Bacterial Infections Yield to ChEs

Implanted medical devices, such as intravenous catheters, heart valves, and prosthetic joints, are mainstays of modern medical treatment. Despite their life-saving benefits, each implanted device runs the risk of becoming a site of bacterial infection. Device infections are very common causes of hospital-acquired infection and are increasingly seen in patients leaving the hospital with devices in place. The cost of treating infected devices exceeds $10 billion annually. Bacteria contaminate medical devices most often at the time the device is surgically implanted or during manipulation of the device post-placement. Once attached to the device, bacteria reproduce, and secrete a sticky polysaccharide that protects the colony. These bacterial communities, called biofilms, resist typical treatments such as antibiotics. Eventually, parts of the biofilm can even fracture off to cause new infections elsewhere.

Confocal microscopy (green) and electron microscopy (gray) images of biofilms subjected to bulk rheometry.

Chemical Engineering doctoral students Elizabeth Stewart, Leo Pavlovsky and Mahesh Ganesan from Professor Michael Solomon’s research group are collaborating with Professor John Younger from the U-M Medical School to better understand how these infections occur. Why are chemical engineers working on this problem? It turns out that understanding these infections requires combining tools in polymer science, rheology, and transport phenomena—all ideas central to chemical engineering—with techniques from the medical science and micro-biology.

The genetics of the bacteria in biofilms are widely studied by microbiologists around the world, but chemical engineers can approach this problem from a different perspective. A chemical engineer wonders about the mechanical properties and rheology of the biofilm as well as the spatial organization of bacteria in it. Elizabeth, Leo and Mahesh are studying Staphylococcus epidermidis. It’s a very common bacteria—and its name indicates why: It lives on our skin. But if these bacteria find their way into the body, they can form biofilms and cause infection.

Elizabeth is determining the impact of flow and nutrients on S. epidermidis biofilm growth, using the department’s confocal laser scanning microscope to image the biofilm in 3D—a microscopic equivalent of an MRI image. Elizabeth then uses image processing techniques to resolve...
Welcome to another edition of ChE News. Many exciting things have happened in the department over the last year including the National Research Council (NRC) ranking us as one of the top ten graduate programs in the country! We look forward to the coming year as we continue to expand and to improve the department.

In September all Michigan Engineering departments will host an ABET (Accreditation Board for Engineering and Technology) accreditation visit. We feel that the changes we have made in the last five years, such as adding a process economics course and upgrading the ChE 460 lab are examples of the continuing excellence of our undergraduate program.

We are also continuing to bring new talent to the department. Assistant Professor Timothy Scott joins us from the University of Colorado. Tim brings expertise in polymer chemistry and adds strength to our already strong complex fluids thrust. We will also be looking for three new faculty this fall in a variety of areas including tissue engineering, energy, and medical technology.

With all the additions to our faculty and the increased enrollment in our undergraduate program, we continue to experience a significant space shortage. One expansion opportunity is through the Biointerfaces program led by Professor Joerg Lahann. Joerg and five other faculty members are currently scheduled to initiate this program by moving to new space at the North Campus Research Complex (NCRC), which formerly housed Pfizer’s Ann Arbor facilities. This effort is just beginning and will most likely expand to include more faculty in the department.

The vacated space will allow us to make room in Dow and G.G. Brown for new faculty and research programs. In addition, we plan to increase the size of our undergraduate labs to accommodate more students. We also plan to add an undergraduate learning center to host office hours and tutoring services, among other activities.

Our undergraduate program has received a significant boost through the establishment of the Julius F. and Zelda Bartus Endowed Memorial scholarships. This multimillion-dollar endowment provides much needed scholarships for over 30 ChE students each year. Michael Bartus, son of the benefactors, is actively involved in developing a community of Bartus Scholars.

I invite you to visit us this year to see all that has had changed since you were last on campus. The department’s homecoming luncheon on October 28 is a great opportunity to socialize with old friends and classmates, and with our energetic and active Alumni Board. The board is working to improve alumni connectivity, so I look forward to hearing from more of you in the future. The support of our alumni is vital to the future of the department and helps us ensure the highest quality of our teaching, research, and service activities. Go Blue!
ChE Students Have A Global Impact

Our students have been increasingly active in socially conscious team projects, using their technical and team skills to develop devices that can have an impact in underserved communities throughout the world.

The challenges of access to clean water inspired senior Michael O’Connor to get involved in the U-M student group BLUElab’s project to design and implement a biosand filter and a solar drier for a poor, rural community in Hagley Gap, Jamaica. Michael traveled to Jamaica last summer and returned this spring with senior Cristine Zuchora and others to install the filter in a preschool and to deliver the solar drier to an area farmer’s cooperative, in partnership with Blue Mountain Project (www.bluemountainproject.org).

Michael felt that “it was within my capabilities and knowledge base to do something to improve the conditions and therefore it was imperative for me to do so. We must adapt to rapidly changing situations on site in Jamaica such as misinformation about design criteria and material availability, in addition to working with design failures and hard deadlines.” They continue to optimize the biofilter design to make the device cheaper, faster, and easier to build and maintain.

Another BLUElab project, BLUElab Wind, is focused on developing a wind turbine system with woven blades. Sophomores Sita Syal, Anna Liang, Michelle Fernandes, and Sonya Kavalam and the rest of the team are co-designing the blades with women in a Guatemalan weaver’s cooperative in the village of Nueva Santa Catarina Ixtahuacan. Over Spring Break they traveled there to learn their weaving techniques, and co-design two blades and a demonstration-sized system that was wired to light an LED as a proof of concept.

Reflecting on the project, project leader Sita reports “I have been so fortunate in life and this is a great chance for me to truly give back. The families that we met had so little, yet they gave so much. Being part of BLUElab Wind has been one of the best choices I have made in college. It has led me to meet so many great friends at Michigan and abroad. I’ve learned the truths and realities as well as the joys that come with working in communities that are less fortunate than mine.” (Photos at www.facebook.com/pages/BLUElab-Wind/116733891747111.)

Sophomore Alexander Thinath and junior Carolyn Yarina lead the CentriCycle (www.centricycle.com) social venture group, developing a bicycle-based manually-powered centrifuge to help diagnose anemia and other illnesses. Alex was on the team that initially developed the device as part of his freshman engineering class. CentriCycle team members spent most of this year developing a sustainable business plan and locating sources of funding. Alex believes that “we will be able to make a positive difference in rural India while learning an incredible amount about engineering, global health, and ourselves.” In his two years on the project he has gained much respect for the personal dedication of humanitarian workers and entrepreneurs. “CentriCycle also helped me realize the importance of a multidisciplinary approach in tackling many design and implementation issues.” The team will be traveling to clinics in Mysore, India in August to collect feedback on the performance of the device.

Not only are these students having an immediate impact on underserved communities through the devices they are developing, they are learning valuable skills that will serve them well in the long term. As Michael reflects on his time with BLUElab, he realizes that “my experience has taught me more about the world and other cultures than I could ever have learned from any textbook.”
Continuing the Tradition in ChE 460

Unit Operations, published by a team of Michigan Chemical Engineering faculty led by Professor George Granger (G.G.) Brown (photo to right) in 1950, revolutionized chemical engineering curricula from the previous emphasis on specific industries. Our senior laboratory course was revamped to this new approach. In the 1980s our ChE 460 lab received a major upgrade. Alumnus Pablo LaValle, with the assistance of lab technician Don Trombley, built five new experimental stations and added computer based data acquisition and control to all the equipment.

Under Professor Rane Curl the ChE 460 curriculum evolved in the mid-1980s, into a simulated industrial environment, known as “G.G. Brown Industries, Inc.” with Professor Curl as CEO and graduate student instructors (GSIs) as plant supervisors. Students took on the role of engineers, characterizing and optimizing unit operations in each of the three divisions, separations, reaction engineering and controls.

LaValle worked under the direction of Professor Curl, to increase the safety and reliability of the equipment and to modify it to accommodate new projects. The large distillation column was replaced with a laboratory-size packed-bed distillation column to characterize mass-transfer coefficients in random packing and to optimize distillation operations using a methanol/water system. The long-tube vertical evaporator was replaced with a double-effect evaporator designed and constructed by chemical engineering staff and used today to evaluate multiple-effect evaporation with water/glycerol system. A reaction cell was also added.

