Speakers

The Philomathia Foundation Symposium at Berkeley: Pathways to a Sustainable Energy Future

OCTOBER 1–2, 2010

9 A.M.–5 P.M. BOTH DAYS (DOORS OPEN AT 8:30 A.M.)

BERKELEY REPERTORY THEATRE

The symposium is free and open to the public. Registration was required.

Paul Alivisatos

Paul Alivisatos is the Director of the Lawrence Berkeley National Laboratory. He is an award-winning chemist and internationally recognized authority on the fabrication of nanocrystals and their use in solar energy applications. As director of Berkeley Lab, Alivisatos has launched two major scientific initiatives, “Carbon Cycle 2.0,” a multidisciplinary approach to developing ways to help restore the balance in Earth’s carbon cycle, which has been adversely affected by human activity, and the “Next Generation Light Source,” the world’s first facility capable of producing x-ray pulses measured in attoseconds, the timescale needed to capture the movement of electrons. In addition to his Berkeley Lab duties, Alivisatos holds appointments with UC Berkeley as the Larry and Diane Bock Professor of Nanotechnology and as a professor in the Departments of Materials Science and Chemistry. More about Paul Alivisatos

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Alex Bell

Alex Bell is a Professor of Chemical and Biomolecular Engineering at UC Berkeley and a senior scientist at Berkeley Lab. A leading authority on catalysis, Bell and his research group have been studying ionic liquids under a grant from the Energy Biosciences Institute (EBI), a partnership led by UC Berkeley that includes Berkeley Lab and the University of Illinois at Urbana-Champaign. Ionic liquids – salts that are

liquids rather than crystals at room temperatures – are expected to play an important role in the transformation of biomass into sustainable and carbon-neutral transportation fuels. Ionic liquids possess a unique capacity for dissolving lignocellulosic biomass and helping to hydrolyze the resulting liquor into sugars. More about Alex Bell

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Jeff Bokor

Jeff Bokor is a Professor of Electrical Engineering and Computer Sciences at UC Berkeley with a joint appointment at Berkeley Lab. In 2004, he was appointed as Deputy Director for Science at the Molecular Foundry, a major new nanoscale science research center at the Lab. His current research activities include novel techniques for nanofabrication, new devices for nanoelectronics, quantum information processing, extreme ultraviolet lithography, optical metrology, and Fourier optics. He is working on the design of highly efficient computers, devices and networks that will draw significantly less electricity than today's devices. More about Jeff Bokor

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Severin Borenstein

Severin Borenstein is E.T. Grether Professor of Business Administration and Public Policy at the Haas School of Business and Co-Director of the Energy Institute at Haas. He is also Director of the University of California Energy Institute. His research focuses on business competition, strategy, and regulation. He has published extensively on the airline industry, the oil and gasoline industries, and electricity markets. His current research projects include the economics of renewable energy, economic policies for reducing greenhouse gases, equity and efficiency effects of electricity pricing, and competitive dynamics in the airline industry. More about Severin Borenstein

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Jamie Cate

Jamie Cate is a Professor of Biochemistry and Molecular Biology at UC Berkeley and a Faculty Scientist in the Physical Biosciences Division at Berkeley Lab. His research interests include liquid fuels produced from cellulosic biomass that have the potential to reduce our dependence on oil. Since the current process for converting biomass to liquid fuels is too expensive for them to be cost competitive

with conventional gasoline or diesel fuels, Cate and researchers in his group study the biological degradation and utilization of cellulose by microorganisms in order to gain a more complete understanding of microbial cellulose utilization will help to reduce the cost of cellulosic biofuels. More about Jamie Cate

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Ralph J. Cicerone

Ralph J. Cicerone is President of the National Academy of Sciences and Chair of the National Research Council. His research in atmospheric chemistry, climate change and energy has involved him in shaping science and environmental policy at the highest levels nationally and internationally. In 1999 the Franklin Institute recognized his fundamental contributions to the understanding of greenhouse gases and ozone depletion by selecting Cicerone as the laureate for the Bower Award and Prize for Achievement in Science. One of the most prestigious American awards in science, the Bower Award also recognized his public policy leadership in protecting the global environment. Immediately prior to his election as Academy president, Dr. Cicerone served as Chancellor of UC Irvine from 1998 to 2005, a period marked by a rapid rise in the academic capabilities of the campus. His research has focused on atmospheric chemistry, the radiative forcing of climate change due to trace gases, and the sources of atmospheric methane, nitrous oxide and methyl halide gases. More about Ralph Cicerone

