Young Innovators
and industry leaders
finding solutions to
tomorrow’s challenges
The chemical industry faces many challenges and opportunities at the start of the 21st century, including the rapid emergence of new fields and the maturing of existing methods for research and manufacturing. Only a renewed focus on innovation will harness promising technologies and spur industry growth.

To promote early career innovation, the Chemical Heritage Foundation and the Society of Chemical Industry jointly organize an annual Innovation Day, consisting of the Warren G. Schlinger Symposium, the SCI Gordon E. Moore Medal, and the SCI Perkin Medal. The Schlinger Symposium brings together promising young scientists and technology leaders from across the chemical industries with a focus on frontiers of chemical R&D. Plenary and breakout sessions are oriented to areas where the chemical industry interfaces with other emerging business sectors. In combination with the medal ceremonies, the Schlinger Symposium offers participants the opportunity to learn about cutting-edge science and technology, exchange ideas with peer industrial researchers and entrepreneurs, and prepare to be innovation leaders.
10 September

6:00–7:00 p.m.
Reception
Jacobs Reading Room, CHF

7:00–9:00 p.m.
Dinner and Address
Ullyot Meeting Hall, CHF
Welcoming Remarks by Warren G. Schlinger
Beyond Benign: The Societal Benefits of Chemical Innovation
John C. Warner, Professor of Plastics Engineering and Director of the Center for Green Chemistry, University of Massachusetts Lowell

11 September

8:00 a.m.
Continental Breakfast
Main Lobby, CHF

8:30–9:25 a.m.
Schlinger Symposium
Opening Plenary
Ullyot Meeting Hall, CHF
Removing Heavy Metal Contaminents from Water for Health and Profit
Owen Boyd, CEO, SolmeteX

9:30–11:30 a.m.
Morning Breakout Sessions

Eco-Friendly Products
President's Room, APS
Moderator: Ryan R. Dirks, Vice President of Research and Development, Arkema
Speakers: Terrence Collins, Thomas Lord Professor of Chemistry and Director of the Institute for Green Oxidation Chemistry, Carnegie Mellon University
Carina Maria Alles, Group Leader, Engineering Evaluations and Sustainability, DuPont Engineering Research and Technology

Sustainable Chemistry and Engineering
Samuel Fels Room, APS
Moderator: Miles Drake, Chief Technology Officer, Weyerhaeuser Company
Speakers: Henry C. Foley, Dean, College of Information Sciences and Technology, The Pennsylvania State University
Paul Bryan, Vice President of Biofuels Technology, Chevron

Chemistry of Energy Sources
Meeting Room 110/112, Omni Hotel
Moderator: Michael Altes, Science and Technology Director, Advanced Materials, Dow Corning Corporation
Speakers: Charles F. Gay, Corporate Vice President and General Manager, Solar Business Group, Applied Materials
Stanley R. Bull, Associate Director for Science and Technology, National Renewable Energy Laboratory
**Health Materials**

**OTHER CONFERECE ROOM, CHF**

**MODERATOR:** William Fraser, Senior Director, Global Technology Alliances, The Dow Chemical Company

**SPEAKERS:**
- Leonard J. Buckley, Head of Materials Chemistry Research, Naval Research Laboratory
- Angelo G. Scopelianos, Vice President for R&D, Center for Biomaterials and Advanced Technologies, Johnson & Johnson

**Electronic Materials**

**ROOM 603, CHF**

**MODERATOR:** Gary Calabrese, Vice President and Chief Technology Officer, Rohm and Haas Company

**SPEAKERS:**
- Sharon L. Nunes, Vice President of Technology, IBM
- Rajarao Jammy, Director, Front End Processes Division, Sematech

**Emerging Global Economies**

**ROOM 1409, PENTHOUSE, OMNI HOTEL**

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

**SPEAKERS:**
- Theresa Kotanchek, R&D Technology Director, Asia Pacific, The Dow Chemical Company
- David Greenley, Global Director of Technology Operations, Rohm and Haas Company

**11:45 a.m.–1:45 p.m.**

**SCI Gordon E. Moore Medal Ceremony and Luncheon**

**ULLYOT MEETING HALL, CHF**

Gordon E. Moore Medal Lecture by Paul A. Sagel, Principal Engineer, Procter & Gamble Company Health Care Research Center

