In what has truly become a multidisciplinary field, researchers in the Department of Chemical Engineering and Materials Science are taking an active role in determining the future of health sciences in America. From diagnostic tools and implants to lab-grown tissue, the next generation of medical miracles is just as likely to come from an engineer as from a medical doctor.

**Engineers Offer New Tools for Understanding, Preventing Disease**

Christina Chan, associate professor, is using metabolic engineering and systems biology in the fight against Alzheimer’s and diabetes. She and an inter-disciplinary team of researchers are taking a two-pronged approach to understanding and treating the diseases that together contributed to the deaths of more than 300,000 Americans last year.

Working from what she calls a top-down approach, the researcher is developing mathematical models to help identify which genes and proteins are responsible for Alzheimer’s and diabetes. Chan hopes that her systems biology research will lay the groundwork for software that can identify pathways from high-throughput gene analysis that may become novel targets for treating these diseases.

“This could be a highly effective tool to help people understand the genes or proteins causing any number of diseases,” she says. “For example, we could identify the pathways responsible for faster growth of certain cancer cells, shut them down, and thus slow the rate of cancer metastasis.” Chan says pharmaceutical companies could also benefit from the systems biology framework. “If you understand how a disease develops, you can develop more targeted ways of intervening and create drugs to treat the disease with minimal toxicity.”

Chan is using RNA interference (RNAi) to interrupt the protein production of potential genetic culprits and studying the results. “The basic idea is to alter the genes that you determine may be involved in the diseases through the systems biology approaches and then experimentally validate if the outcome is what you expect,” says Chan. Eventually, she would like to be able to manipulate the disease-causing genes to prevent diabetes and Alzheimer’s, even in the presence of genetic predisposition and environmental causative agents.

Chan’s research is funded by the National Science Foundation, National Institutes of Health, Environmental Protection Agency, and the Whitaker Foundation.
In technical research fields there is an unfortunate tendency to speak of the work we do in terms of particles, data points, grants, and proposals. While these issues are certainly critical, the semantics of research often mask the most essential piece of the equation—people. For the benefit of all humanity, good researchers struggle through the frustrations and disappointments inherent in the discovery process. It is their hope that these endeavors will pay great dividends in terms of quantity and quality of life for people around the world.

Perhaps nowhere is the research connection to humanity more evident than in the exciting interdisciplinary field of biomedical engineering. Exploiting the medical knowledge of the scientist and the problem-solving expertise of the engineer, hybrid technologies are being developed that have the potential to revolutionize the way we care for the human body. The Department of Chemical Engineering and Materials Science is privileged to take an active role in the emergence of this vital collaborative field.

This issue’s cover story details the activities of just a few of our faculty members engaged in biomedical engineering research. Their efforts in fields like proteomics, RNA interference, and tissue engineering are paving the way for better healthcare and expanding our notions of what is medically possible.

We may occasionally become consumed by our research, but we strive always to recall that—in the final analysis—the people of this community, this state, this nation, and the world are the beneficiaries of the knowledge we garner through our efforts. We also recognize that the contributions our alumni have made to humanity continue to bolster the reputation of Michigan State University and secure the continuation of our scientific activity. Thank you for your efforts and your dedication, and we hope you enjoy this issue of The Bond.

~ Martin Hawley
Professor and Chairperson
Department of Chemical Engineering and Materials Science

Faster than a speeding bullet, able to leap tall buildings in a single bound, he’s the man of … plastic? Thanks to the work of chemical engineering and materials science professor, Michael Mackay, and his graduate student, Anish Tuteja, the way we think of plastics may change forever. The researcher has discovered two rules for dispersing nanoparticles in polymers that have revolutionized nanotechnology in this field and earned his research a coveted place in the March 24 issue of Science.

According to Mackay, the ability to evenly distribute nanoparticles in plastics eluded investigators in the polymers field until he and his group—including Phillip Duxbury, MSU professor of physics and astronomy—discovered two general rules that make it possible to disperse nanoparticles in any polymer. First, the nanoparticles must be smaller in size than the polymer molecule to prevent separation. Second, the nanoparticles must be between 5 and 20 nanometers, or they may behave more like molecules and follow different dispersion rules.

