

ChE *news*

In This Issue

Recent Moves 3
Faculty Changes..... 4
Faculty Honors 6
Research Highlights.... 10
Alumni Profiles..... 16
Alumni News 19
Gifts 22



P10. Chameleon-style camouflage for vehicles?



P12. Graduate students and their hobbies.



P15. 1st woman to get ChE degree also pioneering scientist.



Paying It Forward

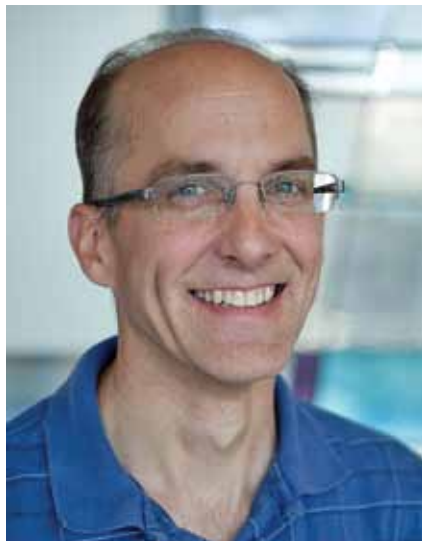
Our faculty make a tremendous effort to provide our students with a curriculum that has a sound basis in the fundamentals and prepares them for their careers. But YOU, our alumni, help us fulfill our mission in numerous ways. Whether it's participating in class panels, presenting lectures, providing job opportunities for our students, mentoring our seniors in process design, or helping in so many other ways, our program is enriched by the alumni who give of themselves to help the next generation of chemical engineers.

In our Material and Energy Balances class our students get to meet a handful of alumni every year in a career panel that represents the wide range of career options available to chemical engineers. More technical panels in other core courses allow our students to see applications of chemical engineering fundamentals in industrial settings. Junior Connie Jiang really appreciates the alumni insights. "It's hard to see how the material we learn in lecture applies to the 'real' working world. Having alumni come back to tell us what kind of jobs they do and how material we are learning in lectures applies to their

particular jobs gives me more motivation to absorb the information I am acquiring in my classes."

Scott Siegmund (BSE '79), Global Manager for Customer Plant Support at Air Products and Chemicals, Inc., has for the past few years presented a case study in our Process Economics class in which he walks the students through some real-world economic decision-making. "I feel that it's our responsibility to help train the next generation of engineers just as those who taught us took it as their responsibility to train us and, as an added

Note From the Chair



have moved to North Campus Research Complex (NCRC) leaving only six remaining in the Dow Building. However, we have also moved the ChE 360 lab from the G.G. Brown building to a suite in Dow adjoining the new Product Design lab. Both are across the hall from the undergraduate advising center. Very convenient!

The new faculty at NCRC join the six already there. The newest occupants are all housed in Building 28. This building was recently renovated, and ChE occupies one and a half floors of the four-story structure. Although there is a bit of a walk to classes, everyone is enjoying the improved facilities. I know that my research group is happy to finally have windows in their offices after students went without them for 24 years!

Finally I do want to mention two changes to our faculty roster. Although we were very happy for Phil Savage to have the opportunity to lead the ChE Department at Penn State, we are already missing his presence in the department. We know he will do an outstanding job there, and we wish him all the best. As for additions, Lonnie Shea (PhD '97) has returned to Michigan as chair of the Department of Biomedical Engineering. We are glad to have him as an affiliated faculty member and look forward to working with him.

I hope you have the opportunity to come back to campus. But if you don't, I hope this newsletter brings you just a little closer to life in the department.

As always, thanks for your support and Go Blue!

Welcome to our 2014 Newsletter! As you will see, there have been many activities in the department in both the undergraduate and graduate programs at Michigan.

The department has seen arguably its most dramatic change in the last several decades—an additional ten faculty

Our faculty and students continue to excel in all they do. Sharon Glotzer was elected into the National Academy of Sciences, and she and Nick Kotov won the 2014 MRS Medal. Levi Thompson was elected to the Board of Directors of AIChE, and Suljo Linic was awarded the ACS Catalysis Lectureship.

Introducing the 2014-2015 Chemical Engineering Alumni Board

Laurie Stevenson Altman, BSE '80
Patrick Gipson, BSE '97
Paul Horst, BSE '72, MBA '73
Christopher Jones, BSE '95 *
Deborah Mielewski, BSE '87,
MSE '93, PhD '98 *
Tahmid Mizan, PhD '96 *

Tony Orlando, Chair, BSE '87
Sharon (Tavery) Pfeuffer, BSE '84
Sid Sapakie, BSE '67
Scott Siegmund, BSE '79 *
Rosemarie D. Wesson, MSE '85,
PhD '88
William Wulfsohn, BSE '84

More information about the board members is at www.engin.umich.edu/che/about/board

* new members
(Only U-M degrees listed)

CHEMICAL ENGINEERING

University of Michigan
3074 H. H. Dow Building
2300 Hayward Street
Ann Arbor, MI 48109-2136
(734) 764-2383
cheme@umich.edu

www.engin.umich.edu/che

Department Chair

Mark A. Burns

Editor and Designer

Sandra G. Swisher

Contributing Writer

Kate McAlpine
College of Engineering

The University of Michigan, as an equal opportunity/affirmative action employer, complies with all applicable federal and state laws regarding nondiscrimination and affirmative action. The University of Michigan is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, national origin, age, marital status, sex, sexual orientation, gender identity, gender expression, disability, religion, height, weight, or veteran status in employment, educational programs and activities, and admissions. Inquiries or complaints may be addressed to the Senior Director for Institutional Equity, and Title IX/Section 504/ADA Coordinator, Office of Institutional Equity, 2072 Administrative Services Building, Ann Arbor, Michigan 48109-1432, 734-763-0235, TTY 734-647-1388. For other University of Michigan information call 734-764-1817.

Regents of the University of Michigan: Mark J. Bernstein, Julia Donovan Darlow, Laurence B. Deitch, Shauna Ryder Diggs, Denise Ilitch, Andrea Fischer Newman, Andrew C. Richner, Katherine E. White, Mark S. Schlissel *ex officio*.

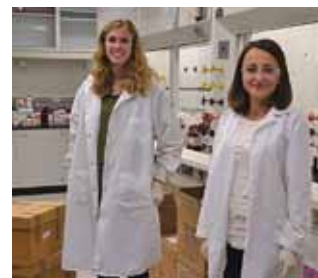
© 2014 Regents of the University of Michigan

More Moves to NCRC This Summer



In August, ten more faculty members and their research labs moved out to recently renovated space in the North Campus Research Complex or NCRC (formerly the Pfizer Building). We now have about three quarters of the department in NCRC. The offices and labs of Mark Burns, Lola Eniola-Adefeso, Erdogan Gulari, Nina Lin, Jennifer Linderman, Suljo Linic, Tim Scott, Greg Thurber, Fei Wen, and Bob Ziff are now located in NCRC. Three staff members, Susan Hamlin, Connie Bacus, and Barbara Perry also have new offices in the building.

The space we have moved into is in Building 28, one of the chemistry-intensive buildings on the campus. There are four floors with labs, offices, and common areas scattered throughout each floor. Of particular interest to the more experimental groups is the abundance of fumehoods—many labs have 8 or more hoods compared to the one or two in labs back in G.G. Brown or H.H. Dow. The building also connects to the rest of the NCRC campus so that students and faculty can go to other buildings, the cafeteria, or the gym without going outside, a convenience that will become very useful in the winter.



The top image is the entrance to NCRC Buildings. Clockwise starting from the top left: Tim Scott in his lab; Katawat Namdee and Ted Zaroff III in Lola Eniola-Adefeso's lab; Scott Zavada in Tim Scott's lab; Saadet Albayrak Guralp and an undergraduate student in Erdogan Gulari's lab.

Labs Move into the Dow Building

Renovations in the G.G. Brown Building, as much of the building goes back to use by the Department of Mechanical Engineering, resulted in the ChE 360 lab returning to Dow this summer after many years. The larger space is much appreciated by students and instructors. The ChE senior lab, ChE 460, remains at the east end of G.G. Brown

Our product design course moved to new facilities in the Dow Building last winter. The new lab enables students to produce products in accordance with FDA's Good Manufacturing Practices (GMP) guidelines for the first time. The product design course is offered as senior design alternative to up to 20 creative seniors who are interested in learning how to identify new products to meet existing needs or improve upon existing products. The class covers all aspects of developing a new product from identifying a need to making a prototype product.

Along the way they learn how to do market surveys, to develop the financial and business plans for the product, to finance a new idea, to do a complete life cycle analysis of the product, to develop the technology to make the product, as well as how to design a process to make the product commercially, with the same rigor as the regular process design course, and how to build intellectual property protection. Finally, the students make prototypes of the product for the design expo at the end of the term. The students are also coached on how to prepare oral and written reports; making at least four oral reports and four written reports. Discussion of ethics and product safety are the other components of this demanding two-term course. Students report that they enjoy the challenge and response from alumni about the course has been very positive.

Phil Savage Departs for Penn State Post



Professor Phillip Savage retired from the department this summer after 28 years at Michigan. While we were sorry to see him retire, we are excited for him as he joined the faculty at Penn State, his alma mater, as the Walter L. Robb Family Department Head of Chemical Engineering in August.

In 1986, then ChE chair Scott Fogler was responsible for bringing Phil to Michigan. After recently completing his doctoral degree at University of Delaware, Phil was ready to take a job in industry when he received a call from Scott. He persuaded Phil to come to Ann Arbor to talk about a position at Michigan and soon after was able to convince Phil that he should pursue an academic career and that the University of Michigan was the place for him.

Phil, an Arthur F. Thurnau Professor, has taken on many roles in the department through the years in addition to teaching and research. He served as the AIChE advisor, was a member of the Undergraduate Program Committee for many years, served as the graduate program advisor for five years, and most recently was interim chair of the department. Phil also oversaw a department review and led a strategic planning effort during his time here.

Through the years, Phil has been a sounding board for department chairs and other

faculty. Ralph Yang, chair from 1995-2000, remarks that, "I sought advice from him often when I was chair. He provided me with many insightful suggestions about improving the department and I will always be grateful." Scott Fogler says "Phil was uncanny in the way he would bring clarity and vision to many unfocused discussions in faculty meetings concerning key issues and the mission of our department. He was not only a mentor to his students but also to his fellow faculty members."

Phil's early research was in reactions in supercritical fluids but through the years he moved into the area of green chemical reactions and green energy harvesting. His work has provided advances toward reducing the environmental impact of chemical manufacturing and toward the production of renewable transportation fuels from algal biomass. Ron Larson, who was chair from 2000-2008, says, "Phil quickly built a top-flight research program in biofuels." In 2009, he received a Michigan Green Chemistry Governor's Award.

He taught at least a portion of every undergraduate course with the exception of Process Dynamics and Control and Fluid Mechanics. Ron says, "I very much appreciated Phil's attitude towards departmental teaching and other duties. When asked about what course he was willing to teach, Phil would reply that while he had prefer-

ences, he would teach any course to which he was assigned. His teaching is predictably excellent; he always does a great job, earning the high honor of being named a Thurnau Professor."

Most recently, he had been teaching primarily graduate courses. Stacy Ramacharan, a third-year PhD student who took the graduate reactor engineering course with him in 2013, says, "He was an excellent teacher, giving thorough explanations and going through his thought processes out loud so that students could follow his logic. It was clear that the students were his priority." She adds, "It is unusual to find professors like Phil, who are also mentors and excellent teachers." Molly Kozminsky, another third-year PhD student in the class, remembers that Phil was able to engage the whole class regardless of students' backgrounds with the material. "He clearly enjoyed interacting with us; teaching was not a rote activity for him," she says.

