Thank you ECL™ Plus, you’ve been great.

For every success there’s a successor. It’s called progress. So while we knew we had something special in Amersham™ ECL Plus, our Western blotting team was quietly working on the next generation of detection reagent. The result: a new substrate that operates with superior levels of sensitivity, signal intensity and stability than even its famous predecessor, making it an excellent choice for CCD imagers. Welcome to ECL Prime.

<table>
<thead>
<tr>
<th>Ab dilution</th>
<th>Primary</th>
<th>Secondary</th>
<th>Signal intensity sustained at higher antibody dilutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amersham ECL Prime</td>
<td>Amersham ECL Plus</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>10 µg</td>
<td>156 ng</td>
<td></td>
</tr>
<tr>
<td>1:3000</td>
<td>1:300 000</td>
<td>1:500 000</td>
<td></td>
</tr>
<tr>
<td>1:10 000</td>
<td>1:10 000</td>
<td>1:500 000</td>
<td></td>
</tr>
</tbody>
</table>

Comparison of Amersham ECL Prime and Amersham ECL Plus detection of β-catenin in NIH 3T3 whole cell lysates using different dilutions of rabbit anti-β-catenin and HRP-conjugated anti-rabbit IgG.

Find out more about Amersham ECL Prime at www.gelifesciences.com/eclprime
INTRODUCING

AAAS MemberCentral

The exclusive new website for the AAAS member community.

AAAS MemberCentral is a new website focused on helping you — the scientists, engineers, educators, students, policymakers, and concerned citizens who make up the AAAS community — connect like never before.

On MemberCentral you can contribute to discussion groups or blogs, participate in a webinar, or share photos of your field research. You can exchange ideas, learn about your fellow members, and gain fresh insights into issues that matter to you the most. MemberCentral is also an easy access point for a wide variety of other AAAS membership benefits, like discounts on cars and books, travel opportunities, and more.

Experience MemberCentral for yourself. Visit MemberCentral.aaas.org today and log in using your Science online username and password.
NEW
Women in Science Booklet

*Science* and the L’Oréal Foundation present

Read inspiring profiles of women making a difference in biology.

Free download at
ScienceCareers.org/LOrealWIS
The most accurate next-gen sequencing technology available.

Every Illumina sequencer is powered by TruSeq—the technology that delivers the most accurate human genome at any coverage. TruSeq produces the highest yield of error-free reads. The most bases over Q30. The greatest number of peer-reviewed publications—more than 1,000 in the past three years.

That’s Tru data quality.

Get the proof. Go to www.illumina.com/TruSeq
Join Us in Washington, DC

Attend sessions on the implications of finding other worlds, the next steps in brain-computer interfaces, frontiers in chemistry, the next big solar storm, and more. Talk to leaders in science, technology, engineering, education, and policy-making. Mingle with colleagues at receptions and social events.

It’s all available at the world’s largest interdisciplinary science gathering. Among 157 scientific sessions, 84 have international participation. Speakers alone represent more than half of the world’s top 200 universities and colleges. World-renowned research institutes will be there, too. Attendees will come from nearly 50 countries and almost all of the 50 states and territories of the United States.

Follow us in cyberspace at:
http://www.facebook.com/AAAS.
Science. Get regular updates at Twitter.com, #AAASmtg

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

AAAS, publisher of Science, presents the
2011 Annual Meeting

Science Without Borders
17—21 February • Washington, DC

Alice S. Huang, Ph.D.
AAAS President and
2011 Program Chair

Dear Colleagues,

On behalf of the AAAS Board of Directors, it is my distinct honor to invite you to the 177th Meeting of the American Association for the Advancement of Science (AAAS).

The Annual Meeting is one of the most widely recognized pan-science events, with hundreds of networking opportunities and broad global media coverage. An exceptional array of speakers and attendees will gather at the Walter E. Washington Convention Center in Washington, DC. You will have the opportunity to interact with an exceptional array of scientists, engineers, educators, and policy-makers who will present the latest thinking and developments in the areas of science, technology, engineering, education, and policy-making.

The meeting’s theme — Science Without Borders — integrates interdisciplinary science, both across research and teaching, that utilizes diverse approaches as well as the diversity of its practitioners. The program will highlight science and teaching that cross conventional borders or break out from silos, especially in ground-breaking areas of research that highlight new and exciting developments in support of science, technology, and education. Sessions will feature strong scientific content to illustrate the interface of different disciplines or will exemplify a multidisciplinary approach to problem solving.

Everyone is welcome at the AAAS Annual Meeting. Those who join us will choose among a broad range of activities, including plenary and topical lectures by some of the world’s leading scientists and engineers, multidisciplinary symposia, cutting-edge seminars, career development workshops, an international exhibition, and a host of networking opportunities.

The Annual Meeting reflects contributions from the AAAS sections, which I gratefully acknowledge. I also extend a personal thanks to the Scientific Program Committee for assembling this outstanding meeting and to our local co-chairs, Freeman A. Hrabowski III, president, University of Maryland, Baltimore County; Ray O. Johnson, vice president and chief technology officer, Lockheed Martin; and Robert Tjian, president, Howard Hughes Medical Institute.

I look forward to seeing you in Washington, DC,

Alice S. Huang
AAAS President and
Senior Faculty Associate in Biology
California Institute of Technology
President’s Address

Thursday, 17 February

Alice S. Huang
AAAS President and Senior Faculty Associate in Biology, California Institute of Technology

Dr. Huang is a distinguished virologist and proponent for women in science. She was previously a professor of microbiology and molecular genetics at Harvard Medical School and subsequently dean for science at New York University. She is particularly interested in interdisciplinary research, the organization of higher educational institutions, and in policy issues related to education, science, and technology. She was the first to purify and characterize defective interfering viral particles. Her suggestion that these particles play a major role in viral pathogenesis stimulated work on many viral systems including plant viruses, and has led to the possibility of using these particles for disease prevention.

Sunday, 20 February

Plenary Panel on Biosecurity

Rita R. Colwell
Distinguished University Professor, University of Maryland, College Park, and Johns Hopkins University Bloomberg School of Public Health

Dr. Colwell recently chaired a study committee of the U.S. National Research Council that wrote, Responsible Research with Biological Select Agents and Toxins. A former AAAS president, she has held many advisory positions in the U.S. government, nonprofit science policy organizations, and private foundations as well as in the international scientific research community.

