Join Us in Boston for Science and Good Cheer

There will be symposia, seminars, lectures, and news briefings on topics at the intersection of science and society. Learn about emerging areas of study, gather story ideas for the year ahead, renew contacts with science sources and make new ones. Mingle with colleagues at receptions and social events. It’s all available at the world's largest interdisciplinary science forum.
Dear Colleagues,

On behalf of the AAAS Board of Directors, it is my honor to invite you to join us in Boston for the 2013 AAAS Annual Meeting, 14-18 February. As you may know, this annual event is one of the most widely recognized global science gatherings, with hundreds of networking opportunities and broad U.S. and international media coverage.

The meeting’s theme — *The Beauty and Benefits of Science* — points to the “unreasonable effectiveness” of the scientific enterprise in creating economic growth, solving societal problems, and satisfying the essential human drive to understand the world in which we live.

The phrase “unreasonable effectiveness” was coined in 1960 by physicist Eugene Wigner, who explored the duality of mathematics — both beautiful unto itself, and also eminently practical, often in unexpected ways. The scientific program will highlight the rich and complicated connections between basic and applied research, and how they bring about both practical benefits and the beauty of pure understanding.

Everyone is welcome at the AAAS Annual Meeting. Those who join us will have the opportunity to 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, and an international exhibition. You and your family can also enjoy Family Science Days, a free event open to the general public.

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

Please join us in Boston,

William H. Press  
AAAS President and Program Chair, and  
Warren J. and Viola M. Raymer Professor in  
Computer Science and Integrative Biology  
The University of Texas at Austin
AAAS Annual Meeting Newsroom

The AAAS Annual Meeting Newsroom, located in Room 101 of the Hynes Convention Center, will provide an array of news opportunities and resources to news reporters and career science communicators who, with appropriate credentials, are eligible for complimentary meeting registration.

News briefings during the meeting will offer newsroom registrants access to some of the world’s leading scientists. You are strongly encouraged to register in advance via our online registration site: www.eurekalert.org/aaasnewsroom. Credentialing criteria and other newsroom information are available via the “Newsroom Links” section of that site.

PLEASE NOTE FOR PLANNING PURPOSES:
AAAS news briefings and interview opportunities will begin on the morning of Thursday, 14 February, starting with the AAAS President’s Press Breakfast.

Virtual Newsroom
EurekAlert! will host the Annual Meeting’s virtual newsroom: http://www.eurekalert.org/aaasnewsroom.

The schedule of news briefings will be available to newsroom registrants upon their arrival at the meeting. The schedule also will be available online at the virtual newsroom beginning Monday, 11 February, to reporters who have log-in access to the embargoed section of the EurekAlert! website.

You may search for the latest information on symposia at the main Annual Meeting website (www.aaas.org/meetings) using the “Browse the Program” link.

Embargo Policy
AAAS Annual Meeting newsroom registrants are required to observe news embargoes, which coincide with the date and time of the scientific session or a related news briefing, whichever comes first. AAAS will schedule daily news briefings on research and policy issues being discussed at the meeting. Attendance at news briefings is restricted to newsroom registrants.

Note to Public Information Officers
Once again, we will be using the AAAS Annual Meeting Speaker Paper Recruitment System to ask speakers and their public information officers (PIOs) to submit information about presentations and upload supporting materials to our virtual newsroom. Speakers and PIOs will receive instructions by e-mail. Reporters registered for the embargoed section of EurekAlert! will be able to gain access to speaker materials submitted to the virtual newsroom. Speaker papers also will be available to news media on site at our AAAS Papers Room.

Twitter
Follow the AAAS Annual Meeting on Twitter: www.twitter.com/AAASMeetings. The Twitter hashtag is #AAASmtg.

A SPECIAL INVITATION
FRIDAY, 15 FEBRUARY • 7:00PM–10:00PM

AAAS will host a reception at historic Fenway Park for all newsroom registrants to honor the winners of the 2012 AAAS Kavli Science Journalism Awards, endowed by The Kavli Foundation. Shuttle buses will be provided from the Hynes Convention Center beginning at 6:45 PM. Newsroom badges will be required.

SPONSORED BY:
THE KAVLI FOUNDATION

www.eurekalert.org/aaasnewsroom • Visit the Web site for the latest updates and registration details.
Disclaimers
Abstracts and synopses of material presented at the AAAS Annual Meeting reflect the individual views of the author and not necessarily those of the AAAS, its Council, Board of Directors, officers, or the views of the institutions with which the authors are affiliated. Presentation of ideas, products, or publications at the AAAS Meeting or the reporting of them in resulting news accounts does not constitute endorsement by AAAS.
Special Events for Newsroom Registrants

**AAAS President’s Breakfast and Briefing**
14 February 7:45AM–8:30AM
The breakfast briefing with AAAS President William H. Press will be held in Room 200, Hynes Convention Center. **This event is for reporters only.**

**International Reporters Reception**
15 February 8:00PM–10:00PM
AAAS welcomes international reporters with a special reception. Location to be determined. **Newsroom badges are required. All newsroom registrants are welcome.**

**European Commission Breakfast**
15 February 7:45 AM–9:00AM
Newsroom registrants are invited to this sponsored breakfast briefing in Room 200, Hynes Convention Center.

**Science Journalism Roundtable**
15 February 12:00PM-1:00PM
Winners of the 2012 AAAS Kavli Science Journalism Awards will be invited to a special luncheon in their honor, hosted by The Kavli Foundation, to include a moderated roundtable discussion in Room 200, Hynes Convention Center.

**EurekAlert! Reception**
15 February 2:30PM–4:30PM
Hynes Convention Center, Room 200. All newsroom registrants are invited.

**AAAS Kavli Science Journalism Awards**
15 February 7:00PM–10:00PM
All newsroom registrants are invited to the awards reception and ceremony at historic Fenway Park. The awards have been endowed by The Kavli Foundation. Shuttle buses will be provided from the Hynes Convention Center beginning at 6:45 PM. **Newsroom badges are required.**

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**Helmholtz Association Press Breakfast**
16 February 7:45AM–9:00AM
This networking and information opportunity, sponsored by the Helmholtz Association of German Research Centres, will be held in Room 200, Hynes Convention Center.

**Canada Press Breakfast**
17 February 7:45AM–9:00AM
All newsroom registrants are invited to this sponsored breakfast in Room 200, Hynes Convention Center.

**New England Science Writers Party**
16 February 7:00PM–11:00PM
The New England Science Writers will host an evening party for Newsroom registrants at the Top of the Hub in the Prudential Center.

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**NASW Student Programs and Travel Fellowships**
The National Association of Science Writers (NASW) will again sponsor several programs for student journalists at the AAAS meeting. Funding from NASW will provide travel fellowships for up to 10 undergraduate students to attend the meeting and cover a session for the NASW website. Application deadline is Nov. 30. Details will be posted at [www.nasw.org/aaas2013](http://www.nasw.org/aaas2013). NASW also will sponsor its popular mentoring program, pairing undergraduate and graduate students with senior journalists, and an internship fair for summer writing positions with professional editors. All activities require student membership in NASW.
General Information

Meeting Location
Meeting events will be held in downtown Boston, MA, at the Hynes Convention Center, the Sheraton Boston, Hilton Back Bay, and Marriott Copley Place hotels.

On-Site Press Registration
Press registration will be located in the Hynes Convention Center, Level One, Room 101. Hours are as follows:

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Note: Access to the AAAS Annual Meeting Newsroom requires appropriate press credentials. Valid photo ID is required on site. See details online at www.eurekalert.org/aaasnewsroom.

For questions about press registration call AAAS Press Registration at (617) 954-2601 or send an e-mail to media@aaas.org.

The Newsroom
The Newsroom, located in the Hynes Convention Center, Level One, Room 101, hosts hundreds of print, broadcast, and online reporters from around the world. It offers news briefings, a newsroom equipped with Internet access and computers, a papers room with copies of speaker presentations, a reporters’ coffee lounge, and private interview rooms.

Discount Hotel Rates
AAAS has negotiated special rates for AAAS Meeting attendees at hotels close to the Hynes Convention Center. For details on the hotels and rates, go to www.aaas.org/meetings and click on “Hotels and Travel” then “Hotel Reservation.” Special room rates are available only through the AAAS Travel Desk. Please do not contact the hotels directly. Newsroom registrants will receive a code number for making reservations at official meeting hotels once their online applications for press credentials are approved.

AAAS Family Science Days and “Meet the Scientists!” Speakers Series
Stop by Exhibit Hall D on Saturday and Sunday to take part in free, fun, hands-on science opportunities and hear a diverse range of scientists describe their amazing explorations. The 2013 Family Science Days will feature exciting, interactive programming for children and will include a series of unique opportunities for young people to speak directly with top scientists who will explain what it takes to succeed in “cool science careers.”

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Exhibition
The Exhibition and poster sessions will be located in Hall C and the Veterans Memorial Auditorium at the Hynes Convention Center. Hours are as follows:

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Barrier-Free Environment
Accommodations for people with disabilities will be provided on request at all general lectures and sessions. Services include interpreters or real-time captioning for persons who are deaf or hearing impaired, audio-recorded highlights, and mobility assistance within and outside the conference facilities as needed. In addition, a resource room for people with disabilities will be available off the Main Lobby on Level One at the Hynes Convention Center.

Discount Travel to Boston
For details about discounts on airfare and rail, visit www.aaas.org/meetings and click on “Hotel and Travel” then “Travel Discounts.”

Airport Transportation
For information about transportation to and from the airport, visit www.aaas.org/meetings and click on “Hotels and Travel,” then “Transportation.”

Environmental Practices
A CD contains speaker and poster abstracts. Program materials are produced with recycled material. Recycling containers are provided on site.

Register online: Save time and register in advance at: www.eurekalert.org/aaasnewsroom.
Plenary Lectures

Thursday, 14 February
AAAS PRESIDENT'S ADDRESS

William H. Press
AAAS President; Warren J. and Viola M. Raymer Professor in Computer Science and Integrative Biology, University of Texas at Austin

Dr. Press is a noted researcher in computer science, genomics, statistical methods, astrophysics, and international security. He is a member of the President's Council of Advisors on Science and Technology. His current research focus is bioinformatics and whole-genome genetics. He previously served as deputy laboratory director for science and technology at the Los Alamos National Laboratory and as a professor of astronomy and physics at Harvard University. He is a member of the U.S. National Academy of Sciences and a fellow of the American Academy of Arts and Sciences.

Friday, 15 February

Sherry Turkle
Abby Rockefeller Mauzé Professor of the Social Studies of Science and Technology in the Program in Science, Technology, and Society, Massachusetts Institute of Technology

The Robotic Moment: What Do We Forget When We Talk to Machines?

Dr. Turkle is founder and director of the MIT Initiative on Technology and Self. She received a joint doctorate in sociology and personality psychology from Harvard University and is a licensed clinical psychologist. Her research focuses on the psychology of human relationships with technology, especially in the realm of how people relate to computational objects. She is an expert on mobile technology, social networking, and sociable robotics and a regular media commentator on the social and psychological effects of technology. Her most recent book is Alone Together: Why We Expect More from Technology and Less from Each Other.

Saturday, 16 February

Nathan Myhrvold
Founder and Chief Executive Officer, Intellectual Ventures

Modernist Cuisine: The Art and Science of Cooking

Dr. Myhrvold founded Intellectual Ventures after retiring as chief strategist and chief technology officer of Microsoft Corporation. At Intellectual Ventures, he is focused on a variety of business interests relating to the funding, creation, and commercialization of inventions. During his tenure at Microsoft, he was responsible for founding Microsoft Research and technology groups that resulted in many successful products. He has extensive experience linking research to product development and commercialization and holds hundreds of patents. As a postdoctoral fellow in applied mathematics and theoretical physics at Cambridge University, he worked with Stephen Hawking on research in cosmology, quantum field theory in curved space time, and quantum theories of gravitation. He earned a doctorate in theoretical and mathematical physics and a master's degree in mathematical economics from Princeton University. He also has a master's degree in geophysics and space physics and a bachelor's degree in mathematics from UCLA.

Sunday, 17 February

Robert Kirshner
Clowes Professor of Science, Harvard University

The Beauty of the Accelerating Universe

Dr. Kirshner is an astrophysicist studying the physics of supernovae and observational cosmology. He is a member of the High-z Supernova Search Team that used observations of extragalactic supernovae to discover the accelerating universe, which implied the existence of dark energy. Dr. Kirshner's graduate students Brian Schmidt and Adam Riess shared the 2011 Nobel Prize in Physics with Saul Perlmutter for the discovery of cosmic acceleration. He teaches a popular course for Harvard undergraduates called "The Energetic Universe" and is author of the book The Extravagant Universe: Exploding Stars, Dark Energy, and the Accelerating Cosmos. He is a past president of the American Astronomical Society, a member of the National Academy of Sciences, and a 2012 Guggenheim Fellow.

Monday, 18 February

Cynthia Kenyon
American Cancer Society Professor and Director of the Hillblom Center for the Biology of Aging, University of California, San Francisco

Mechanisms for Life Extension in C. elegans

Dr. Kenyon is a molecular biologist whose discovery with colleagues that a single-gene mutation could double the lifespan of the worm C. elegans sparked an intensive study of the molecular biology of aging. Her findings have since led to the discovery that an evolutionarily conserved hormone signaling system controls aging in other organisms as well, including mammals. As a doctoral student at Massachusetts Institute of Technology, she was the first to look for genes on the basis of their expression profiles, discovering that DNA damaging agents activate a battery of DNA repair genes in E. coli. She is a member of the U.S. National Academy of Sciences and the Institute of Medicine, a fellow of the American Academy of Arts and Sciences, and a past president of the Genetics Society of America.
Topical Lecture Series
Attend lectures on prominent topics across a range of disciplines.

Richard Alley
Evan Pugh Professor, Department of Geosciences, and Earth and Environmental Systems Institute, Pennsylvania State University

*Ice Sheets, Sea Level, and Other Surprises: Benefits of Understanding Some Beautiful Places*

Karl Deisseroth
Associate Professor of Bioengineering and Psychiatry, Stanford University

*Optogenetics: Development and Application*

Felice Frankel
Research Scientist, Center for Materials Science and Engineering, Massachusetts Institute of Technology


Nina Jablonski
Distinguished Professor of Anthropology, Pennsylvania State University

*The Evolution and Meanings of Human Skin Color*

Chad Mirkin
Director of International Institute for Nanotechnology and George B. Rathmann Professor of Chemistry, Northwestern University

*“Artificial Atoms” Formed from Nucleic Acid Nanoparticle Conjugates: The Dawn of a New Periodic Table*

Topical Panel:
European Science Policy on the Move

Paul Boyle
President, Science Europe; Chief Executive, U.K. Economic and Social Research Council

Anne Glover
Chief Scientific Advisor to European Commission President, European Union

Helga Nowotny
President, European Research Council

Robert-Jan Smits
Director, Directorate-General for Research and Innovation, European Commission

William H. Press, Moderator
AAAS President; Warren J. and Viola M. Raymer Professor in Computer Science and Integrative Biology, University of Texas at Austin

Special Session

John Grotzinger
Fletcher Jones Professor of Geology, and Project Scientist, Mars Science Laboratory, California Institute of Technology

*Curiosity’s Mission at Gale Crater, Mars*

GEORGE SARTON MEMORIAL LECTURE IN THE HISTORY AND PHILOSOPHY OF SCIENCE

Silvan Schweber
Emeritus Professor of Physics and Richard Koret Professor in the History of Ideas, Brandeis University

*Hans Bethe and Physics in the 20th Century*

JOHN P. MCGOVERN LECTURE IN THE BEHAVIORAL SCIENCES

Lecturer to be announced.
Scientific and technological issues increasingly trigger societal conflicts whenever they intersect with personal or political views. Particularly amid pressures on research and development budgets, and related concerns about transparency and accountability, today's scientists and engineers are challenged to communicate and engage with the public, reporters, and policymakers. This seminar will share science communication expertise in working with different types of content, across a range of presentation formats, for various audiences.

**Working with Print, Broadcast, and Online Media**

*8:00AM-9:30AM*

This session will encompass tips, cautionary tales, and examples of effective science communication by three leading journalists. Speakers will discuss the challenges of communicating science through print, broadcast, and online formats. What kinds of science news stories interest each journalist and how is journalism changing?

Organized by: Cornelia Dean, The New York Times, New York City; Dennis Meredith, Science Communication Consultant, Purlear, NC

**SPEAKERS**

- **Juliet Eilperin**, The Washington Post, Washington, DC
  *Science Reporting at Newspapers in an Age of Tight Budgets, Constant Deadlines, Political Polarization, and Industry Upheaval*

- **Chris Joyce**, National Public Radio, Washington, DC
  *Science Journalism: Alive and Kicking*

- **Alan Boyle**, NBCNews.com, Redmond, WA
  *Science Journalism on Internet Time*

**Visualizing Science**

*1:00PM-2:30PM*

This session will focus on cutting-edge strategies for visualizing science through photography, illustrations, video, and more.

Organized by: Cornelia Dean, The New York Times, New York City; Dennis Meredith, Science Communication Consultant, Purlear, NC

**SPEAKERS**

- **Felice Frankel**, Massachusetts Institute of Technology, Cambridge
  *Tell Me What You See: Understanding Science Images*

- **Erik Olsen**, The New York Times, New York City
  *Explaining Science in Video*

- **Yael Fitzpatrick**, AAAS/Science, Washington, DC
  *Starting with the Basics, Ending with a Bang*

**Communicating Science to Policy-Makers**

*10:00AM-11:30AM*

How can scientists and engineers help shape science policy? Is this task becoming increasingly complicated in the current political climate? This session will encompass an overview on the basics of government relations in support of the scientific enterprise, including do's and don'ts, tips about timing, working individually or with organizations, and how to deal with “pushback.”

