

XLinks

FALL 2009

CROSSLINKS

The Newsletter of the
Department of Chemical and
Biological Engineering

Sustaining IIT's **Tradition of Excellence** in Energy Research



**ALSO IN
THIS ISSUE**

**Leading by Example:
Frank A. Crossley
Smarts Not Only Key
to Ph.D. Success
Not a Boys' Club Anymore**

ILLINOIS INSTITUTE
OF TECHNOLOGY



Message from the Chair

Dear ChBE Alumni, Students, Faculty, Staff, and Friends,

It is my pleasure to once again welcome you to the pages of *Crosslinks*, the annual publication of the Department of Chemical and Biological Engineering at Illinois Institute of Technology.

I am amazed that my first year as acting chair has already come and gone; yet, I'm even more amazed by the outstanding accomplishments of our students, faculty, and alumni throughout the past year. Many of these achievements are highlighted in the following pages of this magazine. Our faculty members have presented their research at conferences around the globe. Our students have won numerous awards and accolades. Our alumni have strived to solve some of the challenging issues facing society today.

One of the greatest joys of the chair position is getting to share firsthand in these memories. I will never forget witnessing four ChBE alumni—including my own former Ph.D. student—receive university alumni awards. Nor will I forget shaking the hand of every ChBE graduate during this year's Commencement ceremony. My time as acting chair has reaffirmed to me just how special this group of students, alumni, faculty, and staff is, and has led me to admire even more their unwavering commitment to the advancement of the chemical and biological engineering profession.

As one academic year comes to a close, and another prepares to begin, the department has much to look forward to and anticipate. In this publication, we are very pleased to introduce Assistant Professor Nancy Karuri, the newest addition to our faculty and the first African-American female professor hired by ChBE. We are in the midst of planning for our annual advisory committee meeting, a gathering of industry professionals and leaders in chemical engineering education, to help shape the direction of the department. And we look forward to welcoming National Academy of Engineering member Norman Li as the 2009 Darsh Wasan Lecture distinguished speaker. And that's all in the first month and a half of the semester!

When I speak with alumni of this department, I am often asked, "How can I give back?" The obvious answer is always that we depend on alumni contributions to help fund lab renovations, scholarships, fellowships, and other department activities. But giving back is more than writing a check. It is taking a vested interest in today and tomorrow's ChBE students and providing them with every opportunity possible to help them succeed. I ask our alumni to consider mentoring a current student, notifying the department of internship opportunities, or joining us for department events to meet current students.

We love to welcome our alumni back to campus and sincerely look forward to your participation in upcoming events and other programs. More information on the ways to get involved in the department is included on the back cover of this publication. As always, don't forget to visit our website at www.chbe.iit.edu to stay current on the department's latest activities.

The 2009–2010 academic year is shaping up to be another great one for ChBE! Until next time, I wish all of you the best of health and prosperity for the coming year.

Warmest regards,



Jai Prakash
Acting Chair and Professor of Chemical Engineering



Jai Prakash addresses students, alumni, and guests during the first-ever ChBE Alumni Day, hosted April 24.

CROSSLINKS

The Newsletter of the
Department of Chemical and
Biological Engineering

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Founded in 1890, Illinois Institute of Technology is a private Ph.D.-granting university. The chemical engineering program was established in 1901 and graduated its first student, Charles W. Pierce, the same year. Pierce is regarded as the nation's first African-American chemical engineer. Today, the department devotes its efforts toward excellence in chemical and biological engineering education, and is home to three members of the National Academy of Engineering, 16 full-time faculty members, and more than 350 undergraduate and graduate students.

IIT MISSION STATEMENT

To provide distinctive and relevant education in an environment of scientific, technological, and professional knowledge creation and innovation.

XLinks

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ON THE COVER

Pierre-Paul Amegasse (CHE, 4th year) takes a break from studying to enjoy the view from IIT's newest residence hall, State Street Village. Amegasse is a native of Gabon and a former semi-professional soccer player. He moved to the United States after a career-ending injury to pursue an education in chemical engineering.



New Dean Joins Armour College

ChBE is pleased to introduce Natacha DePaola as the new dean of IIT Armour College of Engineering. She joins the university from Rensselaer Polytechnic Institute (RPI), where she served as chair of the Department of Biomedical Engineering since 2005 and on the faculty since 1994. Before RPI, DePaola was assistant professor of biomedical engineering at Northwestern University.

In a prepared statement, IIT President John Anderson said of the new dean, “Natacha DePaola brings the experience, energy, and innovative thinking needed to continue Armour College’s tradition as an internationally recognized engineering school. Her demonstrated success in maintaining excellent undergraduate programs while growing graduate and research studies, and her commitment to developing interdisciplinary opportunities, make her a perfect fit for IIT.”

DePaola received a bachelor of science in mechanical engineering from Universidad Simón Bolívar in 1984, and a master of science in mechanical engineering from Massachusetts Institute of Technology (MIT) in 1987. She completed her Ph.D. degree in medical engineering and medical physics from the Harvard–MIT Division of Health Sciences and Technology (1991) and postdoctoral training at Columbia University (1992). DePaola received a National Science Foundation Faculty Early Career Development (CAREER) Award, is a Frontiers Alumna of the National Academy of Engineering, and a fellow of the American Institute for Medical and Biological Engineering. She is the first female dean of engineering in the history of IIT.



Natacha DePaola joined IIT as new dean of Armour College of Engineering, effective August 2009.

Professor Darsh Wasan, David Edwards, and IIT President John Anderson celebrate the inaugural Wasan Lecture, hosted September 20, 2008.



ChBE Mourns the Loss of Henry R. Linden

As this publication went to press, ChBE was notified of the passing of Henry R. Linden (Ph.D. CHE '52), Max McGraw Professor of Energy. The department sends its deepest condolences to his family, friends, and colleagues. Professor Linden played a tremendous role in establishing IIT as a leader in energy research and education, and remained active in energy research until his passing in September 2009. ChBE remembers Linden through a tribute on its website, available at www.chbe.iit.edu.

Legacy of Ralph Peck Lives on Through 2009 Lecture

On April 24, the department once again celebrated the legacy of Ralph Peck through the annual lecture held in his name. This year's Peck Lecturer was Jefferson W. Tester, H. P. David Croll Professor of Sustainable Energy Systems in the School of Chemical and Biomolecular Engineering at Cornell University, director of the Energy Institute in the College of



Jefferson W. Tester, 2009 Peck Lecturer, shared his current research works with ChBE faculty, students, and alumni on April 24.

Engineering, and associate director of the Cornell Center for a Sustainable Future. His presentation, titled "Achieving Sustainable Energy: Connecting Goals to Research Across Scales and Disciplines," provided attendees with an overview of the current energy challenges facing the world, as well as possible solutions to overcome these obstacles.

The event was paired with the first-ever ChBE Alumni Day, which included a student poster competition, laboratory tours, the presentation of the Charles W. Pierce Distinguished Alumni Awards and other departmental awards, and the annual alumni dinner. The department was pleased to welcome alumni from the Chicago area to participate in this special event.

Second Annual Darsh Wasan Lecture Features NAE Member

ChBE is honored to welcome Norman Li to present the 2009 Darsh T. Wasan Lectureship, hosted September 30 on IIT's Main Campus. Li's lecture is titled "Membrane Technology for a Thirsty Century—from an Industrial Perspective of Energy, Sustainability, and Globalization." Among Li's many accomplishments are membership in the National Academy of Engineering, as well as the Chinese



Academy of Sciences and the Academia Sinica in Taiwan. He is best known for his research in membrane science and technology, and his invention of liquid-facilitated transport membranes.

The Wasan Lecture was established in 2008 from the generous contributions of former students, faculty, and friends of Darsh Wasan, currently Motorola Chair Professor of Chemical Engineering and vice president for International Affairs, to honor his many contributions to IIT and the advancement of the chemical engineering profession. The lecture seeks to bring internationally recognized leaders to IIT to discuss global issues facing today's society. The inaugural lecture, presented by a former student of Wasan, Gordon McKay Professor of Biomedical Engineering and Applied Sciences at Harvard University David A. Edwards (Ph.D. CHE '87), focused on innovation in global health care, education, and the arts. Edwards is a member of the National Academy of Engineering and was recently recognized by the American Institute of Chemical Engineers on its One Hundred Engineers of the Modern Era list.

ChBE Computer Labs Upgraded

Students returning from summer break this fall have returned to find new equipment in the department's computer lab. The upgrade is part of ChBE's commitment to provide students with the most up-to-date facilities to aid in their education and mastery of chemical and biological engineering skills. The department depends on the generous donations of ChBE alumni to help support the upgrade and renovation of existing laboratories. Each dollar contributed to the department's lab fund helps to purchase new computers, laboratory equipment, and other materials to benefit ChBE students. To make a gift, please return the envelope enclosed with this publication.

The 2008–09 academic year was filled with exciting opportunities for alumni, students, and faculty to reconnect with friends, meet new acquaintances, and celebrate the accomplishments of all. Here are a few favorite photos taken throughout the past year.



