

20-21 September
2006

Warren G. Schlinger Symposium

Young innovators
and industry leaders
finding solutions to
tomorrow's challenges



Renewable Chemical Feedstocks
Sustainable Chemistry and Engineering
Chemistry of Energy Sources
Electronic Materials
Health Materials
Meeting Global Water Needs

Join senior executives, research
and technology managers,
and young scientists as they
examine emerging research
areas and celebrate innovation
in the chemical industry.

INNOVATION DAY

INNOVATION DAY 2006

Join us on 21 September 2006 for Innovation Day, when young innovators and industry leaders will come together to celebrate innovation in the chemical industry and find solutions for tomorrow's challenges.

For the third year in a row, the Chemical Heritage Foundation (CHF) and the Society of Chemical Industry (SCI) will host Innovation Day, featuring the **Warren G. Schlinger Symposium** and the awarding of the **SCI Gordon E. Moore Medal**.

The Schlinger Symposium will bring together senior executives, research and technology managers, and young scientists to examine frontier research areas in the chemical industry. This year's sessions will explore renewable chemical feedstocks, sustainable chemistry and engineering, the chemistry of energy sources, electronic materials, health materials, and global water needs. Attendees can participate in two of these sessions, one in the morning and one in the afternoon. The two plenary sessions will be open to all attendees.

The evening before the symposium, on 20 September, registrants are invited to attend a reception and dinner, which will feature speaker J. Keith Grime of Procter & Gamble on "Changing the R&D and Business Model for Discontinuous Innovation."

Half way through the day on 21 September, the third annual SCI Gordon E. Moore Medal will be awarded to Jonathan M. McConnachie of ExxonMobil Research and Engineering, honoring his early career success in innovation.

Innovation Day is organized by the Center for Contemporary History and Policy at CHF, which carries out projects at the interface of contemporary chemical and molecular sciences and technologies, industry, and science policy. The center's programs are guided by the core principle that history and policy are domains that should inform one another.

Please read through the invitation and register by 7 September. We look forward to seeing you!

Following the Innovation Day events at CHF, SCI will award its prestigious Perkin Medal at a reception and dinner. Please see the program for details.

20 September

6:00 – 7:00 p.m.

Reception

7:00 – 9:00 p.m.

Dinner and Address

Welcoming Remarks by
Warren G. Schlinger

J. Keith Grime
“Changing the R&D and Business Model
for Discontinuous Innovation”

21 September

8:00 a.m.

Continental Breakfast

8:30 – 9:15 a.m.

Schlinger Symposium Opening Plenary

Rebecca Henderson
“Disruptive Technology and
Product Development in Large Firms”

9:30 – 11:30 a.m.

Morning Breakout Sessions

1. Renewable Chemical Feedstocks
2. Sustainable Chemistry and Engineering
3. Chemistry of Energy Sources
4. Electronic Materials
5. Health Materials
6. Meeting Global Water Needs

11:45 a.m. – 1:45 p.m.

SCI Gordon E. Moore Medal Ceremony and Luncheon

Gordon E. Moore Medal Lecture
Jonathan M. McConnachie, Recipient

2:00 – 4:00 p.m.

Afternoon Breakout Sessions

1. Renewable Chemical Feedstocks
2. Sustainable Chemistry and Engineering
3. Chemistry of Energy Sources
4. Electronic Materials
5. Health Materials
6. Meeting Global Water Needs

4:00 – 5:00 p.m.

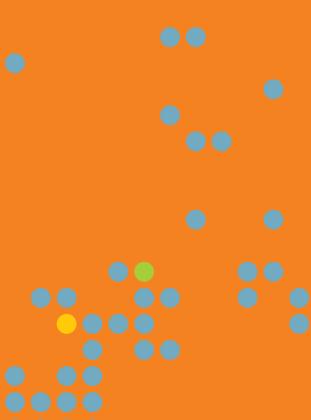
Schlinger Symposium Closing Plenary

Panel Discussion

6:00 p.m.

SCI Perkin Medal Ceremony and Dinner

James C. Stevens will be honored with the SCI Perkin medal at a reception and dinner at the Hyatt Regency Hotel, Penns Landing, beginning at 6:00 p.m. There is a separate charge for this event. Please contact Michelle von Bleichert of SCI for details and registration: 973-635-0189; fax: 973-635-0958; sciamerical@aol.com.



about THE PLENARY SESSIONS

Address, Changing the R&D and Business Model for Discontinuous Innovation

SPEAKER: **J. Keith Grime**, Vice President, Corporate R&D, Procter & Gamble

TIME: Wednesday, 20 September, 7:00 p.m.

