On behalf of the entire Organizing Committee, we are delighted to welcome a record number of participants to Chicago for the 9th International Conference of the Learning Sciences. The ICLS 2010 program, with its theme Learning in the Disciplines, features a broad range of keynotes, symposia, papers and posters that will engender an exciting exploration of important issues in the learning sciences, disciplinary and professional learning. In addition to keynotes by three pre-eminent scholars in their fields - Carl Wieman, Koeno Gravemeijer, and Pam Grossman, and five invited, theme-related symposia, the schedule contains 149 papers, 25 multi-paper symposia, 7 poster symposia and 109 posters. All of that preceded by 8 pre-conference workshops plus the Doctoral Consortium and Early Career Workshop. We anticipate that the ICLS 2010 Conference week will be packed with engaging and informative discussions and exchanges on critical issues in learning, teaching, instructional and materials design, technology, assessment, and evaluation.

The conference location at the historic Palmer House Hilton Hotel puts you in the heart of Chicago’s loop with access to numerous cultural and entertainment venues as well as excellent restaurants and shopping. Just a few blocks away from the Palmer House you will find the Art Institute of Chicago and its recently opened Modern Art Wing designed by Enzo Piano. Just across the street from the Art Institute and across Michigan Avenue is Millenium Park with its iconic sculptures, gardens, fountains, and the Pritzker Music Pavilion designed by Frank Gehry. Coinciding with ICLS 2010 is Taste of Chicago, an annual event that offers a variety of free musical performances and lots of places to sample foods from vendors throughout the city. Your registration packet contains a variety of informational materials and maps that elaborate on the many attractions of Chicago, including a restaurant list. Hopefully, you’ll find some time to enjoy the wonders of Chicago’s downtown and loop area just outside your hotel doorstep.

A conference of this magnitude does not happen without the hard work of many individuals. This one is no exception. We have been most fortunate to collaborate with a super Conference Organizing Committee. We are deeply appreciative of the countless hours, tireless effort, and energy that they have dedicated to all aspects of this Conference. We especially want to acknowledge the Learning Sciences Research Institute’s Associate Director, Deana Donzal, who took on the role of Business Manager for the Conference and navigated the complex web of contracts, financial arrangements, and details associated with this event. Finally, other LSRI staff and graduate student volunteers from the Learning Sciences programs at UIC and Northwestern have been working behind the scenes to prepare for this meeting and will be available to assist you throughout the Conference. (Look for the folks in Conference Staff shirts!)

The Conference is also fortunate to have a number of sponsors whose material support is contributing to several major conference events, including the Keynote speaker series, the Doctoral Consortium and Early Career Workshop, the evening receptions, and a major social event on Thursday. And in the priceless category: ICLS2010 – There’s an App for that – thanks to Inquirium LLC.

But you can’t build a conference unless there are people interested in and willing to co-construct it. To all of you our deep thanks for contributing to what we hope will be a very successful conference that attests to the presence and impact of the learning sciences community. In celebration of that community we invite everyone to join us Thursday evening in the Preston Bradley Hall of the historic Chicago Cultural Center for an evening of music, food, drink and dancing.

Welcome to Chicago and ICLS 2010

Susan R. Goldman & James W. Pellegrino
ICLS 2010 Conference Chairs
June 28, 2010
Organization

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The Learning Sciences And Learning In The Sciences—
The Perspective From Post-Secondary Science Education

**TUESDAY 4:00-5:30PM, RED LACQUER BALLROOM**

Over the past few years Dr. Carl Wieman has become increasingly involved with trying to improve undergraduate physics education and has been balancing his time between that and his research. He has been examining alternative curricula and learning about the research in physics education as to how students do and do not learn. A particular concern has been improving how physics is taught to students who are not planning to become physicists, in the hope of one day making physics understandable, useful, and interesting to a large fraction of the population. His efforts have ranged from working with national organizations pursuing widespread change in undergraduate physics education to developing useful innovations in the individual courses that he teaches. Because of his particular concerns, these courses have lately been large introductory courses primarily for non-science students. Wieman currently serves as Chair of the Board on Science Education of the National Academy of Sciences. In 2007, Wieman was awarded the Oersted Medal, which recognizes notable contributions to the teaching of physics, by the American Association of Physics Teachers (AAPT). In 2004 he was named United States professor of the year. He was awarded the Nobel Laureate in Physics in 2001.

Instructional design, theory and practice in mathematics education

**THURSDAY 8:30-10:00AM, RED LACQUER BALLROOM**

Dr. Gravemeijer currently is Professor of Science and Technology Education at the Eindhoven University of Technology. Earlier he was affiliated with the Freudenthal Institute of Utrecht University, and with Vanderbilt University. At that time his primary focus was on mathematics education. His research interests focus on curriculum development, instructional design, domain-specific instruction theories (such as the theory for realistic mathematics education, RME), teacher professional development, and students’ use of symbols and modeling. In relation to the latter he developed the ‘emergent modeling’ design heuristic. His interest in instructional design is not only theoretical. He headed a team that developed a textbook series for primary school, in the Netherlands, and he was part of the group that developed the NSF-funded, Middle School, textbook series, ‘Mathematics in Contexts’. His current research involves using design-based research to develop local theories of instruction as a means to understand and support learning processes.

Learning to Ponder: The Puzzle and Pleasure of Literary Text

**FRIDAY 8:30-10:00AM, RED LACQUER BALLROOM**

Pam Grossman is the Nomellini-Olivier Professor of Education at the Stanford University School of Education. Her research interests include teacher education and professional education more broadly, teacher knowledge, and the teaching of English in secondary schools. Along with her colleagues Don Boyd, Hamilton Lankford, Susanna Loeb, and James Wyckoff, she has been engaged with a five year study of pathways into teaching in New York City schools, focusing on the features of preparation that affect student achievement. She is currently investigating the classroom practices of middle-school English teachers that are associated with student achievement. She is the co-Principal Investigator of the Teachers for a New Era project at Stanford, funded by the Carnegie Corporation, and is the Faculty Director of the new Center to Support Excellence in Teaching. A former high school English teacher, Grossman also teaches the prospective English teachers in Stanford’s teacher education program.
The Spencer Foundation was established in 1962 by Lyle M. Spencer. The Foundation received its major endowment upon Spencer’s death in 1968 and began formal grant making in 1971. Since that time, the Foundation has made grants totaling approximately $250 million. The Foundation is intended, by Spencer’s direction, to investigate ways in which education, broadly conceived, can be improved around the world. From the first, the Foundation has been dedicated to the belief that research is necessary to the improvement in education. The Foundation is thus committed to supporting high-quality investigation of education through its research programs and to strengthening and renewing the educational research community through its fellowship and training programs and related activities.

Please visit us at our website at www.spencer.org

In 1915, Albert W. Harris (pictured above) of Harris Bank and other local civic leaders had a vision of creating a community foundation that would meet the critical needs of metropolitan Chicago in perpetuity. Thanks to their ambitious venture, The Chicago Community Trust has played a vital role in creating one of the most vibrant, dynamic cities in the nation, touching the lives of virtually every resident for the last 95 years.

For more information, please visit www.cct.org.
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Building the Field of Digital Media and Learning

Through its digital media and learning initiative, the MacArthur Foundation is funding research that is yielding new information, insights and ideas about learning in a digital world. More information at www.macfound.org/education.

The MacArthur Foundation is proud to support the new YOUmedia “teen space” at the Chicago Public Library. It is an innovative, 21st century learning space created to connect young adults to books, media, mentors, and institutions throughout the city of Chicago. More information at www.youmediachicago.org.

NATIONAL GEOGRAPHIC Education Foundation

The National Geographic Education Foundation is pleased to sponsor the 9th International Conference of the Learning Sciences

education.nationalgeographic.com
Program

Monday, June 28
9:00 AM - 5:30 PM  PRECONFERENCE WORKSHOPS

DOCTORAL CONSORTIUM | Supported by National Science Foundation
Organizers: Cindy Hmelo-Silver, Rutgers University; Jerry Andriessen, Wise & Munro Learning Research
Participants: Lauren Barth-Cohen, University of California Berkeley; Crina Damşa, University of Oslo; Deborah Fields, University of California Los Angeles; Celso Gonçalves, University of Grenoble; Alan J. Hackworth, University of Wisconsin-Madison; Alecia Marie Magnifico, University of Wisconsin-Madison; Yvonne Mulder, University of Twente; Antti Rajala, University of Helsinki; Beat Schwendimann, University of California Berkeley; Suparna Sinha, Rutgers University; Kenneth Tang, University of Michigan; Richard Vath, University of Michigan; Megan Wawro, San Diego State University; Kristen B. Wendell, Tufts University; Naxin Zhao, OISE University of Toronto

EARLY CAREER WORKSHOP | Supported by National Science Foundation
Organizers: Susan A. Yoon, University of Pennsylvania; Paul Kirschner, Open University of the Netherlands
Participants: Janice Anderson, University of North Carolina at Chapel Hill; Ayelet Baram-Tsabari, Technion; Jana Bouwma-Gearhart, University of Kentucky; Leah A. Bricker, Loyola University Chicago; Cheryl Cohen, Michigan Technological University; Edward Dieterle, SRI International; Mingfong Jan, University of Wisconsin-Madison; Matthew Kam, Carnegie Mellon University; Ben Kehrwald, Massey University; Ingo Kollar, University of Munich; Victor Lee, Utah State University; Molly Phipps, Science Museum of Minnesota; Julia Plummer, Arcadia University; Gabriel Reedy, King’s College London; Margarida Romero, Universitat Autònoma de Barcelona; Cianan Russell, Georgia Institute of Technology; Ji Shen, University of Georgia; Carrie Tzou, University of Washington Bothell; Carla van de Sande, Arizona State University; Heather Toomey Zimmerman, Pennsylvania State University

WORKSHOP 1: PRODUCTIVE MULTIVOCALITY IN THE ANALYSIS OF COLLABORATIVE LEARNING
Organizers: Nancy Law, University of Hong Kong; Kristine Lund, University of Lyon; Carolyn Rosé, Carnegie Mellon University; Daniel Suthers, University of Hawaii; Christopher Teplovs, University of Toronto

WORKSHOP 2: THREE PERSPECTIVES ON TECHNOLOGY SUPPORT IN INQUIRY LEARNING - PERSONAL INQUIRY, MOBILE COLLABORATORIES AND EMERGING LEARNING OBJECTS
Organizers: Astrid Wichmann, University of Duisberg-Essen; Daniel Spikol, Linnaeus University; Stamatina Anastopoulou, University of Nottingham; Ulrich Hoppe, University of Duisberg-Essen; Marcelo Milrad, Linnaeus University; Roy Pea, Stanford University; Ton de Jong, University of Twente; Heidy Maldonado, Stanford University; Mike Sharples, University of Nottingham

WORKSHOP 3: IT’S ABOUT TIME - PURPOSE, METHODS AND CHALLENGES OF TEMPORAL ANALYSES OF MULTIPLE DATA STREAMS
Organizers: Britte Cheng, SRI International; Inge Molenaar, University of Amsterdam; Ming Ming Chiu, State University of New York Buffalo; Vanessa Svihla, University of California Berkeley; Alyssa Wise, Simon Fraser University; Vanessa Peters, University of Toronto; Katerina Zourou, University of Luxembourg

WORKSHOP 5: ENGINEERING LEARNING
Organizers: Aditya Johri, Virginia Tech; Barbara Olds, Colorado School of Mines

WORKSHOP 6: COLLABORATIVE LEARNING WITH INTERACTIVE SURFACES - AN INTERDISCIPLINARY AGENDA
Organizers: Michael Evans, Virginia Tech; Jochen Rick, Open University

Registration Open
Monday 8am- Thursday 2pm
The Northwestern Learning Sciences Graduate Program is proud to sponsor the 9th International Conference of the Learning Sciences.