**2:00–4:00 p.m.**

**Afternoon Breakout Sessions**

Same as Morning Breakout Sessions

**4:00–5:00 p.m.**

**Schlinger Symposium Closing Plenary: CEO Roundtable**

**ULLYOT MEETING HALL, CHF**

**MODERATOR:** Arthur Daemmrich, Assistant Professor, Harvard Business School

**SPEAKERS:**
- James J. Barber, Former CEO, Metabolix
- Raj L. Gupta, CEO, Rohm and Haas Company
- Andrew N. Liveris, CEO, The Dow Chemical Company

**7:00 p.m.** **SCI Perkin Medal Ceremony and Dinner**

**HYATT REGENCY HOTEL, PENN’S LANDING**

William Henry Perkin Medal Lecture by Herbert Boyer, Cofounder, Genentech
THE PLENARY SESSIONS

10 September
AFTER-DINNER TALK
Beyond Benign: The Societal Benefits of Chemical Innovation
John C. Warner
When developing a new technology, chemists have the opportunity to consider regional human and natural resources. For example, we can promote regional economic development in communities that desperately need new manufacturing jobs. Chemists can also create new self-reliant supply chains in geographic regions that are suffering economic tragedies. Strategies to help incorporate these possibilities into design at the molecular level are just now emerging and being articulated.

11 September
OPENING PLENARY
Removing Heavy Metal Contaminants from Water for Health and Profit
Owen Boyd
According to the U.S. Geological Survey, 40 states have mercury contamination levels high enough to trigger fish consumption advisories. As many as 10 million people in the United States drink water that exceeds the EPA standards for arsenic levels, and as many as 100 million people in India and Bangladesh are at risk for arsenicosis from well water. Yet as much as 95 percent of the treated water in the United States (and even more in developing countries) is cleaned using century-old technologies. There is clear room for advanced materials to make water safer and cleaner; more than that, there is market demand for cleaner water, if the technology is right.

CLOSING PLENARY
CEO Roundtable
Andrew N. Liveris
Raj L. Gupta
James J. Barber
The current CEOs of The Dow Chemical Company and Rohm and Haas and the former CEO of Metabolix will address strategic issues concerning innovation in the chemical sector. Specifically the CEOs will present their perspectives on the coming decade, especially in relation to research and development, and answer questions on career paths for scientists within industry.
As sustainability becomes an economic necessity, fundamentally new chemical transformations must be developed to minimize environmental impact, using green and sustainable chemistry and engineering. Following the principle of “better to prevent waste than to clean up after it,” researchers need to replace harmful solvents and improve catalytic selectivity and efficiency in chemical reactions and also provide cost savings. Presentations and discussion in this session will focus on such topics as removing sulfur from fuels, CO₂ sequestration, cleaner aqueous processes, new membranes for separation and filtration, and fluorocarbon chemistry.

With fossil fuel production at or near its peak, the chemical industry is intensifying its search for alternative energy sources that are abundant, renewable, and environmentally friendly. Methods that show promise include fuel cells, hydrogen fuel, conventional and nanotechnology-enhanced solar systems, wind turbines, methane hydrate from the sea floor, and safer, less wasteful nuclear power. Meanwhile innovations that minimize waste from generation to transmission to consumption lead to more efficient energy use. Presentations and discussion in this session will focus on the innovative materials essential for new energy sources, especially solar energy, as well as business changes needed to alter our current energy infrastructure.
About the Breakout Sessions

**Health Materials**
Recent innovations in biomedicine and hybrid inorganic and organic materials offer great potential for new markets for the chemical industry. But very old innovations, developed by biological organisms themselves, are often still superior to commercial products. As they learn more about how biochemistry works, chemical firms are beginning to understand how to mimic and even improve on biology. Bio-inspired materials depend on advanced characterization of biological materials, novel synthesis based on that biology, and sophisticated understanding of an extraordinarily complex health-care market. Presentations and discussion in this session will explore ways in which chemical firms can use their manufacturing and R&D expertise to develop advanced health materials.