Anthony S. Fauci
Director, National Institute of Allergy and Infectious Diseases, National Institutes of Health

Dr. Fauci oversees an extensive research portfolio of basic and applied research to prevent, diagnose, and treat infectious diseases such as HIV/AIDS and other sexually transmitted infections, influenza, tuberculosis, malaria and illness from potential agents of bioterrorism. He is also a member of the National Science Advisory Board for Biosecurity, which deals with such questions as how to prevent published research in biotechnology from aiding terrorism without slowing scientific progress.

Claire M. Fraser-Liggett
Director of the Institute for Genome Sciences and Professor of Medicine, University of Maryland School of Medicine, Baltimore

Dr. Fraser-Liggett was previously the president and director of The Institute for Genomic Research, and has played a role in the sequencing and analysis of human, animal, plant, and microbial genomes to better understand the role that genes play in development, evolution, physiology, and disease. She has served on a number of National Research Council’s committees on counterbioterrorism, domestic animal genomics, polar biology, and metagenomics.

The Honorable Rush Holt
U.S. Congressman
Invited

Prior to his election in 1998 to represent New Jersey’s 12th District, Dr. Holt, a physicist, worked as an educator, scientist, and arms control expert. At the U.S. State Department, he monitored the nuclear programs of countries such as Iraq, Iran, North Korea, and the former Soviet Union. He serves on the House Permanent Select Committee on Intelligence, its only scientist.

Moderator: Jeanne Guillemin
Senior Advisor, MIT Security Studies Program, Research Professor, Boston College, Chestnut Hill, MA

Dr. Guillemin has long been involved in issues regarding medicine, infectious diseases, and biological weapons. She documented the U.S.-Russian inquiry into the contested cause of the 1979 Sverdlovsk anthrax outbreak. She also investigated the “yellow rain” controversy of the 1980s. Her latest book is Biological Weapons: From the Invention of State-Sponsored Programs to Contemporary Bioterrorism.

Monday, 21 February

Graham Walker
American Cancer Society Research Professor, HHMI Professor, Massachusetts Institute of Technology

Dr. Walker is an American biologist, notable for his work explicating the structure and function of proteins involved in DNA repair and mutagenesis. He also coordinates a program at MIT to develop curricular materials in biology. In 2010, the Howard Hughes Medical Institute (HHMI) announced three grants to MIT that recognize and promote excellence in science education at the Institute. These resources will help faculty pursue some of their most creative ideas by developing new ways to teach and inspire students about science and research.
Topical Lecture Series

G. Wayne Clough
Secretary, Smithsonian Institution
Scientific Literacy—Where Are Our Forçados When We Need Them?

Regina E. Dugan
Director, Defense Advanced Research Projects Agency
Topic To Be Announced

Robert M. Hazen
Senior Staff Scientist, Geophysical Laboratory, Carnegie Institution for Science, and Clarence Robinson Professor of Earth Science, George Mason University
The Deep Carbon Observatory

Samantha B. Joye
Professor of Marine Sciences, University of Georgia, Athens
Offshore Ocean Aspects of the Gulf Oil Well Blowout

Gerard Karsenty
Paul A. Marks Professor and Chair, Department of Genetics and Development, Columbia University Medical Center
Biology Without Walls: The Novel Endocrinology of Bone

Patrick Cunningham
Chief Scientific Adviser to the Government of Ireland
Growing the Knowledge Economy: An Irish Perspective

Colin Phillips
Professor of Linguistics, Neuroscience, and Cognitive Science, University of Maryland, College Park

Lisa Randall
Frank B. Baird, Jr. Professor of Science, Harvard University
String Theory and New Physics

Sean C. Solomon
Director, Department of Terrestrial Magnetism, Carnegie Institution for Science
Exploring the Planet Mercury: The MESSENGER Mission

Subra Suresh
Director, National Science Foundation
Topic To Be Announced

George M. Whitesides
Woodford L. and Ann A. Flowers University Professor, Harvard University
Changing the Paradigms of Science

GEORGE SARTON MEMORIAL LECTURE IN THE HISTORY AND PHILOSOPHY OF SCIENCE

Lawrence M. Principe
Drew Professor of the Humanities, Johns Hopkins University
Revealing the Secrets of Alchemy

John P. McGovern Lecture in the Behavioral Sciences

Linda M. Bartoshuk
Bushnell Professor of Community Dentistry and Behavioral Science, University of Florida, Gainesville
We Live in Different Taste Worlds: How Do We Know and What Does It Mean?

Mind and Machine: The Next Step in Neuroprosthetics and Brain-Computer Interfaces


SPEAKERS
Daniel Moran, Washington University, St. Louis, MO
Electrocorticographic Brain-Computer Interfaces
José del R. Millan, EPFL, Lausanne, Switzerland
Multitasking with Non-Invasive Neuroprosthetics
Christa Neuper, Graz University of Technology, Austria
Future Directions in Hybrid Brain-Computer Interfaces
Andrew Schwartz, University of Pittsburgh, PA
Useful Signals from the Motor Cortex
Dennis McFarland, New York State Department of Health and State University of New York
Brain-Computer Interfaces: Traditional Assumptions Meet Emerging Realities

Other Worlds

Saturday, 19 February
Speakers will represent multidisciplinary and multinational initiatives that are closely coordinated at national and international levels.