The UIC Learning Sciences Graduate Program is proud to sponsor the 9th International Conference of the Learning Sciences.
**Tuesday, June 29**

**9:00 AM - 12:30 PM  Preconference Workshops**

**DOCTORAL CONSORTIUM | Supported by National Science Foundation**

Organizers: Cindy Hmelo-Silver, Rutgers University; Jerry Andriessen, Wise & Munro Learning Research

Participants: Lauren Barth-Cohen, University of California Berkeley; Cina Damisa, University of Oslo; Deborah Fields, University of California Los Angeles; Celso Goncalves; Alan J. Hackbart, University of Wisconsin-Madison; Alecia Marie Magnifico, University of Wisconsin-Madison; Yvonne Mulder; Aniti Rajala; Beat Schwendimann, University of California Berkeley; Suparna Sinha, Rutgers University; Kenneth Tang; Richard Vath; Megan Wawro, San Diego State University; Kristen B. Wendell, Tufts University; Naxin Zhao

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Organizers: Susan A. Yoon, University of Pennsylvania; Paul Kirschner, Open University of the Netherlands

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**WORKSHOP 1: PRODUCTIVE MULTIVOCALITY IN THE ANALYSIS OF COLLABORATIVE LEARNING**

Organizers: Nancy Law, University of Hong Kong; Kristine Lund, University of Lyon; Carolyn Rosé, Carnegie Mellon University; Daniel Suthers, University of Hawaii; Christopher Teplow, University of Toronto

**WORKSHOP 7: STRIKING A BALANCE BETWEEN FREE AND GUIDED EXPLORATION - CONCEPTUALIZING SUPPORT IN EXPLORATORY ENVIRONMENTS (ISEE’10)**

Organizers: Ido Roll, University of British Columbia; Manolis Mavrikis, University of London; Sergio Gutierrez Santos, University of London

**WORKSHOP 8: GROWING THE LEARNING SCIENCES - BRAND OR BIG TENT? IMPLICATIONS FOR GRADUATE EDUCATION**

Organizers: Mitchell Nathan, University of Wisconsin-Madison; Nikol Rummel, Ruhr University Bochum; Kenneth Hay, Indiana University

**WORKSHOP 9: HANDS-ON INTRODUCTION TO CREATING INTELLIGENT TUTORING SYSTEMS WITHOUT PROGRAMMING USING THE COGNITIVE TUTOR AUTHORING TOOLS**


**4:00 PM - 5:30 PM  Opening Session and Keynote**

**Keynote 1**

Chair: James Pellegrino, University of Illinois at Chicago

The Learning Sciences And Learning In The Sciences— The Perspective From Post-Secondary Science Education

Carl Wieman, University of Colorado and University of British Columbia

Reactor: Richard Duschl, Pennsylvania State University

Sponsored by the Spencer Foundation

**5:30 PM - 7:00 PM  Reception and Poster Session**

**Poster Session 1**

1.1 Children Learning Science through Engineering: An Investigation of Four Engineering-Design-Based Curriculum Modules

Kristen B. Wendell, Kathleen G. Connolly, Christopher G. Wright, Linda Jarvin, Chris Rogers

1.2 Expertise in Engineering Learning: Examining Engineering Students’ Collaborative Inquiry of Computer Systems

Yuen-Yan Chan

1.3 Robot Diaries: Encouraging and Enabling Technological Creativity

Debra Bernstein
Tuesday, June 29

POS Ter Sess ion 1 (continued)

1.4 Incorporating Affect in an Engineering Student’s Epistemological Dynamics
Brian A. Danielak, Ayush Gupta, Andrew Elby

1.5 Reflection Tools in Modeling Activities
Nora Siewiorek, Mary Besterfield-Sacre, Eric Hamilton, Larry J. Shuman

1.6 Development of Engineering Design Modules for Middle School Students: Design principles and Some initial Results
James Van Haneghan, Susan Pruet, Rhonda Waltman

1.7 Learning in mathematics: Effects of procedural and conceptual instruction on the quality of student interaction
Dejana Diziol, Nikol Rummel, Hans Spada, Stephanie Haug

1.8 Mapping topological relationships between contexts
Jonathan Boxerman, Bruce Sherin

1.9 Math Anxiety in Middle School Math Teachers: Implications for Teacher Practice and Professional Development
Nicole Shechtman

1.10 Virtual Math Teams: An Online Tool for Collaborative Learning in the Mathematics Disciplines
Baba Kofi Weusijana, Jimmy Xiantong Ou, Gerry Stahl, Stephen Weimar

1.11 Student Understandings of Solutions
Stephanie Ryan, Donald Wink, Susan Goldman, James Pellegrino

1.12 Students’ Plausibility Perceptions of Human-Induced Climate Change
Doug Lombardi, Gale M. Sinatra

1.13 Finding the “Learning” in Biology Students’ Use of Learning Management Systems
Steven Lonn

1.14 Analyzing People’s Views of Science Though Their Categorization of Television Science Programs
Pryce Davis

1.15 Coordination and contextuality: Revealing the nature of emergent mathematical understanding by means of a clinical interview
Mariana Levin, Rozy Brar

1.16 A Photograph-Based Measure of Students’ Beliefs About Math
Lee Martin, Pamela Gourley-Delaney

1.17 The Role of Definition in Supporting Mathematical Activity
Marta Kobiela, Rich Lehrer

1.18 NetLogo HotLink Replay: A Tool for Exploring, Analyzing and Interpreting Mathematical Change in Complex Systems
Michelle Wilkerson-Jerde, Uri Wilensky

1.19 Units of length: A notational system for conceptual understanding of size and scale
Cesar Delgado

1.20 Mathematics at Play
Osvaldo Jimenez, Kristen Pilner Blair, Indigo Esmonde, Shelley Goldman, Lee Martin, Roy Pea

1.21 Students’ Investigations with Physical Activity Data Devices
Victor Lee, Maneksha DuMont

1.22 Learning to Categorize Word Problems: Effects of Practice Schedules
Brian Gane, Richard Catrambone

1.23 Anomalous Graph Data and Claim Revision During Argumentation
Leema Berland, Victor Lee

1.24 Reasoning about the Seasons: Middle School Students’ Use of Evidence in Explanations
Julia Plummer, Lori Agan
1.25 Student Progress in Understanding Energy Concepts in Photosynthesis using Interactive Visualizations
  Kihyun (Kelly) Ryoo, Marcia Linn

1.26 Using the Activity Model of Inquiry to develop undergraduate students’ views of the scientific inquiry process
  Sara Marchlewicz, Donald Wink

1.27 Argumentation at the table-talk level of middle school students participating in scientific cafés
  Gerald P. Niccolai, Zeynab Badreddine, Christian Buty

1.28 The Use of Animations and Online Communication Tools to Support Mathematics Teachers in the Practice of Teaching
  Chieu Vu Minh, Patricio Herbst, Michael Weiss

1.29 What makes a “good” scientific question? Supporting independent student-driven inquiry
  Julia Svoboda, Cynthia Passmore

1.30 The Effect of Curricular Elements on Student Interest in Science
  Su Swarat

1.31 Using Design Personas to Inform Refinements to Software for Science Learning
  Patrik Lundh, Britte Cheng, William R. Penuel, Aasha Joshi, Hannah Lesk

1.32 - 1.36 Facilitation, Teaching, and Assistance at the Intersection of the Learning Sciences and Informal Science Education
  Lisa Bouillion Diaz, Jean Creighton, Catherine Eberbach, Dean Grosshandler, Leslie Herrenkohl, Sandra Toro Martell
Inquirium is a proud sponsor of the 9th International Conference of the Learning Sciences.
Wednesday, June 30
7:30 AM - 8:30 AM  JLS Board Meeting (closed)  CRYSTAL BALLROOM

8:00 AM - 10:00 AM  CONTINENTAL BREAKFAST  SALON FOYER

8:30 AM - 10:00 AM  PARALLEL SESSIONS

**PAPER SESSION 1: DYNAMICS OF COLLABORATIVE GROUP INTERACTIONS**  SALON 9

*Group Awareness of Social and Cognitive Behavior in a CSCL Environment*
Chris Phielix, Frans Prins, Paul Kirschner

*Coordinating Collaborative Problem-solving Processes by Providing Part-task Congruent Representations*
Bert Slof, Gijsbert Erkens, Paul Kirschner

*Fostering Online Search Competence and Domain-Specific Knowledge in Inquiry Classrooms: Effects of Continuous and Fading Collaboration Scripts*
Christof Wecker, Ingo Kollar, Frank Fischer, Helmut Prechtl

*Using collaborative activity as a means to explore student performance and understanding*
Marcella Borge, John M. Carroll

**PAPER SESSION 2: TRAJECTORIES OF EARLY CHILDHOOD SCIENCE LEARNING**  SALON 4

*Dispositions, disciplines, and marble runs: A case study of resourcefulness*
Margaret Carr, Jane McChesney, Bronwen Cowie, Robert Miles-Kingston, Lorraine Sands

*Scaffolding Children’s Understanding of the Fit Between Organisms and their Environment In the Context of the Practices of Science*
Kathleen Metz, Stephanie Sisk-Hilton, Eric Berson, Uyen Ly

*Kindergarten and First-Grade Students’ Representational Practices While Creating Storyboards of Honeybees Collecting Nectar*
Joshua Danish, David Phelps

*Interactional Arrangements for Learning about Science in Early Childhood: A Case Study Across Preschool and Home Contexts*
Siri Mehus, Reed Stevens, Linda Grigholm

**PAPER SESSION 3: SCIENCE TEACHERS’ LEARNING - MULTIPLE PERSPECTIVES**  SALON 7

*Transformative professional development: Cultivating concern with others’ thinking as the root of teacher identity*
Rachel E. Scherr, Hunter G. Close

*Activity-Theoretical Research on Science Teachers’ Expertise and Learning*
Cory Forbes, Cheryl Madeira, James D. Slotta

*Teacher Learning about Teacher-Parent Engagement: Shifting Narratives and a Proposed Trajectory*
Corey Drake, Angela Calabrese Barton

*Appropriating Conceptual Representations: A Case of Transfer in a Middle School Science Teacher*
Suparna Sinha, Steven Gray, Cindy Hmelo-Silver, Rebecca Jordan, Sameer Honwad, Catherine Eberbach, Spencer Rugaber, Swaroop Vattam, Ashok Goel

**PAPER SESSION 4: HOME-SCHOOL CONNECTIONS FOR MATH AND SCIENCE LEARNING**  SALON 8

*The Impact of a Media-Rich Science Curriculum on Low-Income Preschoolers’ Science Talk at Home*
William R. Penuel, Lauren Bates, Shelley Pasnik, Eve Townsend, Lawrence P. Gallagher, Carlin Llorente, Naomi Hupert

*Math Engaged Problem Solving in Families*
Shelley Goldman, Roy Pea, Kristen Pilner Blair, Osvaldo Jimenez, Angela Booker, Lee Martin, Indigo Esmonde
Wednesday, June 30

**Paper Session 4 (continued)**

Micros and Me: Leveraging home and community practices in formal science instruction
Carrie Tzou, Philip Bell

Playing with Food: Moving from Interests and Goals into Scientifically Meaningful Experiences
Tamara Clegg, Christina Gardner, Janet Kolodner

**Symposium 1: Fostering the Acquisition and Application of Domain-Specific Knowledge through Concept Mapping**

Fostering the Acquisition and Application of Domain-Specific Knowledge through Concept Mapping
Carmela Aprea, Hermann G. Ebner, Bert Slof, Gijsbert Erkens, Paul Kirschner, Baerbel Fuerstenau, Jeannine Ryssel, Janet Kunath

Concept Mapping versus Summary Writing as Instructional Devices for Understanding Complex Business Problems
Baerbel Fuerstenau, Jeannine Ryssel, Janet Kunath

Matching Representational Tools’ Ontology to Part-task Demands to Foster Problem-solving in Business Economics
Bert Slof, Gijsbert Erkens, Paul Kirschner

Direct and Indirect Means of Scaffolding the Effective Use of Student-generated CMs in Economics Education
Carmela Aprea, Hermann G. Ebner

**Symposium 2: Developing Students’ Disciplinary Historical Thinking - The Role of Textual and Instructional Resources**

Developing Students’ Disciplinary Historical Thinking: The Role of Textual and Instructional Resources
Darin Stockdill, Byeong-Young Cho, Avishag Reisman, Amy A. Wilson

The Teen Empowerment through Reading, Research, and Action (TERRA) Project
Darin Stockdill

Historical reasoning on the Internet: How do students read and learn about socially controversial issues in new literacy environments?
Byeong-Young Cho

Reading Like a Historian: A Document-Based History Curriculum Intervention with Adolescent Struggling Readers
Avishag Reisman

Constructing History in Middle Schools: A Social Semiotic Analysis of Texts Used in Three History Classrooms
Amy A. Wilson

**Poster Symposium 1: Using Visualization to Link Abstract Science and Everyday Experience**

Chair: Marcia Linn, University of California Berkeley
Discussant: Frank Fischer, University of Munich

