

AIChE Looks to the Future at Minneapolis Annual Meeting

AIChE's celebration of the International Year of Chemistry (IYC-2011) provided the context for wide-ranging discussions on the path forward for the chemical engineering discipline when the Institute held its 2011 Annual Meeting in Minneapolis, MN, Oct. 16–21.

The Annual Meeting attracted more than 4,900 participants from industrial, academic, and governmental organizations from around the world. This diversity contributed to the global perspectives presented at the nearly 800 technical sessions, 13 topical conferences (including an expanded International Congress on Energy and a new World Congress on Sustainable Engineering), as well as scores of other activities, including poster sessions, exhibits, lectures, and social gatherings.

The next generation

AIChE's Annual Student Conference dominated the meeting's opening weekend, attracting more than 1,200 undergraduate ChEs. Co-hosted by the student chapters from the Univ. of Minnesota, Twin Cities, and Iowa State Univ., and with corporate support from Chevron, DCP Midstream, and Barrick North America, the conference was packed with career development workshops, social events, sessions on strengthening student chapters, and scholarly competitions. The Annual Student Paper Competition was won by Abel Cortinas of Texas Technological Univ., for his



▲ At the Student Conference Bash, a team from the Univ. of Nebraska edged out Stevens Institute of Technology and the Univ. of Minnesota, Twin Cities, in Chem-E Jeopardy.



▲ The team from Univ. of Puerto Rico won the 13th Annual Chem-E-Car Competition with its "CoKi Stroj" thermally controlled vehicle.

► Top right, students from Mexico's Monterrey Tech prepare their Chem-E-Car for launch. Bottom right, the Stanford Univ. team recalibrates its car to travel the target distance of 68 ft while carrying a load of 350 mL of water.



presentation entitled "Flow-Aligned Graphene/PVA Nanocomposite Films."

A highlight of every Student Conference is the Chem-E-Car Competition, where teams of undergraduates build shoe-box-sized vehicles powered by chemical reactions that must carry a variable load over a variable distance. Thirty-two teams competed in the finals, which consisted of two rounds. The Univ. of Puerto Rico's "Coki Stroj" car won first prize in the performance competition, with a best run of 2 in. from the target stopping point. The pneumatically powered car, built with a LEGO motor, used hydrogen peroxide to produce oxygen and water, and employed a thermal controller that tripped a solenoid to shut down the forward motion when a specific temperature was reached.

Finishing second was the Univ. of California, Davis, with a best run of 4 in. from the target. Missouri Univ. of Science and Technology finished close behind with a distance of 5.5 in. from the stopping line.

The Univ. of Puerto Rico took second place in the Chem-E-Car Poster Competition, which was won by the team from the Univ. of Akron. Akron also won the award for the most consistent performance. Bucknell Univ. won an award for the best use of a biological reaction to power a car, sponsored by AIChE's Society for Biological Engineering, and Texas Tech Univ. received an award for inherent safety in design, sponsored by SACHe (Safety and Chemical Engineering Education).

Today's leaders. . .

The Annual Meeting kicked off on Sunday evening, Oct. 16, with the Institute's Honors Ceremony. AIChE's major awards were presented to eminent figures in research, education, technology, and the profession — including individuals and organizations honored for their contributions to industrial practice.

A team of engineers and business leaders from Eastman Chemical Co. received the Industrial Research and

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Chevron (Gold Sponsor); **Process Systems Enterprise (PSE)** (plasma screen displays); **American Elements** and **Xerox** (Silver Sponsors); and **Air Products**, **Chemstations**, **Eastman**, and **ProSim** (Bronze Sponsors).



▲ At the Honors Ceremony, Gregory W. Nelson of Eastman Chemical Co. accepted the Institute's Industrial Research and Development Award.

Development Award for its commercialization of the Eastman Tritan co-polyester. Ganesh Kailasam, Vice President of R&D at The Dow Chemical Co.'s Performance Materials Div. (profiled in *CEP*'s October 2011 issue) received the Industry Leadership Award for his contributions to high-performance plastics and materials. Paul F. McKenzie, Head of Global Development at Johnson & Johnson Pharmaceutical Research and Development, received the Lawrence B. Evans Award in Chemical Engineering Practice for introducing chemical engineering principles into pharmaceutical process development.