As an advisor to students in his research group, Phil has mentored nearly 30 PhD students through the years, not to mention countless undergraduate students who worked in his lab. Not only did Phil guide his students through their doctoral studies, he also provided them with many examples of how to conduct themselves when they began their careers. "As a member of Phil's group, I always felt supported yet free to explore. This environment enabled his students to be very productive," Jennifer Dunn (PhD '04), Energy Systems and Sustainability Analyst at Argonne National Laboratory, says. "He is still a role model for me a decade after I left his lab."

Jake Dickinson (PhD '14), recent graduate and Principal Investigator at Dupont, voices a similar assessment of Phil's style, "He had an adept sense of when to leave students alone to think, experiment, and be creative, yet he also knew when to provide guidance and direction. Without Phil as my advisor, my graduate school experience would have been longer, more frustrating, and less productive."

Alumni of his group also appreciated how he helped them improve their cognitive skills. “Phil taught us to not only bring questions but to also bring answers. You always needed to be ready for a ‘well what do you think?’ question,” recalls Shawn Hunter (PhD '05), Sustainability and New Business Development Leader at Dow Chemical and Adjunct Professor in the department. “This expectation pushed us to think critically and independently. He was able to teach us important skills that will continue to pay dividends throughout our careers.”

Phil managed to make graduate school a little less stressful for his students because of this ready availability to his students. Peter Valdez (PhD '13), Chemical Engineer at Algae Biosystems, LLC, recalls, “If I had a question or needed assistance, I would check to see if his door was open, and it usually was. Even my late-night email questions received prompt responses from him.” Shujauddin Changhi (PhD '12), Research Engineer at Eli Lilly, appreciated that Phil not only made it possible for his students to enjoy the day-to-day work in the lab but that he also encouraged them to participate in extracurricular activities to balance their intense work schedules.

The University recognized Phil several times for his dedication to his students at all levels. He was named an Arthur F. Thurnau Professor in 1997, for his “outstanding contributions to undergraduate education,” and nearly a decade later he was an inaugural recipient of Rackham Graduate School’s Distinguished Graduate Mentor Award.

We wish Phil well as he and his wife, Elaine, move back to their home state and the university where they met. He won’t be severing all ties with the University though. In addition to advising his current group members until they complete their PhDs, the Michigan Regents recently named him Arthur F. Thurnau Professor Emeritus and Professor Emeritus of Chemical Engineering.

If you would like to send a message to Phil as he starts this new phase in his life, you can still reach him at psavage@umich.edu.

Shea Returns to Michigan



Lonnie D. Shea (PhD '97) joined the Department of Biomedical Engineering this fall as a professor and chair, and he will also have a joint appointment in Chemical Engineering. He received his PhD in chemical engineering and scientific computing from U-M in 1997, working with Professor Jennifer Linderman. He then served as a postdoctoral fellow with then ChE Professor David Mooney in the Department of Biologic and Materials Science at the U-M Dental School.

Shea had been on the faculty of Northwestern University’s Department of Chemical and Biological Engineering since 1999. He is an internationally recognized researcher at the interface of regenerative medicine, drug and gene delivery, and immune tolerance, whose focus is controlling the local microenvironment for directing tissue growth or regeneration. His projects include ovarian follicle maturation for treating infertility, islet transplantation for diabetes therapies, nerve regeneration for treating paralysis, autoimmune diseases and allogeneic cell transplantation, and cancer diagnostics. He is also developing and applying systems biology approaches to molecularly dissect tissue formation and identify key drivers of normal and abnormal growth.

Shea has published more than 150 manuscripts, and has numerous inventions to his credit, among them a cellular assay with which he can measure the activity of numerous transcription factors within the cell that reveal key signaling pathways as cells differentiate. He served as director of Northwestern’s NIH Biotechnology Training Grant and was a member of its Institute for BioNanotechnology in Medicine. He is a fellow of the American Institute of Medical and Biological

Engineering (AIMBE), a standing member of the Biomaterials and Biointerfaces study section at NIH, and a member of the editorial boards for *Molecular Therapy*, *Biotechnology and Bioengineering*, and *Drug Delivery and Translational Research*.

He has many great memories of his days in graduate school and is looking forward to once again interacting with Michigan faculty, whom he has known for years, as he learns his new job. The value Michigan places on research innovation and the multidisciplinary collaborative research opportunities offered by the medical school and engineering departments were instrumental to his decision to return to Michigan.

Shea would like to increase the number of joint research projects between the engineering and medical school faculty, to find additional ways to apply engineering technology to help doctors treat disease and solve problems they encounter on a regular basis as they care for patients. He realizes that it can take a while to shape successful collaborations—as the engineers learn about the biology of diseases and as doctors work with engineers to develop technologies that can enhance patient care.

He also plans to foster more cross-disciplinary interactions between the biomedical, chemical, and medical school researchers at the North Campus Research Complex, NCRC, building on existing multidisciplinary efforts like the BioInterfaces Institute that Joerg Lahann and other ChE professors have helped establish.

Lonnie and his wife, Jacqueline Jeruss, who accepted a position at Michigan also this fall as an Associate Professor of Surgery, look forward to living in a smaller town after living in the Chicago area. They are impressed already with the excellent educational opportunities their young daughters will have in Ann Arbor. His daughters, however, negotiated for rollerblades before agreeing to leave Chicago. Buying the skates for his daughters has been an excellent investment for meeting their neighbors.

Thanks to Brandon Baier from BME for content.

Department Honors

FACULTY



Mark Barteau and **Sharon Glotzer** were elected fellows of the American Association for the Advancement of Science (AAAS).



They are among the 388 AAAS members to receive this honor. Barteau was honored for groundbreaking contributions to metal oxides and transition metal catalysis, which led to the development of fundamental understanding and design of novel, improved catalysts. Sharon Glotzer was honored for her groundbreaking simulations of the self-assembly of nanoparticles into complex structures and theoretical contributions to patchy particles, colloidal crystals, quasicrystals and glass forming liquids.



Mark Burns and **Ralph Yang** were named

National Academy of Inventors fellows. They are among 143 Fellows from 96 universities and research institutions. Burns is honored for inventing, advancing, and licensing inexpensive, life-saving, lab-on-a-chip microfluidic technology for diagnosing infectious diseases. Yang is honored for his advances in novel materi-

als and processes for separations and energy and environmental applications. He holds 33 US patents.



Scott Fogler was selected to receive the 2014 ChE Departmental Faculty Award. Fogler was singled out for the award because in 2013 his lab made important advances related to asphaltene precipitation in crude oils, he published the 3rd edition of his book, "Strategies for Creative Problem Solving," he did an outstanding job with undergraduate classroom teaching, and he was named an Associate Editor of the journal *Energy & Fuels*.

Sharon Glotzer and **Nick Kotov** have been named co-recipients of the 2014 MRS Medal for their "foundational work elucidating processes of nanoparticle self-assembly." The MRS Medal is awarded annually by the Materials Research Society® (MRS) for an outstanding recent discovery or advancement that has had a major impact on the progress of a materials-related field. The award will be presented at the 2014 MRS Fall Meeting.



The Materials Research Society® (MRS) named **Nick Kotov** one of their 2014 MRS Fellows.

Nick was honored at the MRS Spring Meeting in April. Kotov was also selected as a Thomson Reuters Highly Cited Researcher in both the chemical engineering and materials science categories.



Nina Lin was promoted to Associate Professor of Chemical Engineering, with tenure.



Suljo Linic has been awarded the American Chemical Society (ACS) Catalysis Lectureship for 2014. This national award is sponsored by the ACS Division of Catalysis Science & Technology and the ACS Publications journal ACS Catalysis. A symposium in Suljo's honor was held at the 2014 National ACS Meeting .

Linic was also promoted to Professor of Chemical Engineering this year.



Phillip Savage was the winner of the 2014 Michigan Catalysis Society Parravano Award for Excellence in Catalysis Research and Development. He gave an Award

Keynote Lecture at the 35th Annual Michigan Catalysis Society Spring Symposium.

This summer the AIChE Forum for Sustainable Engineering selected Savage to receive the 2014 Research Excellence Award in Sustainable Engineering.

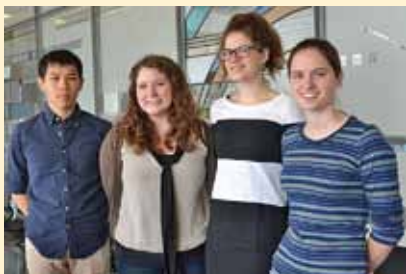


The American Institute of Chemical Engineers (AIChE) elected **Levi Thompson**, to the 2014 AIChE Board of Directors, where he will serve a three-year term.



Fei Wen has been named the Dow Corning Assistant Professor of Chemical Engineering.

STUDENTS



This year, four of our graduate students received National Science Foundation Fellowships (in the photo from l/r): **Howie Chu** from Charles Monroe's group; **Megan Dunn** from Tim Scott's group; **Molly Kozminsky** from Sunitha Nagrath's group; and **Sydney Laramie** from Levi Thompson's group. Only 69 fellowships in chemical engineering were awarded nationally. Congratulations also to **Sarah Peleg** from Levi Thompson's group, who received an honorable mention.

Megan Dunn was also awarded a Ford Foundation Fellowship, along with **Corine Jackman**. Jackman is a doctoral candidate in Nina Lin's research group.

Senior **Aaron Priluck** was selected to receive both a 2014 Astronaut and a Goldwater Scholarship. The former was created to honor the Mercury 7 astronauts, and the latter to honor the late Senator Barry Goldwater. The scholarships were created to promote future U.S. scientists in all STEM fields.



ChE undergraduate students, **Leo Devota**, **David Marsh**, and biomedical student **Spencer Paris** won the 2014 BP Ultimate Field Trip competition. Team RECon proposed a system for capturing, purifying and using associated petroleum gases that are currently lost through flaring at some well sites.

New National Academy of Sciences Member



Continuing the long tradition of academic excellence in the department, we are pleased to announce that Sharon C. Glotzer, the Stuart W. Churchill Professor of Chemical Engineering, is among the most recent inductees to the National Academy of Sciences.

A University of Michigan faculty member since 2001, Sharon C. Glotzer is an internationally recognized scientist, with over 200 publications and nearly 300 invited, keynote, and plenary talks on five continents. Glotzer is the Stuart W. Churchill Collegiate Professor of Chemical Engineering and is also a professor of

Materials Science and Engineering, Physics, Applied Physics, and Macromolecular Science and Engineering and is a core faculty member in the Biointerfaces Institute.

She serves on many editorial and advisory boards, and has provided leadership and input on roadmapping for federal granting agencies on many research topics, including simulation-based engineering and science, and the Materials Genome Initiative. Her computational research on assembly science and engineering concentrates on predictive materials design of colloidal and soft matter, with current emphasis on shape, packing, and assembly pathways.

Glotzer presented the 2013 Danckwerts Lecture, was the recipient of the Charles M.A. Stine Award in Materials Science and Engineering of the American Institute of Chemical Engineers, is a Fellow of the American Physical Society and a Fellow of the American Association for the Advancement of Science. She was elected member of the American Academy of Arts and Sciences in 2011. She also holds a National Security Science and Engineering Faculty Fellowship from the Department of Defense, and is a Simons Investigator.

Linderman Appointed Associate Dean



Jennifer Linderman became the Associate Dean of Graduate Education in the College of Engineering on August 1. In her new position, she works with departments on recruiting, climate and opportunities for graduate students. Linderman also serves as an Associate Director of the university's ADVANCE Program, and previously served as the chair of the ChE Undergraduate Program Committee.