Using Visualization to Link Abstract Science and Everyday Experience
Ji Shen, Hsin-Yi Chang, Jennifer Chiu, Douglas Clark, Kevin McElhaney, Keisha Varma, Eric Wiebe, Helen Zhang, Marcia Linn

Investigating the Role of Physical and Virtual Experiments in Developing Integrated Understanding of Thermal Conductivity and Equilibrium
Hsin-Yi Chang, Kun-Chen Tsai

Promoting Links and Developing Students’ Criteria for Visualizations by Prompting Judgments of Fidelity
Jennifer Chiu

SURGE: Intended and Unintended Learning in Digital Games
Douglas Clark, Brian C. Nelson, Cynthia M. D’Angelo, Kent Slack, Mario Martinez-Garza

How Do Interactive Graphing Tools Help Students Interpret Virtual Experiments about Car Collisions?
Kevin McElhaney

Transformative Modeling in Learning Current Electricity: A Case Study of Preservice Teachers
Ji Shen, Rutchelle Enriquez
**Wednesday, June 30**

**Poster Symposium 1 (continued)**

*Using Interactive Models to Support Content Learning through Scientific Reasoning*
Keisha Varma

*Abstraction and Re-representation in Visualizations: Understanding Where the Learning Occurs*
Eric Wiebe, Mike Carter, James Minogue, Lauren Madden, John Bedward

*Exploring Drawing and Critique to Enhance Learning from Visualizations*
Helen Zhang

**Poster Symposium 2: The Educative and Scalable Functions of Authoring Tools to Support Inquiry-based Science Learning**

*Chair: Iris Tabak, Ben Gurion University of the Negev*

*The Educative and Scalable Functions of Authoring Tools to Support Inquiry-based Science Learning*
Itay Asher, Iris Tabak, Vassilis Kollias, Eleni Kyza, Iolie Nicolaidou, Andreas Redfors, Lena Hansson, Sascha Schanze, Ulf Saballus

*Knowledge of prior implementations leverages authoring tool efficacy: The case of the Cyprus University of Technology team (CUT)*
Eleni Kyza, Iolie Nicolaidou, F. Terzian, A. Hadjichambis, D. Kafouris

*Using STOCHASMOS to scaffold students in discussing key issues while retaining ownership of their learning processes: The case of the Kristianstad team (HKr)*
Andreas Redfors, M. Rosberg, Lena Hansson, I. Lundh

*Specialized authoring tool as boundary object: The case of the Ben Gurion team (BGU)*
Iris Tabak, Itay Asher, S. Naser, Lina Gnaim, M. Fried, I. Katz, M. Weinstock

*Design foreclosure and the proliferation of offline activities: The case of the Leibniz Universität Hannover team (LUH)*
Sascha Schanze, Ulf Saballus, A. Neumann, M. Manske, B. Sieve, M. Söhlke, O. Jansen

*The case of the University of Thessaly team (UTH)*
Vassilis Kollias, A. Matos, A. Davaris, A. Karnavas, A. Daropoulos, K. Zaganas, V. Christodoulopoulos, Th. Tsaknia

10:00 AM - 10:20 AM  **Morning Break**

10:20 AM - 11:50 AM  **Parallel Sessions**

**Invited 1: ISLS Advances and Future Opportunities**

*Chair: Marcia Linn, University of California Berkeley*

*Respondents: Iris Tabak, Ben Gurion University of the Negev; Paul Kirschner, Open University of the Netherlands*

*An Emerging Society*
Christopher Hoadley

*Internationalization of Research*
Pierre Dillenbourg

*Leveraging New Technologies*
Roy Pea

*International Challenges*
Claire O'Malley

*Highlighting Junior Researchers*
Yasmin Kafai

*Collaborative Challenges*
Naomi Miyake

*Capitalizing on Social Networking*
Marcia Linn
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<tr>
<td><strong>Paper Session 5: Knowledge-Building Communities Across Contexts and Disciplines</strong></td>
<td>Social Software and Knowledge Building: Supporting Co-Evolution of Individual and Collective Knowledge</td>
<td>Salon 6</td>
<td>Joachim Kimmerle, Ulrike Cress, Christoph Held, Johannes Moskaliuk</td>
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<td></td>
<td>Teacher-education students’ views about knowledge building theory and practice</td>
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<td>Huang-Yao Hong, Fei-Ching Chen, Ching Sing Chai, Wen-Ching Chan</td>
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<td>Making Knowledge Building Moves: Toward Cultivating Knowledge Building Communities in Classrooms</td>
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<td>Kate Bielaczyc, John Ow</td>
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<td>Gaining an Insider Perspective on Learning physics in Hong Kong</td>
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<td>Jan van Aalst</td>
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<td><strong>Paper Session 6: Engineering Education - What is This Thing Called Engineering?</strong></td>
<td>Disciplinary Knowledge, Identity, and Navigation: The Contributions of Portfolio Construction</td>
<td>Salon 3</td>
<td>Jennifer Turner, Brook Sattler, Deborah Kilgore</td>
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<td>Contingent Identification in a Biomedical Engineering Classroom</td>
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<td>Vanessa Svihi</td>
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<td>Knowledge Transmission and Engineering Teaching</td>
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<td>Sili Zhang, Monica Cardella</td>
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<td>Cross-disciplinary practice in engineering contexts - a developmental phenomenographical perspective</td>
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<td>Robin Adams, Tiago Forin, Saranya Srinivasan, Llewellyn Mann</td>
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<td><strong>Paper Session 7: Learning Progressions - The State of the Field</strong></td>
<td>Validation of a Learning Progression: Relating Empirical Data to Theory</td>
<td>Salon 4</td>
<td>Nicole Shea, Ravit Golan Duncan</td>
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<td>Designing Assessments to Track Student Progress</td>
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<td>Namsoo Shin, Shawn Stevens, Joseph Krajcik</td>
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<td>Discourse as a lens for reframing consideration of learning progressions</td>
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<td>Alicia C. Alonzo</td>
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<td>A critique of how learning progressions research conceptualizes sophistication and progress</td>
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<td>Tiffany-Rose Sikorski, David Hammer</td>
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<td><strong>Symposium 3: Social Construction of Mathematical Meaning Through Collaboration and Argumentation</strong></td>
<td>Social construction of mathematical meaning through collaboration and argumentation</td>
<td>Salon 2</td>
<td>Baruch Schwarz, Shirley Atzmon, Rina Hershkowitz, Chris Rasmussen, Gerry Stahl, Megan Wawro, Michelle Zandieh</td>
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<td>Computer Mediation of Collaborative Mathematical Exploration</td>
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<td>Gerry Stahl</td>
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<td>Brokering as a Mechanism for the Social Production of Meaning</td>
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<td>Chris Rasmussen, Michelle Zandieh, Megan Wawro</td>
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<td>Distinctiveness of teachers’ discourse patterns and their impact on students’ emergent and subsequent argumentative activities</td>
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<td>Rina Hershkowitz, Baruch Schwarz, Shirley Atzmon</td>
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Wednesday, June 30

**Symposium 4 (continued)**

Broadening the Scope of Research on Epistemic Cognition: Implications from Epistemology and Philosophy of Science  
Clark Chinn

Implications of Philosophy for Assessing Epistemic Cognition  
Luke Buckland

Underdetermination in Philosophy of Science and Science Education  
Ala Samarapungavan

**Symposium 5: Qualitative, Quantitative, and Data Mining Methods for Analyzing Log Data to Characterize Students’ Learning Strategies and Behaviors**  
Discussant: Wouter van Joolingen, University of Twente

Qualitative, Quantitative, and Data Mining Methods for Analyzing Log Data to Characterize Students’ Learning Strategies and Behaviors  
Ryan Baker, Janice Gobert, Roger Azevedo, Ido Roll, Wouter van Joolingen

Studying the interaction between learner characteristics and inquiry skills in microworlds  
Janice Gobert, Michael São Pedro, Juelaila Raziuddin, Nathan Krach

Educational Data Mining Methods For Studying Student Behaviors Minute by Minute Across an Entire School Year  

Deciphering the complex nature of log-file data collected during self-regulated learning with MetaTutor  
Roger Azevedo, Amy Witherspoon, Amber Chauncey, Mihai Lintean, Zhiqiang Cai, Vasile Rus, Arthur Graesser

Analysis of students’ actions during online invention activities – seeing the thinking through the numbers  
Ido Roll, Vincent Aleven, Kenneth R. Koedinger

**Poster Symposium 3: Terra Nova Toward Terra Firma - Data on Games For Science Learning**  
Discussant: Yasmin Kafai, University of Pennsylvania

Terra Nova Toward Terra Firma: Data On Games For Science Learning  
Douglas Clark, Noel Enyedy, Constance Steinkuehler, Daniel Hickey, Brian C. Nelson, Kurt Squire, Eric Klopfer, Jody Clarke-Midura, Diane J. Ketelhut, Mingfong Jan

The Role of Embodiment and Symbolization in Supporting Physics Learning with Games and Virtual Worlds for Young Children  
Noel Enyedy

Model Based Reasoning & Use in Massively Multiplayer Online Games  
Constance Steinkuehler

Current Evidence of Engagement, Understanding, and Achievement in the Taiga Curriculum in Quest Atlantis  
Daniel Hickey, Eun Ju Kwon, Michael K. Filsecker

SURGE: Intended and Unintended Science Learning in Games  
Douglas Clark, Mario Martinez-Garza, Brian C. Nelson, Cynthia M. D’Angelo, Kent Slack

Learning Argumentation through a Role-playing Game-based Curriculum  
Mingfong Jan, Kurt Squire

Virtual Environment-based Assessments of Science Content and Inquiry: The SAVE Science Project  
Brian C. Nelson, Younsu Kim, Cecile Fishbe, Diane J. Ketelhut, Catherine Schifter, Deepa Mudgowder, David Majerich, Melanie Wills, Angela Shelton, Patrick McCormack, Tera Kane, Zoe Freeman

GameBuilder: Does Reduced Software Complexity Allow More Time on Task?  
Eric Klopfer, Chuan Zhang, Judy Perry, Josh Sheldon

MUVES and Meta-Knowledge  
Jody Clarke-Midura, Eugenia Garduno
**Wednesday, June 30**

**12:00 PM - 1:15 PM  ** **FIELD TRIP TO YOUmedia**  
Location: Harold Washington Library  
400 S. State Street

YOUmedia is an innovative, 21st century learning space, housed at the Harold Washington Library in downtown Chicago. It was created to connect young adults, books, media and institutions throughout the city in one dynamic space designed to inspire collaboration and creativity. The Chicago Public Library and the John D. and Catherine T. MacArthur Foundation invite you to an open house and tour of YOUmedia. Staff will be available to offer tours and answer your questions throughout the lunch break. Please meet at YOUmedia. Directions: Head west on E. Monroe Street (away from the lake) and take the first left onto S. State Street. Continue approximately 3 blocks on S. State Street. The main entrance to YOUmedia is located on S. State Street at W. VanBuren Street.

