



2009 Annual Meeting

Our Planet and Its Life: Origins and Futures

12–16 February • Chicago

Dear Colleagues,

The 2009 AAAS Meeting will bring together an exceptional array of speakers addressing some of the most crucial and timely areas of science, technology, and engineering.

The meeting's theme — *Our Planet and Its Life: Origins and Futures* — recognizes that 2009 is the 200th anniversary of Charles Darwin's birth and the 150th anniversary of the publication of his book, *On the Origin of Species by Means of Natural Selection*. New understanding of the processes that fascinated Darwin continues to be the focus of intense research 150 years later. Indeed every discipline can demonstrate its own unique evolutionary path and speculate on where it may lead.

Attendees from more than 50 countries 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.

Typically the meeting includes thousands of participants and hundreds of members of the international and national media. It offers unparalleled networking opportunities. More details can be found at www.aaas.org/meetings, including how sustainability science, an emerging field, has found a home.

The Annual Meeting reflects tremendous efforts from the AAAS sections, divisions, and committees, which we gratefully acknowledge. I also extend a personal thanks to the members of the Scientific Program Committee who reviewed and assembled the many excellent ideas and proposals into this outstanding meeting.

I urge you to join us in Chicago,

James J. McCarthy, Ph.D., AAAS President and
Alexander Agassiz Professor of
Biological Oceanography, Harvard University

► Probe the evolution of emotions, language, morality, and microbes.

► Join leaders who are tackling the climate change crisis.

► Learn how the U.S. elections will shape policy and funding.

Register now and obtain program details at <http://www.aaas.org/meetings>.

Reporters: The EurekAlert! Web site hosts the AAAS Meeting Newsroom. Reporters can obtain details at www.eurekalert.org/aaasnewsroom.



President's Address



James J. McCarthy

AAAS President; Alexander Agassiz Professor of Biological Oceanography, Harvard University, Cambridge, Mass.

McCarthy received his Ph.D. degree from Scripps Institution of Oceanography and B.S. degree in biology from Gonzaga University. He teaches courses in ocean and climate science and oversees Harvard's program in Environmental Science and Public Policy. His research interests relate to marine plankton, biogeochemical cycles, and climate. He has served on and led many national and international groups charged with planning and implementing studies of global change, including chair of the international scientific committee that establishes research priorities and oversees implementation of the International Geosphere-Biosphere Program from 1986 to 1993; 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 (2001); lead author of the Arctic Climate Impact Assessment; and vice-chair of the Northeast Climate Impacts Assessment. He has been elected a fellow of AAAS and the American Academy of Arts and Sciences and a foreign member of the Royal Swedish Academy of Sciences.

President's Reception: Immediately following

Plenary Speakers



Sean B. Carroll

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 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. Major discoveries from his laboratory have been featured in *Time*, *US News & World Report*, *The New York Times*, *Discover*, and *Natural History*. Carroll is the author of *Endless Forms Most Beautiful* (2005) which was a finalist for the *Los Angeles Times* Book Prize, and *The Making of the Fittest* (2006) which won the Phi Beta Kappa Science Book Award. His most recent book, *Remarkable Creatures: Epic Adventures in the Search for the Origins of Species*, will be published in 2009. He is a member of the National Academy of Sciences and an AAAS Fellow. He received his bachelor's degree at Washington University and his Ph.D. degree in immunology from Tufts University.



Susan W. Kieffer

Center for Advanced Study Professor of Geology and Physics, and Walgreen University Chair, 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. With colleagues, she described the dynamics of the Chixculub meteor impact that caused vaporization of limestone, which resulted in massive amounts of carbon dioxide in the atmosphere and ultimately resulted in a major extinction event 65 million years ago. 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.



Svante Pääbo

Director of the 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. In 1992, he received the Gottfried Wilhelm Leibniz Prize of the Deutsche Forschungsgemeinschaft, which is the highest honor awarded in German research. Pääbo's department in August 2002 published findings about the evolution of the "language gene," FOXP2, which is lacking or damaged in some individuals with language disabilities. He was born in Stockholm and earned his Ph.D. degree from Uppsala University. He is a member of the National Academy of Sciences.

