



***First Annual  
Indiana Building Awareness for  
Science Education Symposium***

Indianapolis, IN  
April 25, 2008

## A Call to Action

**T***ime is of the essence.* American business is facing the stark reality that in a world increasingly based on science and technology, fewer U.S. students are preparing themselves for careers in these fields. As the Business-Higher Education Forum noted in its report *A Commitment to America's Future: Responding to the Crisis in Mathematics & Science Education* (January 2005):

“The United States is losing its edge in innovation and is watching the erosion of its capacity to create new scientific and technological breakthroughs. Increased global competition, lackluster performance in mathematics and science education, and a lack of national focus on renewing its science and technology infrastructure have created a new economic and technological vulnerability as serious as any military or terrorist threat.”

The implications of these trends should trouble us all, but especially business and industry. Unless we act—and act soon—future employers will continue to be faced with a declining pool of qualified workers. Training costs will soar. The pressure to outsource jobs to skilled workers overseas will intensify.

Students also need to learn science because good citizenship demands at least a basic understanding of how the world works. Today's students are tomorrow's voters; they will be asked to pass judgment on many issues—environmental, biomedical, technological—in which science literacy will help them reach intelligent, well-reasoned conclusions.

***We no longer have the luxury of time.*** The time for action is now. Take a leadership role in the coming revolution in science education.

### References

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## A Call to Action

### *Education*

“When I compare our high schools to what I see when I’m traveling abroad, I am terrified for our workforce of tomorrow.”- Bill Gates, Chairman, Microsoft Corporation<sup>1</sup>

- Only 5% of Hispanic students and 2% of African-American Students scored at the ‘proficient’ level in science, according to the 2005 National Assessment of Educational Progress.<sup>2</sup>
- U.S. 12<sup>th</sup> graders ranked 16<sup>th</sup> in an international science test given to students in 21 countries in 1998. “Just 40 percent of students grasped basic concepts such as the relationship between pressure and volume.”<sup>3</sup>
- 68% of parents and 64% of elementary school teachers do not consider themselves to be scientifically literate.<sup>4</sup>

### *Workforce*

“When everyone has access to the same technology platform, human talent...is the only sustainable edge.”<sup>5</sup> -Thomas Friedman, writer

- Currently, almost half of employers report having trouble finding qualified US workers in a wide range of occupations, from engineers to entry-level workers.<sup>6</sup>
- Over two-thirds of employers report that high school graduates are “deficient” in almost all essential workplace skills.<sup>7</sup>
- Business executives ranked education and workforce preparedness as their top concern, ahead of healthcare, energy, global competitiveness, and national security.<sup>6</sup>

### *Economy*

“We can’t hope to keep intact our standard of living, our national security, our way of life, if Americans aren’t competitive in science. Period.”

-David Baltimore, President of the California Institute of Technology,  
Nobel Laureate

- In 2005, for the first time, the United States lost its lead in world economic competitiveness, and dropped to sixth place.<sup>3</sup>
- American investors made more new investments in foreign stock funds than in domestic stock portfolios in 2005.<sup>8</sup>
- An estimated 14 million US jobs are now at risk of being sent offshore.<sup>9</sup>

## NSRC BLUEPRINT FOR SCIENCE EDUCATION REFORM

### NSRC Stages of Reform

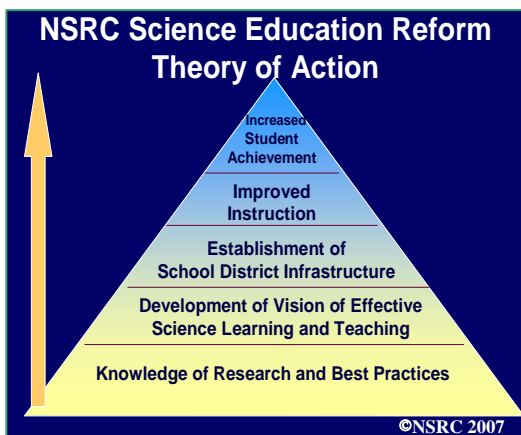
Systemic reform requires leaders with technical knowledge of the five essential components of science education reform (see the NSRC Science Education Systemic Reform Model below), as well as access to products and services that can be used to move leaders through the various stages of reform. During the past two decades, the NSRC has developed differentiated products and services with many organizations and individuals to assist districts, regions, states, and countries in moving through these stages. The work for each of these stages becomes increasingly more complex, requiring more time, resources, and technical expertise. A general outline of the Stages of Reform and related work is provided on the facing page.

### NSRC Theory of Action

The NSRC's Theory of Action, depicted below, advocates that the foundation of all reform is knowledge of research and best practices that should be used to develop a shared vision and an infrastructure for reforming science education programs for all students in districts and states.