2008 Annual Pumpkin Launch

Six first-year students represented ChBE in the 2008 Annual Pumpkin Launch, which challenges students to construct a launcher out of raw materials. The team whose pumpkin travels the furthest distance wins. While the ChBE team's pumpkin fell short, the group enjoyed the experience of working together to compete. They promise they'll be back next year to improve upon their design and try to bring a victory home to the department.



Year IN PHOTOS

2009 ChBE Alumni Day

ChBE alumni from the Chicago area gathered on April 24 for the first-ever Alumni Day, which included the 2009 Peck Lecture, Distinguished Alumni Awards, and Annual Alumni Dinner. The event also provided alumni the opportunity to view presentations by current students in a poster competition and to tour ChBE labs. The department was pleased to recognize the accomplishments of two recently retired faculty members—professors Barry Bernstein and Harold Lindahl (M.S. CHE '54, Ph.D. '57)—during the event.





2009 Alumni Reception at AIChE Annual Meeting

ChBE alumni, faculty, students, and friends once again gathered at the AIChE 2009 Annual Meeting, hosted in Philadelphia, Pa., for a casual evening of networking, departmental updates, and merriment. The event allowed alumni like Jeffery Perl (CHE '77, M.S. '79, Ph.D. '84) and Kadir Aslan (Ph.D. CHE '03) to reconnect with professors Ali Cinar and Darsh Wasan. Octave Levenspiel, a professor in the department from 1958–1969, even stopped by to share his current works with Professor Hamid Arastoopour. (Photos: Courtesy of IIT Alumni Relations)



2009 Commencement Ceremony

On May 16, ChBE was pleased to celebrate the graduation of 66 undergraduate and graduate students during IIT's annual Commencement ceremony. Prior to the event, students, faculty, and staff gathered for a BBQ to honor the accomplishments of the Class of 2009. Despite heavy rain showers, students enjoyed the opportunity to spend one last time with their classmates, mingle with faculty, and even engage in a few student-versus-faculty ping pong games.



Ramani 2009 Recipient of NSF CAREER Award

From the day Assistant Professor Vijay Ramani joined ChBE in 2005, it was obvious he would make a positive impact in the department and in fuel cell technology. Now, the National Science Foundation (NSF) has recognized Ramani's dedication to excellence and research by naming him as a 2009 recipient of the Faculty Early Career Development (CAREER) Award. The award, the most prestigious honor presented by NSF to junior researchers, recognizes researchers who exemplify the role of faculty-researchers through outstanding research, excellent education, and the integration of education and research. It is aimed at supporting the career development of faculty-researchers who are most likely to become the academic leaders of the twenty-first century.

Ramani's research group is recognized nationally and internationally for its work in the area of polymer electrolyte fuel cells. The group has received funding from NSF's Energy for Sustainability Program and IIT's Educational Research Initiative Fund. In conjunction with his students, Ramani has published two book chapters and six peer-reviewed publications with several more under review. He has presented more than 10 seminars in the U.S. and abroad to industry, academia, and national laboratories, and spent the past summer as an Office of Naval Research Summer Faculty Fellow at the National Research Laboratory in Washington, D.C. Ramani was also recently elected vice chair of the Industrial Electrochemistry and Electrochemical Engineering Division of the Electrochemical Society.

ChBE Welcomes New Faculty Member

The department is pleased to introduce Nancy W. Karuri as the newest addition to its faculty. She earned her B.S. in chemical engineering from the University of New South Wales and her Ph.D. in chemical engineering from the University of Wisconsin-Madison. Prior to joining ChBE, Karuri served as a postdoctoral fellow at Princeton University. The addition of Karuri to the ChBE faculty even further



Nancy W. Karuri

strengthens the department's research efforts and academic offerings in the biological engineering discipline. Her research interests include the investigation of the effects of biophysical environments on cell behavior, the creation of biomimetic scaffolds for cell and tissue regeneration, and the development of molecular sensors. Along with her extensive research and teaching experiences, Karuri has devoted herself to mentoring high school and undergraduate students.

Karuri has always felt drawn to engineering, citing it as an avenue to explore and exploit her strengths in math and the physical sciences. She chose to focus on chemical engineering because of the way it intertwines with life and mixes with other disciplines, such as biology, food science, and environmental sciences. Karuri found herself attracted to a career in academia due to her passion for teaching and the atmosphere present for research, collaboration, and knowledge acquisition.

Prakash Receives Energy Research Award from Electrochemical Society

ChBE congratulates Acting Chair and Professor Jai Prakash for receiving the 2009 Research Award of the Energy Technology Division of the Electrochemical Society (ECS) in recognition of his internationally renowned research in the areas of alternative energy sources. This prestigious award recognizes "outstanding and original contributions to the science and technological aspects of fossil fuels and alternative energy sources, energy management, and environmental consequences of energy utilization." Prakash delivered his award lecture at the spring 2009 ECS meeting in San Francisco.

Prakash has been a member of the ChBE department since 1998 and has served as the director of the Center for Electrochemical Science and Engineering for the past six years. His research interests are in the area of energy and sustainability, with an emphasis on electrochemical

energy conversion and storage. Prakash's research group applies the key tenets of fundamental electrochemistry and materials science to achieve advances in battery, fuel cell, photovoltaic, and hydrogen storage technologies. His work has resulted in eight patents and in more than 124 peer-reviewed publications and refereed proceedings papers in these areas.

First-Ever ChBE Outstanding Research Award Presented to Nikolov

Research Professor Alex D. Nikolov was presented with the first-ever ChBE Outstanding Research Award in recognition of his significant contributions to the research activities of the department. Nikolov joined ChBE in 1991. Throughout his career, he has published 163 papers, has a citation index of more than 2,000, received five patents, and presented 35 invited, main, and plenary lectures at international conferences and symposia. He has also directed the thesis work of 27 Ph.D. candidates and 15 M.S. candidates.

2009-2010 ChBE Advisory Committee

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ChBE Acting Chair Jai Prakash presents IIT Distinguished Professor Dimitri Gidaspow with the 2009 Charles W. Pierce Distinguished Alumni Award on April 24.



Photo: Paul Berg
Professor David C. Venerus delivers brief remarks during the investiture ceremony for the Hyosung S. R. Cho Chair.

Former Students and Colleagues to Honor Gidaspow with Festschrift

In honor of IIT Distinguished Professor Dimitri Gidaspow's (Ph.D. GT '62) 75th birthday, former students and colleagues will honor his outstanding contributions to the chemical engineering profession with a festschrift, to be presented during the 2009 AIChE Annual Meeting, November 8–13 in Nashville, Tenn. Gidaspow is internationally recognized as a leader in the field of fluidization and multiphase flow. This session, organized by former students Madhava Syamlal (M.S. CHE '81, Ph.D. '85) and Robert W. Lyczkowski (M.S. GE '66, Ph.D. '70), brings together ChBE alumni and leaders in the multiphase-flow discipline to present invited papers in celebration of Gidaspow's accomplished career.

The department was pleased to honor Gidaspow for his many professional accomplishments and contributions to the department with the 2009 Charles W. Pierce Distinguished Alumni Award, presented on April 24. He joined ChBE in 1977 and has since supervised more than 50 Ph.D. candidates, received nine patents, published more than 185 papers, and authored two books.

Hyosung S. R. Cho Chair Celebrated During Special Ceremony

The investiture of Professor David C. Venerus as the Hyosung S. R. Cho Chair was celebrated during a special ceremony, hosted May 2009. The endowed chair, established in 2008 by S. R. Cho, an IIT

chemical engineering alumnus (M.A.S. CHE '66) and the chair of Hyosung Corporation, recognizes Venerus' outstanding contributions to chemical engineering and his dedication to both research and academic excellence.

Venerus has published roughly 60 refereed papers and presented numerous invited lectures around the world. Working with his colleagues, he has secured nearly \$3.3 million in research funding from government agencies, companies, and foundations. Venerus has also received several departmental and college teaching awards.

Myerson Collaborates with MIT to Improve Drug Manufacturing

Philip Danforth Armour Professor of Engineering Allan S. Myerson is collaborating with researchers at the Novartis–MIT Center for Continuous Manufacturing to streamline drug processing. The goal of the project is to continuously manufacture pharmaceuticals from chemical synthesis to final tablets in one uninterrupted process. Myerson's contributions to the study focus on the crystallization of the drug substance and its integration with the initial process chemistry and the blending and tableting of the final product. His research is conducted at IIT through a subcontract from MIT.

Myerson is internationally recognized as a leader in crystallization research. Throughout the past year, he has traveled to India, the United Kingdom, and The Netherlands to present lectures on the nucleation of organic molecular crystals and concomitant nucleation on engineered surfaces.

