from the **dean**

**enhance** the student experience

**enrich** community, economic, and family life

**expand** international reach

**increase** research opportunities

**strengthen** stewardship

**advance** our culture of high performance

**connect** with our valued alumni
These are exciting times to be part of the Michigan State University College of Engineering Family. It is a time of tremendous growth for the college—in quality, national prominence, and size.

This fall we are welcoming one of the largest classes of freshman students in more than 25 years (with women students comprising nearly one-quarter of the incoming class). Our physical facilities are expanding with the addition of the Bio Engineering Facility, a four-story, 130,000-square-foot research building slated to open in December. And two new departments affiliated with the college have already begun cultivating research and developing academic programs.

The MSU College of Engineering is well on its way to becoming one of the fastest rising engineering programs in the nation.

**NEW AND GROWING PROGRAMS**

MSU was named a core partner in a U.S. Department of Energy–funded national consortium charged with developing advanced composites. In January, President Obama announced the development of the Institute for Advanced Composites Manufacturing Innovation (IACMI), a 122-member consortium of institutions across the country. MSU will lead the light- and heavy-duty vehicle component of IACMI, with University Distinguished Professor Lawrence Drzal as director of IACMI’s Michigan Center of Excellence.

The Department of Biomedical Engineering (BME), approved by the MSU Board of Trustees in October 2014, became effective Jan. 1. We anticipate the department’s first graduate-level courses to be offered in fall 2016. For the time being, undergraduate specializations in BME will be maintained in the Departments of Biosystems Engineering, Chemical Engineering and Materials Science, Electrical and Computer Engineering, and Mechanical Engineering. R. Mark Worden will serve as the interim chairperson for the BME department.

BME will be MSU’s focal point for technological innovations in healthcare technology. Our biomedical engineers will work collaboratively with experts from the Colleges of Human Medicine, Osteopathic Medicine, Nursing, Natural Science, and others, to leverage expertise and advance emerging health science discoveries. Many of the activities of the department will be housed in the Bio Engineering Facility, currently under construction on south campus (see page 36).

Also located in the Bio Engineering Facility will be a new **Institute for Quantitative Health Sciences and Engineering**. The institute will serve as an inter- and multi-disciplinary research center devoted to basic and applied research at the interface of life sciences, engineering, information science, and other physical and mathematical sciences.

The new **Department of Computational Mathematics, Science and Engineering** (CMSE) was approved by the MSU Board of Trustees and became effective in April. CMSE will position MSU as a world leader in scientific discovery through large-scale computation. This new department will be jointly administered by the College of...

**Engineering Deans Diversity Initiative**

Engineering Dean Leo Kempel has joined with ASEE and 100 engineering deans around the country to increase diversity in enrollments, retention, graduation rates, and the workforce over the next decade.
LEADERSHIP FOR GROWTH

A strong foundation for a growing college rests in its leadership. Recent and pending retirements, promotions, and expanding programs have necessitated new appointments to key positions. This summer I had the pleasure of appointing three new associate deans. Their enthusiasm, ideas, and leadership will strengthen our college and help guide our phenomenal growth.

John Verboncoeur became associate dean for research (ADR) on June 1. He served as acting associate dean for research since August 2014, succeeding Karim Chatti, a professor in the Department of Civil and Environmental Engineering (CEE). As ADR, Dr. Verboncoeur is responsible for managing the college’s growing research enterprise and helping faculty members increase their research funding. The college’s annual research expenditures have doubled in less than a decade to more than $50 million.

Dr. Verboncoeur joined MSU as a professor in the MSU Department of Electrical and Computer Engineering (ECE) in 2011, after serving for 10 years as a professor-in-residence in the Department of Nuclear Engineering at the University of California–Berkeley.

Neeraj Buch became the new associate dean for undergraduate studies on July 1. From 2012 to 2015, he was a professor and chair of the MSU Department of Civil and Environmental Engineering (CEE). He replaced Thomas F. Wolff, who served 17 years as associate dean and 29 years with MSU. Dr. Wolff is currently serving as the interim chair of CEE until he retires in summer 2016.

Dr. Buch has served in a variety of leadership roles at MSU since arriving on campus in January 1996. Prior to leading CEE, he was the founding director of the Cornerstone and Residential Experience (CoRe) program from 2009 to 2011. He also served as the director for the Pavement Research Center of Excellence from 2007 to 2013.

Thomas Voice, PE, became the inaugural associate dean for administrative affairs in the college on July 1. He serves as chief operating officer for the college, assisting with academic personnel management; facility, space, and infrastructure issues; administration; and financial oversight.

Dr. Voice came to MSU in 1984. He is currently a professor and associate chair for graduate studies in CEE. He previously served as acting co-chair of CEE, director of the environmental engineering program, and principal investigator of several federal research centers and multi-investigator projects. He has been a member of the board of directors of Consumer Reports, a nonprofit publisher and consumer advocacy organization, since 2008.

Other recent leadership appointments:

- Laura Genik was appointed director of the Applied Engineering Sciences (AES) program in January 2015. She replaced Jon Sticklen, who retired from MSU in 2014 and is now chair of Engineering Fundamentals at Michigan Technological University.
- Amanda Idema was named an assistant dean for undergraduate student affairs in April. Dr. Idema began serving as an MSU academic advisor in 2001. She joined the college in 2008, where she has held a variety of roles with increasing responsibility within the college.
- Darrell Donahue became chair of the Department of Biosystems and Agricultural Engineering on July 1, succeeding Ajit Srivastava, who served almost 20 years as chair. Dr. Donahue most recently served as vice president of operations and research director at Maine Maritime Academy, where he also served as founding research director in the Center for Applied Research and Education.
- John Papapolymerou is the new chair of the Department of Electrical and Computer Engineering and is the first MSU Foundation Professor of ECE, effective Aug. 16. He comes to MSU from the Georgia Institute of Technology, where he was the Ken Byers Professor in the School of Electrical and Computer Engineering and associate director of the Georgia Electronic Design Center. He replaces interim chair Tim Hogan, who will now focus on teaching, research, and service as a faculty member.

GROWING SUPPORT

As you read this edition of Currents Magazine, I hope you are left with a rising sense of pride in your college and university. Of course, our remarkable growth would not
be possible without the support of alumni, industry, and other partners. Notable recent gifts to the college (detailed elsewhere in this issue) include a $5 million bequest from Gary and Patricia Coffman to benefit future innovators, a $2 million commitment from Doug Zongker to establish an endowed chair of computer science, a $1.3 million estate gift from Betty Shanahan and Bob Nuber to endow a professorship for entrepreneurship and diversity, a $200,000 re-investment in the first-year CoRe experience by Consumers Energy, and a $400,000 gift from a grateful former student to launch the Anil K. Jain Endowed Graduate Fellowship. As a result of these and other gifts of support, we are approaching the $45 million mark in the College of Engineering’s campaign goal of $80 million in MSU’s Empower Extraordinary capital campaign. For information on the many ways you can impact the future of engineering at MSU, visit http://givingto.msu.edu/college/college-of-engineering.cfm.

One of the hallmarks of the MSU College of Engineering is how influential our faculty, students, and alumni have been to the Spartan experience. The college is a leader in helping MSU tackle major challenges associated with globalization, technology, demographic shifts, and the need to respond to changing societal needs. Together, our success will help engineering to empower society in unprecedented ways and will be at the forefront of future innovation.

I can’t think of a better future for us all.

LEO KEMPEL, Dean

Remembering Craig Somerton

As we announce new leaders and growing programs, we sadly must also note the passing of a dedicated and highly respected member of the Spartan Engineering family.

Craig Somerton, who served the College of Engineering for three decades as a popular teacher, colleague, and friend in the Department of Mechanical Engineering, died May 9, 2015, in Lansing following a three-year struggle with cancer and complications from diabetes. He was 60.

A memorial service to remember Craig Somerton was planned for Sunday, Sept. 27, at River Terrace Church in East Lansing. Friends and family were scheduled to gather in his honor, to share memories and favorite stories.

Alex Diaz, professor and chair of the Department of Mechanical Engineering, said Somerton’s passing is a tremendous loss. “Craig was a colleague and a friend, a booming presence in the College of Engineering,” Diaz said. “He cared deeply for our department and for our students. They recognized Craig’s genuine care and commitment, and loved him back.”

Leo Kempel, dean of the College of Engineering, said Somerton was particularly known for going out of his way to help students.