Kepler: Looking for Other Earths
Organized by Alan P. Boss, Carnegie Institution for Science, Washington, DC; William J. Borucki, NASA Ames Research Center, Moffet Field, CA

SPEAKERS
William J. Borucki, NASA Ames Research Center, Moffet Field, CA
Kepler Mission Overview and Planet Discoveries
Matthew J. Holman, Harvard–Smithsonian Center for Astrophysics, Cambridge, MA
Searching for Planets by Transit Timing Variations
Sara Seager, Massachusetts Institute of Technology, Cambridge
Planet Discoveries in a Physical Context
William Chaplin, University of Birmingham, United Kingdom
Results for Solar-Like Oscillators Observed by Kepler
Conny Aerts, Instituut voor Sterrenkunde, Leuven, Belgium

To browse the updated program, register, and reserve hotel rooms, visit www.aaas.org/meetings.
The Kepler Guest Observer Program

Astronomy Observatory (NRAO), Charlottesville, VA
Organized by Linda Billings, George Washington University, Washington, DC

SPEAKERS
Mary A. Voytek, NASA, Washington, DC
Greatest Hits and Grand Challenges in Astrobiology
Cassie Conley, NASA, Washington, DC
Preserving the Planets—Ours and Others:
Planetary Protection in Space Exploration
Andrew Steele, Carnegie Institution for Science
The Search for Life on Mars: Mars Science Laboratory and Mars Sample Return

The Universe Revealed by High-Resolution, High-Precision Astronomy
Organized by Mark T. Adams, National Radio Astronomy Observatory (NRAO), Charlottesville, VA

SPEAKERS
Geoffrey C. Bower, University of California, Berkeley
Seeking New Planets at Radio Wavelengths
Mark J. Reid, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA
Mapping Our Galaxy in 3D
James A. Braatz, NRAO, Charlottesville, VA
Supermassive Black Holes and Precision Cosmology with Megamasers

Frontiers in Chemistry

Sunday, 20 February
AAAS is celebrating the International Year of Chemistry to acknowledge the achievements of chemistry, its contributions to the well-being of humankind, and what the future may hold.

Frontiers in Organic Materials for Information Processing, Energy, and Sensors
Organized by Seth R. Marder and Jean-Luc Bredas, Georgia Institute of Technology, Atlanta; Tobin J. Marks, Northwestern University, Evanston, IL

SPEAKERS
Alan Heeger, University of California, Santa Barbara
Plastic Solar Cells and Photodetectors: Self-Assembly by Spontaneous Phase Separation
Richard Friend, University of Cambridge, United Kingdom
Current and Future Scientific and Commercial Opportunities for Organic Electronics
Zhenan Bao, Stanford University, CA
Organic Materials Based Flexible Electronic Sensors
Larry Dalton, University of Washington, Seattle
Electro-Optic Technology: Implications for Telecommunications, Computing, and Sensing
Joseph W. Perry, Georgia Institute of Technology, Atlanta
Organic Photonic Materials for All-Optical Signal Processing

Mark E. Thompson, University of Southern California, Los Angeles
New Molecular Materials for Energy-Based Optoelectronics: Solar Energy and Lighting

Molecular Self-Assembly and Artificial Molecular Machines
Organized by Miguel A. Garcia-Garibay, University of California, Los Angeles;
Bruce E. Maryanoff, The Scripps Research Institute, La Jolla, CA

SPEAKERS
J. Fraser Stoddart, Northwestern University, Evanston, IL
Fashioning Functional Materials with Integrated Mechanostereochemical Systems
Josef Michl, University of Colorado, Boulder
Artificial Surface-Mounted Molecular Rotors
Nadrian C. Seeman, New York University, New York City
DNA: Not Merely the Secret of Life
M. Reza Ghadiri, The Scripps Research Institute, La Jolla, CA
Toward Single-Molecule DNA Sequencing with Engineered Nanopores
Stacey F. Bent, Stanford University, CA
Nanstructuring for Efficient Energy Conversion
Miguel A. Garcia-Garibay, University of California, Los Angeles
Amphidynamic Crystals and Artificial Molecular Machines

Special Session
AAAS Sustainability Forum

Thursday, 17 February
Organized by Vaughan Turekian, AAAS Center for Science Diplomacy
Pre-registration required

Since its inauguration in 2007, the Forum roundtable has provided ample opportunity to key university actors from around the world to discuss collaborative approaches in building the emerging field of Sustainability Science. This year the focus will be on Sustainability Science and the next global summit on sustainability, the United Nations Conference on Sustainable Development (Rio+20) to be held in Rio de Janeiro in 2012. It will call the world’s attention to and direct action toward addressing difficult challenges the planet is facing, including reducing poverty, conserving natural resources, and overcoming financial and economic crisis. This AAAS roundtable is an opportunity to bring together academic experts, business leaders, and policy-makers to help define and shape ideas to feed into the international policy process that is being formulated in advance of the summit. Previous summits have produced global treaties and led to important partnerships to promote sustainability issues. The AAAS Sustainability Forum will help embed the latest policy considerations and science research into the planning process and help identify a potential road map forward in addressing issues of global sustainability. Participation is by invitation only; pre-registration is required. For more information, contact Linda Stroud, lstroud@aaas.org.

Symposium Tracks

Brain and Behavior
Chronic Illness Management and Cognitive Science: Translation Beyond Genes?
Organized by Howard Leventhal, Rutgers University, New Brunswick, NJ
Crossing Borders in Language Science: What Bilinguals Tell Us About Mind and Brain
Organized by Judith F. Kroll, Pennsylvania State University, University Park
Cultural Evolutionary Dynamics of Cooperation
Organized by David M. Carballo, Boston University, MA

From Artificial Limbs to Virtual Reality: How the Brain Represents the Body
Organized by Michael D. Mitchell, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Christian Simm, swissnex San Francisco, CA

From Freud to fMRI: Untangling the Mystery of Stuttering
Organized by Nan Ratner, University of Maryland, College Park

Hunter-Gatherers and Language Change
Organized by Claire Bowern, Yale University, New Haven, CT

Molecules to Mind: Challenges for the 21st Century
Organized by Bruce Altevogt, Institute of Medicine, Washington, DC

Nature, Nurture, and Antisocial Behavior: Biological and Biosocial Research on Crime
Organized by William Alex Pridemore, Indiana University, Bloomington

Neurodegenerative Diseases: A Need for Multidisciplinary and Global Approaches
Organized by Elmar Nimmesgern, European Commission, Brussels, Belgium; Philippe Amouyel, Institut Pasteur de Lille, France

Science Behind Improved Foreign Language Expertise: Meeting the Global Challenge
Organized by Amy S. Weinberg, University of Maryland, College Park
Scientific and Ethical Issues for the Surgical Treatment of Psychiatric Disorders
Organized by Mahlon DeLong, Emory University School of Medicine, Atlanta, GA

The Science of Eating: Perception and Preference in Human Taste
Organized by Albert H. Teich and Rieko Yajima, AAAS Science and Policy Programs, Washington, DC; Jill Pace, American College of Real Estate Lawyers, Rockville, MD