Topical Lecture Series

Colin F. Camerer

Robert Kirby Professor of Behavioral Economics, California Institute of Technology, Pasadena
Interface Between Cognitive Psychology and Economics

Ekaterina Dadachova

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

T. Conrad Gilliam

Marjorie I. and Bernard A. Mitchell Professor and Chair of the Department of Human Genetics, University of Chicago, Ill.
Human Genetics

Lene Vestergaard Hau

Mallinckrodt Professor of Physics and of Applied Physics, Harvard University, Cambridge, Mass.
Wizardry with Light: Freeze, Teleport, and Go!

Amory Lovins

Co-Founder, Chairman, and Chief Scientist, Rocky Mountain Institute, Snowmass, Colo.
Profitable Solutions to the Oil, Climate, and Proliferation Problems

Daniel G. Nocera

Professor of Energy and of Chemistry, Massachusetts Institute of Technology, Cambridge
Harnessing the Sun and Oceans To Meet the World's Energy Demands

Timothy D. White

Professor of Integrative Biology, University of California, Berkeley
Evolution of Early Humans

Jeanette Wing

Assistant Director, National Science Foundation, Arlington, Va.
Computational Thinking

2009 GEORGE SARTON MEMORIAL LECTURE

Ken Alder

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

A History of the International Scientific Conference

2009 JOHN P. MCGOVERN AWARD LECTURE IN THE BEHAVIORAL SCIENCES

Elizabeth Loftus

Distinguished Professor, University of California, Irvine
Illusions and Delusions of Memory

Topical Panel

North-South Scientific International Cooperation—Meeting Global Challenges

Lord Martin Rees, President of the Royal Society, Master of Trinity College, and Professor of Cosmology and Astrophysics, University of Cambridge, U.K.

József Pálkás, President, Hungarian Academy of Sciences, Budapest (*Invited*)

Jacob Palis, President, Academy of Sciences for the Developing World, Rio de Janeiro, Brazil (*Invited*)

Seminar Tracks

Day-long seminars address topics at the intersection of science and society: assessing and responding to climate change, human evolution, and nanotechnology

Assessing and Responding to Climate Change

Equity, Sustainability, and Governance of Mixed-Use Landscapes


Organized by Ashwini Chhatre, University of Illinois, Urbana-Champaign
Sustainability has emerged as a necessary objective of policy interventions. The future of life on Earth depends on our ability to devise governance systems that guide nature-society interactions toward more sustainable trajectories. Moving beyond the role of institutions in dealing with trade-offs among competing land uses along different outcome dimensions — income generation, biodiversity conservation, ecosystem services provision, greenhouse gas emissions, and carbon sequestration — speakers will discuss the challenge of devising complex multi-level governance systems for mixed-use landscapes.

Risky Business: Assessing and Dealing with Extremes in a Changing Climate

Organized by Claudia Tebaldi, Climate Central, Palo Alto, Calif.
Extreme events are arguably the most crucial aspect of climate change, threatening to have the largest impacts on social and natural systems. They pose tough questions, often with heavy financial and legal implications, about the distinction between natural and human causes. This

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session explores what can and cannot be reliably said about the influence of global warming on several aspects of extreme events: hurricanes, temperature and precipitation extremes over North America, and the attribution of specific historic events to human-caused warming. Speakers will discuss what kind of scientific information can help us better understand past, present, and future patterns of extreme events, while taking steps to protect our resources and adapt to a dynamic climate.

U.S. Cities: Responding to Concerns About Climate Change

Organized by Donald J. Wuebbles, University of Illinois, Urbana-Champaign
Cities cover only 0.4 percent of the Earth's surface but generate the bulk of the world's emissions of carbon dioxide, making urban areas key to alleviating the concerns about global warming. Many cities are already taking action by developing climate adaptation and mitigation strategies for their own communities. Several efforts are already underway to attack the climate issue, for example, by enhancing urban planning, reexamining city policies, improving energy efficiency, and reevaluating local transportation systems. The green roofs in Chicago are one such response. Speakers will discuss the ongoing efforts within U.S. cities toward adaptation and mitigation of climate change.

Human Evolution

The Evolution of Human Diets

Organized by Matt Sponheimer, University of Colorado, Boulder

Recent changes in human diet have been implicated in the etiology of modern diseases including Type II diabetes, arteriosclerosis, and several forms of cancer. As a result, many have argued that our dietary recommendations should be informed by our knowledge of the feeding behavior of human ancestors and our close primate kin. In this session, researchers will examine the evolution of human diets through the lenses of archaeology, morphology, biogeochemistry, ethology, genetics, and energetics. Assembling scientists who address similar questions in different ways will underscore areas of growing consensus and controversy and in so doing should considerably advance our knowledge of hominin dietary adaptations.