Linderman, a faculty member since 1987, is a Fellow of the American Institute for Medical and Biological Engineering. Recent work with her graduate students has focused on developing computational models to understand the immune response during infection with Mycobacterium tuberculosis, migration of cancer cells, and cellular signal transduction pathways.

Thank you alumni

CONTINUED FROM PAGE 1



Samih Zaman, Alexis (Clark) Eromosele, and Rob Dieterle from General Mills.

benefit, I really enjoy the interface with the students," says Scott. (See profile about Scott on page 16.)

The AIChE student group has also benefited from Scott's generosity, as he has performed countless liquid nitrogen demonstrations for them over the years, using the experiments to emphasize safety and

I was proud to be able to give back to my university in a personal way, helping the students to transition from engineering students to engineering professionals.

Christine Curran (BSE '10)

separations issues. Lindsey Weisler, AIChE president, comments on their industrial speakers, "They give our members great insight into the industry and the type of work they could be doing. Through these speakers, I know I have been able to better tailor internship/job searches to my interests and I also have taken their valuable advice and applied it to my internships. As president, I am extremely grateful for the alumni support, which has made all the

events AIChE organizes possible. When I was scheduling companies this summer, it was great to see how large an alumni base we have and how enthusiastic and willing they are to help."

One of those alumni is Rob Dieterle (BSE '97), above, Technology Manager of Snacks R&D at General Mills, who along with a large team of U-M ChE alumni, devotes much time to developing creative experiences, such as brainstorming sessions, to expose students to some of the product development activities at General Mills. "Campus recruiting gives me the opportunity to stay connected with the students and faculty in the department," he writes. "I love sharing with students the career opportunities General Mills provides and the value we place in developing our people."

Some of our alumni devote themselves to teams of our students for a whole semester, serving as industrial mentors in our senior process design course. Christine Curran (BSE '10), Flow Assurance Lead at ExxonMobil, explains why she takes the time to mentor design teams: "I have always learned best by teaching others. The immense amount of mentoring and knowledge transfer I have received while working at ExxonMobil was vital to my development as an early career professional. It was great to be able to pay it forward

and share my new industry knowledge with current U-M students in the context of the senior design projects. By answering the students questions, it helped to fill gaps and strengthen my own knowledge of process design. In turn, I was proud to be able to give back to my university in a personal way, helping the students to transition from engineering students to engineering professionals."

"Our alumni mentors are invaluable to the design process. They bring experiences and industry insights that the instructors don't have personal access to," says Dr. Andrew Tadd, one of the senior design instructors, "and the mentors tell me they love working with our students, who have tremendous energy ready to be channeled. It's an opportunity to give back, but also keep in touch with the younger generation of engineers who will be coming to their companies shortly."

Our alumni's breadth of experience also benefits our students through our career counseling sessions. Originated by our Alumni Board, these sessions give our students one on one time with alumni who spend the day on campus answering any questions the students might have. One student who takes advantage of these sessions regularly is Edward Khodaei, a ChE senior. He explains "I talked to alumni representing a variety of employers, who have chosen diverse career paths, from R&D all the way to consulting. They helped me recognize my own goals so I will be able to make wiser career choices. I really appreciate the networking opportunities." So eager are our alumni to counsel our students that even those who couldn't come to town wanted to make themselves available via email to our students. Our list of such alumni has grown to over 120, much to the delight of our students, who appreciate having such a strong network to seek advice from.

Many alumni are involved behind the scenes as well. In addition to our Alumni Board, other alumni approach us to give us suggestions on how to improve our curriculum. Jim Cross (BSE '78), recently

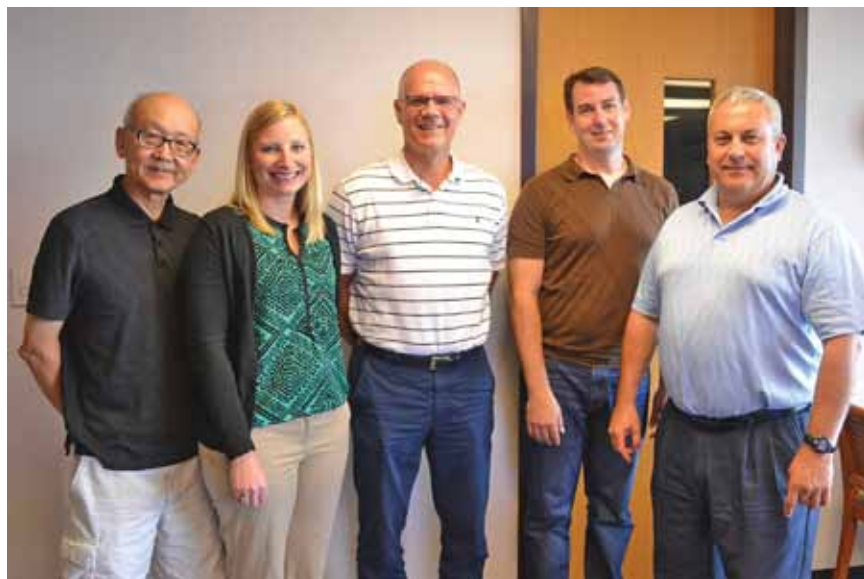
retired from his role as Global Process Safety Director Dow Corning, has organized numerous visits over the years with colleagues Jeff Fox, Corporate Safety Business Partner, and Stephanie Snoblen (BSE '09), Senior Process Engineer at Hemlock Semiconductor to discuss how to better incorporate safety into our curriculum. They have also delivered sessions on safety and other topics in our senior design course. Their real world perspective drives their points home in an impactful manner.

Professor Henry Wang is particularly appreciative of the significant role alumni played in the development of the interdisciplinary Pharmaceutical Engineering program since 2000. "Many of them have become frequent speakers in our courses and act as mentors for our students in their summer internships or co-op programs," he adds. "As the industry is evolving to become more prevention oriented, patient centered and cost conscious, the role of engineering has become increasingly more important. Currently, we have been discussing how to evolve this into a more health engineering and regulatory science focused program."

Many of our alumni forward us announcements regarding internship or permanent opportunities within their companies to pass on to students. Although BASF did

not officially recruit at Michigan at the time, Joel Young (BSE '97), Manager, Specialty Production and Experimental Safety, created a position at their plant in Wyandotte Michigan and selected student Chris Rausch for it. Chris did such a great job that he was offered a permanent position. Chris and Joel led an effort to get Michigan back on BASF's recruiting list, participating in class panels, presenting to our student groups, organizing social events, developing workshops, encouraging students to participate in BASF's Chemistry Challenge, hosting football tailgates, all to get students excited about BASF. Their efforts sure paid off for our students—Michigan was the top school out of 309 BASF interns this summer! One of the interns, Ashley Kiemen, speaks of the mentoring she received from Chris this summer: "... he was able to tell me what employers assume about Michigan students, and he helped me refocus my resume to emphasize the experiences that will make me a more rounded engineer... I appreciate the opportunities that have been presented to me based on the network of ChE graduates I've met at Michigan."

Such a team effort is but one example of how U-M ChE alumni go out of their way to improve our curriculum and develop opportunities for our students. We are humbled by your enthusiasm and thank you for your efforts. You are truly the Leaders and Best.



Henry Wang, Stephanie Snoblen, Jim Cross, Andy Tadd, and Jeff Fox meet before the term begins to discuss safety issues in the curriculum.

ChE Graduate Symposium 2014

The Third Annual Chemical Engineering Graduate Symposium was held on May 7, 2014 at Rackham Auditorium and the Michigan League. The department showcased its current research and innovations to the nearly 100 attendees, including graduate students, visiting scholars, faculty, staff, and industry representatives.

The event included a keynote presentation by Dr. Shawn Hunter (BSE '00, MSE '03, MSE ConEnSus '03, PhD '05) titled "In pursuit of a flourishing, single-planet society: tales from a young career in the chemical industry," oral presentations by graduate students, a poster session, and dinner. Awards were presented to the outstanding presenters and posters. Youngri Kim (Solomon lab) won the top award with her talk on "Photo-induced assembly of colloidal crystals," and the top poster award went to Abdoulaye Dijre (Thompson lab) for his poster titled "Investigation of Charge-Storage Mechanisms of Nanostructured Carbides and Nitrides as Materials for Energy Storage."

Additional department awards were presented to graduate students for outstanding work in service, teaching, and research. The students were nominated by their peers or advisors for the service awards; by undergraduate students for the teaching award; and by their advisors for the research award. A faculty committee selected the winners.

The symposium was organized by graduate student Allison Franck. Dow Chemical, Dow Corning, Air Products, Praxair, and Phillips66 provided sponsorship for the event. DuPont, RVCF, BASF, 3M, ChemTrend, P&G, and Ford gave additional support.

If your company would like to support next year's symposium or you would like to attend the event, please contact Susan Hamlin at hamlins@umich.edu or 734-763-1148.

Chameleon Crystals Could Enable Active Camouflage

By Kate McAlpine, Marketing & Communications, College of Engineering

The ability to control crystals with light and chemistry could lead to chameleon-style color-changing camouflage for vehicle bodies and other surfaces.

Mike Solomon's group discovered a template-free method for growing shaped crystals that allows for changeable structures that could appear as different colors and patterns. One source of color in crystal structures is the spacing between the particles that make up the crystal. The spacing can determine which colors of light the crystal absorbs and which it reflects, resulting in the visible color. By changing the spacing and other aspects of the crystal structure, it is possible to change the color.



The researchers have found a way to control a crystal on the fly as it forms in a solution of latex paint microparticles, around 0.001 millimeters in diameter, in a kerosene-like fluid.

"We can shine the light in a certain region, and the particles create a crystalline region where they all come together and create this crystal structure," said Youngri Kim, the doctoral student who led the study. When the light was turned off, the crystal dissolved back into the solution.

By shining shaped ultraviolet light into the fluid, Kim was able to make the microparticles arrange into the Michigan Block M. Ordinarily, to get a shape like a Block M, the crystal would have to be built on top of a template. A template can make crystals of one shape only, but the new method can produce crystals in any shape that light can assume.

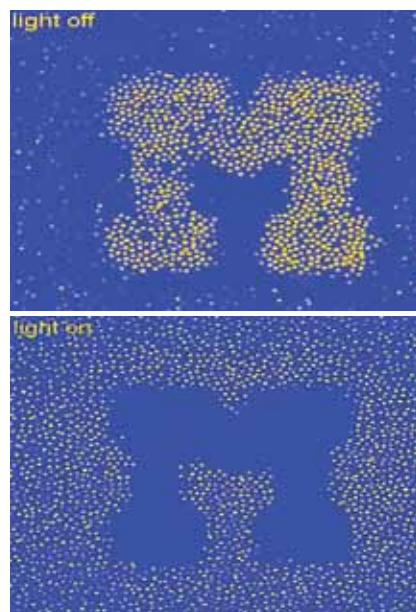
The team found that the key to this flexible crystal formation is a light-induced chemical reaction. It occurs between the layer of indium tin oxide at the bottom of the tiny pool of solution and the kerosene-like fluid. The reaction generates a current of ions in

the fluid. If the microparticles are negatively charged, they are attracted to the illuminated area of indium tin oxide. There, they arrange into a crystal structure that mirrors the shape of the spot, and their spacing depends on the wavelength of the light. If the particles are positively charged, they flow away from the illuminated area, creating a void in the shape of the light. "We have understood why this happens in a way that is not specific to this one system," said Solomon. "Anyone who wants to work on these materials now can use light to manipulate them without a template."

Solomon and Kim would most like to see a thin film system in which the crystals can be modified on demand, changing the color and pattern of an object for the ultimate camouflage. Such a system could also lead to new ways to update images on e-readers and large displays such as billboards.