**12:00 PM - 1:15 PM  ** **LUNCH (ON YOUR OWN IN DOWNTOWN CHICAGO!!)**

**12:00 PM - 1:15 PM  ** ISLS Board Meeting (closed)  
Red Lacquer Ballroom

**1:30 PM - 3:00 PM ** Parallel Sessions

**INVITED 2: CHALLENGES IN PROFESSIONAL DISCIPLINARY PREPARATION**  
Crystal Ballroom

Presenters: Barbara Olds, Colorado School of Mines, Sherri Sheppard, Stanford University; Donald Wink, University of Illinois Chicago; Louis Gomez, University of Pittsburgh  
Discussant: James Pellegrino, University of Illinois Chicago

**PAPER SESSION 8: DESIGNED ARTIFACTS TO SUPPORT COLLABORATION AND LEARNING**  
Salon 7

Chair: Jochen Rick, Open University  
Representational Technology For Learning Mathematics: An Investigation of Teaching Practices in Latino/a Classrooms  
Phil Vahey, Teresa Lara-Meloy, Judit Moschkovich, Griselda Velazquez  
A Tempest in a Teapot Is but a Drop in the Ocean: Action-Objects in Analogical Mathematical Reasoning  
Dor Abrahamson

The Effects of Physical and Virtual Manipulatives on Students’ Conceptual Learning About Pulleys  
Elizabeth Gire, Adrian Carmichael, Jacquelyn J. Chini, Amy Rouinfar, Sanjay Rebello, Garrett Smith, Sadhana Puntambekar

Space And Time In Classroom Networks: Mapping Conceptual Domains In Mathematics Through Collective Activity Structures  
Tobin White, Corey Brady

**PAPER SESSION 9: CLASSROOM DISCOURSE PROCESSES - ROLES, AUTHORITY, AND ARGUMENTATION**  
Salon 2

Chair: Leema Berland, University of Texas Austin  
‘I study features; believe me, I should know!’: The mediational role of distributed expertise in the development of student authority  
Jennifer Langer-Osuna, Randi Engle

Talking with your mouth full: The role of a mediating tool in shaping collective positioning  
Kate Anderson, Melissa Gresalfi

Fostering meaningful scientific argumentation practices through ongoing classroom interactions  
Xiaowei Tang, Janet Coffey

Listen to each other: How the building of norms in an elementary science classroom fosters participation and argumentation  
Suna Ryu, William Sandoval
Wednesday, June 30

**Paper Session 10: Scaffolding Argumentation and Shared Reasoning**

Chair: R. Benjamin Shapiro, Morgridge Institute for Research

- Assessing Change in Learner's Causal Understanding Using Sequential Analysis and Causal Maps  
  Allan Jeong

- Effects of On-line Collaborative Argumentation Processes on Justifications  
  Jingyan Lu, Ming Ming Chiu, Nancy Law

- Arguing with Peers: Examining Two Kinds of Discourse and Their Cognitive Benefits  
  David Shaenfield

- When Students Speak, Who Listens? Constructing Audience in Classroom Argumentation  
  Leema Berland, Andrea Forte

**Paper Session 11: Spatial Reasoning - Issues for Teaching and Learning**

Chair: Frank Fischer, University of Munich

- Spatial Intelligence and the Research - Practice Challenge  
  Moshe Krakowski, Kristin Ratliff, Louis Gomez, Susan Levine

- What counts as scientific practice? A taxonomy of scientists' ways of thinking and doing  
  Lori Takeuchi

- Students' Use of Multiple Strategies for Spatial Problem Solving  
  Mike Stieff, Minjung Ryu, Bonnie Dixon

- Spatial and Temporal Embedding for Science Inquiry: An Empirical Study of Student Learning  
  Tom Moher, Jennifer Wiley, Allison Jaegar, Brenda Lopez Silva, Francesco Novellis, Deborah Kilb

**Symposium 6: The Learning Sciences as a Setting for Learning**

Chair: Jorge Larreamendy, UNIANDES  
Discussant: R. Keith Sawyer, Washington University in St. Louis

- The Learning Sciences as a Setting for Learning  
  Michael Evans, Martin Packer, Reed Stevens, Cody Maddox, R. Keith Sawyer, Jorge Larreamendy

- Mapping the Network of the Learning Sciences  
  Michael Evans

- The History and Micro-Genesis of the Learning Sciences  
  Reed Stevens

- The Constitution of a Learning Scientist  
  Martin Packer, Cody Maddox

**Symposium 7: A Cognitive Apprenticeship for Science Literacy Based on Journalism**

Chair: Joseph Polman, University of Missouri-St. Louis  
Discussants: Kevin Leander, Vanderbilt University; William R. Penuel, SRI International

- A Cognitive Apprenticeship for Science Literacy Based on Journalism  
  Joseph Polman, E. Wendy Saul, Alan Newman, Cathy Farrar, Nancy Singer, Eric Turley, Laura Pearce, Jen Hope, Glenda McCarty, Cynthia Graville

- Toward an Articulation of Standards for Science Literacy Based on Journalism  
  Alan Newman, E. Wendy Saul, Nancy Singer, Eric Turley, Laura Pearce, Joseph Polman

- Designing Transfer Tasks to Measure Science Literacy  
  Cathy Farrar, Joseph Polman, E. Wendy Saul, Alan Newman

- Reframing and Measuring Engagement with Science and Technology  
  Jen Hope, Glenda McCarty, Joseph Polman

- Building an Apprenticeship Community of Practice for Science Journalism  
  Joseph Polman, E. Wendy Saul, Alan Newman, Laura Pearce, Cynthia Graville
**SYMPOSIUM 8: WHEREVER YOU GO, THERE YOU ARE - EXAMINING THE DEVELOPMENT AND INTEGRATION OF IDENTITY ACROSS MULTIPLE DOMAINS AND CONTEXTS**

**Discussant:** Na’ilah Suad Nasir, University of California Berkeley

Wherever you go, there you are: Examining the development and integration of identity across multiple domains and contexts

Cynthia Carter Ching, Emily Evans, Elizabeth Faber, Deborah Fields, Na’ilah Suad Nasir

Trail guide self-perception and domain-expert identity at an environmental reserve

Emily Evans

Life maps and the multi-contextual development of undergraduate leadership identity

Elizabeth Faber

Identity confusion among teachers as professional development participants and novice bloggers

Cynthia Carter Ching

From Home to School and Back Again: Intersecting Trajectories of Identification in a Student’s Development as a Writer

Deborah Fields

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**PARALLEL SESSIONS**

**INVITED 3: REPRESENTATIONAL PRACTICES AND MODELING IN THE DISCIPLINES**

**Presenters:** Jay Lemke, University of Michigan; Rogers Hall, Vanderbilt University; Mary Nakleh, Purdue University

**Discussant:** Andrea DiSessa, University of California Berkeley

**CRYSTAL BALLROOM**

**PAPER SESSION 12: LEARNING TO WRITE AND WRITING TO LEARN**

**Chair:** Kimberley Gomez, University of Pittsburgh

“Ideas First” in Collaborative Second Language (L2) Writing: An Exploratory Study

Yun Wen, Wenli Chen, Chee-Kit Looi

Romantic beats “classic”: New insights on the effects of self-regulation on learning by writing

Isabel Braun, Susanne Philippi, Matthias Nückles

Children Learning Literate Practices in Spriting

Tara Rosenberger Shankar

Getting Others’ Perspectives: A Case Study of Creative Writing Environments and Mentorship

Alecia Marie Magnifico

**PAPER SESSION 13: EXAMINING AND EVALUATING THE USE OF CSCL TOOLS**

**Chair:** Gerry Stahl, Drexel University

Teachers Collaborating with Wiki: The Impact of Professional Status, Language, and Age

Yael Poyas

Preparing for the Long Tail of Teaching and Learning Tools

Charles Severance, Stephanie D. Teasley

An Overview of CSCL Methodologies

Heisawn Jeong, Cindy Hmelo-Silver

A Visualization of Group Cognition: Semantic Network Analysis of A CSCL Community

Li Sha, Christopher Teplovs, Jan van Aalst

**PAPER SESSION 14: FOSTERING CLASSROOM INQUIRY**

**Chair:** Augusto Macalalag Jr, Ravit Golan Duncan

Changes in Teachers’ Ability to Design Inquiry-Based Lessons During a Two-Year Preparation Program

Augusto Macalalag Jr, Ravit Golan Duncan

Eliciting and Developing Students’ Ideas and Questions in a Learner-Centered Environmental Biology Unit

Christopher J. Harris, Rachel S. Phillips, William R. Penuel

Implementing a Lesson Plan Vs. Attending to Student Inquiry: The Struggle of a Student-Teacher During Teaching Science

Loucas T. Louca, Maria Santis, Dora Tzialli
Wednesday, June 30

**Paper Session 14: (continued)**  
Fostering Mathematical Inquiry: Focus on Teacher’s Interventions  
Mara Martinez, Wenjuan Li

**Paper Session 15: Instructional Design in Higher Education**  
Stressed yet Motivated: Web-Based Peer Assessed Competition as an Instructional Approach in Higher Education  
Ronen Hammer, Miky Ronen, Dan Kohen-Vacs

Distributed Creativity Within a Community of Student Instructional Designers  
Richard West

The Role of Concretization in Acquiring Design Knowledge  
Tamar Ronen-Fuhrmann, Yael Kali

Sharing Educational Scenario Designs in Practitioner Communities  
Astrid Wichmann, Jan Engler, Ulrich Hoppe

**Symposium 9: Understanding a Future with Multiple Pasts - Projects on Metahistorical Understanding**  
Chair: D. Kevin O’Neill, Simon Fraser University  
Discussant: Susan Goldman, University of Illinois Chicago

Understanding a future with multiple pasts: Projects on metahistorical understanding  
D. Kevin O’Neill, Yifat Ben-David Kolikant, Joseph Polman, Josh Radinsky

“Compassionate Canada?”  
D. Kevin O’Neill

“Doing history together”: A collaborative investigation by Israeli Jewish and Arab students of their shared past of conflict  
Yifat Ben-David Kolikant

Narrative metacognition and story diagrams as scaffolds for the critique and construction of history narratives  
Joseph Polman

Building nuanced historical narratives around geographic data  
Josh Radinsky

**Symposium 10: On the Process and Outcomes of Inquiry Learning - Changing Approaches to Assessment**  
On the Process and Outcomes of Inquiry Learning: Changing Approaches to Assessment  
Shaaron Ainsworth, Ton de Jong, Cindy Hmelo-Silver, Pascal Wilhelm, Daniel Hickey, Michael Filsecker, Eun Ju Kwon, Stamatina Anastopoulou, Mike Sharples, Charles Crook

Participatory Assessment: Supporting Engagement, Understanding, and Achievement in Scientific Inquiry  
Daniel Hickey, Michael Filsecker, Eun Ju Kwon

Engaging students with assessment: Inquiry cartoons  
Shaaron Ainsworth, Stamatina Anastopoulou, Mike Sharples, Charles Crook, Claire O’Malley

Measuring Inquiry: New Methods, Promises & Challenges  
Jody Clarke-Midura, Michael Mayrath, Chris Dede

**Poster Symposium 4: Energy Across the Curriculum - Cumulative Learning Using Embedded Assessment Results**  
Energy across the Curriculum: Cumulative Learning Using Embedded Assessment Results  
Vanessa Svihla, Libby Gerard, Kihyun (Kelly) Ryoo, Elissa Sato, Tammie Visintainer, Hillary Swanson, Marcia Linn, Hee-Sun Lee, Ou Lydia Liu, Chad Dorsey

Promoting Cumulative Learning  
Marcia Linn, Chad Dorsey

Teacher Perspectives on Cumulative Learning  
Libby Gerard

Eliciting Energy Ideas in Thermodynamics  
Hillary Swanson

Redesigning Plate Tectonics for Cumulative Learning  
Elissa Sato
**Wednesday, June 30**

**POSTER SYMPOSIUM 4 (CONTINUED)**

Redesigning Global Climate Change for Cumulative Learning  
Tammie Visintainer, Vanessa Svihla

New Assessments of Cumulative Learning in Photosynthesis  
Kihyun Ryoo

Measuring Cumulative Understanding: Item Formats  
Hee-Sun Lee, Ou Lydia Liu

Measuring Cumulative Learning Across Disciplines  
Vanessa Svihla

**4:40 PM - 5:00 PM**  
**AFTERNOON BREAK**

**5:00 PM - 6:30 PM**  
**PARALLEL SESSIONS**

**IJCSCl EDITORIAL BOARD MEETING (closed)**

**CRYSTAL BALLROOM**

**PAPER SESSION 16: SCAFFOLDING SCIENTIFIC REASONING AND EXPLANATIONS**  
Chair: Mike Stieff, University of Illinois at Chicago

Explaining across contrasting cases for deep understanding in science: An example using interactive simulations  
Catherine C. Chase, Jonathan T. Shemwell, Daniel L. Schwartz

Scaffolding students in evaluating the credibility of evidence using a reflective web-based inquiry environment on Biotechnology  
Iolie Nicolaidou, Eleni Kyza, Frederiki Terzian, Andreas Hadjichambis, Dimitris Kafouris

Tracing knowledge re-organization - a fine grain analytical framework for looking at students’ developing explanations  
Orit Parnafes

The impact of web-based collaborative inquiry for science learning in secondary education  
Annelies Raes, Tammy Schellens, Bram De Wever

**PAPER SESSION 17: EMBODIED LEARNING PROCESSES**  
Chair: Joshua Danish, Indiana University

The use of a digital dance mat for training kindergarten children in a magnitude comparison task  
Ulrike Cress, Ursula Fischer, Moeller Korbinian, Sauter Claudia, Nuerk Hans-Christoph

Using conceptual blending to describe emergent meaning in wave propagation  
Michael Wittmann

Embodied Experiences within an Engineering Curriculum  
Molly Bolger, Marta Kobiela, Paul Weinberg, Rich Lehrer

Made by Hand: Gestural Practices for the Building of Complex Concepts in Face-to-Face, One-on-One Learning Arrangements  
Stephanie Scopelitis, Siri Mehus, Reed Stevens