**Electronic Materials**
In some parts of the electronics sector, technical limits on materials engineering threaten to impede the development of new, faster, cheaper, more efficient products; while in other parts of the sector, novel materials are making possible dramatic new applications for untapped markets. Topics at the forefront of discussion include using miniaturized fuel cells to replace lithium-ion batteries; new alternatives or supplements to silicon; novel ceramics for heat management; and the use of techniques from micro-electronics manufacturing for biomedical applications. Presentations and discussion in this session will focus on new developments in semiconductor processing and the challenges of innovating into new markets.

**Emerging Global Economies**
Globalization and the rapid growth of emerging economies, such as China and India, present dramatic prospects for growth and diversification into new markets and new sites of innovation. As chemical companies seek to take advantage of this growth, they also struggle with such issues as industry consolidation, changing supply chain patterns, regulatory compliance, and environmental concerns that present different challenges in different regional settings. Presentations and discussion in this session will focus on obstacles and opportunities in setting up an R&D operation in emerging economies and managing a transnational research and manufacturing base.
James Alder earned a B.S. in chemical engineering from the Massachusetts Institute of Technology. He began his career at Celanese as a process engineer. In 1981 he was promoted to R&D group leader in economics and design, and in 1984 he became R&D manager for chemical engineering. Alder was named project manager for the start-up biotechnology company Codon in 1988, president of BHC Company (a joint venture with Boots Pharmaceuticals) in 1994, and business director for Celanese generic pharmaceuticals in 1997. He became vice president of operations and technology at Celanese in 2000.

Alder is currently responsible for Celanese’s sixteen global chemical and emulsion sites; a start-up site in Nanjing, China; and an MTBE joint venture in Saudi Arabia.

Carina Maria Alles leads the Engineering Evaluations and Sustainability group in the DuPont Engineering Research and Technology organization. Alles is an expert in life-cycle assessment, a holistic approach to quantify the environmental footprint of products along the value chain. Her experience in life-cycle assessment covers a wide range of products, from pigments to renewably sourced materials to biofuels. At DuPont Alles has pioneered the use of sustainability analysis to support strategic business decisions and guide research and development efforts. She is currently involved in initiatives to integrate life-cycle thinking into product positioning and stakeholder engagement.

Alles was formerly a research fellow with the University of Karlsruhe in Germany, where she taught particle technology and industrial biotechnology and led research programs in these areas. Alles holds a doctorate in chemical engineering, with graduate-level training in process engineering, environmental engineering, and biotechnology.

Michael Altes is science and technology director for the Advanced Technologies and Ventures Business at Dow Corning Corporation. In this role he is responsible for product and technology development serving the electronics, solar, automotive, aerospace, and other advanced materials industries. During his career at Dow Corning Altes has held numerous positions in R&D as well as roles in new business development and product line management. He has a degree in chemical engineering from Iowa State University and an M.B.A. from the University of Michigan.
Paul Bryan is vice president, technology, for Chevron Biofuels. During 12 years with Chevron, Bryan has been an R&D engineer, an R&D team leader, and most recently, manager of Chevron's R&D Alliance in Perth, Australia. Previously he worked for Cargill and Union Carbide, and he held academic positions at the Massachusetts Institute of Technology and the Colorado School of Mines.

Bryan's educational background includes a B.S. in chemical engineering from the Pennsylvania State University, a Ph.D. in chemical engineering from the University of California, Berkeley, and a postdoctoral work in applied thermodynamics at the Ecole des Mines, Paris. He has been active in a variety of industry and professional organizations, including the Separations Division of the American Institute of Chemical Engineers, the North American Membrane Society, the Gas Processors Association, and the Gordon Research Conferences.