All of this means that Mackay has made it possible for materials scientists to create an entirely new generation of plastics, the applications of which are just starting to be explored. The nanoparticle-doped polymers are stronger, tougher, more heat-resistant, easier to work with, and can even be magnetic. These properties have potential research sponsors—including the U.S. Army and German chemical company, BASF—taking a hard look at the new technology.

Thus far, the processing implications of the material are the most exciting outcome of Mackay’s research. Molten plastic mixed with nanoparticles is thinner—or less viscous—and therefore easier to work with. “When nanoparticles and polymers are mixed by our rules, the viscosity decreases,” he says. “That means you can process materials 5 to 10 times faster—saving money and time. You get a stronger product for less money.”

Mackay continues to work on potential applications for nanoparticle-doped polymers. Some possibilities on the table include solar panels, multifunctional fibers, sensors, and even biomedical devices. “We really don’t know what this will lead to yet,” says Mackay. “We’ve just solved a major problem in nanotechnology. This will affect everyone working with plastics.”
It’s the end of the month and you’re out of cash. Wouldn’t it be great if you had a machine that could print you enough to get by until payday? Well, believe it or not, many Americans are doing just that. Using digital imaging equipment and home computers, the amateur forger dealing in small batches of currency is quickly becoming one of the top threats to the security of U.S. money.

Couple this threat with the activities of the more traditional gangs of professional forgers, and the need for currency security features has never been greater.

Martin Crimp, professor and expert in materials durability, enlisted in the fight to stabilize and secure American money last year when he was invited to join the National Academies National Research Council Committee on Technologies to Deter Currency Counterfeiting. The committee is charged with ascertaining which existing and emerging technologies pose the greatest counterfeiting threats to Federal Reserve notes, and identifying which features, materials, and technologies have the best deterrent potential.

According to Crimp, the casual counterfeiters using desktop publishers are the newest—but not the only—threats to the security of U.S. money.

“It used to be you had to be an engraver to be a counterfeiter, and you had to make a large amount to make it worth it your while. These days, someone can use a computer to whip out a few twenties and pass them off in a dark bar,” says Crimp. “We also have forgery gangs domestically and abroad, and the potential for foreign governments to counterfeit our currency.”

According to Crimp, these illegal activities can have a destabilizing effect on our economy and the prestige of U.S. money.

“Around two-thirds of U.S. currency is held overseas because it’s a reserve currency—people trust our money and save in U.S. dollars if their own government is unstable,” says Crimp. “Having a reserve currency is not only prestigious; it helps secure the domestic economy. Counterfeiting threatens the reserve-currency status of the dollar and can be used to destabilize our government. Making a country’s money worthless has a profound effect.”

The currency committee will issue its findings in two parts over the next two years. In the mean time, the team continues to assess future threats to the dollar and evaluate methods for making U.S. currency more durable, robust, and hard to duplicate or simulate. Crimp says that he finds the work interesting and rewarding and enjoys being a part of currency design. “I was actually on the floor of the Bureau of Engraving and Printing and got to stick my head in a room with over $800 million in it … but, of course, I wasn’t offered a sample.”
In 20 years, your doctor may be able to implant a highly sensitive receiver to continuously monitor your health and wirelessly report abnormalities in real time—giving you information about health conditions and diseases before symptoms appear or become life-threatening. It sounds like science fiction, but thanks to the work of Mark Worden, professor; Robert Ofoli, associate professor; and Ilsoon Lee, assistant professor, futuristic biomedical applications are taking shape today.

As part of an interdisciplinary team—including researchers from electrical engineering, human medicine, chemistry, and biochemistry—the group is at the forefront of the hybrid science of nanotechnology and structural biology known as proteomics. Proteomics is the study of protein functions and reactions for the purpose of understanding and diagnosing illness, developing drug treatments, and detecting environmental hazards.

The researchers say the primary application of their work is in the field of biomedicine. “Most functions in our bodies occur because of the work of a variety of proteins,” says Worden. “Many diseases are due to the defective function of a particular protein. If we can detect a defect, we can quickly and accurately diagnose illnesses.”