Organized by: Cornelia Dean, The New York Times, New York City; Dennis Meredith, Science Communication Consultant, Purlear, NC

**SPEAKERS**

- **David Goldston**, Natural Resources Defense Council, Washington, DC
  *Why Can’t They Just Do What’s Right?: Misperceptions and Barriers to Science Communication*

- **Bill Foster**, United States House of Representatives, Washington, DC
  *Talk Title to Be Determined*

- **Arthur Lupia**, University of Michigan, Ann Arbor
  *Communicating Science in Politicized Environments*

**Engaging with Social Media**

*3:00PM-4:30PM*

In a constantly changing online landscape, what is the best way for scientists and engineers to engage the public through social media? This session will discuss how people are accessing science information via blogs and social networks and the importance of researchers getting involved directly. Speakers will address the ways that researchers can create meaningful interactions with the public through social media.

Organized by: Cornelia Dean, The New York Times, Cambridge, MA; Dennis Meredith, Science Communication Consultant, Purlear, NC

**SPEAKERS**

- **Scicurious**, blogger
  *Science Blogging for Fun and Profit*

- **Christie Wilcox**, University of Hawaii, Honolulu
  *Science in a Digital Age*

- **Dominique Brossard**, University of Wisconsin, Madison
  *Science and the Public in New Information Environments*

**The Biology and Evolution of Human Language**

*Friday, 15 February*

The human ability to learn and use language is deeply rooted in the biology of our species and processes of cultural evolution. We are biologically equipped for language in general, but inherit the
specific cultural form of the languages in which we are socialized. The creation of new languages provides unique perspectives on language acquisition.

The Language Organ: The Bases of Human Language in Human Biology
8:30AM-11:30AM

The human ability to learn and use natural languages is not simply an incidental outgrowth of more general intellectual capacities, but something deeply rooted in the biology of our species. The fact that our “language organ” is not physiologically localized in the fashion of, say, the kidneys, does not alter the conclusion that our capacity for language is biologically determined in the organization of our body, mind, and brain. This symposium will explore several dimensions of that conclusion, surveying communication in other species to demonstrate that the essential properties of human language are quite different from anything found elsewhere. The structural properties of language suggest an origin like that of any biologically determined trait — evolution through natural selection. We argue that the logical prerequisites for such an account are satisfied in the case of language. Language emerges in the individual as natural growth, not arbitrary learning, and that growth is associated with specific periods in the life of the organism. A nonhuman system showing interesting analogies with important properties of language is birdsong: we present recent work on its neurophysiological bases. The symposium will also survey the brain bases of human language. The signed languages of the deaf provide unique perspectives on the interplay of first- and second-language acquisition as a new grammar is built from complex and variable input. A full picture of changes large and small over a broader span of time requires corpora of a size unimaginable only a few years ago. Corpus work allows us to see fine-grained conditioning of change and establish tipping points for larger changes. The focus will be on how these approaches complement one another and how a new synthesis can emerge for the study of syntactic change as a window on human cognition and how the treatment of phase transitions in syntax relate to phase transitions in other areas of science (e.g., evolutionary changes in biology).

Organized by: David Lightfoot, Georgetown University, Washington, DC; Joseph Salmons, University of Wisconsin, Madison

SPEAKERS

David Lightfoot, Georgetown University, Washington, DC

Phase Transitions in Language History

Tony Kroch, University of Pennsylvania, Philadelphia

Studying the Diffusion of Syntactic Changes in Historical Corpora

Michel DeGraff, Massachusetts Institute of Technology, Cambridge

A Null Theory of Creole Formation

DISCUSSANT

Mark Liberman, University of Pennsylvania, Philadelphia

Language Evolving: Genes and Culture in Ongoing Language Evolution
3:00PM-4:30PM

The theory of evolution is “unreasonably effective” (in Wigner’s terms) in that it seems to apply to both biological evolution and cultural change — domains that might seem completely unrelated. Nowhere is this parallelism clearer than in the domain of language, where there is both an evolved biological basis for language and processes of cultural evolution that lie behind the diversification of languages. Language is clearly a bio-cultural hybrid — we are biologically equipped for language in general, but inherit the specific cultural form of the languages in which we are socialized. This symposium explores the genetic foundations of language, the phylogenetic patterns of cultural diversification in language, and the ongoing interplay between biological and cultural evolution. Individual papers will address the relation between linguistic
ability, brain, and genes; the biological basis for communicative interaction; the phylogenetic patterns in language diversification both in form and content; the effects of population genetics on language diversification; and the case of village sign languages: the interplay between genetics and language type. The papers suggest that one reason that evolutionary theory applies so well to both biological and cultural phenomena is that the two are intertwined and in ongoing interaction.

Organized by: Stephen C. Levinson, Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands; Karen Emmorey, San Diego State University, CA

SPEAKERS
Simon E. Fisher, Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands
Language, Evolution, and the Genomics Revolution
Russell Gray, University of Auckland, New Zealand
Evolutionary Principles and the Diversification of Linguistic Form
Carol Padden, University of California, La Jolla
Culture Before Genes: The Case of a Village Sign Language

DISCUSSANTS
Dan Dediu, Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands
Fiona Jordan, Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands

Brain Function and Plasticity
Saturday, 16 February
Early experience has a lasting impact on our ability to perceive the world. It is widely understood that the brain is initially plastic and that its connections are tuned by early experience to match the environment. Recent evidence indicates that there is also considerable residual plasticity in the adult brain, which has implications for treatment of brain injury and recovery of lost function.

The Connectome: From the Synapse to Brain Networks in Health and Disease
8:30AM–11:30AM
A series of innovative studies are being done to map the brain from the molecular to the systems level both structurally and functionally. At the synaptic level, how neurotransmitters, their receptors, and signaling pathways influence neural function and plasticity is becoming much better understood. Integrating neuronal function at the level of single neurons and groups of neurons into larger circuits at the anatomical level in the mammalian brain, while a daunting task, is being studied by advanced imaging techniques requiring vast amounts of information storage and processing. To integrate local circuit function with whole brain function, understanding the structure and processing of brain networks is critical. A major project to accomplish this task, the Human Connectome Project, is in the process of integrating the structure and function of brain networks using the most advanced imaging and analysis techniques in 1,200 people, including twins and their non-twin siblings. This step will allow for major new insights into not only brain structure and function, but also their genetic underpinnings. Comparing this information in both the normal brain and in different brain disorders such as neurodegenerative diseases is providing novel insights into how understanding brain function from the molecular to the systems level will provide insights into normal brain function and disease pathogenesis as well as provide new treatment strategies.

Organized by: David Holtzman, Washington University, St. Louis, MO

SPEAKERS
Mark F. Bear, Massachusetts Institute of Technology
Molecules and Mechanisms Involved in Synaptic Plasticity in Health and Disease
Jeff Lichtman, Harvard University, Cambridge, MA
Connectomics: Developing a Wiring Diagram for the Mammalian Brain
Steve Petersen, Washington University, St. Louis, MO
The Human Connectome Project
Marcus E. Raichle, Washington University, St. Louis, MO
The Brain’s Dark Energy and the Default Mode Network
Nicole Calakos, Duke University, Durham, NC
Synaptic Plasticity in the Basal Ganglia in Health and Disease
William W. Seeley, University of California, San Francisco
Brain Networks: Linking Structure and Function in Neurodegenerative Diseases

Old Dogs, New Tricks: How Plastic Is the Adult Human Brain?
1:00PM–2:30PM
Early experience has a lasting impact on our ability to perceive the world. When it is missing — because of temporary blindness or deafness — there are seemingly permanent deficits in sensory processing. Comparable deprivation in adulthood has no adverse effects. Similarly, unlike adult stroke, brain damage from a stroke early in life can be largely mitigated by wholesale remapping of the brain. These findings illustrate the well-established principle that the brain is initially plastic and that its connections are tuned by early experience to match the environment.
When the experience is missing during a critical period early in life, it appears to be too late to change the brain. However, recent evidence indicates that there is considerable residual plasticity in the adult brain. That evidence will be illustrated by examples from three diverse fields. The first example is that the vision of adults can be improved by training or playing action videogames, even when vision was damaged by abnormal early visual experience (e.g., lazy eye, cataract). The second example is that a variety of interventions lead to successful recovery from adult stroke. The third example is that physical exercise can modify the plasticity of the adult brain and even mitigate the typical cognitive degeneration with aging. In each case, the speakers will consider the mechanisms underlying the plasticity and whether they are best viewed as a reinstatement of childhood plasticity or a different process.

Organized by: Daphne Maurer, McMaster University, Hamilton, ON, Canada; Susan M. Fitzpatrick, James S. McDonnell Foundation, St. Louis, MO

SPEAKERS
Daphne Maurer, McMaster University, Hamilton, ON, Canada
Improving Vision After the Critical Period
Alex R. Carter, Washington University School of Medicine, St. Louis, MO
A “New Trick” for Neuro-Rehabilitation: Treating Networks Not Spots
Arthur Kramer, University of Illinois, Urbana-Champaign
Physical Fitness Effects on Brain and Cognition

DISCUSSANT
Susan M. Fitzpatrick, James S. McDonnell Foundation, St. Louis, MO

Teaching the Brain to Speak Again: New Frontiers in Trauma and Stroke Recovery
3:00PM-4:30PM
Loss of language ability (aphasia) after stroke or trauma is devastating. Recovery has been thought to be limited by loss of plasticity in adult brains; chronic impairment is common. This panel addresses new frontiers in the functional restoration of communication skills in people with aphasia and biomarkers of recovery. The first speaker describes new therapies to facilitate language in people with aphasia by using speech entrainment to an audiovisual model.

Practice with this “app” increases spontaneous speech, even in chronic, severely impaired patients. Critically, improvement generalizes and is reflected in changes in brain activity, showing plasticity potential in the adult brain. Next, we will explore how new eye-tracking techniques can discern subtle problems that underlie language deficits in acquired aphasia. Newer therapies targeting more linguistically complex structures first, not by scaffolding from simpler treatment goals (a more traditional method), result in improved outcomes. The speaker will describe the complex neurological network that supports grammar in healthy adults and how to isolate biomarkers of recovery after language loss. The final speaker will explore how therapy that embeds language targets in melody — and alters the timing of input models to maximize sound contrasts that are often lost in the speech of adults recovering from aphasia — can improve language outcomes. Together, the symposium panel will demonstrate new ways to teach the damaged brain to use language again.

Organized by: Nan Ratner, University of Maryland, College Park; Margaret Rogers, American Speech-Language-Hearing Association, Rockville, MD

SPEAKERS
Julius Fridriksson, University of South Carolina, Columbia
Real-Time Audiovisual Feedback Enables Stroke Patients to Reacquire Speech

Global Fisheries and Food Supply
Sunday, 17 February
Ecosystem sustainability may be endangered by exploitation. As the rising world population increases demand for food production, the sustainable development of goods and services and the protection of ocean and fisheries environments will be a formidable challenge. Cooperation across scientific disciplines and international borders is crucial to securing the future ocean.

Realizing Jacques Cousteau’s Vision of Aqua-Farming Replacing Hunting of the Sea
8:00AM-9:30AM
The world population has now reached 7 billion and is projected to increase to 9 billion by 2050. There is a greater demand for seafood worldwide. Because no further increases from capture fisheries are possible, aquaculture becomes a crucial part of the sustainable solution to meet the global demand for seafood. For the past few decades, the industry has experienced dynamic growth, with an annual rate of 6.6 percent. In 2010, global aquaculture production reached 55 million metric tons and was valued at $105 billion. The famous French sea explorer Jacques Yves Cousteau once envisioned, “We must plant the sea and herd its animals using the sea as farmers instead of hunters. That is what civilization is all about — farming replacing hunting.” Yet, it has become clear that aquaculture itself, in common with all other food production practices, is facing challenges for responsible development. Issues such as preservation of environmental conditions (water, land, and coastal areas), sustainable supply of feed ingredients, and production of high-quality seafood have become serious and must be dealt with in a responsible manner. In this session, a panel of
international experts will highlight issues relating to responsible aquaculture development; discuss how the world is addressing the issues through scientific research, technology development, and improvement in production practices; and provide achievable solutions.

Organized by: KeShun Liu, U.S. Department of Agriculture (USDA) Agricultural Research Service, Aberdeen, ID; Jeffery Silverstein, USDA Agricultural Research Service, Beltsville, MD

SPEAKERS
Margareth Overland, Norwegian University of Life Sciences, Arbeordveien
Sustainable Ingredient Development for Aquaculture Feed
Steven Summerfelt, The Conservation Fund Freshwater Institute, Shepherdstown, WV
Responsible Aquaculture by Minimizing Environmental Impacts on Land and Water
Jeffery Silverstein, USDA Agricultural Research Service, Beltsville, MD
Responsible Aquaculture Development: A Holistic Approach

Moving Toward Sustainable Development of Large Marine Ecosystems
10:00AM-11:30AM

Studies of marine ecosystems indicate that services essential to humans have been diminished and future ecosystem sustainability is endangered by exploitation patterns commonly practiced around the globe. A global effort is underway to strengthen the robustness and resiliency of large marine ecosystems (LMEs). The world’s LMEs annually produce 80 percent of the yields from marine fisheries and contribute $12.6 trillion to the global economy. LMEs are national and regional centers of coastal pollution, acidification, nutrient over-enrichment, overfishing, habitat degradation and biodiversity loss — contributing to the diminished resilience and robustness of coastal ocean services. A five-module, science-based strategy is being applied to enhance the health of LMEs in 110 economically emerging countries in Africa, Asia, Latin America, and Eastern Europe. The countries are implementing projects for protecting ecosystems as they move toward the sustainable development of goods and services in 17 LMEs along the coasts of Africa, Asia, and Latin America. They are being assisted in this effort with $4.1 billion in financial support mobilized through grants, investments, and co-financing funds from the Global Environment Facility and the World Bank and focused governance actions predicated on science-based assessments of the changing ecosystem conditions. Participating countries are turning the corner from degradation trends toward sustainable development of LME goods and services.

Organized by: Kenneth Sherman, National Oceanic and Atmospheric Administration, Northeast Fishery Science Center, Narragansett, RI

SPEAKERS
Hashali Hamukuyua, Benguela Current Commission, Windhoek, Namibia
The Resilience and Robustness of the Benguela Current Large Marine Ecosystem
Yihang Jiang, United Nations Development Program/Global Environment Facility Yellow Sea Project, Seoul, South Korea
The Resilience and Robustness of the Yellow Sea Large Marine Ecosystem
Michael Akester, United Nations Office for Project Services, Magdalena del Mar, Lima, Peru
The Resilience and Robustness of the Humboldt Current Large Marine Ecosystem

Weaving the Future Ocean Web Through Collaboration: the Nereus Program
1:30PM-4:00PM

Life in the global ocean is a complex web of interactions, spun by nature, described by science, and often reshaped by human activities. To understand these often-conflicting mechanisms and their interactions, we rely on scientific disciplines that do not have tradition for interacting. Yet, interdisciplinary cooperation is key if we are to secure a sustainable future ocean. The Nippon Foundation–University of British Columbia “Nereus Predicting the Future Ocean” program develops and supports ocean management policies that enhance resilience to climate change and can help ensure seafood and healthy oceans for future generations. Nereus works across disciplines, using global datasets in a modeling complex framework, to project conditions of and evaluate management options for the future ocean. In doing so, we strive to overcome the inherent differences between scientific disciplines and develop a framework for interdisciplinary collaboration. We base the session on the development of an Earth-system diagram that links our disciplinary work (biogeochemical, ecological, social, and economic). Our focus is on the interdisciplinary linkages through which we exchange information. This is crucial for the comprehensive modeling and for providing feedback to the individual components of the overall framework. By understanding the interactions, drivers, and impact, we build capacity for how we collectively can shape the future ocean.