The Corporate Innovation Award was presented to Xerox Corp. at a special session on Thursday, Oct. 20, at which Hadi Mahabadi, Vice President and Director at Xerox Research Centre of Canada, presented a lecture about the company's prize-winning emulsion aggregation toner technology.

... Tomorrow's innovators

The technical program began on Monday, Oct. 17, with the International Year of Chemistry Plenary — a highlight of AIChE's IYC-2011 involvement. This session inspired diverse perspectives on the prospects for U.S. chemical science and innovation.

In his plenary address, Thomas W. Peterson, Assistant Director for Engineering at the National Science Foundation, spoke about the importance of basic research investment to economic growth. While noting that innovation

and entrepreneurship remain bywords in U.S. society and education, Peterson cautioned that not enough U.S. students are being trained as engineers and entrepreneurs, and that the U.S. must work harder to educate and inspire a stronger engineering and science workforce capable of competing internationally in business and technology.

This theme was continued in a pair of subsequent sessions entitled "Chemical Science Innovation — The Future of the U.S. Chemical Enterprise." Part of the International Congress on Energy, these symposia, co-sponsored by the Council for Chemical Research, offered insights into how chemical science innovation is fostered; the importance to the U.S. of global initiatives; challenges in materials, chemicals, and energy sustainability; and the workforce of the future.

Robert A. Brown, President of Boston Univ., underscored Peterson's comments in his talk entitled "Educating Global Chemical Engineers in the 21st Century." Brown discussed the need for the U.S. to educate a new generation of global citizens in order to compete and benefit from a world economy rapidly shifting toward China and India.

William Banholzer, CTO and Executive Vice President at Dow, presented a talk on the future of fuels and alternative feedstocks. Banholzer believes that disproportionate investment is being directed toward bioengineering, especially where it extends to the hydrogen economy and the prospects for biofuels as a petroleum replacement — which he views as untenable in the current U.S. economic and technical model. (See related story on pp. 5–6.) Monty Alger, CTO of Air Products, offered a different viewpoint in his talk on chemical product lifecycle management and enterprise environmental stewardship. Alger sees value in hydrogen production for the vehicle market — for its potential to reduce carbon emissions, and as a niche fuel.

The Second International Congress



▲ Thomas W. Peterson of the National Science Foundation delivered the International Year of Chemistry plenary address.

on Energy, presented by AIChE's Center for Energy Initiatives, included more than 100 sessions covering four key areas: Global Solar and Nuclear Energy in the 21st Century (including a plenary session entitled "What Makes Energy Clean?"); Lignocellulosics: Biorefineries and Sustainable Energy; Hydrogen Production and Storage; and Innovations of Green Process Engineering for Sustainable Energy and Environment.

Blog all about it

People who could not travel to Minneapolis to enjoy the Annual Meeting in person could participate virtually in many of the meeting's main events via AIChE's ChEnected blog. A half-dozen AIChE member bloggers provided on-the-scene reports — including photographs, videos, and session summaries and personal commentary — from the meeting's major events, as well as from technical sessions that captured their individual interest. The blog posts included video interviews with the meeting's featured lecturers, as well as video highlights from the Student Conference and Chem-E-Car Competition. The postings are archived at <http://chenected.aiche.org/annual>.

IN THE DECEMBER ISSUE:

CEP's coverage of the 2011 Annual Meeting will continue with a review of the major lectures, details on key topical conferences, and a wrap-up of the meeting's highlights.



Institute News

Meet Some of the New AIChE Fellows



Kenneth Cox, P.E., is Professor in the Practice at Rice Univ. (Houston, TX), where he teaches product and process design and conducts research in molecular thermodynamics and colloidal behavior. He previously taught at Ohio State Univ. and worked as a research engineer at Shell Development. He is chair of AIChE's South Texas Section, advisor to the Rice Univ. Student Chapter, a member of the Safety and Chemical Engineering Education (SACHE) Committee, and has chaired AIChE's programming groups for engineering sciences and fundamentals, and thermodynamics and transport properties. He is a licensed P.E. in Texas.