According to Ofoli, the ultimate goal of the research is to develop a small diagnostic chip that may house as many as 10,000 nanoscale protein-based sensors. “The idea is to be able to put a blood sample on this chip and have the sensor report back to a physician or health professional about which proteins are ‘activated,’ or responding to body events,” he says. “That should provide the physician with clues to the possible causes of the patient’s condition.”

The protein-sensing technology could also be used for drug screening and to detect toxins and environmental hazards. According to Worden, if researchers know a specific protein is responsible for an illness, they can add drug compounds to analyze the effect a substance has on protein behavior. By the same token, if a particular protein reacts to natural or chemical toxins, they can use that protein as an indicator to detect the hazards. “For instance, nerve gas attacks proteins in the body,” says Worden. “If we know which proteins it affects, we can put those on a chip and see if they react in the presence of a suspicious gas.”

All of these potential applications, however, hinge on being able to get proteins in the laboratory to behave the same way they do in the body. Worden, Ofoli, and Lee’s primary task for the time being is to develop biomimetic interfaces—chips that mimic the body’s environment and essentially trick the protein into functioning like it would in its natural surroundings. “If you want to truly understand the function of a protein, then you need to provide an environment that is similar to what it has in the human body,” says Ofoli. “Once we get a protein in its natural environment, we can measure its activity and interpret it in terms of what’s happening in the body on the molecular scale.”

**Pushing the “Off Button” on Disease**

S. Patrick Walton, assistant professor, is an applied biomolecular engineer using the unique chemical and physical properties of nucleic acids to develop new technologies or make improvements to existing ones. Specifically, he wants to understand the mechanisms involved in the interactions of nucleic acids with other biomolecules and use that knowledge to develop diagnostic and therapeutic tools. His research falls into two general areas: (1) analysis of the mechanism of RNA interference (RNAi); and (2) development of high-throughput, parallel cellular measurement methods. The applications of these technologies have far-reaching implications for science.

RNAi is a process that can selectively stop the production of a protein by a cell. “This means that if you have a gene that predisposes you to cancer, we can potentially turn that gene off,” says Walton. “We can already
do this in single cells and simple animals. The process becomes much more complex, however, when applied in the human body.”

In human populations, that complexity can translate into side effects. While the technology is targeted, it can have unintended consequences. RNAi can be recognized like an infection, which might cause the cells to shut themselves down and die. One project in his lab focuses on avoiding cell shut-down and death. Another project is focused on better understanding how RNAi-related proteins interact with the nucleic acids that initiate the RNAi process.

The researcher is also investigating ways to better understand the intended and unintended impacts of drugs on proteins in the body. Using established technologies for nucleic acids, Walton hopes to devise a protocol for quickly analyzing the impact of drugs on all human protein components simultaneously. The process is called high-throughput, parallel cellular measurement. Once fully developed, it can potentially allow researchers to understand how proteins react to drugs quickly, in great detail, and with high sensitivity.

“Currently, when we analyze the cellular effects of a drug, we go looking for what we expect to find. We know that a drug affects protein X, so we look at the effects of the drug on that certain protein,” says Walton. “What we don’t know is how that drug affects the other proteins in the body—for better or worse.”

The new technology will provide a means of understanding basic cell function at a level that cannot currently be achieved. Moreover, the technology could be used to screen drugs for potential side effects, hopefully avoiding situations like the one that occurred with COX-2 inhibitors. “In that case, we knew these drugs were inhibiting the COX-2 protein, but with better analytical tools, we might have also been able to see that it was leading to cardiac problems,” says Walton. “The work we do can mean better drugs with fewer side effects.”

Baumann Hopes to Engineer Safe Source of Bone for Grafting

Melissa Baumann, associate professor, is working on what could be called the “backbone” of tissue engineering. The researcher is studying the growth of osteoblasts on specially made scaffolds constructed from the same minerals as human bone, and hopes to one day provide lab-engineered bone for grafting. Currently, patients who need bone transplants rely on autografts—bone from another location in the patient’s body—and allografts—donated cadaver bone. Both procedures, however, have limited applicability.