**PAPER SESSION 18: LEARNING TO READ - AND READING TO LEARN FROM - INFORMATIONAL TEXTS**  
Chair: Kimberley Gomez, University of Pittsburgh

The Influence of Presentation Format and Subject Complexity on Learning from Illustrated Texts in Biology  
Mareike Florax, Rolf Ploetzner

Delinquent or criminal? - How to foster conceptual understanding of technical terms in computer-mediated collaborative learning.  
Elisabeth Paus, Gisela M. Gerhards, Regina Jucks
Wednesday, June 30

**Paper Session 18 (Continued)**

A Web-based Reading Environment Designed to Fundamentally Extend Readers' Interaction with Informational Texts
Khusro Kidwai

The Effectiveness of Reading Comprehension Strategies in High School Science Classrooms
Phillip Herman, Kristen Perkins, Martha Hansen, Louis Gomez, Kimberley Gomez

**Paper Session 19: Making Students' Thinking Visible for Reflection and Learning**

Chair: Alicia C. Alonzo, Michigan State University

Ji Shen, Ou Lydia Liu, Hsin-Yi Chang

Student learning through journal writing in a natural science course for pre-elementary education majors
Michael Dianovskiy, Donald Wink

Using Knowledge Space Theory to Analyze Concept Maps
Laura Cathcart, Mike Stieff, Gili Marbach-Ad, Ann Smith, Kenneth Frauwirth

Conceptual Change and Epistemic Growth Through Reflective Assessment in Computer-Supported Knowledge Building
Carol KK Chan, Ivan CK Lam

**Symposium 11: Transformative Play - Games as 21st Century Curriculum**

Chair: Sasha Barab, Indiana University

Transformative Play: Games as 21st Century Curriculum
Sasha Barab, Melissa Gresalfi, Anna Arici, Adam Ingram-Goble, Patrick Pettyjohn

Taiga Fishkill: Example 1 of Transformational Play
Sasha Barab, Anna Arici, Daniel Hickey

Ander City: Example 2 of Transformational Play
Sasha Barab, Melissa Gresalfi, Anna Arici, Adam Ingram-Goble, Patrick Pettyjohn

Modern Prometheus: Example 3 of Transformational Play
Patrick Pettyjohn, Sasha Barab

**Symposium 12: Internationalizing the Learning Sciences from Formal to Informal Learning Environments**

Chairs: Carolyn Rosé, Carnegie Mellon University; Matthew Kam, Carnegie Mellon University
Discussant: Christopher Hoadley, New York University

Symposium: Internationalizing the Learning Sciences from Formal to Informal Learning Environments
Carolyn Rosé, Matthew Kam, Therese Laferriere, Nancy Law, Neema Moraveji, Ravi Vatrapu, Christopher Hoadley

LearnLab India: Towards “In Vivo” International Comparative Education Research
Carolyn Rosé, Matthew Kam

Knowledge Building International Project (KBIP): a Nested Network of Learning and Knowledge Creation
Therese Laferriere, Nancy Law

Supporting and Measuring Global Information Literacy Through Cross-cultural Studies of Web Search
Neema Moraveji

Comparative Informatics: Investigating Cultural and Linguistic Influences in Computer Supported Collaborative Learning
Ravi Vatrapu

Language and Literacy Learning in Developing Communities via Cellphones
Matthew Kam
Wednesday, June 30

**Symposium 13: Increasing Rigor and Generativity in Learning: Connections Between the Disciplines, Children’s Lived Experience and Everyday Knowledge**

Chair: Megan Bang, American Indian Center
Discussant: Beth Warren, TERC

Increasing Rigor and Generativity in Learning: Connections Between the Disciplines, Children’s Lived Experience and Everyday Knowledge
Megan Bang, Christopher G. Wright, Eli Tucker-Raymond, Folashade Solomon Cromwell

Learning to “see” sound: Meaning-making about sound through architectural diagrams among elementary school Black boys
Christopher G. Wright

History in Schools, Teachers, and Students: Identities and Meaning Making in Middle School Social Studies
Eli Tucker-Raymond, Maria Rosario

A Writer’s Way: One Teacher’s Experience Learning to See Her Students’ Intellectual Strengths
Folashade Solomon Cromwell

**Symposium 14: Content Analysis of Collaboratively Constructed Knowledge Artifacts: Issues and Opportunities for Research**

Discussant: Christine Greenhow, University of Maryland

Content Analysis of Collaboratively Constructed Knowledge Artifacts: Issues and Opportunities for Research
Bram De Wever, Hilde Van Keer, Vanessa Peters, James D. Slotta, Elizabeth Charles, Nathaniel Lasry, Chris Whittaker, Crina Damsa, Patrick Sins, Bert Reijnen

Development of a Content Analysis Approach for Collaboration in a Wiki Environment
Bram De Wever, Hilde Van Keer

Analyzing Student Collaborations in a Wiki-based Science Curriculum
Vanessa Peters, James D. Slotta

Does Scale Matter: Using Different Lenses to Understand Collaborative Knowledge Building
Elizabeth Charles, Nathaniel Lasry, Chris Whittaker

Learning Through Collaborative Creation of Shared Knowledge Objects: Technological Support and Analytic Challenges
Crina Damsa, Patrick Sins, Bert Reijnen

**6:30 PM - 8:00 PM Reception and Poster Session**

**Poster Session 2**

2.1 Aggregation in the blog-o-sphere
Richard Alterman, Johann Larusson

2.2 Oh god, please don’t let me hurt them!: Assessing Self-Regulated Learning in Medical School Education
Ted Hanss, Stephanie D. Teasley

2.3 Cutting the Distance in Distance Learning: Perspectives on Effective Online Learning Environments
Erica Boling, Mary Hough, Hindi Krinsky, Hafiz Saleem, Maggie Stevens

2.4 Understanding Formative Instruction By Design
R. Benjamin Shapiro, Peter Wardrip

2.5 Community knowledge advancement and individual learning
Nancy Law, Johnny Yuen, Jing Leng, Wing O W Wong

2.6 Facilitation of reform based teacher identity development in pre-service teachers using post-activity reflection debriefs
Michael Occhino, April Lynn Luehmann

2.7 Structural validation of a feedback perceptions questionnaire
Jan-Willem Strijbos, Ron J. Pat-El, Susanne Narciss
2.8 Designing Environments to Encourage Collaborative Creativity: Two Case Studies in Higher Education  
Richard West, Geoff Wright, Isaku Tateishi, Dan Randall

2.9 Robotics and environmental sensing for low-income populations: design principles, impact, technology, and results  
Arnan Sipitakiat, Paulo Blikstein

2.10 Model-Evidence Link Diagrams: A Scaffold for Model-Based Reasoning  
Luke Buckland, Clark Chinn

2.11 Predicting Social Influence and Project Influence in Online Communities of Creators  
Elisabeth Sylvan

2.12 Effects of Case-Based Professional Development on Teacher Technological Pedagogical Content Knowledge  
Chrystalla Mouza

2.13 Beyond epistemological deficits: Incorporating flexible epistemological views into fine-grained cognitive dynamics  
Ayush Gupta, Andrew Elby

2.14 Investigating teacher growth in the context of content innovation  
Sao-Ee Goh, Susan A. Yoon

2.15 Impasses to innovation in the development and design of new media curriculum  
Kimberley Richards, Kimberley Gomez

2.16 From Visualization to Logical Necessity Through Argumentative Design  
Naomi Prusak, Rina Hershkowitz, Baruch Schwarz

2.17 Improvising in music: A learning biography study to reveal skill acquisition  
Iwan Wopereis, Jeroen van Merriënboer, Paul Kirschner

2.18 The Video Mosaic: Design and Preliminary Research  
Cindy Hmelo-Silver, Carolyn Maher, Grace Agnew, Marjory Palius, Sharon Derry

2.19 From Gettysburg to the Cuban Missile Crisis: Designing for historical reenactments with Twitter  
Tom Caswell, Marion Jensen, Victor Lee, Brett Shelton

2.20 The CORDTRA Analysis Tool in Action: Experiences and Suggestions  
Andri Ioannou-Nicolau, Agni Stylianou-Georgiou

2.21 Using Video-Based Examples of Peers’ Performance on a Task to Support Prospective Educators’ Interpersonal Skill Development  
Joan Walker, Benjamin Dotger

2.22 Explanation as a guide to learning  
Cristine Legare, Tania Lombrozo

2.23 The role of explanation in discovery and generalization: evidence from category learning  
Joseph Williams, Tania Lombrozo

2.24 Teachers’ Pedagogical Content Knowledge of Students’ Science Writing and Talk  
Katherine McNeill, Amanda Knight

2.25 Toward an emphasis on evidence and explanation in K-5 science teaching  
Carla Zembal-Saul

2.26 Disentangling conceptual and epistemic influences on scientific explanation  
William Sandoval, Jarod Kawasaki, Tina Stanford, Sara Carriere, Vladimir Lopez-Predo

2.27 Towards a Taxonomy of Explanations in Science Education  
Barbara White, Jennifer L. Chiu, Lauren Barth-Gohen, Beat Schwendimann, Eric Berson, Jennifer King Chen, Hillary Swanson

2.28 Connecting Brain and Learning Sciences: An Optical Brain Imaging Approach to Monitoring Development of Expertise in UAV Piloting  
Murat Cakir, Hasan Ayaz, Justin Menda, Kurtulus Izzetoglu, Banu Onaral
Wednesday, June 30

**Poster Session 2 (continued)**

2.29 Activating childhood expertise to engage with disciplinary concepts  
Sasha Palmquist

2.30 Knowledge eCommons: Merging Computer Conferencing and Wikis  
Jim Hewitt, Earl Woodruff

2.31 21st Century Assessment: Redesigning to Optimize Learning  
Vanessa Svihla, Drue Gawel, Nancy Vye, Megan Brown, Allison Moore, John Bransford

2.32 Unpacking the Design Process in Design-based Research  
Mingfong Jan, Yam San Chee, Ek Ming Tan

2.33 The elusive link between emotion and self-regulated learning: How does emotion affect metacognition, study-time, and performance during multimedia learning?  
Amber Chauncey, Roger Azevedo

2.34 Validity Evidence for Games as Assessment Environments  
Girlie C. Delacruz, Gregory K.W.K. Chung, Eva L. Baker

2.35 Learning inter-related concepts in mathematics from videogames  
Hee Seung Lee, Belinda Thompson, Keith Holyoak, James Stigler

2.36 Rhythm Games and Learning  
Matthew Gaydos

2.37 Neighborhood Investigations and Game Design Using Mobile Media  
James Mathews, Mark Wagler

2.38 Sources of Evidence for Embedded Assessment in Immersive Games  
Brian C. Nelson, Benjamin Erlandson, Andre Denham

2.39 Improving the Language Ability of Deaf Signing Children through an Interactive American Sign Language-Based Video Game  
Kimberly A. Weaver, Harley Hamilton, Zahoor Zafrulla, Helene Brashear, Thad Starner, Peter Presti, Amy Bruckman

2.40 Identity Supportive Games as a Tool to Learn about Asian-American Stereotypes and Self-Concept  
Joey Lee

2.41 Building Creativity: Collaborative Learning and Creativity in a Virtual Gaming Environment  
Kylie Peppler, Maria Solomou

2.42 Small Groups, Big Mistakes: The Emergence of Faulty Rules During a Collaborative Board Game  
Matthew Berland, Victor Lee, Maneksha DuMont

2.43 Student Conceptions of Number in Solutions Chemistry  
Stephanie Ryan, Donald Wink

Registration Open  
Monday 8am- Thursday 2pm
Thursday, July 1
7:30 AM - 8:30 AM  CSCL 2011 Program Committee Meeting  Crystal Ballroom

8:00 AM - 10:00 AM  Continental Breakfast  Red Lacquer Ballroom

8:30 AM - 10:00 AM  Keynote 2  Red Lacquer Ballroom

Chair: Alison Castro-Superfine, University of Illinois at Chicago

Instructional design, theory and practice in mathematics education
Koen Gravemeijer, Eindhoven University of Technology
Reactor: Danny B. Martin, University of Illinois Chicago

Sponsored by the Spencer Foundation

10:00 AM - 10:15 AM  Morning Break  Red Lacquer Ballroom

10:15 AM - 11:45 AM  Parallel Sessions

Invited 4: Identity as a Lens on Learning in the Disciplines  Crystal Ballroom

Chair: Josh Radinsky, University of Illinois Chicago
Presenters: Na’Ilah Suad Nasir, University of California Berkeley; Reed Stevens, Northwestern University; Avi Kaplan, Temple University
Discussant: Stanton Wortham, University of Pennsylvania