Past Chair Returns to Research Roots

In May 2008, Johnson Polymer Professor Fouad Teymour finished his term as ChBE chair and immediately returned to his attention towards his research activities in polymer reaction engineering, complex systems and complexity, and renewable energy. In September, Teymour visited the University of Los Andes in Bogotá, Colombia, and the Centre for Basic and Applied Interdisciplinary Studies in Complexity (CeIBA-Complejidad) to present a lecture titled "Complex Networks and Intelligent Autonomous Agents."

Teymour spent most of his spring semester sabbatical as a visiting professor at the University of Auckland in New Zealand. There, he conducted research on developing polymeric encapsulants for phase change materials used in thermal storage management. He also delivered a lecture titled "Modeling of Hydrogel Membrane Synthesis for Biomedical Applications," which was based on work he had jointly supervised with ChBE Associate Professor Victor Pérez-Luna. Most recently, he was an invited speaker at the 2009 Foundations of Computer-Aided Process Design conference in Breckenridge, Colo., where he presented his vision for the future of energy generation.

Other Notable Achievements

- The administrative responsibilities of Professor Ali Cinar—who also serves as dean of the graduate college and vice provost of research—were recently expanded to include overseeing the Office of Graduate and Professional Enrollment.
- Associate Professor Victor Pérez-Luna was awarded the 2009 Hamid Arastoopour Excellence in Teaching Award–Teacher of the Year, based on the votes of ChBE students.
- Professor Jay D. Schieber was named to the Board of Directors of PolyHub, an engineering virtual organization with the goal to initiate and catalyze fundamental research of the physical phenomena associated with polymer dynamics on a global scale.

Leading by Example

The Story of Frank A. Crossley

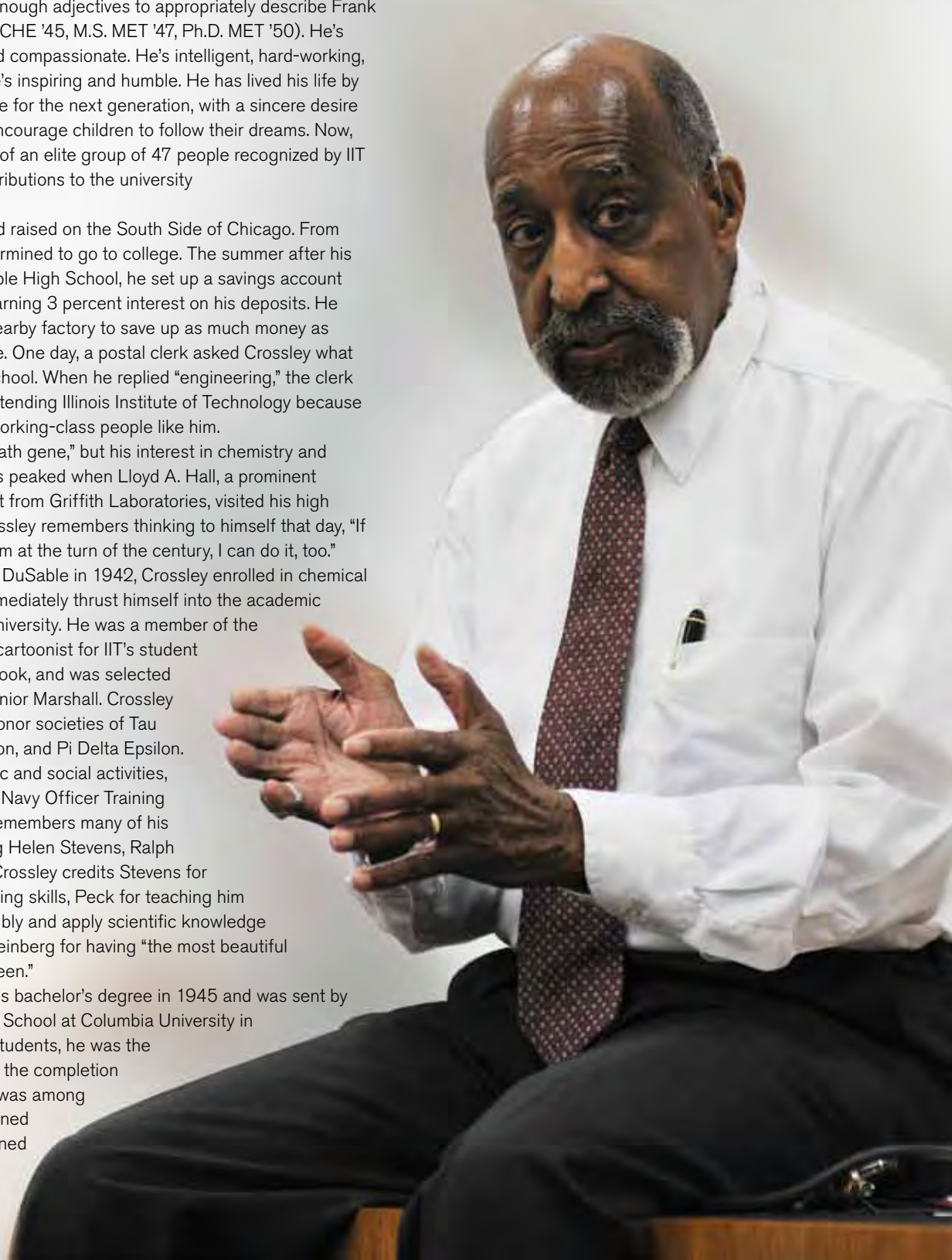
There aren't enough adjectives to appropriately describe Frank A. Crossley (CHE '45, M.S. MET '47, Ph.D. MET '50). He's warm, friendly, and compassionate. He's intelligent, hard-working, and ambitious. He's inspiring and humble. He has lived his life by setting an example for the next generation, with a sincere desire to motivate and encourage children to follow their dreams. Now, Crossley is a part of an elite group of 47 people recognized by IIT for their outstanding contributions to the university and society.

Crossley was born and raised on the South Side of Chicago. From an early age, he was determined to go to college. The summer after his sophomore year at DuSable High School, he set up a savings account at the local post office, earning 3 percent interest on his deposits. He worked long hours at a nearby factory to save up as much money as he could to attend college. One day, a postal clerk asked Crossley what he intended to study in school. When he replied "engineering," the clerk suggested he look into attending Illinois Institute of Technology because it was founded to serve working-class people like him.

He always had the "math gene," but his interest in chemistry and chemical engineering was peaked when Lloyd A. Hall, a prominent African-American chemist from Griffith Laboratories, visited his high school science class. Crossley remembers thinking to himself that day, "If this man could buck racism at the turn of the century, I can do it, too."

After graduating from DuSable in 1942, Crossley enrolled in chemical engineering at IIT and immediately thrust himself into the academic and social scene at the university. He was a member of the Rifle Club, served as the cartoonist for IIT's student newspaper and the yearbook, and was selected by his classmates as a Junior Marshall. Crossley was also elected to the honor societies of Tau Beta Pi, Pi Lambda Upsilon, and Pi Delta Epsilon. In addition to his academic and social activities, Crossley joined IIT's V-12 Navy Officer Training Program. He still fondly remembers many of his professors at IIT, including Helen Stevens, Ralph Peck, and Eli Steinberg. Crossley credits Stevens for greatly enhancing his writing skills, Peck for teaching him how to think comprehensively and apply scientific knowledge to solve problems, and Steinberg for having "the most beautiful blackboard he has ever seen."

Crossley completed his bachelor's degree in 1945 and was sent by the Navy to Midshipmens School at Columbia University in New York. Out of 1,500 students, he was the only African American. At the completion of the program, Crossley was among the 1,127 men commissioned as ensigns. He was assigned to the U.S.S. Storm King,





[Left] Many family members and friends, including Crossley's close friend and classmate Walter Grengg (second row, fourth from left), joined Crossley for the presentation of the IIT Alumni Medal. (Photo: Bonnie Robinson) [Center] Crossley warmly greets Robert Pritzker (IE '46, Hon. Ph.D. ENG '84) during the Alumni Awards luncheon. The men were both honored with the IIT Alumni Medal during the event. Crossley and Pritzker attended IIT during the same time and knew of each other. Pritzker once recommended Crossley for a position at one of his manufacturing plants in Cleveland, Ohio, but Crossley respectfully declined the offer after his wife refused to move to the city because of an aunt she did not like. Crossley laughed, "I never got to tell Mr. Pritzker why I turned down the offer until today." (Photo: Bonnie Robinson) [Right] Crossley in his IIT days (Photo: IIT Archives)

AP-171, a ship responsible for transporting soldiers and Marines home following Japan's surrender. As part of an experimental program designed to determine whether whites would take orders from black officers, Crossley had 40 men, including one officer, under his command. He was regarded by his fellow shipmates as any other officer, and, by all accounts, was well-liked by his subordinates and other officers. The success of Crossley and approximately 30 other black officers participating in the program led President Harry S Truman to issue the executive order to outlaw the segregation of the United States armed forces in 1948.