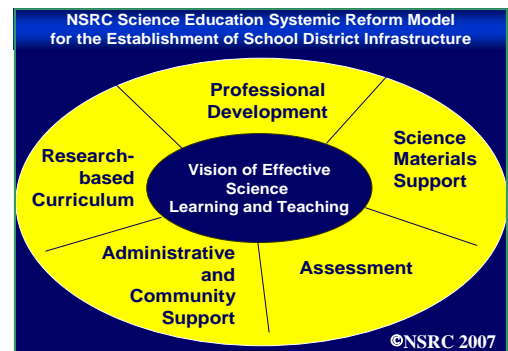
The design of the theory and the associated work conducted by informed leaders to implement it should reflect research in the following areas:

- Development of science concepts
- Learning and teaching
- Assessment of learning
- Evaluation of programs
- Systems thinking
- Accountability structures
- Introduction of interventions and the process of change
- Scaling-up principles
- Incentives
- Methods for ensuring sustainability



### NSRC Science Education Systemic Reform Model

One critical aspect of the NSRC Theory of Action is the establishment of an infrastructure needed to support learning. To establish an effective infrastructure, leaders need to have a shared vision of effective science learning and teaching and implement five essential components simultaneously. The NSRC has defined this system as the NSRC Science Education Systemic Reform Model, which is illustrated below.



Components of the system include:

1. A curriculum framework and comprehensive research-based K-16 science instructional program based upon research findings.
2. Teachers participating in professional development programs that are aligned with current research about adult learning and designed to move teachers from novice to expertise.
3. Assessments that are aligned with research about how students learn and that elicit meaningful feedback about student learning.
4. Cost-effective and efficient systems that supply resources and materials to teachers.
5. Administrative and community leaders providing long-term support for research-based science learning and teaching.

## NSRC Stages of Reform

Stages	Goals	General Description of Work
<b>Assessing Strengths, Opportunities, and Challenges</b>	Assess the landscape to understand the context of work.	Analyze the strengths, weaknesses, opportunities, and threats (SWOT). Monitor and document needs, challenges, and development of assets annually.
<b>Building Awareness for Reform</b>	Develop a shared vision of the importance of an effective science and technology education needed to prepare informed citizens and a scientifically literate workforce	Plan and conduct annual awareness events for school, university, and business and other community leaders, including parents. The events are designed to help leaders with a stake in science education develop a vision of effective science learning and teaching and to understand the system that is needed to support this vision.
<b>Initiating Reform</b>	Provide leaders with the expertise and support needed to develop a five-year strategic plan for establishing a comprehensive and challenging K–12 science program of instruction for all students in their districts. The plan will benchmark with exemplary U.S. districts that have significantly improved student achievement, attitudes, and skills.	Annually identify and recruit of school district leadership teams to attend the NSRC Leadership Development and Science Education Strategic Planning Institutes. The institutes will prepare the teams to take leadership in establishing systemic reform programs based on research and promising practices.
<b>Implementing Reform</b>	Provide a system of technical assistance to schools and districts in partnership with government, industry, the education community, and parents. This ongoing assistance will help school districts to establish, sustain, and continuously improve the infrastructure needed to support high-quality instruction for all students for a decade and longer.	Develop and implement academies and other events and services needed to provide school district administrators and teachers with the technical assistance required to implement research-based programs. Areas of assistance needed include the following:  Pilot testing and development of curriculum frameworks; Differentiated professional development programs for moving teachers from being novice to developing competency; Strategies for assessing student learning in science; Cost effective and efficient materials support systems to supply teachers with equipment and supplies needed to teach science; Strategies for integrating mathematics, reading, and writing within the context of learning and teaching science; Programs for educating administrators and community leaders to establish, continuously improve, and sustain effective science programs in their communities, including NSRC Advanced Leadership Development Institutes; Ongoing technical assistance services that regions and states need to provide districts to help them sustain their efforts.
<b>Beginning</b>		
<b>Middle</b>		
<b>Advanced</b>		
<b>Building Leadership Capacity</b>	Develop a corps of informed leaders representing the scientific and education communities who have knowledge and expertise	Design annual program activities that will systematically cultivate a corps of 100 or more teachers, school administrators, scientists, and other community officials to become leaders who can conduct institutes, academies, and workshops and become advocates for reform.
<b>Evaluation</b>	Establish and monitor performance measures.  Report progress and impact data	Develop a formative and summative evaluation program to assess the quality of program activities, progress being made in accomplishing goals, and assessing impact on student achievement.
<b>Dissemination</b>	Provide the public and other stakeholders with information about the program and its impact	Disseminate information to leadership groups and interested stakeholders.

## Program Goals

Focus Questions	Sessions	
<i>What is the state of K–16 science education in the United States and in Indiana?</i>	Overview session highlighting the education and workforce pipeline issues.	
<i>What are the characteristics of effective K–16 science education programs?</i>	Interactive session and videotapes providing a model for building a shared vision about the characteristics of effective science learning and teaching.	
<i>What state models can be used to benchmark current and future work?</i>	Review and discussion of the leadership, expertise, systems, and resources needed to phase in research-based programs for all districts in a state.	
<i>What lessons have been learned from this work and what steps can leaders take to move forward with addressing the challenges in K-16 science education?</i>	Discussion sessions outlining the next steps for K-16 science education in Indiana.	



