“Assessing Student Understanding of Science: Perspectives and Solutions”
CONFERENCE ORIENTATION/WELCOME CEREMONY

**Grand Salon H**

**7:30-8:30 AM**  
NSTA Conference Orientation  
Dr. Norman Lederman, Conference Chair

**8:30-9:00 AM**  
Welcome & Introductions  
Dr. Norman Lederman, Conference Chair  
Dr. Patricia Shane, NSTA President 09-10  
Mr. Manoj Chitnavis, Chair, The Association for Science Education, UK  
Mr. Al Hovey, NSTA International Advisory Board Chair, 09-10

PLENARY SESSION

**Grand Salon H**

Dr. Rodger Bybee will speak about the contexts, competencies, content, and attitudes assessed by the Program for International Student Achievement (PISA). The discussion will also include implications for the instructional core of science teaching.

**9:00-9:05 AM**  
Introduction of Speaker:  
Dr. Norman Lederman

**9:05-9:30 AM**  
Dr. Rodger W. Bybee, Chair, PISA 2006 Science Expert Group, Golden, Colorado  
“Assessing Scientific Literacy: International Perspectives and Classroom Possibilities”

All of us regularly hear about global issues related to the environment, resources and health. Professional science teachers ask: How competent are my students to address these situations? Science teachers point of view is not significantly different from the PISA 2006 perspective.

**9:30-9:45 AM**  
Break
CONCURRENT SESSION

K-12 LEVEL ASSESSMENT #1

*Grand Salon H*

This concurrent session will feature papers from national and international science educators on issues of assessment of students’ and teachers’ knowledge.

**9:45-9:50 AM**
Welcome & Introductions: Dr. Judith Lederman, Presider

**9:50-10:10 AM**
*Using Assessment to Improve Learning: Effective Marking,***
Douglas A. Buchanan (University of Edinburgh, United Kingdom)
This interactive presentation reflects the best practice in formative assessment and explores ways for teachers to mark less and have students learn more.

**10:10-10:30 AM**
*Improving Student Achievement on Assessments of Science Concepts,*** Jane Konrad (University of Pittsburgh, Pennsylvania)
The Pittsburgh Regional Center for Science Teachers presents a systems approach strategy for improving student conceptual development and assessment including international integration. Hands-on activities.

**10:30-10:45 AM**
*Evaluating the ENEM High School Science Exam in Brazil. Constraints and Possibilities,*** Everaldo dos Santos (Parana State Educational Board, Curitiba, Brazil); Christiane Gioppo (The Federal University of Parana, Curitiba, Brazil)
The study evaluated ENEM High School Exams in Brazil using two different backgrounds: the revised Bloom Taxonomy and NRC report 2007. Results show that the tests are still focused on memorizing information and not focused on discussing the nature of science.

**10:45-11:15 AM**
Poster Session (Grand Salon H)

**11:15 AM-12:15 PM**
Concurrent Sessions – Continued
K-12 Level Assessment #1 (Grand Salon H)
K-12 Level Assessment #2 (Grand Salon I)
College Level Assessment (Grand Salon J)
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9:45-9:50 AM  Welcome & Introductions:  Dr. Norman Lederman, Presider

9:50-10:10 AM  Assessing Student Understanding of Science: Perspectives and Solutions (Sweden), Hans Persson (University of Stockholm, Sweden); Elisabeth Hagman, and Anna Lindblom (Haninge, Sweden)
Example from Sweden: Successful school development in a municipality where assessment is one of the key ingredients in the project.

10:10-10:30 AM  Assessing Students HOCS Understanding of Science, Uri Zoller (University of Haifa – Oranim, Tivon, Israel)
Research suggests that traditional science education contributes little to HOCS understanding of science. The “Knowing-to-Learning” paradigm shift is attainable and should be done.