Aayush Shah, a former doctoral candidate in Solomon's lab and now at Dow Chemical, saw the first hints of this phenomenon when he was assembling crystals using electric fields. He noticed that sometimes the particles seemed drawn to the laser spots. When Shah convinced Solomon that he was seeing a real effect, Solomon asked Kim, a new group member at the time, if she would take on the project. The morning that Kim told Solomon her hypothesis – about two years later – she proposed that she could probably arrange the particles into the Michigan Block M with the scanning UV light.

"I thought 'That's cool, we should try that.' I was just talking into the air I think. Then I came into the lab at 4 o'clock that afternoon and she'd already done it," said Solomon. "There's no way that would have worked if she didn't understand the mechanism."



Light was used as a template to make particles form a crystal in the shape of a Block M when positively charged, and used to form a void in the same shape with a negative charge (above).

"I've never been involved in something that definitive in all my years of doing science and engineering."

Now that the group has revealed the way to create crystals using light alone as the template, the team hopes that other researchers will apply the technique in their fields. In addition to color-adjustable coatings, they imagine sensors that change color depending on the composition of the fluid around it, detecting molecules that are important for medical or environmental monitoring.

With conductive particles, the technique may also enable the development of reconfigurable electrical circuits.

This work was published in the April 23 issue of *Nature Communications*, in an article titled "Spatially and temporally reconfigurable assembly of colloidal crystals."



Shape-shifting Clusters Move Beyond 'Hardware'

By Kate McAlpine
Marketing & Communications
College of Engineering

A Rubik's Cube-like arrangement of nanoparticles could lead to a form of wet information storage, Sharon Glotzer's group and collaborators at New York University have shown.

Getting away from hard and electronic silicon computing could lead to machines that work more naturally with biological systems, opening new pathways for medicine, robotics and bio-engineering. The research team simulated how a solution of nanoparticle clusters in a liquid could work as computer information storage and made the simplest, one-bit cluster from plastic particles. "We came up with an idea to use stuff that's in principle easy and cheap to make, that could be made by the bucket full, and that would let us read and write information," said Sharon Glotzer.

A conventional computer bit has two information storage states – 0 and 1. In the researchers' new scheme, unique configurations of particles stand for different states. A memory cluster of four particles connected to a central sphere can have two states like a conventional bit. But a 12-particle cluster, for example, could have nearly 8 million unique states, representing 2.86 bytes of data or 22.9 conventional bits.

The simulation group, led by Glotzer, showed that a tablespoon of a solution containing 12-nanoparticle clusters could store a terabyte of data, at a concentration of just 3 percent, compared with a smartphone-size external hard drive it takes to store that much data electronically. The

idea for using particle clusters to store data arose from simulations of the particles performed by Carolyn Phillips and Eric Jankowski, formerly students in Glotzer's lab but now post doctoral researchers at Argonne National Laboratory and the National Renewable Energy Lab, respectively.

This computer simulation shows a particle cluster "bit" changing from one state to another. Clusters like this may serve as high-density information storage for a computing system that works more naturally with biological systems. "These clusters reminded me of Rubik's Cubes and how you can solve them from one pattern to another. You can use the same mathematics that describes a Rubik's Cube to show that every rearrangement of the cluster's spheres is possible and reachable," said Phillips.

In the team's scheme, nanoparticles are attached to a central sphere. If the sphere is small, the outer particles trap one another in place, and the data is stored. If the sphere is just large enough, the particles can be reconfigured in a controlled way to store different information, using patterns of movement similar to those on a Rubik's Cube.

The experiment, led by David Pine, a professor of physics at New York University and Stefano Sacanna, a professor of chemistry at NYU, achieved the simplest scenario for the clusters—four particles on a central sphere, all made of polymers. Kazem Edmond, a postdoctoral researcher in Pine's group, made an unlocked cluster

and observed the particles shifting between the two unique states, following the path predicted by Glotzer's team. Color-coding the particles with fluorescent molecules to make the two states instantly distinguishable is the group's next goal.

The team stresses that this is but a first step toward a new kind of computing. "We need to look at ways of reading and writing information to these clusters reproducibly," said Jankowski.

The clusters could potentially be used to detect pollutants in water, among other applications. While Glotzer notes that the most interesting uses are distant, they could be revolutionary. Wet computing techniques may allow medical information processing to occur inside the body. For instance, she proposes immunity enhancers that could recognize threats and attack them or mobilize the body's own immune system. Likewise, the memory clusters could enable sensing and control in "soft robotics," a branch of robotics that dispenses with the traditional metal, hinges and electronics in favor of more flexible and water-friendly materials.

More immediately, Glotzer says that the clusters could serve as a barcode of sorts for liquid materials, making it easier to track controlled substances such as fuels, explosives and precursor chemicals for illegal drugs. "If you take a droplet out and read its state, you immediately know where the material came from," said Glotzer.

A paper describing this work, titled "Digital Colloids: Reconfigurable Clusters as High Information Density Elements" is published in the journal *Soft Matter*. The research was supported by the U.S. Army Research Office, the U.S. Department of Energy, the National Science Foundation, Argonne National Laboratory and the Simons Foundation.

Grad Students Find Diverse Pastimes



Tao Wei surrounded by her orchids.

Life for a graduate student is often full of stress. They move from the structure of undergraduate school where they are under pressure to do well on exams and projects but the guidelines are fairly clear and bright students know if they apply themselves to their studies they will usually succeed. The rules change when they enter graduate school and the more open-ended world of research. Those who succeed often do so by balancing their intensive research schedules with outside activities to unwind and keep their research in perspective.

For Liang Zhang and Tao Wei, growing orchids has become a relaxing hobby. Liang started getting interested in orchids in high school when his mother bought orchids at local grocery stores. When he was looking for something to decorate his college apartment, he took some of his mother's plants. He added more to the collection during his undergraduate days, and by the time he

came to Michigan in 2013, he moved 10-15 orchids with him—all were hybrids or cross species as are most of the orchids available in stores.

When Liang started dating Tao, she, too, developed an interest in orchids. She suggested that they start growing pure orchid species in addition to the hybrids. So they started buying orchids, mainly on e-Bay. Today they have around 100 different species. They have created a variety of different grow areas, such as an aquarium tilted vertically, where they can control the environment. They have LED lights on timers, a constant humidity source, a heater, a fan, and sensors to monitor temperature and humidity—reminiscent of a chemical engineering system.

Liang says he enjoys the challenge of growing orchids. "Some plants grow and others do not," he says. He credits his hobby for teaching him about dedication and patience. Tao is more the true hobbyist and enjoys the beauty, the aroma (of most), and the boundless varieties of orchids.

Julia Faeth enjoys salsa dancing, a popular form of social dance that has strong influences from Latin America, particularly Cuba

and Puerto Rico. She spends about four hours a week during the school year dancing with the M-Salsa Club on campus, where they dance the Cuban-style of salsa called Rueda de Casino. In Rueda, couples dance in a circle. A leader in the circle will spontaneously call out moves to the other dancers, including spins, dips, and changing partners.

She first became interested in salsa and ballroom dancing when she was an undergraduate student in Dayton, Ohio. For Julia, dancing has become an escape from the analytical thinking she must practice in the lab. "I can put my mind on automatic pilot and I don't have to analyze anything or worry about the details," she says. "The freedom to just 'be in the moment' helps me bring my life into balance."

Not only does she enjoy the exercise and time of relaxation that dancing gives her but it is also a great way to meet people. In fact, she met her fiancé, Jason, at a dance class



Photo by Humberto Mayol

Julia Faeth in a dance circle to the left.

in Columbus when she was doing a summer internship. They still enjoy dancing, and this past summer worked on the Viennese Waltz for a performance in September. They will have a year to prepare for their next performance—at their wedding in July 2015.

Thomas Yeh and Leo Pavlovsky started brewing beer in 2012 because they wanted to make beer flavors not generally available commercially, and, well, they simply enjoyed drinking beer. They didn't buy a beer kit but instead have cobbled together equipment



Student Pastimes

CONTINUED FROM PAGE 12



Leo and Thomas mixing the beer with sugar for carbonation.

they have purchased inexpensively, including a heat exchanger to run cool water through.

Their chemical engineering backgrounds help them better understand which steps to modify to get the flavors they are looking for. For instance, they found that it is better to keep the lid off the kettle when they were making the wort so they could get rid of the compound dimethyl sulfide. Many new brewers without chemistry backgrounds cover the wort mixture when boiling it. Thomas and Leo thought that made the beer taste a little like creamed corn rather than have the crisp refreshing taste they were looking for.

Thomas likes to use his chemical engineering skills to make something he can enjoy. He also enjoys brewing beer with a friend, as there is a lot of sitting around when you're making beer. It's relaxing for him to have a beer and watch TV and talk with Leo, or invite fellow grad students over to sample their potions. This sideline has been important for him because of the many failures he experienced in the early years of his research. He says, "Failure is never easy. The beer making helps me remember during the hard times just why I love chemistry and why I chose chemical engineering."

Sketch of Meiracyllium Trinasutum by Tao Wei.

Annual Department Lectures

Donald L. Katz Lecture



Kristi Anseth, a Howard Hughes Medical Institute Investigator and Distinguished Professor of Chemical and Biological Engineering at the University of Colorado, presented the 44th Annual Donald L. Katz Lectures on March 13 & 14, 2014. Her lecture topics were "Body Building: Designer Gels to Promote Tissue Regeneration" and "Goodbye Flat Biology?" After receiving her bachelor's degree at Purdue and her PhD at Colorado, Anseth did post-

doctoral research at MIT before joining the faculty at Colorado. Her research interests lie at the interface between biology and engineering where she designs new biomaterials for applications in drug delivery and regenerative medicine.

She was the first engineer to be named a Howard Hughes Medical Institute Investigator and received the Alan T. Waterman Award, the highest award of the National Science Foundation for demonstrated exceptional individual achievement in scientific or engineering research. Anseth is an elected member of the National Academy of Engineering (2009), the Institute of Medicine (2009), and the National Academy of Sciences (2013).

At the annual lecture dinner, Professor Emeritus Jim Wilkes spoke about Don Katz' career and accomplishments and the department honored doctoral students who will graduate this year.

Blue/Green Seminar with Michigan State University

The speaker at last fall's Joint Chemical Engineering Seminar with the Department of Chemical Engineering at Michigan State University was Michael R. Ladisch, Director of the Laboratory of Renewable Resources Engineering and Distinguished Professor of Agricultural and Biological Engineering at Purdue University. Professor Ladisch gave a talk on the "Second Generation Renewable Fuels." The October

24 event was held at the Gerald R. Ford Presidential Library and the day's schedule included a poster session Ladisch spoke and a dinner at the library immediately following the lecture.

This year's seminar will be held on the MSU campus in East Lansing on November 6, 2014.

Rane Curl Set Very High Standards for Students



Professor Emeritus Rane Curl retired from the department seventeen years ago. Although he does not particularly miss teaching, Curl says, "I miss working with my associates in the department and being involved with them in teaching and research. I particularly enjoyed developing aspects of the undergraduate laboratory courses, which are important transitions for the students from academic study to practical applications." First in ChE 360, where uncertainty analysis is also taught, he invented the algorithm for UNCANAL, a program for calculating total uncertainties in computed quantities derived from several different measured values. This shifted the laboratory work to attempting to minimize errors instead of sometimes grueling derivations of the uncertainty relations themselves.

Many alumni will remember Professor Curl from their senior laboratory class, ChE 460. In the 1980s, Curl introduced major changes to the senior laboratory course including "Brown Industries" named after the late George Granger Brown, with a new emphasis on simulating real problems in the experiments, in addition to making laboratory safety and environmental protection concerns more prominent in the course.