After the U.S.S. Storm King arrived at the Navy's Norfolk, Va., base for decommissioning in July 1946, Crossley returned to IIT to pursue master's and doctorate of philosophy degrees in metallurgical engineering. He completed his studies in 1950, making him the first African American and first IIT student to earn a Ph.D. in the discipline. Tennessee Agricultural and Industrial State University hired Crossley to establish a chemical engineering department with a minor in foundry engineering, but lack of funding to support the effort prompted him to return home to Chicago in 1952. He asked his former professor and then-director of Metal Research at the IIT Research Institute (IITRI) Max Hanson where he might find a job in the city. Crossley was encouraged to apply for two open positions with IITRI, and was the candidate of choice by both supervisors. But, when his applications reached the final stages of the interviewing, his candidacy for the positions was denied, presumably because of his race.

Hearing of Crossley's rejection for the position, his thesis advisor, Professor Lucio Mondolfo, complained to IIT's then-president. The president called the head of IITRI, saying, "This man has three degrees from IIT and you rejected him without interviewing him? We cannot do that. We are an equal-opportunity employer."

Crossley reflects that was the first time he had ever heard the term "equal-opportunity employer." He was asked back to interview for the positions with four of the top executives of IITRI. Crossley instantly impressed them with his technical background and communication skills. When asked whether he thought the industry was ready for a black salesman, he responded by telling them of a highly respected, African-American dermatologist on the South Side of Chicago whose patient base

was half white. He added, "When people learn that you can help them, color becomes unimportant."

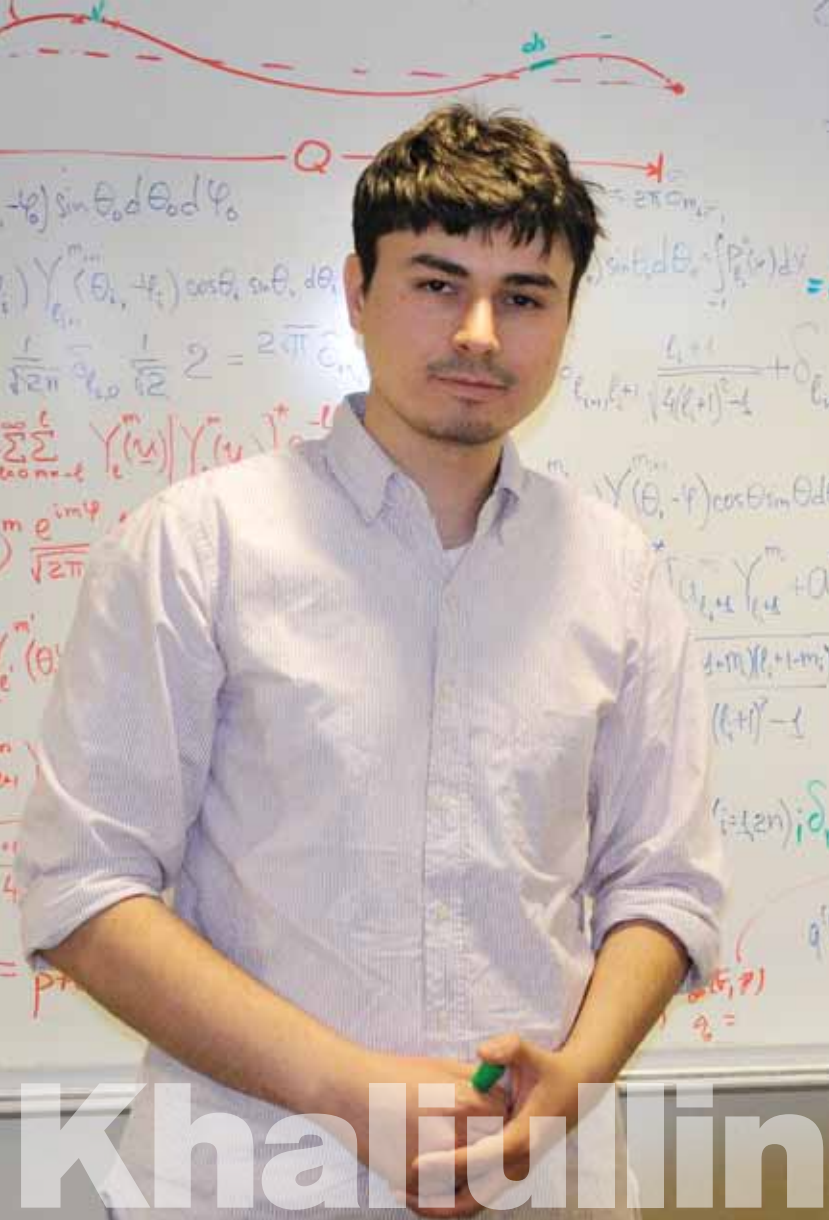
He was hired by IITRI and served as a senior scientist with the institute until 1966, when he accepted a position with Lockheed Missile & Space Co. in Sunnyvale, Calif. Crossley spent 20 years with the company before joining GenCorp AeroJet. He retired in 1991. Throughout his career, Crossley authored more than 50 articles in refereed publications and received seven patents. Though none of the patented technology was implemented in production, it contributed greatly to the development of titanium-base alloys for aircraft and aerospace applications.

Crossley now resides in Framingham, Mass., near his daughter, Desne, who, with her husband, Kenneth Hollman, lives in Attleboro, Mass. Retirement hasn't slowed down the 84-year-old one bit. He tutors elementary, middle, and high school students in math and science, sharing his natural ability to break complex problems into easy-to-understand, logical steps. He has raised funds for scholarships to help students with their college tuition. Crossley is a favorite guest at his at nearby Western High School's career day and is often invited to convey his career experiences as a means of inspiring students to chase their dreams.

On May 1, IIT was proud to give Crossley his much-deserved place in the university's history by presenting him with the Alumni Medal, the highest honor bestowed on alumni. He spent his visit meeting with current students, faculty, and staff, and even stayed on campus in the guest suites in Gunsaulus Hall. The event also allowed for Crossley to reunite with classmate Walter Grengg (CHE '45), who traveled from Madison, Wis., to join the celebration. The friends have stayed in touch for nearly 65 years since departing IIT, and thoroughly enjoyed the chance to reconnect.

Crossley attributes much of his success to the education he received at IIT and still beams with pride when sharing memories of his alma mater. He's a living example of how a great education, ambition, and desire to succeed can help to accomplish dreams and conquer any adversity faced along the way. Crossley hopes to inspire the next generation of scientists and engineers to realize the sky is the limit.

"If you're not convinced to accept challenges," he adds, "you'll never know what you can achieve."

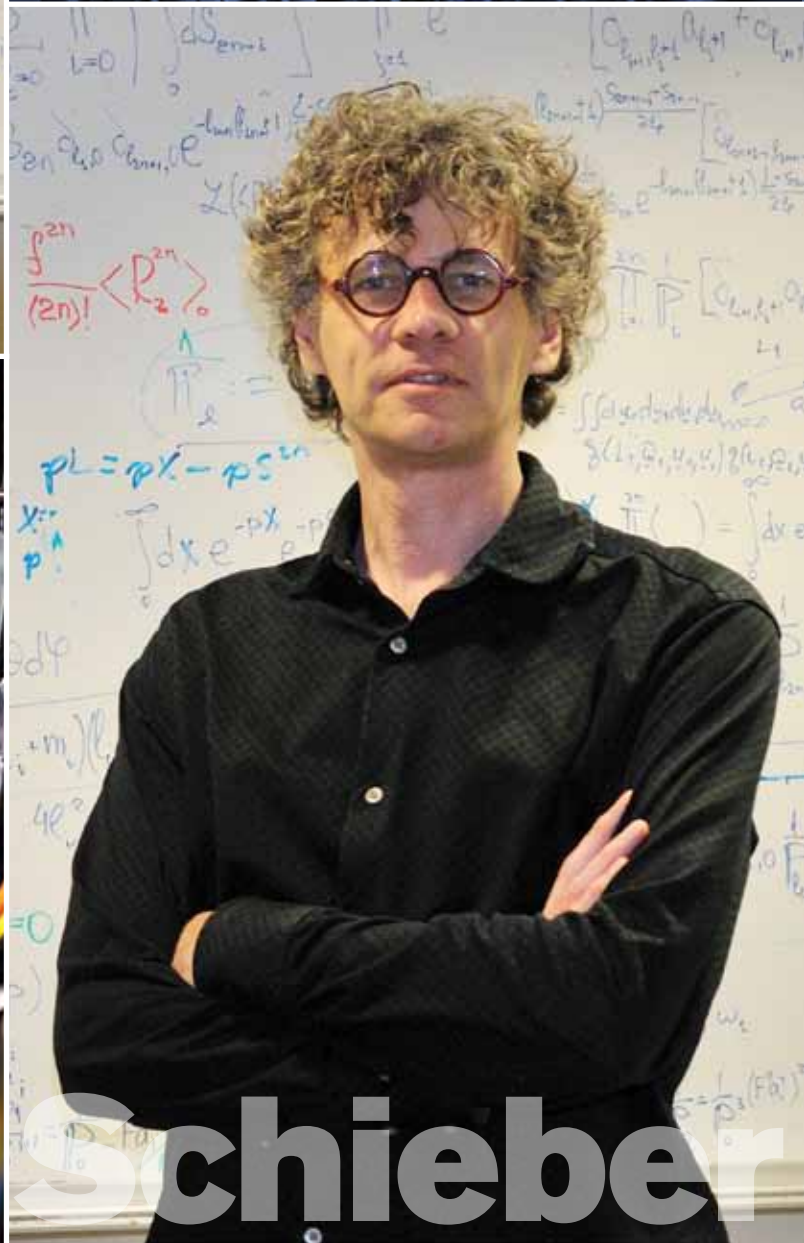


Khaliullin



Schieber observes Khaliullin's work on one of the computer clusters in the Center for Molecular Study of Condensed Soft Matter's server room.