Benny Freeman is the Kenneth A. Kobe and the Paul D. and Betty Robertson Meek & American Petrofina Foundation Centennial Professor of Chemical Engineering at the Univ. of Texas at Austin. His research explores the relationships among polymer structure, processing, and properties, and has led to the development of membrane materials used to separate CO₂ from hydrogen, and technology for fouling-resistant coatings for water purification membranes. These technologies were used to launch a start-up company, Advanced Hydro, Inc. He is currently chair of AIChE's Separations Div.



Cheryl Grounds, P.E., is the Chief Engineer for Process and Process Safety Engineering at BP Upstream (Houston, TX). She has 28 years of oil and gas industry experience in hazard and risk management, fire protection engineering, and management of process safety. Prior to joining BP, she held process safety and risk management positions at ExxonMobil and Baker Engineering. She is a Certified Safety Professional and a licensed P.E. in Texas and Pennsylvania. She is active in AIChE's Center for Chemical Process Safety (CCPS) and chaired AIChE's March 2011 Global Congress on Process Safety.



Ramesh Hemrajani is president of Mixing and Reactor Solutions (Millington, NJ), where he consults on mixing and separations technologies and reactor designs. Prior to starting Mixing Solutions, he worked as a senior engineering associate at ExxonMobil Research and Engineering Co., where he performed process engineering and R&D on mixing technologies. He holds more than 25 patents in mixing and process technologies. He is a leader of AIChE's North American Mixing Forum and a consultant to the British Hydromechanics Research Group. He earned his PhD in chemical engineering at Northwestern Univ.



Willie (Skip) Rochefort is an associate professor and the Director of the Center for Outreach in Science and Engineering for Youth at Oregon State Univ. (OSU). He held research positions at Dow Chemical, Kodak, and AT&T Bell Labs before joining OSU in 1993. His research interests encompass virtually all areas of polymer engineering and science. His current focus is engineering education, recruitment and retention of women and minorities into engineering, and K-12 student outreach. He has been the advisor to AIChE's OSU Student Chapter since 1993, and a longtime leader of the Student Chapters Committee and the Chem-E-Car subcommittee.



Gavin Towler is the Senior Director of Development at UOP (Des Plaines, IL), where he manages technology development and delivery for all UOP business units. He has 20 years of experience in process and product design, including refining, gas and petrochemical processes, separations, heat integration, refinery optimization, fuel cells, and process miniaturization, and he holds 50 U.S. patents. He is co-author of the textbook *Chemical Engineering Design*, and is an adjunct professor at Northwestern Univ. He is a past director of AIChE, and a trustee of Computer Aids for Chemical Engineering (CACHE) Corp.



Venkat Venkatasubramanian is the Reilly Professor of Chemical Engineering at Purdue Univ. His research focuses on process fault diagnosis and abnormal-events management, risk analysis, informatics, molecular-product design, pharmaceutical engineering, and complex adaptive systems using artificial intelligence, mathematical programming and statistical approaches. He has published more than 200 papers and delivered more than 130 invited lectures, including 21 keynote/plenary lectures, and he is co-author/co-editor of five books. He received AIChE's Computing and Systems Technology (CAST) Div.'s Computing in Chemical Engineering Award and was recently honored by Purdue for his research contributions.



Ralph E. White, P.E., is a professor of chemical engineering at the Univ. of South Carolina, where he has served as chemical engineering department chair (1993-2000) and Dean of the College of Engineering and Computing (2000-2005). His research interests include electrochemical systems, mathematical modeling, batteries, corrosion, and electrodeposition. He has more than 300 publications and holds one U.S. patent. He is a review board member at the National Science Foundation, and a current member of the NASA Energy and Safety Center's Electrical Power Technical Discipline Team. He is a registered P.E. in Texas.

For information about AIChE's Fellows program, visit www.aiche.org/About/OurMembers/fellow.aspx.

DIVISIONS AND FORUMS PRESENT HONORS

Each year, AIChE's technical divisions and forums present nearly 50 awards that honor contributions across a wide spectrum of chemical engineering specializations (www.aiche.org/About/Awards/Division.aspx). These honors are presented at events held during AIChE's Spring and Annual meetings. The following awards were presented during the Oct. 2011 Annual Meeting in Minneapolis, MN. Other groups will present their honors at the Spring Meeting and Global Congress on Process Safety in Houston, TX, Apr. 1–5, 2012.