Paper Session 20: Scripts, Prompts, and Feedback as Scaffolds for Learning  Salon 4

Chair: Erica Rosenfeld Halverson, University of Wisconsin-Madison

Known Knowns and Unknown Knowns: Multiple Memory Routes to Improved Numerical Estimation
Dav Clark, Michael Ranney

Representational Scripting to Support Students’ Online Problem-solving Performance
Bert Slof, Gijsbert Erkens, Paul Kirschner

Fading Instructional Scripts: Preventing Relapses into Novice Strategies by Distributed Monitoring
Christof Wecker, Frank Fischer

Promoting Learning in Complex Systems: Effect of Question Prompts versus System Dynamics Model
Progressions as a Cognitive-Regulation Scaffold in a Simulation-Based Inquiry-Learning Environment
Deniz Eseryel, Victor Law

Paper Session 21: Knowledge Construction and Online Inquiry  Salon 6

Group Micro-creativity in Online Discussions: Effects of New Ideas and Social Metacognition
Gaowei Chen, Ming Ming Chiu, Zhan Wang

Analyzing Collaborative Knowledge Construction in Secondary School Biology
Vanessa Peters, James D. Slotta

Analyzing Equality of Participation in Collaborative Inquiry: Toward a Knowledge Community
Hedieh Najafi, James D. Slotta

Paper Session 22: Learning to Attend to Students’ Thinking  Salon 7

Chair: Ravit Golan Duncan, Rutgers University

Exploring how novice teachers learn to attend to students in analyzing case studies of classroom
teaching and learning
Daniel Levin, Jennifer Richards

Using changes in framing to account for differences in a teacher’s classroom behavior
Jennifer Lineback, Fred Goldberg
**Thursday, July 1**

**Paper Session 22 (Continued)**

Examing Preservice Teachers’ Ability to Attend and Respond to Student Thinking  
Vicky Pilitsis, Ravit Golan Duncan

Dynamics of disciplinary understandings and practices of attending to student thinking in elementary teacher education  
Janet Coffey, Ann Edwards, Carla Finkelstein

**Paper Session 23: Methodological Issues and Challenges for the Learning Sciences**

Chair: William R. Penuel, SRI International

Where to Find the Mind: Identifying the Scale of Cognitive Dynamics  
Luke Conlin, Ayush Gupta, David Hammer

Adapting Workflow Technology to Design-Based Research: Development of a Method for Organizing the “Messiness” of Research in Technology-Rich Online Learning Environments  
Alan J. Hackbarth, Sharon Derry, Brendan R. Eagan, Julia Gressick

Finding Transactive Contributions in Whole Group Classroom Discussions  
Hua Ai, Marietta Sionti, Yi-Chia Wang, Carolyn Rose

Arts and Learning: A Review of the Impact of Arts and Aesthetics on Learning and Opportunities for Further Research  
Kylie Peppler, Heidi Davis

**Paper Session 24: Processes of Co-construction in Groups**

Chair: David Uttal, Northwestern University

Exploring Convergence of Science Ideas through Collaborative Concept Mapping  
Dana Gnesdilow, Anushree Bopardikar, Sarah Sullivan, Sadhana Puntambekar

What Are They Talking About? Findings from an Analysis of the Discourse in Peer-Led Team Learning In General Chemistry  
Patrick Brown, R. Keith Sawyer, Regina Frey, Daniel Gealy, Sarah Luesse

Multiple Conceptual Coherences in the Speed Tutorial: Micro-processes of Local Stability  
Brian Frank

Science Learning as the Objectification of Discourse  
Valerie Otero

**Symposium 15: A New Age in Tangible Computational Interfaces for Learning**

Chair: Paulo Blikstein, Stanford University  
Discussant: Edith Ackermann, Massachusetts Institute of Technology School of Architecture

A New Age in Tangible Computational Interfaces for Learning  
Paulo Blikstein, Leah Buechley, Michael Horn, Hayes Raffle

Topobo: programming by example to create complex behaviors  
Hayes Raffle

LilyPad Arduino: rethinking the materials and cultures of educational technology  
Leah Buechley

Connecting the science classroom and tangible interfaces: the Bifocal Modeling framework  
Paulo Blikstein

Tangible Programming in Formal and Informal Educational Environments  
Michael Horn

**Symposium 16: Are We Managing Learning with Learning Management Systems?**

Chair: Stephanie D. Teasley, University of Michigan  
Discussant: James Laffey, University of Missouri

Are We Managing Learning with Learning Management Systems?  
Stephanie D. Teasley, Tanya Cleveland Solomon, Andrew E. Krumm, Steven Lonn, Kara Makara, Diana Perpich, James Laffey
Thursday, July 1

**Symposium 16 (continued)**

**Salon 3**

A Multi-Institutional Analysis of Interactions Supported by a LMS  
Andrew E. Krumm, Steven Lonn

Commuter vs. Residential: LMS Perceptions & Use on Two Campuses  
Steven Lonn, Andrew E. Krumm

How Does LMS Use Affect Instructional Time?  
Tanya Cleveland Solomon, Kara Makara

The Gifts We Give Ourselves: Embedding Disciplinary Tools in LMS  
Diana Perpich

**11:45 AM - 1:00 PM  Lunch (on your own in downtown Chicago!)**

**ISLS Education Committee Meeting (closed)**  
**Crystal Ballroom**

**ISLS Conference Committee Meeting (closed)**  
**Salon 3**

**ISLS Membership Committee Meeting (closed)**  
**Salon 6**

**1:10 PM - 2:40 PM  Parallel Sessions**

**Invited 5: Geography Education Reform: A Cinderella Story in the Making?**  
**Crystal Ballroom**

Chair: Daniel Edelson, National Geographic Society  
Presenters: David Uttal, Northwestern University; Josh Radinsky, University of Illinois Chicago; David Rutherford, University of Mississippi  
Discussant: Clare Brooks, University of London

**Paper Session 25: Learning in video game authoring, design, training, and play**  
**Salon 12**

"Let the Players Play!" and Other Earnest Remarks about Videogame Authorship  
Paul Teske, Teale Fristoe

Leading to Win: The Influence of Leadership Styles on Team Performance during a Computer Game Training  
Anna Siewiorek, Andreas Gegenfurtner

First-Year Engineering Students’ Environmental Awareness and Conceptual Understanding with Participatory Game Design as Knowledge Elicitation  
Melissa Dyehouse, Nicole Weber, Jun Fang, Constance Harris, Annette Tomory, Johannes Strobel

Reading in the Context of Online Games  
Constance Steinkuehler, Catherine Compton-Lilly, Elizabeth King

**Paper Session 26: Disciplinary Lenses and Epistemologies Shaping Conceptual Learning**  
**Salon 3**

Chair: Leema Berland, University of Texas Austin

Conceptual Confusion in the History Classroom  
Chava Shane-Sagiv

Perceptions of the relationship between evolutionary theory and biblical explanations of the origins of life and their effects on the learning of evolution among high school students  
Pratchayapong Yasi, Rebecca Mancy

Which science disciplines are pertinent? -Impact of epistemological beliefs on students’ choices  
Torsten Porsch, Rainer Bromme

Discipline-specific Socialization: A Comparative Study  
Iris Tabak, Michael Weinstock, Hilla Zviling-Beiser

**Paper Session 27: Exploring Learning Possibilities with Handheld Technologies**  
**Salon 7**

Chair: Paula Hooper, Exploratorium

Facilitating Group Learning in Science Laboratory Courses Using Handheld Devices  
Chen-Wei Chung, Wang-Hsin Kuo, Chen-Chung Liu
Thursday, July 1

**Paper Session 27 (continued)**

**Students’ Meaning Making in a Mobile Assisted Chinese Idiom Learning Environment**
Lung-Hsiang Wong, Chee-Kuen Chin, Chee-Lay Tan, May Liu, Cheng Gong

**Extending Students' learning Spaces: Technology-Supported Seamless Learning**
Wenli Chen, Peter Sen Kee Seow, Hyo-Jeong So, Yancy Toh, Chee-Kit Looi

**Quiet Captures: A Tool for Capturing the Evidence of Seamless Learning with Mobile Devices**
Ivica Boticki, Hyo-Jeong So

**Symposium 17: Scaling Practices of Spatial Analysis and Modeling**
Chair: Rogers Hall, Vanderbilt University
Discussant: Reed Stevens, Northwestern University

Scaling Practices of Spatial Analysis and Modeling
Rogers Hall, Jasmine Ma, Kevin Leander, Katie Taylor, Nathan Phillips

Shifting Between Person, Structure and Settlement Scales in Anthropological Field Work
Jasmine Ma, Rogers Hall, Kevin Leander

Changing the Structure of Planning Participation by Moving Across Scales
Katie Taylor, Rogers Hall, Kevin Leander

Modality and Scale at AirMed
Nathan Phillips, Kevin Leander

**Symposium 18: Understanding Families’ Educational Decision-Making Along Extended Learning Pathways**
Discussant: Brigid Barron, Stanford University

Understanding Families’ Educational Decision-Making Along Extended Learning Pathways
Leah A. Bricker, Heather Toomey Zimmerman, Suzanne Reeve, Philip Bell

Negotiating Identity and Expertise in a Vietnamese Immigrant Family
Leah A. Bricker, Heather Toomey Zimmerman, Suzanne Reeve, Philip Bell

Orienting Children Towards Science: Influences of Parental Values and Family History on How Parents Arrange Children’s Educational Experiences
Leah A. Bricker, Heather Toomey Zimmerman, Suzanne Reeve, Philip Bell

Examining the Complex Ecologies Associated with Immigrant Youth and Family Educational Decision Making
Leah A. Bricker, Heather Toomey Zimmerman, Suzanne Reeve, Philip Bell

**Symposium 19: Adaptive Human Guidance of Computer-Mediated Group Work**
Chair: Baruch Schwarz, Hebrew University of Jerusalem
Discussant: Annemarie Palincsar, University of Michigan

Adaptive human guidance of computer-mediated group work
Baruch Schwarz, Christine Wang, Ming Ming Chiu, Cynthia Ching, Kenneth Koedinger, Erin Walker, Nikol Rummel, Baruch Schwarz, Christa Asterhan, Michael Baker

Statistical Discourse Analysis of Young Children’s Peer Tutoring at Computers
Christine Wang, Ming Ming Chiu, Cynthia Ching

Automated Adaptive Support for Peer Tutoring in High-School Mathematics
Erin Walker, Nikol Rummel, Kenneth Koedinger

Human guidance of synchronous discussions: A nascent school practice
Baruch Schwarz, Christa Asterhan

Buds, flowers and fruit: potentialities for guidance in collaborative argumentation-based learning
Michael Baker

**Symposium 20: Learning about Dynamic Systems by Drawing**
Learning about Dynamic Systems by Drawing
Shaaron Ainsworth, Mitchell Nathan, Peggy van Meter, Helen Zhang, Marcia Linn, Arzoo Buksh, Chelsea Johnson, Wouter van Joolingen, Lars Bollen, Frank Leenaars
Thursday, July 1

**SYMPOSIUM 20 (CONTINUED)**

**How can selection and drawing support learning from dynamic visualizations?**
Helen Zhang, Marcia Linn

**Can self-explanation help learners draw to learn?**
Shaaron Ainsworth, Arzoo Buksh

**Drawing Inferences about Students' Mental Models of Dynamic Processes Depicted in Scientific Drawings: The Role of Gestures and Speech**
Mitchell Nathan, Chelsea Johnson

**Interactive drawing tools to support modeling of dynamic systems**
Wouter van Joolingen, Lars Bollen, Frank Leenaars

**2:40 PM - 3:00 PM** **AFTERNOON BREAK**

**3:00 PM - 4:30 PM** **PARALLEL SESSIONS**

**PAPER SESSION 28: KNOWLEDGE-BUILDING COMMUNITIES AND COLLABORATIVE DISCOURSE**
Chair: David Schaenfield, Teachers College Columbia University

- An invisible preference for intrinsic motivation in Computer-Mediated Communication
  Bart Rienties, Dirk Tempelaar, Bas Giesbers, Mien Segers, Wim Gijselaers

- Collaborative Productivity as Self-Sustaining Processes in a Grade 4 Knowledge Building Community
  Jianwei Zhang, Richard Messina