The Origin of the Human Species

Organized by Leslie C. Aiello, Wenner-Gren Foundation for Anthropological Research, New York City

In *On the Origin of Species by Means of Natural Selection*, Charles Darwin famously said that "light will be thrown on the origin of man and his history." Although there were no widely accepted human fossils at the time of publication (1859), today there are more than 20 fossil hominin species spanning over 6 million years of prehistory. This session brings together leading international experts to discuss what the extensive fossil and archaeological record can tell us about six major periods in human biological and cultural evolution.

Nanotechnology

Driving Beyond Our Nano-Headlights?

Organized by Joel G. Pounds, Pacific Northwest National Laboratory, Richland, Wash.

Nanotechnology has enormous potential to benefit society and the economy. It also might yield unanticipated, negative environmental change. DDT had long-term ecological side effects that were not understood until organisms failed to adapt. And, commercial development of genetically modified organisms was delayed by the perception that risks from these organisms outweighed their benefits. Speakers will explore where the science of nanotoxicology is heading, the challenges in understanding and predicting long-term effects, approaches to nanotoxicological research, and the policy framework required.

From Donuts to Drugs: Nano-Biotechnology Evolution or Revolution?

Organized by Rodney A. Hill, University of Idaho, Moscow

The foods we eat and the drugs we take in the future could be more revolutionary than evolutionary, if research at the nano-bio interface continues at its current pace. Imagine targeted drugs and guilt-free food; or treatments that make you even better than new. Nanotechnology is driving the development of tools to understand biology better and materials to promote good health. Where is bio-nanoscience heading and how can science and citizens work together to ensure its success? This session will turn to the interface between nanomaterials and humans, and highlight provocative, cutting-edge science.



Special AAAS Membership Offer

Do you have colleagues who are not yet members of AAAS?

If they register in advance for the 2009 Annual Meeting in Chicago, they will receive a one-year membership to AAAS along with all member benefits. These include a one-year subscription to the journal *Science*, online access to *Science* and all of its archives, and access to *Science Express*. International members will receive *Science Digital*.

This offer is good for advance registration only, and expires on 19 January 2009. Only nonmembers qualify.

Share the news now.

Register Now: Get special discounts on meeting and hotel registration.

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Special Sessions

2009 Forum for Sustainability Science Programs

One of the biggest challenges that the planet faces is how to balance the needs of human development with the needs of the environment. Policy-makers at all levels of governance increasingly look to scientists and engineers to provide guidance in creating sustainable societies. Universities are increasingly responding by developing academic and research programs in Science and Technology for Sustainable Development or “Sustainability Science” that undertake practical, place-based research to provide decision-support for addressing sustainability challenges.

Since the inaugural Forum at the 2007 AAAS Annual Meeting in San Francisco, the AAAS Center for Science, Technology, and Sustainable Development has convened key university actors in Sustainability Science to dialogue on collaborative approaches to building this emerging field.

Though participants from the United States and abroad hail from diverse perspectives and institutions, most are experiencing similar challenges as they develop interdisciplinary programs, which combine both basic and applied research methods.

As a follow-up to previous sessions which identified key challenges and opportunities (2007) and began to identify opportunities to further connect these universities (2008), the 2009 Forum will tackle a number of common concerns for these programs including:

- ▶ Curriculum Development
- ▶ Sustainability Science and Decision-Making
- ▶ Support for Interdisciplinary Sustainability Research

The Forum will include a series of roundtable discussions, led by key actors in the sustainability science community.

2009 Forum for School Science

The quality of science and mathematics education is high on the list of concerns in most countries of the world. Scientists and educators in many countries are developing and testing programs and practices,

including a number they have adapted from U.S. initiatives. Many states are visiting programs in other countries and attempting to benchmark those that show high levels of performance on international assessments.