More recently, Professor Henry Wang has revamped the lab to simulate the unit operations required to generate an ASTM grade biodiesel product, with an emphasis on process integration with product recovery and reprocessing. This approach integrates most of the previously isolated unit operations in the laboratory into a “virtual” process where the inputs and outputs of each unit operation are intimately related. Students are encouraged to understand the entire process and grasp the interconnectedness of all the processing streams. Students address the need to meet the product quality and specifications, and minimize waste generation. They also identify technical problems, generate possible solutions, and evaluate the economic consequences of these solutions.

A memo introduces students to a proposed biodiesel production scheme developed by the United States Department of Agriculture (USDA) (Haas et al), and charges them with improving this process to minimize waste by proposing ways to recover, reuse, or recycle the byproduct streams. Students use information obtained through experimentation and data analysis to evaluate each of the proposed improved unit operations and scale them up to meet the desired output.

Students must keep an eye on the “big picture” so they know what to achieve in each task and how this fits in with the overall improvement of the biodiesel process. During the first rotation, teams of three students use the laboratory to characterize the process or equipment for the assignment. For example, establishing reaction rates as function of catalyst concentration and reactor operating parameters; or measuring mass transfer characteristics of a proposed packing to be used in the plant distillation operation. In some cases, simple Design of Experiment (DOE) concepts are encouraged in the experimental plan. For the second rotation new teams of students develop models of their assigned operation using simulation packages or spreadsheets to simulate various operation conditions encountered in the proposed plant. Concepts of “sustainability” through recycling and waste...
We welcome Assistant Professor Timothy Scott to the department this fall. Born in Melbourne, Australia, Tim received his bachelor’s degree with honours (Chemistry) from University of Melbourne, Australia. His honours project on novel polymer architectures via nitroxide-mediated living radical polymerization was completed under the direction of David H. Solomon, a pioneer of polymer science in Australia.

In 2006, he received a PhD (Materials Engineering) from Monash University, Australia, working in the labs of advisors Wayne D. Cook and John S. Forsythe. For his doctoral project, Tim examined the photopolymerization kinetics of styrene/dimethacrylate blends, morphology of the resultant polymer networks, and the utility of visible light irradiation to initiate radical polymerizations in composite materials. This research ultimately led to a new approach for the rapid fabrication of large, high quality, glass-reinforced composite structures.

After graduation, he went to the University of Colorado at Boulder to work on a postdoctoral project with Professor Christopher N. Bowman. Initially Tim focused on the incorporation of ring opening monomers in thiol-ene materials. His work led to the first demonstration of a cross-linked polymer incorporating addition-fragmentation chain transfer functional groups that, upon the introduction of radicals, exhibits stress and/or strain relaxation without any concomitant change in material properties. The consequences of this technique were profound, and Tim’s subsequent research exploiting similar approaches to dynamic polymer networks has yielded ultra-low stress thermosets, photoinduced elastomer actuation, and crack-healing behavior.

Tim also worked on subdiffraction photolithography using two irradiation wavelengths in the Bowman lab. The two-color irradiation scheme developed allowed for the fabrication of structures with both feature sizes and monomer conversions otherwise unobtainable with use of either single- or two-photon absorption photopolymerization.

While at Colorado, Tim accepted a position as an assistant research professor in the Mechanical Engineering Department during which he worked with Endosha, a Boulder-based start-up company, on shape memory polymers for patient-specific biomedical devices. While working there he was awarded an NIH R21 grant on biomedical adhesives/sealants.

As he starts his work at Michigan he plans to continue his research on utilizing light, in conjunction with other physical phenomena, to spatially and temporally confine chemical reactions for applications focused on membrane operations and biomaterials. “Engineers solve problems, ideally elegantly,” says Tim. “The research in my lab will aim to exemplify this philosophy of elegant solutions to intractable problems.”

When Tim takes a break from setting up his new lab and figuring out how to navigate around the summer construction in Ann Arbor, he enjoys cycling, working out, and fixing his ever-broken car. He loves American football and is looking forward to seeing his first Michigan game in the Big House this fall!
BACTERIAL INFECTIONS
CONTINUED FROM PAGE 1

hidden features of the biofilm microstructure. For example, why the cells cluster within the biofilm seems to be a function of how stressed the cells are.

Leo is looking at mechanical properties of the biofilm to learn if they can be thought of as a viscoelastic composite, just as chemical engineers have long viewed many advanced materials. He would like to determine the maximum stresses that the biofilm can undergo before it yields and fluidizes. By studying the mechanical properties, Leo can get a sense of how the biofilms can break apart and spread throughout the bloodstream.

Mahesh is focusing on the sticky part of the biofilm, or in technical terms its “extracellular polysaccharide.” He is using methods from polymer science, such as size exclusion chromatography and light scattering, to learn about the size and molar mass of the polysaccharide that the bacteria secrete. Mahesh hopes to discover what makes the polymer matrix so strong and how these polymers are arranged in the biofilm.

As all three combine what they have learned about how bacteria arrange inside the biofilm, what exactly holds the biofilm together, and how it responds to changes in its environment, they hope they can help improve treatment of biofilm-related infections. For these chemical engineering students, an attraction of the work is the collaboration with Professor Younger. In addition to his research activities, he is an emergency room physician. His medical background helps steer the research in a clinically relevant direction. As Stewart notes: “As chemical engineers, we are equipped with the tools to analyze biological problems. However, our collaboration with John Younger allows for the clinical aspects of the work to be brought to light in a way we are incapable of doing. He is in the ER with patients three days a week and knows what kinds of solutions health systems will value.” For his part, John says, “This collaboration has been one of the most rewarding of my career. The energy of the team is just amazing, and by approaching this clinical problem from such widely diverse directions, we’re developing approaches that neither Mike’s group nor mine would ever have pursued alone. Besides the science, contributing to the career trajectories of Mahesh, Leo, and Elizabeth has been a real honor for me. There are so many areas that young chemical engineers can pursue—it means a lot to be able to show them some of the really critical challenges in medicine and how answering those questions can become a career.”
Fighting Tuberculosis with Computers

An astounding one-third of the world is infected with *Mycobacterium tuberculosis*, the microorganism that causes tuberculosis (TB), and approximately two million deaths per year result from this infection. Treatment, especially in the developing world, is complicated by the over six months required for a long antibiotic regimen and the emergence of antibiotic-resistant strains.

Many of these individuals have latent TB. In the latent disease, infected cells are found in the lungs and are surrounded by immune cells that contain the infection. This collection of cells is termed a granuloma; the human host and the bacteria are in a steady state in which both can survive. When a granuloma fails to contain the infection—perhaps due to age, HIV co-infection, or other poorly understood causes—the individual develops active TB and the infection can spread to others. Understanding how the immune system contains the disease, and why it doesn’t always do so successfully, will provide keys to the development of new therapies and vaccines.

Mohammad Fallahi-Sichani observes immunofluorescence microscopy analysis of bead granulomas from mice.

Professor Jennifer Linderman’s group, in collaboration with the labs of Denise Kirschner (Michigan), Steve Kunkel (Michigan) and JoAnne Flynn (Pittsburgh) has been studying how the immune system responds to *Mycobacterium tuberculosis* infection. Mohammad Fallahi-Sichani and Nick Cilfone, two graduate students in the Linderman group, design both experiments and computer simulations to investigate how molecular diffusion and kinetics control granuloma formation and function. In a recent article in the *Journal of Immunology*, simulations using an agent-based model identified particular parameters that influence whether a granuloma is able to contain the infection. The group has been awarded an NIH grant to use the computer simulations to study the effects of adding antibiotics together with molecules that may affect the immune system (immunomodulation). This combination therapy might shorten treatment time or make treatment more successful. Ultimately, new therapies for TB may be designed and piloted first on the computer.

Fallahi-Sichani says that “computational approaches, in particular agent-based modeling, are very useful in dissecting the temporal and spatial aspects of the immune response to TB infection. By using systems biology approaches that integrate experimental and computational methods, we address critical questions basic to our understanding of granulomas as well as translational questions of vaccination and drug treatment.”