Leonard J. Buckley is manager of the Materials Chemistry Branch at the Naval Research Laboratory, where he directs and manages Ph.D.-level research scientists and engineers performing innovative R&D in chemistry and physics for the U.S. Department of Defense. Buckley has championed efforts in bio-inspired optics, self-decontaminating and self-cleaning surfaces, chemical sensing, high-temperature polymers, and photovoltaic paints. He has also provided technical expertise and analysis for the Smithsonian Institution on the restoration of the Star-Spangled Banner, the flag that inspired the American national anthem.
Buckley earned a bachelor’s degree in materials engineering from Drexel University. He holds a master’s degree in polymer science and a doctorate in materials science and engineering from the Massachusetts Institute of Technology. He has authored more than 150 publications and reports and holds 9 patents. Buckley’s awards and honors include a Navy-sponsored Award for Scientific Achievement, an Alan Berman Outstanding Publication Award from the Naval Research Laboratory, and the Secretary of Defense Medal for Exceptional Civilian Service.

Stanley R. Bull has more than 30 years of experience in energy and related applications, including renewable energy, energy efficiency, transportation systems, bioenergy, medical systems, and nondestructive testing. He is currently the associate director for science and technology for the National Renewable Energy Laboratory and vice president of the Midwest Research Institute.

Bull leads the National Renewable Energy Laboratory’s R&D, which emphasizes renewable energy and energy efficiency technologies in support of U.S. Department of Energy programs. Bull has also held university faculty and private sector positions. He has authored 75 publications, presented 75 papers at professional meetings, and made numerous public presentations on energy-related topics.

Bull holds an M.S. and a Ph.D. from Stanford University and a B.S. from the University of Missouri-Columbia. His professional recognition and honors include a Senior Fulbright-Hays Professorship in Grenoble, France; the Faculty-Alumni Award from the University of Missouri-Columbia; and the Secretary of Energy Outstanding Program Manager Award.

Gary Calabrese earned a B.S. in chemistry from Lehigh University and a Ph.D. in inorganic chemistry from the Massachusetts Institute of Technology. In 1983 Calabrese began his industrial career as a research chemist at Polaroid Corporation. Two years later he joined Allied-Signal at its Massachusetts-based Allied Health and Scientific Products Division as a research group leader.

Calabrese’s interest in the high-growth markets of electronics and semiconductors led him to the Shipley Company in 1989. In 1994 he was named Shipley’s North American director of engineering. He returned to research in 1997 as global director of R&D for the company’s microelectronics materials business, and he was named vice president and chief technology officer for Shipley two years later. Calabrese became the first director of Rohm and Haas Company’s Emerging Technologies Group in 2002. He was appointed a vice president of Rohm and Haas and the company’s chief technology officer in 2003.
1st Floor
1 Uliyot Meeting Hall
2 Elevators to 3rd and 6th floors
3 American Philosophical Society (APS)
   (427 Chestnut Street)
4 Omni Hotel (401 Chestnut Street)
5 Hyatt Regency (201 S. Columbus Blvd.)

3rd Floor
5 Dow Public Square
6 Jacobs Reading Room
7 Othmer Conference Room

Chestnut Street Locations
9 Chemical Heritage Foundation (CHF)
   315 Chestnut Street
10 Omni Hotel
   401 Chestnut Street
11 American Philosophical Society (APS)
   427 Chestnut Street
**Terrence Collins** is the Thomas Lord Professor of Chemistry at Carnegie Mellon University, where he directs the Institute for Green Oxidation Chemistry, a research, education, and development center focused on developing a holistic approach to sustainability science. He is also an honorary professor at the University of Auckland.

Collins taught the first university course in green chemistry in 1992 at Carnegie Mellon. He writes and lectures widely on how chemists can promote sustainability and has delivered more than 400 public lectures. Collins’s research is focused on greening the historically dirty area of oxidation chemistry by designing nontoxic catalysts for activating the natural oxidants hydrogen peroxide and oxygen. He created tetra-amido macrocyclic ligand activators, which promise to transform industrial peroxide chemistry, allowing it to substitute more effectively for chlorine- and metal-based processes and to enable much more effective processes for destroying recalcitrant pollutants and hardy pathogens in water.

Collins received B.Sc., M.Sc., and Ph.D. degrees from the University of Auckland. He conducted postdoctoral studies at Stanford University.

**Arthur Daemmrich** is an assistant professor in business, government, and international economy at Harvard Business School and a senior research fellow at the Chemical Heritage Foundation. His research and teaching focus on business in regulated environments and international comparative analysis of risk and regulation. At Harvard Business School he also plays an active role in the interdisciplinary Healthcare Initiative, advancing scholarship and developing applied lessons for the business of creating and delivering health services and health-related technologies.