“Craig Somerton helped transform the lives of Spartan Engineers as a teacher and well beyond the classroom,” Kempel said. “He was a leader in curriculum development and a proud proponent of engineering education and program evaluation. He was a favorite consultant to universities on accreditation issues because his commitment was so true. We will miss him and his many contributions both personally and professionally.”

Laura Genik, his former student and now the director of the college’s Applied Engineering Sciences program, said Somerton was a big reason she became a professor and educator.

“He was an inspiring teacher and one of the kindest people I knew,” Genik said. “Not many people can count their PhD advisor among their best friends, but I certainly have always placed Craig there,” she added.

Somerton last taught in the college in fall 2014.

Gifts to remember Somerton may be directed to the College of Engineering Office of Development at (517) 355-8339 or email at egrdevel@egr.msu.edu.

Enhance the student experience

Mechanical engineering major Julia Briggs hopes to create medical equipment following graduation, so she uses every opportunity she can for hands-on time in the machine shop.

Hands-on in the machine shop

Engineering design classes require a certain proficiency in the machine shop. Knowing how to identify tools and use shop equipment like a drill press, bandsaw, lathe, and milling machine can be a stopper for some students.

That’s why the college hosted a hands-on remedy for women students interested in developing these skills. Each participant was taught how to use the major equipment in the shop and then had an opportunity to practice what they learned.

The event, called “Shoppin’ with the Ladies,” was organized by Laura Gumpper, a mechanical engineering senior from Livonia, and Tamara Reid Bush, an assistant professor in mechanical engineering. A group of 20 gathered in the college’s Mechanical Machine Shop, Room B250, on a cold January evening.

“Some female students are not comfortable with the machine shop and the equipment in it,” said Bush. “Many of them have not previously used this type of equipment. So, we offered an evening where ‘ladies trained ladies’ on the various shop equipment and provided a practice session using the equipment, too.”

Gumpper said the session was important because the Department of Mechanical Engineering has at least four courses that are heavy on design and build requirements.

“I wanted women students who are hesitant about using machines in the mechanical shop to get this opportunity,” Gumpper said. “My hope is that this exposure will allow women to be more confident in their engineering courses. It’s not that women aren’t capable,” Gumpper added. “It’s just we haven’t had many opportunities to develop this skill yet.”

Bush said the activity is also a good retention tool and a way for women to connect with other women in their discipline.

Mechanical engineering major Julia Briggs hopes to create medical equipment following graduation, so she uses every opportunity she can for hands-on time in the machine shop.
Tamara Reid Bush (left), assistant professor of mechanical engineering, and Laura Gumpper, a mechanical engineering senior, organized “Shoppin’ with the Ladies” to give women students more time in the mechanical machine shop.
College seeks more women in engineering

There will be more women students in the College of Engineering this fall.

In fact, officials are expecting that more than 1,000 women students, from freshmen to seniors, will be enrolled in the college when the academic year opens in September.

The upward trend follows the college’s overall enrollment increase in the past several years.

In 2013, the college set an admissions record when it welcomed 1,300 undergraduates to campus. That record was shattered in the fall of 2014, when the college brought in its largest entering class in 25 years—1,400 freshmen. Among those 1,400 freshmen were about 260 women—one of the largest groups of women to enter the college in decades. The college’s current undergraduate enrollment is around 5,000 students.

Driving enrollment and increasing diversity generally fall to the staff in the college’s K–12 Outreach and Diversity Programs offices. However, changing the college’s “peoplescape” to more female students is the work of many faculty and staff members.

Four who have been given that specific task are Teresa Isela VanderSloot, director for women in engineering recruitment and K–12 outreach.
It’s been a big couple of years for David Zoltowski, who graduated in May with an electrical engineering degree.

He heads to the University of Cambridge this fall as one of 14 American students nationwide to be awarded a Churchill Scholarship, where he will pursue a master of philosophy in information engineering.

His newest honor arrived in August when he was named a 2015 Tau Beta Pi Laureate.

In June, he added the accolades of the 2015 Outstanding Student Engineer of the Year Award from the Engineering Society of Detroit, and the 2015 Capital One Academic All-America At-Large Second Team by the College Sports Information Directors of America (CoSIDA).

Zoltowski graduated in May with a perfect 4.0 grade point average as a member of the Honors College, and as captain of the MSU Varsity Swimming and Diving team.

In April, he was given the President’s Award at MSU’s 2015 Academic Excellence Gala, the evening’s most prestigious honor. He was also honored April 17 when the MSU Board of Trustees recognized 36 students with the Board of Trustees’ Award for having the highest scholastic average at the close of their last semester.

Add in Second Team Academic All-American and Big Ten honors, and being a Goldwater Scholar his junior year—Spartans Will!

Eight students from the college were recognized with the Board of Trustees’ Award at the board’s April 17 meeting. The award celebrates the highest scholastic average at the close of a student’s last semester at MSU. Honored were:

- **Ryan Austin** of Ada, an environmental engineering major and member of the Honors College.
- **Thomas Heuser** of Brighton, a materials science and engineering major and member of the Honors College.
- **Minh Pham** of Ha Noi, Vietnam, a computer science major and member of the Honors College.
- **Kyle Sherman** of Grand Rapids, a mechanical engineering major and member of the Honors College.
- **Paul Stanos** of Midland, a computer science major and member of the Honors College.
- **John Suddard-Bangsund** of Monticello, Minn., a materials science and engineering major and member of the Honors College.
- **Luan Tran** of Th Phu Yen, Vietnam, a computer science major.
- **David Zoltowski** of West Lafayette, Ind., an electrical engineering major and a member of the Honors College.
The Spartan Spanners finished in the top 5 percent in the nation in the 2015 Student Steel Bridge competition in May. The team ended up 12th out of 47 teams at the national championship at the University of Missouri, Kansas City. Competing were (back row, l to r) David Hayden, Kyle Savoie, Shayne Maguire, and (front) Jake Maise, Colleen Bianco, Eric Kamps, and Lucas Manhice. The team advisor is Frank Hatfield.

#1 IN THE NATION. Jake Patin, (l to r) Daniel Domino, Thomas Bonney, Kate Capeneka, and Sanpreet Singh Gill won $5,000 and first prize at the 2015 Air and Waste Management Association Environmental Competition International (ECi) in Raleigh, N.C., in June. They advanced to the national contest after being judged in Environmental Engineering ENE 489, taught by Susan Masten, professor of civil and environmental engineering. The competition asked students to evaluate hydraulic fracturing in King County, N.C., in terms of environmental, economic, and social cost benefits. Bonney and Capeneka are civil engineering majors, Patin and Domino graduated in May in environmental engineering, and Singh Gill is an ENE graduate student. Last year, MSU’s team placed second in the nation.
The MSU Baja Race Team took “Betty” to Maryland in May and were proud of their 11th place finish in endurance and 25th place overall. They completed the full endurance race without breaking anything! At the SAE competition in Oregon in late May, they ended up 14th in design and 35th overall out of 100 teams.

SR 15, MSU’s entry in the 2015 Formula SAE competition, fared well among international competitors at Michigan International Speedway in Brooklyn in May. The Spartans placed 11th overall among more than 100 teams from around the world. Overall winner was Graz Tech of Austria. At Formula SAE in Lincoln, Neb., in June, the team placed first in acceleration and skidpad, and fifth in design. They were not able to complete the endurance race, but were proud of their season.

Zane Crawford is the recipient of a prestigious U.S. Department of Energy Computational Science Graduate Fellowship. Crawford graduated in May with a dual major in electrical engineering and computer engineering. He is now pursuing a dual PhD degree at MSU in the Department of Electrical and Computer Engineering (ECE) and MSU’s new Department of Computational Mathematics, Science and Engineering (CMSE). He is advised by ECE/CMSE faculty member Shanker Balasubramaniam.
Innovative teaching method improves learning

**Gilbert Baladi**, professor of civil and environmental engineering, and **Ronald Rosenberg**, College of Engineering associate dean emeritus, have teamed up to improve student learning in CE 221–Statics.

CE 221, one of the first technical classes taken by engineering students, is notorious for being difficult for the majority of students. Most of the students in the course—which is required for several majors—are sophomores.

“It’s not an easy course,” admitted Baladi, who has taught the class for seven years.

Over the past seven years, annual enrollment has grown from about 400 to more than 700. During that time, the course has been progressively moving from traditional teaching methods to online content.

During fall semester 2015, the course will be taught for the first time as a partially “flipped” class; rather than going to class three times a week, students will attend class twice a week and complete work online once a week. By fall 2016, the aim is to have one session in class and two online.
“Data from the past seven years has indicated that student learning has been enhanced tremendously,” Baladi said. “The average on the tests is higher and the average on the homework is higher.”

