

Langer Receives Millennium Technology Prize for Intelligent Drug Delivery

Robert S. Langer, Institute Professor of Chemical and Biomedical Engineering at the Massachusetts Institute of Technology (MIT), has been awarded the 2008 Millennium Technology Prize, the world's largest prize for technology. The Millennium Prize is awarded every two years by Finland's Technology Academy for a technological innovation that significantly improves the quality of human life and promotes sustainable development.

Langer was honored "for his invention and development of innovative biomaterials for controlled drug release and tissue regeneration that have saved human lives and improved the lives of millions of patients." Langer received the prize of €800,000 (\$1.27 million) and the "Peak" prize trophy from Tarja Halonen, the President of the Republic of Finland, at the Grand Award Ceremony in Helsinki on June 11, 2008.

Cited as "the father of controlled drug delivery and tissue engineering" and "one of history's most prolific inventors in medicine," Langer's innovations have had a significant impact on fighting cancer, heart disease, and numerous other diseases. His work has also brought about significant advances in tissue engineering, including synthetic replacement for biological tissues, such as artificial skin. Over 100 million people a year are already using advanced drug-delivery systems, and this number is rising rapidly. In the future, tissue engineering may revolutionize medical treatment that could affect millions of other people. "Tissue engineering holds the promise of creating virtually any new tissue or organ," Langer says.

Langer's research laboratory at MIT is the largest bio-



Millennium Prize winner Robert Langer displays a vial of nanoparticles.

medical engineering laboratory in the world. He holds more than 600 issued or pending patents, which have been licensed to over 200 pharmaceutical, chemical, biotechnology and medical device companies, and his research has spawned more than a dozen biotechnology firms.

A past chair of the U.S. Food and Drug Administration's Science Board, Langer is also the youngest person (at age 43) in history to have been elected to all three of America's major national science academies: the National Academy of Sciences, the National Academy of Engineering and the National Institute of Medicine. His many honors include the U.S. National Medal of Science, the Charles Stark Draper Prize (the equivalent of the Nobel Prize for engineering), the John Fritz Medal, the Max Planck Research Award, and AIChE's William H. Walker and Professional Progress Awards.

Edwards to be Honored for Contributions to Arts and Sciences

David A. Edwards, a writer and professor of biomedical engineering at Harvard Univ., has been elected to the Order of Arts and Literature of France. He will receive the knighthood designation Chevalier de l'Ordre des Arts et des Lettres, recognizing his contributions to the arts and literature and their propagation.

As an author, Edwards has been involved in the translation of ideas from the university through novel medical technology, performing and visual arts. His work gained recognition in France through his creation of Le Laboratoire (www.laboratoire.org), which he describes as "the first experiment-driven art and science incubator." The center aims to give scientists a venue for creative thinking outside the constraints of specialization and grant applications.

Edwards's scientific research concerns the mathematical design of novel physical parameters that allow nano-

structured materials to efficiently deliver drugs and vaccines to the lungs and other human organs, with a special focus on infectious diseases in developing nations.

Aside from his research, he has written several fiction and nonfiction books, most recently "ArtScience: Creativity in the Post-Google Generation" (Harvard Univ. Press, 2007), which examines the intersection of the arts and sciences in culture, education, industry and society.

Edwards is a member of the National Academy of Engineering, and received AIChE's Professional Progress Award in 2002.

The Ordre des Arts et des Lettres was established by France's Minister of Culture and confirmed as part of l'Ordre National du Merite by President Charles de Gaulle in 1963.

Edwards's investiture will take place in Paris on Sept. 24, 2008.

Celebration Time: Marking AIChE's Centennial

On a sultry June day in 1908, the “committee of six” — Charles F. McKenna, William M. Booth, John C. Olsen, Richard K. Meade, William H. Walker, and Arthur D. Little — gathered in Philadelphia to form the American Institute of Chemical Engineers. (For more on AIChE's past, visit www.aiche.org/About/Centennial/Books/index.aspx.)

