

# ChE News

FALL 2009

The Newsletter of  
 the Department of  
 Chemical Engineering

## Nanotubes Are in Fashion

A carbon nanotube-coated “smart yarn” that conducts electricity can be woven into soft fabrics that detect blood and monitor health. This carbon nanotube-coated smart yarn can conduct enough electricity from a battery to power a light-emitting diode device. Researchers can take advantage of its conductivity to design garments that detect blood.

“Currently, smart textiles are made primarily of metallic or optical fibers. They’re fragile. They’re not comfortable. Metal fibers also corrode. There are problems with washing such electronic textiles.

We have found a much simpler way—an elegant way—by combining two fibers, one natural and one created by nanotechnology,” said Professor Nicholas Kotov. Kotov and his doctoral student Bongsup Shim are among the co-authors of a paper on this material that was published in *Nano Letters*.

The only perceptible change to the yarn is that it turned black, due to the carbon. It remained pliable and soft, and can be woven into smart textiles that would be softer and more practical than current designs for electrically-conducting fabrics.

To make these “e-textiles,” the researchers dipped 1.5-millimeter thick cotton yarn into a solution of carbon nanotubes in water and then into a solution of a special sticky polymer



This carbon nanotube-coated smart yarn can conduct enough electricity from a battery to power a light-emitting diode device. Researchers can use its conductivity to design garments that detect blood.

in ethanol. After being dipped just a few times into both solutions and dried, the yarn was able to conduct enough power from a battery to illuminate a light-emitting diode device.

“This turns out to be very easy to do,” Kotov said. “After just a few repetitions of the process, this normal cotton becomes a conductive material because carbon nanotubes are conductive.”

In order to put this conductivity to use, the researchers added the antibody anti-albumin to the carbon nanotube solution. Anti-albumin reacts with albumin, a protein found in blood. When the researchers exposed their anti-albumin-infused smart yarn to albumin, they

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# Note from the Chair



Welcome to the 2009 edition of *ChE News*, the newsletter for the Department of Chemical Engineering here at Michigan! This is

my first edition of *ChE News* as chair. I would like to thank our previous chairs for making the department what it is today—one of the world's top chemical engineering departments. I particularly want to thank Ron Larson, who did an excellent job leading and expanding the department. His record will be a tough act to follow!

As you read this newsletter, you will see that the department's list of recent

accomplishments is impressive. We have made major breakthroughs in many areas, including nanotechnology, energy research, and materials development. Our faculty and students continue to win national awards for their outstanding work. Most notably, Suljo Linic won the ACS Colloid and Surface Chemistry Unilever Award and the Camille Dreyfus Teacher-Scholar Award, and Sharon Glotzer received a National Security Science and Engineering Faculty Fellowship Award. Graduate students Elizabeth Stewart, Robert Levine, and David Adams, and undergraduate student Barry Shang, received National Science Foundation Fellowships, one of the most prestigious fellowships in the country. More details and other awards that faculty and students received can be found in this newsletter.

With such talented faculty and students, the only thing that might impede our success is money. However, even though many institutions, both public and private, are cutting faculty and facing extreme budgetary pressures, our department and university have been spared so far. In fact, the University of Michigan was mentioned in a New York Times article earlier this year as being one of the few universities seemingly unscathed by the financial downturn. While we are still going strong and hope to search for new faculty this year, we anticipate that there may be belt-tightening in the future. We are working hard to increase our endowment base to provide scholarships to those students who might not be able to afford a

Michigan education without assistance, and to provide research support for our faculty and graduate students.

As we move forward in the coming months and years, I am excited about the potential of the department. We have an outstanding group of faculty doing cutting edge research. We have a vibrant and active alumni board that will add four new board members (Margaret Gilligan (BSE '89), Paul Horst (BSE '72), Cory Phillips (BSE '93), Frank Tranzow (BSE '59)) at this fall's meeting (September 24-25). Our graduate and undergraduate students are among the best in the country. Although we have had our share of difficulties this past year, including two major leaks and a fire in the building, the future looks very bright indeed!

Finally, I would like to thank all of you who have contributed to the department in the past, both financially and in other ways, and plan to do so in the future. Without your support, especially that of our dedicated alumni, we could not accomplish many of the things we do. Our supportive alumni base sets Michigan apart from other schools and I'm proud to be associated with all of you. If you can, please take a moment to continue that commitment by filling out the donation form near the end of this newsletter or by visiting our website. Thanks again and I hope you enjoy this issue of the newsletter!

Mark A. Burns, Chair

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## Walter J. Weber, Jr. Retires

The department hosted a retirement reception celebrating the career of Walter J. Weber, Jr. on May 7, 2009. Professor Weber, a University of Michigan faculty member since 1963, is the Gordon Maskew Fair and Earnest Boyce Distinguished University Professor.

During his 46 years at the University, Weber made many significant contributions to the field of environmental engineering as a scientist, educator, and mentor. An international leader in the development of advanced technologies for water treatment, pollution control, and environmental restoration, he was elected to the U.S. National Academy of Engineering in 1985.

He received the Stephen S. Attwood Award for Engineering Excellence from the College of Engineering in 1987, and was named a Distinguished University Professor in 1994. Both honors recognize faculty for exceptional scholarly achievement, national and international reputation, and outstanding teaching skills.

Each fall, the department hosts the Walter J. Weber, Jr. Distinguished Lecture in Environmental and Energy Sustainability. This lecture series brings the world's foremost experts in environmental engineering and science to campus to share the results of their work and their vision for the future. The event is made possible through the endowment to the University by the 1996 Athalie Richardson Irvine Clark Prize, awarded to Weber by the National Water Research Institute.

Recently, he endowed the Walter J. Weber, Jr. Professorship of Sustainable Energy, Environmental and Earth Systems Engineering, and in 2007, Gary Was, Professor of Nuclear Engineering & Radiological Sciences, and Materials Science & Engineering, was appointed to the chair.

In 2008, Weber was chosen as one of the "One Hundred Engineers of the Modern Era" by the American Institute of Chemical Engineers for his lifetime of work in the area of environmental process dynamics & system sustainability.



Walter J. Weber, Jr., and his daughters, (l/r) Elizabeth, Linda, Pamela and Wendy at the reception.

## Suljo Linic Receives Three Major Awards



Suljo Linic received three major international faculty awards this past year. He was awarded the ACS Colloids and Surface Chemistry Unilever Award. This award recognizes Linic's contributions to the field of surface chemistry and heterogeneous catalysis. He presented the award lecture at the ACS Colloids and Surface Science Meeting in New York, NY in June 2009.

Linic is also a recipient of the Camille Dreyfus Teacher-Scholar Award. The Camille and Henry Dreyfus Foundation selects awardees based on their research in chemical sciences. Only three chemical engineering faculty members in the country were selected for this prestigious award in 2009.

In addition, Linic was awarded a DuPont Young Professor Award in 2008, given to approximately 10, mainly assistant or associate, professors worldwide across multiple disciplines by the DuPont Corporation. The award recognized Linic's work in the fields of chemical energy conversion and electro-catalysis.