Thinking About Thinking: How Do We Know What We Know?
Organized by Eva Hoogland and Chloé Kembery, European Science Foundation, Strasbourg, France

Transatlantic Synergies To Promote Effective Traumatic Brain Injury Research
Organized by Ramona Hicks, National Institute of Neurological Disorders and Stroke, Bethesda, MD; Patrizia Tosetti, European Commission, Directorate General-Research/Health, Brussels, Belgium

Climate Change
Adapting to a Clear and Present Danger: Climate Change and Ocean Ecosystems
Organized by Chad English, Communication Partnership for Science and the Sea, Silver Spring, MD; Mary Ruckelshaus, National Oceanic and Atmospheric Administration (NOAA) Northwest Fisheries Science Center, Seattle, WA; Scott Doney, Woods Hole Oceanographic Institution, MA

Can Reef Fisheries Take the Heat? Ecological and Economic Impacts of Climate Change
Organized by Joshua E. Cinner, Australian Research Center, Townsville

Changing Climate, Changing Approaches: Conservation in the Face of Climate Change
Organized by Michelle M. McClure, NOAA Northwest Fisheries Science Center, Seattle, WA

Climate Change: Altering the Physics, Ecology, and Socioeconomics of Fisheries
Organized by Rashid Sumaila, University of British Columbia, Vancouver, Canada; William W.L Cheung, University of East Anglia, Norwich, United Kingdom

Comparing National Responses to Climate Change: Networks of Debate and Contention
Organized by Jeffrey P. Broadbent, University of Minnesota, Minneapolis

How Climate Change Affects the Safety of the World’s Food Supply
Organized by Ewen C. Todd, Michigan State University, East Lansing

In Hot Water: Rising Public Health Concerns from Changing Ocean Conditions
Organized by Carolyn Sorta, NOAA Oceans and Human Health Initiative, Charleston, SC; Paul Sandifer, NOAA, Washington, DC

Limiting Climate Change: Reducing Black Carbon and Tropospheric Ozone Precursors
Organized by Frank Raes, European Commission, Joint Research Council (JRC) Institute for Environment and Sustainability, Ispra, Italy; Geraldine Barry, European Commission, JRC, Brussels, Belgium

Research Infrastructures: The Emergence of Key Players for Environmental Research
Organized by Janine Delahaut and Elena Right-Steele, European Commission, Brussels, Belgium

Rethinking Adaptation to a Changing Global Environment
Organized by Gregory P. Dietl, Paleontological Research Institution, Ithaca, NY

Where Ocean Meets Land: Dynamic Shorelines in a Warming World
Organized by Gregory S. Mountain, Rutgers University, Piscataway, NJ; Charna Meth, Consortium for Ocean Leadership, Washington, DC

Education
Aiming for Scientific Literacy by Teaching the Process, Nature, and Limits of Science
Organized by Jay B. Labov, National Academy of Sciences, Washington, DC; Judy Scotchmoor, University of California Museum of Paleontology, Berkeley

Celebrating Marie Curie’s 100th Anniversary of Her Nobel Prize in Chemistry
Organized by Penny J. Gilmer, Florida State University, Tallahassee; Alan Rocke, Case Western Reserve University, Cleveland, OH

Engaging Students in Undergraduate STEM Education with a Focus on Global Stewardship
Organized by Jay B. Labov, National Academy of Sciences, Washington, DC; Melvin D. George, University of Missouri, Columbia; Catherine Middlecamp, University of Wisconsin, Madison

Implementing the Vision and Change Report on Undergraduate Biology Education
Organized by Michael M. Cox, University of Wisconsin, Madison; Barbara Illman, U.S. Forest Service, Madison, WI

Invisible Men? Addressing the Participation of Minority Males in Science and Engineering
Organized by Catherine Didion, National Academy of Engineering, Washington, DC

Just-in-Time Support for Science Teaching: Web-Based Approaches
Organized by Nancy P. Moreno and Deanne B. Erdmann, Baylor College of Medicine, Houston, TX

Learning Research and Educational Practice: How Can We Make Better Connections?
Organized by Janice Earle and Soo-Siang Lim, National Science Foundation (NSF), Arlington, VA

Science Without Borders: Learning from TIMSS Advanced 2008
Organized by Patsy Wang-Iverson, Gabriella and Paul Rosenbaum Foundation, Stockton, NJ

Teaching and Learning in the Digital Age: Reliable Resources across the Disciplines
Organized by Linda N. Fanis, Chemical Education Digital Library, Madison, WI

The Challenge of Teaching Evolution in the Islamic World
Organized by Eugenie C. Scott, National Center for Science Education, Oakland, CA

The University of the Future
Organized by Robert M. Nerem, Georgia Institute of Technology, Atlanta; James J. Duderstadt, University of Michigan, Ann Arbor

Transcending Gender and Ethnic Barriers to Full STEM Participation
Organized by Nicole M. Else-Quest, Villanova University, PA

Emerging Science and Technology
Aerocology: Transcending Boundaries Among Ecology, Meteorology, and Physics
Organized by Winifred F. Frick, University of California, Santa Cruz; Phillip B. Chilson, University of Oklahoma, Norman

Biological Role and Consequences of Intrinsic Protein Disorder

To browse the updated program, register, and reserve hotel rooms, visit www.aas.org/meetings.
Organized by H. Jane Dyson and Peter E. Wright, The Scripps Research Institute, La Jolla, CA

Bioprinting: A Future of Regenerative Medicine
Organized by Vladimir Mironov, Medical University of South Carolina, Charleston

Chemically Speaking: How Organisms Talk to Each Other
Organized by Barbara Illman, U.S. Forest Service, Madison, WI; Jerrold Meinwald, Cornell University, Ithaca, NY

Explaining Phase Transitions
Organized by David Lightfoot, Georgetown University, Washington, DC

First Physics from the Large Hadron Collider
Organized by James Gillies, European Organization for Nuclear Research (CERN), Geneva, Switzerland; Katie Yurkewicz, Fermi National Accelerator Laboratory, Batavia, IL

Growth and Form in Mathematics, Physics, and Biology
Organized by L. Mahadevan, Harvard University, Cambridge, MA; Edward Aboufadel, Grand Valley State University, Allendale, MI

