Freeman’s solutions for the astronomy and physics classroom are rich in content, innovation, customization options, and effectiveness—but not in price. To learn more, stop by Booth #111 at the AAAS/AAPT meeting in Chicago.

Not attending the conference? Share your complaints with us by email at physics@whfreeman.com
Welcome to Chicago
and the AAAS Annual Meeting/
AAPT 2009 Winter Meeting

Any paid registrant for the AAPT Winter Meeting can attend AAAS sessions unless they are noted as “closed” or “by invitation only.” Registrants of the AAAS meeting will be able to attend any of the AAPT sessions, plenaries and demo show. This booklet lists the activities that may be of most interest to attendees of both meetings!

The AAAS Annual Meeting begins with the Opening Ceremony and an address by the AAAS President, who is also the program chair. Beginning Friday night, plenary lectures are given by eminent scientists and engineers on topics of broad interest to the science, technology, and engineering communities. Attendees will have the opportunity to choose among a broad range of activities, including nearly 175 symposia, seminars, and career development workshops as well as plenary and topical lectures by some of the world’s leading scientists and engineers.

The AAPT Winter Meeting begins on Friday evening with a demo show. From Saturday through Monday, the AAPT meeting offers a wide spectrum of sessions of invited and contributed talks and posters on contemporary research, the content of what we teach, effective uses of technology, recent research in physics education, and numerous other disciplinary and interdisciplinary topics. Additionally, several special sessions in which distinguished individuals give talks and, in some cases, receive an AAPT award are distributed throughout the meeting.
Opening Ceremony and Plenary Lectures

Thursday, 12 February
6:30–8:00 p.m.
Fairmont, Imperial Ballroom

Welcome by AAAS Board Chairman, David Baltimore, Ph.D.
Opening Remarks by Local Co-Chair Robert J. Zimmer, President, University of Chicago

AAAS President’s Address
James J. McCarthy, Ph.D., AAAS President; Alexander Agassiz Professor of Biological Oceanography, Harvard University

McCarthy’s research interests relate to the regulation of plankton productivity in the sea and focus on regions that are strongly affected by seasonal and inter-annual variation in climate. He teaches courses on biological oceanography and biogeochemical cycles, marine ecosystems, and global change and human health, and oversees Harvard's program in Environmental Science and Public Policy. From 1982 until 2002, he was the director of Harvard’s Museum of Comparative Zoology. McCarthy has served on and led many national and international groups charged with planning and implementing studies of global change, including as chair of the international scientific committee that establishes research priorities and oversees implementation of the International Geosphere–Biosphere Program; founding editor for the American Geophysical Union's Global Biogeochemical Cycles; co-chair of the Intergovernmental Panel on Climate Change (IPCC), Working Group II, which had responsibilities for assessing impacts of and vulnerabilities to global climate change for the Third IPCC Assessment; lead author of the Arctic Climate Impact Assessment; and vice-chair of the Northeast Climate Impacts Assessment. He received his Ph.D. degree from Scripps Institution of Oceanography and B.S. degree in biology from Gonzaga University.
**Special Invited Address**

**FRIDAY**

**Special Invited Address**

**Friday, 13 February**

6:30–7:30 p.m.
Fairmont, Imperial Ballroom

*Attendance is restricted to regular AAAS and AAPT registered attendees*

The Honorable Albert Arnold Gore, Jr., Former U.S. Vice President and Nobel Peace Prize Recipient

Mr. Gore is the author of *An Inconvenient Truth*, a best-selling book on the threat of and solutions to global climate change, and the subject of an Academy Award-winning movie by the same title. A leading advocate for confronting the threat of global warming, his efforts were outlined in the book, *Earth in the Balance: Ecology and the Human Spirit* (1992). He also led the Clinton-Gore Administration’s efforts to protect the environment in a way that also strengthens the economy. He was awarded the Nobel Peace Prize, together with the Intergovernmental Panel on Global Climate Change, in 2007. Currently, he is co-founder and Chairman of Generation Investment Management, a firm focused on a new approach to Sustainable Investing. He is also co-founder and Chairman of Current TV, an independently owned cable and satellite television network for young people. A member of the Board of Directors of Apple Inc. and a Senior Advisor to Google, Mr. Gore also serves as a Visiting Professor at Middle Tennessee State University in Murfreesboro, Tenn. He is a partner with Kleiner, Perkins, Caufield & Byers.

**AAAS Plenary**

**Friday, 13 February**

4:30–5:30 p.m.
Fairmont, Imperial Ballroom

Sean B. Carroll, Ph.D., Professor of Molecular Biology and Genetics, University of Wisconsin, Madison

**Remarkable Creatures: Epic Adventures in the Search for the Origins of Species**

Until recently, scientists studying evolution relied on fossil records and animal morphology to painstakingly piece together a picture of how animals evolved. Today, scientists are now using DNA evidence collected from modern animals to find new clues. Molecular biologist Sean Carroll focuses on the way new animal forms have evolved, and his studies of a wide variety of animal species have dramatically changed the face of evolutionary biology. Using genetics and the tools of molecular biology, he is looking back to the dawn of animal life some 600 million to 700 million years ago.