To celebrate the Institute's 100th birthday, AIChE returns to its birthplace for the 2008 Annual Meeting, which will be held in Philadelphia Nov. 16–21. The conference — expected to be AIChE's largest ever — will take place at the Pennsylvania Convention Center, Marriott Hotel and



Loews Hotel, with presentations that reflect the achievements of chemical engineering in the past century as well as peer into the future of the profession. Two special centennial topical conferences will be dedicated to chemical engineering education and chemical engineering research and technology. For information on these sessions and the complete conference program, visit www.aiche.org/annual/.

Highlights of the Technical Program

In addition to these special centennial sessions, the conference will host more than 700 technical sessions featuring topics such as energy, sustainability and green engineering, water treatment and purification, life sciences, and molecular engineering.

Other highlights will include:

- Monday, Nov. 17, 11 am–12 pm — Danckwerts Lecture, “Incremental Identification of Reaction and Transport Models,” by Wolfgang Marquardt, professor of process systems engineering at RWTH Aachen Univ. and spokesperson for AVT, Aachener Verfahrenstechnik
- Tuesday, Nov. 18, 9–10:45 am — James Oldshue Lecture by Carlos Cabrera, CEO and president of UOP LLC (part of the XXII Interamerican Congress on Chemical Engineering)
- Tuesday, Nov. 18, 11 am–12 pm — Professional Progress Award Lecture by Jay Keasling, professor of chemical engineering, Univ. of California, Berkeley



- Wednesday, Nov. 19, 11 am–12 pm — Institute Lecture, “The Rise and Realization of ‘Molecular Chemical Engineering’” by Mark Davis, Warren and Katharine Schlinger Professor of Chemical Engineering, California Institute of Technology

- Thursday, Nov. 20, 11 am–12 pm — Industrial Innovation Lecture.

In a special Centennial Convocation on Sunday, Nov. 16 at 4 pm, Boston Univ. president Bob Brown — a distinguished scholar of chemical engineering and an inno-

vative leader in higher education — will deliver a keynote address. And, what would a celebration in Philadelphia be without a visit from one of America's Founding Fathers — Ben Franklin? Franklin will pay attendees a visit and impart his words of wisdom. Philadelphia's Mayor Michael Nutter has been invited to give a welcome, and the convocation will also feature international chemical engineering dignitaries and musical and video interludes. The convocation will be followed by a special Centennial Welcome Reception.

Social Activities and Plant Tours

Apart from the technical program, the General Arrangements Committee has created a full educational and social program for attendees, their families and guests. It will also host a guest headquarters offering hospitality to visitors. Philadelphia itself offers a wide variety of historic and cultural attractions that will make a memorable holiday for those who accompany meeting attendees.

Here is just a sampling of the available attractions:

- Monday, Nov. 17, 9–11 am — River to River Tour (providing an overview of Philadelphia)
- Monday, Nov. 17, 1–5 pm — Hagley Museum (including historic DuPont sites)
- Tuesday, Nov. 18, 9 am–12:15 pm — Plant tour: Sela Fluid (a thermal oxidizer plant)
- Tuesday, Nov. 18, 2–4 pm — Historical Philadelphia
- Wednesday, Nov. 19, 9 am–1 pm — Longwood Gardens
- Wednesday, Nov. 19, 1–5 pm — Plant tour: Montanay Energy Resources (a waste-to-energy facility).

Additionally, there will be a Centennial Dessert Reception



at the National Constitution Center, on Wednesday, Nov. 19, from 7 to 10 pm, including multimedia presentations and interactive exhibits.