Inspiring Researchers: Building on the Legacy of Marie Curie
Organized by Louise Byrne, Research Executive Agency, Brussels, Belgium

Mathematics and Collective Behavior
Organized by Warren Page, City University of New York (Retired), Larchmont, NY

Matter Wave Magic and Technology
Organized by Charles W. Clark, National Institute of Standards and Technology, Gaithersburg, MD

NanoWorld, Megaproblems? The Impact of Nanotechnology on the Environment and Society
Organized by Alberto Pimpinelli, Science and Technology Office of the French Embassy in the United States, Houston, TX

Sharper Images in Astronomy, Microscopy, and Vision Science Using Adaptive Optics
Organized by Christopher Dainty, National University of Ireland, Galway

Superconductivity: From 1911 to 2021
Organized by David Pines, University of California, Davis

Through the Looking Glass: Recent Adventures in Antimatter
Organized by Charles W. Clark, National Institute of Standards and Technology, Gaithersburg, MD

Use of Lasers in Surgery, Regenerative Medicine, and Medical Device Fabrication
Organized by Roger Narayan, University of North Carolina, Chapel Hill

Energy
Biorefinery: Toward an Industrial Metabolism
Organized by Daniel Thomas, University of Technology of Compiegne, France; Adele Martial, Consulate General of France, Chicago, IL

Deepwater Drilling: A Risk Worth Taking?
Organized by Richard D’Souza, Granherne Global Operations, Houston, TX

Energy Efficiency in Europe and the United States: Success Stories and Future Potentials
Organized by Katja Stempfle-Eberl, Baden-Württemberg International, Stuttgart, Germany

Fractures Developing: The Science, Policy, and Perception of Shale Gas Development
Organized by John P. Martin, New York State Energy Research and Development Authority, Albany; Michele L. Aldrich, California Academy of Sciences, San Francisco

If Termites Can Do It, Why Can't Humans?
Organized by Lakshmi N. Reddi and Eduardo Divo, University of Central Florida, Orlando

Mathematics and Our Energy Future
Organized by Mary Lou Zeeman, Bowdoin College, Brunswick, ME; Russel E. Caflisch, Institute for Pure and Applied Mathematics, Los Angeles, CA

Pillars, Polymers, and Computers: Creative Approaches to Electrical Energy Storage
Organized by Ashley Predith, University of Maryland, College Park

Portraits of the California Energy System in 2050: Cutting Emissions by 80 Percent
Organized by Jane C.S. Long, Lawrence Livermore National Laboratory, CA; Susan Hackwood and Miriam John, California Council on Science and Technology, Riverside

Powering the Planet: Generation of Clean Fuels from Sunlight and Water
Organized by Harry B. Gray, Bruce B. Brunswig, and Jay R. Winkler, California Institute of Technology, Pasadena

The Energy and Water Nexus: Turning a Double Problem into a Solution
Organized by Estathios Peteves, European Commission, JRC Institute for Energy, Petten, Netherlands; Geraldine Barry, European Commission, JRC, Brussels, Belgium

Waste Not, Want Not: Waste As the World’s Most Abundant Renewable Resource
Organized by Michael Webber, University of Texas, Austin

Global Collaboration

Bridging Nations and Fields: East Asian Approaches to Science and Technology Policy
Organized by Asuka Hoshikoshi, National Institute of Science and Technology Policy, Tokyo, Japan

Bringing Innovation to International Development: New Actors, New Mechanisms
Organized by Alex Dehgan and Ticora V. Jones, U.S. Agency for International Development, Washington, DC; Mark Doyle, NSF, Arlington, VA

Can Global Science Solve Global Challenges?
Organized by Tracey Elliott, The Royal Society, London, United Kingdom

Cross-Border Responses to Global Challenges: Can Everybody Win?
Organized by David Wilkinson and Geraldine Barry, European Commission, JRC, Brussels, Belgium

Crossing Boundaries and Opening Borders: The European Research Council as Innovation
Organized by Samantha Christey, European Research Council, Brussels, Belgium

Education, Science, and Innovation as Tools for New Engagement with the Islamic World
Organized by Ben Koppelman, The Royal Society, London, United Kingdom

Europe, Africa, and Asia: Rising on the Same Tide
Organized by Geraldine Barry, European Commission, JRC, Brussels, Belgium

Foreign Participation in National Technology Development Programs
Organized by Christopher Hill, George Mason University, Arlington, VA; George R. Heaton, Technology Policy International, Newton Center, MA; David Cheney, SRI International, Arlington, VA
International Territory: Science at Sea, Science in Space, and Science at the Poles
Organized by Susan Humphris, Woods Hole Oceanographic Institution, MA; Charna Meth, Consortium for Ocean Leadership, Washington, DC

Joining Global Efforts in Post-Disaster Recovery and Reconstruction
Organized by Delilah Al Khudhairy, European Commission, JRC Institute for the Protection and Security of the Citizen, Ispra, Italy; Geraldine Barry, European Commission, JRC, Brussels, Belgium

Networks, Collaboration, and Research in a Non-Western Context: The Role of Technology
Organized by B. Paige Miller, University of Wisconsin, River Falls; Ricardo B. Duque, University of Vienna, Austria

Research Integrity in the Global Perspective
Organized by Melissa S. Anderson, University of Minnesota, Minneapolis

Role of U.S. Federal Agencies in Building Scientific Capacity in Developing Countries
Organized by Pallavi Phartiyal, AAAS Science and Policy Programs, Washington, DC

The Crowd and the Cloud: The Future of Online Collaboration
Organized by Michael R. Nelson, Georgetown University, Washington, DC

The Practice of Science Diplomacy in the Earth Sciences

Human Biology and Health

Anthropology and Global Health: Genes, Biology, and Culture
Organized by Cynthia M. Beall, Case Western Reserve University, Cleveland, OH

Diseases Without Borders: TB and AIDS
Organized by Anne E. Goldfeld, Harvard Medical School, Boston, MA

Epigenetic Processes in Development: Gene-Environment Interplay
Organized by Jeanne Brooks-Gunn, Columbia University, New York City; Stephen J. Suomi, National Institutes of Health, Bethesda, MD

Evolutionary Personalized Medicine
Organized by Turkan K. Gardenier, Pragmatica Corp., Vienna, VA