## NANOTUBES

CONTINUED FROM PAGE 1



Original pristine cotton yarn on the right and coated cotton yarn on the left.

found that the conductivity significantly increased. Their new material is more sensitive and selective as well as sim-

pler and durable than other electronic textiles, Kotov said.

Clothing that can detect blood could be useful in high-risk professions. An unconscious firefighter, ambushed soldier, or police officer in an accident, for example, couldn't send a distress signal to a central command post. But the smart clothing would have this capability.

Kotov says a communication device such as a mobile phone could conceivably transmit information from the clothing to a central command post.

"The concept of electrically sensitive clothing made of carbon-nanotube-coated cotton is flexible in implementations and can be adapted for a variety of health monitoring tasks as well as high performance garments," Kotov said.

It is conceivable that clothes made out of this material could be designed

to harvest energy or store it, providing power for small electronic devices, but such developments are many years away and pose difficult challenges.

Most recently the Kotov group has been working on scaling up and optimizing the process. Any fabric can be coated by modifying the surface. So far, they have worked with silk, cotton, nylon, and Kevlar®. Applications under development for this innovative technology are wearable energy harvesting/storing devices, virus-detecting sensors, and assistive devices for disabled people.

The researchers also hope to use this technology to make a flexible and lightweight radio frequency sensing material to be used in structurally integrated antennas for radar, guidance, satellite communication, and other related applications. The conformable antenna could be used where concealment is vital, such as in the next generation of the military's unmanned Aerial Vehicles (UAVs) and small ground vehicles.

(Shim, B.S., W. Chen, C. Doty, et al., "Smart Electronic Yarns and Wearable Fabrics for Human Biomonitoring made by Carbon Nanotube Coating with Polyelectrolytes," *Nano Letters*, 8(12), 4151-4157, December 2008.)

*From an article by Nicole Casal Moore, U-M News Service*

### Dow Building Repairs Soon to be Completed



On February 9, 2009, an electrical short circuit in the Dow Building mechanical room caused a fire that destroyed the motor control center for the entire building. The building was evacuated quickly and fortunately there were no injuries. Although Dow was only closed for a day, the ventilation was shut down for

two days, and all fume hoods were out of operation for two to four weeks to complete emergency repairs. The damage was extensive, so the motors in the building are running with temporary electrical hook-ups until all repairs are completed in September 2009.



**Nicholas Kotov's webpage:**  
[www.engin.umich.edu/dept/cheme/people/kotov.html](http://www.engin.umich.edu/dept/cheme/people/kotov.html)

# Designing Shape-Shifters

Developing blueprints for designer materials that can change their shape at will is the goal of a \$4.3 million, five-year grant chemical engineering professor Sharon Glotzer has received as a National Security Science and Engineering Faculty Fellowship from the Department of Defense.

This prestigious fellowship, one of only six awarded this year, will allow Glotzer and her research group to use modeling and simulation to discover how to create these shape-shifting materials from nanoparticles.

Today researchers can fabricate nanoparticles in many shapes and out of many substances. They can make particles assemble into different arrangements, which ultimately controls the material's properties.

Through this grant, Glotzer aims to nurture a burgeoning branch of nanotechnology. The particles she envisions would be substantially more complex than today's nanoparticles.

"We'll be designing new particles that don't yet exist, for materials that don't yet exist," Glotzer says. "They will be new building blocks with intrinsic functionality. In the far future, the basic science framework we develop in this project will provide the blueprints for materials that today can only be imagined."

Potential applications are vast, Glotzer says. In the national security realm, such materials could be used for protective uniforms and gear, chemical detection, and stealth, for example. An aircraft conceivably could be painted with a material that changes its appearance as a chameleon does, Glotzer says. A bulk solid could be made to soften on cue and then morph between multiple shapes,

each with a different purpose.

Advances in petascale computing could help bring about these next-generation materials. Petascale systems in development promise to be between 100 to 1,000 times faster than the "tera-scale" systems on many of today's college campuses. The University is a founding member of the Great Lakes Consortium for Petascale Computation, (GLCPC), which is a partner in "Blue Waters," the world's first sustained petascale computer system dedicated to open scientific research. It is expected to be online in 2011. Glotzer is the director of a new Virtual School of Computational Science and Engineering, affiliated with Blue Waters and the GLCPC.

*From an article by Nicole Casal Moore,  
U-M News Service*



**Sharon Glotzer's webpage:**

[www.engin.umich.edu/dept/cheme/people/glotzer.html](http://www.engin.umich.edu/dept/cheme/people/glotzer.html)

## Chemical Engineering Faculty to Participate in New Center

A new center will bring together U-M faculty—including chemical engineering faculty Sharon Glotzer, Jinsang Kim, Nick Kotov, Joerg Lahann, Ronald Larson, and Mike Solomon—to make a new generation of "active" building blocks capable of self-assembling into novel new materials. The nanometer and colloidal particles to be made will be designed and fabricated in collaboration with the Glotzer group's new five-year research grant to develop a theoretical and computational framework for reconfigurable, self-assembling materials.

## Gulari Appointed Associate Dean



Erdogan Gulari has accepted a five-year appointment as Associate Dean for Research and Graduate Education. He is not new to College administration: From 1986-1993, he served as Senior Associate Dean of the College.

Gulari, a faculty member since 1978, has received numerous awards, including the College's Excellence in Research Award and Excellence in Service Award, and the University's Faculty Recognition Award. In 2004, he was appointed the Donald L. Katz Collegiate Professor in Chemical Engineering. The main focus of his research is on microfluidic MEMS devices for DNA-peptide synthesis and genetic diagnosis.

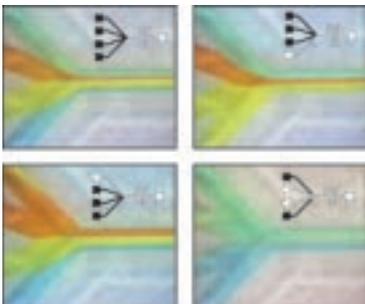
# Research News in Brief



Microfluidic assembly blocks fit together like puzzle pieces. Illustration by Hanna Bae.

**Mark Burns'** lab's make-your-own-micro-fluidic-device kit was named one of *The Scientist* magazine's top 10 innovations of 2008. **Min-soung Rhee**, a graduate student in the Burns group, developed the 16-piece set of microfluidic building blocks.

The device, also known as a "lab-on-a-chip," integrates multiple laboratory functions onto one chip just millimeters or centimeters in size. The kit in essence brings the lab-on-a-chip to the scientific masses. It cuts the costs and the time involved in making one from days to minutes. *From an article by Nicole Casal Moore, U-M News Service.*



Acoustically switchable liquid concentration gradients. Colored channel layout indicates the presence (black) or absence (white) of resonant tones supplied to the device.

Music, rather than electromechanical valves, can drive experimental samples through a lab-on-a-chip in a new system developed by **Mark Burns** and doctoral student, **Sean Langelier**. This development could significantly simplify the process of conducting experiments in microfluidic devices. To do an experi-

ment in a microfluidic device today, researchers often use dozens of air hoses, valves and electrical connections between the chip and a computer to move, mix and split pinprick drops of fluid in the device's microscopic channels and divots.