In some cases, economical, cultural, and social differences result in different ideas, strategies, and adaptations. In other countries, where elements of U.S.-developed programs are implemented, lessons can be learned from their results, especially to inform the work of transformation in the United States. The Forum for School Science will offer a series of “global” conversations with U.S. and international presenters. The discussions will include examples of programs and current thinking in each area and reflect on symposia to be offered in the symposium track, Learning and Literacy. Areas to be covered include:

- ▶ Rethinking U.S. reforms of the curriculum core (sharing, adapting, and delivering materials)
- ▶ Implementing what we know (policy, research, and scaling)
- ▶ Restructuring undergraduate and graduate STEM education
- ▶ Engaging the public with science and education.

Welcome to China, Greece, Italy, Mexico, Poland, and Russia.

In other words, **welcome to Chicago**. Easy access, big business, lots of science, and great diversity make Chicago one of the truly global cities.



Symposium Tracks

Brain and Behavior

Beyond the Beagle: Evolutionary Approaches to the Study of Social Behavior

Organized by Jill Mateo, University of Chicago, Ill.

Comparative Cognition: The Science of Mental Evolution

Organized by Edward A. Wasserman, University of Iowa, Iowa City

Embodied Language and Cognition: Brains, Mouths, and Hands

Organized by Philip Rubin, Haskins Laboratories, New Haven, Conn.

Expression of Emotions: Biocultural Perspectives

Organized by Carl A. Maida, University of California, Los Angeles

Languages Without Ancestors

Organized by Karen Emmorey, San Diego State University, Calif.

Post-Traumatic Stress Disorder and the Military

Organized by Stephanie J. Bird, Massachusetts Institute of Technology, Cambridge, Mass.

Post-Traumatic Stress Disorder: The New Battle for Veterans

Organized by Virginia R. G. Carson, Chapman University, Orange, Calif.

The Science of Kissing

Organized by Albert H. Teich, AAAS Science and Policy Programs, Washington, D.C.

Social Emotion and the Brain

Organized by John T. Cacioppo, University of Chicago, Ill.

Evolution and Revolution

Animal Body Plan Evolution of Development

Organized by Christopher J. Lowe, University of Chicago, Ill.

Celebrating Darwin at 200: Explaining How Human Morality Evolved

Organized by Douglas Allchin, University of Minnesota, Minneapolis

Evolution Makes Sense of Biology

Organized by Eugenie C. Scott, National Center for Science Education, Oakland, Calif.

Evolution of Mammalian Retroelement Activity

Organized by Robert C. von Borstel, University of Alberta, Canada

Genetics Meets Anthropology: How DNA Unravels the Roots of Human Society

Organized by Eamonn Cahill, Office of the Chief Scientific Adviser to the Government of Ireland, Dublin

Host-Pathogen Interactions: Evolution of Immune Defenses

Organized by Nancy E. Beckage, University of California, Riverside

The Invisible Woman in Evolution: Natural Selection and Life-Cycle Events

Organized by Marquisa LaVelle, University of Rhode Island, Kingston

The Last Piece of Darwin's Puzzle: The Evolution of the Social Mind

Organized by Dario Maestriperi, University of Chicago, Ill.

Microbes in a Changing World: The Lessons of Darwin

Organized by Roberto G. Kolter, Harvard Medical School, Boston, Mass.

Origins of Complex Societies in Primates and Humans

Organized by Robert D. Martin, Field Museum of Natural History, Chicago, Ill.

Studying Vertebrate Genomes: Reading Evolution's Notebooks

Organized by Eric D. Green, National Human Genome Research Institute, Bethesda, Md.

Symbiosis as an Evolutionary Driver: Mergers of Cells and Genomes

Organized by Jeffrey D. Palmer, Indiana University, Bloomington

Feeding a Hungry Planet

Adulteration, Counterfeiting, and Smuggling: How Safe Is Our Imported Food?

Organized by Ewen C. D. Todd, Michigan State University, East Lansing

Aquaculture Impacts, Standards, and Sustainability

Organized by Angela T. Bednarek, Lenfest Ocean Program, Washington, D.C.

Beyond the Obituaries: Successful Fish Stories in Ocean Conservation

Organized by Jeremy B. C. Jackson, Scripps Institution of Oceanography, La Jolla, Calif.

Foods of the Future

Organized by Clare M. Hasler, University of California, Davis

Green, Gene, Growing Machines: The Evolutionary Shaping of Plant Form

Organized by David A. Baum, University of Wisconsin, Madison

A Hunger for Power: The Global Nexus of Energy and Food

Organized by Michael E. Webber, University of Texas, Austin

Living Soil, Food Quality, and the Future of Food

Organized by Preston K. Andrews, Washington State University, Pullman

Nanofood for Healthier Living?