# National Science Resources Center

THE NATIONAL ACADEMIES  Smithsonian Institution

## Indiana Building Awareness for Science Education Symposium

9:45 a.m. **What is an Example of Research-Based Learning and Teaching?**  
(Breakout Sessions)

**Joe Bellina**  
Professor of Physics  
St. Mary's College

**Mike Benner**  
Director, Agricultural and Environmental Education  
Milton Hershey School

**Gordon Berry**  
Professor of Physics  
University of Notre Dame

**John Brady**  
Instructor  
New Augusta Public Academy North

**Vic Chamness**  
Supervisor of Science, Health, and P.E.  
Evansville-Vanderburgh School Corporation

**Rick Crosslin**  
School Liaison for Science Learning  
Indianapolis Children's Museum

**Monica Ellis**  
Retired Instructor

**Kim Elpers**  
Instructor  
Sts. Peter and Paul School

**Jennifer Hicks**  
Science Curriculum Specialist  
Indiana Department of Education

**Sharon McElroy**  
Instructor  
Eastern Washington Middle School

# National Science Resources Center

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## Indiana Building Awareness for Science Education Symposium

**9:45 a.m.**      **What is an Example of Research-Based Learning and Teaching?**  
*(Breakout Sessions) -Continued-*

**Cyndy Moriarty**  
Lead Flight Director  
Indianapolis Challenger Learning Center

**Sally Goetz Shuler**  
Executive Director  
National Science Resources Center

**John Staver**  
Professor of Curriculum and Instruction, and Chemistry  
Purdue University

**Dane Toler**  
Program Consultant  
National Science Resources Center

**Deb Vannatter**  
Science Resource Facilitator  
Evansville-Vanderburgh School Corporation

**Mark Weaver**  
Science Department Chairman  
Clay Middle School

**Peggy Willcuts**  
Co-Director  
Southeast Washington Leadership and Assistance for  
Science Education Reform (LASER) Alliance

**12:15 p.m.**      **Lunch**

*Science is not just for Mr. Wizard*

**Suellen Reed**  
Indiana State Superintendent of Public Instruction

# National Science Resources Center

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## Indiana Building Awareness for Science Education Symposium

**1:30 p.m.**      **What Infrastructure is Required to Support Research-Based Learning and Teaching?** (*Vienna Ballroom North and South*)

**Jennifer Hicks**  
Science Curriculum Specialist  
Indiana Department of Education

**Sally Goetz Shuler**  
Executive Director  
National Science Resources Center

**2:15 p.m.**      **What is an Example of an Effective State Model of Science Education Reform?** (*Vienna Ballroom North and South*)

**Peggy Willcuts**  
Co-Director  
Southeast Washington Leadership and Assistance for  
Science Education Reform (LASER) Alliance

**3:00 p.m.**      **Break** (*Foyer*)

**3:15 p.m.**      **What are the Roles of Stakeholder Groups in Workforce Development?** (*Vienna Ballroom North and South*)

**Lou Ann Baker**  
Vice President, Communications and Community Relations  
Veolia Water

**Susan Johnson**  
Associate Dean of the College of Sciences and Humanities  
Ball State University

**Terri Schulz**  
Leader of Program Innovation  
Indiana Department of Workforce Development

# National Science Resources Center

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## Indiana Building Awareness for Science Education Symposium

**4:15 p.m.**            **What are the Next Steps for Indiana?** (*Vienna Ballroom North and South*)

*Facilitator:*    **Mike Benner**  
Director, Agricultural and Environmental Education  
Milton Hershey School

**4:45 p.m.**            **Closing Remarks** (*Vienna Ballroom North and South*)

**William Walker III**  
Executive Director  
I-STEM Resource Network

**5:00 p.m.**            **Reception** (*Foyer*)

**“Freedom is the first-born  
daughter of science.”**

**- *Thomas Jefferson***

## Speaker Biographies

### Lou Ann Baker

Vice President of Communications and Community Relations  
Veolia Water  
Indianapolis, IN

Lou Ann Baker is the Vice President of Communications and Community Relations and leads the company's media relations and internal communications, as well as community contributions and sponsorships. She most recently worked as a consultant for clients in the environmental, utility, and motorsports industries and comes to VWI with more than 20 years of experience in the public and private sectors.

### Mike Benner

Director, Agricultural and Environmental Education  
Milton Hershey School  
Hershey, PA  
bennerm@mhs-pa.org

Mike Benner has directed educational programs in applied and integrated science at the Milton Hershey School since 2003. Mike is responsible for integrating concrete, first-hand experiences in applied science into all areas of academic and student life at the nation's largest residential preK-12 school for children in social and financial need. He is responsible for strategic planning, leadership, and curriculum development within four learning centers: Horticultural Center, Environmental Center, Animal Center, and Dairy & Foods Processing Center. Prior to his current position, Mike served as Academic Director of the Teaching and Learning Center, Director of the Science Education and Literacy Center, and Associate Professor of Biology at Rider University, Lawrenceville, New Jersey. He has served as principal investigator and project director for federal, state, and corporate grants to improve science education at all levels. Mike holds a Ph.D. in plant genetics from the University of Minnesota.