Organized by: Yoshitaka Ota and Willy Christensen, University of British Columbia, Vancouver, Canada

SPEAKERS
Henrik Osterblom, Stockholm University, Sweden
Weaving the Future Ocean Food Web: The Nereus Diagram
Ryan Rykaczewski, Princeton University, NJ
Linkages Between the Carbon Cycle and Biota in the Global Ocean
Andre Boustan, Duke University, Durham, NC
Habitat and Fisheries Interactions: Spatial Patterns Under Climate Change
Marc Metian, Stockholm Resilience Center, Sweden
Bridging Demand and Supply of Seafood: Sustainable Aquaculture in a Changing World
Chris McOwen, United Nations Environment Program, World Conservation Monitoring Center, Cambridge, United Kingdom
Linking Terrestrial Processes, Coastal Landscapes, and Marine Ecosystems

DISCUSSANTS
Claire Nouvian, BLOOM Association, Paris, France
Philipe Cury, Center for Mediterranean and Tropical Fisheries Research, Montpellier, France
Symposia

Animal, Plant, and Food Sciences

Plant Viruses: Mutualists, Modulators, and Manipulators

Friday, 15 February  8:00AM-9:30AM
Organized by: Nilsa A. Bosque-Pérez, University of Idaho, Moscow; Ulrich Melcher, Oklahoma State University, Stillwater

SPEAKERS
Marilyn Roossinck, Pennsylvania State University, University Park
Caroline M. Malmstrom, Michigan State University, East Lansing
Nilsa A. Bosque-Pérez, University of Idaho, Moscow

Power of New Generation Biotechnology To Transform Global Food Security

Friday, 15 February  8:30AM-11:30AM
Organized by: Jenny Gu and Larry Beach, U.S. Agency for International Development Bureau for Food Security, Washington, DC

SPEAKERS
Robert Bertram, U.S. Agency for International Development, Washington, DC
Leena Tripathi, International Institute of Tropical Agriculture, Nairobi, Kenya
Vic Knauf, Arcadia Biosciences Inc., Davis, CA
Chuck Niblett, Venganza Inc., Raleigh, NC
Judith A. Chambers, International Food Policy Research Institute, Washington, DC

Fixing the Broken Tomato: What We Like and Why We Like It

Friday, 15 February  10:00AM-11:30AM
Organized by: Harry J. Klee and Linda M. Bartoshuk, University of Florida, Gainesville

SPEAKERS
Valerie Duffy, University of Connecticut, Storrs
Linda M. Bartoshuk, University of Florida, Gainesville
Harry J. Klee, University of Florida, Gainesville

Employing Cutting-Edge Plant Science To Address Global Issues that Threaten Mankind

Saturday, 16 February  1:30PM-4:30PM
Organized by: Melvin J. Oliver, U.S. Department of Agriculture, Agricultural Research Service, Columbia, MO

SPEAKERS
William Davies, Lancaster University, United Kingdom
Michelle Watt, Commonwealth Scientific and Industrial Research Organization, Black Mountain, Australia
Ricardo E. Bressan-Smith, State University of Norte Fluminense Darcy Ribeiro, Campos dos Goytacazes, Brazil
Mary Lou Guerinot, Dartmouth College, Hanover, NH
Richard Sayre, Los Alamos National Laboratory, NM

Transforming Productivity and Incomes of Poor Farm Households in the Developing World

Saturday, 16 February  1:30PM-4:30PM

SPEAKERS
Sieglinde S. Snapp, Michigan State University, Hickory Corners
Patti Kristjanson, World Agroforestry Center, Nairobi, Kenya
Andrew McDonald, International Maize and Wheat Improvement Center, Kathmandu, Nepal
Stanley Wood, International Food Policy Research Institute, Washington, DC

Alternate Paths to Food Security: Making the Right Choices While Feeding the World

Sunday, 17 February  8:30AM-11:30AM
Organized by: Albert G. Medvitz, McCormack Sheep and Grain, Rio Vista, CA

SPEAKERS
Kenneth G. Cassman, University of Nebraska, Lincoln
Michael Carter, University of California, Davis
Alfredo Perez, International Maize and Wheat Improvement Center, Mexico

Advancing Food Safety in a Global Marketplace

Sunday, 17 February  1:30PM-4:30PM
Organized by: Nicola J. Stagg, Dow AgroSciences, Indianapolis, IN; P. Michael Bolger, Retired, Annapolis, MD

SPEAKERS
Angelika M. Trittcher, World Health Organization, Geneva, Switzerland
Daniel M. Wilson, The Dow Chemical Company, Grain, Rio Vista, CA

Using Agricultural Research and Development To Enhance Food Security in South Sudan

Tony Cavalieri, The Bill and Melinda Gates Foundation, Seattle, WA

Farms in the World Food System

Albert G. Medvitz, McCormack Sheep and Grain, Rio Vista, CA

Making the Right Choices While Feeding the World

*Invited
How Microbes Can Help Feed the World

Sunday, 17 February  1:30PM-4:30PM
Organized by: Ann Reid, American Academy of Microbiology, Washington, DC

SPEAKERS
Bernard Glick, University of Waterloo, ON, Canada
Bacteria That Alleviate Plant Stress in High-Salt and Metal-Contaminated Soil

Gabriel Iturriaga, University of the State of Morelos, Cuernavaca, Mexico
Role of Trehalose in Improving Drought Tolerance

Marilyn Roossinck, Pennsylvania State University, University Park
A Plant, A Fungus, A Virus: What It Takes to Take the Heat

Linda Thomashow, Washington State University, Pullman
Biological Control and Plant Growth Promotion by Rhizosphere Bacteria

Ann Lichens-Park, National Institute of Food and Agriculture, Washington, DC
Microbes and Food Security at USDA's National Institute of Food and Agriculture

Ian Sanders, University of Lausanne, Switzerland
Adapting Mycorrhizal Fungi to Improve Yields of Globally Important Crops

Why a Calorie Is Not a Calorie and Why It Matters for Human Diets

Monday, 18 February  9:45AM-12:45PM
Organized by: Rachel N. Carmody and Richard Wrangham, Harvard University, Cambridge, MA

SPEAKERS
Richard Wrangham, Harvard University, Cambridge, MA
Calorie Mismeasurement in Past and Present Human Diets

Klaus Englyst, Englyst Carbohydrates Ltd., Southampton, United Kingdom
Bioavailability of Dietary Carbohydrates

Peter J. Turnbaugh, Harvard University, Cambridge, MA
Taking a Metagenomic View of Human Nutrition

Stephen M. Secor, University of Alabama, Tuscaloosa
The Metabolic Cost of Food Digestion and Its Determinants

Rachel N. Carmody, Harvard University, Cambridge, MA
Contributions of Food Processing to Dietary Energy Harvest

Geoffrey Livesey, Independent Nutrition Logic Ltd., Wymondham, United Kingdom
Improving the Atwater System: Balancing Accuracy and Practicality

Anthropology, Culture, and Language
The Whole of Culture: Anthropology Back on Track
Friday, 15 February  1:00PM-2:30PM
Organized by: Dwight Read, University of California, Los Angeles; Fadwa El Guindi, Qatar University, Doha

SPEAKERS
Robert W. Sussman, Washington University, St. Louis, MO
The Relationship of Human and Non-Human Modes of Social Transmission to Culture

Dwight Read, University of California, Los Angeles
The Unreasonable Effectiveness of Mathematics in Anthropology

Giovanni Bennardo, Northern Illinois University, DeKalb
Language, Cultural Models, and Mind: Anthropology and Cognitive Science

The Scars of Human Evolution
Friday, 15 February  1:30PM-4:30PM
Organized by: Karen Rosenberg, University of Delaware, Newark; Rachel Caspari, Central Michigan University, Mt Pleasant

SPEAKERS
Rachel Caspari, Central Michigan University, Mt Pleasant
Recent Longevity and Its Consequences

Jeremy DeSilva, Boston University, MA
Starting Off on the Wrong Foot

Karen Rosenberg, University of Delaware, Newark
Laboring Humans

Bruce Latimer, Case Western Reserve University, Cleveland, OH
A Backache of Longstanding: An Evolutionary Perspective on the Human Vertebral Column

Alan Mann, Princeton University, NJ
Wisdom Can Be Painful: The Evolutionary Origins of Third Molar Impaction in Humans

William Leonard, Northwestern University, Evanston, IL
Metabolic Challenges of the Modern World: Evolution and Human Nutritional Health

Beyond Color: How Human Skin Interacts with Our World
Saturday, 16 February  3:00PM-4:30PM
Organized by: Nina Jablonski, Pennsylvania State University, University Park
Ellen E. Quillen, Texas Biomedical Research Institute, San Antonio

SPEAKERS
Nathaniel J. Dominy, Dartmouth College, Hanover, NH
Beyond Vision: Touchy-Feely Primates

Nina Jablonski, Pennsylvania State University, University Park
Beyond Fun: Sweating and Barrier Features of Human Skin

Ellen E. Quillen, Texas Biomedical Research Institute, San Antonio
Beyond Melanoma: Skin Color and Disease Risk

Democratizing Science: Virtualization and Global Natural History Repositories
Saturday, 16 February  3:00PM-4:30PM
Organized by: Herbert D.G. Maschner, Idaho Museum of Natural History, Pocatello; Corey D. Schou, Idaho State University, Pocatello

SPEAKERS
Herbert D.G. Maschner, Idaho Museum of Natural History, Pocatello
Democratizing Human and Natural History Science through Virtualization

Norman MacLeod, The Natural History Museum, London, United Kingdom
Collections Digitization Projects in Natural History Museums: Learning from Mistakes

Julie J.C.H. Ryan, George Washington University, Washington, DC
A Design Model for Effective Security for a Virtual Archeological Data Repository

Atmospheric, Hydroospheric, and Oceanic Sciences
Contributions of Citizen Scientists to Climate Science
Friday, 15 February  8:30AM-11:30AM
Organized by: Imke Durre, National Climatic Data Center, National Oceanic and Atmospheric Administration (NOAA), Asheville, NC

SPEAKERS
Nolan J. Doesken, Colorado Climate Center, Fort Collins
Why We Started a Volunteer Rain Gauge Network
Mark D. Schwartz, University of Wisconsin, Milwaukee
U.S. National Phenology Network Citizen Contributions to Atmospheric Science Research

Philip Brohan, Met Office, Devon, United Kingdom
OldWeather.org: Citizen Science for Climate Reconstruction

Myles R. Allen, University of Oxford, United Kingdom
Using Citizen Science for Attribution and Prediction of Climate Change

Scott E. Stevens, Cooperative Institute for Climate and Satellites, Asheville, NC
CycloonCenter: Harnessing the Power of Citizen Science to Analyze Hurricane Imagery

U.S. Climate and Weather Extremes: Past, Present, and Future
Friday, 15 February 8:30AM-11:30AM
Organized by: Connie Woodhouse, University of Arizona, Tucson; Esther Szelein, U.S. National Academies, Washington, DC; Gregory Wiles, The College of Wooster, OH

SPEAKERS
Donald J. Wuebbles, University of Illinois, Urbana-Champaign
Severe Weather in the United States Under a Changing Climate
Heidi Cullen, Climate Central, Princeton, NJ
Coverage of Extreme Weather/Climate Events in a Changing Media Landscape

John Nielsen-Gammon, Texas A&M University, College Station
What Did the Texas Drought Do?
Camille Parmesan, University of Texas, Austin
Observed Impacts of Extreme Climate Events on Wild Species
David Stahle, University of Arkansas, Fayetteville
The Tree-Ring Record of Drought and Disaster Over North America

Richard Seager, Columbia University, Palisades, NY
A Modeling Perspective on Drought in Southwest North America

Friday, 15 February 3:00PM-4:30PM
Organized by: Mary Ruckelshaus and Jodie Toft, Natural Capital Project, Seattle, WA

SPEAKERS
Robert Griffin, Natural Capital Project, Stanford, CA

Sally McGee, The Nature Conservancy, New Haven, CT
Making Sense of It All: Reconciling Existing Uses with Emerging Uses

*Stephanie Moura, SeaPlan, Boston, MA
The Path Forward: Lessons Learned for Marine Planning in Massachusetts and Beyond

Can Oceans Help Meet the Century’s Looming Food Security Challenges?
Saturday, 16 February 8:30AM-11:30AM
Organized by: Steven Gaines, University of California, Santa Barbara

SPEAKERS
Matthew Elliott, California Environmental Associates, San Francisco, CA
Meeting Global Protein Demand: Weighing the Impacts of Land and Sea Food Production

Olaf Jensen, Rutgers University, New Brunswick, NJ
Role of Large-Scale Industrial Fisheries in Feeding the World

Sarah Lester, University of California, Santa Barbara
Improving Management of Small-Scale Fisheries Holds Potential To Feed More Mouths

Steven Gaines, University of California, Santa Barbara
Land Versus Sea: Do the Oceans Offer the Most Sustainable Way To Feed the World?

James Anderson, The World Bank, Washington, DC
Creating Incentives to Manage the Oceans for Sustainable Food Production

Advancing the Frontiers of Understanding the Ocean and Its Role in the Earth System
Saturday, 16 February 1:30PM-4:30PM
Organized by: Robert A. Weller, Woods Hole Oceanographic Institution, MA

SPEAKERS
G.S. Bhat, Indian Institute of Science, Bangalore
Ocean Observations and Monsoon Variability

John R. Delaney, University of Washington, Seattle
Understanding the Planetary Life Support System: Next-Generation Ocean Science

Scott Doney, Woods Hole Oceanographic Institution, MA
Observing Systems for Constraining Ocean Carbon Uptake and Acidification

James W. Hurrell, National Center for Atmospheric Research, Boulder, CO
Decadal Climate Variability, Predictability, and Prediction: Opportunities and Challenges

Eric Schultz, Bureau of Meteorology, Melbourne, Australia
Observations for Understanding Ocean-Atmosphere Interactions

*Invited

Edie Widder, Ocean Research and Conservation Association, Fort Pierce, FL
Creating Water Pollution Gradient Maps as a Tool for Educating Community Stakeholders

Green Dreams, Blue Waves, and Shades of Gray: The Reality of Water
Sunday, 17 February 8:30AM-11:30AM
Organized by: E. John Sadler, U.S. Department of Agriculture, Columbia, MO; Fred Vocasek, Servi-Tech Laboratories, Dodge City, KS

SPEAKERS
Henry Lin, Pennsylvania State University, University Park
World Water Security Begins with an Adequate Blue Water Supply

B. A. Stewart, West Texas A&M University, Canyon
Green Water Supply: The Key Element in World Food Security

Steel Maloney, Cascade Earth Services, Albany, OR
Converting Gray Water to Green Water

Bill Cox, Coaxco Ag Services, Las Cruces, NM
Practical Solutions to Agriculture’s Water Issues

John Peck, University of Kansas, Lawrence
Legal Challenges in Conserving Water in the United States

James Pritchett, Colorado State University, Fort Collins
Economics: Its Impact on World Water Security

The National Climate Assessment: Draft Findings for 2013 and Sustaining the Process
Monday, 18 February 9:45AM-12:45PM
Organized by: Emily Therese Cloyd, U.S. Global Change Research Program, Washington, DC; Kathy Jacobs, Office of Science and Technology Policy, Executive Office of the U.S. President, Washington, DC

SPEAKERS
Jerry Melillo, Marine Biology Laboratory, Woods Hole, MA
The National Climate Assessment: Overview and Key Findings

Melissa A. Kenney, NOAA, Climate Program Office, Silver Spring, MD
Supporting and Informing Decisions Through Assessment

Rosina Bierbaum, University of Michigan, Ann Arbor
Adapting to Climate Change

Robert Corell, Global Environment and Technology Foundation, Arlington, VA
A Research Agenda for Climate Change Science
**Biological Science and Genomics**

**The Architecture of the Cell Nucleus**

Friday, 15 February  
10:00AM-11:30AM  
Organized by: Gary Felsenfeld, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD

**SPEAKERS**

- Steven Benner, Foundation for Applied and Molecular Evolution, Gainesville, FL  
  Paleogenetics and the History of Alcohol in Primates
- John Gerlt, University of Illinois, Urbana-Champaign  
  Sequence Boundaries Between Enzymatic Functions
- Antony Dean, University of Minnesota, Saint Paul  
  Molecular Evolution of Enzymes

**Visualizing Chemistry: Seeing Another Dimension of Plants and Animals**

Saturday, 16 February  
8:00AM-9:30AM  
Organized by: Barbara Illman, U.S. Forest Service, Madison, WI; Janos Kirz, Lawrence Berkeley National Laboratory, CA

**SPEAKERS**

- Carol Hirschmugl, University of Wisconsin, Milwaukee  
  Simultaneous Detection of Organics Leading to Spatial and Temporal Multidimensional Chemical Imaging (MDCI)
- Janos Kirz, Lawrence Berkeley National Laboratory, CA  
  Chemical and Elemental Imaging with X-Ray Microscopy
- Richard Ortega, University of Bordeaux, France  
  Chemical Imaging with an X-Ray Nano-Probe

**New Frontiers in Single Molecule Detection and Single Cell Analysis**

Saturday, 16 February  
8:30AM-11:30AM  
Organized by: X. Nancy Xu, Old Dominion University, Norfolk, VA

**SPEAKERS**

- Robert Singer, Albert Einstein College of Medicine, Bronx, NY  
  Following Single mRNA Molecules in Living Cells and Tissues
- George Church, Harvard Medical School, Boston, MA  
  In Situ Sequencing
- Linda B. McGown, Rensselaer Polytechnic Institute, Troy, NY  
  Investigating Protein Capture at Aptamer Coated Surfaces
- George Church, Harvard Medical School, Boston, MA  
  Nanoparticle Biosensors for Mapping Single Molecule Functions in Single Live Cells
- Scott Fraser, California Institute of Technology, Pasadena  
  Imaging of Live Cells in Developing Embryos
- Xiaowei Zhuang, Harvard University, Cambridge, MA  
  Single Molecule and Super Resolution Imaging of Cells and Tissues

**The Science of Uncertainty in Genomic Medicine**

Friday, 15 February  
10:00AM-11:30AM  
Organized by: Reed E. Pyeritz, University of Pennsylvania, Philadelphia; Shili Lin, Ohio State University, Columbus

**SPEAKERS**

- Giovanni Parmigiani, Harvard Medical School, Boston, MA  
  How Useful Is It to Know Your Genome?
- James P. Evans, University of North Carolina, Chapel Hill  
  Genomics in Clinical Medicine: Navigating the Spectrum from Certainty to Uncertainty
- Robert C. Green, Partners Center for Personalized Genetic Medicine, Boston, MA  
  A Data-Driven Pathway to Genomic Medicine

**Resurrected Ancestral Proteins: Fundamentals and Applications**

Friday, 15 February  
1:30PM-4:30PM  
Organized by: Romas Kazlauskas and Antony Dean, University of Minnesota, Saint Paul

**SPEAKERS**

- Shozo Yokoyama, Emory University, Atlanta, GA  
  Synthesis of Experimental Molecular Biology and Evolutionary Biology
- Joseph Thornton, University of Oregon, Eugene  
  Evolution of Protein Structure and Function in the Steroid Hormone Receptors
- Günter Wagner, Yale University, New Haven, CT  
  Evolution of Transcription Factors and Gene Regulatory Networks
- Steven Benner, Foundation for Applied and Molecular Evolution, Gainesville, FL  
  Paleogenetics and the History of Alcohol in Primates

**Personal Genetics: An Intersection Between Science, Society, and Policy**

Saturday, 16 February  
8:30AM-11:30AM  
Organized by: Peter Yang, Brenna Krieger, and Kevin Bonham, Harvard University, Boston, MA