Most firms continue to rely on an “invention” model of innovation, based in the company’s own research labs. But for large, mature firms, internal R&D no longer contributes enough to growth—research productivity is flat, while innovation costs climb steadily. To survive, companies must disavow a “not invented here” mentality and embrace a culture of “proudly found elsewhere.”

Opening Plenary, Disruptive Technology and Product Development in Large Firms

SPEAKER: **Rebecca Henderson**, Eastman Kodak LFM Professor of Management, Sloan School, MIT

TIME: Thursday, 21 September, 8:30 a.m.

Large firms have traditionally struggled to deal with radical technological changes in fields adjacent to their competence. Folk wisdom and current theory both prescribe establishing smaller, more innovative units within the firm and devising new ways of rewarding the small business’s employees. Yet one of the great uncertainties of technological change is how best to reward the personnel who drive it. Rebecca Henderson explores how this dilemma unfolds in firms struggling to adapt.

Closing Plenary, Panel Discussion

MODERATOR: **Cyrus Mody**, Program Manager for Emerging Technologies, Center for Contemporary History and Policy, Chemical Heritage Foundation

SPEAKERS: **Klaus Heinzlbecker**, Director of Strategic Projects, BASF
Frankie Wood-Black, Director of Consent Decree Compliance, ConocoPhillips
Madeleine Jacobs, Executive Director and CEO, American Chemical Society

TIME: Thursday, 21 September, 4:00 p.m.

Each panelist will give a short talk describing important challenges for the chemical industry in the near future, as well as strategies for predicting or coping with the future that will prepare the industry for currently unforeseeable disruptions. Klaus Heinzlbecker will analyze the practice of scenario planning and its utility for chemical firms. Frankie Wood-Black will describe ways of coping with the technologically and politically unpredictable oil supply, including sustainable methodologies that alleviate dependence on oil. Madeleine Jacobs will give her views on the boom in new markets—and the emergence of new competition—arising from the feverish economies of China and India.

about

THE BREAKOUT SESSIONS



Renewable Chemical Feedstocks

MODERATOR: **John M. Vohs**, Carl V. S. Patterson Chair in Chemical and Biomolecular Engineering, University of Pennsylvania

SPEAKERS: **Alan D. Baylis**, CEO, Nuvistix Innovation
Richard Chapas, Director of Industrial Collaboration, Battelle Memorial Institute

In recent years the chemical industry has been plagued by price and supply issues for its core feedstocks. Research efforts are underway to replace these nonrenewable feedstocks with alternatives. Sources such as clean coal, products from agricultural crop wastes and residues, and gases produced by municipal solid waste hold out the potential for stable futures that would enable a continued manufacturing presence in North America. Presentations and discussion in this session will explore the challenges and benefits of coal gasification, crop-based feedstocks, and other alternative technologies, and address the role of the industry in developing new feedstocks.



Sustainable Chemistry and Engineering

MODERATOR: **Paul Clark**, Vice President, Research and Technology, NOVA Chemicals

SPEAKERS: **Michael D. Bertolucci**, President, Interface Research Corporation;
Chairman, Envirosense Consortium
David Anton, Program Manager DuPont Bio-Based Materials, DuPont

Looking to improve manufacturing efficiencies and reduce their environmental footprint, chemical companies have pioneered new uses for existing product lines and new manufacturing methods. Challenges remain in a wide range of areas (for example, replacing harmful solvents and improving catalytic selectivity and efficiency in chemical operations). Techniques for removing sulfur from fuels, CO₂ sequestration, cleaner aqueous processes, and fluorocarbon chemistry will become increasingly important as we depend less on fossil fuels. Presentations and discussion in this session will range from a macro, industry-wide perspective on change to a more focused look at specific ways individuals and firms can make their practices more sustainable.

about

THE BREAKOUT SESSIONS

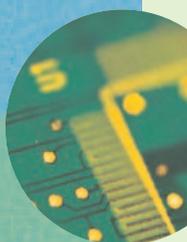


Chemistry of Energy Sources

MODERATOR: **Miles Drake**, Vice President and Chief Technology Officer, Air Products and Chemicals

SPEAKERS: **Rakesh Agrawal**, Winthrop E. Stone Distinguished Professor of Chemical Engineering, Purdue University
Khalil Amine, Senior Fellow Scientist and Manager, Argonne National Laboratory

With fossil fuel production at or near its peak, the chemical industry is intensifying its search for alternative energy sources that are more abundant, renewable, and environmentally friendly. Innovations that show promise include fuel cells, hydrogen fuel, conventional and nanotechnology-enhanced solar systems, wind turbines, methane hydrate from the sea floor, and improved nuclear reactions. The hope in these and other areas of research is to minimize waste along the chain from generation to transmission to consumption. Presentations and discussion in this session will focus on innovative materials essential for new energy sources (for example, more durable and lightweight batteries), as well as opportunities for new businesses within the chemical industry that supply energy to commercial or domestic consumers.