## Speaker Biographies

### Joe Bellina

Professor of Physics  
Saint Mary's College  
Notre Dame, IN  
jbellina@saintmarys.edu

Joe Bellina has been a Professor of Physics at Saint Mary's College since 2004, and associated with the College since 1975. After receiving his Ph.D. in Surface Physics from the University of Notre Dame, Joe completed a post-doctoral fellowship at Brown University. His current interests include changing how science is taught in schools. A core issue in his work is changing the image and beliefs teachers have about science, science learning, and learning in general. Joe received the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) in both 2004 and 2006.

### Gordon Berry

Professor of Physics  
University of Notre Dame  
Notre Dame, IN  
hgberry@nd.edu

Besides being a scientist engaged primarily in research and in teaching at the College level, Gordon Berry has a fundamental interest in the quality of the U.S. Public schools - his 4 sons went to the Chicago Public Schools (CPS), and his wife has participated in programs for the CPS for at least 30 years. Following more than a year of being involved in writing the Chicago School Reform Proposals in Springfield, IL, four colleagues (Drs. Leon Lederman, Henry and Priscilla Frisch and Dr. Berry) set out to develop the Academy for Mathematics and Science Teachers, Chicago (now TAMS). Gordon Berry was its first acting Director. This Academy has a proven record of improving science and mathematics instruction (more than 100 schools in all) in the Chicago Public Schools, and in schools in East St. Louis IL and in Aurora IL.

In the field of pre-college education, Dr. Berry has viewed himself as a facilitator, developer and organizer, rather than as an expert in learning and teaching techniques. However, the guided inquiry experiential process of learning has always been one which he tries to apply both within the college classroom, and in the understanding of science in our community. The logical processes involved in STEM learning are vital to the development of modern effective and successful communities - if we can do even a small part in transferring ideas, excitement and understanding the needs, it is our rewarding duty to do so. Dr. Berry has a Ph.D. in Physics from the University of Wisconsin, Madison.

## Speaker Biographies

### John Brady

Instructor  
New Augusta North Public Academy  
Indianapolis, IN  
jbrady@pike.k12.in.us

John Brady is a 6th grade science teacher and outdoor lab coordinator at New Augusta North Public Academy in the Metropolitan School District of Pike Township in Indianapolis, Indiana. He attended Northland College in Wisconsin for a Secondary Education, Biology degree. He is currently enrolled at Butler University for his Masters. He is an active member of the National Science Teachers Association (NSTA) and a member of the Pike Making Science Matter grant. John has presented at Pike Township's Best Practice Institute (Ecology and Your Students: How to Tap into Your Students' Environmental Intelligence) and CLASS Works Science Academy (Utilizing the Space Beyond the Four Walls of Your Classroom). He has been awarded a Lilly Science Education Outreach grant for an Environmental Education Inquiry Box and an Indiana Wildlife Federation grant to improve the outdoor lab on the New Augusta campus.

### Vic Chamness

Supervisor of Science, Health, and Physical Education  
Evansville-Vanderburgh School Corporation  
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vchamness@evsc.k12.in.us

Vic Chamness is the curriculum supervisor of science, health and physical education for the Evansville-Vanderburgh School Corporation (EVSC) located in southwestern Indiana. Vic led a partnership with the University of Southern Indiana to develop a grant-funded program titled Reform of Middle School Science (ROMSS). Through ROMSS and other grant funds, EVSC is implementing inquiry-based science kits and embedded professional development within their twenty elementary schools and ten middle schools.

Vic taught high school biology, chemistry, and physics for nine years in the EVSC and also served as science department head. He worked as a training consultant for GE Plastics in Mt. Vernon, IN, supervising their Technology Training Program, which provides core and elective courses to enhance applied science skills for technicians.

## Speaker Biographies

### Rick Crosslin

School Liaison for Science Learning  
Indianapolis Children's Museum  
Indianapolis, IN  
RickC@childrensmuseum.org

Rick Crosslin, School Liaison for Science Learning at the Indianapolis Children's Museum and Science Teacher at MSD Wayne Township, has received numerous awards recognizing him as an outstanding classroom teacher. His awards include a 2005 Emmy DataCast Demonstration Technical Achievement PBS WFYI, 2004 Indiana University School of Education Distinguished Alumni, 2001 Christa McAuliffe Fellow, the 1999 Hoosier Association of Science Teachers Inc. Distinguished Service Award, the 1998 Milken National Educator Award, the 1997 Indiana Exemplary Teacher Network Award, finalist for the 1996 Indiana Teacher of the Year, the 1996 MSD Wayne Township Teacher of the Year, and the 1990 Presidential Award for Excellence in Science. He has 20 years experience with summer camps. He is currently the director for the Diabetes Youth Foundation of Indiana. He has taught grades 3, 4, 6 in Indiana and Cairo, Egypt and graduate courses for IUPUI. In addition, he has taught pre-school children at the Children's Museum of Indianapolis, adolescent teens at the Indiana Department of Correction Boys' School, and intergenerational classes at Oasis centers. He is the author of the monthly science section of the publication *Inquisitive Kids*, *Mr. C the Scienceman* where he shares his expertise and motto: This is science. Try it yourself! He is the host and creator of *Indiana Expeditions* a WFYI PBS science television program