Specifically, fall semester 2013, the average score on the first exam was 76; in fall 2014, the average jumped to 91. The final exam score was much higher, and the overall semester score was much higher—with an increased number of students receiving a 4.0.

“One of the reasons we went in this direction was the price of the textbook we were using. When it hit $300, we said, ‘that’s enough,’” Baladi said. The textbook has been replaced by a $99 course pack and online material.

Statistics across fields and across universities show that when a textbook is required, especially in a large-enrollment course, only about 30 percent of students buy the book. This spring, out of 264 students enrolled in CE 221, all of them bought the course pack.

“This is tremendous, because it means the students are actually getting the material you want them to have,” Rosenberg said.

“And we are seeing the benefits of this,” Baladi added.

The course is composed of three major parts—lectures with illustration and extensive examples (which students can view as a PowerPoint slideshow or as a video), practice problems worked out step-by-step online as well as with only the answers, and an active problem pool for homework assignments.

“This past semester, we added the homework component online,” said Baladi. “We opened the second homework on Wednesday, and by Friday more than 70 students had done the homework. Typically they wait until the last minute to complete homework assignments!”

Online, a student can attempt a specific homework problem three times; he or she immediately receives feedback on whether the answer is right or wrong. After the third incorrect attempt, the correct answer is given. The student can then re-click the same problem and try again with a new set of values.

“For some students, it may take five attempts to get it right, whereas another student may get it right on the first try. And that’s okay, as long as the student is willing to learn,” Baladi said.

“I believe this immediate feedback helps a student guide himself or herself toward learning,” Rosenberg said.

“Last spring, when we tested the ‘active problem’ pool with about 270 students, statistics showed that student performance was significantly higher. That gave us a lot of incentive to continue to refine and improve what we’re doing.

“An advantage with putting homework online is we can spot exactly which students are having trouble. We can spot it early, we can talk to them about what they did and didn’t try to do. We can shift the responsibility for their learning to them; we point out all of the resources available to them,” Rosenberg said.

“We can analyze our data in two ways. We can determine the weak spots and strengths of an individual student, and we can pinpoint areas of the material where, collectively, student performance is not so strong. We can then put more resources into figuring out what we need to do better, or more thoroughly, in a specific area,” Rosenberg continued.

“We regard this course as a ‘leader’ course in looking at ways to do these things. Our long-term goal is to teach the computer to handle more complex problems; and over time, I think we’ll be able to do that.”

> LAURA LUPTOWSKI SEELEY

MICHIGAN STATE UNIVERSITY COLLEGE OF ENGINEERING
Beginning with an age-old agricultural practice of threshing, which separates bean seeds from their pods, four mechanical engineering students added a new twist: pedal power. Designed as a low-technology, low-cost alternative to manual threshing for developing markets, the innovative device was prototyped and shipped off to Central America in 2014, where today it is being put to good use.

Over the course of a year, two functioning threshing machine prototypes were completely conceptualized, designed, and fabricated from the ground up by a team of students as part of professor Brian Thompson’s Humanitarian Engineering ME 491 class.

In January, two of the mechanical engineers who helped create the thresher—Adam Kluz ’14 from Wixom and Adam Lyman ’15 from DeWitt—continued the humanitarian engineering project outside the classroom by traveling to Quetzaltenango, Guatemala.

“It was an unbelievable opportunity to follow up a year-long class project from conceptualization to field testing, and now to potential scaling,” Lyman explained. The threshing machine can be universally adapted to a bicycle, harnessing pedal power to process pigeon peas and other varieties of legumes. It is part of a larger humanitarian project to encourage farmers in the world’s fourth most malnourished country to expand into a new agriculture market and to introduce small-scale mechanization to increase the production of nutrient dense legumes.

Converting pedal power into work, the MSU-designed equipment will decrease legume processing time in Guatemala by four times with a
Go Green! Spartan engineers Adam Kluz and Adam Lyman (far right) are working to encourage farmers in Guatemala to expand into new agriculture markets by introducing small-scale, pedal-powered harvesters.

tested throughput of 100 pounds of seed per hour.

Lyman said their community visits with farmers in Guatemala provided important information about their current harvesting process, including acreage farmed, poundage produced, and manual harvesting times. The project’s next step is determining a proper implementation plan, and continuing development on the second prototype.

“We left the first prototype as a rental network and farmer usage test model. Farm and community leaders will document initial evaluation data on farmer usage, pigeon pea yields, and machine throughputs, and give us feedback to continue improvements.

The other team members on the thresher project are Joe Aljajawi ’14 from Troy, and Tyler Jezowski ’15 from Linwood. 

Detroit Semester showcases downtown Detroit to interns, promoting urban living benefits

The College of Engineering is “all in” when it comes to Detroit this summer.

The college’s new Detroit Semester is a one-credit co-op course for MSU engineering students who are working in Southeast Michigan from May through August.

“Today’s students want the benefits of urban living. They already see it in Chicago. This one-credit class will let them see what Detroit has to offer,” said Kyle Liechty, co-op/internship coordinator in the college’s Center for Spartan Engineering. “If students see the kind of life offered in Detroit, they are more likely to accept jobs and stay in Detroit after graduation,” he explained.

Students enrolled in the EGR 393 Cooperative Engineering Education course are participating in discussion groups, networking, and 12 events through the summer.

“The Detroit Semester is Detroit 101 in many ways,” said Garth Motschenbacher, director of the Center for Spartan Engineering. “It allows students to see, learn, and experience The New Detroit while helping them narrow down their career interests through their co-op, internship, or summer job. MSU is partnering with the After 5 Intern Program to give students both professional and social introductions to the downtown area.”

About 85 percent of MSU Engineering students do some form of experiential learning, like co-ops or internships, prior to graduation, he added.
R. Mark Worden is using his expertise to adapt his patented biosensor technology so it can be used in portable, low-cost, handheld sensors similar to the personal glucose meters used by diabetics.

The Next Phase
Commercialization of biosensor technology

Millions of Americans with diabetes use a variety of meters to check their blood glucose levels and manage the disease. This concept is spurring R. Mark Worden, a professor of chemical engineering and materials science and an AgBioResearch scientist, to commercialize a biosensor system that would have widespread applications in other venues, such as food processing facilities or clinical laboratories that assess high volume samples from many sources.

Worden began working in oxidation-reduction reactions, also known as redox, in the late 1990s. These chemical reactions are important in a number of areas, including biofuel production. As the research progressed, Worden developed expertise in nanotechnology and biocatalysts, which are often used to perform chemical transformations on organic compounds.

Over the years, various stages of this project received funding from the National Science Foundation (NSF) and other organizations. In looking at various aspects of these reactions and trying to exploit their economic benefits, Worden developed a biosensor system that was recently patented by MSU.

Now Worden is collaborating on a new NSF project with Paul Satoh, MSU adjunct professor in engineering and food science and former vice president of research at Neogen, a Lansing-based company that develops and markets products dedicated to food and animal safety.

“This is a grant called ‘Accelerating Innovation Research,’ or AIR. It is not a grant for fundamental research but rather a grant to take previous NSF discoveries and move them toward commercial applications,” Worden explained.

Worden and Satoh hope to develop prototypes of three commercial biosensor systems: portable point-of-care meters, electrochemical multi-well plates, and flow injection analyzers.

“One of the features of the patented bioelectronics sensor platform that we have developed is a technique to amplify the signal...
and so increase sensitivity, which is an asset for customers using the finished product,” Worden explained.

The patented biosensor was designed to measure an enzyme in humans that is affected by nerve gases. Worden is now striving to make it applicable to a wider range of enzymes and extending it to antibodies, which are used in detecting diseases, toxins, and microorganisms in food.

Worden points out that linking the biosensor system to antibodies, proteins produced by the body in response to harmful substances, is useful in food safety applications. Other features of the patented bioelectronics sensor platform include multiple types of biological recognition molecules, compatibility with other commercial biosensor systems, and disposable sensing units. These features make the new systems more user-friendly, convenient, and cost-effective than competing technologies, he said.

Read the full story at www.agbioresearch.msu.edu.

> COURTESY OF MSU AGBIORESEARCH

UPDATE

MSU's newest startup originated as a 2014 Design Day project

A new medical device that will improve the way infants with jaundice are treated is one step closer to market, thanks to a partnership between a new Michigan State University startup company and a Michigan-based medical sector investment firm.