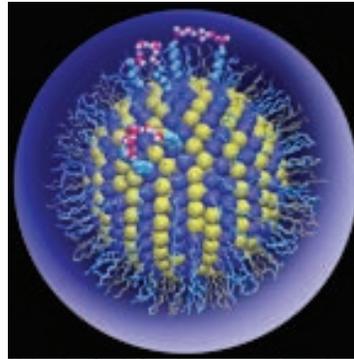
The new device uses sound waves to drive a unique pneumatic system that does not require electromechanical valves. Instead, musical notes produce the air pressure to control droplets in the device. This requires only one "off-chip" connection. *From an article by Nicole Casal Moore, U-M News Service.*

Watch video demonstration of music moving, splitting and sorting droplets at <http://www.ns.umich.edu/htdocs/releases/story.php?id=7247>



**Mark Burns' webpage:**

[www.engin.umich.edu/dept/cheme/people/burns.html](http://www.engin.umich.edu/dept/cheme/people/burns.html)



Molecular simulation shows how water molecules around a surfactant-coated nanoparticle restructure, changing thermodynamic properties. Image courtesy of Hao Jiang.

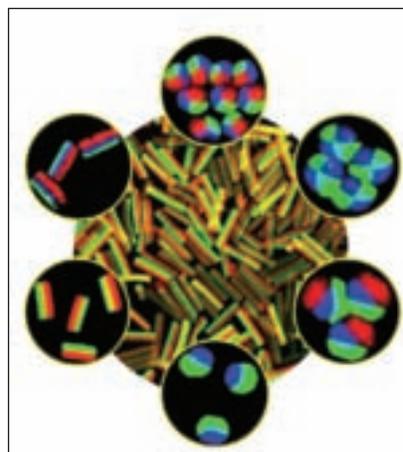
In the October 1 issue of *Nature Materials*, chemical engineering graduate student **Chetana Singh**, postdoctoral researcher **Hao Jiang**, and professor **Sharon Glotzer**, working together with collaborators at MIT, show how continuum thermodynamics fails for nanoparticles dispersed in water. Using molecular simulation, they showed how water

molecules order differently at the nanoparticle surface than in bulk water, changing the solid-liquid interfacial energy in an unexpected way, and violating predictions of continuum thermodynamics. The work has important implications for understanding the behavior and function of proteins.



**Sharon Glotzer's webpage:**

[www.engin.umich.edu/dept/cheme/people/glotzer.html](http://www.engin.umich.edu/dept/cheme/people/glotzer.html)



Multicompartment cylinders can be produced by a combination of electrohydrodynamic co-spinning and microsectioning. Each color in the longitudinal and cross-sectional micrograph images depicts an individual component.

Micro- and nanoparticles are being investigated for use as capsules for delivering drugs or for bioimaging. Hollow or core-shell spheres can for instance be used to carry drugs or imaging agents. To ensure optimum biological functionality, the chemical and physical properties of particles need to be precisely designed. Novel particle synthesis methods are needed that can yield

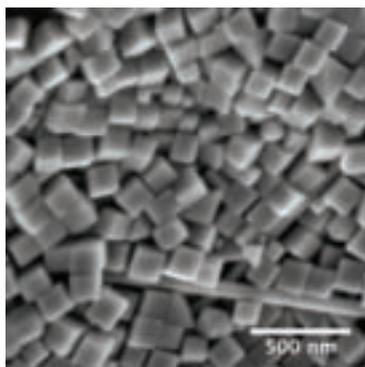
particles with defined size, shape, and compartmentalization. Particles with different compartments have been made, but so far only spherical ones.

Recently, **Joerg Lahann** and colleagues from the University of Michigan have made microcylinders with controlled size and shape that have two, three or even four compartments. They

used electrohydrodynamic spinning from two separate jets to create sectioned polymer microfibers and then cut them into cylinders around 50- $\mu\text{m}$  long by cryosectioning. The polymer was a lactide-glycolide copolymer, chosen for its biodegradable properties, which are useful in many biomedical applications.

Loading the different compartments with different dye molecules means that the structures were clearly visible under confocal laser scanning microscopy. The number and arrangement of the compartments could be controlled by altering the electrospinning process.

▶ **Joerg Lahann's webpage:**  
[www.engin.umich.edu/dept/cheme/people/lahann.html](http://www.engin.umich.edu/dept/cheme/people/lahann.html)



Scanning electron microscopy image of a tailored, highly selective silver nanocube catalyst for ethylene epoxidation.

of the shape of catalytic particles was demonstrated in a case study where it was shown that well-defined, tailored silver nanowires and nano-cubes are much more selective in heterogeneous epoxidation of ethylene to form ethylene oxide (EO) ( $\text{ethylene} + \frac{1}{2} \text{O}_2 \rightarrow \text{EO}$ ) than conventional industrial catalysts. The work was reported in the *Journal of the American Chemical Society*.

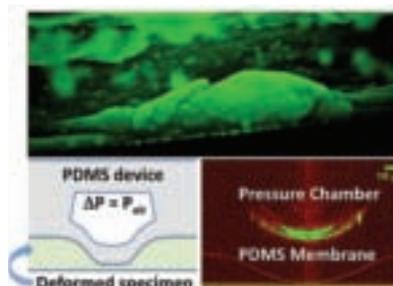
Linic and doctoral students **Hongliang Xin** and **Neil Schweitzer**, and former student, **Dr. Eranda Nikolla**, have recently demonstrated that there is a universal relationship between the electronic structure of alloy materials and their chemical activity and catalytic performance. They formulated a simple and physically transparent theory that allows one to predict the general effect of alloying on the electronic structure of a material and therefore on its chemical performance. This work is important since it represents a critical step towards the development of predictive theories of alloy catalysis, which will allow them to identify novel alloy catalysts without having to engage in inefficient trial and error experimental screening. Dr. Nikolla was co-advised by **Johannes Schwank** and Neil Schweitzer is co-advised by **Levi Thompson**.

▶ **Suljo Linic's webpage:**  
[www.engin.umich.edu/dept/cheme/people/linic.html](http://www.engin.umich.edu/dept/cheme/people/linic.html)

**Suljo Linic** and his doctoral student, **Phil Christopher**, have recently demonstrated that the shape of metallic nano-particles affects their chemical and catalytic performance significantly. This discovery opens up new avenues for the design of highly active and selective catalysts, as conventional catalytic materials have been limited to spheres. The effect

**Phil Savage** and his students have been processing plant-based oils, woody biomass, and microalgae in hot, pressurized water to produce  $\text{H}_2$  and liquid fuels. Novel chemical processes are needed to reduce the cost of biofuels and to facilitate the implementation of these renewable energy sources. Savage gave a keynote lecture on his group's research at the 9th International Symposium on Supercritical Fluids this spring in Arcachon, France. His lab has published a review article on biodiesel production and several other research articles describing their approach and results.