**AAPT Demo Show**

**Friday, 13 February**

8:00–9:00 p.m.
Hyatt Regency, Crystal Ballroom B

AAPT members organize and put on a fantastic physics demonstration show that will be fun and informative for all.
AAAS Topical Lecture Series

Beginning Friday afternoon, topical lectures are given by eminent scientists and engineers on more specialized topics of interest to the science, technology, and engineering communities.

Friday, 13 February
12:30–1:15 p.m.
Hyatt Regency, Crystal Ballroom B

Daniel G. Nocera, Ph.D., Professor of Energy and of Chemistry, Massachusetts Institute of Technology, Cambridge

Harnessing the Sun and Oceans To Meet the World’s Energy Demands
Daniel G. Nocera is the Henry Dreyfus Professor of Energy at the Massachusetts Institute of Technology, director of the Solar Revolutions Project, and director of the Eni Solar Frontiers Center at MIT.

Friday, 13 February
12:30–1:15 p.m.
Hyatt Regency, Crystal Ballroom C

T. Conrad Gilliam, Ph.D., Marjorie I. and Bernard A. Mitchell Professor and Chair of the Department of Human Genetics, University of Chicago, Ill.

Human Genetics
With new opportunities in genome science and bioinformatics, research has shifted toward the study of common heritable disorders. Gilliam’s research focuses on identifying and characterizing heritable mutations that affect the nervous system.

Friday, 13 February
12:30–1:15 p.m.
Hyatt Regency, Crystal Ballroom A

Topical Panel: The Central Role of International Scientific Cooperation in Meeting Global Challenges
AAAS President McCarthy will moderate a Davos-style panel discussion that explores how scientific collaborations can help meet global challenges.

–József Pálinkás, Ph.D., President, Hungarian Academy of Sciences, Budapest, and professor, University of Debrecen, an atomic physicist who also served as Secretary of State and then as Minister of Education for the Hungarian government.

–Lord Martin Rees, Ph.D., President of the Royal Society, Master of Trinity College, and Professor of Cosmology and Astrophysics, University of Cambridge, U.K., is an English cosmologist and astrophysicist.

AAAS Workshops

The following list is a guide to the AAAS Career Development and Sponsored workshops on Friday:

Friday, 13 February
8:30 a.m.–5:00 p.m. SPONSORED WORKSHOP  Hyatt, Columbian
Ultra High Resolution Stereo Visualization Theater (Sponsored by National Science Foundation)
(Show times will be posted on site.)

10:00 a.m.–5:00 p.m. CAREER RESOURCE CENTER  Hyatt, Stetson Conference Center, Suite B/C
Browse and collect information about the many career development resources, fellowships and internships, and job search assistance available from AAAS and many of its affiliated organizations. The center is hosted by the AAAS Center for Careers in Science and Technology. Science Careers, published by the AAAS, is a comprehensive careers website dedicated to helping scientists at all career stages. Search thousands of jobs, get great career advice, find grant and funding information, and network with peers —all for free at http://sciencecareers.sciencemag.org/
**FRIDAY**

**9:00 a.m.–10:00 a.m.**  
**CAREER WORKSHOP**  
*Hyatt, Stetson Conference Center, Suite F*  
*Finding Hidden Value in the Job Market*

**10:30 a.m.–11:30 a.m.**  
**CAREER WORKSHOP**  
*Hyatt, Stetson Conference Center, Suite F*  
*Career Boosters for Women and Minority Scientists*

**11:00 a.m.–NOON**  
**SPONSORED WORKSHOP**  
*Hyatt, Grand Suite 5*  
*WorldCommunityGrid.org: Free Supercomputer for Humanitarian Research*  
(Sponsored by WorldCommunityGrid.org)

**NOON–1:00 p.m.**  
**SPONSORED WORKSHOP**  
*Hyatt, Stetson Conference Center, Suite F*  
*Book Publisher Pitch-Slam: Who Wants To Be an Author?*  
(Sponsored by Island Press)

**12:30 p.m.–1:30 p.m.**  
**SPONSORED WORKSHOP**  
*Hyatt, Grand Suite 5*  
*Resources and Trends for Online STEM Teaching Materials for K–12*  
(Sponsored by National Science Digital)

**1:30 p.m.–3:00 p.m.**  
**CAREER WORKSHOP**  
*Hyatt, Stetson Conference Center, Suite F*  
*When It's Not a Perfect Fit: Overcoming Adviser Challenges*

**2:00 p.m.–3:30 p.m.**  
**SPONSORED WORKSHOP**  
*Hyatt, Plaza Ballroom*  
*You Ought To Be in Pictures: Science as Entertainment in Movies and Television*  
(Sponsored by National Science Foundation)

**3:00 p.m.–4:00 p.m.**  
**SPONSORED WORKSHOP**  
*Hyatt, Grand Suite 5*  
*NSF TeraGrid: Free National Resources for Science, Research, and Education*  
(Sponsored by NSF TeraGrid)