Daemmrich was previously the director of the Center for Contemporary History and Policy at the Chemical Heritage Foundation. He earned a Ph.D. in science and technology studies from Cornell University and has held fellowships at the Social Science Research Council/Berlin Program for Advanced German and European Studies, the Kennedy School of Government at Harvard University, and the Chemical Heritage Foundation. He has published widely on pharmaceutical and chemical regulation, biotechnology business and policy, innovation, and history of science.
**Ryan R. Dirkx** is the vice president of R&D at Arkema. A 20-year veteran of Arkema and its predecessor companies, Dirkx has directed global R&D organizations for several Arkema businesses, most recently those within the Technical Polymers and Altuglas International divisions. He has also held business and market management positions within the Specialty Chemicals Division.

Dirkx has a Ph.D. in solid state science from the Pennsylvania State University and a B.S. in ceramic engineering from the New York State College of Ceramics at Alfred University. He holds a number of patents worldwide, and he is active within the Industrial Research Institute.

**Miles Drake** is chief technology officer of Weyerhaeuser Company, where he oversees a research department of 430 employees devoted to growing the core businesses, supporting customers, and creating new technology-based options for growth for the corporation.

Drake was formerly vice president, R&D, and chief technology officer at Air Products and Chemicals. In that role, he managed a global R&D budget of $150 million with facilities in the United States, the United Kingdom, Germany, the Netherlands, Spain, Korea, Japan, and China. In 2004–2005 he was chairman of the Industrial Research Institute, an organization of 200 global companies focused on enhancing the effectiveness of technological innovation. He currently serves as a board member of the Da Vinci Discovery Center.

Drake holds a Ph.D. from Bristol University School of Surface Chemistry and a B.A. in natural science from Cambridge University.

**Henry C. Foley** is the dean of the College of Information Sciences and Technology at the Pennsylvania State University. Previously Foley was a professor of chemical engineering and director of the Center for Catalytic Science and Technology at the University of Delaware. Foley has received awards and honors throughout his career, including the National Science Foundation Presidential Young Investigator Award, the American Chemical Society Leo C. Friend Award, the Philadelphia Catalysis Club Annual Award, the Union Carbide Company Research Innovation Recognition Award, and the Ernest W. Thiele Lectureship in Chemical Engineering. He has authored more than 90 papers and holds 15 patents.

Foley is a Fellow of the American Institute of Chemists and a member of the American Society for Engineering Educators, the American Association for the Advancement of Science, the American Institute of Chemical Engineers, Sigma Xi, Phi Lambda Upsilon, and Sigma Pi Sigma. He received a B.S. in chemistry from Providence College and a Ph.D. in physical chemistry from the Pennsylvania State University.
William Fraser is senior director of global technology alliances for The Dow Chemical Company’s Core R&D operations. He joined Dow in 2001 through the Dow-Union Carbide merger.

At Union Carbide Fraser was executive vice president of R&D and engineering for Univation Technologies, a joint venture with ExxonMobil Chemicals. Univation Technologies serves as a discovery, development, and licensing company for world-scale polyethylene manufacturing. Fraser was involved with Carbide’s development of UNIPOL Process Technology for linear low-density polyethylene (LLDPE) and the launch and building of the UNIPOL licensing franchise and the commercialization of LLDPE film technology. In Carbide’s silicones business, he led R&D efforts in the leveraging of Si technologies in plastics applications and directed a business initiative in plastics additives systems.

Fraser earned a B.S. in chemical engineering from Tufts University and a Ph.D. in chemical engineering from Princeton University.

Charles F. Gay is corporate vice president and general manager of the Solar Business Group at Applied Materials. He is also cofounder of the Greenstar Foundation, which delivers solar power and Internet access for health, education, and microenterprise projects to small villages in the developing world.