Global Health Care: Advances and Challenges
Organized by Metin Akay, University of Houston, TX

Humans Without Borders: Evolutionary Processes at Work in Humans and Their Relatives
Organized by James J. Smith, Michigan State University, East Lansing; Robin Smith, National Evolutionary Synthesis Center, Durham, NC

Interfering with Gene Expression and Interfering with Disease
Organized by Judy Lieberman, Harvard Medical School, Boston, MA

Medicine Safety in a World of Science Without Borders
Organized by William T. Beck, University of Illinois, Chicago; Guill Wientjes, Ohio State University, Columbus

One Health: From Ideas to Implementation, Rhetoric to Reality
Organized by Barbara Hyde, American Society for Microbiology, Washington, DC

Oral Sex Is Sex and Can Lead to Cancer
Organized by Margarita Zeichner-David, University of Southern California, Los Angeles

Personalized Medicine: Moving Forward or Backward?
Organized by Jennie C. Hunter-Cevera, RTI International, Research Triangle Park, SC; Anice Anderson, Private Consultant, Terre Haute, IN

Reducing the Cost of Health Care Through Science and Engineering
Organized by Raphael C. Lee, University of Chicago, IL; Anice Anderson, Private Consultant, Terre Haute, IN

The Human Body as Supra-Organism, Microbial Observatory, and Ecosystem at Risk
Organized by David A. Relman, Stanford University, Palo Alto, CA; Jeffrey I. Gordon, Washington University School of Medicine, St. Louis

The Surprising Influenza H1N1 Pandemic, Waves I and II: The Race to Vaccinate
Organized by M. Elizabeth Halloran, University of Washington, Seattle

Land and Oceans

2050: Will There Be Fish in the Ocean?
Organized by Villy Christensen, University of British Columbia, Vancouver, Canada

A New Vision for Research: Goals for the National Institute of Food and Agriculture
Organized by Brian A. Larkins, University of Arizona, Tucson; Roger Beachy, U.S. Department of Agriculture, Washington, DC

Beyond Lines on Maps: Marine Spatial Planning for a Dynamic World
Organized by Donald F. Boesch, University of Maryland Center for Environmental Science, Cambridge, MD; Karen L. McLeod, Oregon State University, Corvallis

Borlaug’s Impact on World Agriculture: Will There Be a Second Green Revolution?
Organized by Ronald L. Phillips, University of Minnesota, St. Paul; Edward Runge, Texas A&M University, College Station

Fishing for Solutions: Community Institutions for Effective Resource Management
Organized by Astrid J. Scholz, Ecotrust, Portland, OR

From Practice to Theory and Back: Ecosystem Services and Marine Spatial Planning
Organized by Anne Guerry, Stanford University, CA; Mary Ruckelshaus, NOAA Northwest Fisheries Science Center, Seattle, WA; Paul Sandifer, NOAA, Washington, DC

Global Agricultural History: Mapping the Past for Modeling the Future
Organized by William E. Doolittle, University of Texas, Austin; Mats Widgren, Stockholm University, Sweden

Global and Local Responses to the Nitrogen Challenge: Science, Practice, and Policy
Organized by Todd S. Rosenstock and Thomas P. Tomich, University of California, Davis

GM Crop Regulations: Safety Net or Insurmountable Obstacle?”
Organized by Wayne Parrott, University of Georgia, Athens; Alan McHughen, University of California, Riverside; Donald P. Weeks, University of Nebraska, Lincoln

Invasive Species: What Harm Do They Do?
Organized by Peter Alpert, Invasive Species Advisory Committee, Amherst, MA

Lost at Sea: Where Are the Humans in Marine Ecosystem Management?

To browse the updated program, register, and reserve hotel rooms, visit www(aaas.org/meetings.
Science and Society

Astronomical Pioneering: The Implications of Finding Other Worlds
Organized by Jennifer Wiseman and Peyton West, AAAS Science and Policy Programs, Washington, DC

Communicating Diversity in Science: Implications for Climate Change Denial
Organized by Prajwal Kulkarni, U.S. Environmental Protection Agency, Washington, DC

Communication Outside the Box
Organized by Michel Claessens, European Commission, Brussels, Belgium; David Bennett, Delft University of Technology, Netherlands; Richard Jennings, University of Cambridge, United Kingdom

Crossing Boundaries with Citizen Science

Doing Good with Good OR: Applying Operations Research for Societal Impact
Organized by Karen Smilowitz, Northwestern University, Evanston, IL; Ozlem Ergun, Georgia Institute of Technology, Atlanta

Earth Science and Evolution
Organized by Jere H. Lipps, University of California, Berkeley

Earthwatch and the HSBC Climate Partnership: A Unique Citizen Science Model
Organized by Kristen Kusek, Earthwatch Institute, Boston, MA

Evangelicals, Science, and Policy: Toward a Constructive Engagement
Organized by Peyton West and Jennifer Wiseman, AAAS Science and Policy Programs, Washington, DC

Innovative Strategies for Ensuring Access to the Benefits of Scientific Progress

The Science Endeavor

As Borders Dissolve, Which Standards and Mechanisms Prevail?
Organized by Mary Kavanagh, European Commission, Directorate-General for Research, Brussels, Belgium

Crisis Averted? How a Critical Shortage in Helium-3 Was Good and Bad for Science
Organized by Benn Tannenbaum, AAAS Center for Science, Technology, and Security Policy, Washington, DC

Design Thinking To Mobilize Science, Technology, and Innovation for Social Challenges
Organized by Yoko Nitta, Tateo Arimoto, and Suguru Ishiguro, Japan Science and Technology Agency, Tokyo

It Is Unethical Not To Do Research with Animals

The Science Without Borders and Media Unbound: What Comes Next?
Organized by Bud Ward, Yale Forum on Climate Change and the Media, White Stone, VA

Surprise...It’s Science! Reaching New Audiences in Unconventional Ways with Festivals
Organized by Jan Riise, European Science Events Association, Onsala, Sweden; Ben Wiehe, MIT Museum, Cambridge, MA

Techno-Optimism or Pessimism? Media Coverage of Quick Fixes for Global Climate Change
Organized by Crisitne Russell, Harvard Kennedy School, Cambridge, MA