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Robert Collier

Robert Collier is a Visiting Scholar at the Center for Environmental Public Policy (CEPP) in UC Berkeley's Goldman School of Public Policy. He initiated and coordinated CEPP's program on intellectual property rights and technology transfer at the U.N. climate negotiations and serves as an occasional lecturer at the Goldman School of Public Policy and the Berkeley School of Law with courses on the national and international politics of global warming. Between 1991 – 2007 Cate was a staff reporter for the San Francisco Chronicle covering international news, energy and climate policy.

William Collins

William Collins is a Professor in Residence in UC Berkeley's Department of Earth and Planetary Science and the Head of the Climate Science Department at the Berkeley Lab. A leading climate modeling expert, his research is focused on the changes in the energy balance of the Earth system and the implications of those changes for the future of our climate. Prior to coming to Berkeley, Collins worked at the National Center for Atmospheric Research and the Scripps Institution of Oceanography. More about William Collins

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David Culler

David Culler is the Associate Chair of the Department of Electrical Engineering and Computer Science at UC Berkeley. His research addresses networks of small, embedded wireless devices, planetary-scale internet services, parallel computer architecture, and high performance communication. He is one of the Berkeley faculty leading LoCal, a network architecture for localized electrical energy reduction, generation and sharing. He is the PI of Sensor Network Architecture and a former PI of the Network Embedded Systems Technology project. He is also involved in the Berkeley HydroWatch project, a multidisciplinary effort that will help us to better understand the hydrological cycle by instrumenting two large watersheds in Northern California with hundreds of sensors. More about David Culler

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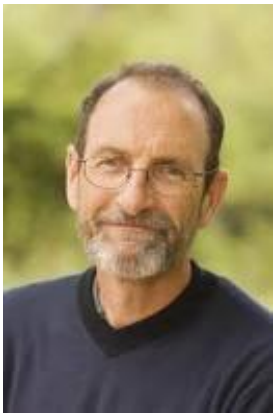

Chris Field

Chris Field is the founding director of the Carnegie Institution's Department of Global Ecology, Professor of Biology and Environmental Earth System Science at Stanford University, and Faculty Director of Stanford's Jasper Ridge Biological Preserve. Field's research emphasizes impacts of climate change, from the molecular to the global scale. His work includes major field experiments on responses of California grassland to multi-factor global change, integrative studies on the global carbon cycle, and assessments of impacts of climate change on agriculture. He was a coordinating lead author for the fourth assessment report of the Intergovernmental Panel on Climate

Change. In September, 2008, he was elected co-chair of working group 2 of the IPCC, and will lead the next IPCC assessment on climate change impacts, adaptation, and vulnerability. More about Chris Field

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Graham Fleming

Graham Fleming is Vice Chancellor for Research and Professor of Chemistry at the University of California, Berkeley. As Vice Chancellor for Research, Fleming has overall responsibility for the University of California, Berkeley research endeavor and exercises primary leadership in research policy, planning and administration for the Berkeley campus. Dr. Fleming, who served as Berkeley Lab's Deputy Director from 2005 through 2007, has been at the forefront of a major revolution in the biophysical sciences. Through joint appointments as Melvin Calvin Distinguished Professor of Chemistry at UC Berkeley, and Founding Director of both the Berkeley Lab's Physical Biosciences Division and UC Berkeley's California Institute for Quantitative Biosciences (QB3), he has re-shaped the intersection of physical and biological sciences, while maintaining his own ground-breaking investigations into ultrafast chemical and biological processes, in particular, the primary steps of photosynthesis. More about Graham Fleming