### Kim Elpers

Instructor  
Saints Peter and Paul School  
Haubstadt, IN  
kelpers77@hotmail.com

Kimberly Elpers is a science teacher at the Saints Peter and Paul School in Haubstadt, Indiana. She holds a Masters degree with a Science Endorsement from Indiana State University, and has taught for over 25 years. For the last five years, Kim has been a Model Classroom science teacher for the Diocese of Evansville. She was selected as a Space Foundation Teacher Liaison in 2007, and among her many accomplishments is a current NSTA Reviews Board Member. From 2004 to 2008, Kim was an appointed member of the ISTEP+ Science Content Review Panel. Kim has also presented at numerous conferences, including NSTA and HASTI.

## Speaker Biographies

### Jennifer Hicks

Science Curriculum Specialist  
Indiana Department of Education  
Indianapolis, IN  
jhicks@doe.in.gov

Jennifer Hicks is currently the Science Curriculum Specialist in the Office of Curriculum and Instruction for the Indiana Department of Education. She is responsible for managing the development of science standards, supporting curriculum resources for science, and promoting innovation in science teaching throughout Indiana. She is currently working on the development of new science assessments for Indiana. She serves on a number of advisory boards in the state including, Hoosier Association of Science Teachers, Discovery Park, Natural Heritage of Indiana, and the Natural Resources Education Center. Prior to joining the Department, Jennifer was a high school science teacher in California and received a Life Sciences Single Subject Credential from San Francisco State University. She has taught biology, chemistry, marine biology and earth sciences at the high school level. She also developed a biotechnology summer camp for middle school students in San Francisco and was the Assistant Director for Youth in Science, a residential science summer camp for low income students in San Jose, CA. Prior to teaching high school, she was a postdoctoral fellow in the Biology Department at Washington University in St. Louis, where she performed research on fruit flies. She has also taught science coursework at the college level at Webster University in St. Louis and at Indiana University in Bloomington. Dr. Hicks received a B.S. in Biology and a Ph.D. in Visual Sciences from Indiana University.

### Susan Johnson

Associate Dean  
College of Sciences and Humanities  
Ball State University  
Muncie, IN

Susan M. Johnson is Professor of Science Education and Associate Dean of the College of Sciences and Humanities at Ball State University in Muncie, Indiana. She is currently Co-Director of the Ball State I-STEM (Indiana Science, Technology, Engineering and Math) Regional Resource Network, and of the Woodrow Wilson Indiana Teacher Fellowship Program at Ball State University – “Science and Mathematics Education Redefined.” She is also the university representative for a Math/Science Partnership project, “Passport to Science” with the Indianapolis Public Schools. She is recipient of the National Science Teachers Association National Exemplar Award for Pre-Service Preparation of Elementary Teachers in Science. She is the recipient, as principal investigator or senior staff member, of approximately \$9 million in external funding in support of initiatives with public schools, especially dealing with the teaching of science in the elementary grades. Her duties as Associate Dean include serving as liaison between the College of Sciences and Humanities and Teachers College for policy, curriculum, student issues, and STEM leadership. She holds a Ph.D. in Science Education from the University of Texas at Austin, an M.A.T. from the Johns Hopkins University, and a B.S. from Bates College.

## Speaker Biographies

### Vic Lechtenberg

Interim Provost  
Purdue University  
West Lafayette, IN

Victor (Vic) L. Lechtenberg is the Interim Provost at Purdue University. He previously served as Dean of Agriculture at Purdue University beginning in 1994. He was Executive Associate Dean of Agriculture from July 1989 to July 1993. Dr. Lechtenberg has been a professor of agronomy at Purdue since 1971. He taught and conducted research on forage quality, herbage composition, forage production, quality changes in hay during storage, hay drying, and use of forages for herbaceous biomass production on marginal lands.

From 1982 to 1989 Lechtenberg served as Associate Director, Purdue University Agricultural Experiment Station, where he was responsible for research program and project review, communications with USDA, developing and reviewing proposals for outside research funding from federal agencies and companies, manuscript approval, travel approval, Purdue Agricultural Centers research programs, sponsored research licensing and agreements. Lechtenberg received his bachelor of Science degree from the University of Nebraska, where he was an Agricultural Honors Program Graduate in 1967. He received his Ph.D degree in Agronomy from Purdue University in 1971.