“For patients who are missing a critical size or amount of bone, it isn’t feasible to get it from somewhere else in their body—that’s like robbing Peter to pay Paul,” says Baumann. “The quality of cadaver bone is generally poor and presents the risk of disease transmission. Tissue engineering could provide a safe source of bone for people like cancer patients and accident victims.”

Baumann’s NSF-funded research is specifically investigating optimal environments for bone growth. She is building the scaffolds for tissue generation and studying how cells react to their surroundings. “We want to do everything we can to trick the cells into thinking they are in their natural setting so they’ll lay down more and better bone,” she says.

The researcher isn’t just interested in growing new bone; she’s also involved in joint-replacement research. Working with a new alloy developed by Carl Boehlert, assistant professor and materials scientist, Baumann is investigating the biocompatibility of alternative metals for hip and knee replacement devices. Current joint replacements are made of a titanium alloy containing vanadium, a heavy and potentially toxic substance. The team is proposing Boehlert’s new alloy—containing niobium and titanium—which is strong, non-toxic, and more closely matches human bone.

Melissa Baumann, associate professor, hopes to provide lab-engineered bone for grafting.

Thank You Pfizer!

The department would like to thank Pfizer, and in particular Dee Clement and Tom Schmidt, for their generous equipment donation to the Cellular and Molecular Biology Laboratory.
Dale Named Associate Director of MSU’s Office of Bio-based Technologies

Bruce Dale, professor and university leader in exploring alternatives to fossil fuels, has been named associate director of Michigan State University’s new Office of Bio-based Technologies. Dale, who is also a faculty adviser to MSU’s Biomass Conversion Research Laboratory, is an expert in research aimed at converting agricultural bounty—such as corn—into fuel. These materials, called plant biomass, have the potential to provide cost-effective and environmentally beneficial ways of generating fuels, chemicals, materials, foods, and feeds from renewable resources.

The goal of the Office of Bio-based Technologies is to marshal MSU research and resources in the plant sciences, chemistry, agricultural sciences, and engineering fields to help foster connections with public- and private-sector initiatives designed to transform Michigan’s economy. “Dr. Dale brings a lot of energy and a wealth of technical expertise to the office,” says Steven Pueppke, director of the Office of Bio-based Technologies. “He’s already begun to lead a series of campus conversations to coordinate our activities on the bioeconomy and to strengthen linkages with partners in the private sector.”

Dale describes his role as providing “technical reality” stemming from his 30 years of work in biomass technology. He hopes to bring this technology out of the laboratory and into the marketplace. “I’ll be trying to help put together large proposals and working to link plant science researchers and others with engineers to build relationships allowing us to move forward,” he says.

Dale, who has been at MSU for 10 years, has developed a patented process called ammonia fiber explosion which makes the breakdown of cellulose more efficient, thus tackling one of the thornier problems of producing ethanol. He received his doctorate in chemical engineering from Purdue University. In the past two years, Dale has received 13 U.S. and international patents and has filed eight patent disclosures.

~Sue Nichols, University Relations

Case Receives Withrow Teaching Excellence Award

Eldon Case, professor, received the Withrow Teaching Excellence Award at the Engineering Awards Luncheon, Thursday, March 30. He is a four-time winner of the teaching excellence award and a dedicated teacher who has an amazing gift for explaining course material well and sharing his vast knowledge with his students. Case is often praised for his enthusiasm, sense of fairness, and use of real-world examples. His students feel more prepared to enter the workplace with confidence because of his practical, industry-focused teaching style. Case has the ability to create an effective learning environment by encouraging student feedback in innovative ways. He provides helpful class notes and well-designed course packs and practice exams. His efficient and effective class management skills allow students to learn complicated material in clear and concise formats. According to one student, “Dr. Case manages to convey his immense amount of knowledge using an economy of words and time.”

Satish Udpa Named College of Engineering Dean

As we went to press, Satish Udpa, acting dean of the College of the Engineering for the past year, was approved by the MSU Board of Trustees to permanently fill the dean position. Please visit the MSU University Relations Web site at http://newsroom.msu.edu/site/indexer/2816/content.htm for more information.
Matthew Neurock Speaks at the 8th Annual Johansen-Crosby Lecture

Matthew Neurock, professor of chemical engineering and chemistry at the University of Virginia, delivered the 8th annual Johansen-Crosby guest lecture April 27 in the MSU Engineering Building. Neurock, an MSU chemical engineering alumnus (BS ’86), spoke about “First Principles-Based Design of Catalytic Materials.”