Jennifer Linderman’s webpage:  
www.che.engin.umich.edu/people/linderman.html

On the left, immune cells localize around a bead that is coated with a mycobacterial peptide. This mouse system mimics some aspects of granuloma formation in human lungs. On the right, a computer simulation of a granuloma.
Department Kudos

FACULTY

Omolola (Lola) Eniola-Adefeso won a CAREER Award from the National Science Foundation (NSF). Lola was also selected as the 2011 recipient of the Lloyd N. Ferguson Young Scientist from the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE).

Sharon Glotzer has been elected to the American Academy of Arts and Sciences, one of the nation’s most prestigious honorary societies and a leading center for independent policy research.

Nick Kotov is one of the “Top 100 Chemists, 2000-2010,” listed in Science Watch (Thomson Reuters) in February 2011. The Top 100 is intended to celebrate the achievements of chemists, and chemical engineers whose papers made the highest impact in the discipline published since January 2000. Nick also ranked in the top 25 in Materials Science.

Joerg Lahann was inducted into the College of Fellows of the American Institute for Medical and Biological Engineering (AIMBE).

Xiaoxia (Nina) Lin won an NSF CAREER Award. Nina’s proposal centers on developing synergistic microorganisms that together can perform functions that individual organisms cannot.

Suljo Linic won the NSEF (Nano Science and Engineering Forum) Young Investigator Award from AIChE. The award is given by the NSEF Division to recognize outstanding research in nanoscience and nanotechnology.

Phil Christopher (Linic Lab) won the CoE’s Outstanding PhD Student Research Award. Several other students also received awards at the College’s Graduate Student Symposium.

Chad Huelsman (Savage Lab) was recently awarded an EPA STAR graduate fellowship. The EPA STAR program supports master’s and doctoral candidates in environmental studies.

Bobby Levine (Savage Lab) was a recipient of the 2010 Walter J. Weber Jr. Award in Environmental and Energy Sustainability.

Undergraduate Zach Markin was named “RPM Student Entrepreneur of the Year” for his work with Get Fresh Detroit. The Center for Entrepreneurship recognized Markin with this award for his leadership of a socially-oriented startup. Get Fresh Detroit, a business founded to increase access to healthy foods and fresh produce in Detroit, was started while taking a social entrepreneurship class.

Senior Nicholas Orichella received AIChE’s Donald F. & Mildred Topp Othmer National Scholarship Award. This award is presented to students on the basis of academic achievement and involvement in student chapter activities.

Elizabeth Stewart (Solomon Lab) was awarded a CoE Distinguished Leadership Graduate Award.

The 2011 National Science Foundation Fellows from the department are: Youngri Kim (Solomon Lab), Brittany Lancaster (Linic Lab), and Jake Dickenson (Savage Lab).

STUDENTS

Mike Solomon has won the 2011 Soft Matter Lectureship. As recipient of this award, given annually by the Royal Society of Chemistry’s journal Soft Matter, Mike will present three research lectures at three different locations (one in the US), and will have an invited paper published in a journal.

Walter J. Weber, Jr., received the Silver Anniversary Medal Award from the National Academy of Engineering (NAE).
Nicholas Kotov and a team of researchers from the University of Michigan and Kyungpook National University are using nanoparticles to attract and capture the oligomers of amyloid peptides that are known to be cytotoxic in neurodegenerative disorders, such as Alzheimer’s disease. These oligomers and longer fibrils form the plaque associated with these diseases. In their study published online in May 2011 in *Angewandte Chemie International Edition*, the researchers describe inhibiting amyloid-beta fibrillation using cadmium telluride (CdTe) nanoparticles with a tetrahedral shape and negative charge. These research findings were also featured in the May 20, 2011 issue of *Scientific American*.

Cellulosic biofuels, derived from lignocellulosic feedstocks such as corn stover and grasses, hold tremendous potential as a renewable alternative fuel to help meet our nation and the world’s energy demands in the future. To realize this potential, Nina Lin’s research group is engineering microorganisms, including model bacterium *E. coli*, to enable an efficient and robust transformation process. As one critical step, graduate student Jeremy Minty is working to improve microbial tolerance to isobutanol, a promising next-generation biofuel. Their initial results were recently published in *Microbial Cell Factories*.

Conventional means of collecting solar energy, such as solar cells, are notoriously inefficient. Suljo Linic, and his doctoral students David Ingram, Phillip Christopher and Hongliang Xin are exploring new means of exploiting the abundant energy produced by the sun. Metallic nanoparticles (photo above) can act as nanoscale antennas to enhance the efficiency of solar driven photocatalytic reactions. By tailoring the nanoparticle geometry, different portions of the solar spectrum can be exploited, making metal nanoparticles optimal building blocks for converting solar energy into chemical energy.

**Nick Kotov’s webpage:**
www.che.engin.umich.edu/people/kotov.html

**Nina Lin’s webpage:**
www.che.engin.umich.edu/people/lin.html

**Suljo Linic’s webpage:**
www.che.engin.umich.edu/people/linic.html

Two graduate students in Johannes Schwank’s group, Liz Ranney and Thomas Westrich, presented papers on photocatalysis at the 22nd North American Catalysis Society meeting in Detroit. Liz reported on her recent discovery of a method to achieve record high conversion of water into hydrogen in a continuous flow reactor using ruthenium-doped titania nanotubes (scanning electron micrograph image above) in presence of an oxygen trapping material. The hydrogen gas generated in this process can be used to recycle CO₂ from stationary sources into methane via the Sabatier reaction. Photocatalysis also plays an important role in the remediation of volatile organic compounds. Tom has been using photocatalytic oxidation of ethylene as a probe reaction to explore the fundamental aspects of high-temperature photocatalytic reactions.

**Johannes Schwank’s webpage:**
www.che.engin.umich.edu/people/schwank.html
James Wilkes has been enjoying life as an emeritus professor since 2000. Until recently, when spine surgery curtailed some of his pursuits, Jim had been very active in playing tennis, and with his wife, Mary Ann, mountain-walking in Big Bend National Park. He has continued to teach for a few weeks every year in Bangkok, 2010 marking his 15th visit to the Petroleum College at Chulalongkorn University. At home, he is a keen gardener, and practices his large 3-manual electronic organ regularly. Two years after retirement, in 2002, he completed A Century of Chemical Engineering at the University of Michigan. In 2006, Prentice-Hall published the second edition of his 773-page textbook, Fluid Mechanics for Chemical Engineers. He is currently editing his grandfather’s beautifully illustrated 1,000-page manuscript, Place-Names of Hampshire and the Isle of Wight, in which his grandfather traced the names of all the hamlets, villages, and towns in the county to their origins—which are mainly Anglo-Saxon.

He continues to take an active interest in selecting recipients for the undergraduate scholarships established in his name—and kindly endowed by alums and friends at his retirement. Jim’s father-in-law, William Gibson, endowed a similar scholarship fund, named after his late wife, Helen B. Gibson, who died in 1997.

During his 40-year career at Michigan, Jim was a pioneer in the numerical solution of partial differential equations, both by finite-difference and finite-element methods. A native of Southampton, England, Jim obtained his bachelor’s degree in chemical engineering from the University of Cambridge in 1955 and completed a master’s degree at Michigan in 1956, thanks to a fellowship awarded to him while a student at Cambridge. He returned to England for four years as a faculty member at the University of Cambridge, coming back to the U-M in 1960 to study for his PhD (1963) with Stuart Churchill.

At the U-M, Jim was most at home in the classroom, where he mainly taught fluid mechanics and numerical methods. He was recognized many times for his dedicated classroom teaching, being a first recipient in 1980 of the College of Engineering’s Engineering Excellence in Teaching Award. In 1987, he received the highest University of Michigan award for classroom teaching—the Amoco Good Teaching Award, and was named an Arthur F. Thurnau Professor from 1989–1992.

Jim was department chairman from 1971–1977 and Assistant Dean for Admissions from 1990–1994. For many years he was co-editor of the Class and Home Problems section of Chemical Engineering Education, and Associate Editor of Chemical Engineering Research & Design.

Brice and Jim worked closely and extensively together in two main areas—numerical methods and freshman digital-computing education. Their early work was influenced greatly by their senior faculty colleague Don Katz’s landmark project, “The Use of Computers in Engineering Education,” generously sponsored by the Ford Foundation and for which Brice was a major assistant director.