The startup, TheraB Medical Products Inc., was developed by MSU students with the help of $150,000 in funding from Quantum Medical Concepts.

The project was originally called Swaddle-mi-Bili and was one of 150 innovative projects showcased at the College of Engineering Design Day on April 25, 2014. It was created by biosystems engineering students Oliver Bloom (BS ’14), Vu Hoang (BS ’14), and Alexa Jones (BS ’14).

The medical device is a wearable swaddle that treats newborn jaundice. Jaundice is caused by a high level of pigment in the blood called bilirubin, which causes the skin to look yellow. A newborn baby’s still-developing liver may not yet be able to remove this bilirubin from the blood.

TheraB provides the blue light needed to help the newborn break down the bilirubin molecules. The new parents are able to hold their newborn during treatment, rather than having the infant lie in isolation beneath special lights that treat the condition.


> COURTESY OF MSU AGBIORESEARCH
Spartan students showed their ingenuity by building an Internet-enabled, solar-powered computer system in a remote village in Tanzania. Students continue to return to the remote region to improve and expand the technology.

Learning by helping: MSU students engineer solutions in Africa

Long before Michigan State University adopted the “Who Will? SPARTANS WILL.” brand, a group of Spartan students showed their will—and ingenuity—in building an Internet-enabled, solar-powered computer system. Then they took the system to a remote village in the Rift Valley of northern Tanzania and installed it in an elementary school. This gave Tanzanian students and teachers access to the vast educational resources and information of the Internet in a place that lacked not only computers, but the electricity to power them. That was in 2008.

Unlike many other international projects, this was not a one-time deal. MSU students, primarily engineering and communication arts undergraduates, have returned year after year to improve and expand the project that now encompasses three elementary schools and two secondary schools. The project was funded in part by corporate partners with start-up funding from MSU. However, to continue the project additional funding is needed.

“It all began when Lenovo, a computer manufacturing company, wanted to sponsor a senior capstone design team in electrical and computer engineering to work on technology for creating cost-effective, solar-powered computers for a
“My experiences in Tanzania both as an engineer-in-training and as a young man are immeasurable,” said Eric Tarkleson (‘09, ‘13), who went with the first group of students in 2008, and who has made many trips to Tanzania since then.

developing country,” explained Erik Goodman, professor of electrical and computer engineering (ECE) in the MSU College of Engineering and director of BEACON, an NSF Center for the Study of Evolution in Action.

At the time, Goodman was teaching the ECE capstone course where seniors design real-world solutions for a variety of projects. He teamed up with faculty members from the Department of Media and Information in MSU’s College of Communication Arts and Sciences and got the idea approved as a senior capstone design project. In the spring of 2008 a capstone team, along with more students in the fall of 2008, took up the challenge of designing an innovative, multi-seat computer system and a solar power system to run it.

Meanwhile, Goodman and Jennifer Olson, an associate professor in the MSU Department of Media and Information whose research is in communication technology in Africa, went to Tanzania seeking a site to install the computer system. Olson’s familiarity with the country helped in finding a town with appropriate
housing for MSU students and the perfect rural primary school. The town selected was Mto Wa Mbu, Tanzania, southwest of Mount Kilimanjaro.

In December 2008, the MSU students and professors headed to Tanzania. There they were joined by faculty members and electrical engineering students from Tanzania’s University of Dar es Salaam. The group worked from dawn to dusk to assemble, install, and test the system in the school—the first primary school in Tanzania to have Internet access. They were undaunted by the lack of electricity, the extreme heat and dust, many large and small critters chewing on wires and parts, and excited users who had never touched a computer before. In the end, the computer system the students had designed turned into a strong, rugged system that uses little power. It has forever changed the lives of Tanzanian students and teachers. However, the project also had an effect on the MSU students.

“My experiences in Tanzania both as an engineer-in-training and as a young man are immeasurable,” said Eric Tarkleson, an ECE student who went with the first group of students in 2008 and ended up returning 11 times as part of the project. “Traveling to a place like Tanzania as an American for the first time shifts one’s perspective. My views and ideas are different because of my travels and experiences there.”

Today, there are five schools in and around Mto wa Mbu with enhanced technology and Internet access that are improving Tanzanian
students’ learning experience and helping teachers to provide students with more and better information. MSU students continue to develop improved computer, power, and communications systems. A few years ago the project became an annual month-long MSU Service-Learning Study Abroad Program open to students from any major.

The project continues to be an exciting challenge for MSU students. “They have to decide what hardware to replace, what to replace it with, and there is a lot of technology that has to be figured out, parts ordered and tested before any of the teams leave the U.S. because once we are on the scene it’s too late for that kind of work,” Goodman explained. Making the computers relevant to the educational system in Tanzania, too, is a challenge. MSU students have developed new software, adapted educational materials for the local setting, written guides for using the computers, and provided computer training to Tanzanian teachers and students.

In addition to the expansion of computer systems, the project has expanded in other ways. “We now have a local Tanzanian with expertise in computers, to keep things running all year long,” explained Goodman. “He’s a computer specialist who does training and repairs in between our trips. He knows how to fix anything when something goes wrong, which, as we all know, can happen when working with computers.” So, the teachers and students have working equipment all year long; this regular maintenance, according to Goodman, is a vital part of the project.

The 2014 project was an ambitious effort to address the critical teacher shortage in Tanzania. It involved designing and installing a video conferencing system between the two secondary schools. This system allows a teacher to teach in one school, and simultaneously teach a class in another school. In the distant classroom, students can see and hear the teacher, and the teacher can see and hear them. To make the system work, WiMax antennas were installed at each school along with cameras, projectors, screens, white boards, microphones, and speakers. Since communications between schools are ensured with WiMax, access to Internet is not required.

“The reason we developed a video conferencing system and why the Tanzanians are so excited about it is because there is a severe teacher shortage in Tanzania, especially for more advanced subjects like physics,” said Olson. “With this system, one teacher can teach in two schools at the same time.”

Goodman and Olson believe that the most important thing MSU students take away is self-confidence. “They go to a country halfway around the world that has a completely different culture. But our students see that they are able to communicate with people and install or complete the project as planned,” Olson said. “Our students walk away with a better understanding of different cultures and see how they can work in that culture and how they can contribute.”

For Eric Tarkleson, his many trips to Tanzania have had a major effect on his life. “The experiences like this look great on paper and transfer well to any job environment,” said Tarkleson, who received his BS degree in ECE in 2008 and went on to get a master’s degree in electrical engineering with a concentration in power electronic systems in 2013. “The solar-powered computer project gave me the confidence and the résumé to really choose to do something I enjoy,” said Tarkleson. He had been working as an engineer in the Cincinnati, Ohio, area, but returned to Tanzania in April to work for Off Grid Energy, a startup company selling solar energy.

The organizers of the long-running project to bring computers and Internet access to students in Tanzania are now trying to raise private funding to keep the program going.

For more information on ways to donate to the project, contact Erik Goodman at goodman@egr.msu.edu or (517) 355-6453.
Laura Dillon helps bring technology skills to young Rwandan women

Laura Dillon envisions a workforce with more women in information technology and engineering careers. Her work with Women in Computing as well as other outreach programs both on campus and nationally has influenced many young women now working in technology fields.

Dillon, a professor in the Department of Computer Science and Engineering (CSE), was presented with an opportunity to expand that vision to Rwanda, an African country where many young women have little or no exposure to technology.

Her initial visit to Rwanda was in summer 2014, followed by a two-week trip in summer 2015.

“One of our CSE alumni, Louise Hemond-Wilson (BS ’86), a Distinguished Engineer with IBM, was consulting in Rwanda when she came up with the idea of a computer technology camp for young Rwandan women,” explained Dillon. “Louise has always been supportive of my work, especially with Women in Computing, so she got me and a second executive consultant at IBM, Celest Metuassalol, involved in this

Camp Techcobwa aids young women in Rwanda in learning the fundamentals of robotics, logical reasoning, visualization skills, and working in teams.

营 Camp Techcobwa aids young women in Rwanda in learning the fundamentals of robotics, logical reasoning, visualization skills, and working in teams.
Although it was hard work, it also was a fulfilling and enlightening experience, and I think we made an impact on more than 50 young female students and 12 teachers.”

The project, called Camp Tech kobwa, was made possible by a four-way collaboration: MSU had the expertise to design and deliver the robotics and computing curriculum; Hemond-Wilson and Metuassalol helped build and teach IT and teaming modules; the U.S. Peace Corps in Rwanda had on-the-ground experience; and the Ministry of Youth and Information Technology in Rwanda cooperated and helped with transportation. Personnel at the U.S. Embassy in Kigali, the capital of Rwanda, also assisted with the project.