10:30-10:45 AM  Assessing High School Students’ Understanding of Weightlessness, Ming-Liang Lin (Tsoying Senior High School, Zuoying, Kaohsiung, Taiwan); Ming jun Su (Shu-Te University, YanChou, Kaohsiung County, Taiwan); Shing-Ho Chiang (National Kaohsiung Normal University No. 62, Yanchao, Kaohsiung County, Taiwan)
Based on the news report about Dr. Hawking’s weightless flight, a four-tier questionnaire was developed to assess high school students’ understanding of weightlessness.

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1:55-2:00 PM  Closing Remarks (Grand Salon H)
This concurrent session will feature papers from national and international science educators on issues of assessment of students’ and teachers’ knowledge.

9:45-9:50 AM Welcome & Introductions: Dr. John Staver, Presider

9:50-10:10 AM *Initiating Intercultural, Interdisciplinary Programs, Peter Lynch (Green Across the Pacific, Shoreham, Vermont); Tomomichi Kobayashi (Tottori University of Environmental Studies, Shoreham, Vermont)*
Students from Tottori, Japan, and Vermont, USA will meet in March 2010. Learn about the challenges that confront organizers and our hopes for success.

10:10-10:30 AM *Assessment IS a four-letter word: TOOL, Linda Schoen-Giddings (South Carolina Department of Education, Columbia, South Carolina)*
Assessment should be part of a learning cycle, not an end in itself. Teachers need to learn how to develop relevant classroom assessments and analyze assessment data to further student achievement.

10:30-10:45 AM *Assessing the Relationship between Achievement Goals and Teaching Self-efficacy of Turkish Pre-service Science Teachers, Burcu Senler (Mugla University, Turkey)*
The study is on the relationship between Turkish pre-service science teachers’ achievement goals and their teaching self-efficacy.

10:45-11:15 AM Poster Session (Grand Salon H)

11:15 AM-12:15 PM Concurrent Sessions – Continued
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1:15-1:45 PM Panel Discussion (Grand Salon H)
1:45-1:55 PM  Updates from Around the World (Grand Salon H)
1:55-2:00 PM  Closing Remarks (Grand Salon H)
Opening of Poster Session: Dr. Norman Lederman, Presiding

An opportunity to have focused, unrestricted interactions with your science teaching colleagues from around the world. Posters representing all grade levels will focus on projects related to assessment of learning.

*Cultivation of Scientific Thinking and Innovation Ability with Practical Courses for College Students*, Cai Zhenming (Taiwan); Sun Qiao (Dalian University, Dalian/Liaoning Province, China)

*Developing Pre-Service Teacher Data Literacy: A Canadian Perspective*, G. Michael Bowen (Mount Saint Vincent University, Halifax, Nova Scotia); Anthony Bartley (Lakehead University, Thunder Bay, Ontario, Canada); Leo MacDonald, St. Francis Xavier University, Antigonish, Nova Scotia); J. Lawrence Bencze (OISE/UT, Toronto, Canada)

*Teaching Chemistry with Logical Puzzles*, Carlos M. Castro-Acuna (Fac. Quimica, Universidad Nacional Aut. De Mexico, Lab 112 Posgrado Ed. B, Facultad de Quimica, C.U., Distrito Federal); Ramiro E. Domínguez-Danache, UNAM Chemistry School Fac. De Quimica, Mexico City, Mexico)

*The European PARSEL Project*, Martin Lindner and Dr. Wolfgang Graeber (IPN at the University of Kiel, Germany)

*Green Across the Pacific, Environmental Leadership Exchange Programs*, Peter Lynch (Green Across the Pacific, Shoreham, Vermont)

*An Integrated Module of Inquiry-Based Activities: A World of Pendulums*, Yun-Ju Chiu (Chang Gung University, Kwei-shan, Taoyun, Taiwan)

*Assessing Athlete-Students’ Interest and Engagement in Learning Physics*, Ming Jun Su (Shu-te University, Yanchao, Kaohsiung County, Taiwan); Jang Jenq Chern (Kaohsiung Municiple Tsoying Senior High School, Tsoying District, Kaohsiung City, Taiwan)
Three AMAZING Teaching Aids—Singing Cup, Gyroscope and Auto-Returning Airplane, Cheng-Ming Tsai (Taiwan Creative Science Center, Beinan, Taitung, Taiwan)