**3:30 p.m.–4:30 p.m.**  
**SPONSORED WORKSHOP**  
*Hyatt, Stetson, Conference Center, Suite F*  
*The Future of Energy: Planet Earth Faces Tough Choices*  
(Sponsored by National Energy Technology Laboratory)

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**AAPT Commercial Workshops**

**Friday, 13 February**

12:00–1:30 p.m.  
*Hyatt Regency, Stetson Conference Center, Suite G*  

**And You Thought It Was About Homework—–The Way You Imagined Teaching Could Be™**

Help your students learn with WebAssign. Find out what’s new. WebAssign, the premier online homework, quizzing, and testing system, continues to have all of the features you want and includes content from all major publishers. Access questions from all major physics and astronomy textbooks, or write your own. Check out our latest offerings with assignable simulations, assignable examples with content-specific hints and feedback, more online components and tutorials—all specific to your textbook. Give partial credit with conditional weighting.  
(Sponsored by WebAssign)

**Friday, 13 February**

5:00–6:30 p.m.  
*Hyatt Regency, Stetson Conference Center, Suite F*  

**Measuring the Charge to Mass Ratio of an Electron, It's Back to the Classic WL0623**

Come to this workshop and perform the classic e/m experiment, using state-of-the-art equipment. The experts at Cenco have brought back the classic e/m apparatus that has the largest magnetic field and bulb in the industry. Come give the experiment a text run before anyone else. In this hands-on workshop participants will set up and perform the e/m experiment and verify the e/m ratio. At the end of the session there will be multiple give-aways, including gift certificates and different apparatus.  
(Sponsored by Cenco Physics)
AAPT Job Fair

Friday, 13 February and Saturday, 14 February
11:00 a.m.–5:00 p.m. Friday
10:00 a.m.–4:00 p.m. Saturday
Hyatt Regency, Grand Columbus Foyer

See available physics jobs – employers find available physicists. (Also on Saturday)

AAAS/AAPT Exhibit Show

Hyatt Regency, Riverside Center

Hours:
Friday, 11 a.m.–6 p.m.
Saturday, 10 a.m.–6 p.m.
Sunday, 10 a.m.–5 p.m.

See and visit hundreds of vendor booths, Family Science Days, and more!
AAPT Richtmyer Award

Saturday, 14 February
9:00–10:00 a.m.
Fairmont, Imperial Ballroom

Vera Rubin, Senior Fellow, Dept. of Terrestrial Magnetism, Carnegie Institution of Washington, Washington, DC

Rotating Galaxies and Dark Matter

Vera Rubin’s pioneering work in astronomy on rotation rates of dozens of galaxies has shown that this velocity does not decrease at large distances from the galactic center. A decrease would be expected if the center-seeking force were due to the gravitational pull of the galaxy's luminous matter. This led to the conclusion that the universe contains copious amounts of “dark matter” that was heretofore undetected. In 1993 Vera Rubin received the National Medal of Science, the United States’ highest scientific award, for her pioneering research...which demonstrated that much of the matter in the universe is dark. In 1996, Vera Rubin authored the book Bright Galaxies Dark Matters (Masters of Modern Physics).

AAAS/AAPT Symposium

Saturday, 14 February
10:30–12:00 p.m.
Hyatt Regency, Grand Ballroom C North

Advancing Women in Physics Internationally

Organized by Beverly Hartline, Delaware State University, Dover; Luz Martinez-Miranda, University of Maryland, College Park

Why so few? What can we do? Women are greatly underrepresented in physics and many other scientific and engineering fields. Internationally, the situation varies, with some countries having a greater presence of women than the United States; others less. This session will highlight progress and international best practices shared from more than 60 countries at the Third International Conference on Women in Physics (Seoul, Korea, October 2008). Though centered on physics, the conference attracted participants with backgrounds and interests from many fields of science and engineering. The first and second conferences in Paris (2002) and Rio de Janeiro (2005), respectively, empowered action.

AAAS Symposium/AAPT Plenary

Saturday, 14 February
1:30–3:00 p.m.
Fairmont, Imperial Ballroom

Exciting Research at the Fermi National Accelerometer Laboratory

Organized by David M. Cook, Lawrence University, Appleton, WI; Gordon Ramsey, Loyola University, Chicago; Spencer Pasero, Fermilab, Batavia, Ill.