“Having this broad-based partnership was what made it all possible—we certainly could not have done it without the Peace Corps doing the legwork on the ground to contact the right people to set up and run the camp,” said Dillon.

The camp was specifically for teachers and female high school students. Fifty-seven girls, ranging in age from 11 to 20, and 12 teachers, all from remote areas of Rwanda, were brought to the camp in 2014, which was held at St. Jerome School in Janja, the country’s top boarding school. The 12 teachers spent five days prior to the start of the camp in training sessions with Dillon and her partners learning the curriculum. Then the girls arrived for six days of activities and learning sessions. The program included lessons on the fundamentals of robotics, basic algorithms, programming in Scratch, logical reasoning and visualization skills, Internet and Internet safety, oral and written communications, and experience in working in teams.

“The robotics unit was, of course, one of the most popular units,” Dillon said. “We brought robotics kits with us, which we left with the Peace Corps in Rwanda for ‘road shows’ and
demonstrations as examples of what can be done with technology.”

There were many obstacles in teaching the curriculum. The first thing the group discovered is that many teachers could not use the provided PowerPoint presentations at their respective schools because their schools did not own LCD projectors. In addition, Internet connectivity at the camp was limited and completely absent from many of the teachers’ schools.

“So we improvised,” said Dillon. “We used blackboards and flip charts for ‘CS Unplugged’ activities that teach computer concepts—like how a computer represents information in binary and what an algorithm is—without a computer or overhead projector. These were all new topics for the students.”

An important part of the project, according to Dillon, was working with the teachers. She hopes that there will be a long-term impact, because the teachers not only learned the various parts of the curriculum, but also practiced delivering it to students with help from camp organizers. All the materials used were sent home with the teachers, so they could continue projects at their home schools.

Two College of Engineering students with experience in outreach also went with the group to Rwanda. Blair Fleet, a doctoral student in electrical engineering, and James Holly Jr., who has since graduated with a bachelor’s degree in computer science and engineering and is now a graduate student at Purdue, primarily taught the robotics units, but their skills in reaching out to American students helped with the work in Rwanda. Two other volunteers from the U.S.—Emily Wilson, a 2014 MSU
Two Fulbright Scholars expand the college’s international reach

Two faculty members are currently part of the prestigious Fulbright Scholar Program.

Elias Strangas, professor of electrical and computer engineering, recently returned from Austria. He spent from March to June teaching and conducting research at Graz University of Technology (TU Graz) Electric Drives and Machines Institute. TU Graz is located in the south of Austria and serves as the country’s focal point for teaching and research in the technical sciences.

His Fulbright work included teaching a class on the fault diagnosis and failure prognosis of electrical machines and drives.

“We have already had exchanges, joint work, and publications with the institute there,” he said. “I hope and expect that this exchange will further enhance our collaborative work with TU Graz and the University of Vienna, as well as with institutes and universities in France and Spain, with whom we have been having close cooperation and exchanges in the past six years,” Strangas said.

Volodymyr Tarabara, associate professor of civil and environmental engineering, is spending five months spread through 2016 conducting research on water quality control in the Republic of Georgia.

Tarabara is collaborating in Tbilisi, the capital and largest city in the Republic of Georgia, which is located on the southeastern edge of Europe. The host institution is the Agricultural University of Georgia. The project is in cooperation with a team from the Eliava Institute of Bacteriophages, Microbiology and Virology.

His research focuses on the use of bacterial viruses, called bacteriophages, as human virus surrogates in water quality control applications.

“Georgian researchers are considered to be among the best in the world in the science and application of bacteriophages,” Tarabara said. “At the same time, the country is in need of modern engineering solutions to ensure microbiological safety of its waters. I hope that my project will lay a foundation for a laboratory that would serve as a regional hub for water treatment research where engineers and microbiologists collaborate toward the common goal of protecting Georgia’s water supply,” he added.
Yimu Zhao, a doctoral student in chemical engineering and materials science, and Richard Lunt run a test in Lunt’s lab. The researchers are working on new materials that can be placed over windows to harvest solar energy. Photo courtesy of MSU Communications and Brand Strategy.

Solar energy that doesn’t block the sun

A team of researchers at MSU has developed a new type of solar concentrator that when placed over a window creates solar energy while allowing people to actually see through the window.

It is called a transparent luminescent solar concentrator and can be used on buildings, cell phones, and any other device that has a clear surface.

And, according to Richard Lunt of the MSU College of Engineering, the key word is “transparent.”


Research in the production of energy from solar cells placed around luminescent plastic-like materials is not new. Past efforts, however, have yielded poor results. The energy production was inefficient and the materials were highly colored.

“No one wants to sit behind colored glass,” said Lunt, an assistant professor of chemical engineering and materials science. “We take an approach where we actually make the luminescent active layer itself transparent.”

One of the benefits of this new development is its flexibility. While the technology is at an early stage, it has the potential to be scaled to commercial or industrial applications with an affordable cost.
“It opens a lot of area to deploy solar energy in a non-intrusive way,” Lunt said. “It can be used on tall buildings with lots of windows or any kind of mobile device that demands high aesthetic quality like a phone or e-reader. Ultimately we want to make solar harvesting surfaces that you do not even know are there.”

Lunt said more work is needed in order to improve its energy-producing efficiency. Currently it is able to produce a solar conversion efficiency close to 1 percent, but noted they aim to reach efficiencies beyond 5 percent when fully optimized. The best colored LSC has an efficiency of around 7 percent.

Self-powered sensors may warn of bridge, building defects

Imagine a bridge or a dam that could sense a structural defect before it happens, diagnose what the problem will be and alert the authorities before something bad happens.

Three MSU College of Engineering researchers are developing a new technology known as substrate computing. This will allow sensing, communication, and diagnostic computing, all within the substrate—the building material—of a structure, using energy harvested from the structure itself.

The research is funded by the National Science Foundation, including a recent $1 million grant.

Subir Biswas, professor of electrical and computer engineering, said the goal is to install sensors that continuously monitor and report on the structure’s integrity, using new sensor-network technology.

“Adoption of such monitoring has previously been limited because of the frequency of battery replacement for battery-powered sensors,” he said, “as well as the need for a separate communication subsystem usually involving radio frequency sensor networks.”

A research team of Biswas; Rigoberto Burgueño, professor of civil and environmental engineering; and Shantanu Chakrabartty, now a professor of computer science and engineering at Washington University in St. Louis, are developing this new technology.

Read more on this research at MSUToday: http://bit.ly/1MIkgwS.

Rigoberto Burgueño, Subir Biswas, and Shantanu Chakrabartty are advancing self-powered sensors using a $1 million grant from the National Science Foundation.

BEACON Center nets $22.5M to continue evolution research

A $22.5 million grant from the National Science Foundation will help MSU researchers continue their work and outreach activities at the BEACON Center for the Study of Evolution in Action.

Faculty from the college are among the computer scientists and engineers who use digital organisms—self-reproducing computer programs operating in a controlled computer environment—to explore evolutionary dynamics much more rapidly than studies in the lab or field.

Evolutionary computational tools provide design and engineering solutions for industrial and societal use, said BEACON Director Erik Goodman, a professor of electrical and computer engineering. For more on BEACON, visit http://beacon-center.org/.

Other members of the research team include Yimu Zhao, an MSU doctoral student in chemical engineering and materials science; Benjamin Levine, assistant professor of chemistry; and Garrett Meek, doctoral student in chemistry.

> TOM OSWALD, MSU TODAY
One of the world’s foremost authorities on biometrics is also one of MSU’s busiest researchers and collaborators. University Distinguished Professor Anil Jain, of the Department of Computer Science and Engineering, is internationally renowned and, like MSU, is advancing the common good in uncommon ways. Here are a few of his recent accomplishments.

**FACIAL RECOGNITION PROVES ITS METTLE**

In an experiment that demonstrated the value of the latest in automatic facial recognition technology, researchers at MSU were able to quickly identify one of the Boston Marathon bombing suspects from a law enforcement video.

In the Pattern Recognition and Image Processing Laboratory, Anil Jain, University Distinguished Professor of computer science and engineering, and research scientist Josh Klontz tested three different facial-recognition systems. By using actual law-enforcement videos from the bombing, they found that one of the three systems could match suspect Dzokhar Tsarnaev. “The other suspect, Tamerlan Tsarnaev, the one ultimately killed in the shootout with police, could not be matched at a sufficiently high rank, partly because he was wearing sunglasses,” Jain said. “The younger brother could be identified.”