- Examining the Role of Verbal Interaction in Team Success on a Design Challenge
  Xornam S. Apedoe, Kristina V. Mattis, Bianca Rowden-Quince, Christian D. Schunn

- Software-Based Scaffolding: Supporting the Development of Knowledge Building Discourse in Online Courses
  Nobuko Fujita, Christopher Teplov

**PAPER SESSION 29: PROFESSIONAL VISION AS A LENS ON LEARNING IN THE DISCIPLINES**
Chair: Phillip Herman, University of Pittsburgh

- Assessing the Development of Expertise in an Historical-Based Science: The Case of Integrative Archeology
  Inbal Flash Gvili, Jeff Dodick

- Tension resolution as pattern for practice transformation in interdisciplinary teamwork in professional development
  Patrick Sins

  Andreas Gegenfurtner, Anna Siewiorek

- The Epistemography of Journalism 335: Complexity in developing journalistic expertise
  David Hatfield, David Williamson Shaffer

**PAPER SESSION 30: TRAJECTORIES OF MATH AND SCIENCE LEARNING**
Chair: Deborah Morrison, Kathleen Henson, Sarah A. Roberts

- Centering a Professional Learning Community on a Learning Progression for Natural Selection: Transforming Community, Language, and Instructional Practice
  Erin Marie Furtak, Deborah Morrison, Kathleen Henson, Sarah A. Roberts

- A Longitudinal Approach to Appropriation of Science Ideas: A Study of Students’ Trajectories in Thermodynamics
  Olivia Levini, Paola Fantini, Barbara Pecori, Marta Gagliardi, Mariateresa Scarongella, Giulia Tasquier

- The Construction, Refinement, and Early Validation of the Equipartitioning Learning Trajectory
  Alan Maloney, Jere Confrey

- Magnetism as a Size Dependent Property: A Cognitive Sequence for Learning about Magnetism as an Introduction to Nanoscale Science for Middle and High School Students
  David Sederberg, Lynn Bryan
Symposium 21: The Design Framework: An Organizing Artifact for Enhancing the Fidelity of Educational Research, Implementation, and Assessment

Discussant: Louis Gomez, University of Pittsburgh

The Design Framework: An Organizing Artifact for Enhancing the Fidelity of Educational Research, Implementation, and Assessment
Richard Halverson, Erica Rosenfeld Halverson, Dana Gnesdilow, Jen Scott Curwood, Michelle Bass, Anne Karch

A Modest Proposal: A Design Framework to Unify Educational Discourse
Richard Halverson, Erica Rosenfeld Halverson

Using the Design Framework as a Metarepresentation to Facilitate Teacher-Researcher Collaboration
Dana Gnesdilow, Jen Scott Curwood

Artifact Families: An Affordance of the Design Framework
Michelle Bass

Branching Up, Out or Off: How Features Become Affordances
Anne Karch

Symposium 22: Using Digital Video to Investigate Teachers' In-the-Moment Noticing

Discussant: Rogers Hall, Vanderbilt University

Using Digital Video to Investigate Teachers’ In-the-Moment Noticing
Bruce Sherin, Miriam Sherin, Adam Colestock, Rosemary Russ, Melissa Luna, Martha Mulligan, Janet Walkoe, Rogers Hall

Freezing Time: What Mathematics and Science Teachers “See” While Teaching
Bruce Sherin, Miriam Sherin

Science and Mathematics Teachers’ In-The-Moment Noticing: Attending to Student Thinking Within a Lesson and Beyond
Adam Colestock, Rosemary Russ

Supporting Video Club Conversations Using Teacher-Selected Video Clips
Melissa Luna, Martha Mulligan, Miriam Sherin, Janet Walkoe

Symposium 23: Learning about Complexity and Beyond - Theoretical and Methodological Implications for the Learning Sciences

Organizer: Michael Jacobson, University of Sydney Chair: Uri Wilensky, Northwestern University
Discussant: Peter Reimann, University of Sydney

Learning about Complexity and Beyond: Theoretical and Methodological Implications for the Learning Sciences
Michael Jacobson, Uri Wilensky, Peter Reimann, Pratim Sengupta, Michelle Wilkerson-Jerde, Manu Kapur

The Role of Perceptual Signatures and Agent-Level Mechanisms in Understanding Emergence: An Example in Learning Electricity
Pratim Sengupta, Uri Wilensky

Seeing Change in the World from Different Levels: Understanding the Mathematics of Complex Systems
Michelle Wilkerson-Jerde, Uri Wilensky

Learning as an Emergent Phenomenon: Methodological Implications
Manu Kapur, Michael Jacobson

Ontologies as Scale Free Networks: Implications for Theories of Conceptual Change
Michael Jacobson, Manu Kapur

Symposium 24: Understanding the Role of Place in Environmental Education across Settings

Understanding the Role of Place in Environmental Education across Settings
Giovanna Scalone, Philip Bell, Shari Rose, Angela Calabrese Barton, Carrie Tzou

Ideological dimensions of place: (re)creating an urban area
Giovanna Scalone, Philip Bell

“The Coal Plant Could Give People Jobs, But at the Same Time, It could Pollute the Air”: Science learning as participation with and in a place
Shari Rose, Angela Calabrese Barton
Thursday, July 1

**SYMPOSIUM 24 (CONTINUED)**

“My Place in Puget Sound”: Leveraging youths’ sense of place in ocean sciences education

Carrie Tzou

**POSTER SYMPOSIUM 5: TECHNOLOGIES AND TOOLS TO SUPPORT INFORMAL SCIENCE LEARNING**

**SALON 12**

Chair: Heather Toomey Zimmerman, Pennsylvania State University

Discussants: Sherry Hsi, Lawrence Hall of Science; Brian K. Smith, Rhode Island School of Design

Technologies and Tools to Support Informal Science Learning

Heather Toomey Zimmerman, David E. Kanter, Kirsten Ellenbogen, Leilah Lyons, Steven J. Zuiker, Tom Satwicz, Sandra Toro Martell, Sherry Hsi, Brian K. Smith, Matthew Brown

Using the demand for data in a project-based science curriculum to bridge high school biology classrooms and an informal science center

David E. Kanter

Rain Table: Visualization technology using complex datasets that allows learners to control and follow water flow across the Earth’s surface

Kirsten Ellenbogen, Molly Phipps

Mobile devices transforming the museum experience: Opportunistic user interfaces to exhibits

Leilah Lyons

Cyber-stretching: The Taiga biome around kids’ worlds

Steven J. Zuiker

Understanding the pieces of knowledge in informal learning environments

Tom Satwicz

Using digital photography on an Internet portal to extend and enrich outdoors learning experiences

Heather Toomey Zimmerman, Robert Jordan, Jennifer Weible, Chris Gamrat

Innovative Tools and Student Perceptions of Technology: Owl Tracking and GIS Mapping with Fifth and Sixth Graders

Sandra Toro Martell

Take a Stand: Creating an immersive social experience with people tracking, 3D game technology, and interactive storytelling

Matthew Brown, Ben Loh, Joyce Ma

**4:45 PM - 6:00 PM PARALLEL SESSIONS**

**PAPER SESSION 31: REPRESENTATIONAL PRACTICES OF LEARNERS**

**SALON 6**

Chair: R. Benjamin Shapiro, Morgridge Institute for Research

Representational practices in the activity of student-generated representations (SGR) for promoting conceptual understanding

Orit Parnafes

Learning physics as coherently packaging multiple sets of signs

Kristine Lund, Karine Becu-Robinault

Digital art-making as a representational process

Erica Rosenfeld Halverson

**PAPER SESSION 32: MULTIMEDIA RESOURCES FOR LEARNING ENVIRONMENTS**

**SALON 3**

Chair: Nichole Pinkard, University of Chicago

Pictorial illustrations in intelligent tutoring systems: Do they distract or elicit interest and engagement?

Ulrike Magner, Rolf Schwonke, Alexander Renkl, Vincent Aleven, Octav Popescu

Digital Video Tools in the Classroom: Empirical Studies on Constructivist Learning with Audio-visual Media in the Domain of History

Carmen Zahn, Karsten Krauskopf, Roy Pea, Friedrich W. Hesse

From Show, To Room, To World: A Cross-Context Investigation of How Children Learn from Media Programming

Therese E. Dugan, Reed Stevens, Siri Mehus
Thursday, July 1

**Paper Session 33: Mathematics Instruction: Innovations and Challenges**

**Chair:** Phil Vahey, SRI International

- Interactional Achievement of Shared Mathematical Understanding in a Virtual Math Team
  Murat Cakir, Gerry Stahl, Alan Zemel

- Free, open, online, mathematics help forums: The good, the bad, and the ugly
  Carla van de Sande

- Effects of Instructional Design Integrated With Ethnomathematics: Attitudes And Achievement
  Melike Kara, Ayse Yontar Togroil

**Paper Session 34: Teachers’ Epistemologies and Science**

**Chair:** Joseph Polman, University of Missouri St. Louis

- Investigating pre-service elementary teachers’ epistemologies when talking about science, enacting science and reflecting on their enactment
  Loucas T. Louca, Dora Tzialli, Zacharias C. Zacharia

- Interpreting Elementary Science Teacher Responsiveness Through Epistemological Framing
  April Cordero Maskewicz, Victoria Winters

- Personal beliefs about learning and teaching: Comparison of student teachers in the sciences and humanities at different stages of their studies
  Natalia Schlichter, Rainer Watermann, Matthias Nückles

**Paper Session 35: Learning Sciences Research at Scale**

**Chair:** Louis Gomez, University of Pittsburgh

- Equity in Scaling Up SimCalc: Investigating Differences in Student Learning and Classroom Implementation
  Jeremy Roschelle, Jessica Pierson, Susan Empson, Nicole Shechtman, Margie Dunn, Deborah Tatar

- Large Scale Analysis of Student Workbooks: What Can We Learn About Learning?
  Nicole Shechtman, Jeremy Roschelle

- Complexity, Robustness, and Trade-Offs in Evaluating Large Scale STEM Education Programs
  Susan A. Yoon, Lei Liu

6:00 PM - 7:30 PM **Reception & Poster Session**

**Poster Session 3**

- **3.1** The identity formation of youth with disabilities across academic disciplines and social contexts
  AnnMarie Baines, Philip Bell

- **3.2** Designing an online environment for all teachers: Supporting teachers in learning to learn online
  Rebecca Schneider

- **3.3** SURGE: Integrating Vygotsky’s Spontaneous and Instructed Concepts in a Digital Game?
  Douglas Clark, Brian C. Nelson, Cynthia M. D'Angelo, Kent Slack, Mario Martinez-Garza

- **3.4** Multi-Touch Tabletop Computing for Early Childhood Mathematics: 3D Interaction with Tangible User Interfaces
  Michael A. Evans, Elisabeth Drechsel, Eric Woods, Guoqiang Cui

- **3.5** Impact of the distribution of social skills within learning groups in a CSCL- setting: An empirical pilot study
  Michele Notari, Adrian Baumgartner

- **3.6** Pre-Implementation Technology Acceptance Model in the Case of a University-Based Electronic Portfolio System
  Jeng-Yi Tzeng

- **3.7** Investigating youth’s identity trajectories through positioning within the dialectic interstices of online and offline worlds
  Azilawati Jamaludin

- **3.8** Broadening Participation through Scaffolding
  Shelley Stromholt, Andrew Shouse, Philip Bell
3.9 An Analysis of the Interactional Patterns in One-to-One and One-to-Many Collaborative Concept Mapping Activities
Chiu-Pin Lin, Lung-Hsiang Wong, Tzu-Chien Liu, Yin-Juan Shao

3.10 Finding Essential Complexity for Learning in Virtual Worlds
Benjamin Erlandson, Brian C. Nelson, Andre Denham

3.11 Overherd: Designing Information Visualizations to Make Sense of Student’s Online Discussions
Libby Hemphill, Stephanie D. Teasley

3.12 Out-of-School Virtual Worlds Based Programs: A Cross-Case Analysis
Constance Steinkuehler, Esra Alagoz

3.13 Formative Feedback Handheld Tools for Teachers
Suzanne Rhodes

3.14 Moving Towards Learning with One-to-One Laptop: A Longitudinal Case Study on Tools, People, and Institutions
Arnan Sipitakiat

3.15 The Design and Evaluation of Educative Just-In-Time Teacher Supports in a Web-Based Environment
Hebbah El-Moslimany, Ravit Golan Duncan, Janice McDonnell, Sage Lichtenwalner