The Johansen-Crosby Lectureship honors the parents of Professor Edwin Johansen-Crosby. Crosby received a BS in chemical engineering from Michigan State University in 1950 and continued his studies at the University of Wisconsin, completing his PhD in 1955. His father, Edwin Rallard Crosby, owned an electrical supply company in Flint, Michigan, and his mother, Thora Anne Johansen-Crosby, was an ardent horticulturist and volunteer for Michigan State University cooperative extension service in Flint. Crosby spent his entire career as an inspiring educator and researcher in the Department of Chemical Engineering at the University of Wisconsin-Madison until his untimely death on December 25, 1991 at the age of 66. Crosby’s interest in atomization and spray-drying phenomena resulted in the first fundamental study of controlled collisions between pairs of drops using high-speed cinematography. His pioneering book, *Experiments in Transport Phenomena*, was published by John Wiley & Sons in 1961.

Matthew Neurock

Lawrence T. Drzal

Drzal Receives Fifth Fellow Award

Lawrence T. Drzal, University Distinguished Professor of chemical engineering and materials science has been named a Fellow of the Society for the Advancement of Materials and Process Engineering (SAMPE) for his contributions to developing a fundamental understanding of adhesion and composite materials. He received the award on May 6 at the society’s annual conference in Long Beach, California. The Fellow award represents prestigious recognition of a SAMPE member for distinguished contributions in the fields of materials and processes. An international professional society with more than 4,000 members, SAMPE provides information on new materials and processing technology via technical forums, journal publications, and books. Over its entire history SAMPE has awarded the rank of fellow to approximately 100 members. Drzal has earned the fellow designation from five different professional organizations over the course of his career.

Department Holds Third Annual Research Forum

The Department of Chemical Engineering and Materials Science held the 2006 Research Forum at the Lansing Center March 30-31. This year’s event was conducted in cooperation with the Michigan Small Tech Association and focused on research and commercialization opportunities in the field. Presenters included departmental faculty, industry representatives from General Motors and Merck Company, Inc., and researchers and staff from other universities in Michigan. John Bedz, director for the Michigan Small Tech Association, spoke to the group about commercialization opportunities in micro- and nanotechnology. The annual event also featured a graduate-student poster presentation.
Timothy Howes (BS ’06) was notified in March of this year that he was one of 10 students nationwide to receive a Churchill Scholarship for graduate study at Cambridge University. The Brighton, Michigan, native headed to England in August to pursue an MPhil degree in computational biology at the elite British institution. The one-year award provides approximately $35,000 in tuition and living expenses for students doing graduate work in mathematics, science, or engineering. Howes also received a National Science Foundation (NSF) Fellowship for advanced study. The NSF awards 850 fellowships annually, and provides three years of support for advanced studies.

While at MSU, Howes worked on research projects with Mark Worden, professor of chemical engineering, and John Ohlrogge, University Distinguished Professor of plant biology. He received fellowships to participate in research projects at the University of Hawaii, the Keck Graduate Institute of Applied Life Sciences at the Claremont Colleges, and the chemical engineering division of Osaka University in Osaka, Japan. As an undergraduate, Howes was awarded the 2005-2006 Barry M. Goldwater Scholarship, a prestigious award given to a fraction of the top engineering and science majors in the country. Ultimately, he would like to obtain a PhD in bioinformatics or bioengineering and apply his research commercially to reduce the environmental impact of chemical manufacturing processes.

Joon S. Moon (BS ’60) was presented with the Red Cedar Circle Award in Chemical Engineering and Materials Science at the College of Engineering Alumni Awards Banquet May 6 at the Kellogg Hotel and Conference Center. The award honors outstanding graduates of the department who have made important contributions to the field and to society.

Moon will also be awarded the Michigan State University Alumni Association (MSUAA) Distinguished Alumni Award September 28, 2006, at the Grand Awards Ceremony. The award is given annually to alumni who have distinguished themselves by attaining the highest level of professional accomplishment and who possess the highest standards of integrity and character to positively reflect and enhance the prestige of Michigan State University.