SMARTS Not Only Key to Ph.D. Success



Schieber

Pursuing a doctorate of philosophy degree in any engineering discipline isn't for the casual student. It requires a significant time commitment, often constituting more than four years of a student's life. The rigors of coursework and thesis research challenge students intellectually and force them to learn how to express their ideas clearly. It demands creativity and attention to even the minutest details. Those students willing to devote the efforts needed to successfully complete a Ph.D. join an elite group of engineers who have achieved the highest level of education available.

According to the American Society for Engineering Education, just 7.5 percent of the more than 122,000 engineering degrees presented in 2008 were awarded to Ph.D. candidates; just 843 students earned a Ph.D. in chemical engineering during that year. Renat Khaliullin is poised to join the 2009 class of elite IIT Ph.D. candidates who have successfully defended their theses.

Khaliullin, who graduated with a physics degree with honors from Novosibirsk State University in Russia, is pursuing his degree under the supervision of Chemical and Biological Engineering (ChBE) Professor and Director of the Center for Molecular Study of Condensed Soft Matter (uCoSM) Jay Schieber. Working together, the pair seeks to develop a single unified mathematical model to predict polymer melt behavior for most flow experiments, independent of polymer structure. This is known as the sliplink model. Khaliullin adds, "We're working to create a theory that explains polymer behavior. At the moment, all equipment is designed based on trial and error. If successful, we'll be able to predict deformation, stresses, and flow of polymer systems to help better design equipment for polymer processing."

Khaliullin and Schieber's research started with mapping out theoretical ideas

and translating them into mathematical form. A computer algorithm was then derived from the math and written into code to run simulations to solve the mathematics numerically. After each simulation, the results were confirmed with prior experiments and analyzed to create an analytic representation of the model. Schieber comments, "Each of these steps needs to be done without error. An error in any single step could easily lead you to the wrong conclusion about what nature is trying to tell you."

Developing theory and mathematical equations to solve a specific problem is the most difficult part of research for any new graduate student; it's so challenging that most graduate students don't even attempt it. In regards to this particular project, it required knowing or learning many complex subjects, such as transport phenomena, thermodynamics, statistical mechanics, stochastics, probability, and quantum mechanics. When Khaliullin entered Schieber's laboratory, the experienced advisor started him on the steps involving programming, simulation, and data analysis. As he excelled in these areas, Schieber added theory development to Khaliullin's responsibilities, a very rare feat for any graduate student in such a mature and complex subject. Khaliullin has continued to exceed expectations in Schieber's lab and expects to defend his thesis during the fall 2009 semester. After completion of his degree, he plans to advance his academic research in a post-doctoral position.

The bond between this student-teacher pair has undoubtedly played a role in Khaliullin's success as a graduate student. He comments, "Professor Schieber practically trained me. He's spent a great deal of time addressing all of my questions and helping me with my research." He continues, "His enthusiasm is very catching. It's kept me going despite any challenges I have encountered."

Schieber is no stranger to supervising the research activities of ChBE students. Since joining the department in 1995, he has mentored numerous students of various academic levels. He strives to help students become competent in their weaknesses so they don't limit success in the future. He adds, "It is my strongest hope that every student that studied any degree under me has learned how to think more clearly, and not just about the subject that we studied together. Students will forget most of the facts we teach them. My goal is to teach

them how to ask the right questions to deepen their understanding."

When speaking with current ChBE undergraduates interested in furthering their education, Schieber cautions students that their selection of an advisor is more important than the department or university they choose to attend. Students should pay careful attention to the impact a potential mentor is having on the international research community, including journal articles, presentations, funding sources, and the accomplishments of former students. Schieber adds, "ChBE is fortunate to have several faculty members who have achieved global recognition in their fields, including three members of the National Academy of Engineering."

Students benefit greatly when studying beneath a respected faculty member. Khaliullin and Schieber's first paper together was published in *Physical Review Letters*, a prestigious journal that has also published the Nobel Prize-winning research of United States Department of Energy Secretary Steven Chu. They've also presented their research at meetings of the American Physical Society and the Society of Rheology. These experiences have not only helped Khaliullin build his resume, but also provided him with valuable opportunities to enhance his skills outside of the lab. As director of uCoSM, Schieber is also able to expose his students to a multi-disciplinary center in which engineers, biologists, and physicists collaborate to conduct complex research. His laboratory attracts a steady stream of visitors from Europe, Asia, and Latin America, allowing his students to interact with a variety of researchers and expand their global perspective as engineers.

The partnership between Khaliullin and Schieber is more than the simple student-teacher relationship. It is characterized by a student eager to learn from his mentor, thirsty for every opportunity and challenge that comes his way, and a professor sincerely invested in the success of his student, willing to provide guidance and support through research breakthroughs and setbacks.

Schieber adds, "A friend once said to me, 'If you are not making any mistakes, you're doing something wrong.' Really, all of our understanding of the universe is, in some crude approximation anyway, a mistake. I try to make sure my students see and learn that it is okay to make mistakes."

ChBE Update: As this publication went to press, ChBE was notified of Professor Linden's passing on Sunday, September 13. The department expresses its deepest condolences to Linden's family, friends, and colleagues.

Sustaining IIT's Tradition of Excellence in Energy Research

By Peg Murphy



In April 30, Hamid Arastoopour was invested as the IIT Henry R. Linden Chair of Engineering, earning one of the highest honors that can be bestowed on a faculty member. The pinnacle of his professional achievements, according to Arastoopour, "The day also held tremendous personal significance for me." It marked a relationship that had begun with Linden, his mentor, more than 35 years earlier.



On the opposite page:
[Left] Hamid Arastoopour and his mentor, Henry Linden, pose together in 1994 for a department photo shoot. (Photo courtesy of ChBE Archives)

[Bottom] Arastoopour discusses key points during his research group's weekly meeting.

The Henry R. Linden Professorship was established to honor and recognize the accomplishments of Henry Linden, IIT professor and director of the university's Energy and Power Center, and co-founder of the Gas Research Institute. The university was pleased to welcome Michael Adewumi (M.S. GE '81, Ph.D. '85), vice president of international programs and Quentin E. and Louise L. Wood Faculty Fellow in Petroleum and Natural Gas Engineering at Pennsylvania State University, as the special guest speaker for the event.



Photo: Bonnie Robinson

Michael Adewumi and Hamid Arastoopour celebrate after the investiture ceremony for the Henry R. Linden Professorship. Arastoopour was Adewumi's advisor while Adewumi pursued his Ph.D. in gas engineering at IIT.

Arastoopour's journey began in 1973, when he left his home in Iran to begin his Ph.D. studies in IIT's world-renowned gas engineering program. Completing his undergraduate degree at Abadan Institute of Technology, an elite institution specializing in petroleum engineering education, Arastoopour already possessed a keen awareness of the importance of energy and its pivotal relationship to the advancement of society. Linden, a recognized giant in energy forecasting and policy, was then president of the Institute of Gas Technology (IGT), and also served on the IIT chemical engineering faculty. He recalls that Arastoopour was a "feisty" student, never hesitant to question his assumptions or positions. Not certain whether it was "because of his incessantly inquisitive nature, or in spite of it," Linden says, he offered Arastoopour a position at IGT in 1978 as adjunct professor of gas engineering—a position he held until 1985, when he joined the IIT chemical engineering department faculty under then chair Darsh Wasan. Since those early days, Linden and Arastoopour have continued to work together, sharing the same relentless approach to the solution of complex energy challenges.

During Arastoopour's doctoral studies at IIT, his direct supervisor was Distinguished Professor Dimitri Gidaspow, and he also worked with professors Sandy Weil and Stuart Leipziger—all internationally recognized experts in the fields of fluidization, heat transfer, thermodynamics, and computational techniques. It was under their tutelage that Arastoopour says he "really learned how to do research and to love it." That passion has translated into his reputation today as a leading researcher in the area of computational fluid dynamics (CFD) of multiphase flow and particle technology. A fellow of the American Institute of Chemical Engineers (AIChE) and three-time AIChE award winner in fluidization, fluid/particle systems, and energy conversion and heat transfer, Arastoopour has authored in excess of 100 publications and 12 United States patents, and advised

the research and dissertations of more than 50 doctoral and master's degree students.