Electronic Materials

MODERATOR: **Cathie Markham**, Vice President, Technology, Rohm and Haas Electronic Materials, CMP Technologies

SPEAKERS: **Robert Wisnieff**, Senior Manager, Interconnect Technology, IBM Thomas J. Watson Research Center
Marc Chason, Director and Fellow of Technical Staff, Physical Realization Research, Motorola

Technical limits of currently used materials are beginning to inhibit the end products that the electronics sector has targeted. Innovations from the chemical industry can help advance the state of the art, for example, using miniaturized fuel cells to replace lithium-ion batteries, high temperature superconducting ceramics to help heat management, techniques from microelectronics manufacturing to obtain biological data, and using new alternatives to silicon. Presentations and discussion in this session will examine portable power, heat management, CMOS transistor scaling, the silicon-organic interface, inks for printed electronics and printed displays, and nanotechnology for functional surfaces, and will explore the challenges of innovation in an area undergoing rapid technological and market changes.



Health Materials

MODERATOR: **Uma Chowdhry**, Vice President, Central Research and Development, DuPont

SPEAKERS: **George Kodokian**, Research Manager DuPont Medical Materials, Central Research and Development, DuPont

Sumita B. Mitra, Corporate Scientist, 3M ESPE Dental Products Laboratory, 3M Company

Recent innovations in biomedicine and organic and inorganic materials offer great potential for new markets for the chemical industry. A critical area of research is enabling the creation of materials that better simulate living tissue and are more compatible with biological systems. This research promises to provide revolutionary new candidates to replace bones and teeth, scaffolding to help cells regrow in the proper orientation, wound closure materials, and specialized drug-delivery systems such as dendrimers that will release pharmaceuticals when and where they are needed in the body. Presentations and discussion in this session will focus on advanced dental materials and novel chemistry for post-trauma wound tissue and tissue regrowth.



Meeting Global Water Needs

MODERATOR: **James Alder**, Vice President, Operations and Technical, Celanese

SPEAKERS: **Karl Fennessey**, Global Technology Leader, The Dow Chemical Company

Harry Ott, Director of Global Environmental Assurance, The Coca-Cola Company

As water-intensive manufacturing and populations continue to expand in regions such as India, China, and the American Southwest, water quality and availability issues are becoming urgent. The availability of clean water for high-tech manufacturing in the biotechnology, electronics, and other sectors; the minimization of water use within a chemical facility; and the operation of a zero-discharge chemical plant offer challenges and opportunities to chemical innovation. The chemical industry must find new technologies for treating and delivering fresh water; otherwise, other industries will develop solutions and seize the market. Presentations and discussion in this session will explore new processes to manufacture compounds using less water, materials to recoup water and transport fresh water over long distances, bioremediation and other techniques for cleaning water, nanotechnology approaches (such as new membranes) for potable water creation, and the delivery of clean water to new manufacturing centers in developing countries.



Jonathan M. McConnachie

2006 SCI Gordon E. Moore Medalist

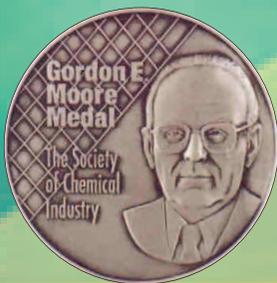
Jonathan M. McConnachie is awarded the SCI Gordon E. Moore Medal for his contributions to the first new class of friction modifier for automotive lubricants in 30 years.

Molybdenum sulfide is a well-known and widely used machine lubricant. It cannot, however, be introduced directly to hydrocarbon-based lubricants because of insolubility.

To overcome this obstacle, McConnachie designed an elegant molecular architecture for a molybdenum additive that would decompose in situ to form the desired molybdenum sulfide layer. At a concentration far below that of previous additives, McConnachie's additive provided friction reduction superior to all previous commercially available additives.

Unexpectedly, the new additive also showed significant antiwear and antioxidation activity. The new additive is much less prone to oxidation than earlier additives and has demonstrated benefits of a longer effective lifetime and improved fuel economy. Critically for commercialization of this product, McConnachie devised a cheaper synthesis for manufacture—using low-cost, commercially available starting materials—and shepherded the product from ExxonMobil to its additives subsidiary, Infineon.

McConnachie is an advanced research associate with ExxonMobil Research and Engineering. He joined Exxon in 1993 after receiving his Ph.D. in inorganic chemistry from Northwestern University and a B.S. in chemistry from Baylor University in 1988. His research activities include the direct conversion of methane and light hydrocarbons into liquid products, the development of new trinuclear molybdenum additives for passenger-car motor oils to improve engine life and fuel economy, and leadership of ExxonMobil's effort to develop new processes and catalysts for the production of ultra-low-sulfur fuels to lower truck and auto emissions and improve air quality.