Born in South Korea, Moon became a U.S. citizen shortly after graduating from MSU. He earned his PhD (’63) in chemical engineering from the University of California–Berkeley. While at Berkeley, he was awarded a fellowship by the U.S. Atomic Energy Commission. Over 30 years ago, he founded Moon Chemical, the first of many companies. He has been responsible for the development of the chemicals used in such popular household products as Roman Cleanser, Sani-Flush, and Liquid-Plumr. He was appointed in 1991 by then Michigan Governor John Engler to the Michigan International Trade Authority, which provides export assistance for small and medium-sized companies.

Moon has been active on the boards of numerous universities and corporations. He served on the MSU College of Engineering Alumni Board and has been involved with the MSU Foundation for many years. He and his wife, Zaida, are devoted supporters of their alma mater, and are members of MSU’s Jonathan L. Snyder Society. One of their most prominent gifts was the Mirdza Kuze Library Endowment Fund, named for Mrs. Moon’s mother. The endowment enabled MSU Libraries to begin a Baltic collection. Another gift in 1991 established the Joon S. Moon Distinguished International Alumni Award, which each year honors an international MSU graduate who has made outstanding contributions in his or her field.

Moon’s philosophy of working harder than the competition while maintaining a clear set of values encourages the people and corporations he affiliates with to achieve their business goals while exemplifying good citizenship.
Professor Kris Berglund has what many might consider a dream job. Working with a custom-made German still housed at the Michigan Brewing Company (MBC) in Williamston, he offers classes in artisan distilling and conducts research into consumable alcohol quality and processes. Berglund not only makes high-quality boutique brandies and other distilled spirits—he makes them better; and soon the public will have an opportunity to taste the fruits of his labor.

As part of an arrangement with MBC, Berglund moved his still from MSU to the company’s brewery to operate under their commercial distillation license. The change of scenery means that the researcher and his students gain lab space and the ability to sell the spirits they produce. MBC will have access to the still for commercial use when Berglund is not utilizing it.

“Under our research license with MSU, we had to dispose of everything we made,” says Berglund. “Now, we can bottle it and sell it, all while giving the Michigan Brewing Company an opportunity to expand its own business.”

Berglund says—though he is a chemical engineer—he has long been interested in developing new uses for agricultural products. The exploding popularity of distilled beverages, coupled with a 1997 reduction in the yearly state licensing fee for stills, prompted Berglund and a consortium including the Michigan Department of Agriculture and Michigan Apple Growers Association to create a program to support the brandy industry in Michigan.

The idea was to provide training in artisan distilling for existing wineries, breweries, and orchards. “Adding a distillery on the end of an existing business is a relatively modest investment,” says Berglund. “We are producing very good quality brandies that you can sell for between $30 and $40 a bottle. There’s also a certain entertainment value—like agri-tourism—that’s tremendously attractive to business owners.”

The idea seems to have taken off. Berglund’s consortium purchased the first 4 stills in Michigan, and now the state boasts more than 10—second only to California, where there are 12 in operation. All of Michigan’s stills are owned by long-standing agricultural businesses like St. Julian Winery out of Paw Paw and Chateau Chantal on the Old Mission Peninsula in Traverse City.

“In this niche area we’ve made a lot of economic progress for Michigan—we’ve created jobs and generated investment,” says Berglund. “Every year wineries, breweries, and new stills are added. We can’t replace the auto industry, but as one of a hundred things it makes an impact.” Burgland’s first bottling of spirits will be available at the Michigan Brewing Company sometime later this year. For more information, visit the MBC website at www.michiganbrewing.com.
Kaltz Wins 2006 Goldwater Scholarship

Stuart R. Kaltz, a materials science and engineering major and member of the Honors College, was selected as a 2006 Goldwater scholar. The Lapeer, Michigan, junior is one of three MSU students to receive the award this year. The College of Engineering has produced seven winners of the Goldwater Scholarship in the past eight years—five of these were chemical engineering and materials science majors.