Professor Curl set very high standards of performance for his students. Paul Graham (BSE 94), a student in ChE 460 in 1994 and now a product development

specialist at 3M, remembers that Professor Curl had a well-deserved reputation for being very sharp, and not afraid to provide very honest feedback. As a result, it was somewhat intimidating for students to present in front of him.

Paul recalls, "John Santini (BSE '94) and I and another partner were assigned to the filtration project. It was a struggle to get good data out of it, and there were a few lab periods that went by where we did not get anything useful. Of course, this was leading to higher and higher anxiety on our part because our presentation to Curl was looming, and we had nothing! We made a breakthrough when we went into the lab during off hours. We made measurements that provided a bit of a new theory that helped us to understand some of our prior difficulties. We wrote it up the new measurements and our theory and submitted them to Professor Curl and Professor Donahue. There was quite a bit of suspense because we did not know if this theory was going to be the source of 'honest feedback' in Professor Curl's inimitable style, or, if we were on to something. Our suspense grew as the rest of the class got their online feedback, and we were still waiting.

We made our presentation in G.G. Brown, and, at the end, Professor Curl took one look at us and said, 'it is an interesting idea.' Given his reputation and the difficul-

ties that we had faced, this was quite high praise, and we were proud to receive it." Looking back on the experience, Paul says that the professors who were the most demanding were also the ones who motivated him the most, taught him the most, and made the biggest impact in his life, and he is happy that Professor Curl taught his ChE 460 class."

For some time after Curl retired he volunteered with the American Red Cross, and as a licensed radio amateur served as the local chapter's communications officer and with Red Cross Disaster Action Teams, and with other public service projects of the ARROW Radio Amateur Club. Until recently he enjoyed caving, skiing and sailing, though currently settles for practicing Tai Chi. Family activities include travel with his wife Alice, with children and their families in New Hampshire, New York, and California.

Curl continues his long-time interest in speleology, the scientific study of caves and other karst features. He served on the boards of the nonprofit Michigan Natural Areas Council, the Karst Waters Institute, and the Michigan Karst Conservancy, of which he was founding president and for which he conducted field projects. He has continued a research program involving mathematical modeling of geomorphic processes in karst.

In addition, he was an advisor and project organizer with the Monroe County Karst Subcommittee of the Monroe-Lenawee Groundwater Stewardship Team, and is currently on the Washtenaw County Natural Areas Technical Advisory Committee, and volunteers with the West Lake Erie Cluster of the Stewardship Network.

Curl has lunch with other ChE emeriti professors on Fridays at Knight's Steak House on the west side of Ann Arbor. The lunch group includes Rane, Dale Briggs, Frank Donahue, Jim Wilkes and occasional visits from Scott Fogler, who is of course still an active ChE faculty member.

First Woman ChE Graduate's Career Impressive



In 1918, Dorothy Hall Brophy was the first woman to receive a bachelor's degree in chemical engineering at the University of Michigan. She graduated from high school in Toledo, Ohio, where she taught while awaiting acceptance to Michigan. After completing her chemical engineering degree, she went on to complete a PhD in chemistry at Michigan in 1920 (her graduation photo above) and was elected to the Society of Sigma Xi. Her dissertation was titled "The Separation of Copper and Cobalt by Phenylhydantoic Acid and the Volumetric Determination of Cobalt." Education was important in Dorothy's family; her parents both held business school diplomas and her older sister, Marguerite, earned a master's and doctoral degree at Michigan.

After graduating from Michigan, Dorothy worked briefly as a consultant to the U.S. Government in the Bureau of Mines before taking a job as a chemist at General Electric Company in Schenectady, New York. She was the first woman with a PhD to work at the GE Research Laboratory, where she was a research chemist from 1920 to 1932. She authored many papers on analytical methods of identification and separation of rare metals such as tungsten, vanadium, molybdenum, and thorium, and testified in patent defense cases for the company. Dorothy was awarded

several patents for her work on an alkali metal alloy while she was at GE. She was also a Fellow of the American Association for the Advancement of Science.

She married Gerald R. Brophy, also employed at GE, in 1921. They had a daughter Margaret "Peggy" who died of meningitis at age eight. Her family and society judged her harshly, blaming her child's death in part on Dorothy being an absent (i.e., working) mother. Soon after Peggy's death, Dorothy left GE never to return to research. She and Gerald had two more children, Elizabeth Margaret and Jere Hall, but Dorothy never fully recovered from the loss of her beloved first child and the bitterness of feeling forced to abandon the career she worked hard to achieve.

Dorothy eventually returned to the workforce, teaching chemistry at the University of Connecticut, Hartford, and in the Hartford public schools but only as a substitute. The school district wanted to hire her as a full-time teacher but Dorothy had no interest in obtaining her teaching certificate—she thought her PhD in chemistry was sufficient preparation! Her granddaughter, Kathryn Janoff, Elizabeth's daughter, says Dorothy was deeply proud of her work achievements, and of her edu-

cation and association with the University of Michigan. She remained active in the University of Michigan Alumni Association, and served as president of the Hartford, CT U-M Club, as well as president of the First District of the Alumni Association.

Her daughter, Elizabeth, attended the University of Michigan, and her son, Jere, who passed away in 2013, earned four degrees at Michigan in chemical engineering and metallurgical engineering: BSE ChE 1956, BS MTL 1956, MSE MTL 1957, PhD MTL 1958. Both Jere and Elizabeth met their spouses at U-M. When Dorothy Hall died in 1989, the family asked friends to send memorial gifts in her name to the College of Engineering at Michigan.

Dorothy's career as one of the nation's first female scientists has been documented in two books, *Women in Engineering: Pioneers and Trailblazers* by Margaret Layne, and *Women Scientists in America: Struggles and Strategies to 1940* by Margaret Rossiter.

Thanks to Kathryn Janoff for the images and newspaper articles, and for other assistance with details about her grandmother's career.



Dorothy is at the right with two unidentified coworkers in the GE Research Laboratory in the 1920s.

Scott Siegmund Enjoys Coming Back to A²



Scott C. Siegmund (BSE '79), the oldest of four brothers, grew up just outside of New York City, in Parsippany, New Jersey. When it came time to choose a college, he initially visited a number of schools in the Northeast. At the suggestion of his father, also a chemical engineer, he applied to the University of Michigan. Ten minutes into his visit to Ann Arbor, he was feeling comfortable and knew Michigan was where he wanted to go to school. After he met with some engineering professors, he was further impressed when he learned of the variety of the educational experiences available for students and of the University's long tradition of academic excellence.

His time at Michigan helped set his course for life. Between his chemical engineering studies and playing goal for the lacrosse team, he managed to secure a position in Dr. Fogler's lab in East Engineering. There, he assisted in studies that he now realizes were cutting edge research in the properties of oil and gas, and methods to enhance their recovery. Studying under many of the current professors emeriti, including Carhahan, Curl, Kadlec, and Wilkes, he developed a never-ending fascination with engineering.

After graduation, he took a job with Air Products and Chemicals Inc. (APCI), where he began an exciting and diverse career. Siegmund started out working in the operations and development areas. There he spent time in the APCI operations plant optimizing their performance. He also worked in customer facilities where he oversaw the application of oxygen to FCC's and Claus units.

In the middle of his tenure at APCI, he was presented with a unique opportunity to join the equipment sales team. Scott's territory was primarily off shore and through his travels he was able to explore many corners of the world. He spent time in countries as diverse as Chile, China (50 trips and counting), Zambia, and Slovenia, to name just a few of the over 40 countries he's done business in. As Scott tells the school groups during his Liquid Nitrogen presentations, his Michigan Chemical Engineering degree is his passport to visit and make friends all over the world.

Today Scott manages the company's after-services group. In that job he has offices in America, Europe, the Middle East,

and Asia, in addition to customers on all continents except Antarctica. Recently he celebrated 35 years at APCI.

Scott is married with two children. His wife, Carol, is a professor of nursing at a local college, his daughter is an artist in residence for Disney, and his son designs helicopters for Boeing. Scott is an avid bicyclist, recently completing a Pittsburgh to Washington D.C. trail ride, and coaches the lacrosse team at a local junior college. He received an MBA from Lehigh University in 1986 and is a registered professional engineer in the State of Pennsylvania.

Scott is the lead recruiter for Air Products to the Michigan. Through this assignment he has had the unique opportunity to be the guest lecturer for the process economics class and has had the chance to interact with Michigan chemical engineering students through numerous presentations to various organizations, and corporate information sessions. Scott looks forward to joining the ChE Alumni Advisory Board this fall and the prospect of working with faculty and alumni.



Scott Siegmund at the 2011 Career Fair.

Note to Young Alumni from Kimberly Chaffin



Photo by Richard Anderson

Dr. Kimberly (McCall) Chaffin (BSE '92, MSE '95) is a Distinguished Scientist and Bakken Fellow at Medtronic. She is currently on assignment in Zurich, Switzerland with her husband, Paul, and her two children, Cole (age 13) and Julia (age 11). She wrote the following note to young alumni from the French Mediterranean in August.

It seems that cardiologists pick the best locations for their conferences. So here I sit, on the French coast overlooking the Mediterranean, writing this account of my story. I have spent the day talking to doctors who want to understand polymer science, of all things. How they decide to treat their patients depends on me explaining my research to them in a way they can understand and translate into recommendations and treatments that will keep their patients safe.

I could never have imagined, in my wildest dreams 26 years ago, that this girl from Hastings, Michigan, who only had a vague idea of what chemical engineering actually was, would now be in this very interesting place as a scientist. My emotions are mixed. I feel a huge sense of achievement knowing that the results of our research have had a profound effect on the medical device industry and the field of polymer science. However, I also feel anxious. Our research results have implications for real people. I know that my comments about the long-term stability of these polymers need to be measured and framed appropriately to prevent overreaction, which could put patients at risk. These

situations must be carefully navigated. My Michigan training has prepared me for times like this and I am thankful.

Michigan...what an awesome institution to be from! As these physicians probe my credibility, asking questions about my pedigree, I can see how the mention of the University of Michigan impresses them. Of course, shortly after mentioning Michigan, someone will ask when I was last in the Big House. I always find this line of questioning interesting—the quick transition between Michigan academics and sports. Clearly, both combine to form a unique Michigan legacy.

Mine was the era of the Fab Five (Chris, Jalen, Juwan, Jimmy, and Ray) and Heisman Trophy winner, Charles Woodson. During my time as a student, the Wolverines became one of 10 schools in NCAA history to win Division I titles in both football and basketball in the same year. While I will forever associate the connectedness that supporting a winning team brings with my student days in Ann Arbor, these sports legacies are a 'flash in the pan.' The real heroes of Michigan are the engineers, doctors, and scientists who have truly changed the world by inching forward the frontiers of knowledge, building upon the fundamentals that only top-notch institutions like Michigan instill. While receiving less flash and media attention than our athletic colleagues, many brilliant Michigan alumni have changed our lives in ways that are often not recognized until years after their graduation. This great institution and our brilliant predecessors have given those of us who follow a gift, the gift of starting our careers at a highly regarded establishment.

I earned both my BSE and MSE in chemical engineering at Michigan. After receiving my bachelor's degree, I took a job with Corporate Research at Ford Motor Company—for those fellow Ford employees, I worked in SciLabs where I did adhesion research in the Polymer Department. I had a fantastic boss who encouraged me to continue my academic studies, so I completed my master's on a part-time basis while working. Later in

a career development discussion, this same selfless boss told me that I needed a PhD. My husband, who has two degrees from Michigan, had an opportunity to work in Minneapolis so I enrolled in a PhD program in chemical engineering at the University of Minnesota. Upon graduation from 'the other' U-M, where my thesis topic was in the field of polymer thermodynamics, I began my second career at Medtronic, Inc., a medical device company.