The Fermi National Accelerator Laboratory in the western suburbs of Chicago is the nation’s premier particle physics laboratory. Three of its leading researchers will discuss current projects. The Collider Detector at Fermilab is one of the two detectors that discovered the top quark. Its groundbreaking work continues with characterization of the top, the quest to find the Higgs Boson, and searches for even more exotic physics at the energy frontier. Speakers include: Niki Saoulidou, Rob M. Roser, and Michael B. Crisler.
AAAS Plenary

**Saturday, 14 February**

6:30 p.m.—7:30 p.m.
Fairmont, Imperial Ballroom

**Susan W. Kieffer, Ph.D.**, Walgreen Endowed Chair of Geology and Physics, University of Illinois, Urbana–Champaign

**Celebrating the Earth: Its Past, Our Present, a Future?**

Planetary scientist Susan Kieffer has degrees in math, physics, geology, and planetary science, which is apparent in the interdisciplinary nature of her work. She is internationally renowned and a leading authority on the mechanisms of meteorite impact, geyser dynamics, volcanic eruptions, and river floods. She was the first scientist to describe the physics and chemistry involved in the eruptions on Jupiter’s moon Io, the lateral blast associated with the eruption of Mt. St. Helens, the dynamics of Old Faithful as seen by a micro video camera lowered into the geyser between violent eruptions, and the hydraulics of the rapids of the Colorado River. Kieffer is a member of the National Academy of Sciences, a MacArthur Fellow, and has received numerous awards and honors. She attended Caltech, University of Colorado, Boulder, and Allegheny College.

AAPT Oersted Medal

**Saturday, 14 February**

8:00 p.m.—9:00 p.m.
Hyatt Regency, Regency A


**The History and Fate of the Universe**

George Smoot has done forefront work in cosmology using microwave radiation detectors in airplanes, high-altitude balloons, and satellites. He is best known for his analysis of data gathered by the COBE satellite. His differential microwave radiometer enabled him to detect temperature differences as small as 0.001 K. His work provided the first evidence of structure in the early universe and smaller ripples in the temperature of the cosmic background radiation, consistent with Big Bang theory. For his major findings, George Smoot shared, with John Mather, the 2006 Nobel Prize in Physics. His *Wrinkles in Time: Witness to the Birth of the Universe*, co-authored with Keay Davidson, provides many details about his scientific journey.

AAAS Topical Lecture Series

**Saturday, 14 February**

12:30 p.m.—1:15 p.m.
Hyatt Regency, Crystal Ballroom A

**Lene Vestergaard Hau, Ph.D.**, Mallinckrodt Professor of Physics and of Applied Physics, Harvard University, Cambridge, Mass.

**Wizardry with Light: Freeze, Teleport, and Go!**

Danish physicist Lene Hau led a Harvard University team who succeeded in slowing a beam of light to about 17 meters per second and eventually was able to momentarily stop a beam using a superfluid. Her formalized training is in theoretical physics but her interest moved to experimental research in an effort to create a new form of matter known as a Bose-Einstein condensate.
AAAS Topical Lecture Series

Saturday, 14 February
12:30 p.m.–1:15 p.m.
Hyatt Regency, Crystal Ballroom B

Ekaterina Dadachova, Ph.D., Sylvia and Robert Olnick Faculty Scholar in Cancer Research, and Associate Professor of Nuclear Medicine and Microbiology and Immunology, Albert Einstein College of Medicine of Yeshiva University, Bronx, NY

New Approaches to the Therapy of Infectious Disease
Radionuclides are radioactive atoms which emit particles capable of destroying the cells extremely efficiently. Dadachova’s research interests include targeted radionuclide therapy of cancer and infectious diseases. Her current research projects include radioimmunotherapy of infectious diseases and melanoma, and therapy of breast cancer with radioactive glucose.

Saturday, 14 February
12:30 p.m.–1:15 p.m.
Hyatt Regency, Crystal Ballroom C

Tim D. White, Ph.D., Professor of Integrative Biology, University of California, Berkeley

Evolution of Early Humans
Tim White and his colleagues have been working for the last 25 years in the Afar desert of Ethiopia to assemble the planet’s longest record of early hominid evolution (hominids comprise the branch of our family tree after the split of the last common ancestor we shared with chimpanzees).

Saturday, 14 February
12:30 p.m.–1:15 p.m.
Hyatt Regency, Crystal Ballroom D

2009 JOHN P. MCGOVERN AWARD LECTURE IN THE BEHAVIORAL SCIENCES
Elizabeth Loftus, Ph.D., Distinguished Professor, University of California, Irvine

Illusions and Delusions of Memory
Elizabeth Loftus holds faculty positions in three departments — Psychology and Social Behavior; Criminology, Law, and Society; and Cognitive Sciences — and in the School of Law, and is also a Fellow of the Center for the Neurobiology of Learning and Memory. First delivered in 1990, the John McGovern Lecture honors prominent behavioral scientists from around the world. This lecture has been endowed by the John P McGovern Foundation, to enable all scholars to learn and explore the accomplishments and challenges of the behavioral sciences. Dr. McGovern was an internationally recognized practicing physician, scientist, scholar, educator, and humanitarian.

AAPT Session

Saturday, 14 February
10:00 a.m.–12:00 p.m.
Fairmont, Regent

Presider: Daniel M. Smith, Jr., South Carolina State University, Orangeburg, S.C.

Frontiers in Space Science and Astronomy
The year 2009 has been designated as the International Year of Astronomy. In this session, Michael Turner, George Smoot, Daniel Suson, and Lawrence Krauss will highlight particularly significant areas of current research having to do with the origin and fate of our universe.
AAAS Workshops

The following list is a guide to the AAAS Career Development and Sponsored workshops on Saturday:

Saturday, 14 February

8:30 a.m.–5:00 p.m. SPONSORED WORKSHOP Hyatt, Columbian
Ultra High Resolution Stereo Visualization Theater (Sponsored by National Science Foundation)
(Show times will be posted on site.)