Under controlled conditions, when the face is angled toward the camera and if the lighting is good, this technology can be up to 99 percent accurate.

Jain and his team are internationally recognized in the field of...
identification technology. His team has developed methods to match forensic facial sketches with mug shots, as well as technology that allows police to identify criminal suspects by tattoo matching.

Read more at MSUToday: http://bit.ly/1qfedtQ.

**“3D PHANTOMS” IMPROVE FINGERPRINT MATCHING**

MSU computer scientists have built the first three-dimensional model of a human fingerprint. The development will not only help today’s fingerprint-matching technology do its job better, but could eventually lead to improvements in security.

What Anil Jain, his MSU colleagues, and research collaborator Nick Paulter at the National Institute of Standards and Technology did was develop a method that takes a two-dimensional image of a fingerprint and maps it to a 3D finger surface. The 3D finger surface, complete with all the ridges and valleys that make up the human fingerprint, is made using a 3D printer. It creates what Jain’s team called a fingerprint “phantom.”

Read more on this research at MSUToday at http://bit.ly/1jRl0Ci.

**SCANNING BABIES’ FINGERPRINTS TO SAVE LIVES**

In research funded through the Bill & Melinda Gates Foundation, a team led by University Distinguished Professor Anil Jain is developing a fingerprint-based recognition method to track vaccination schedules for infants and toddlers, which will increase immunization coverage and save lives.

Jain and his team traveled to rural health facilities in Benin, West Africa, to test a new fingerprint recognition system. They used an optical fingerprint reader to scan the thumbs and index fingers of babies and toddlers. From this scanned data, a schedule will be created and become a part of the vaccine registry system.

“Paper documents are easily lost or destroyed,” Jain said. “Our initial study has shown that fingerprints of infants and toddlers have great potential to accurately record immunizations. You can lose a paper document, but not your fingerprints.”

Each year 2.5 million children die worldwide because they do not receive life-saving vaccinations at the appropriate time.

Read more on this research at MSUToday: http://bit.ly/1tpsxfr.

Matthew Vasher won a $500 grand prize at MSU’s 2015 University Undergraduate Research and Arts Forum (UURAF) in April.

His research with Professor Evangelyn Alocilja, titled “Detecting Pathogens Using a DNA-Based Biosensor,” won UURAF’s STEM division. Around 750 students presented 518 projects. Vasher is a biosystems engineering senior from Pinckney, Mich.
ENGINEERING FOR EXTREMES

Water: the oil of the 22nd century—and maybe the 21st

Yadu Pokhrel has spent his career studying rainfall patterns and how humans are affecting the global water cycle.

The message: With seven billion-plus of us on the planet, we’ve got to start rethinking how we use fresh water.

“Extremes are getting worse,” Pokhrel said of global climate. “Rainfall patterns are changing. We are getting historical droughts. We are also getting historical floods. These are affecting water supply systems—not only surface water, but people are getting water from increasingly deep water systems, and those are depleting at a very rapid rate. Water levels in California are going down so fast that if we keep using water at this rate, it won’t last long.”

Pokhrel is a native of Kathmandu, Nepal, where he studied civil engineering. He received his PhD at the University of Tokyo and spent several years as a post-doctoral researcher and research faculty member at Rutgers before becoming an assistant professor of civil and environmental engineering at MSU.

Pokhrel called the use of groundwater “the drought we can’t see. People don’t realize how fast the groundwater is depleting. Solving these problems requires hard measures. Constructing more dams and storing more water is not feasible in all areas due to environmental impact. But there are softer measures—better ways of irrigating crops, asking citizens to save water however they can.”

Water shortages may even force changes in diet, Pokhrel said. Raising beef cattle requires much more water than growing vegetables. Chicken requires less water per pound of meat, he said.

Pokhrel, who recently published a research paper on the depletion of the Ogallala Aquifer under the Great Plains, and the aquifer under California’s Central Valley, said the clock is ticking on the world’s freshwater supply. “We are using up our aquifers at 22 times the replenishment rate.”

Pumping that much water from that deep under the ground means it never returns to the aquifer. His research shows that humans are now pumping enough water out of deep layers that it’s contributing to sea level rise.

As for the Great Lakes, he said climate change may balance itself out; warmer winters mean more evaporation from the lakes, but a warmer, moister atmosphere also means more heavy precipitation events.

> MATT ROUSH, TECHCENTURY MAGAZINE

Yadu Pokhrel warns that the Earth’s groundwater supply is depleting faster than people realize. “The clock is ticking,” he said.
Mobile phones for improved diagnosis of malaria

Researchers in the MSU College of Engineering are getting closer to phoning home a rapid-response diagnostic test for malaria, one of the world’s most deadly infectious diseases. Most of the world’s 600,000 malaria victims are children.

Peter Lilleshøj, assistant professor of mechanical engineering, is heading a team of researchers that will use a $1.8 million grant from the National Institutes of Health (NIH) to diagnose and monitor cerebral malaria using mobile phones.

MSU University Distinguished Professor Terrie Taylor, an internationally recognized expert on malaria and co-investigator on this project, said the diagnosis and clinical care for patients with cerebral malaria is complicated. “It is difficult to predict which patients are at risk of deteriorating from the disease, and which are not,” she said.

To tackle this challenge, Lilleshøj and his team are working to develop and test a field-ready mobile phone–based biosensor that can perform rapid measurements of malarial biomarkers from human serum and blood samples. The proposed biosensor will provide a handheld platform for rapidly measuring malaria biomarkers which, if implemented broadly, could improve the clinical diagnosis of cerebral malaria and triage of patients with uncomplicated malaria.

“It will incorporate a miniature detection circuit that plugs directly into a mobile phone, a disposable microfluidic chip, and a user-friendly app,” he explained.

The app will provide graphical operating instructions to assist the user in performing the test. It will also be capable of wireless data transmission for sending test results to centralized laboratories and public health agencies.

Other researchers working with Lilleshøj on the project are Andrew Mason, professor of electrical and computer engineering; Karl Seydel, assistant professor of internal medicine; Mathew Reeves, professor of epidemiology and biostatistics; Guoliang Xing, associate professor of computer science and engineering; and Don Mathanga, from the University of Malawi College of Medicine.

Lilleshøj joined Michigan State in 2012. His research is focused on developing innovative technologies for biomedical applications. His lab is also working to advance wearable sensor technologies through the development of textile biosensors capable of detecting biomarkers for disease diagnosis and health monitoring.

“By creating diagnostics that are fast, low cost, and easy to use, we can do a better job of supporting preventive medicine through early disease detection,” Lilleshøj said. “Ultimately, this will reduce healthcare costs worldwide and offer low-cost diagnostics in places where resources are limited, such as developing countries.”


$5 million Coffman bequest to benefit future innovators

A $5 million bequest commitment from a Kentucky couple will strengthen the MSU College of Engineering’s ability to coach, develop, and educate the next generation of innovation leaders.

The estate gift from **Gary and Patricia Coffman** is one of the largest donations ever given to MSU Engineering. It will establish the Gary A. and Patricia A. Coffman Endowed Scholarship/Fellowship, funds that will be split into an endowed scholarship/fellowship fund for talented, qualified students and a discretionary fund for the dean.

Gary Coffman said supporting the next generation of engineering leaders is exactly what they had in mind in creating the endowment.

“One of the key things in the engineering field is to establish an environment for others to leverage their capabilities,” he said. “As a leader, you are responsible for providing coaching and development for your employees to stretch and grow. It is my hope to impact students with this gift.”

Coffman was born and raised in the Detroit area. He came to MSU to study engineering and landed an internship at the Ford Motor Co. while a student. At Ford, he was encouraged to be curious about innovation.

“I helped develop and build unique equipment for engine dynamometer testing,” he said. “We worked on the durability and testing of developmental emission controls for early emission controlled vehicles.”

Coffman graduated from MSU in 1974 with a bachelor’s degree in electrical engineering and began a 31-year career with Dow Corning.

His responsibilities included a variety of plant management roles. He served as plant manager for the Dow Corning facility in Elizabethtown, Kentucky, from 1998 until his retirement in 2005.

“We’re thrilled to receive this entire commitment from the Coffmans, but the financial flexibility afforded by the endowed discretionary fund is particularly important,” said Dean Leo Kempel. “Discretionary funds allow us to take advantage of opportunities to support faculty researchers at critical junctures, implement innovative new programs when other funding sources aren’t available, and keep improving our student experiences.”
Google software engineer creates legacy at MSU

A senior software engineer at Google has made a $2 million commitment to benefit the college by establishing the first endowed chair of computer science at MSU.