**SPEAKERS**

- Ting Wu, Harvard University, Boston, MA  
  Personal Genetics and Education
- Mary Carmichael, Boston Globe, Malden, MA  
  The Media and the Personal Genetics Revolution
- Brian Naughton, 23andMe Inc., New York City  
  Commercialization of Personal Genomics: Promise and Potential Pitfalls
- Mira Irons, Children's Hospital Boston, MA  
  Personal Genomic Medicine: How Physicians Can Adapt to a Genomic World
- Sheila Jasanoff, Harvard University, Cambridge, MA  
  Societal and Ethical Dimensions of the Personal Genomics Revolution
- Jonathan Gitlin, National Human Genome Research Institute, Bethesda, MD  
  Personal Genomics and Science Policy

**How Symbiosis, Horizontal Gene Transfer, and Virolution Call for an Extended Synthesis**

Saturday, 16 February  
1:30PM-4:30PM  
Organized by: Nathalie L. Gontier, University of Lisbon, Portugal

**SPEAKERS**

- Douglas Zook, Boston University, MA  
  Symbiosis as a Driving Force of Evolution
- William Martin, Heinrich Heine University, Düsseldorf, Germany  
  The Importance of Horizontal Gene Transfer in the Evolution of Life
- Frédéric Bouchard, University of Montreal, QC, Canada  
  How Research on Symbiosis Should Transform Our Understanding of Adaptation
- Nathalie L. Gontier, Dutch Free University of Brussels, Belgium  
  Importance of Horizontal Evolution for the Sociocultural Sciences
- Luis Correia, University of Lisbon, Portugal  
  Models of Multi-Species Evolution in Natural and Artificial Societies

**Innovations in Imaging**

Saturday, 16 February  
1:30PM-4:30PM  
Organized by: Amy S. Gladfelter, Dartmouth College, Hanover, NH

**SPEAKERS**

- Jennifer Lippincott-Schwartz, National Institutes of Health, Bethesda, MD  
  Navigating the Dynamic Cell
Eric Betzig, Howard Hughes Medical Institute
Janelia Farm Research Campus, Ashburn, VA
*Imaging Three-Dimensional Dynamics in Cells and Embryos*

Rainer Heintzmann, King’s College, London, United Kingdom
*Structured Illumination and the Analysis of Single Molecules in Cells*

Rudolf Oldenbourg, Marine Biological Laboratory, Woods Hole, MA
*New Frontiers in Polarized Light Microscopy for Live Cell Imaging*

John Condeelis, Albert Einstein College of Medicine, Bronx, NY
*Imaging Single Cells in the Breast Tumor Microenvironment*

Amy S. Gladfelter, Dartmouth College, Hanover, NH
*Single Molecule Imaging in Live Cells*

**A Decade After “Forensic Science: Oxymoron?”: Will There Be Real Change?**

Saturday, 16 February 3:00PM-4:30PM
Organized by: Clifford H. Spiegelman, Texas A&M University, College Station

**SPEAKERS**
Anne-Marie Mazza, The National Academies, Washington, DC
*The NRC (2009) Report: Why, and What It Was Meant To Do*

John H. Laub, National Institute of Justice, Washington, DC
*Strengthening Forensic Science at the National Institute of Justice*

Karen Kafadar, Indiana University, Bloomington
*Critical Role of Statistics in Development and Validation of Forensic Methods*

**Interfacing with the Body Using Implants and Prostheses**

Sunday, 17 February 8:00AM-9:30AM
Organized by: Erin Heath, AAAS Office of Government Relations, Washington, DC

**SPEAKERS**
Leigh Hochberg, Massachusetts General Hospital, Boston
*Restoring Communication and Mobility Through Neurotechnology*

*Hugh Herr, Massachusetts Institute of Technology (MIT) Media Lab, Cambridge, MA
Perfecting the Prosthetic Limb*

Joseph F. Rizzo III, Harvard Medical School, Boston, MA
*Creating a Retinal Implant*

**How Macro-Evolutionary Studies Call for an Extended Synthesis**

Sunday, 17 February 8:30AM-11:30AM
Organized by: Nathalie L. Gontier, University of Lisbon, Portugal; Emanuele Serrelli, University of Milan-Bicocca, Italy

**SPEAKERS**
David Sepkoski, Max Planck Institute for the History of Science, Berlin, Germany
*Stephen Jay Gould’s Hierarchical Alternative to Neodarwinism*

Douglas H. Erwin, Smithsonian Institution, Washington, DC
*The Evolution of Evolution: Changing Dynamics in Macroevolution*

Derek Turner, Connecticut College, New London
*Contingency and the Explanation of Macroevolutionary Trends*

Folmer Bokma, Umeå University, Sweden
*Complexity and Limits to Change*

Nathalie L. Gontier, University of Lisbon, Portugal
*Punctuated Equilibria: A Universal Pattern in Life and Culture*

Alycia L. Stiggall, Ohio University, Athens
*Expanding the Role of Biogeography and Niche Evolution in Macro-Evolutionary Theory*

**The Invisible Revealing the Dangerously Beautiful**

Sunday, 17 February 1:00PM-2:30PM
Organized by: Isabelle Boscaro-Clarke, Diamond Light Source, Didcot, United Kingdom

**SPEAKERS**
John Jenkin, La Trobe University, Melbourne, Australia
*Bragg’s Law: 100 Years On and Still Going Strong*

Dave Stuart, Diamond Light Source, Oxfordshire, United Kingdom
*Dangerously Beautiful Science at the Heart of Global Health*

Filip van Petegem, University of British Columbia, Vancouver, Canada
*How X-Rays Are Shedding Light on Our Understanding of Heart Function*

**Evolution of Giants: The Great Whales**

Sunday, 17 February 1:30PM-4:30PM
Organized by: Jere H. Lipps, Cooper Archaeological and Paleontological Center, Fullerton, CA; Nicholas D. Pyenson, Smithsonian National Museum of Natural History, Washington, DC

**SPEAKERS**
Nicholas D. Pyenson, Smithsonian National Museum of Natural History, Washington, DC
*What Does the Fossil Record Tell Us About the Evolution of Gigantism in Whales?*

Meredith Rivin, Cooper Archaeological and Paleontological Center, Fullerton, CA
*Before They Were Giants: The Fossil Record of Toothed Baleen Whales*

Jeremy A. Goldbogen, Cascadia Research, Olympia, WA
*The Ultimate Mouthful: The Evolution of Lunge Feeding in Rorqual Whales*

Megan F. McKenna, National Park Service, Fort Collins, CO
*Singing in a Crowded Ocean: Acoustic Adaptations of Great Whales and Human Impacts*

Daniel Palacios, Joint Institute for Marine and Atmospheric Research, Pacific Grove, CA
*Where Do Giants Go in the Deep Blue Sea? Ecology Using Satellite Tags*

D. Graham Burnett, Princeton University, Princeton, NJ
*Into the Belly of the Beast: Antarctic Whaling in the 20th Century*

**Dragons of the East: China’s Paleontological Riches**

Monday, 18 February 9:45AM-11:15AM
Organized by: Richard A. Stone, AAAS/Science, Washington, DC

**SPEAKERS**
Shu-Zhong Shen, Nanjing Institute of Geology and Paleontology, Nanjing, China
*The Permian Period’s Catastrophic End*

Olivier Rieppel, The Field Museum, Chicago, IL
*China: A Hotbed for Fossils of Marine Reptiles*

Xing Xu, Institute of Vertebrate Paleontology and Palaeoanthropology, Beijing, China
*China’s Fabulous Feathered Dinosaurs*

**Confluence of Streams of Knowledge: Biotechnology and Nanotechnology**

Monday, 18 February 9:45AM-12:45PM
Organized by: Elicia M.A. Maine, Simon Fraser University, Vancouver, BC, Canada; James M. Utterback, MIT, Cambridge, MA

**SPEAKERS**
Robert S. Langer, MIT, Cambridge, MA
*Challenges and Opportunities at the Confluence of Biotechnology and Nanomaterials*

Nathan Lewis, California Institute of Technology, Pasadena
*Clean Energy Innovation from the Confluence of Technologies*

Sarah Kaplan, University of Toronto, ON, Canada
*The Process and Practice of Interdisciplinary Research*

Elicia M.A. Maine, Simon Fraser University, Vancouver, BC, Canada
*Global Bio-Nano Firms: Exploiting the Confluence of Technologies*

Han Cao, BioNano Genomics Inc., San Diego, CA
*Commercializing Innovation: Applying Nanotechnology to Genomics*
Breakthroughs in Our Understanding of Primate Cognition and Psychopathology

Friday, 15 February 1:00PM-2:30PM
Organized by: Neal D. Barnard, George Washington University, Washington, DC

SPEAKERS
Tetsuro Matsuzawa, Kyoto University, Inuyama, Aichi, Japan
Pan Troglodytes and Homo Sapiens: Neuroanatomical Comparison of Cognitive Development
Victoria Wobber, Harvard University, Cambridge, MA
Recent Findings from Comparative Cognition Research with Chimpanzees and Bonobos
Martin Brüne, University of Bochum, Germany
Psychopathology in Hominoids: Do Apes Present Treatable Psychiatric Conditions?

The Economic Costs of Crime and Justice in the United States

Saturday, 16 February 8:00AM-9:30AM
Organized by: William Alex Pridemore, Indiana University, Bloomington

SPEAKERS
Jens Ludwig, University of Chicago, IL
The Economic Costs of Youth Violence (and the Value of Small Effects)
Philip J. Cook, Duke University, Durham, NC
Reducing Public Costs of Crime via Private Action: Business Improvement Districts
Mark A. Cohen, Vanderbilt University, Nashville, TN
Economic Costs of White-Collar Versus Street Crime

Why is Living Healthily So Difficult?

Saturday, 16 February 1:00PM-2:30PM
Organized by: Benedikt Herrmann, Joint Research Center, European Commission, Ispra, Italy; Geraldine Barry, Joint Research Center, European Commission, Ispra, Italy

SPEAKERS
David Laibson, Harvard University, Cambridge, MA
Behavioral Economics and Health Behaviors
Todd Hare, University of Zurich, Switzerland
Neurobiological Mechanisms of Self-Control in Value-Based Choices
Benedikt Herrmann, Joint Research Center, European Commission, Ispra, Italy
How Much Do Social Norms Influence Our Ambitions To Live Healthily?

Computation, Computational Efficiency, and Cognitive Science

Saturday, 16 February 1:30PM-4:30PM
Organized by: Anna Maria Di Sciuillo, University of Quebec, Montreal, Canada; Robert C. Berwick, MIT, Cambridge, MA

SPEAKERS
Randy Gallistel, Rutgers University, Piscataway, NJ
Using Bayes’ Rule to Shave with Einstein’s Razor
Shimon Ullman, Weizmann Institute of Science, Rehovot, Israel
Efficient Extraction of Visually Meaningful Information
Leslie Valiant, Harvard University, Cambridge, MA
Biological Evolution as a Form of Learning
Charles Yang, University of Pennsylvania, Philadelphia
Optimization in the Evolution of Language
Roland Friedrich, Humboldt University, Berlin, Germany
Mathematics and Linguistics
Anna Maria Di Sciuillo, University of Quebec, Montreal, Canada
Computational Efficiency in Naming Big Numbers

Advances in Brain-Machine Interfaces: Applications and Implications

Sunday, 17 February 8:30AM-11:30AM
Organized by: Peyton West and Jennifer Wiseman, AAAS Center for Science, Policy, and Society Programs, Washington, DC

SPEAKERS
Miguel Nicolelis, Duke University, Durham, NC
Brain Machine Brain Interfaces for Virtual Tactile Exploration
Todd Coleman, University of California, La Jolla
Wireless Tattoo Electronics
Nicolas Nova, Near Future Laboratory, Geneva, Switzerland
Brain-Machine Interfaces in the Real World
Martha J. Farah, University of Pennsylvania, Philadelphia
Ethical and Societal Implications of Brain Machine Interfaces
Brent Waters, Garrett-Evangelical Theological Seminary, Evanston, IL
Brain-Machine Interfaces and Personhood

The Elusive Common Good: What Moral Psychology and Neuroscience Now Tell Us

Sunday, 17 February 1:00PM-2:30PM
Organized by: Robert E. Fay, Westat, Bethesda, MD

SPEAKERS
Jonathan Haidt, New York University, New York City
The Righteous Mind: The Multiple, Conflicting Dimensions of Moral Goodness
Joshua D. Greene, Harvard University, Cambridge, MA
Beyond Point-and-Shoot Morality: How the Moral Brain Works and How It Can Work Better
Rebecca R. Saxe, MIT, Cambridge
Mens Rea: Moral Thinking About Other Minds

Evidence from Music, Fiction, and Visual Arts: Transfer of Learning from the Arts?

Sunday, 17 February 1:30PM-4:30PM
Organized by: Ellen Winner, Boston College, Chestnut Hill, MA

SPEAKERS
Daniel Levitin, McGill University, Montreal, QC, Canada
Defining the Musical Phenotype: A Precursor to the Study of Cognitive Transfer
Aaron Kozbelt, Brooklyn College, NY
Skilled Drawing as a “Non-Artificial” and Thus Transferable Domain of Expertise
E. Glenn Schellenberg, University of Toronto at Mississauga, ON, Canada
Transfer from Music: A Critical Examination of the Evidence
Keith Oatley, University of Toronto, ON, Canada
Effects of Literature: Understanding Others, Transforming Oneself
Ellen Winner, Boston College, Chestnut Hill, MA
Relationship Between Visual Arts Learning and Understanding Geometry

Understanding Memory: The Legacy of Case H.M.

Monday, 18 February 9:45AM-12:45PM
Organized by: Howard Eichenbaum, Boston University, MA

SPEAKERS
Howard Eichenbaum, Boston University, MA
Models of Memory Processing by the Hippocampus
Brenda Milner, Montreal Neurological Institute and Hospital, Montréal, QC, Canada
Background to H.M.
Suzanne Corkin, MIT, Cambridge, MA
The Nature of Amnesia
Jean Augustinek, Massachusetts General Hospital, Charlestown
Postmortem Examination of H.M. ‘s Brain: Autopsied Brain, In Situ MRI, and Ex Vivo MRI
Li-Huei Tsai, MIT, Cambridge, MA
Mechanisms of Memory and Memory Loss
Communication and Public Programs

Engaging Lay Publics in Museums on Provocative Societal Questions Related to Science
Friday, 15 February 8:00AM-9:30AM
Organized by: Larry Bell, Museum of Science, Boston, MA
SPEAKERS
Dan M. Kahn, Yale Law School, New Haven, CT
Deepening Public Engagement Through a Two-Channel Strategy of Science Communication
Lucy Kirshner, Museum of Science, Boston, MA
Elizabeth Kunz Kollmann, Museum of Science, Boston, MA
Research and Formative Evaluation Suggest Support for Dialogue and Argumentation

Artful Science
Friday, 15 February 8:30AM-11:30AM
Organized by: John R. Jungck, Beloit College, WI
SPEAKERS
Maura Flannery, St. John’s University, Jamaica, NY
The Herbarium as Muse: Plant Specimens as Inspiration
Robert J. Krawczyk, Illinois Institute of Technology, Chicago
Dimension of Time in Strange Attractors
Jo Ellis-Monaghan, Saint Michael’s College, Colchester, VT
DNA Nanostructures, Virtual Seashells, and Crocheted Hyperbolic Corals
George W. Hart, Independent Sculptor, Stony Brook, NY
Sand Dollars, Echinodermata, and Radiolaria: Sculptural Forms from Hyperbolic Tessella
John R. Jungck, Beloit College, WI
Fostering Figuring and Fascination: Engagement in Aesthetic Appreciation of Science

New Tools to Engage Publics and Assess the Impact of Science Communication
Friday, 15 February 8:30AM-11:30AM
Organized by: David Herring, NOAA, Silver Spring, MD
SPEAKERS
Margaret Mooney, University of Wisconsin, Madison
Measuring Climate.gov’s Quality of Relationship with Its Four Audiences
Rachel Connolly, NOVA/WGBH, Boston, MA
Dialogues To Promote Ecological Literacy Among the American Public

Martin Storksdieck, National Research Council, Washington, DC
Evaluating the Use of Hands-on Materials in Science Museums
Arno Scharl, MODUL University, Vienna, Austria
News and Social Media Monitoring To Assess the Impact of Science Communication

A New Social (Media) Contract for Science
Friday, 15 February 1:30PM-4:30PM
Organized by: Elizabeth Neely, COMPASS, Seattle, WA
SPEAKERS
Spencer Wood, Stanford University, CA
Social Media as Data on the Recreational Value of Coastal Areas
*Seth Cooper, University of Washington, Seattle
People, Puzzles, Prizes: Using Computer Gaming To Predict Protein Structures
Dario Taraborelli, Wikimedia Foundation, San Francisco, CA
Experts as Contributors and Contributors as Experts: Bridging the Gap Between Wikipedia and Academia
Jai Ranganathan, National Center for Ecological Analysis and Synthesis, Santa Barbara, CA
It's Not (Just) About the Money: Crowdfunding for Science
Jason Priem, University of North Carolina, Chapel Hill
Altmetrics: Measuring Scholarly Impact over the Social Web
*Karyn Traphagen, ScienceOnline, Durham, NC
ScienceOnline: A Global Conversation

The Beauty and Benefits of Escaping the Ivory Tower
Saturday, 16 February 10:00AM-11:30AM
Organized by: Dawn J. Wright, Environmental Systems Research Institute, Redlands, CA; Elizabeth Hadly, Stanford University, CA
SPEAKERS
Dawn J. Wright, Environmental Systems Research Institute, Redlands, CA
“Story Mapping” the Geographical and Knowledge Networks of Science
Leah Gerber, Arizona State University, Tempe
Overcoming Institutional Barriers to Science Communication
Jessica Hellmann, University of Notre Dame, IN
Strategies for Engaging Outside the Ivory Tower and How to Find the Time to Do It