10:00 a.m.–5:00 p.m. CAREER RESOURCE CENTER Hyatt, Stetson Conference Center, Suite B/C
Browse and collect information about the many career development resources, fellowships and internships, and job search assistance available from AAAS and many of its affiliated organizations. The center is hosted by the AAAS Center for Careers in Science and Technology. Science Careers, published by the AAAS, is a comprehensive careers web site dedicated to helping scientists at all career stages. Search thousands of jobs, get great career advice, find grant and funding information, and network with peers—all for free at http://sciencecareers.sciencemag.org/

8:30 a.m.–10:00 a.m. CAREER WORKSHOP Hyatt, Grand Suite 5
Run for Your Local School Board

9:00 a.m.–10:00 a.m. CAREER WORKSHOP Hyatt, Stetson Conference Center, Suite F
You Earned a Bachelor’s Degree in Science: What’s Next?

10:30 a.m.–NOON CAREER WORKSHOP Hyatt, Grand Suite 5
How To Publish in Science

10:30 a.m.–NOON SPONSORED WORKSHOP Hyatt, Stetson Conference Center, Suite F
You Ought To Be in Pictures: Science as Entertainment in Movies and Television
(Sponsored by National Science Foundation)

12:15 p.m.–1:15 p.m. SPONSORED WORKSHOP Hyatt, Grand Suite 5
National Energy Technology Laboratory
(Sponsored by U.S. Department of Energy)

12:30 p.m.–1:30 p.m. SPONSORED WORKSHOP Hyatt, Water Tower
MORGEN Education Outreach: High School Biology for the 21st Century
(Sponsored by University of British Columbia)

1:30 p.m.–2:30 p.m. CAREER WORKSHOP Hyatt, Grand Suite 5
The One-Minute Talk

1:30 p.m.–3:00 p.m. CAREER WORKSHOP Hyatt, Stetson Conference Center, Suite F
Not Science as Usual: Become an AAAS Science and Technology Fellow

2:00 p.m.–3:30 p.m. SPONSORED WORKSHOP Hyatt, Water Tower
Darwin Now?
(Sponsored by British Council)

3:00 p.m.–4:00 p.m. CAREER WORKSHOP Hyatt, Grand Suite 5
Beyond the Resume: How To Network and Market Yourself To Enhance Your Career

4:00 p.m.–5:30 p.m. SPONSORED WORKSHOP Hyatt, Water Tower
Community Input for the National Academies’ Climate Change Study
(Sponsored by National Academies)
AAAS Family Science Days

Saturday and Sunday
11:00 a.m.–5:00 p.m.
Hyatt Regency, Riverside Center Exhibit Hall

This community science showcase—featuring hands-on demonstrations and other family and kid-friendly activities—will occur on Saturday and Sunday at the Hyatt Regency in the AAAS/AAPT Exhibit Hall. It features a broad range of formal and informal science educators who promote an interest in science among the general public.

AAPT Commercial Workshops

Saturday, 14 February
12:00–1:30 p.m.
Hyatt Regency, Stetson Conference Center, Suite G
National Standards Focus: Science Content Standards
Race into Physics with CPO Science Energy Car
   Explore the concepts of speed, velocity, and acceleration. Make studying friction and momentum simple. Check out Newton's laws, use the law of conservation of energy, and calculate work done with our inquiry-based investigations that are integrated with student reading text and our unique Teacher's Guide to offer both students and teachers a complete hands-on learning experience with CPO's exciting Car. (Sponsored by CPO Science)

Saturday, 14 February
3:30–5:00 p.m.
Hyatt Regency, Stetson Conference Center, Suite F
Physics2000.com – Free Workshop
   Physics2000.com is a college-level introductory physics course developed at Dartmouth College that begins with special relativity, ends with quantum mechanics, and in-between covers the usual topics with a 20th Century focus. The approach eliminates the great divide between classical and modern physics. If you visit our exhibit booth we will show you how to use our powerful yet free MacScope II laboratory oscilloscope program (works on Windows, too) to teach Fourier analysis and the time-energy form of the uncertainty principle. Attend our workshop and receive a free copy of the CD version and the printed version of the Physics2000 text. (Sponsored by Physics2000.com)

Saturday, 14 February
4:00–5:30 p.m.
Hyatt Regency, Stetson Conference Center, Suite E
Medical Imaging Physics – Vista – Cone Beam Optical CT Scanner
   The last few decades have seen rapid growth in the use of X-Ray Computed Tomography (CT) in health care. Widespread use and rapid innovation in CT have contributed to the need for improved training for physicists and related health-care professionals. The physical principles of Computed Tomography (CT) are difficult to demonstrate in a teaching environment. Most CT Scanners are dedicated medical systems in regular clinical use—this limits access for education. Furthermore, the use of X-Rays and the complexity of the controls on medical CT scanners limit the ability of students to interact with the scanner and to investigate relationships between acquisition and reconstruction parameters and the resultant CT image. (Sponsored by Modus Medical Imaging)
AAAS/AAPT Symposium