The gift, established through an estate plan, is from Doug Zongker of Mountain View, Calif., who graduated from MSU in 1996 with a bachelor’s degree in computer science. His commitment was announced in July 2014.

“I wouldn’t be where I am today without the tools and training that I received during my years at Michigan State University,” Zongker said. “I am pleased to be in a position to be able to give back. This gift is a small way that I can help my industry and my alma mater stay in the forefront of technology advancement.”

Endowed professorships and chair positions are the highest level of faculty distinction. The support from an endowment provides a dependable, perpetual source of funding to support the position, as well as the ability to conduct research and scholarship as new opportunities arise.

“Doug’s long-range vision helps our entire college and the computing community,” said Dean Leo Kempel. “His gift will provide a steady stream of income to advance MSU’s mission and help us sharpen our plan for adapting to the vast technological changes that await us in the future.”

Stephen Bates, senior director of university development and alumni relations in the college, called Zongker an outstanding example of an alumnus who has provided significant support to his alma mater. “While being young for the traditional bequest donor, he shows that it is never too early to think about an estate gift,” Bates said. “This is an exceptional way for a person wanting to establish a legacy and honor their relationship with Michigan State University.”

After graduating from MSU, Zongker earned a doctoral degree at the University of Washington in Seattle in 2003 and joined Google. He was an early engineer on the Gmail email service, and worked on its first spam-detection system, systems to manage the service’s rapidly expanding production deployment, and other internal infrastructure.

Since 2007, he has worked on the Android mobile phone operating system, specifically for remote device management and over-the-air system update.

In February 2011, he established the Doug Zongker Endowed Discretionary Fund for Computer Science and Engineering at MSU. It has funded the purchase of devices for the department’s new mobile applications development class, which began in spring 2013. Students use the devices for the course’s programming projects.
$400,000 launches the Anil K. Jain Endowed Graduate Fellowship

A $400,000 cash gift will honor one of the world’s foremost authorities on pattern recognition, computer vision, and biometric recognition with the creation of an endowed fund in his name at MSU.

The Anil K. Jain Endowed Graduate Fellowship is an anonymous gift from an international businessman who was a visiting scholar in computer graphics and image processing in Jain’s laboratory in the early 1980s. The fellowship fund will support doctoral-level research on pattern recognition, computer vision, and biometric recognition. The Department of Computer Science and Engineering will select the recipients of the Jain Fellowship.

Jain is a University Distinguished Professor of Computer Science and Engineering at MSU who has conducted trailblazing research in data clustering, fingerprint recognition, and face recognition.

His research is followed by his peers as indicated by his h-index which is the highest among active computer science researchers in the world today. The h-index measures the productivity and citation impact of a scientist’s or scholar’s published body of work. For details of Anil Jain’s contributions, visit http://biometrics.cse.msu.edu/people/index.html.

“I am so very grateful that a former student has chosen to honor me by establishing this endowment,” Jain said. “I am flattered that our time together at MSU was so meaningful to him. Ultimately, this endowed fellowship will enhance our mutual scientific interests through new generations of graduate students.”

Jain’s research interests include pattern recognition, computer vision, and biometric recognition. His articles on biometrics have appeared in Scientific American, Nature, IEEE Spectrum, Scholarpedia, and MIT Technology Review.

He has received numerous awards, including a Guggenheim Fellowship, the Humboldt Research Award, a Fulbright Fellowship, the IEEE Computer Society Technical Achievement Award (2003), the W. Wallace McDowell Award (2007), the IAPR King-Sun Fu Prize (2008), and the ICDM 2008 Research

strengthen stewardship
Contribution Award. He holds six patents and is the author of several books. He was the 2014 Innovator of the Year at Michigan State University.

The $400,000 gift is part of Michigan State University’s Empower Extraordinary campaign. Jain and his family will provide an additional $100,000 to augment this endowment. Others wishing to contribute to the Anil K. Jain Endowed Graduate Fellowship fund may contact Stephen Bates, senior director of development in the MSU College of Engineering, at batesst@egr.msu.edu.

Estate gift will invest in entrepreneurship and diversity

A Chicago couple, who met in a calculus class at MSU in the 1970s, have endowed a professorship to support entrepreneurship and diversity in the college. The $1.3 million gift, established through their estate plan, creates the Bob Nuber and Betty Shanahan Endowed Professorship and supports Empower Extraordinary, the $1.5 billion campaign for MSU that publicly launched in October 2014.

Nuber, 1978 computer science and Honors College graduate, is managing director of digital technology for Tribune Publishing Co. Shanahan, who received her MSU degree in 1978 in electrical engineering, served as the executive director and CEO for the Society of Women Engineers for more than a decade and is regarded as one the country’s key voices in support of diversity in engineering and industry.

“Entrepreneurial activities and supporting diversity in engineering are two key priorities of our college,” said Dean Leo Kempel. “This significant commitment demonstrates Betty and Bob’s confidence in what we’re currently doing and in our vision for the future.”

Nuber said he is proud of the college’s championing of efforts that make a difference, like inclusion and entrepreneurship.

“If we’re going to remain a premier institution, we need to sharpen our focus on new activities and processes that change our world for the better,” he said. “If anyone will do that, I believe that Spartan engineers will.”

Shanahan added that she hopes this gift opens up dialogues and creates a ripple effect.

“Our goal is to shape the potential of philanthropy among Spartan engineers,” she said. “We invite others to figure out what their passion is and share in the growing excitement of this campaign.”

Both Nuber and Shanahan are members of the MSU College of Engineering Campaign Cabinet. Shanahan is also a member of the College of Engineering Alumni Association Board and the Cornerstone and Residential Experience Sounding Board.

Jack and Dottie Withrow create graduate fellowship in biomedical engineering

A $500,000 gift from long-time friends of the college will be used to attract some of the country’s most talented graduate students into MSU’s new biomedical engineering department.

continued on page 35
$200,000 commitment from Consumers Energy

The vibrant strength of the MSU-Consumers Energy relationship was celebrated March 20 during a recognition ceremony honoring Consumers Energy and its Foundation’s most recent $200,000 donation to the college’s Cornerstone & Residential Experience (CoRe) program.

CoRe is an integrated first-year engineering academic program and living-learning community that works to “build the whole engineer,” with activities ranging from strengthening interviewing skills to festive seasonal celebrations.

Representatives from Consumers Energy and MSU dedicated the redesign of the second-floor lobby in East Wilson Hall. The updated lobby is decorated with colorful circles and geometric patterns and offers students a gathering space with charging stations and other furnishings to encourage studying and socializing.
Jack and Dottie Withrow of Naples, Fla., established the Withrow Endowed Graduate Fellowship in the Department of Biomedical Engineering in November 2014.

“We are so pleased to support the convergence of traditional engineering and the developing technologies in the college’s new department,” Jack Withrow said. “We’re especially excited to be the first to contribute to its graduate program. This feels like an opportunity to create a lasting foundation for biomedical engineering grad students now and in the future.”

The gift establishes an endowment that will provide support in perpetuity. “This is an incredible start for this academic department,” said Dean Leo Kempel. “Endowing graduate student fellowships provides the momentum that will help to ensure the future success of the department and propel it forward as an important part of the college’s future.”

The Withrows’ latest gift joins their other investments at MSU, including the college’s Withrow Endowed Teacher/Scholar/Service Awards. The Withrows also are long-time supporters and donors to the College of Music.

The Department of Biomedical Engineering was approved in October 2014 and became the college’s first new academic department since the Department of Computer Science and Engineering was established in 1969. It will begin by offering master’s degree and doctoral programs. An undergraduate program could follow once the department is established.
Construction of MSU’s new Bio Engineering Facility continues on south campus. The four-story, $61 million building will become MSU’s hub for interdisciplinary research in the Colleges of Engineering, Human Medicine, and Natural Science.

MSU’s two newest academic departments are affiliated with the MSU College of Engineering. The Department of Biomedical Engineering (BME) was approved by the MSU Board of Trustees in October 2014 to expand collaborative research in health care on campus. Graduate-level courses will begin in fall 2016.

Dean Leo Kempel said MSU’s new BME department will become a lightning rod between the college and the rest of campus. “This will allow the expansion of translational research at MSU and provide a framework for expanding our collaborations in translational health care.”