At Don’s “suggestion” (i.e., command), Brice and Jim wrote with H.A. Luther from Texas A&M “a few notes” on numerical methods. Just 18 months of very hard work led to their enormously successful text, Applied Numerical Methods—first as a 790-page preliminary paper-back edition in 1964 and then, with 40 FORTRAN programs, as a 622-page large-format hardcover version, published by Wiley in 1969. It was very popular nationally for the following 20 years.

Catching up with Jim Wilkes and Brice and Jim worked closely and extensively together in two main areas—numerical methods and freshman digital-computing education. Their early work was influenced greatly by their senior faculty colleague Don Katz’s landmark project, “The Use of Computers in Engineering Education,” generously sponsored by the Ford Foundation and for which Brice was a major assistant director.

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Since beginning his phased retirement in 1999, Brice Carnahan has continued his work with CACHE (Computer Aids for Chemical Engineering Education) Corporation. He was a founding member and served on the Board for 50 years until 2009. He’s edited several AIChE Conference Proceedings, taught occasionally at Michigan and at ASEE Summer Schools for young ChE faculty, took Spanish classes at Washtenaw Community College (¡Hola!), and has tried to keep up with the great things happening in the Department.

Brice is an avid reader, with a keen interest in world affairs, politics, education, business, travel, and music (all perfect for his new iPad). Disillusioned with the current state of US politics, he has decided to emphasize foreign travel for a while. In recent years, he has visited Thailand, Indonesia, Burma, Hong Kong, Singapore, New Zealand, Australia, South Africa, Egypt, Brazil, Uruguay, Argentina, and virtually all countries in Europe. Upcoming trips include China with a cruise on the Yangtze, Chile, Argentina, and a one-week Caribbean cruise for R&R. He winters in Florida, and summers at his home in Ann Arbor and cottage near Pinckney. For exercise, he gardens (a lot) and speedwalks several hours per week.

Brice’s 42 years in the department began with project work with Don Katz on computers in engineering and design education (1959-1965). From then on, he was at the forefront of computing in chemical engineering.

In the late 1970s and early 1980s, Brice and a cadre of student assistants developed one of the earliest micro-computer-based authoring systems and courseware for chemical engineers, MicroCACHE, and later, the more powerful MicroMENTOR. His research interests and those of his doctoral students focused on algorithm design and software development for computer-aided process modeling, particularly for dynamic process simulation in both serial and parallel computing environments.

At Michigan, Brice served on the College Executive Committee (1979-83), and, as a member of the CAEN Executive Committee (1983-1993), was heavily involved in the early development of the College Computing Network. He was departmental graduate chair for nearly twenty years until 1998. Brice has received numerous citations for his dynamic style of teaching and service from the Department, the College and the University.

On the national scene, in addition to his CACHE activities, Brice was involved in creation of the AIChE CAST (Computer and Systems Technology) Division and was elected its second chair (1981-82). He was also a long-term member of the editorial board of Computers and Chemical Engineering. A Fellow of the AIChE, he earned the AIChE Computers in Chemical Engineering Award in 1982, the ASEE Chemical Engineering Lectureship in 1991, and the ASEE Lifetime Achievement Award for Contributions to Computing in Chemical Engineering Education in 2009.
Department Annual Lectures

Jens K. Nørskov, the Leland T. Edwards Professor in Engineering at Stanford University, delivered the 2011 Donald L. Katz lectures on April 7 and 8, 2011. His lecture titles were: Catalysis for Sustainable Energy and “Tailoring Surface Chemical Properties Using Electronic Structure.”

Presently Dr. Nørskov is professor of chemical engineering and professor of photon science at Stanford University and at SLAC National Accelerator Laboratory. He is a member of the Royal Danish Academy of Science and Letters (1996) and the Danish Academy of the Technical Sciences (1987).

Paul Anastas, the Assistant Administrator for the Office of Research and Development of the Environmental Protection Agency, presented the 2011 Walter J. Weber, Jr. Distinguished Lecture in Environmental and Energy Sustainability on January 21, 2011. The title for his lecture was “The Future of Science and Technology for Environmental Protection.”

Known widely as the “Father of Green Chemistry” for his groundbreaking research on the design, manufacture, and use of minimally-toxic, environmentally-friendly chemicals, Dr. Anastas has an extensive record of leadership in government, academia, and the private sector.

Your Invitation to Subscribe to a New Edition of the Department’s History Book

We published our history, A Century of Chemical Engineering at the University of Michigan, in 2002. It contained 640 pages and 560 photographs, spanning the years 1898–2002, and was extremely well received, particularly by our alums. Our original print run of 850 copies is now depleted, and we shall be preparing a second and updated hardcover edition, which we expect to publish in late 2012, to include between 50 and 100 additional pages—again with lots of photographs. You are invited to become a “subscriber” to the second edition, which will ensure that your name is printed at the beginning of the book. The names of the approximately 400 subscribers to the first edition will still be retained, and if you have subscribed to both editions, it will be noted.

If you wish to subscribe, would you please fill out the form below.

**Yes, I would like to be a subscriber to the updated chemical engineering history book, with the understanding that a copy will be mailed to me when ready.**

**My name as I wish it to appear in the book:**

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**If any, my degree(s) or expected degree(s) from the University of Michigan are [give date(s) and name(s) of degree(s)]:**

________________________________________________________________

**My permanent/home mailing address is:**

________________________________________________________________

________________________________________________________________

**My permanent/home telephone number is:**

________________________________________________________________

**My e-mail address (if any) ________________________________________**

☐ **My payment of $25.00 by check to “University of Michigan” is enclosed.**

Please take or mail this form and check to: Pamela Bogdanski, Department of Chemical Engineering, University of Michigan, 2300 Hayward Street, Ann Arbor, MI 48109–2136

Thank you for your interest and support.
Fall 2011 ChE Alumni Events

**Monday, September 26, 2011**
Career Fair Reception
4:30-6:00 p.m., 3158 H. H. Dow (Podbielniak Lounge)

If you are coming to the Tau Beta Pi/SWE Career Fair on September 26, please stop by our annual alumni reception. It’s a great opportunity to talk to former classmates and professors, and to kick back and relax after a long day at the career fair!

**Monday, October 17, 2011**
2011 Annual Meeting Open House
7:00 p.m. - 9:00 p.m., Minneapolis, MN

We always enjoy welcoming alumni to our annual open house at the AIChE National meeting. If you are attending the meeting, or if you live nearby, please stop by and visit with ChE faculty and other alums.

**Friday, October 28, 2011**
11:30 a.m. - 1:30 p.m.
Lunch with the Department
(Morning activities TBD)
Johnson Rooms, Lurie Engineering Center

Please join us on October 28 for lunch in the department during Michigan Alumni Homecoming Weekend at 11:30 a.m. Paul Werler (BSE 1947, MSE 1948), our Alumni Society Award Winner will be our guest of honor at the lunch. Students and faculty will be at the lunch to answer your questions about our program. We will have morning activities for visiting alumni, including tours of the Dow labs. More details about the events taking place before lunch will be available soon on the ChE alumni webpage (www.engin.umich.edu/alumni).

If you would like to join us, sign up for “Lunch in the Departments” when you register for the alumni weekend. If you have not made reservations yet, you can register online at www.engin.umich.edu/alumni/homecoming or call 734-647-7046. If you are not participating in other activities during alumni weekend, but would like to join us for lunch, please contact Sandy (734-764-7413, sandys@umich.edu).

*Note: All alumni activities on October 28 will take place (or originate) in the Johnson Rooms on the 3rd Floor of the Lurie Engineering Center (on Beal Ave. near Bonisteel Blvd.).*

**Videotaping during Fall Career Fair AND Homecoming Weekend**

We are going to be videotaping alumni again this fall to use in publications promoting the department. We will be looking for volunteers to talk to us especially during the Career Fair and Homecoming Weekend events. We will be starting our October 28th interviews a few hours before lunch in the Johnson Rooms on the 3rd floor of the Lurie Engineering Center.

**Introducing the 2011-2012 Chemical Engineering Alumni Board**

Robert Bratzler, Chair, BSE ’68
Margaret Gilligan, BSE ’89
Paul Horst, BSE ’72, MBA ’73
Leslie Mowrey, BSE ’70, MSE ’71
Tony Orlando, BSE ’87
Cory Phillips, BSE ’93
Robert Ranger, Chair, BSE ’83
Frank Tranzow, BSE ’59, MBA ’61

Steven Waier, BSE ’88
William Wulfsohn, BSE ’84

New Members:
Tom Golczynski, BSE ’97
Warren Seider, MSE ’63, PhD ’66

(Only U-M degrees listed)

Come meet the board at the 2011 homecoming department luncheon on October 28 (see above).