I have spent the last 15 years performing polymer research for Medtronic. I joined the company at a very interesting time for a polymer scientist. Breast implant litigation coincided with a cardiac lead recall. As a result, the major polymer manufacturers terminated their supply agreements with implantable medical device companies, taking with them their very large polymer research programs. With established polymer producers opting out of implantable applications, small start-ups filled the void. This change shifted the research responsibility to the device manufacturers. What a wonderful opportunity for me! I have spent these years learning, teaching, researching, and guiding our product designs to assure that the associated use-conditions remain within the capability of the polymer components.

Now as I defend an accelerated testing protocol that predicts unfavorable long-term performance, I think back to those famous Michigan ChE Open Ended Problems (OEPs). Remember those real world projects? They took too much time; the problem solving methodology was never in the textbook; the assigned working group was always a bit dysfunctional; they were graded too harshly. I have never said it but THANK YOU for the OEP experience. I can't think of a better training platform for what I must do today.

It is time to go and make a difference, not looking for short-term glory, but seeking ways that will have a lasting impact on the world, securing the Michigan gift for those who follow...the gift of credibility that their Michigan pedigree offers. Go Blue!

Alumni Honored by College and Department



Rosemarie Wesson (PhD '88) was the recipient of the 2013 ChE Alumni Merit Award. After taking a leave in 2001 from Dow Chemical, Dr. Wesson joined the Engineering Directorate of the National Science Foundation as a Visiting Scientist/Engineer. Dr. Wesson is currently the Program Director for the Chemical and Biological Separations Program in the Chemical, Bioengineering, Environmental, and Transport Systems Division.

Dr. Wesson is a member of the Board of Directors of the American Institute of Chemical Engineers and an adjunct professor in the Department of Chemical Engineering at the University of Maryland. She became a member of the department's Alumni Advisory Board in 2013. She did her doctoral research with Jim Wilkes and Tasos Papanastasiou.



Shawn Hunter (BSE '00, MSE '03, PhD '05) received the 2013 Alumni Recent Graduate Award. At Dow Chemical Company, he is committed to advancing sustainability with robust, scientifically supported methods. Using the foundation of his engineering education at U-M, his experience in Dow's Research and Development function and his keen interest in sustainability, Dr. Hunter has made significant strides to integrate life cycle thinking at Dow in a few short years, in addition to numerous contributions to the advancement of life cycle assessment.

Dr. Hunter is the Product Sustainability Leader for the Dow Energy Materials business and Dow's Corporate Venturing organization. He is also a member of the U.S. Life Cycle Inventory Advisory Committee, where he advises National Renewable Energy Laboratory on management of the U.S. Life Cycle Inventory database. Hunter is currently an adjunct professor in Michigan's Chemical Engineering Department and serves as an External Advisory Board member for both the Center for Sustainable Systems and the Erb Institute at Michigan. Phil Savage was his doctoral advisor.

From Marketing and Communications, College of Engineering

2014 Fall Alumni Events

Friday, October 31, 2014

11:30-1:30 p.m.

Lunch with the Department

Johnson Rooms

3rd Floor, Lurie Engineering Center

1221 Beal Avenue

Please join us on October 31 for our annual department luncheon. William Wulfsohn (BSE '84), president and CEO of Carpenter Technology Corporation and ChE Alumni Advisory Board member, is this year's ChE Alumni Award winner, and he will speak at the event. Food will be provided by Zingerman's.

If you would like to join us, please contact Sandy Swisher, 734-764-7413 or sandys@umich.edu, or sign up for the lunch when you are making homecoming reservations through the College of Engineering.

Monday, November 17, 2014

7:00 p.m.-9:00 p.m.

2014 Annual AIChE Meeting Open House

International 3 Room

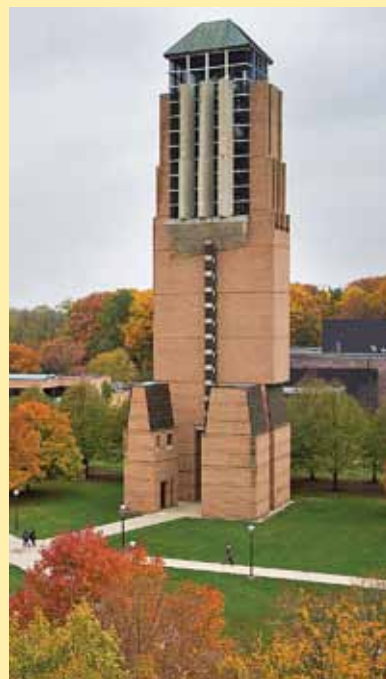
Atlanta Marriott Marquis

265 Peachtree Center Ave NE

Atlanta, GA

We invite you to join us for our annual open house in Atlanta. If you are attending the meeting or live in the area, please plan to stop by and visit with faculty and students.

If you have any questions about the open house, please contact Kelly Raickovich at raick@umich.edu or 734-936-3314.



News from Alumni

Ralph E. Hillman (BS '50, MS '53) is compiling a fully documented genealogy of the descendants of John Hillman who settled at Martha's Vineyard in 1670. He is presently working on the fifth generation, after completing 78 persons through the 4th generation. It is a research process, which he partially attributes to his training in science and engineering at Michigan.

Ralph Robinson (MSE '50) and his wife, Georgia, are splitting their retirement years between Lincolnshire, IL and Fort Myers, FL.

Joseph Ray (BS '55) is moving to the San Francisco Bay area.



David Hellums (PhD '61) went directly from Michigan to Rice University where he is now a Professor Emeritus. Over his 54 years at Rice, he has served as Chair of ChE Department,

Chair of Bioengineering, and Dean of Engineering. He is a member of the National Academy of Engineering.

Max Legatski (BS '61, MS '63, PhD '66) is semi-retired in Bartlesville, OK, but still working part time in the Petroleum Engineering business. He and his wife have two sons and two granddaughters. He says he's glad he's not old yet and he would like to hear from former classmates at MLegatski@aol.com.

After retiring from 35 years of environmental protection work, **Mike Downs** (BSE '67) now does volunteer work for Tampa Bay Watch and The Florida Aquarium.

Robert Harrer (MSE '72) has fond memories of his time in Ann Arbor. He retired from Chevron Corporation after 36 years with the company and still lives in San Francisco with his wife, Janis. They travel regularly, with trips to France almost annually. He is president of his neighborhood association, which is very involved in city politics. He has also been spending time working on his genealogy, which requires more analytical skills than he expected.

Todd Miller (BSE '82) retired in January and is splitting his time between Cavanaugh Lake outside Chelsea, MI and New Jersey. He's keeping very busy with many lifelong hobbies and sports, travel, and U-M football and basketball.



David B. Harwood (BSE '83) recently changed positions at DTE Energy. He was the Director of the Major Enterprise Project Management Office and Nuclear Development for the

last 5 years or so. In January 2014, he became the Director of Renewable Energy. DTE has spent ~\$2 billion since 2008 building their renewable energy portfolio and plan to spend more in the coming years. By 2015, 10% of their sales will be generated by Michigan-based renewable sources, mainly wind.



John Zavicar III (BSE '84) recently retired from Los Alamos National Laboratory in New Mexico after a 15-year career there supporting national security and nuclear safety. He and his

wife, Karen (a nurse who also retired from the Lab), are enjoying bike rides, running on the Corpus Christi beach, traveling, and spending time with their 4 children and 7 grandchildren. John is also playing classic rock in a band and starting up another martial arts school in their "Margaritaville" location. He says hello to his Michigan Wolverine family!

Paul Theisen (BSE '85) is an Operational Excellence Leader at Dow Chemical Michigan Operations in Midland. He joined Dow in March 1986. He and his wife, Kristine, were married in June 1993 and have two daughters, Casey and Jessica. Paul still loves attending most U-M Football games. The family has added two playful cats, Bo and Georgia. Now Paul is outnumbered 5 to 1 by the females in the house.

Margaret Gilligan (BSE '89) is a principal engineer with Coca-Cola where she just finished installing and commissioning a Smart Water line in Milwaukee, a \$31 million dollar investment. She has also been working on the joint venture between Coca-Cola and Fairlife (a Dairy Company). Their product, Core Power, is an all natural, protein enhanced, lactose-free milk product. Core Power is aseptically filled and produced at their plant in Coopersville, MI.

Kim (Gors) Frazier (BSE '93) is nearly retired! She and her husband, George, both retired in 2012; Kim from ND Industries, Inc. (her first employer after graduation) in Troy, MI, and George, from United States Gypsum (USG) in River Rouge. They moved to Mikado in northeast Lower Michigan, near Oscoda, where they started a consulting and managing business, and are working on projects, mainly environmental ones so far, for the USG quarry facility in Alabaster, Michigan. Last year, they created wetlands on the property, and started a National Pollutant Discharge Elimination System (NPDES) water project. This year, they are removing a marine bin from Lake Huron that has been there since 1929. Kim says it has been great fun to have the time to enjoy smelling the roses but also to work on a few projects to keep her skills sharp.

In June 2014, **Michael Pisarczyk** (BSE '93) was appointed Treasurer and Finance Director for the Hemlock Semiconductor Group. Hemlock is a majority owned joint venture of Dow Corning Corporation where Michael has worked since 2009. He continues to reside in Midland, MI with his wife, Jennifer, and their three children.

Dieter Schweiss (MSE '96) and his family moved from Wisconsin to Ohio nearly four years ago when he joined TriHealth, a Cincinnati-based healthcare system. As a lead programmer/analyst for their electronic medical record software, he specializes in providing custom solutions for enterprise-wide projects. Thankfully, his wife and sons have more modest expectations of him, and they're happy to call the Cincinnati area home.

CONTINUED ON PAGE 20

Update your contact information with the University at www.engin.umich.edu/college/info/alumni

Alumni News

CONTINUED FROM PAGE 19

Tommy Golczynski (BSE '97) was named one of the "40 under 40" young professionals in 2014 in the Houston area by the Houston Business Journal. All honorees have started their own companies or successful charities and are "setting the bar high for young professionals across the nation with their job creation and impact on society." Tommy is the owner and managing partner of Assured Flow Solutions LLC.

Darren Golomb (BSE '00) married Kelly Hoi Lyn Quah, an alumna of Western Michigan University, on June 26, 2014 in Calistoga, CA. Both are excited to embark on life's journey together beginning with home visits to Detroit, MI in August and Kuala Lumpur, Malaysia in February 2015.

Nick Ortiz (BSE '00) and his wife welcomed their second child, Xavier Ortiz, on June 12, 2014. Mom, Dad, big brother Sam, and Xavier are all doing great!

Matt Ross (BSE '00) completed his PhD at Wayne State University, moved to Kalamazoo, and accepted a tenure-track position as an assistant professor of finance at Western Michigan University. Go Broncos! Go Blue!

Julie Champion (BSE '01) and her husband, Kevin Boulware, welcomed their first child in January 2014, Kathleen Annie Boulware. They reside in Atlanta, where Julie is an assistant professor at Georgia Tech.



Darren N. Goetz (BSE '01, MSE MEng '06) recently transitioned into the role of Global Manufacturing Operations Manager (MOM) for 3M's Automotive Division, and will be based in St.

Paul. Previously he had been Manufacturing Operations Manager for the 3M PC Touch Solutions business, based in St. Paul and Singapore, working on spreading new touchscreen technology throughout the world. Nice to be grounded (literally) for a change!