▶ **Phil Savage's webpage:**  
[www.engin.umich.edu/dept/cheme/people/savage.html](http://www.engin.umich.edu/dept/cheme/people/savage.html)



*Staphylococcus epidermidis* biofilm grown under capillary flow after 24 hours. Bottom: Schematic (left) and image (right) of how the flexible microfluidic rheometer deforms a specimen due to an applied air pressure. (Image by J. Younger, D. Hohne, and M. Solomon)

**Dr. Danial Hohne**, a recently-graduated PhD in chemical engineering, and his advisor, **Michael Solomon**, professor of chemical engineering and macromolecular science and engineering, have devised a microscaled, microfluidic device to help them understand the mechanical behavior

of biofilms, slimy colonies of bacteria involved in most human infectious diseases. Their research, with John Younger, associate chair for research in the Department of Emergency Medicine at the U-M Health System, was published in *Langmuir*.

Bacteria are single-celled organisms that rarely live alone. Most bacteria in nature take the form of biofilms. Biofilms experience various kinds of pressure in nature and in the body as they squeeze through capillaries and adhere to the surfaces of medical devices, for example. Representing a new application of microfluidics, the device measures biofilms' resistance to pressure.

The experiments were performed on colonies of *Staphylococcus epidermidis* and *Klebsiella pneumoniae*, which are known to cause infections in hospitals. *From an article by Nicole Casal Moore, U-M News Service.*

▶ **Mike Solomon's webpage:**  
[www.engin.umich.edu/dept/cheme/people/solomon.html](http://www.engin.umich.edu/dept/cheme/people/solomon.html)

# Department Kudos

## FACULTY



**Brice Carnahan** received the 2009 Lifetime Achievement Award in Chemical Engineering Pedagogy from Computer Aids for Chemical Engineering (CACHE) Corporation. The award was presented to Brice at the 2009 ASEE Annual Meeting in Austin, TX, in June.



**Sharon Glotzer** was selected as a National Security Science and Engineering Faculty Fellow by the Department of Defense. Sharon is one of six distinguished university faculty scientists and engineers in the U.S. chosen for this honor in 2009. She will use the \$4.5 million five-year grant to design self-assembled, reconfigurable materials.



**Nicholas Kotov** received the 2008 Gutenberg Fellowship and the 2008 Nanotech Briefs/NASA Top 50 Award. He also won the 2008 Great Lakes Entrepreneurship Quest Competition.



**Ron Larson** was the Mason Lecturer at Stanford University on May 11-13. The topic for his two lectures were "Microfluidic methods for analysis of polymer dynamics" and "Can microfluidics help us solve problems in biology and biotechnology?"



**Phil Savage** was a keynote lecturer on biofuels at the 9th International Symposium on Supercritical Fluids at Arcachon, France.



**Johannes Schwank** was recently appointed to the International Science Council of the King Abdullah Institute for Nanotechnology at King Saud University in Saudi Arabia. During the inaugural session of the International Science Council in March 2009, Johannes was invited to a private audience with King Abdullah of Saudi Arabia. In April, he returned to the Middle East to present a keynote lecture at the Amman Science Week in Jordan. Johannes also presented seminars at Princess Sumaya

University for Technology and at the King Abdullah II Design and Development Bureau in Jordan.



**Max Shtein** received the Presidential Early Career Award for Scientists and Engineers (PECASE). The award from the U.S. Office of Science and Technology Policy is the federal government's highest honor to early-career scientists and engineers.



**Jim Wilkes** has been elected a bye-fellow of his alma mater, Emmanuel College, Cambridge. Out of 30 Cambridge colleges, Emmanuel (founded in 1584) has rated first academically over the past five years, and has the highest number of would-be student applicants for each available place.

Jim received his bachelor's degree in Emmanuel College in 1955. At Emmanuel, he was Secretary of the Musical Society, Captain of the Table-Tennis Club, and Vice-President of the Thomas Young Club; he was also President of the University of Cambridge Chemical Engineering Society.

## Recent Promotions



**Jinsang Kim** was promoted to Associate Professor with Tenure.



**Michael Mayer** was promoted to Associate Professor with Tenure.



**Michael Solomon** was promoted to Professor with Tenure.



**Angela Violi** was promoted to Associate Professor with Tenure.



**Bob Ziff** was named one of the 360 Outstanding Referees of the *Physical Review* and *Physical Review Letters* journals, as chosen by the journal editors for 2009.

## STUDENTS



Elizabeth Stewart and Bobby Levine.

**Elizabeth Stewart** (Nick Kotov's group), **Robert Levine** (Phil Savage's group), **David Adams** (joint physics student; Bob Ziff's group), and senior

**Barry Shang** (Ron Larson's group) received National Science Foundation (NSF) Fellowships. The NSF awards given to our ChE students ranks our department in the top five schools nationally. A total of seven NSF fellowships were awarded to engineering students at Michigan.

**Fernando Resende** (recent graduate from Phil Savage's group) received the Walter J. Weber, Jr. Student Award in Sustainability.

**Robert Levine** (Phil Savage's group) was part of a team that won the inaugural Clean Energy Prize, in the contest sponsored by DTE Energy, the University of Michigan, the Masco Corporation Foundation and the Kresge Foundation. The team, Algal Scientific Corporation, won the top prize by developing a plan to use algae to simultaneously treat wastewater and produce the raw materials for biofuel. **Steve Edmund**, **Tom Gilbert**, and **Sameer Parvathikar**'s team were 3rd place.

**Robert Levine** (Phil Savage's group) was also selected as one of six new Graham Institute Graduate Fellows from across the University. The Graham Environmental Sustainability Institute provides funding to U-M students, faculty, and staff to further the research and education of environmental sustainability issues.

Four undergraduate students, **Yuan Chen**, **Lauren Fladger**, **Jessica Rilly**, and **Edwin Yik**, were selected to receive SURE (Summer Undergraduate Research in Engineering) awards to work in department research labs.

## Schwank Named Street Endowed Professor



Jim and Judy Street, with the new James and Judith Street Professor of Chemical Engineering, Johannes Schwank, at the April 23 lecture in the Lurie Engineering Center.

Johannes W. Schwank was installed as the James and Judith Street Professor of Chemical Engineering at a lecture and ceremony on April 23, 2009. Johannes joined the faculty at the University of Michigan in 1980 where he rose through the ranks and became Professor of Chemical Engineering in 1990. He served as chairman of the department from 1990 – 1995, and is currently a member of the College of Engineering Executive Committee.

Johannes is the author of more than 150 publications, and holds nine U.S. patents. His research group is working on a wide range of topics, including nanostructured materials for catalysis, energy storage, and gas sensing applications; synthetic fuels from coal and biomass; hydrogen production from gasoline, diesel, and jet fuel; solid oxide fuel cells; automotive emission control catalysts and sensors;

and novel materials synthesis and characterization methods.

He received the Giuseppe Paravano Award for Excellence in Catalysis Research, the Research Excellence Award, and the Class of 1938E Distinguished Service Award from the University of Michigan. He serves on editorial boards and advisory committees for several academic institutions in the United States and abroad.