## Speaker Biographies

### Sharon McElroy

Instructor  
Eastern Washington Middle School  
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Sharon McElroy, from Borden, Indiana, has taught science for 33 years and is currently employed by the East Washington School Corporation in Pekin, Indiana. Sharon received her undergraduate degree from the College of the Ozarks in Branson, Missouri and her master's in Education from Indiana University Southeast in New Albany, Indiana. Sharon served as co-president for the Indiana Mid-level Association of Science Teachers (IMAST) from 1996 to 1998. She was the Middle School Representative for the Hoosier Association of Science Teachers, Inc. (HASTI) from 1999 to 2002, Vice-president and President from 2002 to 2004, and Chairperson for their 2005 Conference, *"Engaging Inquiry."* Sharon is active in several state and national professional organizations and has served on committees for the International Science and Engineering Fair (ISEF) and the National Science Teacher's Association (NSTA).

Sharon has received numerous awards and recognition from state and national science organizations. She won the Intel Excellence in Teaching Award in 1999. She was awarded a position as one of five American teachers to represent the United States at the American Association for the Advancement of Science/Asia-Pacific Economic Cooperation (AAAS/APEC) Youth Science Festival in Singapore in 2000. She was awarded the Science Education Foundation of Indiana (SEFI) Distinguished Service Award Outstanding Teacher of the Year in 2003 for her dedicated work with students in her Science Research program and received the HASTI Distinguished Service Award in 2006. Sharon represented Indiana in Washington, D.C. as the 2006 science awardee for the Presidential Award for Excellence in Math and Science Teaching (PAEMST). Sharon challenges, inspires, and supports students in every subject she teaches. It is Sharon's desire to encourage students to discover and fulfill their true potential. Over the past 20 years, her research students have won numerous local, state, national, and international awards.

## Speaker Biographies

### Cyndy Moriarty

Lead Flight Director  
Indianapolis Challenger Learning Center  
Indianapolis, IN  
cmoriarty@msddecatur.k12.in.us

Cyndy has the exciting position of going to space every day at the Challenger Learning Center of Indianapolis. She works with Indiana students, teachers, community groups, and corporate teams in simulated space missions in Mission Control and Space Station to develop teamwork, problem solving, and critical decision-making skills based on National and State Science and Math Standards.

Cyndy is also a veteran teacher with over 25 years of teaching experience. Prior to becoming a Lead Flight Director at the CLC, Cyndy taught elementary and middle grade students at St. Barnabas Catholic School, James A. Garfield School #31 in the Indianapolis Public School System, and Stephen Decatur Elementary in the Decatur Township School System. She has also taught inquiry-based science at IUPUI and has been clinical faculty at Butler University.

Cyndy is a National Board Certified Teacher, received the Cristel deHaan Project E Excellence in Education Teacher Award, received the IPALCO Golden Apple Award, and was selected for the NASA NEW program. She earned her Master's and Bachelor's Degree in Elementary Education from Indiana University. Cyndy has two grown children and lives in Clermont, Indiana.

## Speaker Biographies

### Suellen Reed

Superintendent of Public Instruction  
Indiana Department of Education  
Indianapolis, IN

As Indiana's 36th Superintendent of Public Instruction, Dr. Suellen K. Reed is Indiana's Chief State School Officer, serving as the Chairperson of the State Board of Education and the CEO of the Indiana Department of Education.

First elected in November 1992 and sworn into office on Jan. 11, 1993 as Indiana's first female State

Superintendent of Public Instruction, Dr. Reed currently is serving her fourth consecutive four-year term. During her tenure as Superintendent, she has played a fundamental role in shaping major educational reform initiatives for Indiana, including Indiana's academic standards, ISTEP+ testing, Public Law 221, and the Indiana Education Roundtable. Dr. Reed has also visited schools in all 92 counties during her first three terms and has visited 55 counties so far in her fourth term.

Additionally, she has contributed her time and talents to many organizations, including Phi Delta Kappa, Pi Lambda Theta, Delta Kappa Gamma, Kappa Delta Pi, and the Council of Chief State School Officers.

Prior to her term as State Superintendent, Dr. Reed served as a teacher at the elementary, middle, and high school levels, assistant principal, principal, assistant superintendent, and local superintendent.

Dr. Reed received her B.A. from Hanover College, her M.A. from Ball State University, and her Ed.D. from Ball State. She has completed post-master's and postdoctoral work at Indiana University, Purdue University, Indiana State University, University of Southern Indiana, Butler University, Earlham College, University of Alaska, Florida Atlantic University, University of Scranton, University of Virginia at Edinburgh University in Scotland, and the Oxford Roundtable in the United Kingdom. She has also traveled widely, visiting schools throughout the world.

## Speaker Biographies

### Terri Schulz

Leader of Program Innovation  
Indiana Department of Workforce Development  
Indianapolis, IN

Terri Schulz is the Leader of Program Innovation with the Indiana Department of Workforce Development. She holds a Masters degree in Public Administration and Policy Analysis from Indiana University, and has been working in education for over 10 years. Terri works with innovative education programs at the agency, including robotics, workforce literacy, and entrepreneurship. She also serves as the Indiana State Leader for Project Lead the Way in Biomedical Science.

### Sally Goetz Shuler

Executive Director  
National Science Resources Center  
Washington, D.C.