Exploring Teaching Strategies in Physics for Vocational Students in Taiwan, Wan Ying Lin (Kaohsiung Chung-Cheng Vocation High School, Kaohsiung City, Taiwan); Ming jun Su (Shu-Te University, YanChou, Kaohsiung County, Taiwan)

Assessment Project from a Municipality Outside Stockholm, Sweden, Anneli Pettersson & Katherine Ahlqvist (Haninge, Sweden)

Assessment Project: Pre-school Science Project from a Municipality Outside Stockholm, Sweden, Linda Karlsson & Anna Berg (Haninge, Sweden)

Green Building Literacy, Yu Chao-Ching (National Taiwan Normal University, Jung-Li, Taiwan); Sung Quo-chen (Ching Yun University, Jung-Li, Taiwan)

Three Marvelous Teaching Aids for Revealing Magnetic Field, Cheng-Ming Tsai (Taiwan Creative Science Center, Beinan, Taitung, Taiwan)

Mexico’s Role in Iberoamerican Chemistry Olympiads, Carlos M. Castro-Acuna and Ramiro E. Dominguez-Danache, (Facultad de Quimica, Fac. Quimica, Edificio B, Lab 112, Unam, C.U., Mexico City)

Changing Teaching Perspectives, Behaviors and Attitudes – Costa Rica, Sandy Doss (Holbrook Travel, Gainesville, FL); Marylin Lisowski (Pittsburgh, PA); Paulo Valerio (Costa Rica); Ann and Rob Simpson (Lord Fairfax Community College)

The Turning in the Assessment of Science Education: View from the Point of Sociology, Hanchao Yang (Zhejian University of Science and Technology, Hangzhou, Zhejian Province, China)
This concurrent session will feature papers from national and international science educators on issues of assessment of students’ and teachers’ knowledge.

**11:15-11:20 PM**  
Welcome & Introductions: Dr. Judith Lederman, Presider

**11:20-11:40 PM**  
Assessment in Early Childhood Science Education: Going Beyond Worksheets, Thelma R. Mingoa (de la Salle University, Manila)  
This study shows how analyzing children’s drawings of science concepts can assess details of knowledge which young children may not yet have the vocabulary for.

**11:40-12:00 PM**  
Assessing Chinese Science Teachers’ Pedagogical Content Knowledge, Ma Min (East China Normal University)

**12:00-12:15 PM**  
Assessing Chinese Middle School Science Teachers’ Conceptions of Nature of Science, Miancheng Guo (Illinois Institute of Technology, Chicago, Illinois)

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This concurrent session will feature papers from national and international science educators on issues of assessment of students’ and teachers’ knowledge.

11:15-11:20 PM  Welcome & Introductions: Dr. Norman Lederman, Presider

11:20-11:40 PM  Applying Fuzzy Multi-Criteria to Assess Experimental Performance in Science Lab, Jing Jou Su (Li-Chih Senior High School, Sanmin District, Kaohsiung City, Taiwan); Mingjun Su (Shu-Te University, YanChou, Kaohsiung County, Taiwan)
Via Fuzzy computation and TPOSIS estimation to create FMCAM, an assessing platform, created through Visual Basic, storage of mass database and internet transmission.

11:40-12:00 PM  Performance Assessment Strategies for an Internet-based Native High School, Anthony W. Bartley and John Friesen (Lakehead University, Thunder Bay, Ontario, Canada); Eli K. Pivnick (Keewaytinook Internet High School, Sachigo Lake, Ontario, Canada)
A collaboration between a native internet school and a university - we examine how performance assessment strategies were developed in 9th and 10th grade science

12:00-12:15 PM  Hands-on Performance Assessment for K-12 Students: Assessing Student Understanding of and Abilities in Inquiry, Deborah L. Tucker (Napa, California); Grant M. Gardner (Assessment Services, Inc., Pepperell, Massachusetts)
Engage in a hands-on performance task and how this type of assessment supports your comprehensive assessment plan.