CATALYSIS AND REACTION ENGINEERING DIV.

Division Practice Award

Robert McCabe, Ford Motor Co.

COMPUTATIONAL MOLECULAR SCIENCE AND ENGINEERING FORUM (CoMSEF)

CoMSEF Impact Award

Bernhardt Trout, Massachusetts Institute of Technology

COMPUTING AND SYSTEMS TECHNOLOGY (CAST) DIV.

Computing in Chemical Engineering Award

Sponsor: Dow Chemical Co.

Paul Barton, Massachusetts Institute of Technology

Computing Practice Award

Sponsors: Aspen Technology and ExxonMobil Chemical Co.

R. Donald Bartusiak, ExxonMobil Research and Engineering Co.

David Himmelblau Award for Innovations in Computer-Based Chemical Engineering Education

Sponsor: Chemstations, Inc.

Frank Doyle, Univ. of California, Santa Barbara; Edward Gatzke, Univ. of South Carolina; Robert Parker, Univ. of Pittsburgh

Outstanding Young Researcher Award

Sponsor: Air Products

Martha Grove, Georgia Institute of Technology

W. David Smith, Jr. Graduate Publication Award

Sponsor: Process Systems Enterprise, Inc.

Fengqi You, Northwestern Univ.

ENVIRONMENTAL DIV.

Lawrence K. Cecil Award in

Environmental Chemical Engineering

Urmila Diwekar, Vishwamitra Research Institute

FOOD, PHARMACEUTICAL AND BIOENGINEERING DIV.

Food, Pharmaceutical and Bioengineering Div. Award

Sponsor: Merck

Martin Yarmush, Rutgers Univ.

NANOSCALE SCIENCE AND ENGINEERING FORUM (NSEF)

Nanoscale Science and Engineering Forum Award

Brian A. Korgel, Univ. of Texas at Austin

Young Investigator Award

Suljo Linic, Univ. of Michigan

NORTH AMERICAN MIXING FORUM (NAMF)

Award for Excellence and Sustained Contributions to

Mixing Research and Practice — Sponsor: Dow Chemical Co.

W. Roy Penney, Univ. of Arkansas, Fayetteville

NUCLEAR ENGINEERING DIV.

Robert E. Wilson Award — Sponsor: Fluor Foundation

William F. Banholzer, Dow Chemical Co.

PARTICLE TECHNOLOGY FORUM (PTF)

Best PhD Thesis Award — Sponsor: Procter and Gamble

Deliang Shi, SC Johnson & Son

Particle Technology Forum Award

Daniel Rosner, Yale Univ.

Lectureship Award in Fluidization

Sponsor: Particulate Solid Research, Inc.

Jesse Zhu, Univ. of Western Ontario

Thomas Baron Award in Fluid Particle Systems

Sponsor: Shell Global Solutions

Roger Bonnecaze, Univ. of Texas at Austin

Fluidized Processing Recognition Award

Sponsor: Dow Chemical Co.

S. B. Reddy Karri, Particulate Solid Research, Inc.

PROCESS DEVELOPMENT DIV.

Excellence in Research Award — Sponsor: Pfizer

Miguel Bagajewicz, Univ. of Oklahoma

Division Student Paper Award — Sponsor: Eli Lilly & Co.

Chuanyu Zhao, Lamar Univ.

SEPARATIONS DIV.

Clarence G. Gerhold Award — Sponsor: UOP LLC

Richard D. Noble, Univ. of Colorado

FRI/John G. Kunesh Award

Sponsors: Fractionation Research, Inc.; Shell Global Solutions

Isabel Escobar, Univ. of Toledo

Separations Div. Service Award

Atanas Serbezov, Rose-Hulman Institute of Technology

Graduate Student Award — Sponsors: Praxair; Chevron

Energy Technology Corp; Sepro Corp.

Daniel Beneke, Univ. of Witwatersrand; Ying Siao, MIT;

Scott R. Lewis, Univ. of Kentucky; Jian Liu, Vanderbilt Univ.;

Suzanne D'Addio, Princeton Univ.; Ying Hou, Rensselaer Poly-

technic Institute; Kartik Ramasubramanian, Ohio State Univ.