Sally Goetz Shuler is the Executive Director of the National Science Resources Center, an organization of the National Academies and the Smithsonian Institution, with a mission to improve K-16 science learning and teaching in the U.S. and throughout the world. As one of the co-founders of the NSRC two decades ago, her leadership has created an organization committed to establishing effective science programs for all students. She has formed numerous strategic partnerships with national academies, academic institutions, corporations, and museums that are resulting in the development, implementation, and evaluation of research-based products and services for improving science education programs for school districts, states, and countries. In addition to the NSRC, her three decades of national and international experience in K-16 science education have also included 15 years of teaching math and biology and serving as a chair, trustee, or advisor for numerous boards and organizations. These include being a member of the Board of Trustees for the Keystone Center; the Merck Institute for Science Education Advisory Board; Chair of the Science Education Program of the Burroughs Wellcome Fund; Chair of the Assessment Committee for the National Youth Science Camp; Advisory Board Members for the Math/Science Partnership Comprehensive Projects of Rutgers University and the Boston Science Partnership; Expert Panel for Washington State; a member of the DC Children and Youth Investment Trust Corporation Academic Advisory Panel; member of National Assessment of Educational Progress Science Steering Committee; and membership on the National Advisory Board of the Centers for Ocean Science Education Excellence. Ms. Shuler has a M.S. in Environmental Health Sciences from George Washington University, and a B.A. from Edinboro State University, with majors in Biology and Geology. At the 2007 National Science Teachers Association Convention held in St. Louis, Sally Goetz Shuler received the NSTA Distinguished Service Award in recognition of her contributions to and demonstrated excellence in science education.

## Speaker Biographies

### John Staver

Professor of Curriculum and Instruction, and Chemistry  
Purdue University  
West Lafayette, IN  
jstaver@purdue.edu

John Staver, formerly at Kansas State University, came to Purdue in August as professor of curriculum and instruction (education) and chemistry and co-director of the Center for Research and Engagement in Science and Mathematics Education (CRESME). CRESME is a collaborative partnership between Purdue's College of Education and College of Science. Its mission is to study the learning process and improve science and mathematics education on campus, statewide, and beyond at the P–12, undergraduate, and graduate levels. John is active in the Indiana Science, Technology, Engineering, and Mathematics (I-STEM) Resource Center, a statewide collaborative partnership that seeks to increase K–12 student achievement in STEM disciplines and improve student attitudes toward STEM education.

John earned a BS in education from Indiana University (1968), an MS in chemistry from Purdue University (1973), and an EdD in science education from Indiana University (1978). He taught high school students chemistry for seven years in Indianapolis. Before joining the Purdue faculty, Staver held faculty appointments at DePaul University, University of Illinois at Chicago, and Kansas State University. John's research and scholarship focus on constructivist epistemology and its implications for improving science teaching and learning. He also examines the interface between science and religion within a constructivist perspective, and while in Kansas he delved into the evolution debate.

### Dane Toler

Program Consultant, Physical Sciences  
National Science Resources Center  
Washington, D.C.  
tolderd@si.edu

Dane Toler currently works as an educational consultant for the NSRC. He is a retired physics teacher with 32 years of experience in middle school and high school education. Dane previously worked as a developer for the NSRC and completed the development of *Energy, Machines, and Motion* module. His next assignment was the development of the *Electrical Energy and Circuit Design* module for the STCMS program. He is also the principle developer of the *Guide to Probeware and Computer Applications for STCMS*. He currently conducts workshops for these modules and for integrating sensors and probeware in the classroom. He has been recognized for his contributions to physics education by the Fairfax County School Board, the Virginia Association of Science Teachers, and The American Physical Society.

## Speaker Biographies

### Deb Vannatter

Science Resource Facilitator  
Evansville-Vanderburgh School Corporation  
Evansville, IN  
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A veteran teacher of hearing impaired, learning disabled and elementary school children, Deborah currently serves the Evansville-Vanderburgh School Corporation (EVSC) in southwestern Indiana as the District Science Specialist. Implementing embedded professional development, she supports inquiry-centered science through modeling and coaching. She provides after school K-8 professional learning opportunities and coordinates curriculum with community and national resources to increase student achievement in science. Deborah promotes language arts integration by creating and maintaining an extensive lending library of leveled, science theme based non-fiction literature. Collaborating with the University of Southern Indiana, she is the project director of a federally funded 2008-2010 Math Science Partnership science and literacy professional development program for K-8th grade teachers.

An advocate for systemic science education reform, Deborah has been a presenter in local, state and national venues including NSTA (National Science Teachers Association) national conferences and HASTI (Hoosier Association of Science Teachers, Inc.) state conferences. She has served as a faculty member for the National Science Resources Center's LASER (Leadership and Science Education Reform) national strategic planning institutes in Washington D.C. and Pennsylvania's Science Is Elementary (SIE) strategic planning institutes.