Arastoopour's CFD research, as applied to the scale-up of gasification and solid pharmaceutical processes, is expected to assist in shortening the gap between laboratory-scale and commercial-scale processes. Recently, the U.S. Department of Energy (DOE) incorporated his theory and model for the flow of multi-sized particles into the DOE MFIX code used for the design of clean coal gasification and separation of hydrogen from CO₂ processes. Arastoopour's new and innovative approach to link population balance equations with CFD represents a major step in enhancing the design and simulation of fluid/particle systems. His pioneering research in the development of mathematical models and computer simulations for the production of gas from unconventional sources, such as tight sand formations and hydrate resources, has played a significant role in helping to make our nation less dependent on foreign energy.

Arastoopour has demonstrated an equal commitment to engineering education—teaching hundreds, if not thousands, of undergraduate and graduate students during his tenure at IIT and picking up department, Armour College of Engineering, and university awards for excellence in teaching along the way. When asked if he has noticed any significant changes in engineering students over the years, Arastoopour remarks, "Today's students possess a breadth of knowledge that far exceeds the technical realm." This awareness, he feels, well equips them to develop the real-world, responsive solutions required by contemporary energy engineers.

Arastoopour's career as a researcher and educator came full circle in 2008, when he was named director of IIT's newly established Wanger Institute for Sustainable Energy Research. In this new role, he is charged with coordinating a state-of-the-art program in energy and sustainability at IIT, continuing his work in the name of his beloved mentor, Henry Linden.



NOT A BOYS' CLUB ANYMORE

THERE WAS A TIME, not so long ago, when women were discouraged from pursuing degrees in engineering. In their high schools, they weren't welcomed into advanced science and math classes, and were instead pushed toward focusing on home economics. At home, some were told if they went to college for engineering, they'd never get married and people would think they were weird. Others were told of the gender inequality in the profession and cautioned they would never fulfill their career aspirations in a male-dominated industry.

Many of those brave women who dared to enter engineering programs in the first half of the twentieth century were faced by great challenges, including insufficient education in high school, discrimination by classmates and faculty, and the pressure of working twice as hard to prove they belong. Once they earned their degrees, female engineering graduates faced enormous prejudices in the working world and were often treated as secretaries or inferior to their male counterparts.

Lois Bey (CHE '50) was the first woman to graduate from Illinois Institute of Technology's Department of Chemical and Biological Engineering (ChBE), earning her bachelor of science degree in 1950. When she expressed an interest in engineering to a high school teacher, he called in a city psychologist to examine her. Bey's mother also made many attempts to dissuade her from pursuing a degree in engineering. Bey adds, "I was a stubborn child and ignored what she told me. I did not like her, or others, trying to mold me into something or somebody I did not like."

Throughout her career, she faced unfathomable obstacles, from professors who bet against her ability to obtain a degree and managers who refused to work with a woman, to company owners who stole her commissions and co-workers who fought against her pay increases. Bey survived, and thrived, during her career thanks to her own ambitions and hard work.

The profession has come a long way since Bey entered the workforce in 1950. As today's female graduates demonstrate, the days in which chemical engineering is considered a "boys' club" are long over.

For starters, women receive 34.9 percent of all chemical engineering bachelor's degrees awarded in the United States; at IIT, female students accounted for 39 percent of undergraduate degrees granted by ChBE in 2009. Women students held four of the five top GPAs in the ChBE undergraduate class of 2009, and each of them graduated with near-perfect academic records. These bright young women have joined more than 500 female ChBE graduates determined to make a difference in the world.

ChBE's women graduates can be found in nearly every sector in the industry and beyond. Some have gone on to become pediatricians, earn law degrees, and start their own businesses. Others enjoy prosperous careers with some of the world's most recognizable organizations, including eBay, BP, the U.S. Environmental Protection Agency, Shell, SC Johnson—A Family Company, Wm. Wrigley Jr. Company, Kraft Foods, Honeywell, Chevron, Abbott Laboratories, Deloitte, and Motorola. Many of these remarkable women credit their success to the skills they learned while pursuing a chemical engineering degree at IIT.

Valerie Mason-Robinson (CHE '97), founder and owner of an eco-conscious

beauty company named Eden Organix in Highland Park, N.J., is widely known as the "Green Beauty Queen." She credits her success to the challenges of IIT's chemical engineering courses and her involvement in extracurricular activities on campus. "To this day, I don't know how I made it through the program. It truly taught me perseverance and helped me gain a toughness that has helped me succeed in business," says Mason-Robinson.

Dania Ghantous (CHE '88, M.S. '91) also found the ChBE program demanding and worked very hard to maintain her grades. Throughout her studies, she was able to master problem solving, self-discipline, and innovation, and apply this knowledge by conceptualizing, designing, and executing her research work. Ghantous adds, "This combination of skills helped me move up in my career from a staff engineering position to a technical leader in the development of new technologies and products. I've been very fortunate to have worked on some cutting-edge technologies ranging from nanotechnology to clean technology, and, through the use of these skills, created innovative solutions along the way."

With an increasing focus on diversity in industry and government, there is a high demand for female engineers; however, the number of women who earn engineering degrees still lags behind their male counterparts. A study presented in the *New England Journal of Higher Education* (2007)

Photo 1: Current Ph.D. candidates Meriyen Eren and Sukanya Balasubramanian reunite with alumna Deniz Erdemir (Ph.D. CHE '06) during the 2009 Alumni Reception at the Annual AIChE Meeting.

Photo 2: Ph.D. candidate Teresita Kashyap explains her research to ChBE Associate Professor Victor Pérez-Luna and environmental engineering Professor Demetrios Moschandreas during a poster competition held on campus.

Photo 3: Acting Chair Jai Prakash congratulates Priscilla Zellarchaffers (CHE '09) during IIT's Commencement ceremony.

Photo 4: Shirley Schultz-Keenan (CE '50), Ira Graham (FPSE '50), and Lois Bey (CHE '50) celebrate their graduation on June 9, 1950.



Photo: IIT Alumni Relations

indicates high school girls don't have a clear understanding of what engineering entails. Often, girls are told they must have superior math and science skills in order to gain success as an engineer, and are warned more of the rigors of obtaining an engineering degree than the societal value and rewards of being an engineer. In order to attract more females to the discipline, experts indicate the profession must be redefined as a desirable career option for girls. They also stress the importance of providing positive female role models to students.

IIT has taken a major step forward in these areas for the 2009–2010 academic year with the appointment of the first-ever African-American female tenure-track ChBE faculty member, Nancy Karuri, and the first-ever female dean of Armour College, Natacha DePaola. The remarkable accomplishments of both these outstanding women will undoubtedly serve as an example to current and prospective IIT engineering students that the sky is the limit.

Karuri acknowledges that female students still face some barriers in the classroom. As a student, she remembers classmates overlooking her opinions and not taking her seriously. She reflects, "I overcame these challenges by being persistent, hard working, and reaching out to others. My hope is that my achievements will motivate others."

While women have made considerable progress toward gender equality in the engineering profession, much still needs to be done to completely shatter the proverbial glass ceiling. According to a 2006 National Science Foundation study, only 8 percent of women engineers hold management positions in business or industry. The same study also

reports women with chemical engineering degrees hold just 29 percent of all chemical engineering jobs in the U.S.

Today's engineering industry calls for innovation, ingenuity, and interdisciplinary teamwork to solve some of the most daunting issues facing society. To gain success professionally, students must become "global engineers," knowledgeable of a multitude of subjects and exposed to a variety of different ideas and perspectives. To achieve organizational objectives, companies must foster diversity and introduce engineers of different genders, races, and ethnicities to solve problems and benefit humanity.

Karuri adds, "Engineering as a discipline depends on creativity. Thus, the most creative solutions will be obtained from the most diverse group of engineers. To be able to solve the engineering problems that future generations face, I feel that it is imperative that the diversity of engineers should reflect the diversity of the population."

While much progress has been made, there is much to be done to increase the number of females, and other minorities, participating in the engineering industry.

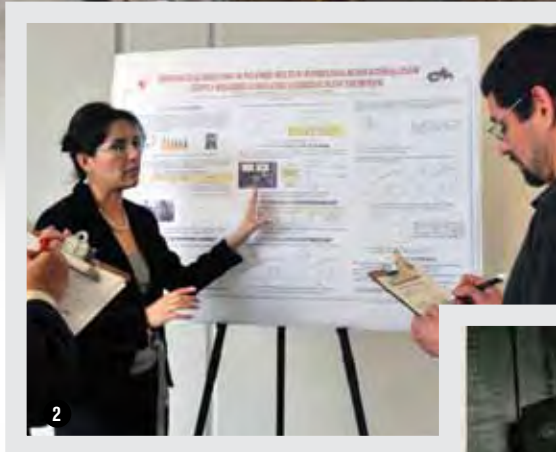


Photo: Michael Laviole



Photo: IIT Archives

ChBE alumni can play a significant role in encouraging students to pursue engineering degrees and change perceptions about the profession. The department encourages all alumni to consider participating in high school career days, mentoring current IIT students, hiring ChBE students as interns, and contributing to departmental scholarships.