Synthetic Biology and Public Perceptions: Communication and Engagement
Saturday, 16 February 1:00PM-2:30PM
Organized by: Peyton West, AAAS Center for Science, Policy, and Society Programs, Washington, DC; Tiffany Lohwater, AAAS Office of Public Programs, Washington, DC
SPEAKERS
Drew Endy, Stanford University, CA
Synthetic Biology: New Findings and Implications
Eléonore Pauwels, Woodrow Wilson International Center for Scholars, Washington, DC
Synthetic Biology: Political and Policy Challenges
Ronald Cole-Turner, Pittsburgh Theological Seminary, PA
Synthetic Biology: Ethical and Theological Implications

Wild Weather, Climate Change, and Media: Communicating Science, Uncertainty, and Impact
Saturday, 16 February 3:00PM-4:30PM
Organized by: Cristine Russell and James McCarthy, Harvard University, Cambridge, MA
SPEAKERS
Chris Field, Carnegie Institution for Science and Stanford University, Stanford, CA
Weather Extremes: Coping with the Changing Risks
Heidi Cullen, Climate Central, Princeton, NJ
From Climate Scientist to Climate Communicator
Seth Borenstein, Associated Press, Washington, DC
When Weather Goes Wild, So Does the Media

Scientists’ Understanding of the Public
Sunday, 17 February 8:00AM-9:30AM
Organized by: John C. Besley, Michigan State University, East Lansing
SPEAKERS
John Durant, MIT Museum, Cambridge, MA
Patterns of Outreach Participation by Scientists
Hans Peter Peters, Ethics in Neurosciences Research Center, Julich, Germany, and Sharon Dunwoody, University of Wisconsin, Madison
Understanding Scientists’ Beliefs about the Public and Public Communication
John C. Besley, Michigan State University, East Lansing
Key Factors Underlying Scientists’ Willingness to Engage
Writing About Science for the Public
Sunday, 17 February 8:30AM-11:30AM
Organized by: Daniel Levitin, McGill University, Montreal, QC, Canada

SPEAKERS
Gary Calabrese, Corning, Inc., NY
Shirley M. Malcom, AAAS Education and Human Resources, Washington, DC

Creative and Participatory Methods in Climate Communication
Sunday, 17 February 1:30PM-4:30PM
Organized by: Eli Kintisch, AAAS/Science, Washington, DC; Juliette N. Rooney-Varga, University of Massachusetts, Lowell

SPEAKERS
Maxwell T. Boykoff, University of Colorado, Boulder
Inside the Greenhouse: Utilizing Media to Communicate Climate Challenges
Juliette N. Rooney-Varga, University of Massachusetts, Lowell
Simulations and Media Production for Transformative, Experiential Learning
Janot Mendler de Suarez, Boston University Pardee Center for the Study of the Longer-Range Future, Wayland, MA
“Serious Fun” and Learning in Developing Countries: A Participatory Game
Eli Kintisch, AAAS/Science, Washington, DC
Bay in Flux: Designing Tablet Apps on Climate Impacts on Marine Ecosystems

In the Eye of the Beholder: Engaging the Public in Societal Implications of Science
Sunday, 17 February 3:00PM-4:30PM
Organized by: Larry Bell and David Sittenfeld, Museum of Science, Boston, MA

SPEAKERS
Rae Ostman, Sciencenter, Ithaca, NY
Building Societal and Ethical Implications of Nanotechnology into Informal Education

Education and Human Resources

For Scientists and Society: A New Vision of Chemistry Graduate Education
Friday, 15 February 8:30AM-11:30AM
Organized by: Bassam Shakhashiri, University of Wisconsin, Madison

SPEAKERS
Larry Faulkner, University of Texas, Austin
Vision and Recommendations of the ACS Presidential Commission on Graduate Education in the Chemical Sciences
Paul Houston, Georgia Institute of Technology, Atlanta
The ACS Commission on Graduate Education in the Chemical Sciences: Recommendations of the Working Groups
Geraldine Richmond, University of Oregon, Eugene
Graduate Education in the Chemical Sciences: The Graduate Student Profile
George Whitesides, Harvard University, Cambridge, MA
Changing Graduate Education to Meet the Needs of Students and Society, Part 1
Shirley M. Malcom, AAAS Education and Human Resources, Washington, DC
Changing Graduate Education To Meet the Needs of Students and Society, Part 2
Gary Calabrese, Corning, Inc., NY
Changing Graduate Education to Meet the Needs of Students and Society, Part 3

How K-12 Curriculum Reform Can and Will Affect University Studies
Friday, 15 February 8:30AM-11:30AM
Organized by: Arthur Eisenkraft, University of Massachusetts, Boston

SPEAKERS
Gordon E. Uno, University of Oklahoma, Norman
Game-Changing Revisions in AP Science Courses
Susan Singer, Carleton College, Northfield, MN
Re-Visioning Lab Learning
James Pellegrino, University of Illinois, Chicago
Defining What Matters: The Processes and Products of the AP Science Redesign
Stephen Pruitt, Achieve Inc., Washington, DC
Next-Generation Science Standards

Preparing Our Future Scientific Work Force to Ensure the Success of Science
Friday, 15 February 1:00PM-2:30PM
Organized by: Bruce M. Alberts, AAAS/Science, San Francisco, CA; Cynthia N. Fuhrmann, University of Massachusetts Medical School, Worcester; Bill Lindstaedt, University of California, San Francisco

SPEAKERS
Paula Stephan, Georgia State University, Atlanta
Where Are They Going? Economic Trends of the Scientific Work Force
Gregory A. Petsko, Brandeis University, Waltham, MA
Improving the Career Preparation of Postdoctoral Trainees
Keith Yamamoto, University of California, San Francisco
Next Step Recommendations of the NIH Biomedical Work Force Committee

Accelerating School Readiness and Cumulative Academic Performance: Birth to Age 10
Friday, 15 February 3:00PM-4:30PM
Organized by: David L. Featherman, University of Michigan, Ann Arbor

SPEAKERS
Frederick J. Morrison, University of Michigan, Ann Arbor
Executive Functioning and Self-Regulation in Early School Outcomes
Stephanie M. Jones, Harvard University, Cambridge, MA
SECURe: Social-Emotional Learning and Literacy, Pre-K to Grade 3
Lisa Gennetian, ideas42, New York CIty
Incentivizing Parent-Child Interactions for School Readiness, Birth to Age 3
Where and How Are Research and Innovation Fostering Job Creation?
Friday, 15 February 3:00PM-4:30PM
SPEAKERS
Maria da Graça Carvalho, European Parliament, Brussels, Belgium
Innovating Out of the Crisis: The Role of Political Leaders in Fostering Job Creation
Luc Soete, Maastricht University, United Nations University, Netherlands
Innovating Out of the Crisis: On the Need for Radical Institutional Change
Barbara Haering, Econcept, Zurich, Switzerland
Innovating Out of the Crisis: Bridging Research, Demand, and Job Creation

Animals on Exhibit
Saturday, 16 February 8:00AM-9:30AM
Organized by: Joe Zammit-Lucia, Artist and Independent Scholar, Sag Harbor, NY; Linda Kalof, Michigan State University, Okemos
SPEAKERS
John Fraser, New Knowledge Organization, New York City
The Untapped Potential of Zoos in Conservation Science
Karen Rader, Virginia Commonwealth University, Richmond
Live Animals and Interactive Education in Museums
Anita Guerrini, Oregon State University, Corvallis
Natural History and the Ecology of Display

Undergraduate Science Education at a Crossroad: Responding to Research Findings
Saturday, 16 February 8:30AM-11:30AM
Organized by: Martin Storksdieck, National Research Council, Washington, DC; Jay B. Labov, U.S. National Academy of Sciences, Washington, DC; Susan Singer, Carleton College, Northfield, MN
SPEAKERS
Susan Singer, Carleton College, Northfield, MN
Consensus Emerging from Research About Effective Undergraduate Science Education
Jo Handelsman, Yale University, New Haven, CT
How Undergraduate Teaching Practice Influences Student Pathways in STEM
Ann Austin, Michigan State University, East Lansing
Promoting Evidence-Based Change in Undergraduate Science Education
Carl E. Wieman, Office of Science and Technology Policy, Executive Office of the U.S. President, Washington, DC
Transforming Undergraduate Science Education: A Policy Perspective

Increasing Diversity in Science: Learning from Successful Program Models
Saturday, 16 February 10:00AM-11:30AM
Organized by: Rebecca L. Smith, University of California, San Francisco
SPEAKERS
Chrysanthi Demetry, Worcester Polytechnic Institute, MA
Starting Early: Developing an Interest in Engineering Among Middle School Girls
Jean T. MacCormack, University of California, San Francisco
Getting to College: Research Internships to Build Students’ Academic Identities
Carlos Castillo-Chavez, Arizona State University, Tempe
From College to Careers in Science: Increasing the Pool of Minority Researchers

The 25th Anniversary of the First Collection in the History of Women in Science
Saturday, 16 February 1:30PM-4:30PM
Organized by: Pnina G. Abir-Am, Brandeis University, Waltham, MA; Joy Harvey, Independent Scholar, Somerville, MA
SPEAKERS
Margaret Walsh Rossiter, Cornell University, Ithaca, NY
Sue V. Rosser, San Francisco State University, CA
Policy-Making for Women in Science: From NSF Visiting Professorship for Women to ADVANCE
Nancy G. Slack, The Sage Colleges, Troy, NY
Writings on Creative Couples in Science by a Member of a Dual Career Scientific Couple
Pnina G. Abir-Am, Brandeis University, Waltham, MA
Women Scientists in the 1970s: An Ego-Histoire of a Lost Generation

Science After School: Scientists Inspire the Next Generation Outside of the Classroom
Sunday, 17 February 8:30AM-11:30AM
Organized by: Carol M. Tang, Coalition for Science After School, Berkeley, CA
SPEAKERS
Alan Friedman, Independent Consultant, New York City
Importance of Out-of-School Science Learning
Mariette DiChristina, Scientific American, New York City
Recruiting Scientists for Public Education
Rebecca L. Smith, University of California, San Francisco
Challenges and Opportunities for Scientists in After School Settings
Carol M. Tang, Coalition for Science After School, Berkeley, CA
Scientists in After School Programs: Models, Lessons, and Measurable Outcomes

Engaging Students in Complex Science Learning via Games and Simulations
Sunday, 17 February 1:00PM-2:30PM
SPEAKERS
Shari Metcalf, Harvard Graduate School of Education, Cambridge, MA
Using Blending Immersive Learning Environments To Teach Complex Causality
Susannah Gordon-Messer, MIT, Cambridge
Engaging Students While Addressing Science Standards in a Multiplayer Online Game
Jody Clarke Midura, Harvard Graduate School of Education, Cambridge, MA
Assessing Science Problem-Solving and Inquiry Skills in a Game-Like Environment

Creating Interdisciplinary Competency-Based Curricula for Undergraduate Students
Sunday, 17 February 1:30PM-4:30PM
Organized by: Dee U. Silverthorn, University of Texas, Austin; William R. Galey, Howard Hughes Medical Institute, Chevy Chase, MD
SPEAKERS
Catherine L. Drennan, MIT, Cambridge
Simple Strategies for Bringing Biology and Medicine into Introductory Chemistry
Claudia Neuhauser, University of Minnesota, Rochester
Mathematics and Statistics in an Integrated Curriculum for Future Health Professionals
E.F. Joe Redish, University of Maryland, College Park
Rethinking Physics for Biologists and Pre-Meds: The NEXUS Project
Dee U. Silverthorn, University of Texas, Austin
Competency Mapping for Integrated Curriculum

Overcoming Dualisms and Promoting Minority Inclusion in Science Networks and Pipelines
Sunday, 17 February 1:30PM-4:30PM
Organized by: Roberta Spalter-Roth, American Sociological Association, Washington, DC
SPEAKERS
Eduardo Bonilla-Silva, Duke University, Durham, NC
The Real Race Problem: The Power of White Rule
Benefits Beyond Beauty: Integration of Art into STEM Education and Research

Monday, 18 February  9:45AM-12:45PM
Organized by: Rieko Yajima, AAAS Center of Science, Policy, and Society Programs, Washington, DC; Gunalan Nadarajan, Maryland Institute College of Art, Baltimore

SPEAKERS
Gunalan Nadarajan, Maryland Institute College of Art, Baltimore
A National Network to Support Science, Engineering, Art, and Design Collaboration
Brian K. Smith, Rhode Island School of Design, Providence
STEM to STEAM: Developing New Frameworks for Art-Science Pedagogy
J.D. Talasek, National Academy of Sciences, Washington, DC
D.C. Art Science Evening Rendezvous
Marina McDougall, Exploratorium, San Francisco, CA
Art as a Way of Knowing

Environment and Ecology

A Science and Art Interface: Geographic Information Systems and Remotely Sensed Images

Friday, 15 February  8:00AM-9:30AM
Organized by: Daniel Griffith, University of Texas, Richardson; Ren Vasiiliac, State University of New York, Geneseo

SPEAKERS
Daniel Griffith, University of Texas, Richardson
Art and Spatial Statistics: Seeing Abstract Spatial Patterns Using GIS Visualization
Stephen Young, Salem State University, MA
Remote Sensing: The Art and Science of Seeing Our World, from the Micra to the Macro
Kim Yasuda, University of California, Santa Barbara
Experimental Geography: Mapping and Contemporary Art

Indigenous and Western Science: Collaborating for Better Research and Education
Friday, 15 February  10:00AM-11:30AM
Organized by: Patricia B. Campbell, Campbell-Kibler Associates, Groton, MA

SPEAKERS
Sean Chandler, Aaniih Nakoda College, Harlem, MT
Using Indigenous Knowledge To Improve Undergraduate STEM Education
Linda S. Differnt Cloud, Sitting Bull College, Fort Yates, ND
Restoring Plants, Restoring Culture: Ethnobotany and Restoration Ecology
Terry Tatsely, Blackfeet Community College, Browning, MT
Traditional Blackfeet II-NII (WA) Bison Harvest Methods

Partners for the Earth: Scientists and Religious Groups Working for the Environment
Friday, 15 February  3:00PM-4:30PM
Organized by: Jennifer Wiseman and Peyton West, AAAS Center of Science, Policy, and Society Programs, Washington, DC

SPEAKERS
Calvin DeWitt, Au Sable Institute of Environmental Studies, Maneslona, MI
Science, Christian Communities, and Creation Care
Bandana Kaur, EcoSikh, Washington, DC
Sikhs Mobilizing to Protect the Living Planet
Dayna Gibbons, Environmental Protection Agency, Washington, DC
The EPA’s Faith-Based and Neighborhood Partnerships Initiative

Converging on Climate Change: From Middens to Models, the Savannah to Snæfellsjökull
Saturday, 16 February  8:00AM-9:30AM
Organized by: Samantha Christey, European Research Council, Brussels, Belgium

SPEAKERS
Brian McKee Chase, Institute of Evolutionary Sciences, University of Montpellier, France
Rock Hyrax Middens and Climate Change in Southern Africa During the Last 50,000 Years
Maja Schlüter, Stockholm Resilience Center, Stockholm, Sweden
Impact of Social-Ecological Linkages on Human-Environment Systems
Siwan Manon Davies, Swansea University, United Kingdom
Tephra Constraints on Rapid Climatic Events

The Toxicological Impact of the Gulf of Mexico Oil Spill on Human and Wildlife Health
Saturday, 16 February  8:30AM-11:30AM
Organized by: John Pierce Wise Sr., University of Southern Maine, Portland; R. Joseph Griffitt, University of Southern Mississippi, Ocean Springs

SPEAKERS
Iain Kerr, Ocean Alliance, Gloucester, MA
Introduction to the Deepwater Horizon Accident
Samantha B. Joye, University of Georgia, Athens
Impact of the Gulf Oil Crisis on the Sea Floor
Carls Mitchelmore, University of Maryland Center for Environmental Science, Solomons, MD
Laboratory Studies to Assess the Effects of Oil Spill Chemical Dispersants on Corals
R. Joseph Griffitt, University of Southern Mississippi, Ocean Springs
Effects of Dispersed Oil on Larval Sheepshead Minnows
Greg Mayer, Texas Tech University, Lubbock
Weathering and Dispersion of Crude Oil Alter Its Toxicity in Fundulus Grandis
John Pierce Wise Sr., University of Southern Maine, Portland, ME
The Gulf of Mexico offshore Toxocolgy Study

New Dimensions of Biodiversity Science and Application

Saturday, 16 February  1:00PM-2:30PM
Organized by: Julia K. Parrish, University of Washington, Seattle; Sandy J. Andelman, Conservation International, Santa Barbara, CA

SPEAKERS
Selina Heppell, Oregon State University, Corvallis
Scale Matters: Linking Biodiversity Pattern and Process in Exploited Marine Systems
Samantha Davis, University of California, Santa Barbara
Global Partners, Local Data, and the Paradox of Biodiversity and Human Well-Being
Ailene K. Ettinger, University of Washington, Seattle
Public Engagement in Biodiversity Research

Finding the Fault: Sampling the Source of the M9.0 Tohoku Earthquake
Sunday, 17 February  8:00AM-9:30AM
Organized by: Charna Meth, Consortium for Ocean Leadership, Washington, DC

SPEAKERS
Frederick Chester, Texas A&M University, College Station
Defining the Structure of the Earthquake Fault by Geophysical Logging and Coring

www.eurekalert.org/aaasnewsroom • Visit the Web site for the latest updates and registration details.
Building Resilience of Coastal Communities to Environmental and Institutional Shocks