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1:55-2:00 PM  Closing Remarks (Grand Salon H)
CONCURRENT SESSION

COLLEGE LEVEL ASSESSMENT

Grand Salon J

This concurrent session will feature papers from national and international science educators on issues of assessment of students’ and teachers’ knowledge.

11:15-11:20 PM  Welcome & Introductions: Dr. John Staver, Presider

11:20-11:40 PM  Science Teacher Education in Chile: A Curriculum Assessment, Hernan Cofre, Claudia Vergara, and Johanna Camacho (Universidad Catolica Silva Henriquez, Santiago, Chile)

We analyze programs of Science Teacher Education in Chile and we conclude that there exist small development of science teacher strategies courses and few practicum experience.

11:40-12:00 PM  Which are the Most Important Science Teacher Competencies? The Voice of Inservice Teachers, David Santibanez, Alberto Galaz, and Javier Jimenez (Universidad Catolica Silva Henriquez, Santiago, Chile)

We studied inservice teacher preceptions about what are the most important competencies for science teaching in secondary schools.

12:00-12:15 PM  In-service Science Teacher Conceptions about Learning, Teaching and Assessment, Claudia Vergara, and Hernan Cofre (Universidad Catolica Silva Henriquez, Santiago, Chile)

We studied the relationship between science teacher conceptions about learning, teaching and assessment and their practices in three in-service secondary school teacher of biology.

12:15-1:15 PM  Luncheon Plenary Session (Grand Salon H)

1:15-1:45 PM  Panel Discussion (Grand Salon H)

1:45-1:55 PM  Updates from Around the World (Grand Salon H)

1:55-2:00 PM  Closing Remarks (Grand Salon H)
Dr. Robin Millar will explore the role of assessment instruments in changing science teachers’ practices, using evidence from two recent research and development projects.

12:15-12:40 PM Buffet Lunch

12:40-12:45 PM Introduction of Speaker: Dr. Norman Lederman

12:45-1:15 PM Dr. Robin Millar, Chair, Departmental Research Committee, University of York, United Kingdom
Assessment: A Key Lever of Change in Science Education

Assessment is critically important in science education because many of the key outcomes that we seek, such as increased student understanding, are not directly observable – so the assessment instruments that we use become the clearest statements of our real objectives. I will explore the role of assessment instruments in changing science teachers’ practices, using evidence from two recent research and development projects. One shows how teachers’ practices can be changed by providing them with assessment instruments; the other illustrates the key role of assessment instruments in communicating intentions and enabling change. Together they suggest that we should recognize that assessment instruments are key levers of change in science education practices, and learn to exploit more fully their potential for stimulating the kinds of changes we desire.

1:15-1:45 PM Panel Discussion (Grand Salon H)

1:45-1:55 PM Updates from Around the World (Grand Salon H)

1:55-2:00 PM Closing Remarks (Grand Salon H)
This concluding session will engage scholars from each of the educational levels regarding common issues that cut across grade levels when designing and implementing assessment approaches and protocols. Both benefits and obstacles will surely be addressed. This discussion will provide maximum interaction between the panel and audience.

1:15-1:45 PM  Panel Discussion
Dr. Norman Lederman, Illinois Institute of Technology, Chicago, Illinois (Presiding)
Dr. Rodger Bybee, Chair, PISA 2006 Science Expert Group, Golden, Colorado
Dr. Robin Millar, Chair, Departmental Research Committee, University of York, United Kingdom

1:45-1:55 PM  Updates from Around the World

1:55-2:00 PM  Closing Remarks
Dr. Norman Lederman, Conference Chair

NSTA INTERNATIONAL LOUNGE

Please stop by the NSTA International Lounge in the Philadelphia Marriott Downtown Hotel, Registration II Room. The lounge may be used as a place to relax, or as a meeting place while you’re here at the NSTA National Conference on Science Education.

Hours: Thursday, March 18 (9:00 AM – 5:00 PM)
Friday, March 19 (9:00 AM – 5:00 PM)
Saturday, March 20 (9:00 AM – 5:00 PM)