Unguided Tours and Activities

Opportunities for free time and independent activities abound, including a visit to the Chemical Heritage Foundation (CHF; www.chemheritage.org), which was founded by AIChE and the American Chemical Society in the 1980s. Meeting registrants, guests and family members are welcome to visit CHF between 10 am and 4 pm, Monday–Friday. Admission is free. CHF maintains world-class collections of instruments and apparatus, rare books, fine art, and the personal papers of prominent scientists, all related to the chemical and molecular sciences. It is located near the intersection of Third and Chestnut Streets in Phil-

Saluting Minority Achievements

AIChE's Minority Affairs Committee (MAC) is planning two special events to mark the Centennial. On Monday, Nov. 17, 10:30 am–12:30 pm, the committee is hosting a "Black Eminent Chemical Engineers Centennial Forum," chaired by Thomas Mensah, CEO of Georgia Aerospace, and co-chaired by Emmanuel Dada of FMC Corp. and Luke Achenie of Virginia Polytechnic Institute and State Univ. A distinguished panel will provide students and young professionals with strategies for reaching the highest levels of the engineering profession.

Also on Monday, Nov. 17, 8:30–10:15 am, the committee will hold its Scholarships Forum, "Celebrating More than a Decade of MAC Scholarships at the AIChE Centennial." Since 1994, MAC has sustained a scholarship program for high school (incoming freshmen) and college students studying chemical engineering. Approximately 240 scholarships have been awarded to African-American, Hispanic and Native American students with excellent academic records and financial need.

The panel will include scholarship recipients, who will share their stories from college days to the establishment of successful careers. The panel will also feature sponsors and AIChE members who have supported the scholarship program. FMC, the major corporate sponsor of the MAC Scholarship Awards, will be recognized for its continuing support. The Forum will conclude with a presentation addressing what attracts minority students to chemical engineering, what fraction of them leave compared to overall retention, why those students leave, and what can be done to aid recruitment and retention of underrepresented minorities in chemical engineering.

Emmanuel Dada will chair the event, joined by Michael Harris, associate dean of undergraduate education at Purdue Univ., and Norman Loney, associate chair for undergraduate studies at the New Jersey Institute of Technology, as co-chairs.

adelphia, a walkable mile or a five-minute taxi ride from the Convention Center.

During the meeting, CHF will present "Molecules that Matter," a traveling exhibition showcasing ten organic molecules that profoundly altered the 20th century: aspirin, isooctane, penicillin, polyethylene, nylon, DNA, progesterin, DDT, Prozac, and buckminsterfullerene (*CEP*, Feb. 2008, p. 64). Additionally, CHF hosts "Making Modernity," a permanent exhibition that traces scientific progress from the laboratory to the factory to the home. And, CHF's Othmer Library of Chemical History, which houses more than 100,000 volumes, will have a special display of first editions of groundbreaking textbooks in chemical engineering. (See pages 62–63 of this issue for a related story.)

Philadelphia presents many opportunities to make a child's history class come to life, with visits to the Liberty Bell, Independence Hall, or Betsy Ross's home. At the Franklin Institute Science Museum, children can learn the laws of physics, climb aboard a locomotive, watch an IMAX movie, or walk through a model of a human heart. At the Independence Seaport Museum, they can watch boats being made and take a tour of a submarine and a warship.

Other activities for families are: the Adventure Aquarium; the Eastern State Penitentiary, a historic prison that housed notorious criminals like Willie Sutton and Al Capone (children under 7 not admitted); the Please Touch Museum, which provides hands-on exhibits in science, art and humanities; and the Philadelphia Zoo.

On Tuesday morning, Nov. 18, at 10:00 at the Arden Theater, a short walk from the Convention Center, "Gee's Bend" will be performed. The play is a celebration of the Pettway women of Gee's Bend, AL. Through segregation, family turmoil and the civil rights movement, the women turn to quilting to provide comfort and context to their lives. Interwoven with gospel music, "Gee's Bend" is a story of family, self-discovery and artistic expression. The Philadelphia Museum of Art is hosting a related exhibit, "The Architecture of the Quilt."



Program and registration information for the Centennial Annual Meeting are available at www.aiche.org/annual/.