Gay began his career designing solar-power system components for communications satellites at Spectrolab. He later joined ARCO Solar, where he established the R&D program and led the commercialization of single crystal silicon and thin film technologies. In 1990 Gay became president and chief operating officer of Siemens Solar Industries. From 1994 to 1997 he served as director of the U.S. Department of Energy’s National Renewable Energy Laboratory. In 1997 Gay served as president and chief executive officer of ASE Americas, and in 2001 he became chairman of the advisory board at SunPower Corporation.

Gay has a doctorate in physical chemistry from the University of California, Riverside. He holds numerous patents for solar cell and module construction and is the recipient of the Gold Medal for Achievement from the World Renewable Energy Congress.
David Greenley joined Rohm and Haas Company in 1982 as a senior scientist in the Biocides Department. In 1984 he became a research section manager. Over the next five years he was responsible for new molecule discovery, formulations, applications research, technical and sales service, process research, and process engineering. Greenley was named research director for Rohm and Haas’s biocides business in 1989.

In 1994 Greenley became the European business manager for biocides, and in 1998 he became global business director, specialty amines and acetylene. Greenley moved to his current position as director of technology operations and site manager for the Spring House Technical Center in 2000. He holds a Ph.D. in microbiology from the University of Delaware.

Raj L. Gupta joined Rohm and Haas Company in 1971 as a financial analyst. In 1998 he was elected to the company’s board of directors, and in 1999 he was named vice chairman. Later that year Gupta became chairman and chief executive officer. He assumed the additional title of president in 2005.

Gupta holds a B.S. in mechanical engineering from the Indian Institute of Technology, an M.S. in operations research from Cornell University, and an M.B.A. in finance from Drexel University.

He is the immediate past chairman of the American Chemistry Council and the Society of Chemical Industry, America Section. He sits on the Drexel University Board of Trustees and the Board of Overseers of the Chemical Heritage Foundation. He is also a member of the boards of Tyco, The Vanguard Group, and the American Chemistry Council.

Rajarao Jammy began his career at IBM’s Semiconductor Research and Development Center. He subsequently became manager of the Thermal Processes and Surface Preparation Group in the DRAM Development Organization. In 2002 Jammy moved to T. J. Watson Research Center to manage IBM’s efforts in high-k gate dielectrics and metal gates. In 2005 he accepted assignment to SEMATECH as director of the Front End Processes Division.

Jammy holds more than 50 patents and is author or coauthor of more than 134 publications and presentations. He holds a doctoral degree in electrical engineering from Northwestern University.
Theresa Kotanchek is technology director, Asia Pacific, for The Dow Chemical Company. In this role, she leads all Asia Pacific R&D, including the development and staffing of Dow’s new state-of-the-art R&D center in Shanghai, China, and future build-out in India.

Kotanchek joined Dow in 1990 with extensive experience in engineering and materials science. She has since held various leadership roles, including research leader in corporate research, product manager in advanced electronic materials, senior director of technology for Dow’s Growth Center, and global R&D director for ventures.

Kotanchek holds a Ph.D. in materials science, an M.S. in ceramic science, and a B.S. in ceramic science and engineering from the Pennsylvania State University.

Andrew N. Liveris is president, chief executive officer, and chairman of The Dow Chemical Company. His 30-year Dow career has spanned manufacturing, sales, marketing, new business development, and management. Liveris has been a member of Dow’s board of directors since 2004, and he was elected chairman of the board in 2006.

Liveris received a bachelor’s degree in chemical engineering and an honorary doctorate in science from the University of Queensland. He is a Fellow of The Institute of Chemical Engineers.

He serves on the boards of directors of Citigroup and the United States Climate Action Partnership. He is the chairman of the boards of the American Chemistry Council and the International Council of Chemical Associations. In addition he serves on the Board of Trustees of the Herbert H. and Grace A. Dow Foundation, and he is a trustee of Tufts University.

Sharon L. Nunes is vice president of big green innovations in IBM Systems & Technology Group, an organization that identifies and launches new businesses focused on using IBM’s expertise in information technology and materials and processing to solve critical problems around environmental issues.