More information about the board members is at che.engin.umich.edu/people/alumniboard.html.
Polymers Key to West Quad Cadet’s Success

Paul Werler (BSE 1947, MSE 1948) grew up in Buffalo, NY during the Great Depression. He came to Michigan in 1942 to study chemical engineering and, because the country had recently entered WWII, he also enrolled in the Naval ROTC program. By 1943, Paul and the other cadets on campus were put on active duty, and West Quad became their barracks and home for next two years. It was a unique experience for the students to combine engineering and naval science courses and military life. Calisthenics started early every morning, and every night the doors closed at 9 p.m., and lights were out at 10 p.m. sharp! Paul says he spent many nights under his bed covers using a flashlight to complete his homework assignments. The group of engineering cadets Paul met at Michigan formed a special bond of friendship that continues today, as evidenced by their high turnout at class reunions.

Following his commissioning in 1945 and one year of naval duty, he returned to complete his ChE degree in 1947, and an advanced degree in protective coating technology in 1948. His first job after graduation was with Archer Daniels Midland (ADM).

After 15 years in technical, marketing, and management positions, Paul left to partner with a customer in a venture to provide starch-based products to the oil & gas drilling industry. The business prospered during the 1970s but experienced a steep decline in the mid-1980s. To diversify, he and his partner created several starch-based polymers for use as additives in adhesives, textiles, and coatings. With their knowledge of the drilling industry they were able to capitalize on new technologies emerging in the 1990s. By collaborating with their major customers, they were able to develop polymers with special functionalities. Today Paul’s company, Chemstar, is recognized as the world’s leading producer of starch-based polymers. His son, James, is serving as the president of the company.

Paul and his wife have been married for almost 60 years and have five children. One of their daughters received her master’s degree in the School of Public Health, at Michigan and is on the faculty at Boston University. While still active at Chemstar, Paul and his wife enjoy traveling and spending time at their lake cabin in Wisconsin and condo in Puerto Vallarta, Mexico. He says his “continuing contributions to the University of Michigan are based on his strong belief that America must increase technical talent to compete in the emerging industrial world.”

Paul will receive the 2011 Chemical Engineering Alumni Society Award during homecoming weekend on Friday, October 28, 2011.
Michigan & Family Help Shape His Career

Since moving to Chicago, Lonnie Shea (PhD 1997) has seen first hand the breadth and involvement of the Michigan alumni association. On any Saturday in the fall, the familiar winged maize and blue helmet can be seen throughout the city, and in any number of “Michigan” bars. The size of the Michigan community is most noticeable when Michigan plays Northwestern and Northwestern’s parking lot is filled with maize and blue, with only an occasional glimmer of purple and black.

Lonnie received his PhD in chemical engineering and scientific computing from Michigan in 1997, working with Professor Jennifer Linderman. He did postdoctoral research in the Department of Biologic and Materials Science at the Dental School until he accepted a faculty position at Northwestern University in 1999.

Today, Lonnie is a full professor in chemical and biological engineering. He has developed innovative technologies for the delivery of proteins and DNA from biomaterials used in regenerative medicine, with applications to therapies for diabetes, infertility, spinal cord injury, and cancer.

Lonnie attributes his success in this interdisciplinary research to his training at Michigan, and also to his wife, a breast cancer surgeon and scientist. His research in cancer biology and regenerative medicine was shaped by his early work studying how cells sense and respond to their environment. This early work led him into research aimed at developing technologies to control the cellular environment, which can be used as tools to promote healing or to investigate disease. The enthusiasm and passion of the faculty at Michigan for teaching, learning, and cutting-edge research, inspired him to pursue an academic position.

Lonnie looks forward to opportunities to visit Ann Arbor when he brings his wife and three daughters to visit family in southeast Michigan. “Ann Arbor is a unique place,” he says, “and I am grateful for having had the opportunity to train with so many talented scholars at one of the elite universities in the world.”

Algal Scientific is developing technology to use algae to remediate wastewater pollution, while producing feedstocks for fertilizer, food, pharmaceuticals and energy.

Paul and his wife, Nancy, are avid blue water sailors, having cruised with their family in the Expo ’98 Round the World Rally. They have made a second transpacific crossing to Australia, and sailed the Great Lakes for over 30 years.

He was the guest of honor at the ChE Luncheon on October 15 during the 2010 Michigan Engineering Homecoming Weekend and received his award at a College dinner later in the evening.

From College of Engineering Communications and Marketing

numerous acquisitions and worldwide sales. He was engaged in the drafting of the enabling legislation for NextEnergy, the state of Michigan’s alternative energy incubator, and served on its initial advisory board.

Paul is currently an entrepreneur-in-residence responsible for alternative energy and clean technologies at Rocket Ventures, a regional economic development and venture capital firm. He also is a coach for the Great Lakes Entrepreneur’s Quest, a guest lecturer on entrepreneurship at the College of Engineering at the University of Michigan, and a member of the Alumni Board for the Department of Chemical Engineering.

He also serves as the CEO of Algal Scientific Corporation, a start-up founded by recent University of Michigan and Michigan State University MBA graduates and PhD candidates. Algal Scientific is developing technology to use algae to remediate wastewater pollution, while producing feedstocks for fertilizer, food, pharmaceuticals and energy.

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From College of Engineering Communications and Marketing

Algal Scientific Corporation, a startup founded by recent University of Michigan and Michigan State University MBA graduates and PhD candidates.
Bartus Scholarships Benefit ChE’s

Thirty-seven University of Michigan Chemical Engineering students and 35 Civil & Environmental Engineering students were the first recipients of $5,000 Julius F. Bartus Endowed Memorial scholarships. Julius Bartus (BSE CE ’36) and his wife, Zelda V. Bartus (BA ’39, CERTT EDUC ’39), met as undergraduates at the University of Michigan, and one of their sons, David, received his degrees from the Chemical Engineering Department (BSEChE ’79, MSE 81, PhD ’87). Their oldest son, Michael (AB Psychology ’70, MPH Public Health ’75), has been actively involved in the healthcare field. He recalls that his parents’ lives “began quite humbly, but were forever changed by their studies and exposure to so many opportunities that the University had to offer. Their motivation in terms of instituting the scholarship program was to offer the same ‘start in life’ for succeeding generations of U-M civil/environmental and chemical engineering students with demonstrated financial needs.”

Such was their love of the University that Julius and Zelda raised their sons in Ann Arbor, where Julius was involved in King Engineering and Zelda was a high school Latin and French teacher. Michael recalls frequent visits to museums, concerts, lectures, and of course football games. He returned to Ann Arbor in Spring of 2011 for the first annual Bartus Scholars reception, to help the scholars build a community, stay engaged with the Bartus family, and develop the Bartus Scholars Society. Bartus Scholars will be encouraged to participate in group community service activities and to give back in the future.

Chair Mark Burns says that, “with the addition of the Bartus Endowment, the department has more than doubled the number of students we can help financially. We are grateful that Julius and Zelda Bartus chose to honor and support the department in this way.”

Bartus Scholar Eric Raynal (BSEChE ’13) was impressed by the range of talents and convictions of the other scholars he met at the spring activities. Eric was in Washington DC this summer working on an internship with the American Chemical Society, providing support for their internal website design team, and studying to take the MCAT in preparation for medical school. He used his Bartus Scholarship to help pay tuition and to support himself in DC prior to getting his first paycheck. He reports: “I have developed a greater awareness of how influential scholarships can be to a student. Legacy is important, and you never know how much you can influence someone by showing support for the University that has impacted so much of your life.”

To Francis Ogunseye (BSEChE ’12) that impact was tremendous. “The Bartus scholarship came at a really great time of need in my college career,” he states. “I was balancing work and school and also trying to pay for my educational expenses. When I was notified that I had received this award, I was relieved, happy, and felt as though a burden had been taken from me. It also boosted me psychologically as I was encouraged to work even harder so I could earn other scholarships to reduce my loan burdens.” Francis particularly appreciated that Michael Bartus took the time to meet the recipients personally so Francis could express his appreciation for the immense support he has received.