Goldwater Scholarships go to sophomores and juniors who are planning graduate study and research careers in science, engineering, or mathematics. Kaltz plans to earn a PhD in biomedical engineering. His career goal is to conduct orthopedic research, either with a leading company or as a tenure track professor at a major university.

The Goldwater Foundation awarded 323 scholarships for the 2006-2007 academic year from a field of 1,081 students. The one- and two-year scholarships cover the cost of tuition, fees, books, and room and board, up to a maximum of $7,500 per year. The Barry M. Goldwater Scholarship and Excellence in Education Foundation, a federally endowed agency established in 1986 to honor Senator Barry M. Goldwater, was designed to encourage outstanding students to pursue careers in the fields of mathematics, the natural sciences, and engineering. For more information on the Goldwater Scholarship or this year’s winners, visit the Web at http://www.act.org/goldwater/yyschrel.html or http://www.act.org/goldwater/sch-2006.html.

Shaw Honored for Academic Achievements

Stephen Shaw was one of the nineteen Michigan State University students honored for academic achievement by the MSU Board of Trustees in an April 13 announcement. The May graduate earned a perfect 4.0 grade point average. Board of Trustees Awards are granted at each commencement to students having the highest scholastic averages at the close of their last semester in attendance.

2006 Academic and Service Recognition Award Winners

Congratulations to the students from the department who were recognized for academic excellence and service to the community during the 2006 College of Engineering Student Awards Reception April 6 in the engineering auditorium. This year’s award recipients included:

Outstanding Graduate Student Awards:
Christopher John Cowen and Zheng Li

Service Award:
Alexis Susanne Masserang, Elaheh Rahbar, and Traci Marie-Sun Taylor

Undergraduate Academic Awards:
Greeshma Enukonda, Denise Elayne Kenney, Stephen Mathew Shaw, and Adam Robert Southworth

Omega Chi Epsilon Awards Junior Competitive Exam Scholarships
Samhitha Muralidhar, Alex Nezich, and Greeshma Enukonda were awarded Omega Chi Epsilon Junior Competitive Exam Scholarships in May. The three students competed for the scholarships in a rigorous three-hour examination covering all of the junior-level chemical engineering courses taught at MSU. They were required to respond to questions in the fields of fluids, thermodynamics, reactions, and separations. The competition was sponsored by the Dow Chemical Company.
Sibling rivalry has been taken to new levels over the past few years in the Kidambi household. With a brother who graduated from the chemistry program at the University of Michigan, PhD student Srivatsan Kidambi feels the heat of the MSU / U of M opposition whether the teams are playing or not. “Even though my brother was at U of M, I came to MSU because I heard the polymer research was excellent,” says Kidambi. “The work has been so interesting and I’ve met so many new people—I love it here. I don’t know if my brother can say that about U of M. I was so impressed with MSU that I made my younger sister come here for her PhD in chemistry.”

The 26-year-old native of India came to MSU from Chennai and is currently working in the field of materials research with Christina Chan, associate professor, and Ilsoon Lee, assistant professor. He earned his BS from the University of Madras in 1999 and came to MSU that same year. Kidambi received his MS in 2002 and has been working toward his PhD since then. He is currently investigating the applications of polymers in efficient drug-delivery systems and tissue engineering. Kidambi’s awards include the American Chemical Society (ACS) Graduate Research Symposium Excellence Award in Polymer Science and ACS recognition for his paper “Polymers for Bioactive Surfaces.” He also presented a talk on his research at the ACS National Symposium held in Atlanta, Georgia, March 26-30.

Though Kidambi has a job offer from Intel, he says he’s more interested in research related to drug discovery and development. “I would ideally like to get into pharmaceuticals, get some experience, and eventually move on to a faculty position at a university,” he says. “Being in an academic environment gives me the opportunity to be active and useful, and to do groundbreaking research.”

Kidambi had no background in biology when he came to MSU, and credits his instructors and advisers with helping him learn enough to conduct his multidisciplinary research. “MSU has excellent professors and advisers who give me so much inspiration,” says Kidambi. “There is so much interesting interdisciplinary research; this is the most exciting place to be.”
DEPARTMENT OF CHEMICAL ENGINEERING & MATERIALS SCIENCE

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