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Harrison Fraker

Harrison Fraker is a Professor of Architecture and Urban Design at UC Berkeley. He is recognized as a pioneer in passive solar, day-lighting and sustainable design research and teaching. He has pursued a career bridging innovative architecture and urban design education and practice. His research focuses on the design potential of sustainable systems and urban design principles for transit-oriented neighborhoods. He believes in integrating pragmatic and theoretical analysis to create new knowledge about the most critical environmental design challenges facing society. He is currently pursuing his beliefs through a whole systems design approach for entirely resource-self-sufficient, transit-oriented neighborhoods of 100,000 people in China. More about Harrison Fraker

Inez Fung

Inez Fung is a Professor of Atmospheric Science at UC Berkeley and the Faculty Director of the Berkeley Institute of the Environment. Her research interests include the many aspects of biosphere-atmosphere interaction, with the goal of gaining predictive capability of how atmospheric composition may evolve in the future. The present and past variations in atmospheric composition contain information about how sensitive the atmosphere and biosphere, separately and together, are to natural climate fluctuations. This sets the stage for detecting and evaluating the extent the system have been and will be altered by human action. More about Inez Fung

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Dian M. Grueneich

Dian M. Grueneich has served on the California Public Utilities Commission (CPUC) since 2005. She is a nationally recognized expert in energy and environmental issues, with over 30 years experience. At the CPUC, she focuses on transmission planning and permitting, energy efficiency, climate change, renewable energy resources, and low income consumer issues. Grueneich is the lead Commissioner on transmission issues at the CPUC, overseeing the permitting of several significant transmission lines during her tenure. She has also been the lead Commissioner on energy efficiency, overseeing the 3-year, $2.7 billion energy efficiency program of the California investor-owned utilities. Addressing the utility needs of low-income consumers is a top priority for Grueneich, and she has served as the Commission-appointee to California's Low Income Oversight Board since 2005. More about Dian Grueneich

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Dan Kammen

Dan Kammen is the Class of 1935 Distinguished Professor of Energy at UC Berkeley, where he holds appointments in the Energy and Resources Group, the Goldman School of Public Policy, and the Department of Nuclear Engineering. Kammen is the founding director of the Renewable and Appropriate Energy Laboratory and the Director of the Transportation Sustainability Research Center. Prior to joining UC Berkeley Kammen was Professor and Chair of the Science, Technology and Environmental Policy in the

Woodrow Wilson School of Public and International Affairs at Princeton University. Daniel Kammen is a coordinating lead author for the Intergovernmental Panel on Climate Change (IPCC). More about Dan Kammen

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Jay Keasling

Jay Keasling is the Hubbard Howe Jr. Distinguished Professor of Biochemical Engineering at UC Berkeley, the Director of the Synthetic Biology Engineering Center (SynBERC) and the CEO of the Joint BioEnergy Institute. Keasling is a leader in the field of synthetic biology with breakthrough discoveries relevant to affordable treatments for malaria, AIDS, and cancer as well as discoveries of new fuel resources. As the CEO of the Joint BioEnergy Institute Keasling leads a team of researchers that work on efficient conversion into fuels of lignocellulosic biomass, the most abundant organic material on the planet. More about Jay Keasling

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Arun Majumdar

Arun Majumdar became the first Director of the Advanced Research Projects Agency – Energy (ARPA-E), the country's only agency devoted to transformational energy research and development, in October 2009. Prior to joining ARPA-E, Majumdar was the Associate Laboratory Director for Energy and Environment at Berkeley Lab and a Professor of Mechanical Engineering and Materials Science at UC Berkeley. His highly distinguished research career includes the science and engineering of energy conversion, transport, and storage ranging from molecular and nanoscale level to large energy systems. At Berkeley Lab and UC Berkeley, Majumdar has helped shape several strategic initiatives in the areas of energy efficiency, renewable energy, and energy storage. More about Arun Majumdar