Sunday, 17 February 8:30AM-11:30AM
Organized by: Richard Pollnac, University of Rhode Island, Kingston; Joshua E. Cinner, James Cook University, Townsville, Australia

SPEAKERS
Lisa L. Colburn, NOAA, Narragansett, RI
Heathy Oceans, Healthy Communities: Indicators of Coastal Vulnerability and Resilience

Theresa L. Goedeke, NOAA, National Ocean Service National Centers for Coastal Ocean Science, Silver Spring, MD
Developing Indicators of Well-Being and Ecosystem Condition in Gulf Coast Counties

Dawn Kowtowicz, University of Hawaii Joint Institute for Marine and Atmospheric Research, Honolulu
Shifting Perceptions of Resilience in the Wake of the Indian Ocean Tsunami

Maria K. Dillard, NOAA, Hollings Marine Laboratory, Charleston, SC
Integrating Social and Ecological Resilience Indicators for Small Island Communities

Leila Sievanen, Brown University, Providence, RI
Adapting to Climate Variability in the Gulf of California, Mexico

Robert S. Pomeroy, University of Connecticut, Groton, CT
Community Resilience in a Changing Environment: Lessons from the Caribbean and Beyond

Spatially Distributed Environmental Factors and Health Effects

Sunday, 17 February 8:30AM-11:30AM
Organized by: Katherine B. Ensor, Rice University, Houston, TX

SPEAKERS
Stephan Sain, Institute for Mathematics Applied to Geosciences, Boulder, CO
Climate Health and Vulnerability in Urban Populations

Francesca Dominici, Harvard School of Public Health, Boston, MA
Estimating Relative Risk of Mortality Associated with Heat Waves in 105 U.S. Cities

Lance A. Waller, Emory University, Atlanta, GA
Spatial Uncertainty Estimation and Public Health Data

Dan Cohan, Rice University, Houston, TX
Uncertainties Influencing Health-Based Prioritization of Ozone Abatement Options

Global Perspectives and Issues

The Invisible Beauty: How Security Research Helped in Real Life, but Nobody Noticed

Friday, 15 February 8:00AM-9:30AM
Organized by: Stephan Lechner, Joint Research Center, Institute for the Protection and Security of the Citizen, Ispra, Italy

SPEAKERS
Stephan Lechner, Joint Research Center, Institute for the Protection and Security of the Citizen, Ispra, Italy
European Success Stories: The Best Tools Worldwide

Scott Borg, U.S. Cyber Consequences Unit, Norwich, VT
The Truth About Cyber Consequences

Global Food Security in Relation to Climate, Population, Technology, and Earth Changes

Friday, 15 February 1:30PM-4:30PM
Organized by: Felix Kogan and Alfred M. Powell, NOAA, Camp Springs, MD

SPEAKERS
Thomas R. Karl, NOAA National Climatic Data Center, Asheville, NC
Extreme Weather and Climate Events

Paul R. Ehrlich, Stanford University, CA
Feeding All While Avoiding a Collapse of Civilization: Science’s Greatest Challenge

Cynthia Rosenzweig, Goddard Institute for Space Studies, New York City
Improving Projections of Climate Impacts on Agriculture and Food Security

Felix Kogan, NOAA, Camp Springs, MD
Climate Constraints, Grain Production Trend, and Crop Losses

Lead: The Global Poison — Humans, Animals, and the Environment

Saturday, 16 February 8:30AM-11:30AM
Organized by: Mark A. Pokras, Tufts University, N. Grafton, MA; Ronnie Levin, U.S. Environmental Protection Agency, Boston, MA

SPEAKERS
A. Russell Regal, University of California, Santa Cruz
The History of Industrial Lead Contamination: Why Won’t It Go Away?

Joel Schwartz, Harvard School of Public Health, Boston, MA
Health Effects of Lead: What Is Known and What Is Coming

Mark A. Pokras, Tufts University, North Grafton, MA
Lead in Wildlife and Domestic Animals: Sources, Risks, and Pathology

Samantha Langley-Turnbaugh, University of Southern Maine, Gorham
Cycling of Lead in Soils: The Environment and Health

Jessica Wolpaw Reyes, Amherst College, MA
Economic Implications of Lead Contamination

Mary Jean Brown, Centers for Disease Control and Prevention, Atlanta, GA
Non-Essential Uses of Lead and Primary Prevention of Lead Poisoning

David E. Jacobs, National Center for Healthy Housing, Washington, DC
Lead Paint in Housing

Howard Mielke, Tulane University School of Medicine, New Orleans, LA
Lead In Soil
Measurement of Economic and Social Impacts of Science and Technology Investments

Friday, 15 February 8:30AM-11:30AM
Organized by: Yuko Ito and Aska Takeshio, National Institute of Science and Technology Policy, Tokyo, Japan

SPEAKERS
Stephen Merrill, National Academy of Sciences, Washington, DC
The Search for a Research ROI (Return on Investment)

Terutaka Kuwahara, National Institute of Science and Technology Policy, Tokyo, Japan
S&T Policy Research for Advancing Evidence-Based Policy-Making

Alison Alden, Higher Education Statistics Agency, Cheltenham, United Kingdom
Evidence Base for Impact of Research and Innovation in the U.K.: New Approaches

Rongping Mu, Chinese Academy of Sciences, Beijing
Index of Innovation Development and Its Implementation for Policy-Making in China

June Seung Lee, Korea Institute of Science and Technology Evaluation and Planning, Seoul
Impacts of S&T Investment as an Innovation Tool in Korea

Kohtaro Shiraishi, National Graduate Institute for Policy Studies, Tokyo, Japan
Achieving Sustainable Growth and Societal Development in Future Japan

A Tale of Two Networks: Connecting the African Drylands, Rio de Janeiro, and Women

Saturday, 16 February 10:00AM-11:30AM
Organized by: Gillian Bowser, Colorado State University, Fort Collins; Marcelo Vinces, National Science Foundation, Arlington, VA; Timothy L. Killeen, National Science Foundation, Arlington, VA

SPEAKERS
Noshir Contractor, Northwestern University, Evanston, IL
3DWomen: Exploring the Network Dynamics of Three Decades of Women Involved in Sustainable Development

Arno Scharl, MODUL University, Vienna, Austria
3DWomen: Exploring the Network Dynamics of Three Decades of Women Involved in Sustainable Development

Jesse Njoka, University of Nairobi, Kenya
African Drylands Center: A Higher Education Development Collaboration to Build Scientific Capacity

*Cardinal Warde, MIT, Cambridge
Building a Science Foundation: A Caribbean Model

*Bridging the Gap Between Global Environmental Change Research and Development

Saturday, 16 February 10:00AM-11:30AM
Organized by: Erika von Schneidemesser, National Science Foundation, Arlington, VA; Timothy L. Killeen, National Science Foundation, Arlington, VA

SPEAKERS
Robert Watson, Department of Environment, Food and Rural Affairs, London, United Kingdom
Co-Design: Why Broader Engagement Is Crucial for Global Change and Development Science

Alex Dehgan, U.S. Agency for International Development, Washington, DC
Catalyzing Global Action To Address Wicked Environmental and Development Challenges

Bonizella Biagini, The Global Environment Facility, Washington, DC
Global Environmental Change and What It Means for Development

The Role of Higher Education in Science Diplomacy: Possibilities and Potential Pitfalls

Saturday, 16 February 1:00PM-2:30PM
Organized by: Elizabeth E. Lyons, U.S. Department of State, Washington, DC

SPEAKERS
E. William Colglazier, U.S. Department of State, Washington, DC
Higher Education and United States Science Diplomacy

Jason E. Lane, State University of New York, Albany
Impact of International Branch Campuses on Science Diplomacy

Susan Buck Sutton, Bryn Mawr College, PA
Unintentional Diplomats: The Increasing Role of Higher Education in Science Diplomacy

Future Earth: International Coordination of Research for Global Sustainability

Saturday, 16 February 1:30PM-4:30PM
Organized by: Annika Thunborg, Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization, Vienna, Austria

SPEAKERS
Carthage Smith, International Council for Science, Paris, France
Coordinating International Science and Policy Efforts

Diana Liverman, University of Arizona, Tucson
The Future Earth Research Agenda, Including Scaling from Global to Regional Issues

Smart Phones, Smart Devices, Social Networks, and Smart Health Care

Saturday, 16 February 1:30PM-4:30PM
Organized by: Vinton Cerf, Google Inc., Reston, VA; Ram Srima, National Institute of Standards and Technology, Gaithersburg, MD

SPEAKERS
Ramesh Jain, University of California, Irvine
Mobile Social Life Networks in Health Care

Deborah Estrin, Cornell Tech, New York City
Transforming Health Care Through Mobile Platforms

Aydogan Ozer, University of California, Los Angeles
Photonics-Based Telemedicine Technologies Toward Smart Global Health Systems

Julian Goldman, Massachusetts General Hospital, Boston
Transforming Health Care Through Medical System Integration: From Architecture to Apps

Kyoung-Sook Kim, National Institute of Information and Communications Technology, Kyoto, Japan
Cyber Physical Data Cloud: An Event Processing System for Real-World Awareness

Vinton Cerf, Google Inc., Reston, VA
Smart Communications, Security, and Strong Authentication

Unreasonable Usefulness of Test-Ban Verification for Disaster Warning and Science

Sunday, 17 February 10:00AM-11:30AM
Organized by: Annika Thunborg, Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization, Vienna, Austria

SPEAKERS
David W. Strangway, Quest University, Kelowna, BC, Canada
Test-Ban Verification at the Intersection of Basic and Applied Science and Innovation

Mike Ishii, Harvard University, Cambridge, MA
Examples of the Uses of Comprehensive Nuclear-Test-Ban Treaty Verification Data for Advancing Earth Sciences

Raymond Jeanloz, University of California, Berkeley
How Advances in Earth Sciences Help Detect Nuclear Explosions
Networks of Discovery: Delivering Unsurpassed Insight into Changing Global Ecosystems

Sunday, 17 February 1:30PM-4:30PM
Organized by: Joe A. Tyburczy and Kristen Milligan, Oregon State University, Corvallis

SPEAKERS
Steven Gaines, University of California, Santa Barbara
Ecological Research Networks: A Powerful Paradigm for Understanding Global Changes

Bruce Menge, Oregon State University, Corvallis
PISCO: Research that Spans an Entire Large Marine Ecosystem Yields Valuable Insight

Stuart J. Davies, Smithsonian Institution
Global Earth Observatory, Washington, DC
Seeing the Forest for the Trees: SIGEO is Revolutionizing Understanding of Forests

Nancy Knowlton, Smithsonian Institution, Washington, DC
Smithsonian MarineGEO: Understanding Biodiversity of Coastal Oceans Across the Globe

Elizabeth Borger, University of Minnesota, St. Paul
The Nutrient Network: Grassroots Science to Address Global-Scale Environmental Change

Barbara Block, Stanford University, Pacific Grove, CA
Building A Wired Ocean With Electronic Tagged Animals and Mobile Gliders

Health and Pharmaceutical Science

Multi-Scale Study of Cancer
Friday, 15 February 8:00AM-9:30AM
Organized by: Mark Alber, University of Notre Dame, IN; Jil P. Mesirov, Broad Institute of MIT and Harvard University, Cambridge, MA

SPEAKERS
Philip Maini, University of Oxford, United Kingdom
Hybrid Approach to Multi-Scale Modeling of Cancer

Martin Nowak, Harvard University, Cambridge, MA
Dynamics of Targeted Cancer Therapy

Kathleen Wilkie, Tufts University School of Medicine, Boston, MA
Modeling in Cancer Immunology

Monitoring and Assuring the Quality of Essential Medicines
Friday, 15 February 1:00PM-2:30PM
Organized by: Joel Bremen and Gaurvika Nayyar, National Institutes of Health, Bethesda, MD

SPEAKERS
Facundo Fernandez, Georgia Institute of Technology, Atlanta
Field Technologies for Testing Poor Quality Medicines

John Clark, Pfizer Global Security, Groton, CT
Steps That Industry Is Taking To Protect Patients Against Counterfeit Medicines

Amir Attaran, University of Ottawa, ON, Canada
Trade in Fake Medicines Is Impossible to Stop Without Globalized Laws and Governance

The Benefits of Randomized Experiments for Science and Society
Friday, 15 February 1:00PM-2:30PM
Organized by: Daniel McCaffrey, RAND Corp., Pittsburgh, PA

SPEAKERS
Arthur Lupia, University of Michigan, Ann Arbor
Experimenting with Politics

Michael Kremer, Harvard University, Cambridge, MA
Experimenting with Public Health and Education in the Developing World

Susan Murphy, University of Michigan, Ann Arbor
Experimenting to Improve Clinical Practice

Scientific Advances and New Strategies for Reconstruction of Oral and Facial Tissues
Friday, 15 February 1:30PM-4:30PM

SPEAKERS
Mark Weislogel, Portland State University, OR

Robert G. Hale, U.S. Army Institute for Surgical Research, Fort Sam, Houston, TX
Challenges in Craniofacial Reconstruction Following Trauma

Thomas Barker, Georgia Institute of Technology, Atlanta
Novel Approaches for Controlling Fibrin Matrices to Mitigate Scar Formation

Stephen E. Feinberg, University of Michigan, Ann Arbor
Regenerating Human Oral Mucosa

David L. Cochran, University of Texas, San Antonio
Tissue-Engineered Gingival Augmentation

Kacey G. Marra, University of Pittsburgh, PA
Use of Adipose Stem Cells To Restore Subdermal Fat

Stroke Research: New Concepts and Innovative Solutions
Friday, 15 February 3:00PM-4:30PM
Organized by: Virginia Dambrauskaite and Ruxandra Dragha-Akli, European Commission, Directorate General for Research and Innovation, Brussels, Belgium

SPEAKERS
Costantino Iadecola, Weill Cornell Medical College, New York City
Great Expectations: The Promise of the Neurovascular Unit for Stroke Therapy

Molly Shoichet, University of Toronto, ON, Canada
Engineering Meets Medicine: Innovative Strategies To Overcome Stroke

Stephen Meairs, University Medical Center Mannheim, University of Heidelberg, Germany
The European Stroke Network: A Platform for Overcoming the Translational Roadblock

Cultivating the Science and Scientists for 21st Century Drug Discovery and Development
Sunday, 17 February 8:00AM-9:30AM
Organized by: Alice Clark, University of Mississippi, University

SPEAKERS
Kip Guy, St. Jude Children’s Research Hospital, Memphis, TN
Innovative Approaches to Identifying the Next Generation of Drugs

Alice Clark, University of Mississippi, University
New Models for Education and Training of Pharmaceutical Scientists

Garrett FitzGerald, University of Pennsylvania, Philadelphia
A New Paradigm for Therapeutics Discovery
Pathways to Health Equity for Aboriginal Peoples

Sunday, 17 February 10:00AM-11:30AM
Organized by: Danièle St-Jean, Canadian Institutes of Health Research, Ottawa, ON

SPEAKERS
Malcolm King, Canadian Institutes of Health Research’s Institute of Aging, Edmonton, AB
CIHR’s Signature Roadmap Initiative: Pathways to Health Equity for Aboriginal Peoples

Jeff Henderson, Black Hills Center for American Indian Health, Rapid City, SD
Collaborative Efforts and Best Practices as It Relates to Aboriginal People’s Health

Jennie R. Joe, University of Arizona College of Medicine, Tucson
Making Room in the Allopathic Arena for Native Practitioners: The Navajo Example

Engineering the Nervous System: Solutions to Restore Sight, Hearing, and Mobility

Sunday, 17 February 1:30PM-4:30PM
Organized by: Sanna Fowler, Ecole Polytechnique Fédérale de Lausanne, Switzerland

SPEAKERS
Stephanie P. Lacour, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Flexible Electronics for Interfacing with the Nervous System

Silvestro Micera, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Controlling a Prosthetic Hand with Peripheral Neural Interfaces

Grégoire Courtine, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Walking Again After Spinal Cord Injury

Konstantina M. Stankovic, Harvard Medical School, Boston, MA
Reversing Infant Deafness Through Genetic Engineering

Joan Miller, Harvard Medical School, Boston, MA
Saving Sight in Retinal Disease

Clinical Trial and Error: Beauty and the Beast

Sunday, 17 February 3:00PM-4:30PM
Organized by: Aidan Gilligan, SciCom—Making Sense of Science, Brussels, Belgium; Thomas Hartung, Johns Hopkins University, Baltimore, MD

SPEAKERS
Thomas Hartung, Johns Hopkins University, Baltimore, MD
Look Back in Anger? What Clinical Trials Tell Us About Preclinical Research

Jay Siegel, Janssen Research and Development, Raritan, NJ
Product-Oriented Versus Health Care-Oriented Clinical Trials

Paul J. Kenny, The Scripps Research Institute, Jupiter, FL
The Latest Clinical Trial Research on Brain Reward Systems

Control Engineering of Brain in Health and Disease

Sunday, 17 February 3:00PM-4:30PM
Organized by: Alok Sinha, Steven J. Schiff, and Mauricio Terrones, Pennsylvania State University, University Park

SPEAKERS
Albert-Laszlo Barabasi, Northeastern University, Boston, MA
Taming Complexity: Controlling Networks

Jeffrey G. Ojemann, University of Washington, Seattle
Dynamics of Human Learning of a Brain-Computer Interface

Steven J. Schiff, Pennsylvania State University, University Park
Towards Model-Based Observation and Control of Brain Networks

Stem Cell–Based Bioartificial Tissues and Organs

Monday, 18 February 9:45AM-11:15AM
Organized by: Sabina Bossi, Karolinska Institute, Stockholm, Sweden