ChE alumnus and former executive of the Shell Oil Company and the Royal Dutch Shell Group and his wife, Jim and Judy Street, endowed this chair. Jim (BSE ChE'59, MS '61, MSE ChE '61, PhD '63) was an assistant professor in the department before he left academia in 1963 to work as a research engineer for Shell Oil, beginning his extraordinary 39-year career with the company. We were honored to have Jim and Judy attend the ceremony in April.

# Annual Department Lectures

Mark E. Davis, the Warren and Katharine Schlinger Professor of Chemical Engineering at the California Institute of Technology, was the 2009 Donald L. Katz Lecturer. Dr. Davis was honored at the two-day event on April 30 and May 1, where he presented two lectures. The first topic was “Nanoparticle Cancer Therapeutics: From Concept to Clinic,” and his second was “Design of Hybrid Inorganic-Organic Materials for Heterogeneous Catalysis.”



Professor Davis has over 350 scientific publications, two textbooks and over 50 patents. He is a founding editor of *CaTTech* and has been an associate editor of *Chemistry of Materials* and the *AIChE Journal*. He is the recipient of numerous awards, including the Colburn and Professional Progress Awards from the AIChE and the Ipatieff, Langmuir and Murphree Prizes from the ACS. He was elected to the National Academy of Engineering in 1997 and the National Academy of Sciences in 2006.

Davis' research efforts involve materials synthesis in two general areas—namely, zeolites and other solids that can be used for molecular recognition and catalysis, and polymers for the delivery of a broad range of therapeutics. He is the founder of Insect Therapeutics Inc., a company that focused on the use of cyclodextrin-containing polymers for drug delivery applications, and Calando Pharmaceuticals, Inc. a company based in Pasadena, CA that created the first RNAi therapeutic to reach the clinic for treating cancer.

## 2008 UM/MSU Joint Seminar

Juan J. de Pablo, the Howard Curler Distinguished Professor in the Department of Chemical and Biological Engineering at the University of Wisconsin, was the featured speaker at the 27th Annual UM/MSU Joint Seminar last fall. Dr. de Pablo's topic at the October 9, 2008 event was “Field Driven Assembly in Nanotechnology.”

de Pablo obtained his BS at the Universidad Nacional Autonoma de Mejico and his PhD at the University of California, Berkeley, both in chemical engineering. He has won numerous awards, including the National Young Investigator and PECASE awards from NSF and young faculty awards from the Camille and Henry Dreyfus Foundation, Xerox Corporation, 3M, and Dupont.

His research focuses on developing and applying molecular simulations to enhance understanding of the physical and chemical properties of fluids and solids, with the objective of developing efficient chemical processes and developing new materials.



William F. Banholzer, Executive Vice President and Chief Technology Officer of The Dow Chemical Company, was the 2008 Walter J. Weber, Jr.

Lecturer. The topic of Dr. Banholzer's lecture on November 6, was “Changes in the Energy Market and their Impact on the Chemical Industry.”

Banholzer earned a bachelor's degree in chemistry from Marquette University and master's and doctorate degrees in chemical engineering from the University of Illinois. He holds 16 U.S. patents and has over 80 publications, which have received more than 1000 citations, for his work in the field of engineering and chemistry.

In 2002, Banholzer was elected to the U.S. National Academy of Engineering. He is a member of Dow's Executive Leadership Committee, Management Committee, chairs the company's Innovation Committee, and leads Dow's research and development activities across the globe. Prior to working at Dow, Banholzer had a 22-year career with General Electric Company (GE), where he was vice president of Global Technology at GE Advanced Materials.

# Class Project Attracts High School Students



Matt Robinson, Chris Larson, and Joe Janiak show their homemade heat exchanger to a high school student.

Students in Professor Lola Eniola-Adefeso's heat and mass transfer class in Fall 2008 got a chance to showcase their understanding of heat and mass transfer in a very creative way. Their term project was to design an original experiment that would be suitable for a high school teacher to use in demon-

strating a mass or heat transfer principle or concept in class that would attract high school students to chemical engineering. Students took the project to heart, with demonstrations showing key course concepts such as heat transfer in a countercurrent exchanger, mass transfer via carbon dioxide gas in liquid soda pop, and material dependence of heat conductivity via the cutting of ice.

Students from nearby Ypsilanti High School were invited to attend an exhibit of the projects and test the various experiments. The students said

they appreciated the chance to get hands-on experience and went away with an understanding of everyday principles from an engineering perspective. About two-thirds of the students felt "highly" excited about or engaged with the presentations they saw. These students also felt they learned something new and were highly motivated to pursue an engineering career. Their teachers spoke highly of this opportunity for their students to get exposure to chemical engineering.

Other faculty might have been overwhelmed by the enormity of the project, particularly for a class of 124 students, but Professor Eniola-Adefeso didn't let any of these hurdles keep her from providing her students with this enriching experience. This enthusiasm and creativity in teaching is an example of what makes her such a valuable faculty member.

## Obituary

### Imade Asemota, 1984 – 2009



Imade Asemota, first-year student in Lola Eniola-Adefeso's research group, passed away on April 10, 2009. Imade was born in London, and grew up in Nigeria and Jamaica. She received her bachelor's degree from North Carolina A&T State University in 2005, and her master's from Michigan State University in 2007.

Ms. Asemota was an active member of MUSES (Movement of Underrepresented Sisters in Engineering and Science), a mentor in the MUSES program, and a GEM PhD fellow. Although Imade was a graduate student, she had a lot of contact with undergraduates, particularly in her role as a mentor.

She is missed by her colleagues and classmates, who recall her positive attitude and encouraging smile.

## Cory Phillips

# Proud to be Part of the Tradition

Cory Phillips is never shy about sharing his Michigan Wolverine experiences with his Oklahoma Sooner and Oklahoma State Cowboy neighbors in Tulsa, Oklahoma. “Sometimes they get tired of all my boasting, but I can’t help it!” This Detroit native still stays informed about many of the activities going on in Ann Arbor and knows he and his wife, Erika, want to pass on their love for Michigan to their two children, Taryn and Cory Asher.

Cory graduated with a bachelor’s degree in ChE in 1993 and received a PhD from the University of Iowa in chemical and biochemical engineering, concentrating on the production of renewable fuels and oxygenates. He returned to Michigan for post-doctoral work in 1998 with Levi Thompson.

“I owe so much to Levi and Derrick Scott of the Minority Engineering Program Office (MEPO) in the College. I’ve known Professor Thompson since high school and credit him for launching my career in chemical engineering. He is a dear friend, mentor, and colleague, who encouraged me to go to graduate school and to pursue a career in energy.”

After working with Honda R&D for a few years, Cory took a job at ConocoPhillips, where he began his career at the Detroit office in the area of surface tribology/tribo-chemistry. His manager in Detroit was Gary Balzhiser, son of ChE alumnus and former department faculty member and chair, Dr. Richard Balzhiser.

**“I was blessed to receive an incredible education from hard-working, gifted people and feel an obligation to do what I can to maintain the rich heritage and tradition of excellence that U–M faculty, staff, and alumni share.”**

**Cory Phillips**



Cory Phillips (BSE '93) with daughter, Taryn, and son, Cory Asher.