In a 2006 interview, Bey said, "I just hope that today's young ladies don't face the discrimination I faced before college, during college, and after college."

Today's ChBE women demonstrate that the days in which chemical engineering is dominated by men are long gone. Through collaboration between industry and academia, even more women may join the engineering profession and make significant and meaningful contributions to benefit society.

STUDENT Experience

[Right] Christian Arnoux (CHE '09) battles GTI Associate Professor Javad Abbasian in a ping pong match during a picnic organized for graduating students.

[Below] Undergraduate student Goldey Khanna (CHE, 4th year) explains his current research activities to ChBE Assistant Professor Vijay Ramani.



Illinois Institute of Technology, located just minutes from downtown Chicago, has a distinctive reputation globally as a strong engineering school with additional strengths in architecture, science, and design. The

through Chicago's notoriety as an international destination city. From around the world, undergraduate students come to this prestigious university to receive a first-class educational experience.

experience. It has a low student-faculty ratio, which allows students to get to know the faculty members. In many cases, students regard their favorite teachers as professors, mentors, and friends. "I love the fact that you can approach professors in and out of office hours without having to wait in a long line. I do not necessarily have to go see them when I have a problem; many times I just stop by to say hello," remarks Pierre-Paul Amegasse (CHE, 4th year).

ChBE Undergraduate Program

An Education Inside and Outside the Classroom

By Ayokunle "A. K." Apampa (CHE, 4th year), AIChE IIT President

university was founded on the principles of bestowing exemplary technology education on its students. IIT's location enhances the university in two ways; it provides real-world opportunities that help shape students' educational and research initiatives, and it assists with recruitment

The Department of Chemical and Biological Engineering (ChBE) is one the oldest chemical engineering programs in the nation. For more than 105 years, the department has focused on providing undergraduate students with close faculty-student relationships, hands-on laboratory experiences, and real-world application of concepts. ChBE dedicates itself to making sure students get the best education possible by providing up-to-date classroom technology to enhance the learning

Amegasse adds that he enjoys the chemical and biological engineering community at IIT because it makes him feel among people of like minds and goals. Undergraduate students also have the opportunity to pursue research in a multitude of disciplines, including but not limited to fuel cell batteries, drug delivery, solar cells, and nanotechnology. This makes the learning experience much more practical, as concepts learned in class are brought into the lab to solve particular problems. Zhi "Harry" Li (CHE, 3rd year) is very pleased with his experiences in the chemical engineering program, most especially the undergraduate research opportunities. He says, "I never knew lab work could be fun. After taking CHE 317

WHO IS IIT?
INDIVIDUALS WHO SEE POSSIBILITIES
That's what it's all about at Illinois Institute of Technology, where students get a start on their careers — and their lives. At IIT, students are challenged to invent tomorrow's breakthroughs, aided by an interprofessional team-learning environment that prepares them for a world of change. Illinois Institute of Technology has a tradition of people inventing the future.





Photo: Michael Laviole

STUDENT Accomplishments



Ellen Kloppenborg, recipient of the 2009 Harry McCormack Outstanding Senior Award, accepts her diploma from Acting ChBE Chair Jay Prakash during the Armour College of Engineering Commencement ceremony.

and CHE 418 [two of the mandatory laboratory classes], I realized that my paying attention in class finally paid off. Lab is fun.”

For chemical and biological engineering undergraduates, it is not just about academics. When the students are not in the lab or classroom, or studying in the library, they are probably at an event hosted by the IIT student chapter of the American Institute of Chemical Engineers (AIChE IIT), a professional student-run organization that enriches chemical engineering students with the knowledge and ideas necessary for successful future careers through innovative and creative thought processes. AIChE IIT holds weekly meetings every Thursday during the semester, providing free pizza and soda to members and other attendees. Outside of the weekly meetings, the organization conducts events such as an annual alumni dinner, an Evening with Industry, picnics, game nights, and field trips to local museums and industry tours.

Over the years, ChBE has done an excellent job in transitioning students from “backpack to briefcase” by equipping the undergraduates who choose to work after graduation with the tools needed to succeed. For those students who decide to further their education, ChBE provides one of the best undergraduate experiences to lay a solid foundation for a great future.

ChBE Students Take Top AIChE Local Section Honors

ChBE Ph.D. candidate Renat Khaliullin and undergraduate Ellen Kloppenborg (CHE '09) took top honors at the AIChE Chicago Local Section Awards on April 15, 2009. Khaliullin was awarded the first-place prize in the Student Poster Competition for his presentation titled, “Unified mathematical model with a self-consistent constraint dynamics for linear viscoelastic predictions of linear monodisperse and polydisperse and branched polymers.” He competed against students from IIT, the University of Illinois at Chicago, and Northwestern University.

Kloppenborg was named the IIT recipient of the Harry McCormack Outstanding Senior Award, presented by the AIChE local section. In addition to graduating with the highest GPA in her undergraduate class, Kloppenborg was actively involved in the IIT student chapter of AIChE and pursued undergraduate research opportunities in the lab of Professor Jay Schieber. As a direct result of these accomplishments, Kloppenborg received the 2008 Richard A. Babcock Leadership Award, the highest honor IIT bestows on current students.



Michael Walker accepts the 2009 Teaching Assistant of the Year award from Professor Hamid Arastoopour.

Back-to-Back Wins for TA Walker

For the second consecutive year, Ph.D. candidate Michael Walker was selected by ChBE students as the recipient of the 2009 Hamid Arastoopour Excellence in Teaching Award—Teaching Assistant of the Year. The award was presented on April 24 in recognition of Walker’s outstanding dedication to the education of ChBE students.



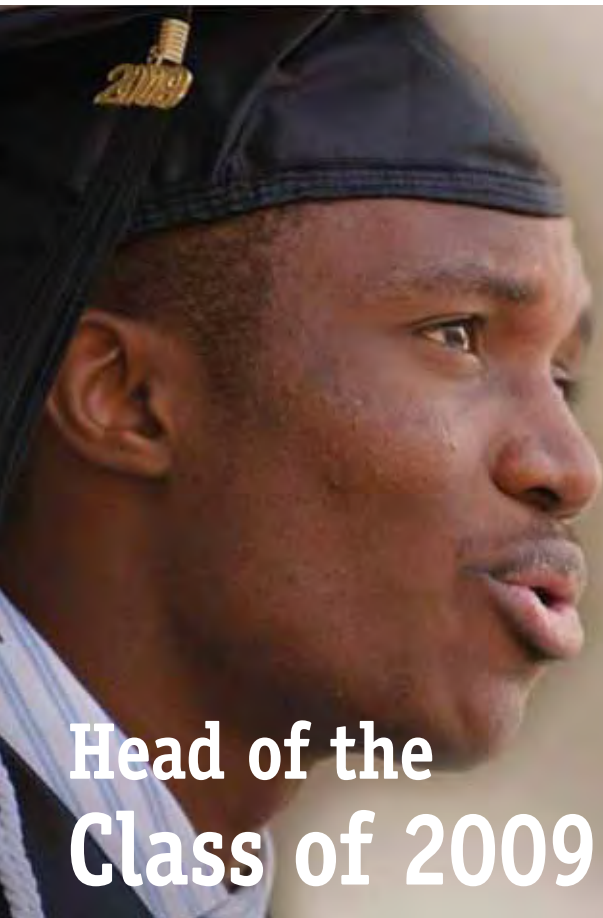


Students Compete in ChBE Poster Competition

Fourteen ChBE graduate and undergraduate students put their research and presentation skills to the test on April 24 to compete in the ChBE Poster Competition. Students were judged based on the visual and technical content of the poster. Ph.D. candidate Sudipto Chakraborty and undergraduate student Goldey Khanna (CHE, 4th year) took first place in their respective categories; Ph.D. candidate Renat Khaliullin and undergraduate students Wai Kit Ong (CHE, 4th year) and Sithambara Kuhan (CHE, 4th year) took second place in their respective categories. The competition judges included ChBE Assistant Professor Vijay Ramani, and Charles Guilfoyle and Robert Jurish, both engineers at Middough, Inc.