Palencia Mobley, P.E. (BSE '01, MS Civil Eng, Wayne State) was awarded the 2014

Emerging Leader Award by the University's Detroit Center this July. She was honored for her extensive volunteer work and leadership in various organizations to improve the conditions of her fellow Detroiters. In September she received Detroit Area Pre-College Engineering Program's (DAPCEP) Chairman's Award for her commitment to the qualities inherent in DAPCEP programming and her investment in the community that DAPCEP serves.

Kenneth "K.C." Chomistek (BSE '02, MSE '06) and his wife recently relocated from Boston, MA to Bloomington, IN and he has taken a job as the product and analytical development manager at Bio-Convergence LLC in Bloomington. They are happy to be back in the Midwest and closer to Ann Arbor.



Kelvin Lau (BSE '02, MEng Pharm '03), is now a senior scientist at AbbVie, a biopharmaceutical company. He and his wife, Hei Man (Grace) Yeung, (BSE EE '04) would like to announce the birth of their son Caleb King-Tin Lau on July 1, 2014. The family now lives in the greater Boston area.

Erik F Schroepfel (BSE '03) has accepted a promotion with Eli Lilly and Company. His new role is with the Clinical Trial Supply Chain organization in Indianapolis as a molecule-planning consultant.

Mike Doornbos (BSE '04, MSE BME '05) recently completed his 9th year at Dow Corning in Midland, MI. Earlier this year, he moved from his role as a manufacturing team leader to the finance department as a corporate economic evaluator. On June 19, Mike and his wife, Amy, welcomed their third child, Nolan Michael, who joins their twin sons, Andrew and Myles.



Though not currently in the engineering profession, **Jonathan West** (BSE '04) has been active in entertainment, working on independent films and commercials, in theatre in Michigan

and New York, and regional commercials and print advertisements. He's living in the Bronx, NY, but active in the Midwest as well, where his twelve-year-old son and eight-year-old daughter live in Allen Park, MI.

Andrew "Bean" Getsoian (BSE '05, MSE '07) and **Elizabeth (Ranney) Getsoian** (BSE '06, PhD '11) welcomed their first son, Zachary Richard Getsoian, on May 6, 2014. Look for him to be part of the University of Michigan Chemical Engineering graduating class of 2036!

Eric Jankowski (BSE '05, MSE '06, PhD '12) will be starting as an assistant professor in the Department of Materials Science and Engineering at Boise State University in January 2015.

Andrea (Sterling) Trimmer (BSE '05) married Scott Trimmer in Sept 2013. They currently live in Findlay, OH. Andrea is busy growing her business, The Midwest Open Rhythm Exchange, which promotes tap dance in the Midwest (tapdancingengineer.blogspot.com) and teaching tap dance at multiple dance studios in the area. She also writes a snarky science/engineering/tap dance blog: midwestopenrhythmxchange.weebly.com.

Brian Gilan (BSE '06) graduated from Duke University's Fuqua School of Business with a master's degree in business administration, concentrating in health sector management, product management, and market analysis & strategy. He now works for Medtronic in Los Angeles, CA in a global marketing role, as a member of their Leadership Development Rotational Program.

Samih Zaman (BSE '06) married Kiran Lodhie in June 2014. They reside in the Twin Cities metro area where Samih works for General Mills.

Navin Bora (BSE '07) has joined Patents+TMS, P.C., an intellectual property law firm based in Chicago. His current projects include preparing and drafting patents for the oilfield services industry, in addition to a variety of other technical fields.

After working for Schlumberger in Australia and the Middle East, **Rob Chockley** (BSE '07) has joined Halliburton, back in the US.

Send your news updates to Sandy Swisher at cheme@umich.edu

For both oilfield service companies, he has been performing reservoir evaluation on wireline. He says it's been an adventure, and anyone interested in an exciting career can feel free to contact him about opportunities.



Rob Damitz (BSE '09) recently started a company (aqUV) with two fellow graduate students at University of Florida to address

the over 780 million people across the globe without regular access to clean drinking water. They have developed a water purification device that is powered completely by hand for use not only in developing nations and for disaster relief but also for military and outdoors enthusiasts. In May, aqUV was selected as winners of UF's "Next Big Idea" business plan competition with an award of \$25,000 in startup funding. The award funding will help them implement their beta prototypes in Haiti by 2015.

Ryan McKee (BSE '09) will be relocating from Chicago to Los Angeles to attend the full-time MBA program at UCLA Anderson School of Management as a member of the Class of 2016.

Danielle (Kapala) Williams (BSE '09) and Matt Williams (BSE ME '09) welcomed their first son, Judah Nathaniel Williams, on April 2, 2014.

Abdullah Awamleh (BSE '10) took a new job within his company, AbbVie. He was a project engineer at AbbVie in Wyandotte, MI and is currently a senior process engineer at AbbVie in North Chicago, IL.



Jon Bauer (BS '10) proposed to his longtime girlfriend, Amanda McAdams (LSA '09). Jon proposed on New Year's Eve while

the two were traveling in Iceland. They currently live in Philadelphia with their cats while Jon is finishing his PhD at the University of Delaware. Jon & Amanda are in Iceland in the photo, after Jon proposed.

Derrick Boroski (BSE '10) and **Nicole Lesnau** (BSE '10) got married on June 14, 2014.

Christine Curran (BSE '10) started a new job as a flow assurance lead at Exxon-Mobil Development Company on April 1, 2014. Previously, she worked as a user support engineer in the ExxonMobil Upstream IT organization providing process simulation support for development and surveillance projects worldwide. On May 10, she received her MBA from the University of Houston, with a concentration in global management.

Katherine (Koterba) Pacynski (BSE '10) went to law school after graduating from Michigan, and she is an associate patent attorney for the Dobrusin Law Firm in Pontiac, Michigan. She and her husband, Steve (BA '06), were married in December 2013, and return to the Big House every homecoming to relive their Michigan Varsity Cheerleading days.

Alon Mandel (BSE '10) has relocated from Israel to Denver to work at Noble Energy as an environmental engineer, where he will be fighting fugitive leakages from oil well production in their air pollution group. He returned to Israel after graduation to complete his army service.

Dustin Meldrum (BSE '10, MSE '11) left his job working for Equatorial Guinea Reservoir Engineering with ExxonMobil to take a job as business development coordinator for Murphy Exploration & Production Company.

Amanda Whalen (BSE '11) recently started a new position as a business analyst within her company, Air Liquide. She moved to Dallas, TX and bought her first home.



James DeRosier (BSE '11) and **Dana Weimar** (BSE '11) were married on August 9, 2014. They are living in Midland, Michigan and are both employed as manufacturing engineers at Hemlock Semiconductor Corporation.

Since the fall of 2012, **Avi Wolf** (BSE '12) has been working as a chemical process engineer for Intel Corporation in Phoenix, Arizona. Prior to 2014, Avi supported the 22-nanometer microprocessor business, the largest manufacturing focus at Intel; he is now working on the start-up of a new technology at Intel, to produce the latest generation of microprocessors, now with

14-nanometer transistors. If you are in the business or the Phoenix area, feel free to reach out to Avi at wolfavi@umich.edu.

Sarah Chronister (BSE '13) has enjoyed exploring new cities while in BASF's Professional Development Program. Sarah started the program in Florham Park, NJ and is currently living in Charlotte, NC. Sarah has enjoyed connecting with local Michigan alumni through the U-M Alumni Association.

Rachel Mallinger (BSE '13) has spent the last year working with Air Liquide as a participant of the ALLEX Program. In this time she has relocated from Ann Arbor, to Albany, NY, and to Houston, Texas, where she worked as a Project Engineer. She moved to Paris in August for her next role and is looking forward to exploring new opportunities abroad.

Since graduation, **Spencer Scolnick** (BSE '13) has been fulfilling his dreams of being a ski bum. After moving back home to Colorado, he spent three months skiing at Vail nearly every weekday. For the next three months he went backpacking in Vietnam, Laos, Thailand, and Peru, culminating with a 4-day, 3-night hike on the Inca Trail to Machu Picchu. Soon, he will travel to New Orleans, where he will begin work as a completion and well intervention engineer at Shell Oil.

Carolyn Yarina's (BSE '13) start-up company, Sisu Global Health, was a finalist in the Saving Lives at Birth Grant and presented at the DevelopmentxChange in Washington DC on August 1, where they won a \$250,000 seed grant from the organization. You can visit the her company's website at www.sisuglobalhealth.com for more information.

IN MEMORIAM

Eduardo Sevilla
(BSE '57)
March 8, 2014

Dennis John Ward
(BSE '54, MSE '55, PhD '58)
August 10, 2014

Send a request to join the ChE alumni e-mail group to cheme@umich.edu

Gifts from Alumni, Friends, and Research Partners, July 31, 2013 to September 30, 2014

INDIVIDUAL GIVING

Chemical Engineering Fellowships Fund and Graduate Student Support

Dr. Sudhama Gopalan
 Dr. Jay D. Keasling
 Mrs. Heidi R. Knodell
 Mr. Jeffrey S. Lawrence and Mrs. Karen Wu
 Dr. and Ms. Xiang-Ming Li
 Dr. Marina Miletic
 Mr. Chandrakant Parkhani
 Dr. and Mrs. Shyam R. Suchdeo
 Mr. Mark R. Zettell and Mrs. Mary E. Tyler

Chemical ChE Fellowship Challenge Fund

Mr. and Mrs. John B. Campbell
 Professor Arturo J. Hernandez-Maldonado
 Mr. and Mrs. David L. Hilderley Sr.
 Dr. Charles M. Thatcher
 Dr. and Mrs. L. Kent Thomas

Stuart W. Churchill Graduate Fund

Dr. Brice Carnahan
 Dr. and Mrs. Jacob Eichhorn
 Dr. and Mrs. Martin E. Gluckstein

Dr. Peter B. Lederman and Dr. Susan S. Lederman
 Dr. and Mrs. Irving F. Miller
 Professor and Mrs. James O. Wilkes

ChE Undergraduate Fund

Mr. and Mrs. John A. Ambrose
 Mr. Michael S. O'Donnell
 Dr. Cynthia B. Rothschild and Mr. Walter G. Rothschild
 Mr. and Mrs. Andrew J. Smydra
 Mr. and Mrs. Paul J. Theisen

Willard J. Ball Scholarship Fund

Mr. Willard J. Ball

Gus L. Constan Scholarship Fund

Ms. Sue C. McMillin
 National Student Clearinghouse

Lloyd L. Kempe Scholarship in Chemical Engineering

Mr. Roger A. Frederick

Anthony C. Lembke Chair of the Department of Chemical Engineering Fund

Mr. and Mrs. Anthony C. Lembke

Arthur and Bess Nicholas Scholarship Fund

Mr. and Mrs. Thomas A. Nicholas
 Nicholas Family Fidelity Charitable Gift Fund

Alfred A. & Beverly H. Nuttall Endowed Scholarship Fund

Mr. and Mrs. Alfred A. Nuttall

Sidney F. and Linda F. Sapakie Endowed Scholarship Fund

Mr. and Mrs. Sidney F. Sapakie

Maurice J. Sinnott Prize in Chemical Engineering

Dr. Brice Carnahan
 Ms. Mary S. Mahan
 Mr. and Mrs. Daniel J. Sinnott
 Ms. Mary L. Sinnott
 Professor and Mrs. James O. Wilkes

BE A PART OF MICHIGAN CHEMICAL ENGINEERING—HELP ENSURE EXCELLENCE IN RESEARCH AND EDUCATION

If you would like to give a gift to the Department of Chemical Engineering's undergraduate program or graduate student fellowship fund, or to any other department fund (e.g., undergraduate scholarships), please complete the form below and send it in with your contribution. Thank you!