Organized by Aidan Gilligan, European Commission, Brussels, Belgium

Protecting Our Planet Against Food Riots in the Future

Organized by Ronald L. Phillips, University of Minnesota, St. Paul

The Promise of Translational Research for Sustainable Agriculture: Darwin on Steroids

Organized by Daniel Bush, Colorado State University, Fort Collins

Global Partnerships

Advancing Women in Physics Internationally

Organized by Beverly K. Hartline, Delaware State University, Dover

Ambitious Materials for Energy 2020: European Cooperation for Major Breakthroughs

Organized by Carlos Saraiva Martins, European Commission, Brussels, Belgium

Building a Diversified Portfolio: The Roles of Nonprofits in Biomedical Research

Organized by Maria T. Vassileva, Foundation for the National Institutes of Health, Bethesda, Md.

East Asian Science Policies and New Global Realities

Organized by Yaeko Mitsumori, National Institute of Science and Technology Policy, Tokyo, Japan

Geologic Storage of Carbon Dioxide: The Regional Carbon Sequestration Partnerships Initiative

Organized by Sean I. Plasynski, U.S. Department of Energy, Pittsburgh, Pa.

Internationalization of Science: Looking Ahead

Organized by Gianpietro van de Goor, European Research Council–European Commission, Brussels, Belgium

New Partnerships for Science in the Cradle of Humanity

Organized by Sarah Banas, AAAS International Office, Washington, D.C.

New Tools in Diplomacy: Environmental Change, Conservation, and Conflict

Organized by Alex O. Dehgan, U.S. Department of State, Washington, D.C.

Science for Diplomacy: Building Scientific Cooperation with North Korea

Organized by Linda Staheli, U.S. Civilian Research and Development Foundation, Arlington, Va.

Thirsting for Daily Sustenance: Public-Private Partnerships for Global Water Access

Organized by Usha R. Balakrishnan, CARTHA, Iowa City, Iowa

Innovations for a Healthy Society

21st Century Medical Challenges: Issues of Development and Delivery

Organized by Paul H. Fagette, Illinois Institute of Technology, Chicago

Adult Stem Cells: From Scientific Process to Patient Benefit

Organized by Norbert Riedel, Baxter International, Deerfield, Ill.

Emerging Genomic Tools for Predicting Adverse Drug Reactions: Promises and Challenges

Organized by Danny D. Shen, University of Washington, Seattle

Epigenetics: Mechanisms and Impact on Biomedicine

Organized by Walter Doerfler, University of Cologne, Germany

Fighting the Rising Tide of Antibiotic Resistance: Causes and Cures in the Sea

Organized by Carolyn Sotka, NOAA Oceans and Human Health Initiative, Charleston, S.C.

Genetics of Addiction: What We Can Learn from Genes?

Organized by Indridi Benediktsson, European Commission, Brussels

Is the World's Drug Supply Safe?

Organized by Darrell R. Abernethy, United States Pharmacopeia, Rockville, Md.

Medicines for Children

Organized by Indridi Benediktsson, European Commission, Brussels, Belgium

Origins of the Perfect Face: Extreme Makeovers

Organized by Mary MacDougall, University of Alabama, Birmingham

Preimplantation Genetic Diagnosis: Beyond Natural Selection?

Organized by Aidan Gilligan, European Commission, Brussels, Belgium

Species and Individual Differences in Response to Drugs

Organized by Margaret O. James, University of Florida, Gainesville

Learning and Literacy

Celebrating Year of Science 2009: Efforts To Improve Public Engagement in Science

Organized by Sheri Potter, American Institute of Biological Sciences, Sarasota, Fla.

College Science Courses: Remembering C.P. Snow

Organized by Jon D. Miller, Michigan State University, East Lansing

Conceptual Interference in Chemistry and Biology Instruction

Organized by Melanie M. Cooper, Clemson University, S.C.

Concern for the Future: Civic Leadership in Advancing Science Education

Organized by Julie Parente, Museum of Science and Industry, Chicago, Ill.