TV Meteorologists Communicating Climate Change
Organized by Katherine E. Rowan, George Mason University, Fairfax, VA

When Pollution Gets Personal: Ethics of Reporting on Human Exposures
Organized by Julia G. Brody, Silent Spring Institute, Newton, MA

Measurements as a Cornerstone of Global Trade and Quality of Life
Organized by David Anderson, European Commission, JRC Institute for Reference Materials and Measurements, Geel, Belgium; Geraldine Barry, European Commission, JRC, Brussels, Belgium

Modeling Across Millennia: Interdisciplinary Paths to Ancient Socionatural Systems
Organized by Timothy A. Kohler and Stefani A. Crabtree, Washington State University, Pullman

Networks and Culture of Scientific and Technological Communities in Global Policy
Organized by Denis F. Simon and Darryl Farber, Pennsylvania State University, University Park

Perspectives on Research and Development in the President’s FY 2012 Budget Request
Organized by Patrick J. Clemins, AAAS Science and Policy Programs, Washington, DC

Publication Without Borders: Spanning Countries, Disciplines, Audiences, and Roles
Organized by Barbara Gastel, Texas A&M University, College Station

Reaching a Global Standard in Research Integrity
Organized by Chloe Kemery and Vanessa Campo-Ruiz, European Science Foundation, Strasbourg, France

Solving the Weight of Evidence Problem: A Way Forward?
Organized by Heather E. Douglas, University of Tennessee, Knoxville

The Digitization of Science: Reproducibility and Interdisciplinary Knowledge Transfer
Organized by Victoria C. Stodden, Columbia University, New York City

Security

Atomic Detectives: Science Behind International Efforts To Combat Nuclear Terrorism
Organized by Klaus Mayer, European Commission, JRC Institute for Transuranium Elements, Karlsruhe, Germany; Geraldine Barry, European Commission, JRC, Brussels, Belgium
International Neighborhood Watch: Citizen Scientists and International Security
Organized by Gerald L. Epstein, AAAS Center for Science, Technology, and Security Policy, Washington, DC

New START and Nuclear Winter: Climatic Consequences of the Nuclear Weapons Agreement
Organized by Alan Robock, Rutgers University, New Brunswick, NJ; Richard Turco, University of California, Los Angeles

Promoting Security and Sustaining Privacy: How Do We Find the Right Balance?
Organized by Christopher Hankin, Imperial College London, United Kingdom; Benn Tannenbaum, AAAS Center for Science, Technology, and Security Policy, Washington, DC

Reconciling National Security Requirements with Research and Education

Science and Policy for Environmental Security in the Asia-Pacific Region
Organized by James Scott Hauger and Virginia Watson, Asia-Pacific Center for Security Studies, Honolulu, HI

Space Weather: The Next Big Solar Storm Could Be a Global Katrina
Organized by Thomas J. Bogdan and Terrance Onsager, NOAA, Boulder, CO; Stephan Lechner, European Commission, JRC Institute for Protection and Security of the Citizen, Ispra, Italy

Using Quantitative Content Analysis To Assess the Likelihood of Terrorist Violence

White-Blue Arctic: Promoting Cooperation and Preventing Conflict in the Arctic Ocean
Organized by Paul Arthur Berkman, University of Cambridge, United Kingdom; Oran Young, University of California, Santa Barbara

Sustainability

Data Cocktails for Biodiversity: Protected Area Management Without the Hangover
Organized by Alan Belward, European Commission, JRC Institute for Environment and Sustainability, Ispra, Italy; Geraldine Barry, European Commission, JRC, Brussels, Belgium

Estimating Earth’s Human Carrying Capacity
Organized by Kenneth G. Cassman, University of Nebraska, Lincoln; Ruth Cooper, The Royal Society, London, United Kingdom; David Tilman, University of Minnesota, St. Paul

How Can the World Feed 9 Billion People by 2050 Sustainably and Equitably?

If a Culture of Growth Is Unsustainable, What Should Change?
Organized by Tom Dietz, Michigan State University, East Lansing; Adam D. Henry, West Virginia University, Morgantown

The Challenge of Measuring Sustainability
Organized by Eugene A. Rosa, Washington State University, Pullman; Thomas Dietz, Michigan State University, East Lansing

Act Now ... Registration Rates Go Up 27 January
Registration
Discounted advance registration rates are available until Thursday, 27 January 2011.
Take advantage of unlimited access to all symposia, seminars, topical lectures, plenary events, career workshops, the International Exhibition, and a variety of networking opportunities.

Professional
$295 Members/$375 New Members/
$399 Non-Members

Student
$60 Members/$70 New Members/
$90 Non-Members

After 27 January 2011, on-site rates apply. For more information visit http://www.aaas.org/meetings.

Housing
Special room rates and benefits are available to Annual Meeting registrants.

Renaissance Downtown
(Headquarters Hotel)
Rate: $232 Single/$252 Double

Embassy Suites Convention Center
Rate: $234 Single/$259 Double

Grand Hyatt Washington
Rate: $239 Single/$264 Double

Hampton Inn Convention Center
Rate: $209 Single/Double

More Ways To Save
Discount Travel to Washington, DC
For details about discounts on airfare and rail, visit www.aaas.org/meetings and click on “Hotel and Travel” then “Travel Discounts.”

To browse the updated program, register, and reserve hotel rooms, visit www.aaas.org/meetings.
To learn more about how to become a sponsor of the 2011 Annual Meeting, contact:

Jill C. Perla  
Manager of Marketing, Exhibits, and Sponsors  
E-mail: jperla@aaas.org  
Phone: 202-326-6736

Web site: http://www.aaas.org/meetings
FLOW CHEMISTRY SYSTEMS
The Asia portfolio consists of high performing, flexible, and easy-to-use systems that are scalable and modular, making it ideal for any flow chemistry requirements. The new systems have a wide temperature (-15 °C to 300 °C) and pressure (0–20 bar) range, as well as an ability to safely provide accurate temperature control. With fast reaction times and microgram to kilogram scalability, its unique design enables manual or automated operation with optional PC control. The Asia flow chemistry range consists of three different series, each with three pre-configured systems providing varying levels of functionality. The Asia 1-series are a manually operated, cost-effective choice. The Asia 2-series systems can automatically perform one experiment at a time, with automated parameters such as reaction temperature, pressure, and collection timings. As a result, they are ideal for users not familiar with flow chemistry techniques. Fully automated for process optimization, the Asia 3-series is ideal for high-end applications.