Government Relations Committee Issues White Paper on Electricity Storage; Takes Action on Licensure and Funding Issues

While the United States searches for ways to use more renewable resources for electric power generation, too little attention is being paid to developing innovative ways to store large quantities of this energy (*CEP*, Mar. 2008, pp. S23–S32). A new white paper published by AIChE's Government Relations Committee (GRC) says that's a problem because intermittent and highly variable solar and wind energy, as generated, needs massive storage to convert it to steady power that can be dispatched to the nation's power grid. The GRC is getting this message out to legislators and science and technology reporters.

Everyone — from T. Boone Pickens to the employees of the U.S. Dept. of Energy (DOE) — seems to be working toward electric power systems that draw more from renewable resources and less from fossil fuels. However, the GRC warns that almost all of the attention on renewable energy is being given to its generation — and not enough to storing this renewable energy, which is necessary for its use on a broad scale.

The solution, say Bernard Lee and David Gushee — the report's authors, who retired from the Institute of Gas Technology and the Congressional Research Service, respectively — is to develop and commercialize massive electricity storage (MES) technology. The authors explain that traditional power plants have nuclear, natural-gas- or coal-fired generators that run steadily and continuously to deliver reliable electricity to consumers. However, if renewable energy — such as wind and solar — is to move from its current role as an incremental provider and become a major supplier of power, then the intermittent and variable renewable energy must be converted to dispatchable power for delivery to the consumers on a steady and continuous basis.

A copy of the full report is available on AIChE's GRC website, found under www.aiche.org/committees.

The GRC in Action

On other fronts, working with representatives of the Career and Education Operating Council (CEOC) and the Professional Development Committee (PDC), the GRC endorsed the American Society of Mechanical Engineers' (ASME) position paper, "Mandatory Educational Requirements for Engineering Licensure," opposing mandatory, across-the-board requirements of 30 credits beyond the bachelor's degree as a requirement for licensure as a Professional Engineer.

The GRC, chaired by Phil Winkler of Air Products and Chemicals, has also written to the chair of the Senate Committee on Health, Education, Labor and Pensions

supporting the "Worker Protection Against Combustible Dust Explosions and Fires Act of 2008." Members of AIChE and AIChE's Center for Chemical Process Safety (CCPS) played key roles in the development of the standards upon which the legislation is based.

Additionally, with the support of the committee, AIChE President Dale Keairns has joined the leaders of 14 other engineering organizations, under the auspices of the American Association of Engineering Societies, in writing to members of Congress to thank them for including crucial science and engineering funding in a recent supplemental appropriations bill. The letter further encouraged them to continue to provide sufficient funding in fiscal year 2009 to assure that the U.S. remains competitive in the face of stronger global competition.

And, the GRC, working with ASME, IEEE and other organizations, has contacted ranking members of Congressional committees asking that funding be made available to implement the Energy Independence and Security Act of 2007, and the related creation of "green collar" jobs that Congress approved last year.

Students at the AIChE Centennial

More than 1,000 undergraduate chemical engineers from 100 schools are expected to join the Centennial celebration at the National Student Conference, Nov. 14–17, at the AIChE Annual Meeting in Philadelphia. In addition to the career workshops, scholarly competitions and social events that make the Student Conference so popular, this year's program will reflect the Centennial theme by adding a new spin to some familiar activities. Two special highlights:

■ The tenth annual Chem-E-Car Competition will see teams from 31 schools vying for bragging rights in the national finals — with special attention this year to car designs that capture the spirit and style of the Centennial.

■ AIChE's Computing and Systems Technology (CAST) Division is sponsoring a Centennial Student Video Contest. Student groups are invited to submit original videos that demonstrate their creativity and articulate their vision about the future of chemical engineering. Prizes will be awarded for best videos, and finalists will have their videos showcased at the Student Conference. Entries are being submitted via YouTube and Facebook, where students can find contest rules and award categories, and vote for their favorite videos. For information, and to view submitted videos, visit YouTube (www.youtube.com/group/futureofcheme) or the Facebook Group "AIChE 2008 Student Contest." Deadline for submissions is Oct. 3, 2008.