Discipline-Based Science Education Research

Organized by David E. Meltzer, Arizona State University, Mesa

Inquiry or Direct? Research-Based Practices in Science Education

Organized by William W. Cobern, Western Michigan University, Kalamazoo

K-12 Engineering Education in the United States

Organized by Greg Pearson, National Academy of Engineering, Washington, D.C.

Mathematical Biology, the New Frontier: Educating the Next Generation

Organized by Bonnie Shulman, Bates College, Lewiston, Maine

A New Kind of Scientist: Professional Master's Education and U.S. Competitiveness

Organized by Brad Wible, Northwestern University, Evanston, Ill.

Science Cafés: Taking Science to Public Places

Organized by Mikkel Bohm, Danish Science Communication, Copenhagen

Science Policy 101: Taking Science Policy Out of Washington and into the Classroom

Organized by Tobin L. Smith, Association of American Universities, Washington, D.C.

Visualizing Earth: Teaching Geoscience Using New Technologies

Organized by Marilyn J. Suiter, National Science Foundation, Arlington, Va.

Machines, Systems, and Knowledge

Analyzing Virtual Worlds: Next Step in the Evolution of Social Science Research

Organized by Jaideep Srivastava, University of Minnesota, Minneapolis

Big, Small, and Everything in Between: Simulating Our World Using Scientific Computing

Organized by Thomas H. Dunning, University of Illinois, Urbana-Champaign

Casting New Light on Ancient Secrets

Organized by Silvana Damerell, Diamond Light Source, Didcot, U.K.

Earth's History and Future Revealed at the Frontier of Scientific Computing

Organized by Norman Chonacky, Yale University, New Haven, Conn.

The Grid, the Cloud, Sensor Nets, and the Future of Computing

Organized by Michael R. Nelson, Georgetown University, Washington, D.C.

How Telescopes Made the Earth a Planet: 400 Years After Galileo

Organized by Virginia Trimble, University of California, Irvine

Information and Communications Technology and Sustainable Infrastructure

Organized by Priscilla P. Nelson, New Jersey Institute of Technology, Newark

Interdisciplinary Approaches to the Study of Large-Scale Human Networks

Organized by David Lazer, Harvard University, Cambridge, Mass.

The Mathematical Twists and Turns of Data Sets

Organized by Robert Ghrist, University of Pennsylvania, Philadelphia

New Computing Platforms for Data-Intensive Science

Organized by Ian Foster, Argonne National Laboratory, Chicago, Ill.

Managing Environmental Challenges

Basic Research for Global Energy Security: A Call to Action

Organized by James Misewich, Brookhaven National Laboratory, Upton, N.Y.

Biofuels Ablaze

Organized by Susan E. Cozzens, Georgia Institute of Technology, Atlanta

Biofuels, Tropical Deforestation, and Climate Policy: Key Challenges and Opportunities

Organized by Holly Gibbs, University of Wisconsin, Madison

Chicago Wilderness: Integrating Biological and Social Diversity into the Future

Organized by Sir Peter Crane, University of Chicago, Ill.

Drake's Well to Solar Cells: 150 Years of Energy Transitions

Organized by Audra J. Wolfe, Chemical Heritage Foundation, Philadelphia, Pa.

Environmental Justice and Climate Change

Organized by Nicky Sheats, Thomas Edison State College, Trenton, N.J.

Food for Thought: Feeding Ourselves, Feeding the Climate Crisis

Organized by Astrid J. Scholz, Ecotrust, Portland, Ore.

The Future of the U.S. Climate-Observing Capability

Organized by Thomas P. Ackerman, University of Washington, Seattle

Global Trade and the Homogocene: Lessons from the Great Lakes for the World

Organized by David M. Lodge, University of Notre Dame, Ind.

Keeping the Lights on: The Revival of Nuclear Energy for Our Future

Organized by Aidan Gilligan, European Commission, Brussels, Belgium

Plug-in Hybrids and Other Electric Vehicles: Key to Planetary Mobility?

Organized by Tina Kaarsberg, U.S. Department of Energy, Washington, D.C.

What Is New and Surprising Since the IPCC Fourth Assessment?

Organized by Berrien Moore, University of New Hampshire, Dover

Oceans, Earth, and Air

21st Century Water: Friend or Foe?

Organized by Charles J. Vorosmarty, City College of New York, New York City

Crossing the Plate Boundary: Probing Earthquakes at the Source

Organized by Charna E. Meth, Consortium for Ocean Leadership, Washington, D.C.