Today, Cory is working with the Advanced Hydrocarbon Fuels group as a senior research engineer at the Bartlesville Technology Center. He is responsible for the molecular design and development of new fuels.

“When I first joined ConocoPhillips I was concerned that I may have sold out to big oil and was turning my back on my work in renewable energy. Well... I

did, but not really. It is more and more apparent to me that this industry is trying to transform itself, and I realize now this only can be accomplished with the help of researchers like me, who have backgrounds in renewable and alternative energy.”

Cory serves as the lead recruiter for ConocoPhillips to the University of Michigan and will be one of the newest members to the ChE alumni board this fall.

Cory says he puts more effort into family and community these days. He’s been actively involved in his company’s

annual collaboration with the United Way. He’s also serving in various capacities with a few church, civic, and community organizations. It’s always been important for him to “give back” to society, and says he is teaching his kids to do the same.

“I was blessed to receive an incredible education from hard-working, gifted people and feel an obligation to do what I can to maintain the rich heritage and tradition of excellence that U–M faculty, staff and alumni share. It always makes me proud to part of this distinguished community, and I am amazed at Michigan’s ability to hire talented scholars and faculty who keep Michigan continually at the cutting edge of science and research.”

## Regina and Mike Iwaniw

# Michigan Important in Their Lives

Mike Iwaniw was a new transfer student at the University of Michigan in 2000. He quickly joined other ChE students in study sessions at the Media Union (now the Duderstadt Center). Mike enjoyed talking with classmate Regina Staniszewski during their much-needed study breaks and, before the end of the year, they were officially a couple.

During the next several years, Ann Arbor became a meeting place for them when their relationship became a long distance one as they accepted jobs and internships in different cities. During all their separations they always came “home” to Ann Arbor for reunions.

When Regina and Mike were married in September 2003, they were finally living in the same city, Midland, Michigan. Mike had accepted a job at Dow in 2002, where he started with a rotational program, working in several areas of the organization. In 2003, he worked as a process engineer and later as an engineering lead on major capital projects. Mike moved to latex manufacturing in 2006 as a production engineer responsible for day-to-day plant operation, and in 2008 to the improvement engineer role, where he executed capital projects. Regina had started at Dow in process engineering in 2002 and was a supporting and lead engineer on projects across multiple businesses, including Dow Automotive, Ethocel, and Glycol Ethers. In 2005 Regina moved to the Latex Technology Center, where she worked on business-aligned process engineering efforts.

In late 2008, both Regina and Mike joined the specialty latex business, which Dow is selling by FTC mandate following the acquisition of Rohm & Haas. Mike

is a project manager and business capital coordinator, and Regina is the business lead process engineer. The new company is tentatively called UCAR Emulsion Systems and Monomers. Being part of this new venture appeals to the entrepreneurial spirit in them both, something that grew, in part, during their time at Michigan.

Regina and Mike are both Certified Six Sigma Black Belts, and Mike is currently completing his MBA through Northwood University. Both have been active in recruiting and hiring for Dow, and Mike has given several guest lectures about being a new engineer in industry for Professor Fogler’s class.

“The University of Michigan and, in particular, the Chemical Engineering Department have played important roles in our lives,” Regina says. “Michigan was where we met not only each other, but where we formed many close friendships with our classmates, whom we still keep in contact with today. It was a beneficial experience for both of us to be part of such a close-knit group of students and faculty in the department. We like getting back to campus, both to meet new aspiring engineers as well as to reminisce about the great times spent on campus.”

Today, the couple lives in Freeland, MI, with their two beautiful children, Rachel, 3, and Jacob, 1, the lights of



Regina (Staniszewski) (BSE '02) and Mike Iwaniw (BSE '01) with children, Jacob and Rachel.

**“University of Michigan was where we met not only each other, but where we formed many close friendships with our classmates, whom we still keep in contact with today. It was a beneficial experience for both of us to be part of such a close-knit group of students and faculty in the department.”**

**Regina Iwaniw**

their lives. Regina plays volleyball and soccer in local women’s leagues, and still regularly trains as a long-distance runner. Mike likes to golf, snowboard, and get into the gym when he can. *Go Blue!*

# Scholarship Funds Change the World

Those of you who generously support our undergraduate scholarship programs must wonder sometimes who benefits from these funds, and what impact your dollars have. The list below includes all students whom you have impacted through your generosity. In this issue we feature one of these students, Aubrey Parker.

Aubrey transferred into our program from Kalamazoo College, as part of a



dual degree program. Her passions for environmental issues and for South America have guided her actions and, through experiences in student

organizations, technology, activism and education, she is preparing herself for a career in the environmental area.

Soon after she transferred to Michigan in January 2008 she became involved in many environmental groups on campus, including Blue Lab (Better Living Using Engineering), and within a year she was executive director of the sustainability group, overseeing groups in international sustainability projects. Last winter term she was selected as one of 16 students from throughout the University to participate in a “Sustainable Energy Development in South America,” course, which includes a one-week trip to Chile to understand better the impact of hydropower development in the Patagonian region. This summer she is completing an internship with “Circle of Blue” preparing reports on the global freshwater crisis. You can read her reports at <http://www.circleofblue.org/waternews/>.

Aubrey knows that technology alone won’t solve the problem. She has lobbied Congress about climate change and been active in environmental activism. She also has worked to educate the next generation. While a student at Kalamazoo, Aubrey completed a one-semester study abroad experience in Quito, Ecuador and followed that up with one semester teaching ecology, chemistry, art, and American culture at two high schools in Quito, also overseeing student research projects.

Aubrey has worked numerous jobs in past summers to pay for her education, so many that more than half of them

had to be removed from her resume to meet the one-page requirements of our internship fair. Tuition assistance, such as the funds she received as a recipient of the Richard I. and Willogene G. Rice Scholarship, has made it possible for Aubrey to focus on gaining the skills and knowledge she’ll need to fulfill her goals. Last month, she was delighted to find out that she also received a BP Scholarship. We understand you have many options to choose from in determining how best to invest your contributions. We hope this story of the impact your dollars can have will help you make these important decisions.

## ChE Undergraduate Scholarships, 2009

### Theodore C. Argue Scholarship

Max Rutz

### The Clifton S. Goddin Prize

Edwin Yik

### Helen B. Gibson Scholarship

Erin Baragar  
Andrew Sereno

### Lloyd L. and Barbara B. Kempe Scholarship

Steven Cavnar  
Dan Hassing  
Andrew King  
Ran Li  
Ian Sebastian

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Olabode Ajenifujah  
Ashley Bragadin  
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Amber Chacon-Saavedra

Laura Chang  
Noel Delgado  
Brittany Flaherty  
Alon Mandel  
Ryan McKee  
Aubrey Parker  
Deandre Reagins  
Nicholas Schuelke  
Khurram Siddiqi  
Stacy Yee  
Matthew Zielinski

### Jane & Howard TenBroeck Scholarship

Alfred Chung  
Daniel Confer

### James O. Wilkes Scholarship

Vikas Hiremath  
Audra Willams

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Yuan Chen

## Diane Finegood



Diane T. Finegood (BSE '78) received the 2008 ChE Alumni Society Merit Award and was a guest of honor at the society's dinner

during Michigan Engineering Homecoming Weekend in October 2008.