About the Gordon E. Moore Medal

The Society of Chemical Industry established the SCI Gordon E. Moore Medal as the premier recognition for early career success in innovation, as reflected in both market impact and improvement to the quality of life. By highlighting extraordinary individuals and their work, the SCI aims to promote public understanding of research and development in the modern chemical industries, enhance the interest of students in applied chemistry by providing role models, and emphasize the role of creative research in the global economy. The award recognizes a significant innovation made by an industrial scientist early in his or her career and is given annually during Innovation Day.

As a research chemist, director of research, and cofounder of Intel, Gordon E. Moore carried out pioneering work on silicon transistors, integrated circuits, and the microprocessor, putting his chemical expertise to work to overcome barriers to large-scale production. In 1965, at age 36, he articulated what has come to be known as Moore's Law, describing and predicting the exponential growth of computer processing power. His innovations as a young scientist employed chemistry to open new markets and radically transform the world in which we live.

Past SCI Gordon E. Moore Medalists:

George Barclay (2004)

Jeffery John Hale (2005)



ABOUT THE PREMIER SPONSOR OF THE SCHLINGER SYMPOSIUM

The symposium is named in honor of **Warren G. Schlinger**, a Ph.D. graduate of Caltech with a distinguished career in industrial innovation. In Schlinger's thirty-five years at Texaco, he was a pioneer in gasification technologies now widely used for production of hydrogen, other chemicals, and power. Among other benchmarks, Schlinger had over 60 U.S. patents issued during his career. He has been honored with the AIChE Technical Achievement Award, the Chemical Engineering Practice Award, and by the National Academy of Engineering.

Innovation Day on the Web

For the most up-to-date and detailed information on Innovation Day, please visit our Web site at www.chemheritage.org/events/innov06/.

Registration

Early-registration discounts and group-rate discounts are available; please see the registration form for the fee schedule. Early registration ends **31 July 2006**. The final registration deadline is **7 September**. An electronic version of the registration form (in PDF format) is available on the Web.

Lodging

Attendees must book their own accommodations. The following hotels offer business-class lodging in close proximity to CHF. Rooms based on availability.

Omni Hotel

401 Chestnut Street
Philadelphia, PA 19106
Tel: 215.925.0000
Fax: 215.925.1263

Sheraton Society Hill

2nd and Walnut Streets
Philadelphia, PA 19106
Tel: 215.238.6000
Fax: 215.238.6652

Best Western

Independence Park Hotel

235 Chestnut Street
Philadelphia, PA 19106
Tel: 215.922.4443
Fax: 215.922.4487

Travel Information

For detailed travel information, please visit Innovation Day on the Web.

For Your Guests

If you are traveling with a companion who will not be attending the symposium and you would like information on things to do in Philadelphia, please contact Nancy Vonada, Events and Stewardship Manager, 215.873.8226, nvonada@chemheritage.org. We will also post information on the Web as available.

Contact Information

Chi Chan, Program Assistant
Tel: 215.873.8249
Fax: 215.629.5370
E-mail: cchan@chemheritage.org



ABOUT THE CHEMICAL HERITAGE FOUNDATION

The Chemical Heritage Foundation serves the community of the chemical and molecular sciences, and the wider public, by treasuring the past, educating the present, and inspiring the future. CHF carries out a program of outreach and interpretation in order to advance an understanding of the role of the chemical and molecular sciences, technologies, and industries in shaping society; maintains a world-class collection of materials that document the history and heritage of the chemical and molecular sciences, technologies, and industries; and encourages research in its collections. CHF's Center for Contemporary History and Policy conducts research and holds conferences in order to bring long-range perspectives to bear on innovation, risk, and industrial research.



ABOUT THE SOCIETY OF CHEMICAL INDUSTRY

The Society of Chemical Industry is an international association that seeks to further the application of chemistry and related sciences for the public benefit. Headquartered in London since its founding in 1881, SCI has sections in the United States, Canada, Australia, and Ireland. Established in 1894, the American Section was the first society in the United States to bring together scientists and business leaders in industrial chemistry. The Perkin Medal was established in 1906 to commemorate the 50th anniversary of the discovery of mauveine. Past recipients include Nobel laureates Glenn T. Seaborg, Carl S. Marvel, and Herbert C. Brown; Donald F. Othmer, chemical engineer; Stephanie Kwolek, inventor of Kevlar; Paul S. Anderson, medicinal chemist, and Gordon E. Moore, the founder of Intel.



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