Disaster Scene Investigation: Lessons of the Wenchuan Earthquake

Organized by Richard A. Stone, AAAS/Science, Washington, D.C.

Emerging Threats and Research Challenges for Global Ecosystems

Organized by William F. Laurance, Smithsonian Tropical Research Institute, Panama City, Panama

Facing Our Uncertain Future: The Reality of Climate-Change Adaptation in the Ocean

Organized by Emily Pidgeon, Conservation International, Arlington, Va.

Life in the Extreme: The Deep Biosphere's Influence on Global Processes

Organized by Charna E. Meth, Consortium for Ocean Leadership, Washington, D.C.

Our Changing Planet: Achievements of the International Polar Year

Organized by Rolf Sinclair, Chevy Chase, Md.

Solutions for Resuscitating Dead Zones: From Chicago to the Gulf of Mexico and Beyond

Organized by Donald F. Boesch, University of Maryland Center for Environmental Science, Cambridge, Md.

Water: Who Gets the Last Drop?

Organized by Deon Stuthman, University of Minnesota, St. Paul

On the Brink of Discovery

Artificial Cells: Models of the Simplest Life

Organized by Christine Keating, Pennsylvania State University, State College

Beyond $E=mc^2$: Unveiling the Early Universe with High-Intensity Accelerators

Organized by Kurt Riesselmann, Fermi National Accelerator Laboratory, Batavia, Ill.

Closing in on High-Energy Physics Discoveries: From the Tevatron to the Large Hadron

Organized by Maria Spiropulu, European Organization for Nuclear Research (CERN), Geneva, Switzerland

Cosmic Cradle of Life

Organized by Mark T. Adams, National Radio Astronomy Observatory, Charlottesville, Va.

From Enlightenment Lunar Theories to the Discovery of Extra Solar Planets

Organized by Ronald S. Calinger, Catholic University of America, Washington, D.C.

Exciting Research at the Fermi National Accelerator Laboratory

Organized by David M. Cook, Lawrence University, Appleton, Wis.

Microbial Communication: Single Cells Gain a Voice

Organized by Clay Fuqua, Indiana University, Bloomington

Origin and Evolution of Planets

Organized by Gilbert W. Collins, Lawrence Livermore National Laboratory, Livermore, Calif.

Origins and Endings: From the Beginning to the End of the Universe

Organized by Lawrence M. Krauss, Case Western Reserve University, Cleveland, Ohio

Quest for the Perfect Liquid: Connecting Heavy Ions, String Theory, and Cold Atoms

Organized by Peter Steinberg, Brookhaven National Laboratory, Upton, N.Y.

Synthetic Life

Organized by Christina Smolke, California Institute of Technology, Pasadena

Weird Life

Organized by Jill C. Tarter, SETI Institute, Mountain View, Calif.

Research Techniques and Resources

Bright Light for Better Health

Organized by Silvana C. Damerell, Diamond Light Source, Didcot, U.K.

Evolution of Knowledge Production: Exploring Creativity, Innovation, and Networks

Organized by Gretchen B. Jordan, Sandia National Laboratories, Albuquerque, N.M.

Frontiers in the Plant Tree of Life

Organized by Michael Donoghue, Yale University, New Haven, Conn.

The Future of U.S. Accelerator Science

Organized by Cherry A. Murray, Lawrence Livermore National Laboratory, Livermore, Calif.

Games People Play: Challenges of Applying Mathematics and Computers to Games

Organized by Robert A. Hearn, Dartmouth College, Hanover, N.H.

Life on Earth: Data Systems About the Past and Current Status of the World's Species

Organized by Bonnie C. Carroll, U.S. Geological Survey, Oak Ridge, Tenn.

Mathematics of Origami: From the Joys of Recreation to the Frontiers of Research

Organized by Edward Aboufadel, Grand Valley State University, Allendale, Mich.

Newer Test, Fewer Animals: Innovative Approaches in Toxicity Testing

Organized by Deborah Runkle, AAAS Science and Policy Programs, Washington, D.C.

Pushing Forward Research on Race, Ethnicity, and Violent Crime

Organized by Karen Heimer, University of Iowa, Iowa City

The World Wide Web as a Tool for Social Research

Organized by Thomas Dietz, Michigan State University, East Lansing

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