102083, 101677 (Paper Session Grouped by Committee, Wed. April 10th, 10:30A–12P)

### **Improving Students' Learning: Biology**

Living Things: An Analysis of Understanding from Domain Specific and Domain General Perspectives  
Shu-Mey Yu & Su-Fang Lin, National Taichung Teachers' College

Social/Affective Dimension in Learning Genetics with Multiple Representations in Secondary Biology  
Chi-Yan Tsui & David Treagust, Curtin University of Technology

## NARST 2002 Annual Meeting

Australian High School Students' Understandings of Biotechnology: Does It Matter?  
Vaille Dawson, Murdoch University

A Study on Fifth Graders' Cognitive Structure Development about Biological Reproduction  
Chin-Chung Tsai & Chao-Ming Huang, National Chiao Tung University, Taiwan

Young People's Drawings of Internal Human Structure  
Michael Reiss & Sue Tunnicliffe, Institute of Education, University Of London

### 11.14

Room P

*Strand 04: Teacher Education (Pre-service)*

Proposals 103245, 104673, 101285 (Interactive Poster Session, Wednesday April 10th, 10:30A–12:00P)

#### **Science Teaching Efficacy & Beliefs**

Becoming Confident Teachers of Science: Changes of Science Teaching Efficacy Beliefs  
May Chen, The Hong Kong Institute of Education

Utilizing the Modified Fennema-Sherman Attitude Scale to Measure Pre-Service Teachers in Science: Tips And Observations  
Nihal Buldu & William Boone, Indiana University, Bloomington

Changes in Pre-Service Teachers' Science Teaching Self-Efficacy  
James Carroll & Patricia Morrell, University of Portland

### 11.15

Room Q

*Strand 04: Teacher Education (Pre-service)*

Proposal 100816 (Symposium, Wednesday April 10th, 10:30A–12:00P)

#### **Recognition and Reflection: Changing the Beliefs and Mental Models of Pre-Service Elementary Science Teachers**

Jon Pedersen, The University of Oklahoma & Julie Thomas, Indiana University

### 11.16

Room R

*Strand 02 Learning: Classroom Contexts and Learner Characteristics*

Proposal 104680 (Multiple Paper Set, Monday April 8<sup>th</sup>, 3:00P–4:00P)

#### **Authentic Science Education: When, Where, and According to Whom? An Exploration of Multiple Meanings**

Authentic Environmental Inquiry Model: Exploring Emergent Authenticity in Two Urban School Settings  
Cory Buxton & Rob Wallace, University of New Orleans

Embracing the Prescriptive and Resisting the "Authentic"  
Heidi Carlone, University of North Carolina, Greensboro

What Does Authenticity Mean in the Eyes of Students, Scientists And Researchers  
Jrene Rahm, Wendy Naughton & John Moore. University of Northern Colorado

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12:30P–4:30P

Business Meeting

Wednesday, April 9th

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NARST Executive Board Meeting