Deborah represents the NASA Jet Propulsion Laboratory as a Solar System Ambassador and is a Teacher Liaison for the Space Foundation in Colorado Springs, CO. A contributing writer to Indiana's Academic Standards Resource for Science, she frequently works with the Indiana Department of Education on statewide testing of applied science skills. She serves on the NSTA Special Education Advisory Board and is an executive committee member of the Science Education Foundation of Indiana (SEFI).

Deborah earned Administrative Licensure at Oakland City University in Indiana, M.A. in Special Education with a K-12 Learning Disabled/Neurologically Impaired endorsement at the University of Evansville in Indiana and B. S. in Education double majoring in Deaf Education and Elementary Education at Ball State University in Indiana.

## Speaker Biographies

### Bill Walker

Executive Director  
I-STEM Resource Network  
West Lafayette, IN  
[bill@istemnetwork.org](mailto:bill@istemnetwork.org)

Bill Walker is the Executive Director for the I-STEM (Indiana Science, Technology, Engineering, and Mathematics) Resource Network and the Director for College of Science K-12 Outreach at Purdue University.

As Executive Director for the I-STEM Resource Network, Bill organizes and manages the creation of a statewide resource center for K-12 STEM education. Early activities have included convening the I-STEM Mathematics committee that created a series of credit courses to address needs in middle level mathematics; facilitating the development of a webpage that will be a leading information source to students, parents, teachers, administrators, and higher education personnel in K-12 STEM education, and initiating a statewide network with 11 regional lead institutions of higher education to facilitate regional and statewide improvement in K-12 STEM education.

As Director of Science K-12 Outreach, Bill oversees a team of K-12 science and mathematics professional development practitioners and directs long-term school district science and mathematics partnerships. Additionally, he creates professional development programs for teachers of science and mathematics on content, standards, instructional strategies, and technology integration and designs hands-on standards-based activities for K-12 students. Prior to working at Purdue University, Bill taught high school and middle school mathematics for over eight years.

## Speaker Biographies

### Mark Weaver

Science Department Chairman  
Clay Middle School  
Carmel, IN  
mweaver@ccs.k12.in.us

Mark R Weaver, Indiana's 2004 Teacher of the Year, is the Science Department Chairman and a seventh grade science teacher in his 26th year at Clay Middle School in Carmel, Indiana. Mark sponsors the Naturalists Club, and is an announcer/timer for junior high and high school football and basketball; is a co-sponsor of the intramural programs at his school; and is in charge of a large Outdoor Ecology Laboratory and pond area on his schools campus. Even though he has traveled extensively and lived in Europe and Great Britain, Mark is a life-long resident of Indianapolis and attended Butler University obtaining a BS degree in Botany and his MS in Biology/Education and additional course-work at IUPUI and Seattle Pacific University.

Mark serves on many educational panels and committees including the Teacher Advisory Council to the State Superintendent of Public Instruction; member of the Board of Visitors to the College of Education at Butler U; member of the Board of Directors to Rose Hulman's Institute of Technology's on-line resources in Indiana Science and Mathematics; and sits on the Board of Advisors for "Brain Quest", an educational game published by Workman Publishing, Inc in New York; and also served as Indiana's Teacher In Residence in 2004-05; serves as an educational consultant; and a volunteer for the Salvation Army. Mark Weaver has conducted educational research producing a film and publishing a website on polar bears and Arctic life in the sub-Arctic area of Churchill, Manitoba; working with his students on continuing to publish a website on Indiana birds-as kids see them; and presently working on educational Japan based on his experiences. Mark has received many honors and commendations for his work including being named an IPL Golden Apple recipient in 1995; a Milken National Educator in 1997; in 2002-03 received the Disney's American Teacher Award; was received at the White House by President George W. Bush; received the "Right Stuff Award" from the 2004 International Educator Space Camp; was accepted into the 2007 Japan Fulbright Memorial Fund program by the Government of Japan; and was made a "Sagamore of the Wabash" (Indiana's highest honor bestowed by the Governor) and has also been made an "Honorary Kentucky Colonel". Mark has just been named as a Butler University College of Education's 2008 Alumnus of the Year.

## Speaker Biographies

### Meredith “Peggy” Harris Willcuts

Co-Director  
Southeast Washington Leadership and Assistance for Science Education Reform (LASER) Alliance  
Walla Walla, WA  
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Meredith "Peggy" Willcuts is the Elementary Science Coordinator in Walla Walla School District. She received a BS in Biology from Whitman College in 1975, was certified by the National Science Teachers Association in 1992, and received an MEd in Science Education from Eastern Washington University in 1995. She is currently working on a doctorate through Washington State University. She is involved in K–8 professional development inside and outside the district working with agencies such as Battelle, Carolina Biological Supply Company, and the Pacific Science Center doing a wide range of professional development for teachers. She is actively a part of LASER serving on Advisory Boards at the national level, the Washington State level, and the SE WA LASER Alliance level. She is also a member of the NSRC's Advisory Board. Having received numerous awards for her work with teachers and students, she is most honored by receiving the Presidential Award for Excellence in the Teaching of Mathematics and Science in 1998. She appears in eight (8) of the STC Teacher Training videos and has written and published several family science kits through Alex-Panline Inc.