Other Student Accomplishments

- Ayokunle Apampa (CHE, 4th year)—Team won first place at the Chicago Innovation Chase 2009
- Ray Ballard (CHE, 4th year)—Won 2009 Richard A. Babcock Leadership Award
- Katie Lazicki (CHE, 4th year)—Won first place in the writing competition for the Edwin H. Lewis Prize for Fiction
- Kirsten Reimann (CHE '09)—Won 2009 Team Leadership Award for IPRO 316—Design of Biofuels Production Facility for Renewable Energy Generation
- Andrey Ivankin (Ph.D. Candidate)—Received the 2009 Ludo Frevel Crystallography Scholarship awarded by the International Centre for Diffraction Data
- Christopher Wolcott (CHE, 4th year)—Spent the summer participating in the University of Delaware's Chemical Engineering Research in Energy and Sustainability program



Head of the Class of 2009

Photo: Michael Lavoie

Babijide Oke (CHE '09) had an amazing senior year. He started it by receiving the 2008 Student Laureate Award, presented by the Lincoln Academy of Illinois, and ended it as the 2009 undergraduate student speaker at IIT's main Commencement ceremony. Throughout his time at IIT, Oke has excelled both academically and professionally, making him a well-deserving recipient of both these distinguished honors.

During his time on campus, Oke was actively involved in the IIT student chapters of the American Institute of Chemical Engineers and the National Society of Black Engineers, as well as the African Student Association and the Intervarsity Christian Fellowship. He was a writer and editor for IIT's student newspaper, *TechNews*, and a resident advisor in the McCormick Student Village residence hall. In addition to his extracurricular activities, Oke participated in Alternative Spring Break, which provides IIT students the opportunity to volunteer for Habitat for Humanity over their semester break, during the past four years.

In Oke's Commencement speech, he said, "I am thankful for every moment, whether good or bad, I have experienced at IIT." He later continued, "I am amazed at the person I have become today and owe most of that to this institution. IIT has provided me with opportunities to grow, challenge myself, and take ownership of my life."



Photo: Mindy Sherman

[Right] IIT Provost Alan Cramb presents Oke with the 2008 Student Laureate Award in Perlstein Hall. [At left] Babijide Oke delivers his speech during the 2009 IIT main Commencement ceremony on May 16.



QUICK FACTS

1978 Ph.D., Illinois Institute of Technology, Chicago

1973 M.S., University of Colorado, Boulder, Colo.

1968 B.S., University of Tehran, Iran

Excellence in Teaching-Teacher of the Year- 1998, 2000, 2006

University Excellence Teaching Award-2000

Getting to Know... Nader Aderangi

Since joining Illinois Institute of Technology's Department of Chemical and Biological Engineering (ChBE) in 1988, Nader Aderangi, lecturer and director of department laboratories, has been considered a favorite teacher by students. He is responsible for introducing the department's students to the fundamentals of experimental techniques in chemical and biological engineering, as well as managing the many labs operated by ChBE. His quiet demeanor, warm smile, and evident commitment to the success of ChBE's undergraduate students have earned him the respect and accolades as a vital member of the department. ChBE prides itself on the exemplary research education and opportunities it provides its students to give them a critical advantage when joining the workforce or pursuing advanced degrees. Acting Chair Jai Prakash says, "We would not be able to accomplish this goal without Aderangi's efforts and hard work."



What his students are saying...

"He has, by far, been my greatest influence at IIT."

—Ricardo Rodriguez (CHE, 4th year)

"He shows the utmost respect for his students and the subjects he teaches."

—Jennifer Peavler (CHE '09)

"Professor Aderangi is an excellent professor and mentor. I will remember and be thankful for the ways he pushed me to think harder while he patiently coached and guided."

—Babajide Oke (CHE '09)

Aderangi recently shared the impact he hopes to have on ChBE's current and prospective students.

What do you love the most about your job?

I enjoy working in an academic environment and interacting with students. It is very rewarding to play a role in the development of our students.

Why do you think students respond so well to your teaching style?

I believe a teacher only provides the tools of education and it is the student that does the learning. However, the learning process is the most efficient when the engineering student sees the application of the theory in practice. I try to provide real-life examples of chemical and biological engineering in all my courses to help our students master skills and apply them outside the classroom.

What skills do you hope to instill in the department's undergraduate students?

I hope to instill in our students the skills of experimentation and the ability to analyze experimental data. It would be ideal if, by the time the ChBE students graduate, they have designed, constructed, and debugged an experiment.

What advice do you have for chemical and biological engineering students as they leave IIT to start their careers or graduate school?

My advice to students is to volunteer for any opportunity that would challenge their current knowledge and comfort zone. Hard work earns you respect and keeps you as a valuable member of an organization. For students pursuing graduate studies, I advise them to make best of the opportunity to enrich their knowledge in one area of chemical or biological engineering in which they would like to pursue a career or teach. In either case, lifelong learning is the key to success.



Four ChBE Alumni Honored During Annual IIT Alumni Awards

The department was proud to celebrate the accomplishments of four distinguished alumni on May 1 during the annual IIT Alumni Awards. For the second consecutive year, ChBE alumni received more awards than any other IIT department, a true testament to the exceptional careers of the department's graduates. Ankit Mehta (CHE '03), neurosurgery resident at Duke University, and William Mustain (CHE '02, Ph.D. '06), assistant professor at the University of Connecticut, were honored with the Outstanding Young Alumnus Award in recognition of their many achievements throughout their short careers. Madhava Syamlal (M.S. CHE '81, Ph.D. '85), focus area leader at the National Energy Technology Laboratory, was presented with the Professional Achievement Award for his contributions to the advancement of computational multiphase flow, including the development of the open-source software MFIX. Frank A. Crossley (CHE '45, M.S. MET '47, Ph.D. MET '50) received the highest honor bestowed by the university—the IIT Alumni Medal. His many accomplishments and remarkable life are shared on page 10 of this publication.

The nomination deadline for the 2010 IIT Alumni Awards is October 1. Additional information, including categories and nomination requirements, is available at www.iit.edu/alumni.

Hank Kohlbrand Elected 2010 President of AIChE

ChBE is pleased to announce that Hank Kohlbrand (CHE '73), Global R&D Director of Engineering and Process Sciences in Core R&D at The Dow Chemical Company, has been elected president of the American Institute of Chemical Engineers (AIChE). He will assume the role in 2010 after serving a one-year term as president-elect. Kohlbrand is the third ChBE alumnus to be elected president of the association. Previous alumni to serve in this position are John Sachs (CHE '48, M.S. '50, Ph.D. '52) and the late James Y. Oldshue (CHE '47, M.S. '49, Ph.D. '51).

During the past 34 years, Kohlbrand has worked in a variety of research and manufacturing roles at Dow, focusing on process development, new technology implementation, and new business growth. On April 24, the department was pleased to present Kohlbrand with the 2009 Charles W. Pierce Distinguished Alumni Award in honor of his contributions to ChBE and the chemical engineering profession.



Hank Kohlbrand will serve as AIChE president in 2010. (Photo courtesy of Hank Kohlbrand)



Mark Zachar, Frederick Wu, Craig McMahon, and Louis Storino share a few final minutes before the start of the 2008 Chicago Marathon. (Photo courtesy of Louis Storino)

ChBE Alumni and Students Compete in Chicago Marathon

Louis Storino (CHE '94, M.S. ENVE '96), Mark Zachar (CHE, ENVE '03), and ChBE undergraduate students Paul Adamczyk (CHE, 3rd year) and Bryce Swillum (CHE, 4th year) joined 40,000 runners on October 12, 2008 to compete in the Chicago Marathon. All completed the marathon in the top 13,000 finishers, with Adamczyk claiming the best time of the ChBE participants at 04:02:25, which earned him 6,776th place. Storino and Zachar were fueled by not only the desire to complete the 26.2 mile race, but also the will to raise money for World Vision, a humanitarian organization dedicated to tackling the root causes of poverty by working with children, families, and their communities to provide necessities such as clean water, health care, nutritious food, education, and economic opportunities. Along with environmental engineering master's candidate student Frederick Wu, the trio of friends raised \$3,886 in support of the nonprofit's mission, as well as finished the race with outstanding times.

ChBE Alumna Publishes Book on Market Meltdown

Janet Tavakoli (CHE '75) is one of many ChBE alumni whose path has led her outside the chemical engineering profession. She recently authored *Dear Mr. Buffett: What An Investor Learns 1,269 Miles From Wall Street* (Wiley, 2009), a detailed account of the factors that lead to the recent market meltdown. Tavakoli is the president of Tavakoli Structured Finance and a global expert in credit derivatives and structured finance, and has been labeled by *BusinessWeek* (2008) as the "Cassandra of Credit Derivatives." After completing her degree at IIT, Tavakoli earned her M.B.A. in finance from the University of Chicago. She has written multiple books on the credit market and is frequently quoted in the nation's largest news publications, including *The Wall Street Journal*, *The Financial Times*, *BusinessWeek*, and *Fortune*.



In Memoriam

ChBE mourns the loss of its alumni who passed away in 2008–09:

Herbert D. Anderson (CHE '48, M.S. BEA '61)

Lakeland, Fla.

Nils K. Anderson (CHE '38)

Ozark, Mo.

Benjamin Theodore Borgerson (CHE '47)

Evanston, Ill.

George W. Falk (CHE '55)

Prospect, Ky.

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John J. Schilf (CHE '46)

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Sidney L. Schwartz (CHE '30)

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Robert J. Swanson (CHEM '45, CHE '46, M.S. CHE '49)

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