Nunes received a Ph.D. in materials science from the University of Connecticut. She is a member of the Look College Engineering Advisory Council at Texas A&M University, the College of Engineering Advisory Committee at the University of Connecticut, and the Board of Directors for the University of Connecticut Foundation. She was a National Academy of Engineering Frontiers of Engineering Fellow in 2000 and has been a member of the National Academy of Engineering’s Engineer of 2020 advisory board.
Nunes has been inducted into the University of Connecticut Academy of Engineering. In 2004 she was awarded the Fran Allen Mentoring Award at the IBM Women in Technology meeting. In 2006 she won a National Association for Female Executives Women of Excellence Award. Nunes is a member of IBM’s U.S. Women’s Council, a leader on the IBM Women in Technology team, and a member of IBM’s executive advisory council for Society of Women Engineers.

Angelo G. Scopelianos received a Ph.D. in organic chemistry from the Pennsylvania State University and a B.S. from the State University of New York College at Oneonta. He joined Dupont’s Medical Products Division in 1982. After spending five years at DuPont’s Experimental Station, he joined Elf Acquitane (formerly Pennwalt) as a manager of the Drug Delivery Systems Group. Scopelianos joined the Johnson & Johnson Corporation in 1988. In 1996 he was appointed director of the Johnson & Johnson Corporate Biomaterials Center, and in 1998 he was promoted to vice president, R&D, for the Center for Biomaterials & Advanced Technologies. The center is currently developing products in the areas of implantable devices, tissue engineering, drug enhanced devices, and drug delivery.

Over the years Scopelianos has received several internal Johnson & Johnson awards for outstanding achievement in R&D, and in 2000 he received the New Jersey Leadership Award in Biomaterials Science. He holds more than 35 patents.

John C. Warner is professor of plastics engineering and director of the Center for Green Chemistry at the University of Massachusetts Lowell. Warner previously worked at the Polaroid Corporation and the University of Massachusetts Boston, where he started the world’s first green chemistry Ph.D. program. His recent patents in the fields of semiconductor design, biodegradable plastics, personal care products, and polymeric photoresists are examples of how green chemistry principles can be immediately incorporated into commercially relevant applications.

Warner is associate editor of the journal Organic Preparations and Procedures International, and he is on the editorial boards of Crystal Engineering and Crystal Growth and Design. He received the 2004 Presidential Award for Excellence in Science Mentoring and the Outstanding Service to Nursing Award from Sigma Theta Tau International Honor Society of Nursing. The American Institute of Chemistry named Warner its Northeast Division’s Distinguished Chemist of the Year for 2002.

He is coauthor of the book Green Chemistry: Theory and Practice, and he serves on the Board of Directors of the Green Chemistry Institute in Washington, D.C.
Sagel is a principal engineer at the Procter & Gamble Company Health Care Research Center in Cincinnati, Ohio. He joined Procter & Gamble in 1993, initially focusing on chewing gum technology, chemical technology for dentifrice, packaging, and clinical imaging methods. In 1996 he began working on tooth whitening; he invented Crest Whitestrips in early 1997.

Sagel has been featured in leading publications as a breakthrough product innovator, and he is lead author on 18 patents, with others pending. He graduated with a degree in chemical engineering from the University of Cincinnati.

### 2007 SCI Gordon E. Moore Medalist

Paul A. Sagel is receiving the 2007 SCI Gordon E. Moore Medal for his successful innovation of Crest Whitestrips, which merge a proprietary strip delivery system with novel design elements for enhanced teeth whitening performance.

Before Crest Whitestrips came on the market, in-home teeth whitening products used generic plastic mouth guards that caused considerable discomfort. The only viable option for teeth whitening required visiting a dentist for expensive custom-made trays. Sagel's Whitestrips combined an effective dose of hydrogen peroxide with a thin and flexible adhesive strip to deliver intrinsic tooth whitening to the consumer in an easy, safe, and effective manner.

The introduction of Crest Whitestrips created a new category of at-home intensive oral-care products in the United States, Canada, Germany, Italy, China, and Mexico and set the stage for additional at-home products aimed at developing countries, where access to professional dental care and health care is not readily available.
ABOUT THE PREMIER SPONSOR

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 35 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.

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, 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.

Past SCI Gordon E. Moore Medalists

Jonathan M. McConnachie | 2006
Jeffrey John Hale | 2005
George Barclay | 2004
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.

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.