Chemical Engineering students for years to come will benefit not only from the financial support provided by the Bartus estate, but also from the personal interest that the family has taken in connecting with and inspiring our students.
Alumni Notes

After his dear wife of 67 years succumbed to Alzheimer’s in 2006, Arthur Kohn (BSE ’34) started attending classes in history, art history, and geology at Kent State Geauga University. This has helped him keep his brain working!

Don Spink (BSE ’45) was a professor at the University of Waterloo for 20 years and retired in 1988. Life is great! He and his wife were blessed with 6 sons, 15 grandchildren and 5 great grandchildren, so far. He says his golf game is pretty bad but he still walks the course. Don and his wife just celebrated their 65th wedding anniversary.

Joyce VanTuyl (BSE ’45) recently retired as the Braille coordinator at the Washington Talking Board and Braille Library. Her specialty is the transcription of math and science into Braille.

Margaret Frank (BSE ’46) retired from Parke Davis & Taylor in Michigan. She and her husband are preparing to move into senior housing. Over the years, since returning to Tucson, AZ, they have enjoyed participating in the programs of the University of Michigan Club of Tucson.

Donald McKee (BSE ’47) is nearing 88 and is still going strong—at least, trying to do so!

John Porter (MSE ’48) is healthy and is happily enjoying his 29th year in retirement.

Takeo Shirasawa (BSE ’48) received a master’s degree in public health from the University of California at Berkeley in 1978 in addition to his degree from Michigan. He says he is happy in retirement and has many great memories of his years at Michigan.

Raymond Czarnecki (BSE ’50) had a long career as vice president of Chem-RID. He was also an adjunct professor in business at North Carolina State University.

Ralph Hillman (BSE ’50, MSE ’53) went to work for Parke Davis & Co. in Detroit as a process development engineer after graduation. After a year, he was reassigned as the midnight shift supervisor for the chloramphenicol production operation. This was the first synthetically produced antibiotic. After receiving his master’s degree in 1953, he applied to the Dow Chemical Co., at the suggestion of Stu Churchill, and began work with them soon after in Michigan. During the course of his 33-year career at Dow, he was responsible for the building and start-up of three production plants, concluding his career as a process engineer in 1986. In retirement Ralph is a certified genealogist and has published two genealogical books and written more than ten articles in national genealogical journals.

Vincent De Sena (BSE ’51) retired from Exxon in 1986. After retirement he became involved in volunteer work in a variety of projects including winning a seat on the governing body of his former home in Bethlehem Township in New Jersey where he lived for over 32 years. He has recently moved into the Hillview Retirement Community in Chester County, Pennsylvania. He and his wife, Virginia, live near their two daughters, Vincent and his wife enjoy as much time as they can with their grandchildren and great-grandchildren, who all live in New Jersey. Other than those visits, at 84 years, he says his travelling days are over.

Alan Molof (MSE ’51) transferred to environmental engineering in the Civil Engineering Department at Michigan and received an MS and PhD in this new area. The master’s was in 1953 and the PhD was completed in 1957 but not awarded until 1960 because he had to leave school—he and his wife had one child and another on the way! Alan joined New York University in 1962 after one year at Dorr-Oliver and four years with Lederle Labs of American Cyanam Co. He is now professor emeritus of environmental engineering.

Ralph Schatz (BSE ’51, MSE ’53, PhD ’57) is now fully retired after 31 years of employment and 21 years of consulting with Exxon Mobil Chemical Co.

Edward Niemiec (BSE ’53) retired from BASF Citing Co. in 1997 after 30-plus years of service. He and his wife have traveled the world many times with the alumni group, and are currently enjoying their grandchildren.

After retirement, Eugene Praschak (BSE ’55) worked and consulted with the auto trade association on government environmental regulations affecting automotive facilities.

George Grove (BSE ’57, BS ’57 Chemistry, MSE ’59) practiced patent law for General Motors Corp from 1965-2001 and still does patent work for GM on a part-time basis. George says he has always been grateful for his experience in the chemical engineering program at the University of Michigan.

Noel de Nevers (PhD ’59), professor emeritus at the University of Utah, says being professor emeritus is better than being professor: no meetings, no reports to grade, and no students complaining about their grades.

William Rose (BSE ’58) retired from General Motors 1993. He has been married for 52 years, and has two sons and nine grandchildren. He and his wife, Eleanor, enjoy classical music, the many arts in the area, and travelling and playing golf. William tutors twice a week at the church. They live six months in Michigan and six months in Florida during the year.

David Stanton (BSE ’59) received a great Michigan education that served him well in research at Union Carbide. His team developed one of

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If you would like to be added to our ChE alumni e-mail group so you can receive periodic news updates, please send us a request to the e-mail address listed above.

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the top chemical technologies, now the basis of 30+ chemical plants worldwide. When he retired from Union Carbide he was the associate director of R & D.

**George Tsao** (BSE ’60) retired from Purdue after 32 years, after training 72 PhD students and 63 post docs, writing over 300 papers, receiving 18 patents and doing pioneer research in the field of biofuel and renewable resources. He was the recipient of a renewable energy award from Department of Energy, in addition to other national awards.

**Roger W. Campbell** (BSE ’63) worked in a variety of positions at Marathon Oil. As technical director of Petroliber, Marathon’s Spanish refinery at La Coruna, he was responsible for the design and construction of the first delayed coker, the first cat cracker, the first ammonia burning sulfur plant, and the first four-stage biological effluent water treatment plant in Spain. After retiring, Roger consulted on design and construction of sulfur recovery plants and tail-gas treating. His last consulting project was on the design and construction of waste motor oil recovery and re-use plants. Unfortunately, all these had to be built in Europe because the US EPA has classified used motor oil as a hazardous waste and doesn’t permit the reuse of used motor oil.

**Eugene Kelly** (MSE ’63, PhD ’67) celebrated his 90th birthday on January 18, 2011.

**Rafael Munoz** (BSE ’63) lives close to CalTech. He says that CalTech has a new chemistry & chemical engineering building and its labs remind him of the East Engineering and North Campus facilities.

**Douglas VanDer Voort** (BSE ’64) tried to retire last May, but the company hired him back to train two recently graduated ChEs and one mechanical engineer. He is not certain exactly where or when he learned what he knows, but it certainly was not all at the U–M. He thanks the department for the start though.

**Thomas Kraska** (BSE ’65, MBA ’66) is now retired from Dow, after some 44 years. He enjoyed many years in Midland as well as some other great locations (Coral Gables, FL, Ludington, MI and Sydney, NSW). Thomas now lives in Chapel Hill, NC most of the year, and has a summer home on Lake Superior in the Keweenaw. He says his Michigan ChE & MBA degrees prepared him for several great assignments in various functions and Dow business units.

**Karl Legatski** (BSE ’66, MSE ’68) is semi-retired from CelTech, an industrial equipment business he started in 1991 that specializes in electro dialysis cells, ultra-filtration, and reverse osmosis. His son, Eric, is now president and majority owner of the company.

**Michael Downs** (BSE ’67) is the owner of a small business, ks7d Software, engaged in creating apps for the Apple iPhone, iPad and iPod touch.

**Anthony Sartor** (PhD ’68) has been a commissioner on the board of the Port Authority on New York and New Jersey (PANYNJ) since 1999. He is the chair of the World Trade Center Redevelopment Subcommittee, charged with oversight responsibility for the reconstruction of the World Trade Center Site for the agency.

**Barry Hollander** (BSE ’69, MSE ’70) is practicing patent law in the Washington DC area at the law firm of Greenblum & Bernstein, P.L.C., in Reston, VA.

**Robert Sander** (BSE ’69) works as a process engineer for INEOS, a polyethylene and polypropylene manufacturer in Houston, TX.

“To solve this problem, start by drawing a box around the operation and carefully label every energy and mass input and output...”  
**John Burleson** (BSE ’72) used this basic approach, drummed into his head at East Engineering, throughout his career. He says he became a master sleuth and problem solver in the R&D labs at AC Spark Plug Div, GMC and continuing at the spin-off, Delphi Corporation. While analytical chemistry is about as far as possible from his projected career in pilot plant operation, the engineering skills taught to him at Michigan let him solve many a situation where the rest of the chemists could never even figure out the right questions to be asking!