Name(s) as you would like them to appear in donor listings _____

Address _____

City _____

State _____

Zip _____

E-Mail _____

Home Phone _____

Business Phone _____

New Contact Information?

Please check if you DO NOT wish to be listed in our donor listing

UNDERGRADUATE PROGRAM
(319715)

GRADUATE FELLOWSHIPS
(302086)

DISCRETIONARY FUND
(313420)

OTHER _____

Enclosed is my gift of \$ _____ made payable to: The University of Michigan

Enclosed is my employer (or my spouse's) matching gift form

Company _____

Charge my gift of \$ _____ to my Visa MasterCard Discover AMEX

Please return form to:

Pamela Bogdanski
 Department of Chemical Engineering
 The University of Michigan
 3074 H.H. Dow Bldg
 Ann Arbor, MI 48109-2136

Account Number

Expiration

Signature _____

Date _____

*THE FUND CONSTITUTES A GIFT FOR ENDOWMENT, AND DISTRIBUTIONS WILL BE MADE IN ACCORDANCE WITH THE UNIVERSITY'S THEN EXISTING ENDOWMENT DISTRIBUTION POLICY. ANY SURPLUS DISTRIBUTIONS FROM THE FUND DURING ANY PERIOD MAY BE ACCUMULATED FOR LATER USE FOR THE ABOVE PURPOSES OR MAY BE ADDED TO THE PRINCIPAL OF THE FUND AT THE UNIVERSITY'S DISCRETION.

All gifts postmarked by December 31, 2014 are tax deductible for the year 2014.

A: 5405

Donate online at www.engin.umich.edu/che/alumni/give

Paul F. Werler Scholarship Fund

Werler Family Charitable Foundation Trust

James O. Wilkes Scholarship Fund

Dr. and Mrs. Finis E. Carleton III
 Dr. Brice Carnahan
 Mr. and Mrs. Adolf E. Garbsch
 Dr. Joseph P. Greene
 Mr. and Mrs. Jeremy M. Hales
 Mr. Vernon J. Mallu
 Mr. Donald K. McCord and Ms. Merrie C. Williams
 Mr. and Mrs. Koh I. Murai
 Dr. Peter E. Parker
 Dr. Bernard J. Schorle
 Mr. and Mrs. Robert A. Singley
 Dr. Michael J. Solomon and Mrs. Ellen C. Lee
 Dr. John C. Ulicny and Ms. Patricia M. Johnson
 Dr. and Mrs. Antonio Valle
 Professor and Mrs. James O. Wilkes

G. Brymer Williams Student Aid Fund

Mr. Chris A. Benson and Ms. Pamela Maker
 Dr. Brice Carnahan
 Mr. and Mrs. Mark R. Deschere
 Dr. and Mrs. Jacob Eichhorn
 Mr. David W. Haartz
 Mr. Mark T. Harrington
 Mr. and Mrs. Ryan Hur
 Mr. and Mrs. Ronnie Johnson
 Dr. Peter B. Lederman and Dr. Susan S. Lederman
 Mrs. Sally C. Miller
 Mr. and Mrs. Garry M. Mlot
 Mr. Ralph C. Peterson
 Dr. and Mrs. Roger K. Rains
 Mr. James D. Randolph
 Mr. and Ms. Craig B. Reinhart
 Mr. and Mrs. Howard A. Sachs
 Mr. and Mrs. Robert A. Singley
 Dr. John C. Ulicny and Ms. Patricia M. Johnson

Other Undergraduate Scholarship Funds

Mr. Randal D. Bauman
 Dr. and Mrs. Dale E. Briggs
 Mr. Nicholas E. Clay
 Mrs. Helen B. Crosier
 Dr. Richard E. Deno and Mrs. Sandra Galle
 Dr. George A. Fouras
 Mr. and Mrs. Scott P. Frederick
 Mr. and Mrs. Richard J. Gentges
 Ms. Katherine A. Gilhool
 Mr. Mitesh Macwan
 Dr. Michele R. Monteith and Mr. Duane C. Garrett
 Dr. and Mrs. Bruce W. Moore
 Mr. and Ms. Kline G. Pepper II
 Professor Joel L. Plawsky
 Mr. and Mrs. Robert A. Singley
 Mr. Jonathan Snow
 Mr. and Mrs. Daniel N. Viaches

Other Chemical Engineering Funds

Mr. and Mrs. Kenneth H. Bergsman
 Mr. Eric F. Bernath
 Dr. and Mrs. David E. Bidstrup
 Dr. and Mrs. Dale E. Briggs
 Dr. and Mrs. James E. Briggs
 Mr. and Mrs. James D. Brown
 Mr. and Mrs. John R. Burleson
 Mr. Scott G. Bushman
 Mr. Brian H. Byers
 Professor and Mrs. Paul J. Carrier
 Dr. Brice Carnahan
 Mr. Salvatore J. Catalano
 Mr. and Mrs. Dennis L. Cima
 Mr. and Mrs. James B. Cross
 Mr. and Mrs. Thomas G. De Jonghe
 Dr. and Mrs. W. Nicholas Delgass
 Dr. and Mrs. Michael DiBattista
 Mr. and Mrs. Richard N. Dodge II
 Mrs. Faye A. Ebach
 Mr. and Mrs. David P. Erfert
 Mr. and Mrs. Alfred J. Fatica
 Fleischer Revocable Living Trust
 Mr. Warren D. Gilbert
 Mr. Frederic L. Glover
 Dr. and Mrs. Martin E. Gluckstein
 Mr. and Mrs. Thomas W. Gougeon
 Mr. and Mrs. Ronald N. Grabois
 Mr. and Mrs. Gary A. Graves
 Mr. and Mrs. George A. Grove
 Mr. and Mrs. William G. Harrison
 Mr. and Mrs. Michael Henderson
 Mr. Melvin Hu and Mrs. Yinghong Xu
 Dr. and Mrs. Robert M. Itami
 Mr. and Mrs. Paul Kobrin
 Dr. and Mrs. William D. Kovats
 Dr. Bernard M. Kulwicky
 Dr. and Mrs. Martin A. Javinsky
 Dr. Peter B. Lederman and Dr. Susan S. Lederman
 Mr. Charles D. Malloch
 Dr. and Mrs. George H. Miley
 Mr. Michael J. Molnar
 Mr. and Mrs. Thomas C. Mowry
 Dr. and Mrs. Donald A. Nast
 Mr. and Mrs. Robert J. Niedzielski Jr.
 Ms. Nancy Pomeranian
 Mr. and Mrs. Stephen M. Pondell
 Mr. Gregory J. Poterala
 Dr. and Mrs. Roger K. Rains
 Mr. James D. Randolph
 Mr. and Mrs. Bob W. Ranger
 Mr. and Ms. Scott Riley
 Mr. and Mrs. Wayne D. Ross
 Mr. James M. Ryan
 Mr. and Mrs. Charles J. Sawyer
 Dr. Craig W. Schmidt
 Mr. and Mrs. Thomas H. Scholten

Mr. and Mrs. Frederick L. Shippey
 Dr. Christopher M. Smith
 Mr. Henry Smithies
 Dr. Michael J. Solomon and Mrs. Ellen C. Lee
 Mr. and Mrs. David B. Stanton
 Mr. William A. Thompson
 Dr. Charles M. Thatcher
 Mr. Jonathan E. Timbers
 Mr. Peter J. Valianatos
 Dr. Jack M. Van Den Bogaerde
 Dr. Bruce K. Vaughen and Mrs. Ann L. Newton
 Vaughen
 Mr. and Mrs. Daniel N. Viaches
 Mr. and Ms. Steven H. Waier
 Dr. and Mrs. Dennis J. Ward
 Mr. Paul F. Werler
 Ms. Julie Westerman
 Dr. Barry F. Wolf and Dr. Sarah N. Jacobson
 Ms. Michelle H. Wu
 Mr. John M. Zalewski
 Dr. Hagar Zohar

CORPORATE GIVING

Air Products Foundation
 Amgen Foundation
 Bristol-Myers Squibb Foundation, Inc.
 BP Foundation
 BP Products North America
 Chevron Corporation
 Chevron Energy Technology Company
 ChevronTexaco
 Colgate-Palmolive Company
 ConocoPhillips
 The Dow Chemical Company
 Dow Chemical Company Foundation
 Dow Corning Corporation
 DTE Energy Foundation
 Eli Lilly & Company Foundation
 ExxonMobil Corporation
 ExxonMobil Foundation
 Kimberly-Clark Foundation, Inc.
 Marathon Petroleum Foundation
 Minerals Technologies, Inc.
 Multi-Chem, A Halliburton Service
 Multiphase Solutions (Wood Group Kenny), Inc.
 Nalco
 Pfizer Foundation
 Phillips 66
 Procter & Gamble Company
 P & G Fund
 Qualcomm Incorporated GE Foundation
 Shell International E & P, Inc.
 StatoilHydro ASA
 Total E&P USA Inc.
 Turner Construction Company

Donate online at www.engin.umich.edu/che/alumni/give

Chemical Engineering Department

University of Michigan
3074 H. H. Dow Building
2300 Hayward Street
Ann Arbor, MI 48109-2136

The Faculty of the Department of Chemical Engineering

Mark A. Barteau • Catalysis, Nanomaterials, and Energy

Mark A. Burns, Chair • Microfluidics and Biochemical Analysis

Omolola Eniola-Adefeso • Cell Adhesion and Migration

H. Scott Fogler • Flow and Reaction in Porous Media

Sharon C. Glotzer • Computational Nanoscience and Soft Materials

Peter Green • Polymer Physics

Erdogan Gulari • DNA, Peptide Synthesis and Reactions at Interfaces

Jinsang Kim • Smart Functional Polymers

Nicholas Kotov • Nanomaterials, Biomaterials, Self-Organization Phenomena, and 3D Tissue Engineering

Mark J. Kushner • Plasma Chemistry, Medicine and Materials Processing

Joerg Lahann • Biomaterials and Biointerfaces

Xiaoxia Lin • Systems and Synthetic Biology

Ronald G. Larson • Complex Fluids and Biological Macromolecules

Jennifer J. Linderman • Receptor Dynamics

Suljo Linic • Catalysis, Surface Chemistry and Fuel Cells

Charles W. Monroe • Electrochemistry
Susan M. Montgomery • G. Brymer Williams Collegiate Lecturer

Sunitha Nagrath • BioMEMS in Cancer Diagnosis/Therapeutics, Cancer Cell Detection/Trafficking, and Microfluidics

Andrew Putnam • Tissue Engineering and Mechanobiology

Johannes W. Schwank • Catalysts, Fuel Cells, and Fuel Conversion

Timothy F. Scott • Photopolymers, Membranes, and Biomaterials

Lonnie Shea • Regenerative Medicine, Immunomodulation, Systems Biology

Max Shtein • Optoelectronic and Thermoelectric Materials, Devices, and Processing

Michael J. Solomon • Complex Fluids and Nanocolloids

Andrew Tadd • Lecturer

Levi T. Thompson • Nanostructured Materials, Energy Conversion and Storage

Greg M. Thurber • Quantitative Pharmacology and Molecular Imaging Agent Design

Anish Tuteja • Surface Science, Polymers, and Separations

Angela Violi • Multiscale Computational Nanoscience

Henry Y. Wang • Bioprocess Engineering and Pharmaceutical Engineering

Fei Wen • Genetic Engineering, Directed Protein Evolution, and Immune Function Modulation

Ralph T. Yang • Separations and New Materials for Energy/Environmental Applications

Robert M. Ziff • Nanostructures, Catalysis, and Modeling