Sunday, 15 February
8:30–11:30 a.m.
Hyatt Regency, Columbus Hall EF

Discipline-Based Science Education Research

Organized by: David Meltzer, Arizona State University, Mesa
Moderator: Carl E. Wieman, University of British Columbia, Vancouver, Canada

Improved science education has long been an important goal both for scientists and for society at large. However, it is only within the past few decades that disciplinary experts in the various sciences have addressed this goal through systematic research. Many new researchers have been drawn into this work and substantial progress has been achieved. This symposium brings together leading investigators in discipline-based education research from several different scientific fields. They all share the aim of finding more effective and efficient methods of teaching their disciplines. They will focus on major findings related to teaching and learning of their disciplines at the undergraduate level, including physics, chemistry, biology, and astronomy. In addition, they will address common themes relevant to all science education, aided by a discussant who is expert in the learning sciences. The speakers will outline challenges specific to learning their disciplines and will describe ways research has been used to generate new and innovative curricular materials and instructional methods. They will also illustrate how this effectiveness has been validated through careful testing. The symposium will provide an unusual opportunity for disciplinary experts to reflect on one another’s findings and to explore common themes. Although there has been significant cross-fertilization among the disciplines, opportunities for joint discussion to address common issues have been rare.

AAPT Symposium on Physics Education

Sunday, 15 February
1:30–3:30 p.m.
Fairmont, Imperial Ballroom


Early High School Physics: Building a Foundation for Understanding the Sciences

Considered by many to be the most concrete of the sciences, physics is the basis for understanding the more abstract concepts introduced in chemistry and biology. At an earlier time when biology primarily concentrated on classification and chemistry focused on applications rather than the atomic structure of matter, it made more sense to follow a biology/chemistry/physics sequence. Putting physics first gives students a basis for understanding the theoretical nature of more advanced science concepts. This movement to reverse the traditional B-C-P science sequence first took hold more than 20 years ago in response to the recommendations of A Nation at Risk. Interest in "Physics First" has recently accelerated due to the strong advocacy by Leon Lederman. Now more than 1200 schools have adopted some version of the Physics First idea as a result of successful national and statewide awareness and implementation efforts.
AAAS Plenary

Sunday, 15 February
6:30 p.m.–7:30 p.m.
Fairmont, Imperial Ballroom

Svante Pääbo, M.D., Ph.D., Director, Department of Genetics, Max-Planck Institute for Evolutionary Anthropology, Leipzig, Germany

A Neanderthal Perspective on Human Origins

A biologist specializing in evolutionary genetics, Svante Pääbo is known as one of the founders of paleogenetics, a discipline that uses the methods of genetics to study early humans and other ancient populations. He is conducting some of the most exacting work ever attempted on the DNA of human and nonhuman primates. His track record of discoveries began in 1985 when he isolated DNA from a 2,400-year-old Egyptian mummy. In 2006, after decoding fragments of DNA from the remains of Neanderthal, he announced plans to reconstruct the entire genome.

AAAS Topical Lecture Series

Sunday, 15 February
12:30 p.m.–1:15 p.m.
Hyatt Regency, Crystal Ballroom A

Colin F. Camerer, Ph.D., Robert Kirby Professor of Behavioral Economics, California Institute of Technology, Pasadena

Interface Between Cognitive Psychology and Economics

Colin Camerer is a behavioral economist whose doctorate program is considered one of the best economics and political science programs in the world. Behavioral economists study precise mathematical models of how willpower and computational limits and emotions work, and use these models to make predictions about behavior. Camerer’s research is conducted at the interface between cognitive psychology and economics, seeking a better understanding of the psychological and neurobiological basis of decision-making in order to determine the validity of models of human economic behavior.

Sunday, 15 February
12:30 p.m.–1:15 p.m.
Hyatt Regency, Crystal Ballroom B

Amory Lovins, Co-Founder, Chairman, and Chief Scientist, Rocky Mountain Institute, Snowmass, Colo.

Profitable Solutions to the Oil, Climate, and Proliferation Problems

Amory Lovins, a consultant physicist, is among the world’s leading innovators in energy and its links with resources, security, development, and environment. He has advised energy and other industries for 35 years as well as the U.S. Departments of Energy and Defense. His work, in more than 50 countries, has been recognized by the “Alternative Nobel”; Blue Planet, Volvo, Onassis, Nissan, Shingo, and Mitchell Prizes; the Benjamin Franklin and Happold medals; a MacArthur Fellowship; 10 honorary doctorates; honorary membership of the American Institute of Architects; foreign membership of the Royal Planet; and World Technology Awards.

Sunday, 15 February
12:30 p.m.–1:15 p.m.
Hyatt Regency, Crystal Ballroom C

Jeannette Wing, Ph.D., Assistant Director, Computer and Information Science and Engineering (CISE), National Science Foundation, Arlington, Va.