Peppas, Schulz are Honored as ASEE Fellows

Two AIChE members are among the 12 new Fellows inducted by the American Society of Engineering Education (ASEE; www.asee.org). Fellow status is conferred upon ASEE members who have made valuable contributions to engineering education.

Nicholas A. Peppas is the Fletcher Stuckey Pratt Chair in Engineering at the Univ. of Texas at Austin, where he directs the Laboratory of Biomaterials, Drug Delivery, Bionanotechnology and Molecular Recognition. Peppas earned his ScD in chemical engineering from MIT in 1973, and has received honorary doctorates from the Universities of Ghent, Parma and Athens. He is a Fellow of AIChE and a member of the National Academy of Engineering and the French Academy of Pharmacy. Among many honors, Peppas is the recipient of AIChE's William H. Walker Award for Excellence in Contributions to Chemical Engineering Literature.



Kirk H. Schulz is professor and vice president for research and economic development at Mississippi State Univ. He earned his PhD in chemical engineering in 1991 at Virginia Tech, and held faculty positions at the Univ. of North Dakota and Michigan Tech. He moved to Mississippi State in 2001 to become director of the Dave C. Swalm School of Chemical Engineering, and in 2005 was selected as Dean of Engineering. Schulz is active in AIChE, ASEE, and the Accreditation Board for Engineering and Technology (ABET), where he is a member of the ABET Engineering Accreditation Commission.



The ASEE Fellows were inducted at a June 25, 2008, ceremony held during ASEE's Annual Conference and Exposition in Pittsburgh, PA.

AIChE Conference Calendar

For information and registration details, visit www.aiche.org/conferences or call Customer Service at 1-800-242-4363 or 1-203-702-7660 (outside the U.S.)

2008 Ammonia Conference

September 7-11, 2008 • Hyatt Regency • San Antonio, TX

2008 AIChE Regional Conference

September 21-23, 2008 • University of Illinois at Chicago • Chicago, IL

2008 AIChE Annual Meeting

November 16-21, 2008 • Philadelphia Marriott & Pennsylvania Convention Center Philadelphia, PA

SBE's 2nd International Conference on Biomolecular Engineering

January 18-21, 2009 • Fess Parker Doubletree • Santa Barbara, CA

SBE's 2nd International Conference on Accelerating Biopharmaceutical Development

March 9-12, 2009 • Marriott Coronado • Coronado Island, CA

2009 Spring National Meeting

April 26-30, 2009 • Tampa Convention Center • Tampa, FL

2009 Offshore Technology Conference

May 4-7, 2009 • Reliant Park • Houston, TX

In Memorium

Peter J. Schmeidler

Peter John Schmeidler, of Delran, NJ, a senior fellow at the Univ. of Pennsylvania's Wharton Risk Management and Decision Processes Center, died April 14 of pancreatic cancer. He was 69.



Schmeidler earned both his bachelor's and master's degrees in chemical engineering from Columbia Univ. in 1969 and 1971, respectively, and an MBA from Rutgers Univ. in 1982. He joined the Wharton Center in 2001, after a 40-year process engineering career with the Rohm & Haas Chemical Co. He was an industrial consultant to the Univ. of Pennsylvania Chemical Engineering Dept's senior class design project since 1977.

Schmeidler was an active AIChE member and a past chair of the Delaware Valley Local Section. He is survived by his wife, Lois, four children, and four grandchildren. Donations can be made to the Peter J. Schmeidler Memorial Capital Improvement Fund of Temple Sinai, Cinnaminson, NJ, where he served as four-time president.

OBITUARIES

Earl A. Ebach, 83, Midland, MI

Howard W. Harlow, 91, Venice, CA

Rene A. Mouton, 74, Lakeland, FL

Edward L. Phillips, 81, Medford Lakes, NJ

Peter J. Schmeidler, 69, Delran, NJ

William D. Weatherford, 85, Denton, TX