CRIMPING TOOL
The La-Pha-Pack stainless steel cleanroom crimping tools are designed for a controlled, low-effort method of vial sealing. Available in a range of sizes, from 11 mm to 20 mm, the optimal crimp is provided for a variety of vial sizes. Made entirely from stainless steel, it provides maximum durability and easily withstands dry heat sterilization or autoclaving. The product range is ideal for highly sensitive chromatography cleanroom applications where it is essential that the environment remains free from any potential contaminateants. The mechanism of the La-Pha-Pack crimping tools is both corrosion- and heat-resistant, making it extremely durable with a long lifespan. Furthermore, the stainless steel construction removes the need for any protective coating on the handle or crimp head. Pressure and height of the La-Pha-Pack stainless steel crimping tools are easily adjustable, enabling optimal torque to be applied to a wide variety of vial styles.
Thermo Fisher Scientific
For info: 215-943-1141  |  www.la-phapack.com

CHROMATOGRAPHY COLUMNS
HiScale is a line of pressure-stable empty columns optimized for process development and preparative chromatography. The empty columns are available in inner diameters of 16 mm, 26 mm, and 50 mm and in lengths of 20 cm and 40 cm. The columns offer an easy-to-use design, providing reproducibility, robustness, and process control. HiScale columns are pressure stable up to 20 bar, ensuring compatibility with modern BioProcess media such as MabSelect and Capto. The ability to axially compress the gel bed and a non-rotating plunger mechanism enable a wide range of packing protocols. The measurement scale on the column and user-friendly, ergonomic design enable precise packing, thereby increasing process control and reproducibility. The QuickLock mechanism of the end caps facilitates column handling and cleaning. HiScale columns can be used with nearly all organic solvets commonly used in liquid chromatography of macromolecules. These columns were developed for scale-up during process development, and enable packing with high-flow agarose media which require higher pressure.
GE Healthcare
For info: 800-526-3593  |  www.gelifesciences.com

SOLUBLE MAMMALIAN PROTEIN EXPRESSION
SoluBL21 competent E. coli is a significantly improved BL21 host strain for soluble mammalian protein expression. Using a directed evolution approach, a mutant strain of BL21(DE3) E. coli has been developed that can produce soluble protein in the majority of cases where expression in the parent BL21(DE3) yielded no detectable soluble product. With SoluBL21, a major obstacle to effective protein expression in E. coli has been overcome for many mammalian proteins. This significant improvement should enable scientists to make progress in a wide range of applications quicker and far less expensively than in the past. Use of the SoluBL21 Competent E. coli follows a simple and straightforward protocol, and the product is compatible with all T7 promoter-based expression vectors.

AMS Biotechnology
For info: +44-1235-828200  |  www.amsbio.com

MOTORIZED PIPETTES
Extremely comfortable, easy-to-use, accurate, and durable are the main features of the new Pipetman M range. These pipettes, covering the range of 0.5 µL to 1000 µL, are fully motorized and require virtually zero pipetting force. Designed for both experienced and inexperienced users, Pipetman M pipettes are intuitive and require no learning curve. With four essential pipetting modes, including reverse, mix, repetitive, and pipetting, these pipettes offer the same high reproducibility, accuracy, and precision that users expect from Gilson pipette products. The motorized piston virtually eliminates pipetting variability among users. Because the speed of the piston is adjustable, users can pipette denser samples with accuracy and confidence. Other features include lockable volume, service alert reminders, and color-coded push-button that correspond to matching Gilson tip packaging. Also, Pipetman M are fitted with a universal tip holder that ensures a secure fit for most brands of tip, eliminating the need for a dedicated tip brand.

Gilson
For info: 800-445-7661  |  www.gilson.com

Electronically submit your new product description or product literature information! Go to www.sciencemag.org/products/newproducts.dtl for more information. Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and governmental organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by Science or AAAS of any products or materials mentioned is not implied. Additional information may be obtained from the manufacturer or supplier.
They say you never know when inspiration will strike. Download the *Science* mobile app for Android devices and be ready the next time you’re inspired to read the latest news, research, and career advice from *Science* on your mobile phone.

**Features include:**
- Summaries and abstracts from *Science, Science Translational Medicine,* and *Science Signaling.*
- Ability to e-mail full-text links.
- The latest news from *ScienceNOW.*
- Career advice articles from *Science Careers.*
- Access to the *Science* weekly podcast and other multimedia.
- Content caching for reading without wi-fi access.

To download the *Science* mobile app for Android visit [content.aaas.org/mobile](http://content.aaas.org/mobile), visit the Android Market on your phone, or just scan this barcode.
R&D Systems Quantikine® ELISAs
The Most Referenced Immunoassays

A direct measure of product quality is the frequency of citations in the scientific literature. R&D Systems has more than 20 years of experience designing, testing, and optimizing the most cited ELISA kits in the world. Find out why scientists trust R&D Systems ELISAs more than any other brand.

R&D Systems is the Most Referenced ELISA Manufacturer

NEW Quantikine ELISA Kits
- α1-Acid Glycoprotein
- Angiopoietin-like 3
- Cathepsin V
- Clusterin
- Dkk-1
- EGF R/ErbB1
- EG-VEGF/PK1
- Fetuin A
- FGF-21
- Galectin-3
- Gas 6
- GDF-15
- IL-17A/F Heterodimer
- IL-19
- Lipocalin-2/NGAL
- MBL
- Proprotein Convertase 9/PCSK9
- Periostin/OSF-2
- Progranulin
- ST2/IL-1 R4
- Thrombomodulin/CD141
- Tie-1
- TIM-1/KIM-1

Approximately 42% of Referenced Immunoassays are Developed and Manufactured by R&D Systems. A survey of 860 manuscripts from 44 journals was conducted to compare the number of citations specifying the use of R&D Systems ELISAs to the number citing ELISAs from other commercial sources. A total of 433 ELISA citations referencing immunoassays from 66 different vendors were identified in the survey.

For more information visit our website at www.RnDSystems.com/go/ELISA

For research use only. Not for use in diagnostic procedures.