SUSTAINABLE ENGINEERING FORUM

Research Excellence in Sustainable Engineering Award

Heriberto Cabezas, USEPA; Ignacio E. Grossmann, Carnegie

Mellon Univ.

Student Paper Award

Xiang Li, Lamar Univ.; Viet Pham, Texas A&M Univ.

Robert T. Milligan, 1919–2011

Robert T. Milligan, an AIChE Fellow, died on July 29, 2011, at the age of 91.

After earning a BS and PhD in chemical engineering at Univ. of Illinois and Ohio State Univ., respectively, Milligan spent more than 25 years working at Shell Development Research, and later worked for Bechtel until his retirement in 1986. He authored many technical papers and patents, and was active in AIChE's Northern California (NorCal) Local Section, where he served a term as section chair. He volunteered in scouting, and enjoyed travel, hiking, classical music, bridge, and family gatherings. He is survived by his wife, Jeanne, four children and their families.

Reuel Shinnar, 1923–2011

Reuel Shinnar, distinguished professor emeritus of chemical engineering at the City College of New York, died on Aug. 19, 2011, at age 87. He spent more than 40 years on the City College engineering faculty before retiring in 2007.

Shinnar was recognized for his work on design methodologies and control of chemical processes. After retiring, he remained an active researcher, earning patents for methods and systems to store energy in nuclear power plants, combined cycle power plants, and solar power plants. The day before his death, the U.S. DOE renewed its support for his work.

A Fellow of AIChE, Shinnar received the Founders Award in 1992, and was elected to the National Academy of Engineering. He is survived by his wife, Dr. Mildred Green Shinnar, and two sons from a previous marriage.

In Memoriam

Albert T. Baker, 84, Freeport, TX

Robert O. Dunn, 76, Grove, OK

Michael E. Hodges, 73, North Augusta, SC

Russell B. Mesler, 84, Lawrence, KS

Arthur R. Price, 80, Belleville, TX

Anthony L. Rasmussen, 68, Plainfield, IL

David G. Short, 71, Landenberg, PA

Ebbe R. Skov, 75, Mission Viejo, CA

AIChE Calendar



Conferences

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.)

NOVEMBER
6–9, 2011

Society for Biological Engineering Conference on Electrofuels Research
Providence Biltmore • Providence, RI

NOVEMBER
9, 2011

AIChE/Institute for Sustainability Waste-to-Energy Exchange
New York Institute of Technology • New York, NY

NOVEMBER
10–11, 2011

AIChE Midwest Regional Conference
Univ. of Illinois • Chicago, IL

FEBRUARY
7–9, 2012

Carbon Management Technology Conference
Caribe Royal Hotel and Convention Center • Orlando, FL

FEBRUARY
19–22, 2012

Sustainability in (Bio)Pharmaceuticals
Sheraton Old San Juan • San Juan, PR

APRIL
1–5, 2012

2012 AIChE Spring Meeting & 8th Global Congress on Process Safety
Houston Hilton and George R. Brown Convention Center • Houston, TX

APRIL 29 –
MAY 2, 2012

Society for Biological Engineering's 3rd International Conference on Stem Cell Engineering
Sheraton Seattle • Seattle, WA



Webinars

Register and view live and archived webinars at <http://www.aiche.org/webinars/>

NOV. 16, 2011
2:00–3:00 PM ET

Polishing Your Technical Communication Skills
Presented by Dr. Donald R. Woods

NOV. 30, 2011
2:00–3:00 PM ET

AIChE/SECARB Webinar: Is Your Facility Carbon Capture Ready? Understanding the Basics of Carbon Capture, Utilization, and Storage (CCUS)
Presented by Dr. Gerald Hill *Free for AIChE Members*

DEC. 7, 2011
2:00–3:00 PM ET

The Science of Classifying Solids: Screening and Air Classification
Presented by Dr. Karl V. Jacob

DEC. 14, 2011
2:00–3:00 PM ET

Chemical Reactions: Control the Intended, Avoid the Unintended
Presented by Robert W. Johnson