Computational Thinking

Jeanette Wing guides and manages CISE, which provides 86 percent of all federally funded research in computer science and contributes to the education and training of future generations of computer scientists and engineers. She is on leave from Carnegie Mel-
Wing is internationally known for her substantive contributions in promoting formal methods — the application of mathematical models and logics — to software.

Sunday, 15 February
12:30 p.m.–1:15 p.m.
Hyatt Regency, Crystal Ballroom D

2009 GEORGE SARTON MEMORIAL LECTURE IN THE HISTORY AND PHILOSOPHY OF SCIENCE

Ken Alder, Ph.D., Professor of History and Milton H. Wilson Professor in the Humanities, Northwestern University, Evanston, Ill.

A History of the International Scientific Conference
Ken Alder studies the history of science and technology in the context of social and political change. Alder studied physics at Harvard University, where he also received a Ph.D. degree in the history of science in 1991. Since 1991, he has taught at Northwestern University, where he is Professor of History and Milton H. Wilson Professor in the Humanities, and directs the Science in Human Culture Program. He has published three books of history: Engineering the Revolution: Arms and Enlightenment in France (1997, winner of the Edelstein Prize); The Measure of All Things: The Seven-Year Odyssey and Hidden Error that Transformed the World (2002, winner of the Davis Prize, the Dingle Prize, and the Kagan Prize, and translated into 13 languages); and The Lie Detectors: The History of an American Obsession (2007).

George Sarton, professor of the history of science at Harvard from 1940 to 1951, is widely regarded as one of the key figures in the establishment of the history of science as a discipline in its own right. In 1960, the History of Science Society, under the auspices of AAAS, established the George Sarton Memorial Lecture. The lecture is coordinated through the AAAS History and Philosophy of Science Section and delivered at the AAAS Annual Meeting.

AAPT Session
Sunday, 15 February
6:00–8:00 p.m.
Hyatt Regency, Columbus IJ

Presider: James Hicks, Barrington High School, Barrington, Ill.

Celebrating the Beginning and Impact of the Illinois State Physics Project
In 1967, a consortium of 11 Illinois colleges and universities secured NSF funding for an initiative titled the Illinois State Physics Project (ISPP). The group’s mission was to reverse the declining enrollment in high school physics. In 1970, with NSF funds no longer available, the demise of the ISPP alliance appeared imminent. However, a few physics education leaders in the Chicago area, led by Harald Jensen of Lake Forest College, refused to let the ISPP flame extinguish. In Harald’s words, “We can’t let this happen. There are just too many worthwhile things coming out of this to let it stop!” The result of Harald’s declaration was the formation of the Chicago area ISPP group. For almost 40 years, through sharing and mentoring, ISPP has helped Illinois physics teachers grow professionally. The result: the enhanced teaching and learning of physics. Please join us to celebrate the impact of ISPP and experience the spirit and flavor of a typical meeting.

AAPT Session
Sunday, 15 February
8:00–10:00 p.m.
Hyatt Regency, Grand C North

Women and Men of the Manhattan Project: The Legacy of Wartime Physics
The Manhattan Project welcomed women into its laboratories because of the tremendous labor shortages caused by World War II. Many women were active in the new and rapidly developing field of nuclear physics both before and during World War II. This talk tells the stories of some of these women and describes their contributions to the Manhattan Project. Women physicists made significant contributions to the effort to design and build a bomb, and they were proud of the work they did. Their efforts opened laboratory doors to those of us who followed them. — Ruth Howes, Santa Fe, NM
AAPT Session
Sunday, 15 February
7:15–10:00 p.m.
Hyatt Regency, Grand A

Presider: Todd R. Leif, Cloud County Community College, Concordia, KS 66901

Energy and the Environment
Wind energy is rapidly becoming an essential source of electricity in the United States. This session is about programs or projects related to the wind energy technology environment or any similar alternative energy programs/projects. Listen to five experts in the field of energy alternatives.

AAPT Commercial Workshop
Sunday, 15 February
8:00–9:30 a.m.
Hyatt Regency, Stetson Conference Center, Suite E

Circular Motion and the Loop Track—How DOES that Marble Stay on the Track?
Why don’t you fall off of a coaster track when it turns you upside down? Can you really calculate the speed of an object looping the loop based on just the radius of the track? We can! Come explore circular motion, centripetal force, and centripetal acceleration with our looping coaster track. Calculate the speed of a rolling steel marble with photogates and our CPO Timer 3. Come see observation, calculation, and formula deviation mesh together with CPO’s loop track. (Sponsor: CPO Science)
AAAS Workshops

The following list is a guide to the AAAS Career Development and Sponsored workshops on Sunday:

**Sunday, 15 February**

8:30 a.m.–5:00 p.m. **SPONSORED WORKSHOP**  
Hyatt, Columbian  
*Ultra High Resolution Stereo Visualization Theater*  
(Sponsored by National Science Foundation) (Show times will be posted on site.)