**Dennis Clifford** (BSE ’74, MSE ’74, PhD ’76), a former department chair and director of environmental engineering at the University of Houston Department of Civil and Environmental Engineering, became the Thomas and Laura Hsu Professor Emeritus in 2010.

**Daniel Holloway** (BSE ’74, MSE ’75) retired after 19 years with BASF Corporation and is now working with Miracle Hill Ministries as a volunteer.

**Timothy Nelson** (BSE ’74) retired from Chevron after 36 years in November 2010. He’s playing golf, traveling and enjoying the change of pace.

**Peter E. Parker** (PhD ’74) retired this spring after 14 years from the Paper Engineering, Chemical Engineering, and Imaging Department at Western Michigan University. He has had the pleasure of helping chaperone the chemical engineering program from its inception in 1998 to its current state of about 180 undergraduates (graduating about 30 ChEs a year). He received the College of Engineering and Applied Sciences’ Outstanding Educator Award in 2008 and a Distinguished Teaching Award in 2009. He says he owes his success to the mentoring he received from faculty at Michigan, especially from Bob Kadlec, Jim Wilkes, and Brice Carnahan. Retirement plans are in flux, but he does plan to do some traveling and would like to stay involved with the program as an emeritus professor at WMU.

**Robert Miller** (BSE ’76) is in his 32nd year with Syngenta, and predecessor companies. After 17 years at the World Trade Center Site for the agency.

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**E-NEWSLETTER MAILINGS**

We send our electronic newsletters twice a year. If you would like to receive our electronic newsletter, please make sure the University has a correct email address for you.

You can send your update to us at cheme@umich.edu, or update your own record at www.engin.umich.edu/alumni.
years in plant process engineering and another 14 years in process technology (R & D support for supply chain), he has recently moved to the formulations engineering team at the Greensboro, NC site—so everything is new once again. He’s currently working on seed care applications.

Frank Palazzolo (BSE ’80) is a former mayor of Harper Woods, MI. His daughter, Erika, graduated from U-M in 2005, and his daughter, Lauren, will receive her dental school degree in 2013.

Dennis Cima (BSE ’81, BS ’81 Chemistry) is process control business improvement network (PC BIN) team leader at Chevron. As such, he is responsible for leading a standing team that addresses new, developing, and on-going process control opportunities on a global basis by developing strategic plans, provides the basis for sharing information, identifies business improvement/alignment opportunities, and leverages resources and work products across Chevron’s refining system. Dennis currently serves as chairman of the NPRA Plant Automation and Decision Support (PADS) Committees and serves on the board of directors of the AspenTech Advanced Control and Optimization World User Group. He and his wife, Brooks, reside in Katy, Texas.

Philip Kalson (PhD ’81) is employed by the Israel Electric Corporation. He has been dealing with the chemical and environmental aspects of power station operation and design since 1987.

Alexander Pamphilis (BSE ’81) had his third child, a son, born on July 30, 2010.

After completing her degree, Joanne Reid (BSE ’81) went to medical school. Now, she is the medical director at a rural health clinic in Northern California. She never used her ChE education but it’s fun to mention at cocktail parties!


James Li Kiang (MSE ’82) has worked for several well-known multinational companies including Digital Equipment, Sun Microsystems, W. L. Gore and Associates. Currently, he is teaching in a Taiwan-based English Cram School, specializing in preparing students for TOEFL, GRE and GMAT standardized exams. James has been doing this part-time since 1986 and full-time since 2001. Every year, he teaches thousands of students who have the aspiration to study in the US. He is going to expand into China this year and is thinking about the possibility of a liaison between U-M and the local market in Taiwan.

Barry Oakes (BSE ’82) has worked for ConocoPhillips Co. for the last 29 years. Presently he is the manager of lease crude operations for the lower 48, a position he has held nearly five years. He’s responsible for buying and selling approximately 350,000 barrels per day.

Debra Keirce (BSE ’83) left engineering for a very rewarding career as a fine artist (www.DebKArt.com):

Bob Ranger (BSE ’83) has enjoyed serving on the ChE Alumni Board, supporting the department, and learning about all the outstanding things going on in it. He highly encourages others to look for ways to reconnect with Michigan ChE and ChE alums.

Kevin Sobnosky (BSE ’84) is the director of compliance for Partners Environmental Consulting, Inc., in Solon, OH. The company provides environmental, health and safety consulting and sustainable solutions to industrial clients.

Ed Steins (BSE ’84) is the CEO of a solar panel system engineering and construction company, The Solar Center, based in New Jersey. He and his wife, Carrie, live in Manhattan and are expecting twins in June, their 4th and 5th children!

Frances Lim Eizember (BSE ’85) received her MD in 1997 from Duke University, completed an emergency medicine residency at Carolinas Medical Center in Charlotte, NC, and has been practicing emergency medicine in Asheville, NC for over 10 years.

George Fouras (BSE ’85) was installed as president of the San Francisco Medical Society on January 27, 2011.

Jim Lee (PhD ’85) is the head of Chemical & Biomolecular Engineering at the National University of Singapore (NUS).

Steve Schwendeman (BSE ’86, PhD ’92 Pharmaceuticals) was appointed chair of the Department of Pharmaceutical Sciences at the University of Michigan in January 2011, when he was also named to the first Ara Paul Professorship in Pharmaceutical Sciences based on his outstanding work in exploring the use of mechanistic approaches to microencapsulate and control the release of biomacromolecular drugs and vaccine antigens from biodegradable polymers.

Ira D. Finkelstein (BSE ’87, JD ’98) is currently employed as senior patent counsel at Baxter Healthcare Corporation, Deerfield, IL.

Carl Shubitowski (BSE ’88) recently started a new job at Stryker Medical in Kalamazoo, MI in February 2011, and is looking forward to a new career in the medical industry.

Randy Stier (BSE ’88) has been working for the last three years at Valero Energy Corporation in San Antonio as the director of refinery heater best practices. Prior to arriving in San Antonio, he received an MSChE from IIT in Chicago and worked for UOP for 19 years. At the industry level, Randy serves as vice chairman of API’s Subcommittee on heat transfer equipment.

Ben Maxey (BSE ’91) and his family have returned from Ethiopia after successfully completing a six-month global fellowship with the Atlanta-based International Trachoma Initiative.

Brian Powers (BSE ’91) recently returned to the US from a 3-year assignment in Milan, Italy as a global marketing manager at Dow Chemical. Brian joined Dow after graduation, and has worked in a variety of technical and commercial roles. He is now working as an associate director of marketing for Dow Water & Process Solutions, located in Midland, Michigan. Brian has three elementary age children, and makes it back to Ann Arbor on most football Saturdays.

Gina Shreve (PhD ’91) has been on the chemical engineering faculty at Wayne State University for 15 years.

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Michael Pisarczyk (BSE ‘93) has worked for Dow Corning Corporation in Midland for almost two years. He works in Treasury as the manager of pensions and investments. Prior to Dow Corning, he was with Dow Chemical Co. for almost 11 years. At Dow Chemical, he was also in finance after completing an MBA from Carnegie Mellon in 1998.

Michael Schultz (BSE ‘93) recently took a position with Lanza Tech, outside of Chicago. His 2- and 4-year-old sons keep him happily busy in his free time.

Homer Sun (BSE ’93, JD ’96) leads the investing business in China for Morgan Stanley Private Equity Asia.

After graduating from Michigan, Victor Thomas (BSE ‘93) went to Wayne State for medical school and did his residency in ophthalmology in Pittsburgh. After residency, he moved to Orlando where he has been since. He has not been back to A2 since medical school.

Chris Hermanson (BSE ‘94) has been employed at Cobham Sensor Systems (formerly Remec Defense and Space) for the past 5-1/2 years as a lead mechanical engineer. Chris and his wife would like to relocate back east to be closer to their families; somewhere between Detroit and Florida.

Michelle (Zimmerman) D’Conto (BSE ‘94) and her husband, Chris, just welcomed their second child, Danielle. They also have a 4-year-old son, Lucas. After 15 years working in the Silicon Valley, Michelle now runs a successful small patent firm. She is studying to take the patent bar and would then work as a patent agent performing patent prosecution work with the US Patent and Trademark Office. Most of their clients are small to midsize technology companies so her engineering degree comes in handy!

Ryan Aguirre (BSE ‘95) has been married almost six years and has a 4-year-old son and a two-year-old daughter. He received his MBA in supply chain management from Arizona State University in 2001 and has been working in procurement at MillerCoors for the last five years in Golden, CO, managing packaging materials suppliers.