SPEAKERS
Paolo Macchiarini, University of Barcelona and Karolinska Institute, Stockholm, Sweden
Regenerative Biotechnological Treatment

Ola Hermanson, Karolinska Institute, Stockholm, Sweden
Molecular and Cellular Effects of Transplanting Artificial Organs

Philipp Jungebluth, The Cardiothoracic Surgery Network and Karolinska Institute, Stockholm, Sweden
Clinical Transplantation of a Tissue-Engineered Airway

Materials Science and Chemistry

Quantum Sensors: Toward the Ultimate Limits

Friday, 15 February 8:00AM-9:30AM
Organized by: Martin Laforest, University of Waterloo, ON, Canada

SPEAKERS
Raffi Budakian, University of Illinois, Urbana-Champaign
The Ultimate MRI: Magnetic Resonance Force Microscopy

Amir Yacoby, Harvard University, Cambridge, MA
Another Use for Diamond: Improved Scanning Probe Microscopy

David G. Cory, University of Waterloo, ON, Canada
Reinventing Neutron Interferometry Using Quantum Information Theory

Watching Atoms Move: From Structures to Dynamics to Mesoscale Processes

Friday, 15 February 10:00AM-11:30AM
Organized by: Donald Baer, Pacific Northwest National Laboratory, Richland, WA; Eric Stach, Brookhaven National Laboratory, Upton, NY

SPEAKERS
Stephen J. Pennycook, Oak Ridge National Laboratory, TN
Direct Imaging of Atomic Structures

R. J. Dwayne Miller, University of Hamburg, Germany
Making the Molecular Movie

Nigel Browning, Pacific Northwest National Laboratory, Richland, WA
Observing Dynamic Processes in Real Time

Translation of Mussel Adhesion to Beneficial New Concepts and Materials

Saturday, 16 February 8:30AM-11:30AM
Organized by: Herbert Waite and Alison Butler, University of California, Santa Barbara

SPEAKERS
Emily Carrington, University of Washington, Friday Harbor
Mussel Attachment in Changing Climates: An Ecomaterial Approach

Herbert Waite, University of California, Santa Barbara
Wet Adhesion: Learning How from Mussels

Phillip Messersmith, Northwestern University, Evanston, IL
Mussel-Inspired Materials for Surgical Repair and Drug Delivery

Marcus Textor, ETH Zürich, Switzerland
Biomedical Applications of Ultra-Small Magnetic Nanoparticles

Attosecond Science in Chemical, Molecular Imaging, Spintronics, and Energy Science

Sunday, 17 February 8:30AM-11:30AM
Organized by: Andre D. Bandrauk, University of Sherbrooke, QC, Canada; Margaret M. Murnane, University of Colorado, Boulder

SPEAKERS
Tenio Popmintchev, University of Colorado, Boulder
Attosecond Pulse Generation and Intense Ultrafast Laser Technology

Ali Belkacem, Lawrence Berkeley National Laboratory, CA
Attosecond Science for Steering Chemical Reactions
Surprises at the Frontier of the Periodic Table: Novel Paradigms in Actinide Science

Sunday, 17 February
Organized by: Roberto Caciuffo, Joint Research Center, European Commission, Eggenstein-Leopoldshafen, Germany; Geraldine Barry, Joint Research Center, European Commission, Eggenstein-Leopoldshafen, Germany

SPEAKERS
David L. Clark, Los Alamos National Laboratory, NM
- Covalency and the Relative Roles of 5f and 6d Orbitals in Actinide-Metal-Ligand Bonds
Piers Coleman, Rutgers University, Piscataway, NJ
- Frontiers in Correlated Electronic Matter
Robin Grimes, Imperial College London, United Kingdom
- Generating the Option of a Two-Stage Nuclear Renaissance

Nucleic Acid Nanotechnology
Sunday, 17 February
Organized by: Andrew D. Ellington, University of Texas, Austin

SPEAKERS
Nadrian C. Seeman, New York University, New York City
- Controlling the Structure of Matter Using the Information in DNA
William M. Shih, Harvard University, Boston, MA
- Self-Assembled DNA Nanostructure Tools for Molecular Biophysics
Erik Winfree, California Institute of Technology, Pasadena
- Chemistry as a New Information Technology
Greg F. Heath, Illumina, Inc., San Diego, CA
- Improving Health Care: The Role of Next-Generation Sequencing
Hanadi Sleiman, McGill University, Montreal, QC, Canada
- DNA Cages and Nanotubes: Simple, DNA Minimal Synthesis and Biological Properties

Remembering Galileo: Lithium Ion Batteries, Atomic Clocks, and Other Stories
Monday, 18 February
Organized by: Carlos Saravia Martins, European Commission, Brussels, Belgium

SPEAKERS
Jean-Marie Tarascon, University of Picardie Jules Verne, Amiens, France
- Li-Ion Batteries: From the Spacecraft Galileo to Our Cars and Grid
Mildred Dresselhaus, MIT, Cambridge
- From Galileo to Nanotechnologies
Peter Whibberley, National Physical Laboratory, Middlesex, United Kingdom
- Precision Time for Satellite Clocks Characterization and Monitoring

Physical Sciences
Is Beauty Truth? Mathematics in Physics from Dirac to the Higgs Boson and Beyond
Friday, 15 February
Organized by: Thomas J. Kelleher III, Basic Books, New York City

SPEAKERS
Graham Farmelo, Science Museum, London, United Kingdom
- Paul Dirac and the Religion of Mathematical Beauty
Frank Close, University of Oxford, United Kingdom
- Hidden Symmetry and the Birth of Quantum Electroweak Dynamics
Chris Quigg, Fermi National Accelerator Laboratory, Batavia, IL
- Particle Physics in a Season of Change

Mathematics of Tipping Points: Framework, Applications, and Prediction
Friday, 15 February
Organized by: Mary Lou Zeeman, Bowdoin College, Brunswick, ME; Mary Silber, Northwestern University, Evanston, IL

SPEAKERS
Mary Silber, Northwestern University, Evanston, IL
- Tipping Points: Overview and Challenges
Sebastian Wieczorek, University of Exeter, United Kingdom
- Rate Induced Tipping Points: The Compost Bomb Instability
Marten Scheffer, Wageningen University, Netherlands
- Forseeing Critical Transitions

Exploring Other Worlds and Seeing Our Own Anew
Friday, 15 February
Organized by: Samuel P. Kounaves, Tufts University, Medford, MA

SPEAKERS
Samuel P. Kounaves, Tufts University, Medford, MA
- Forty Years of Martian Chronicles: A Very Familiar Yet Alien World
Sanjay S. Limaye, University of Wisconsin, Madison
- Venus: The Hot Sister of Earth
Robert T. Pappalardo, NASA Jet Propulsion Laboratory, Pasadena, CA
- The Icy But Warm Moons of Jupiter
Bethany L. Ehlmann, California Institute of Technology, Pasadena
- The Earliest Aqueous, Habitable Environments on Mars: A View from Orbit
Amanda R. Hendrix, Planetary Science Institute, Tucson, AZ
- The Organic Lakes of Titan and Other Moons of Saturn
David T. Blewett, Johns Hopkins University, Laurel, MD
- Reconsidering Our Ideas of Mercury

The Beauty and Utility of Scientific Images
Friday, 15 February
Organized by: Kartik Sheth, National Radio Astronomy Observatory, Charlottesville, VA; Margaret Meixner, Space Telescope Science Institute, Baltimore, MD

SPEAKERS
Stefi Baum, Rochester Institute of Technology, NY
- From Star to Shining Galaxy: The Impact of Astronomical Imaging
Tom Kirchhausen, Harvard Medical School, Boston, MA
- Clathrin Coats: Now You See It, Now You Don’t
David Yousem, Johns Hopkins Medical Institution, Baltimore, MD
- The Beauty of the Brain and the Mind
Alfred McEwen, University of Arizona, Tucson
- Imaging of Planetary Surfaces
Claudia Ford, Antioch University, Providence, RI
- Beautiful Theory: Development of the Ecological Resilience Adaptive Cycle as a Model

Tiny But Mighty: Neutrinos and the New Frontiers of Science
Friday, 15 February
Organized by: Katie Yurkewicz, Fermi National Accelerator Laboratory, Batavia, IL

SPEAKERS
Sam Zeller, Fermi National Accelerator Laboratory, Batavia, IL
- Nature’s Mysterious Messengers
Christian Spiering, DESY, Zeuthen, Germany
*Underground, Underwater, Under Ice: Capturing Cosmic Neutrinos*

Chang Kee Jung, State University of New York, Stony Brook
*The Challenging Art of Creating and Catching Human-Made Neutrinos*

**Compressive Sensing: Sensing Sparse Phenomena in Theory and Practice**
Saturday, 16 February 8:30AM-11:30AM
Organized by: Mark Davenport, Georgia Institute of Technology, Atlanta; Emmanuel Candès, Stanford University, CA

**SPEAKERS**
Mark Davenport, Georgia Institute of Technology, Atlanta
*A Compressive Introduction to Compressive Sensing*

David Brady, Duke University, Durham, NC
*Compressive Tomography*

Anna Gilbert, University of Michigan, Ann Arbor
*Applications of Sparse Signal Recovery in Biological Testing*

Justin Romberg, Georgia Institute of Technology, Atlanta
*Blind Deconvolution Using Convex Programming*

Rachel Ward, University of Texas, Austin
*Restricted Isometries and Johnson-Lindenstrauss Mappings: Equivalent with a Few Flips*

**Neutrinos: Nature's Smallest Surprises**
Saturday, 16 February 8:30AM-11:30AM
Organized by: Janet Conrad, MIT, Cambridge

**SPEAKERS**
Boris Kayser, Fermi National Accelerator Laboratory, Batavia, IL
*Overview and Open Questions*

Janet Conrad, MIT, Cambridge, MA
*Neutrino Detectors*

Ryan Patterson, California Institute of Technology, Pasadena
*Neutrino Oscillations and the Search for CP-Symmetry Violation*

Giorgio Gratta, Stanford University, CA
*Are Neutrinos Their Own Antiparticles?*

Mark Vagins, Kavli Institute for the Physics and Mathematics of the Universe, Kashiwa, Japan
*Astrophysical Neutrinos*

Nikolai Tolich, University of Washington, Seattle
*Geoneutrinos*

**Predictability: From Physical to Data Sciences**
Saturday, 16 February 8:30AM-11:30AM
Organized by: Albert-Laszlo Barabasi, Northeastern University, Boston, MA

**SPEAKERS**
Dirk Helbing, Swiss Federal Institute of Technology, Zurich, Switzerland
*Towards Simulating the Foundations of Society*

Chaoxing Song, Northeastern University, Boston, MA
*Chaos in Human Mobility*

Marta Gonzalez, MIT, Cambridge
*Understanding Road Usage Patterns in Urban Areas*

Alessandro Vespignani, Northeastern University, Boston, MA
*From Human Mobility to Real Time: Visualizing the Impact of Urbanization on Pandemic Spreading*

Dirk Brockmann, Northwestern University, Evanston, IL
*Are Pandemics Predictable?*

Boleslaw Szymanski, Rensselaer Polytechnic Institute, Troy, NY
*On the Influence of Committed Minorities on Social Consensus*

**Worldwide Progress Toward Fusion Energy**
Saturday, 16 February 8:30AM-11:30AM
Organized by: Ned R. Sauthoff, Oak Ridge National Laboratory, TN

**SPEAKERS**
Richard J. Hawryluk, ITER Organization, St. Paul Lez Durance, France
*ITER: A Magnetically Confined Burning Plasma*

Debra A. Callahan, Lawrence Livermore National Laboratory, CA
*The National Ignition Facility and the Ignition Campaign*

Amanda Hubbard, MIT, Cambridge
*Advances in Burning Plasma-Related Physics and Technology in Magnetic Fusion*

Robert L. McCrory, University of Rochester, NY
*Alternate Approaches/Drive in Inertial-Confinement Fusion*

G. H. “Hutch” Neilson, Princeton Plasma Physics Laboratory, NJ
*Issues and Paths to Magnetic Confinement Fusion Energy*

Mike Dunne, Lawrence Livermore National Laboratory, CA
*The Pathway to Laser Inertial Fusion Energy (LIFE)*

**How Fundamental Computing Research Touches Everyday Lives**
Saturday, 16 February 10:00AM-11:30AM
Organized by: Erwin P. Gianchandani and Andrew Bernat, Computing Research Association, Washington, DC

**SPEAKERS**
Jeanette M. Wing, Carnegie Mellon University, Pittsburgh, PA
*A Day in Your Life*

Kevin Knight, University of Southern California, Marina del Ray
*Human Language Technology: What Machines Do with Text and Speech*

Andrew W. Lo, MIT, Cambridge
*Measuring and Managing the Complexity of the Financial System*

**Predictive Model of the Internal Combustion Engine**
Saturday, 16 February 1:30PM-4:30PM
Organized by: Ahren Jasper and Nils Hansen, Sandia National Laboratories, Livermore, CA

**SPEAKERS**
Nils Hansen, Sandia National Laboratories, Livermore, CA
*Exploring Combustion Chemistry in Laboratory-Based Flames*

Stephen Kiplingsten, Argonne National Laboratory, IL
*Current Challenges in Computational Kinetics for Predictive Modeling*

William Green, MIT, Cambridge, MA
*Chemical Kinetics and Modeling of Combustion*

*Katharina Kohse-Höinghaus, University of Bielefeld, Germany
*Combustion Chemistry*

*Alison Tomlin, University of Leeds, United Kingdom
*Chemical Models for Combustion*

Sibendu Som, Argonne National Laboratory, IL
*Simulations of Compression Ignition Engines with Detailed Chemistry and Spray Models*

**Understanding the Universe Through Images of the Cosmic Microwave Background**
Saturday, 16 February 1:30PM-4:30PM
Organized by: Asantha Cooray, University of California, Irvine

**SPEAKERS**
Marc Kamionkowski, Johns Hopkins University, Baltimore, MD
*Theoretical Overview of Cosmic Microwave Background Studies*

Lyman Page, Princeton University, NJ
*Results from the Wilkinson Microwave Anisotropy Probe*

Bruce Partridge, Haverford College, PA
*Results from the Planck Mission*

Mark Devlin, University of Pennsylvania, Philadelphia
*Atacama Cosmology Telescope: Status and Results*

John Carlstrom, University of Chicago, IL
*The South Pole Telescope: Status and New Results*

James Bock, California Institute of Technology, Pasadena
*Technology Developments and Applications in the CMB Studies*

*Invited*
What's Hot in Cold
Sunday, 17 February 8:30AM-11:30AM
Organized by: Charles W. Clark, Joint Quantum Institute, Gaithersburg, MD

SPEAKERS
Markus Greiner, Harvard University, Cambridge, MA
Quantum Simulation: A Microscopic View of Quantum Matter
Ana Maria Rey, University of Colorado, Boulder
Atomic Clocks: From Precise Timekeepers to Quantum Simulators
Daniel Greif, ETH Zurich, Switzerland
Exploring Dirac Points with Ultracold Fermions in a Tunable Honeycomb Lattice
Gretchen Campbell, Joint Quantum Institute, Gaithersburg, MD
Superflow in Bose-Einstein Condensate Rings: Tunable Weak Links in Atom Circuits
Benjamin Lev, Stanford University, CA
New Physics in Strongly Magnetic Ultracold Gases

Beauty and the Beast: Supersymmetry and the Dark Matter in the Universe
Sunday, 17 February 1:30PM-4:30PM
Organized by: Maria Spiropulu, California Institute of Technology, Pasadena

SPEAKERS
Lisa Randall, Harvard University, Cambridge, MA
Particle Physics Models with Dark Matter
Claudio Campagnari, University of California, Santa Barbara
Supersymmetry at the Compact Muon Solenoid Experiment of the CERN LHC
Dan Tovey, University of Sheffield, England
Supersymmetry at the ATLAS Experiment of the CERN LHC
Jonathan Feng, University of California, Irvine
The WIMP Miracle and Other Dark Matter Ideas
Neal Weiner, New York University, New York City
The Dynamics of Dark Matter

The Mirror World of Antiatoms and Antimolecules
Sunday, 17 February 1:30PM-4:30PM
Organized by: Charles W. Clark, Joint Quantum Institute, Gaithersburg, MD; Michael J. Brungen, Flinders University, Adelaide, Australia

SPEAKERS
Eun-suk Seo, University of Maryland, College Park
Searching the Cosmos for Antihelium
Michael Charlton, Swansea University, Swansea, Wales
Resonant Quantum Transitions in Trapped Antihydrogen Atoms
Eric A. Hessels, York University, Toronto, ON, Canada
Trapped Antihydrogen in Its Ground State
David Cassidy, University of California, Riverside
Positronium and its Molecules
Masaki Hori, Max Planck Institute for Quantum Optics, Garching, Germany
Laser Spectroscopy of Antiprotonic Helium

The Higgs Boson: Past, Present, and Future
Monday, 18 February 9:45AM-11:15AM
Organized by: James Gillies, European Organization for Nuclear Research (CERN), Geneva, Switzerland

SPEAKERS
Joseph Lykken, Fermi National Accelerator Laboratory, Batavia, IL
What the Latest Results on the Higgs Tell Us
Howard Gordon, Brookhaven National Laboratory, Upton, NY
The LHC Experiments and Their Physics Accomplishments
Joseph Incandela, University of California, Santa Barbara
The Hunt for the Higgs: Has the Origin of Mass Been Found?