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Charles Marshall

Charles Marshall is a Professor of Integrative Biology and the Director of the University of California Museum of Paleontology. His research interests focus on how paleontology can inform our understanding of the history of life, and the processes that control it. His research takes advantage of data from genomics, molecular phylogenies, developmental biology, and functional studies. Much of his work also involves the

development of new tools or ways of knowing. Current projects in his research group center on understanding how biodiversity changes on geologic timescales, and on how molecular phylogenetic data and the fossil record might be used synergistically to understand the processes responsible for changes in diversity; the calibration of molecular clocks; and, the import of new genomic data on our understanding of the Cambrian explosion. More about Charles Marshall

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R. Ramesh

Ramamoorthy Ramesh is a Professor in the Departments of Materials Science and Engineering, and Physics, at UC Berkeley and is a senior researcher in Berkeley Lab's Materials Sciences Division. He is known throughout the world for his contributions to the science and technology of complex functional oxide materials. Working initially in the early 1990's at Bellcore, he made landmark contributions in ferroelectric perovskites through the recognition that conducting oxide electrodes are the solution to the problem of polarization fatigue, which for 30 years, remained an enigmatic, unsolved problem. He is active in the Berkeley India Joint Leadership on Energy and the Environment, a partnership between the Berkeley Lab and Indian companies and government agencies in both the U.S. and India in several areas, including green buildings, data center energy use and smart grids. More about Ramamoorthy Ramesh

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Arthur H. Rosenfeld

Arthur H. Rosenfeld, a UC Berkeley faculty member and Berkeley Lab researcher, is a long-serving Commissioner to the California Energy Commission. His work has helped California's per capita electricity usage remain flat since the mid-1970s, an achievement that's been dubbed "the Rosenfeld effect." Under Rosenfeld's leadership the Center for Building Science at the Berkeley Lab, which he founded in 1975, developed a broad range of energy efficiency technologies, including electronic ballasts for fluorescent lighting, a key component of compact fluorescent lamps; and low-emissivity windows, a coating for glass that allows light in but blocks heat from entering in the summer and escaping in the winter. Rosenfeld developed DOE-2, a computer program for building energy analysis and design that was incorporated in California's Building Code in 1978, and continues to serve as a model across the nation and around the world. Since 2008 Rosenfeld has focused his efforts on getting new California homes equipped with a radio-controlled thermostat that would allow utility companies to transmit price and reliability signals to the house, giving customers the option to change their energy usage with changes in price. This year, the "Rosenfeld" was proposed as an international unit for measuring electricity savings. One Rosenfeld will equal the electricity

savings of 3 billion kilowatt-hours per year, the amount needed to replace the annual generation of a 500 megawatt coal-fired power plant.

Berend Smit

Berend Smit is a Professor of Chemistry and of Chemical and Biomolecular Engineering at UC Berkeley. He is the leader of one of 46 new Energy Frontiers Research Centers (EFRCs) supported by the Department of Energy. Smit's Center for Gas Separations Relevant to Clean Energy Technologies, aims to develop improved methods for extracting carbon dioxide from flue gases in power plant emissions, and from the methane in natural gas wells, so that the CO2 can be returned underground. More about Berend Smit

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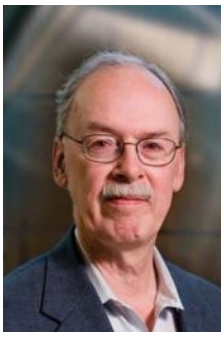

Chris Somerville

Chris Somerville is the Director of the Energy Biosciences Institute, a research and development organization that focuses on the development of next-generation biofuels as well as various applications of biology to the energy sector. Somerville is also a Professor of Plant and Microbial Biology, UC Berkeley, and a visiting scientist at the Berkeley Lab. His research focuses on the characterization of proteins implicated in plant cell-wall synthesis and modification. He has published more than 200 scientific papers in plant and microbial genetics, genomics, biochemistry and biotechnology. Somerville has served on the scientific advisory boards of many corporations, academic institutions and private foundations in Europe and North America. More about Chris Somerville

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Catherine Wolfram

Catherine Wolfram is a Professor at UC Berkeley's Haas School of Business and the Co-Director of the Energy Institute at Haas. Her research focuses on the economics of energy markets. She has studied the impact of environmental regulation on energy markets and the effects of electricity industry privatization and restructuring around the world. More about Catherine Wolfram