Dr. Finegood serves as scientific director of the Canadian Institutes of Health Research Institute of Nutrition, Metabolism and Diabetes. Under her leadership since December 2000, the Institute has guided Canada's health research agenda related to nutrition, metabolism, diabetes, endocrinology, the kidney, the liver and the gastrointestinal tract. Dr. Finegood's research spans many disciplines, including integrative physiology, cell biology, mathematical modeling, metabolism, immunology and nutrition. Additionally, she is internationally recognized for advancing the understanding of the pathogenesis of type 1 and 2 diabetes through the use of mathematical modeling. Dr. Finegood was elected into the Canadian Academy of Health Sciences, in 2007.

An accomplished author, she has written more than 100 peer-reviewed articles and book chapters. She is also a professor in the School of Kinesiology at Simon Fraser University in British Columbia. She earned a doctoral degree in physiology and biophysics from the University of Southern California, and holds engineering degrees from both the University of Michigan and Northwestern University.

*From College of Engineering  
Communications and Marketing*

## Chemical Engineering Fall Alumni Events

### Monday, September 21, 2009

#### Career Fair Reception

4:30 - 6:00 p.m.

3158 H.H. Dow

(Podbielniak Lounge)

Please stop by for this annual event if you're in town. This is a great opportunity for all you recruiters to kick back and relax after a long day on your feet.

### Friday, September 25, 2009

#### Lunch and Meeting with Students

Johnson Rooms

Lurie Engineering Center

11:30 a.m.-1:30 p.m.

We would like you to join us for lunch and conversation with our undergraduate students and faculty. Tom Gougeon (BSE '58), the 2009 Alumni Society Merit Award recipient, will be the featured speaker.

If you would like to join us for lunch, sign up for "Lunch with the Departments" when you register for alumni weekend. If you have not made reservations, you can register online at [www.engin.umich.edu/alumni/events/homecoming](http://www.engin.umich.edu/alumni/events/homecoming). Please contact Sandy Swisher (734-764-7413, [sandys@umich.edu](mailto:sandys@umich.edu)).

### Monday, November 9, 2009

#### Annual AIChE Meeting Open House

7:00 - 9:00 p.m.

Nashville, Tennessee

We will be hosting an open house during the annual meeting and invite you to stop by and visit with faculty, students, and alumni.



## Connect with ChE Alumni and Friends!

Looking for a way to reconnect with U-M ChE alumni friends? You can find many of us by going to [www.linkedin.com](http://www.linkedin.com) and searching under groups for "Michigan chemical engineering." Please join us and help us grow this online community.

# Alumni Notes

**Frank Tranzow** (BSE '59) moved from his winter abode in Arcadia, CA, to his summer retreat at Red Feather Lakes, CO. The highlight of 2009, so far, was representing the Engineering Class of 1959 at the Engineering graduation exercise. He's looking forward to his 50th reunion and the events on campus homecoming weekend.

**Mark Leidy** (BSE '79, MBA '92, University of Iowa) has built a career with Monsanto. Since graduating from the University of Michigan, Mark has lived and worked around the world helping Monsanto deliver Roundup™ herbicide as well as corn, soy, cotton, canola and vegetable seeds. After 30 years with the company, Mark is Monsanto's executive vice president of global manufacturing and oversees manufacturing operations in 33 countries and 156 locations. He is also responsible for the corporate environment safety & health, procurement, supply chain and engineering efforts that make Monsanto's products possible. He and his wife, Diane, and their two children, Katelyn (20), and David (17), live in St. Louis, Missouri and enjoy family ski trips and golfing.

**Steve Pondell** (BSE '79) has recently formed a new consulting firm, Integrated BioTech Solutions. With a partner and a team of associates, the company provides expertise to pharmaceutical, biotech, and device companies in the development and commercialization of their products. Steve and his wife, Pat, live in Sugar Land, TX, a suburb of Houston. They enjoy the area very much and do not miss snow at all!

**Robin L. Brack** (BSE '80) is currently the director of Environmental, Health and Safety for Solopower, Inc., a PV Solar start-up in San Jose CA. She is also working with a local community college on curricula for retraining displaced workers so that they can transition to solar manufacturing jobs.

**Paul Theisen** (BSE '85) is a logistics improvement leader in Dow Chemical in Midland, MI, working on a team integrating Rohm and Haas into Dow. He joined Dow in 1986 and has spent his career in Midland. He

and his wife, Kristine, have been married for 16 years. When he isn't spending time with his daughters (Casey and Jessica), he finds time to go to U-M Football games or watch the Wings and Tigers in his "basement sports bungalow."



**Paul Theisen with daughters, Casey and Jessica, and family dog, Sandy.**

**Kevin Peil** (BSE '86) recently opened a microbrewery called Tri City Brewing in Bay City, MI. His nine different beers are available in bottles and on draft throughout the mid-Michigan area.

**Steven H. Waier** (BSE '88) has worked at Dow Corning Corporation since graduation. In that time he has held a variety of positions in technical service, process engineering, manufacturing and commercial industry roles. In 2008, he was promoted to a new position as the maintenance & reliability manager for the Midland site, located in Midland, MI. Steve is married to **Amy Rosicky** (BSE '89), and they have two boys, David (11) and Matthew (9). Steve is Dow Corning's lead recruiter at the Michigan and returns to campus every fall for engineering interviews.

**Alex Packard** (BSE '91) continues to work at Abbott in Chicagoland and is currently unit manager in manufacturing within the Global Pharmaceutical Operations division. He has been recruiting engineers from Ann Arbor the past several years. The family welcomed another daughter and potential Michigan

engineer, Karis Irene Packard, born on October 28, 2008. She joined older siblings Kayla (11), Kyle (9), and Bryan (4).

**Mike Schultz** (BSE '93) recently relocated to Kuala Lumpur, where he took a position with Battelle Science and Technology Malaysia. He will be helping to establish a laboratory to develop technologies for renewable fuels, chemicals, and energy. In other news, he and his wife, Anne, recently welcomed son Thomas Thornton Schultz, on September 25, 2008, who is looking forward to exploring Southeast Asia with big brother Charlie (age 2).

**Matt Birchmeier** (BSE '94) and his wife, Amy, now have two little boys at home, Luke and Tyler. They sure keep their mommy busy at home! Their daddy still works at Pfizer Animal Health in Kalamazoo, trying to engineer the right crystalline materials for the new animal health drugs in the pipeline.

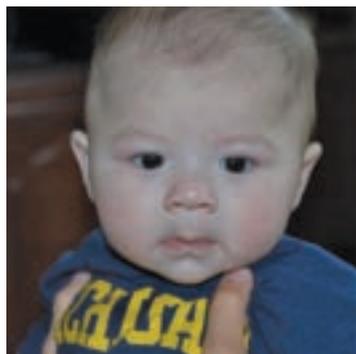
**Manos Mavrikakis** (PhD '94), the Paul A. Elfers Professor of Chemical Engineering at the University of Wisconsin-Madison, has received the 2009 Paul H. Emmett Award in Fundamental Catalysis from the North American Catalysis Society, an award given every two years to an individual performing research in catalysis. You can find more info at <http://www.nacatsoc.org/news.asp?NewsID=136>.