Public Policy
Promoting Collaborative, Policy-Relevant Science: Learning from Fulbright
Friday, 15 February 8:30AM-11:30AM
Organized by: Patrick Feng, University of Calgary, AB, Canada; Walter E. Baethgen, Columbia University, Palisades, NY

SPEAKERS
Walter E. Baethgen, Columbia University, Palisades, NY
Building Linkages Between Science and Policy
Ana Maria Loboguerrero, Government of Colombia, Bogotá
Engaging Policy-Makers on Climate Change: Experiences from Latin America
Roderick King, Massachusetts General Hospital, Boston
Using International Collaborations to Tackle Global Health
Suzanne Pierce, University of Texas, Austin
How Collaboration Platforms Can Benefit Science and Advance Research
Rodrigo Patiño, Cinvestav-Unidad Mérida, Mexico
Influence of Local Context on Energy Policy and Innovation
Laura Forlano, Illinois Institute of Technology, Chicago
Fostering Collaborative and Policy-Relevant Science: Lessons from Fulbright

Predicting Major Events and Planning for Hazards: An Art or Science?
Friday, 15 February 10:00AM-11:30AM
Organized by: Julia Wilson, Sense About Science, London, United Kingdom; Albert Yuan, San Lian Life Weekly, Beijing, China

SPEAKERS
Kelvin Wang, Geological Survey of Canada, Sidney, BC
Operational Earthquake Prediction: Castles in the Air
Azra Ghani, MRC Center for Outbreak Analysis and Modeling, London, United Kingdom
Disease Scarcities: Predicting and Preparing for Outbreaks
Peter Webster, Georgia Institute of Technology, Atlanta
Assessing Risk from Climate Change: Scenario Generation Versus Prediction

Tales of the Unexpected: How Science Advisers Manage Uncertainty
Friday, 15 February 10:00AM-11:30AM
Organized by: Geraldine Barry, Joint Research Centre, European Commission, Brussels, Belgium

SPEAKERS
Anne Glover, European Commission, Brussels, Belgium
Uncertainty: Perception Is Reality
John P. Holdren, Office of Science and Technology Policy, Washington, DC
Uncertainty in Policy Advice: A U.S. Perspective
Miles Parker, Department for Environment, Food, and Rural Affairs, London, United Kingdom
Uncertainty, Ignorance and Open Policy-Making

Getting What We Pay For: Incentives, Peer Review, and Conservatism in Science
Friday, 15 February 1:00PM-2:30PM
Organized by: P. Kyle Stanford, University of California, Irvine

SPEAKERS
P. Kyle Stanford, University of California, Irvine
Changing Incentives and the Closing of the Scientific Mind
Carole J. Lee, University of Washington, Seattle
Double-Speak in Science: Scientific Standards Versus Peer-Review Practices
Kevin J.S. Zollman, Carnegie Mellon University, Pittsburgh, PA
Understanding the Reward System of Science: An Economic Approach
Convergence of Physical, Engineering, and Life Sciences: Next Innovation Economy

Friday, 15 February 1:30PM-4:30PM
Organized by: Larry A. Nagahara, National Cancer Institute, Bethesda, MD

SPEAKERS
Tyler Jacks, MIT, Cambridge
Conquering Cancer Through the Convergence of Science and Engineering
Chad Mirkin, Northwestern University, Evanston, IL
Nanostructures in Biology and Medicine
Franziska Michor, Dana Farber Cancer Institute, Boston, MA
Beauty of Evolutionary Dynamics and Applied Mathematics for the Benefit of Oncology
Robert Austin, Princeton University, NJ
Physics of Cancer: The Impact of Heterogeneity
David Agus, University of Southern California, Los Angeles
End of Illness

The Science of Politics

Friday, 15 February 1:30PM-4:30PM
Organized by: David Lazer, Northeastern University, Boston, MA; Barbara Jasny, AAAS/Science, Washington, DC

SPEAKERS
Donald Green, Yale University, New Haven, CT
Field Experiments in Political Science: An Overview of Advances
Susan Hyde, Yale University, New Haven, CT
The Diffusion of Democratic Norms
David Lazer, Northeastern University, Boston, MA
Network Science Meets Political Science
Rose McDermott, Brown University, Providence, RI
Biological Influences on Political Outcomes
Daniel Diermeier, Northwestern University, Evanston, IL
Modeling Politics: Promise and Limits of Formal Models in Political Science

Understanding and Communicating Uncertainty in Climate Change Science

Friday, 15 February 3:00PM-4:30PM
Organized by: Richard L. Smith, University of North Carolina, Chapel Hill

SPEAKERS
Murali Haran, Pennsylvania State University, University Park
Using Models and Data to Learn About the Future of the Climate
Mark Berliner, Ohio State University, Columbus
Informing Climate Policy-Makers
Leonard A. Smith, London School of Economics and Political Science, United Kingdom

Two-Way Communication with Decision-Makers on Uncertainties of Climate Science

Capturing “Complicated Duality”: Evaluating the Outcomes and Impacts of Science

Saturday, 16 February 1:00PM-2:30PM
Organized by: Julia E. Melkers, Georgia Institute of Technology, Atlanta

SPEAKERS
Kaye Fealing, University of Minnesota, Minneapolis
What Science Policy Questions Can We Really Answer?
Julia Lane, American Institutes for Research, Washington, DC
Using Topic Modeling To Describe Science: International Experiences
Julia E. Melkers, Georgia Institute of Technology, Atlanta
Beauty or Beast? Evaluation of Science in an Age of Accountability

Can Exposure Science Quell the Furor over Environmental Endocrine Disruption?

Saturday, 16 February 1:30PM-4:30PM
Organized by: Justin G. Teegarden, Pacific Northwest National Laboratory, Richland, WA

SPEAKERS
Russ Hauser, Harvard School of Public Health, Boston, MA
BPA and Human Health: Epidemiologic Evidence and Its Interpretation
K. Barry Delclos, National Center for Toxicological Research, U.S. Food and Drug Administration, Jefferson, AR
Relating Internal BPA Doses to Adverse Effects in Rodent Toxicity Studies
Daniel R. Doerge, National Center for Toxicological Research, U.S. Food and Drug Administration, Jefferson, AR
BPA Pharmacokinetics in the Adult and Perinatal Periods in Experimental Animals
Justin G. Teegarden, Pacific Northwest National Laboratory, Richland, WA
Estrogen Receptor Activation Potential of Internal Concentrations of BPA in Humans
Jeffrey Fisher, National Center for Toxicological Research, U.S. Food and Drug Administration, Jefferson, AR
Estimating Infant and Adult Human Serum Levels of Unconjugated Bisphenol A
Richard M. Sharpe, University of Edinburgh, United Kingdom
Are Causal Associations in Epidemiological Studies of BPA Exposure Plausible?

Advanced Manufacturing: Today, Tomorrow, and Beyond

Sunday, 17 February 8:30AM-11:30AM
Organized by: Stephanie Shipp, Science and Technology Policy Institute, Washington, DC

SPEAKERS
Kent Hughes, Woodrow Wilson Center, Washington, DC
The Past and Future of Advanced Manufacturing Partnerships
Sanjay E. Sarma, MIT, Cambridge
Advancing to Advanced Manufacturing: Avoiding the Tyranny of Bulk
Dieter Ernst, East-West Center, Honolulu, HI
Indigenous Innovation and Its Effect on China’s Semiconductor Industry
Nayanee Gupta, Science and Technology Policy Institute, Washington, DC
Future Global Trends in Advanced Manufacturing
Stephen Ezell, Information Technology and Innovation Foundation, Washington, DC
A Strategy for Revitalizing American Manufacturing and Traded Sector Competitiveness
Christopher Hill, SRI International, Knoxville, TN
The Role of Advanced Manufacturing in the Post-Scientific Society

Effective Science for Community Adaptation to Climate Change

Sunday, 17 February 8:30AM-11:30AM
Organized by: Thomas Webler, Social and Environmental Research Institute, Greenfield, MA

SPEAKERS
JoAnn Carmin, MIT, Cambridge, MA
Knowledge Needs and Applications in Urban Climate Adaptation
Kirstin Dow, University of South Carolina, Columbia
Understanding Local Adaptation Concerns and Challenges in South Carolina
Paul H. Kirshen, University of New Hampshire, Durham
Water Infrastructure Management Under a Changing Climate
Susanne C. Moser, Susanne Moser Research and Consulting, Santa Cruz, CA
Defining Adaptation Success: Views from Science and Coastal Management
William Solecki, CUNY Institute for Sustainable Cities, Hunter College, New York City
Connections Between Climate Change Science and Adaptation Planning in New York City
Thomas Webler, Social and Environmental Research Institute, Greenfield, MA
Progress in New Tools for Participatory Vulnerability Analysis to Climate Stressors

Role of Science in the American Democracy: Roots, Tensions, and Paths Forward

Sunday, 17 February 8:30AM-11:30AM
Organized by: Peter Frumhoff and Pallavi Phartiyal, Union of Concerned Scientists, Cambridge, MA; James McCarthy, Harvard University, Cambridge, MA
**SPEAKERS**
Sheila Jasanoff, Harvard University, Cambridge, MA
*Citizenship and the Personal Genomics Revolution*

Dan M. Kahan, Yale Law School, New Haven, CT
*Democracy, Cultural Cognition, and the Science Communication Environment*

Francesca T. Grifo, Union of Concerned Scientists, Washington, DC
*Tools for Strengthening Scientific Integrity in Federal Decision-Making*

*Olympia Snowe, U.S. Senate, Washington, DC
Restoring Evidence-Based Decision-Making to the U.S. Congress*

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**Toward Bridging the Duality of Science: Seed-Push, Issue-Driven, or “Encounter”?**

Sunday, 17 February 8:30AM-11:30AM
Organized by: Tateo Arimoto, National Graduate School for Policy Studies, Tokyo, Japan; Yuki Harayama, Organization for Economic Cooperation and Development, Paris, France; Chikako Maeda, Japan Science and Technology Agency, Tokyo, Japan

**SPEAKERS**
Kumi Okuwada, National Institute of Science and Technology Policy, Tokyo, Japan
*Transformation of Foresight Activities Toward Science, Technology, and Innovation Policy*

Daniel Sarewitz, Arizona State University, Tempe
*Outcome-Oriented Research and Development Strategy*

Nobuhide Kasagi, Japan Science and Technology Agency, Tokyo
*How We Can Direct and Link Scientific Research to Social Wishes*

Barbara J. Sahakian, University of Cambridge, UK
*A Vision for Excelling in Mental Health and Well-Being*

Frans Brom, Rathenau Institute, The Hague, Netherlands
*Research and Development Response to Societal Needs in the Information Technology Area*

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**Coal, Communities, Commerce, and China: A Nexus for the Sciences and Public Policy**

Sunday, 17 February 1:30PM-4:30PM
Organized by: Donna Gerardi Riordan, DGR Strategies, Eastsound, WA

**SPEAKERS**
Dan Kammen, University of California, Berkeley
*Energy and the Coal Economy*

Melissa Ahern, Washington State University, Spokane
*Impact of Exposure to Coal Dust on Animal and Human Health*

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**Sustainability and Resource Management**

**Socio-Hydrology: Co-Evolution and Future of Human-Water Resource Systems**

Friday, 15 February 8:00AM-9:30AM
Organized by: Veena Srinivasan, Pacific Institute, Oakland, CA

**SPEAKERS**
James Wescoat, MIT, Cambridge, MA
*Rethinking the “Duty of Water” Concept in Socio-Hydrology*

Ignacio Rodriguez-Iturbe, Princeton University, NJ
*Observed and Potential Global Pathways of Virtual Water Trade*

Christopher Scott, University of Arizona, Tucson
*Resource-Use Efficiency, Once Paradigm Now Paradox: The Socio-Hydrology of Waste*

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**Getting to Global Ecological Sustainability: Climate and Small-Planet Ethics**

Friday, 15 February 8:30AM-11:30AM
Organized by: Kai Ming A. Chan and Paige Olmsted, University of British Columbia, Vancouver, Canada

**SPEAKERS**
Jonathan A. Foley, University of Minnesota, St. Paul
*Meeting Global Needs of Food, Fiber, Fuel, and Freshwater: All from One Planet*

David Wilcove, Princeton University, NJ
*Mission Impossible: “Proof-First” Management of Complex Adaptive Systems*

Kai Ming A. Chan, University of British Columbia, Vancouver, Canada
*Toward Integrative Science-Inspired Solution-Structures for Sustainability: e.g., C3*

Jane M. Lubchenco, Oregon State University, Corvallis
*Meeting the Monumental Challenges of Climate Change and Other Drivers*

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**Global Health and Environmental Impacts of E-Waste Recycling**

Friday, 15 February 3:00PM-4:30PM
Organized by: Erica L. Dahl, SafeBridge Consultants Inc., New York City; Bruce A. Fowler, ICF International, Fairfax, VA

**SPEAKERS**
Sanmi Areola, Environmental Health Services, Metro Public Health Department, Nashville, TN
*The Scope of the Problem: International Regulation and the Basel Treaty*

Myrto Petreas, California Department of Toxic Substances Control, Berkeley
*Regulated and Unregulated Contaminants in California Waste Streams*

Aimin Chen, University of Cincinnati Department of Environmental Health, OH
*E-Waste Recycling in Developing Countries: Concerns of Developmental Toxicity*

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**Sustainable Chemical Manufacturing in a Resource-Limited World**

Saturday, 16 February 8:00AM-9:30AM
Organized by: Susannah Scott, University of California, Santa Barbara

**SPEAKERS**
Paul J. Chirik, Princeton University, NJ
*Modern Alchemy for Industrial Commodity Chemical and Pharmaceutical Synthesis*
Stephen A. Miller, University of Florida, Gainesville
- Redesigning Petroleum-Based Plastics with Renewable Feedstocks

Theresa G. Kotanchek, The Dow Chemical Company, Midland, MI
- Sustainable Chemical Manufacturing Is a Competitive Advantage

**From Promise to Proof: How Ecosystem Service Science Is Transforming Real Decisions**

Saturday, 16 February
8:30AM-11:30AM

Organized by: Karen L. McLeod, COMPASS, Corvallis, OR; Heather Tallis, The Natural Capital Project, Stanford, CA; Erica Goldman, COMPASS, Silver Spring, MD

**SPEAKERS**

Neil Hawkins, The Dow Chemical Company, Midland, MI
- Nature Meets the Bottom Line: A Collaboration Between Dow and The Nature Conservancy

Heather Tallis, The Natural Capital Project, Stanford, CA
- Redeeming Sins of Omission: Accounting for People in Mitigation

Glenn-Marie Lange, The World Bank, Washington, DC
- Transforming Economic Policy Through Natural Capital Accounting

Belinda Reyers, Council for Scientific and Industrial Research, Stellenbosch, South Africa
- From Bedlam to Bedfellows: Reducing Risk Through Ecosystem Service Partnerships

Elena Bennett, McGill University, Ste-Anne-de-Bellevue, QC, Canada
- Reconnecting People to Nature: Planning for Multi-Functional Agricultural Landscapes

Anne Guerry, Natural Capital Project, Seattle, WA
- Battle Scars and Kumbaya Moments: Stories from the Frontlines of Coastal Decisions

**Water Purification and Monitoring Under Minimal Resource Setting**

Saturday, 16 February
1:30PM-4:30PM

Organized by: Sushanta Mitra and Thomas Thundat, University of Alberta, Edmonton, Canada; Ni-Bin Chang, University of Central Florida, Orlando

**SPEAKERS**

Alexander Zehnder, Nanyang Technological University, Singapore
- Solar Disinfection of Drinking Water

Hauke Harms, Helmholtz Center for Environmental Research, Leipzig, Germany
- Arsenic Monitoring in Drinking Water

Jamie Bartram, University of North Carolina, Chapel Hill
- Technology for Water and Health in Rural Setting

Greg Goss, University of Alberta Water Initiative, Edmonton, Canada
- Meeting the Challenges of Clean Water Delivery to Small and Remote Communities

Bharat Lal, Center for Science and Environment, New Delhi, India
- Excreta Matters: Paradigm Shift in Waste-Water Management

Is the Future of Conservation at a Crossroads?

Saturday, 16 February
3:00PM-4:30PM

Organized by: Colin F. Quinn, NOAA, Washington, DC; Jennifer Howard, NOAA, Silver Spring, MD

**SPEAKERS**

Peter Kareiva, The Nature Conservancy, Seattle, WA
- Next-Generation Conservation Science: Corporations, Human Needs, and Escaping the Bubble

Alan Thornhill, U.S. Department of the Interior, Washington, DC
- Better Integration of Scientists into Leadership and Science into Policy: The Future of Conservation

John Robinson, Wildlife Conservation Society, Bronx, NY
- Conservation and Sustainability in a Human-Dominated World

What Are the Roles of Knowledge Institutions in Sustainability?

Monday, 18 February
9:45AM-12:45PM

Organized by: David D. Hart, University of Maine, Orono; Paul A. Sandifer, NOAA, Washington, DC; Barry Costa-Pierce, University of New England, Biddeford, ME

**SPEAKERS**

Barry Costa-Pierce, University of New England, Biddeford, ME
- A Framework for Assessing Sustainability of Marine Aquaculture Operations

John Forster, Forster Consulting Inc., Port Angeles, WA
- The Potential for Seaweed Culture To Provide Ecosystem Services and Useful Products

Betsy Peabody, Puget Sound Restoration Fund, Bainbridge Island, WA
- Shellfish Culture: High-Quality Seafood and a Means of Enhancing Ecosystem Services

Ole Torrissen, Institute of Marine Research, Bergen, Norway
- Marine Finfish: Super-Chickens of the Sea?

Michael Rust, NOAA Office of Aquaculture, Silver Spring, MD
- Reducing the Fish in Fish Feed: Sciences’ Rush to Develop Alternative Ingredients
AAAS will host a reception at historic Fenway Park in Boston, to honor the winners of the 2012 AAAS Kavli Science Journalism Awards. All Newsroom registrants are welcome. Shuttle buses will be provided from the Hynes Convention Center starting at 6:45 PM. Newsroom badges required.
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