8:30 a.m.–9:30 a.m. **SPONSORED WORKSHOP**  
Hyatt, Grand Suite 5  
*How To Apply for Federal Employment*  
(Sponsored by NOE National Technology Energy Laboratory)

8:30 a.m.–10:00 a.m. **CAREER WORKSHOPS**  
*Comparing and Contrasting Careers in Academe, Industry, and Government*  
Hyatt, Water Tower  
*Science with Style: Manuals that Can Help Your Scientific Writing Succeed*  
Hyatt, Stetson Conference Center, Suite F

10:00 a.m.–5:00 p.m. **CAREER RESOURCE CENTER**  
Hyatt, Stetson Conference Center, Suite B/C  
Browse and collect information about the many career development resources, fellowships and internships, and job search assistance available from AAAS and many of its affiliated organizations. The center is hosted by the AAAS Center for Careers in Science and Technology.  
*Science Careers*, published by the AAAS, is a comprehensive careers web site dedicated to helping scientists at all career stages. Search thousands of jobs, get great career advice, find grant and funding information, and network with peers—all for free at http://sciencecareers.sciencemag.org/

10:00 a.m.–11:00 a.m. **SPONSORED WORKSHOP**  
Hyatt, Grand Suite 5  
*Faculty and Research Fellowship Opportunities in Singapore*  
(Sponsored by Nanyang Technological Univ.)

10:30 a.m.–NOON **CAREER WORKSHOPS**  
*Getting Closer to the Clinic: Ph.D.s in Translational Research*  
Hyatt, Stetson Conference Center, Suite F  
*Published or Be Damned: Peer Review, the Public and You,*  
Hyatt, Water Tower

12:45 p.m.–1:45 p.m. **SPONSORED WORKSHOP**  
Hyatt, Wrigley  
*How To Get Published in the Proceedings of the National Academy of Sciences (PNAS)*  
(Sponsored by PNAS)

1:30 p.m.–3:00 p.m. **CAREER WORKSHOP**  
Hyatt, Water Tower  
*Working with Congress and a New Administration*

1:30 p.m.–4:00 p.m. **CAREER WORKSHOP**  
Hyatt, Stetson Conference Center, Suite F  
*How To Engage Senior STEM Professionals in Supporting Teachers and Students*

2:00 p.m.–3:30 p.m. **SPONSORED WORKSHOP**  
Hyatt, Wrigley  
*Questions of Truth: Perspectives on the Intertwining of Science and Religion*  
(Sponsored by Sciteb)

3:00 p.m.–4:00 p.m. **SPONSORED WORKSHOP**  
Hyatt, Grand Suite 5  
*Resources and Trends for Online STEM Teaching Materials for Higher Education*  
(Sponsored by National Science Digital Library)

3:00 p.m.–5:00 p.m. **CAREER WORKSHOP**  
Hyatt, Water Tower  
*Genomics Teaching Resources and Intramural Training Opportunities*

4:30 p.m.–5:30 p.m. **SPONSORED WORKSHOP**  
Hyatt, Grand Suite 5  
*The Impact of Scientific Partnerships on the Future of Transportation*  
(Sponsored by Federal Highway Administration)
AAPT Plenary

Monday, 16 February
11:30 a.m.–12:30 p.m.
Hyatt Regency, Grand Ballroom EF


Dark Matter in the Laboratory

Most of the universe is dark matter, whose composition is entirely unknown and may involve new forces or principles of nature. Using ultra-sensitive detectors deep underground, physicists are attempting to detect dark matter particles streaming in from space. At the Large Hadron Collider, physicists hope to manufacture large numbers of dark matter particles and study their properties in the laboratory. I will describe these efforts and how impending discoveries may change our fundamental understanding of physics and the universe.

AAPT/AIP Awards & Presidential Transfer

Monday, 16 February
2:30 p.m.–4:30 p.m.
Hyatt Regency, Grand Ballroom EF

Presiders: Harvey Leff
Earl Blodgett

AAPT 2009 Distinguished Service Citation Recipients

Paul Hickman
Boston, MA

Charles Holbrow
MIT
Boston, MA

Bob Shurtz
Hawkins School
Gates Mills, OH

Gary White
AIP
College Park, MD

Courtney Willis
Univ. of Northern Colorado
Greeley, CO

SPS Outstanding Chapter Advisor Award 2008

The American Institute of Physics presents this award annually to faculty members who have excelled in the role of SPS advisor.

Dr. Samuel Lofland, Physics Dept., Rowan University, Director of Materials Research Group, Glassboro, N.J.

Lofland completed his Ph.D. from the University of Maryland in condensed matter physics in 1995, and he joined Rowan University in 1998. He became advisor for SPS in 1999 and was promoted to Associate Professor in 2001 and Professor in 2004. He is Director of Materials Research at Rowan and a member of the University of Maryland NSF Materials Research Science and Engineering Center. His research interests include magnetism, superconductivity, thin-film technology, multifunctional composites, and bio-imaging. He has published more than 150 papers, most of which have undergraduate co-authors, and his students have gone on to pursue doctorates in physics, math, engineering, chemistry, and biochemistry.