David A. Beuther (BSE ’95, MD ’99) is an assistant professor of medicine, and director of biomedical informatics at National Jewish Health. He is also pursuing a PhD in clinical sciences, health information technology track, at the University of Colorado in Denver. David is married, and has a 3-year-old son and 10-month-old daughter.

Kendrick Curry (PhD ‘95) is enjoying his job as a pastor at the Pennsylvania Ave Baptist Church in Washington, DC.

Christopher W. Jones (BSE ‘95) is a professor of chemical & biomolecular engineering at the Georgia Institute of Technology. At GT, he directs a research program focused on material design for applications in catalysis and carbon dioxide capture. In 2010, he was selected to be the founding editor-in-chief of ACS Catalysis, the newest journal published by the American Chemical Society.

Jeff Lievense (BSE ‘95) is senior vice president, process development & manufacturing, at Amyris, a renewable chemicals and fuels company. Thanks to U-M’s bio-option in chemical engineering, he has realized his undergraduate vision to develop solutions to global problems in energy, food, and pollution through the application of biochemistry and engineering.

Tanya (Manson) Sullivan (BSE ’96) and her husband, Tom, had a daughter, Amelia, in May 2010.

Anish Goel (BSE ‘97) is working for the federal government on South Asia foreign policy. He says it is a bit unconventional after engineering but it is constantly fascinating and fun.

Tom (BSE ’98) and Marianne (Hindelang) Warren (BSE ’99) live in Hinsdale, IL. Tom is still with INEOS and Marianne recently “retired” from BASF. They have three boys—born in 2008, 2009, and 2010—and a very active household!

N’Jeri (Jones) Laird (BSE ‘95) is married and the mother of four children. She is a community and ministry leader, and is board secretary and treasurer of Bradford Academy Schools.

Lisa Blount (BSE ’98) is currently working for the Georgia Department of Natural Resources, in the Environmental Protection Division.

Matthew Daily (BSE ’98) is completing his diagnostic radiology residency training at the Fletcher Allen Health Care/University of Vermont in Burlington, VT. He plans to pursue a subspecialty fellowship in either musculoskeletal radiology or interventional radiology. He worked for IBM as a process engineer in the semiconductor manufacturing industry for six years before deciding to attend medical school. He and his wife, Roni, have three boys, Hunter (6), Noah (4), Thatcher (2), and are expecting their 4th boy anytime. He says he is proud to be a ChE alum from U-M. Even though he did not stay in engineering, the education has served him very well in medicine.

Suzanne (Barber) Balko (BSE ’99) recently finished a Fulbright Research Scholar grant in France and, a few years before that had a Chateaubriand Fellowship, a fellowship offered by the French government for Americans to perform research in France.

Marcos Delgado (BSE ’99) and Sapphire Energy are working to turn algae into biofuel.

In September 2009, Andrew Rusiniak (BSE ‘99, MEng ’01) and his wife welcomed their son, Jonah Andrew, into the family. Jonah is now looking forward to his first football game at Michigan’s new stadium.

Neel Chokshi (BSE ‘00, MBA ’05, MD ’05) did a residency in internal medicine at New York University, after completing his graduate studies at Michigan (MD/MBA). He joined the faculty in Internal Medicine at NYU before recently returning to further specialize in cardiology.

Darren Golomb (BSE ‘00), a senior engineering associate with Novartis, has worked nearly 10 years in the biopharmaceutical industry. He also works at Anheuser Busch’s Fairfield brewery in weekend quality assurance.

Julie Champion (BSE ’01) and her husband, Kevin, have recently moved to Atlanta, GA where Julie is an assistant professor in the School of Chemical & Biomolecular Engineering at Georgia Tech.

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David Moler (BSE '02) and Rosabel Chang (BSE '01) got married in June 2007 and son, Miles, was born July 2010.

Laura (Shannon) Dellar (BSE '02, MEng '03) is a senior patent attorney working out of Los Angeles for Kohn & Associates of Farmington Hills, MI. She is married to Shlomo Dellar (PhD '08 Neuroscience), and spends her free time surfing in Southern California and traveling the world. In the last two years she has been to India, Israel, Italy, Australia, New Zealand, Chile, Argentina, Uruguay, and Peru.

Adam Wilson (BSE '02) completed his master's in pharmaceutical engineering at U-M in 2006, worked at Biopure in Boston, then at FDA's Detroit District office as an investigator. He moved to West Lafayette with his wife, Kelly, and started his own biotech/pharma job search website www.biopharmguy.com and is "living the dream" of taking care of his 1-year-old daughter, Linden (named after the street in Ann Arbor where he and his wife met).

Paul Albertus (BSE '03) completed his PhD in chemical engineering in 2009 at UC-Berkeley. He joined the Robert Bosch Research and Technology Center in Palo Alto, CA after graduation, where he continues to work on modeling and experiments on advanced batteries for transportation and grid-scale storage applications. He married a fellow Berkeley student in 2009, and has been happily enjoying his first few years of marriage. Paul's been acclimating to the California weather now for about six and a half years, but his brother and parents are still in Michigan, so he does get to hear about the lovely Michigan winters! He says he does miss working as a power plant engineer on water treatment and air quality control systems for two 677MW coal-fired supercritical boilers in Oak Creek, WI.

André Taylor (PhD '05) won a National Science Foundation (NSF) CAREER Award in 2010. He is an assistant professor of chemical engineering at Yale University. With his new grant, André will investigate ways to combine both top-down micro/nanofabrication techniques (the way integrated computer chips are built, using lithography) with bottom-up techniques (synthesis and layer-by-layer assembly) to create a new generation of micro fuel cells. This combined approach will allow him to build the fuel cells in a similar manner to other microelectronic devices, such as resistors and transistors, rather than having to build around them.

Karls (White) Faust (BSE '05) had a baby girl, Cameron (Cammy) Ann, on January 7, 2011.

K.C. Chemistek (BSE '05) and his wife, Andrea, celebrated the birth of their child, Anna Elizabeth, in May 2010.

Bruce Schiamberg (PhD '06) has been working as an independent consultant. His work focuses on evaluating new technologies in alternative energy and life sciences.

Kelene Soltész (BSE '06, MBA '10) recently became engaged to Marc Kaplan (BSEE '05, MSE BME '05, JD '10) and relocated to Chicago to take a position in pricing intelligence with Walgreens. Kelene says she enjoys hearing about what is going on in the department and appreciates the frequent communications.

Ashley Walton (BSE '06) is a working wife and mom and is enjoying the benefits of attending U–M! Go Blue!

George Cater (BSE '07, MSE '08) is a fourth year medical student at the Cleveland Clinic Lerner College of Medicine. He would like to thank Dr. Montgomery and the ChE faculty for their part in his undergraduate education.

After graduation, Katie Feldt (BSE '08) spent three years teaching high school math in a high poverty/minority school in southwest Denver through Teach for America. She decided she loves teaching, and learned a lot about working with people from different backgrounds, about problem solving in adverse situations, and about many of the issues facing children of poverty in this country today. Her work with the students—the vast majority of whom were Hispanic—has inspired her to spend the next six months abroad, perfecting her Spanish and teaching math as a volunteer in South America. When she returns in January 2012 she hopes to get back into the engineering field, ideally in the renewable energy sector.

Christina (Sadler) Conlin (BSE '09) says Dr. Montgomery and the entire ChE faculty prepared her well for handling the “real world.” She thanks them all for running a great program at the best University in the world!

Robert Damitz (BSE '09) will be attending graduate school in Fall 2011 to work on a doctoral degree in chemical engineering.

Anthony (Tony) J. Lachawiec Jr., (PhD '09) got married this summer to Claudia Torres Garibay, who was a post-doc in the Materials Science & Engineering Department at Michigan while Tony was working on his PhD. They will settle in Hillsboro, OR. He is still with Intel Corporation, working as a gas systems process engineer, and Claudia is an assistant professor at Oregon Institute of Technology in their renewable energy engineering program.

Sarah Ledford (BSE '09) finished her work for the State of Michigan’s Attorney General Office and is now using her engineering knowledge in the private sector at a private investment firm in Grand Rapids. She is also in elected leadership with the Michigan Republican Party as youth chair, statewide.

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