Please take a minute to send a note or e-mail to us ([cheme@umich.edu](mailto:cheme@umich.edu)) and let us know what you're up to!

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

Visit the ChE Alumni News page at [www.engin.umich.edu/dept/cheme/alumni.html](http://www.engin.umich.edu/dept/cheme/alumni.html)

**Mike Colarossi** (BSE '98) and his wife, Kennes, are proud to announce the arrival of their first "little wolverine." Andrew Thaddeus Colarossi was born in Hong Kong on March 13, 2008.



**Andrew Thaddeus Colarossi**

**Johanna E. Rovira** (MSE '99) is in her native Puerto Rico working with Eli Lilly in MS&T/Technical Services. You can keep in touch with her on Facebook or MySpace. Her email is johannar@umich.edu.

**Eric Bernath** (BSE '00) graduated from the Darden School of Business at the University of Virginia in May 2008 with his MBA. After enjoying a 34-country round-the-world backpacking trek, he relocated to Southern California to join Amgen's Commercial Leadership Program.

**M. Jahi Chappell** (BSE '00) received his PhD in ecology and evolutionary biology from the University of Michigan in 2009. He is currently a postdoctoral associate in the Department of Science & Technology Studies at Cornell University, continuing his work on biodiversity conservation and food security. A paper he co-authored in 2007, showing that organic agriculture can produce sufficient yields to feed the world, has continued to generate interest and discussion, and has been mentioned by the Associated Press and by author and journalist, Michael Pollan, in *The New York Times*.

**Jennifer (Chen) Morikawa** (BSE '00) received the Society of Women Engineers (SWE) Distinguished New Engineer Award in 2008 for her work at General Motors and involvement with SWE on the local, regional, and national level, including supporting the

collegiate section at U-M. The award was presented at the SWE National Conference in Baltimore, MD.

**Julie (Messacar) Rivard** (BSE '00) and her husband, Todd, welcomed their first child, Jocelyn Renee Rivard, on April 6, 2009.

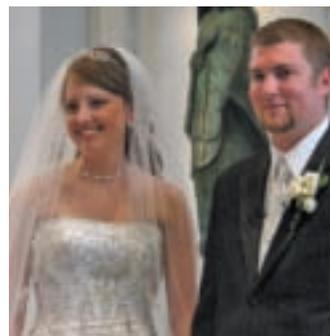
**BT Cesul** (BSE '01) and his wife, Karen (UM BS Psych '03), are expecting their first child in September in Dayton, OH. Ultrasound photos already show the baby mooning in the direction of Columbus.

**Marissa (Bayman) Patrick** (BSE '03) will be reaching her six-year anniversary at Merck in West Point, PA. Over this time, she has held multiple positions within Technology and Quality supporting Sterile Operations. Marissa has been in her current role for two years now as a senior engineer supporting the manufacture of Varicella bulk vaccine. In March 2009, she married Rich Patrick, a fellow Merck employee.

**Johnique Billups** (BSE '03) is getting married to Joseph Atkins on September 26, 2009 in her hometown of Rochester, NY. She is currently pursuing a PhD in pharmaceutical science at Florida A&M University and is expected to graduate in the spring of 2010. After graduation, Johnique and her future husband will reside in Houston, TX.

**Nicole (Arnold) Bartlett** (BSE '05) and Joshua Bartlett (BSE EE, CompE '04) were married on August 2, 2008 in Romeo, MI. They currently reside in Bay City, MI where Nikki is a senior manufacturing engineer for SC Johnson. Josh founded and manages an IT services company.

On April 19, 2008, **Brian Reger** (BSE '05) and **Heidi Knickerbocker** (BSE '05) were married in Ann Arbor. They moved to Denver, CO where Heidi is working at Halliburton and Brian is working at Forest Oil.



**Brian and Heidi (Knickerbocker) Reger**

After working at a start-up company for two years, **Scott Taylor** (BSE '06) moved to live on the beach in the Dominican Republic. He now spends his days surfing, kiteboarding, and enjoying the company of friends at the local beach bars. He works a few hours a week on a variety of projects to earn money to cover expenses.

**Albert Sawalha** (BSE '07) has been employed by Air Liquide Large Industries based in Houston, TX. He is working as a process controls engineer training with the Emerson DeltaV process management system. He is enjoying warmer weather and looking forward to attending the rodeo!

### In Memoriam

**Dr. Murray Player** died on March 21, 2009. Dr. Player, born in Dalby, Queensland, Australia, received an MSE in 1966, and a PhD in 1969 from the then Chemical and Metallurgical Engineering Department, in which he was very popular with his fellow students. While in Ann Arbor he met and married Beatrice, a computer systems analyst employed at University Hospital.

Murray worked in factories in Australia and Fiji, and in research and development

on cane sugar milling, sugar refining and alcohol production. Beginning in 1972 he was appointed to a series of roles including inspecting chemist, production inspector, advisor to Fiji Sugar Corporation's mills, and manager in Research and Technology. In 1985 he was appointed chief technologist, Sugar Division. In 1988, he was also appointed manager of the Central Laboratory, a position he held until his retirement in 1999, after 43 years of service.

Update your contact information with the University at [www.engin.umich.edu/alumni](http://www.engin.umich.edu/alumni)

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### **Emeriti Weekly Lunch Group + Flat Charlie**



**Dale Briggs, Rane Curl, Frank Donahue, and Ed Young, with Flat Charlie**

Dale Briggs, Rane Curl, Frank Donahue, and Ed Young posed for a photo at their weekly emeriti lunch at Knight's Restaurant in Ann Arbor. Flat Charlie was invited to join the group because he and Frank are collaborating on some battery technology workshops for EU designers, manufacturers, and end-users at a conference center outside Dublin. Of course, they'll be taking in some of the tourist sights as well. Pictures will be provided on our return (pictures from the last Ireland trip are at [www.engin.umich.edu/dept/cheme/alumni/flatcharlie.html](http://www.engin.umich.edu/dept/cheme/alumni/flatcharlie.html)).



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**H. Scott Fogler** • Flow and Reaction

**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, 3D Tissue Engineering

**Joerg Lahann** • Biomaterials and Biointerfaces

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**Xiaoxia Lin** • Systems and Synthetic Biology

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**Suljo Linic** • Catalysis, Surface Chemistry and Fuel Cells

**Michael Mayer** • Biomembranes

**Charles W. Monroe** • Electrochemistry

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

**Michael J. Solomon** • Complex Fluids and Nanocolloids

**Levi T. Thompson** • Catalysts, Fuel Cells, and Microreactor

**Angela Violi** • Multiscale Computational Nanoscience

**Henry Y. Wang** • Bioprocess Engineering and Pharmaceutical Engineering

**Peter J. Woolf** • Systems Biology and Bioinformatics

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

**Robert M. Ziff** • Nanostructures, Catalysis, and Modeling