3.16 Reviving Dewey’s Reflective Thinking Framework for the Design of Problems in Virtual Learning Environment based Assessments of Content and Inquiry
David Majerich, Diane J. Ketelhut, Brian Nelson, Catherine Schifter, Younsu Kim

3.17 Using a designed, online games based affinity space as a quasi-natural ethnographic context and experiment lab
Constance Steinkuehler, Elizabeth King, Esra Alagoz, Yoonsin Oh, Sarah Chu, Bei Zhang, Aysegul Bakar, Crystle Martin

3.18 A dual-level approach for investigating design in online affinity spaces
Sean Duncan

3.19 Identity in Informal Game-based Learning Environments
Benjamin DeVane

3.20 Exploring Intersections Between Online and Offline Affinity Space Participation
Elizabeth King

3.21 FormulaT Racing: Combining Gaming Culture and Intuitive Sense of Mechanism for Video Game Design
Nathan Holbert, Uri Wilensky

3.22 DevInfo GameWorks: Supporting inquiry-based game design
Jeff Kupperman, Beth Robertson, Shawn Baglin

3.23 Learning as mediated by a nodal ecology: Findings from studies of Gamestar Mechanic and Quest to Learn
Robert J Torres, Valerie Shute

3.24 The Impact of Video Games and Virtual Environments in Pre-Service Elementary Teacher Science Education
Janice Anderson

3.25 Designing for an Informal Learning Environment: Towards a Participatory Simulation Design Process for Public Policy Planning
Chandan Dasgupta, Leilah Lyons, Moira Zellner, Andrew Greenlee

3.26 Social Network Environments as Third Spaces for Merging Everyday and Formalized Practices
Priya Sharma, Susan Land, Robert Jordan, Jeff Swain, Brian K. Smith

3.27 Using Social Network Analysis to Understand Homeschool Network Interactions
Christopher Steinmeier, Susan A. Yoon

3.28 The “Other” curriculum: Constructing success and failure in a game-based learning environment
Asmalina Saleh, Steven J. Zuiker
M. Gail Jones, Manuela Paechter, Grant Gardner, Iris Yen, Amy Taylor, Thomas Tretter

3.30 Developing and validating a web-based learning environment for helping 6th grade students appreciate subjectivity and uncertainty in science
Georgia Michael, Nicos Papadouris, Eleni Kyza, Constantinos Constantinou

3.31 The Effect of Teachers’ Beliefs and Curricular Enactments on Student Learning in High School Science
Katherine McNeill, Diane Pimentel, Eric Strauss

3.32 Leveraging Multiple Representations to Support Knowledge Integration in Plate Tectonics
Elissa Sato, Marcia Linn

3.33 Investigating the Nature of Evidence 6th Grade Students Use When Constructing Scientific Explanations in Biodiversity
Hayat Hokayem, Amelia Gotwals

3.34 An Investigation into Students’ Interpretations of Submicroscopic Representations
Shawn Stevens, Namsoo Shin

3.35 Knowledge Building for Historical Reasoning in Grade Four
Monica Resendes, Maria Chuy

3.36 How does the use of analogical mapping as a scaffold for science learners’ argumentation support their learning and talking about science?
Brandon Emig, Scott McDonald

3.37 Teachers’ Understanding of Partitioning When Modeling Fraction Arithmetic
Chandra Orrill, Andrew Izsak, Erik Jacobson, Zandra de Araujo

3.38 Putting the pieces together: The challenge and value of synthesizing disparate graphs in inquiry-based science learning
Itay Asher, Samira Nasser, Lina Ganaim, Iris Tabak

3.39 Online Science Classroom Collaborations: A Comparison of Domestic and International Learning Communities
Steven Kerlin, Elizabeth Goehring, William Carlsen

3.40 The Role of Student Agency and Sustained Inquiry on Collaboration and Learning of Science Practices
Kari Shutt, Nancy Vye, John Bransford

3.41 Developing an iMVT Pedagogy for Science Learning
Baohui Zhang, Xiaoxuan Ye, Seekit Foong, Peichun Chia

April Lynn Luehmann, Rachel Chaffee, Liz Tinelli, Kimberly Fluet

3.43 The Function of Mathematical Terminology: The Case of ‘Slope’
Darrell Earnest

8:00 PM - Midnight  SOCIAL EVENT AT THE CULTURAL CENTER

Sponsored by the UIC Learning Sciences Program and by the Learning Sciences Program in the School of Education and Social Policy at Northwestern University.

Music by the “Replays”
with Tom Moher
Friday, July 2

8:00 AM - 10:00 AM  CONTINENTAL BREAKFAST  RED LACQUER BALLROOM

8:30 AM - 10:00 AM  KEYNOTE 3  RED LACQUER BALLROOM

Chair: Susan Goldman, University of Illinois at Chicago

Learning to Ponder: The Puzzle and Pleasure of Literary Text
Pamela Grossman, Stanford University
Reactor: Carol D. Lee, Northwestern University

Sponsored by the Spencer Foundation

10:00 AM - 10:15 AM  MORNING BREAK  RED LACQUER BALLROOM

10:15 AM - 11:45 AM  PARALLEL SESSIONS

INVITED 6: DISCIPLINARY FOUNDATIONS OF THE COMPUTATIONAL SCIENCES  CRYSTAL BALLROOM
Chair: Tom Moher, University of Illinois Chicago
Presenters: Mark Guzdial, Georgia Institute of Technology; Ulrich Hoppe, University of Duisburg-Essen; Yasmin Kafai, University of Pennsylvania
Discussant: Sally Fincher, University of Kent at Canterbury

PAPER SESSION 36: CONTROL OF VARIABLES: LEARNING SCIENTIFIC INQUIRY SKILLS  SALON 12
Chair: Philip Bell, University of Washington
Helping Students Make Controlled Experiments More Informative
Kevin McElhaney, Marcia Linn
Sequential Effects of High and Low Guidance on Children's Early Science Learning
Bryan Matlen, David Klahr
Comparing Pedagogical Approaches for the Acquisition and Long-Term Robustness of the Control of Variables Strategy
Michael Sao Pedro, Janice Gobert, Juelaila Raziuddin

PAPER SESSION 37: APPRENTICESHIP TO PROFESSIONAL PRACTICES AS A MODEL FOR LEARNING ENVIRONMENT DESIGN  SALON 2
Chair: Beth van Es, University of California Irvine
The Epistemography of Urban and Regional Planning 912: Appropriation in the face of resistance
Elizabeth Bagley, David Williamson Shaffer
Motivation To Transfer Revisited
Andreas Gegenfurtner, Marja Vauras, Hans Gruber, Dagmar Festner
Writing and commenting on professional procedures: In search of learning designs promoting articulation between school and workplace learning.
Monica Gavota, Mireille Betran court, Daniel Schneider
Mentor Modeling: The internalization of modeled professional thinking in an epistemic game
Padraig Nash, David Williamson Shaffer

PAPER SESSION 38: PROBLEM REPRESENTATIONS AND STRATEGIES IN COMPUTER-BASED INSTRUCTION  SALON 6
Extending the Self-Explanation Effect to Second Language Grammar Learning
Ruth Wylie, Kenneth Koedinger, Teruko Mitamura
A Closer Look at the Split Attention Effect: Integrated Presentation Formats for Troubleshooting Tasks
Markus Huff, Vera Bauhoff, Stephan Schwan
Concrete vs. Abstract Problem Formats: A Disadvantage of Prior Knowledge
Andrew Heckler

PAPER SESSION 39: WHAT DOES IT MEAN TO THINK MATHEMATICALLY?  SALON 7
Chair: Dor Abrahamson, University of California Berkeley
Design-based knowledge building practices in mathematics teaching
Huang-Yao Hong, Yu-Han Chang
Reconceptualizing Mathematical Learning Disabilities: A Diagnostic Case Study
Katherine Lewis

"I don't know ¿ I'm just genius!": Distinguishing Between the Process and the Product of Student Algebraic Reasoning
Jose Gutierrez

Seeing Algebraic Thinking in the Classroom: A Study of Teachers' Conceptualizations of Algebra
Janet Walkoe

**Symposium 25: Supporting Young New Media Producers Across Learning Spaces: A Longitudinal Study of the Digital Youth Network**
Supporting Young New Media Producers Across Learning Spaces: A Longitudinal Study of the Digital Youth Network
Brigid Barron, Amber Levinson, Caitlin Martin, Veronique Mertl, Daniel Stringer, Maryanna Rogers, Kimberly Austin, Nichole Pinkard, Kimberly Richards, Kimberley Gomez

The Digital Youth Network Model
Nichole Pinkard, Kimberley Gomez

Theoretical Framework and Research Methods
Brigid Barron, Caitlin Martin

Positioning learners as creative and critical producers
Amber Levinson, Veronique Mertl, Daniel Stringer, Maryanna Rogers

Artists as Mentors and Teachers
Kimberly Richards, Kimberly Austin

**Symposium 26: Motivation and Affect in Peer Argumentation and Socio-Cognitive Conflict**
Discussant: Gale M. Sinatra, University of Nevada Las Vegas

Motivation and affect in peer argumentation and socio-cognitive conflict
Christa Asterhan, Baruch Schwarz, Ruth Butler, Fabrizio Butera, Celine Darnon, Timothy Nokes, John Levine, Dan Belenky, Soniya Gadgil, Gale M. Sinatra

Socio-cognitive conflict and learning: past and present
Fabrizio Butera, Celine Darnon

On competitive and co-constructive dialectical argumentation
Christa Asterhan, Baruch Schwarz, Ruth Butler

Investigating the Impact of Dialectical Interaction on Engagement, Affect, and Robust Learning
Timothy Nokes, John Levine, Dan Belenky, Soniya Gadgil

**Symposium 27: Learning to Understand the Tree of Life**
Learning to Understand the Tree of Life
Shaaron Ainsworth, Camillia Matuk, David Uttal, Karl Rosengren, Brenda Phillips, Laura Novick, Kefyn Catley, Jessica Saffer, Kristy Halverson

How high school students reason about the tree of life: A developmental perspective
Brenda Phillips, Laura Novick

Inventing a representation of relatedness
Camillia Matuk, David Uttal

Can children read trees?
Shaaron Ainsworth, Jessica Saffer

Improving undergraduates' approaches to understanding tree thinking
Kristy Halverson

11:45 AM - 1:00 PM  Closing Ceremony and Open Business Meeting (Light Lunch Provided)  Red Lacquer Ballroom
The Office of Vice Chancellor for Research

College of Liberal Arts & Sciences

College of Education

Graduate College

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Notes
Transportation

Airports
Chicago is home to two international airports. Either would be suitable for travel to the conference:
O'Hare International Airport (ORD)
Midway International Airport (MDW)

Public Transit
The Chicago Transit Authority manages a large network of rail and bus routes. Expect to pay 2.25 USD to use the system. The rail lines are color-coded. Travelers pay fare using a fare card, which can be purchased at vending machines located at most entrances to the rail system. Multi-day passes, which can be economical if planning on doing a lot of sightseeing, can be purchased at some (but not all) vending machines.

From O'Hare Airport
When taking public transportation from O'Hare International Airport, take the Blue Line train to Monroe/Dearborn stop. Exit the station, and walk along Monroe east to the hotel. The Palmer House is on the south side of the street.

From Midway Airport
From Midway Airport, take the Orange Line from Midway to downtown. Get off at the Adams/Wabash stop. The Palmer House is located on the west side of 17th Avenue.

Driving
Parking at the Palmer House will incur an additional charge (51 USD/day as of this posting, see Palmer House website for current rates), and the Palmer House is located very close to public transit, so driving is not recommended. Driving directions can easily be obtained from your favorite online route-finding website. If taking a taxi, expect to pay around 35 USD from O'Hare Airport, and 25 USD from Midway Airport. Other door-to-door options (e.g., shuttle or limousine service) are available, and a list of options can be found at the websites for O'Hare and Midway airports.

Train
If taking an Amtrak train to Chicago, the disembarkation point is Union Station, located at 225 South Canal Street, Chicago, IL 60606. One can walk to the Palmer House (about a mile away, 15 minutes) by heading north on Canal Street and East on Monroe, or a taxi can easily be flagged down outside of the station (expect fare to be around 5 USD). Alternatively, one could walk to the Blue Line Clinton stop and board an eastbound train to the Monroe/Dearborn stop. After exiting the station, walk east along Monroe to the hotel.

Conference Location

The Palmer House Hilton Hotel
17 E. Monroe Street
Floor Plans

3rd Floor
Crystal Ballroom
Salons 1 - 12
Salon Foyer

4th Floor
Red Lacquer Ballroom