R. Mark Worden, professor of chemical engineering and materials science, will serve as the interim chairperson.

Many of the BME activities will be centered in the new MSU Bio Engineering Facility, currently being built on the south end of campus. The facility is located between the Life Science Building and the Clinical Center, with proximity to the Radiology Building.

The almost-$61 million project has four stories and around 130,000
square feet. The building is nearing completion. A ribbon-cutting ceremony will celebrate the new facility in spring 2016.

Initially, the BME department will include only a graduate program. While an undergraduate program may be developed, it is likely several years away, Kempel said. Currently, students may pursue biomedical concentrations in biosystems engineering, chemical engineering, computer engineering, electrical engineering, materials science and engineering, or mechanical engineering.

Biomedical engineers will work with researchers from a variety of MSU colleges. The collaborations will help leverage expertise to provide cost efficiencies, advance emerging health science discoveries, and improve health care accessibility. Research examples include imaging enhancements, robotics for physician assistance, and sensors to assess the health of patients in home settings.

BME was the first new academic department in the college since 1969, when the Department of Computer Science and Engineering was established.

MSU’s other new academic department—the Department of Computational Mathematics, Science and Engineering (CMSE)—is bringing together researchers from a variety of disciplines to advance cutting-edge interdisciplinary science and the training of undergraduate and graduate students.

MSU trustees approved the new department at its April 17 meeting. Andrew Christlieb, an MSU Foundation professor of mathematics, will serve as CMSE chair.

Computational science focuses on the construction of mathematical models and quantitative analysis techniques, as well as using computers, to analyze and solve any number of scientific problems. In short, scientific computing is about developing algorithms that allow large problems to be solved in cost-effective ways in the new world of multi-core computing.

“The department will be distinct among computational academic units nationally,” said MSU Provost June Pierce Youatt. “Companion to the innovative research, CMSE will be home to a unique set of undergraduate and graduate degrees that bring together data science, scientific computing, and a blend of traditional disciplines.”

The department, which will be jointly administered by the Colleges of Natural Science and Engineering, is intended to position MSU as a world leader in scientific discovery through large-scale computation.

Eight new faculty members specializing in these areas will use computing as a critical tool to explore fundamental scientific questions in subjects as diverse as nuclear physics and evolutionary biology. The potential impact is widespread across several disciplines in the Colleges of Natural Science, Engineering, Social Science, Business, and health-related colleges.

“Among the biggest beneficiary of the research in the department will be new materials,” Kempel said. “Emerging computer platforms allow scientists to explore nature and how humans design in ways that could not be imagined a couple of decades ago.”

Current CMSE faculty members include (l to r) Brian O’Shea, department chairperson Andrew Christlieb, associate chairperson Shanker Balasubramanian, John Verboncoeur, Jian Qian, and Mark Iwen. Photo courtesy of the College of Natural Science.
MSU Engineering causes big bang at NCWIT Summit

Having actress Mayim Bialik, from the TV comedy Big Bang Theory, at the 2015 National Center for Women & Information Technology (NCWIT) Summit seemed fitting given the “big bang” MSU Engineering made at the event.

Hundreds of educators, entrepreneurs, corporate executives, and social scientists shared research, ideas, and action items for increasing girls’ and women’s participation in computing during the “2015 NCWIT Summit on Women and IT: Practices and Ideas to Revolutionize Computing,” May 19–21 at Hilton Head Island, S.C.

Bialik, who plays the character Amy Farrah Fowler on the popular TV comedy, was among the featured speakers at the NCWIT Summit, where MSU Engineering received multiple national recognitions. They include:

NEXT AWARD
MSU’s Departments of Computer Science and Engineering, Electrical and Computer Engineering, and Mechanical Engineering were the...
recipients of the 2015 NCWIT Extension Services Transformation Award of $50,000 (a second-place tie).

The NEXT Award recognized MSU’s “broad range of well-conceived recruitment and retention efforts.” Dean Leo Kempel and Teresa Isela VanderSloot, director of Women in Engineering Recruitment and K–12 Outreach, accepted the award on behalf of a college-wide team leading these efforts.

MSU was also commended for its active participation in the NCWIT Academic Alliance, including developing key resources for use by other schools, and its participation in the NCWIT Aspirations in Computing program.

EngageCSEdu

Richard Enbody and William Punch, associate professors of computer science and engineering, were recognized by NCWIT and Google with an EngageCSEdu Engagement Excellence Award. The award included a $5,000 cash award.

NCWIT EngageCSEdu is a growing collection of high-quality materials for introductory undergraduate computer science courses created by faculty across the country. All of the peer-reviewed materials in the collection employ a number of “engagement practices” that research suggests are likely to engage students, especially women and other underrepresented groups.

Punch and Enbody were recognized for their extensive collection of projects that are designed to create interdisciplinary connections between computer science and various technical disciplines. This collection of materials incorporates student choice with meaningful and relevant content.

NCWIT Collegiate Award for Angela Sun

An application for mobile phones, known as You++, earned MSU computer science senior Angela Sun recognition by NCWIT.

Sun, of Canton, Mich., was one of three women honored by NCWIT and HP as inaugural winners of the NCWIT Collegiate Award. The award encourages women undergraduates to persist in computing majors by recognizing their impressive innovations.

She was recognized for her mobile application that allows Android users to discover patterns that affect their battery life, such as the amount of time spent on apps, most used apps, and the number of times a phone is accessed in a day. The app is available worldwide on the Google Play Store for free. It is compatible with both phones and tablets, but requires Android 4.2 or newer.

Sun is a research student in the Systems and Security Lab in MSU’s Department of Computer Science and Engineering.

She spent the summer as one of only 30 product manager interns at Google in California.
Faculty notes

WELCOMING NEW FACULTY
Nine new faculty members will join the college in 2015–2016, strengthening and broadening areas of expertise and research interests. The tentative list includes:

- CIVIL ENGINEERING: Timothy Gates, Ali Zockaie, Memnraz Ghamami
- COMPUTER SCIENCE: Jiayu Zhou, Hu Ding (starting 1/1/16), Wolfgang Banzhaf (starting 8/16/16)
- MECHANICAL ENGINEERING: Tong (Tony) Gao, Mohsen Zayernouri, Junlin Yuan

FIRST GENETIC PROGRAMMING CHAIR IN THE UNITED STATES
MSU has hired the first endowed chair in genetic programming in the United States. Wolfgang Banzhaf, currently with Memorial University of Newfoundland, will be the first to hold the John R. Koza Endowed Chair in Genetic Programming. Banzhaf will join MSU in August 2016. His primary appointment will be in the Department of Computer Science and Engineering, and through BEACON he will be interacting with many other researchers from many disciplines.

TOP 125 PEOPLE IN THE ADVANCED BIOECONOMY
University Distinguished Professor Bruce Dale, of the Department of Chemical Engineering and Materials Science, is the top-ranked academic on the Top 125 People in the Advanced Bioeconomy in 2015. The list is created by BiofuelsDigest, the world’s most widely read biofuels daily. Dale was again recognized for his pioneering work in cellulosic ethanol and ongoing research in biofuels.

A HISTORY-MAKING CAREER
Professor Percy Pierre has had a history-making career. He was the first African American to earn a doctorate in electrical engineering in the United States and has been documented by The History-Makers, a Chicago nonprofit that has recorded more than 2,500 interviews with black notables. The interviews are now stored permanently at the U.S. Library of Congress.

FIRST TIME IN U.S.
PROTECT2015—the fifth international workshop on performance, protection and strengthening of structures under extreme loading—attracted 140 professionals from 30 countries to MSU June 29–30 to share research and advances in structural and material engineering fields. Venkatesh Kodur, of civil and environmental engineering, chaired the event. This is the first time the workshop has been hosted in the United States.

ADVISING NATIONAL COUNCIL
Linos J. Jacovides, professor of electrical engineering, shared his knowledge on electric drives with a National Research Council panel of distinguished experts for two years and was part of a congressionally mandated report on Overcoming Barriers to Electric-Vehicle Deployment, which was released in April 2015. Jacovides’ expertise was on the technical aspects of electric drives. “The assumption is that plug-ins could be helpful,” he noted.

6,000 CITATIONS IN INDIA
A 13-year-old research paper that proposed a computational method to help design cars, manage financial portfolios, and even select cricketers has become the first ever from India to receive 6,000-plus citations from scholars worldwide. The paper, by engineer turned computer scientist Kalyanmoy Deb and three under-
graduate students, has received more than 6,035 citations—a measure of the impact and influence of their research. All four previously were at the Indian Institute of Technology, Kanpur. Deb is the Koenig Endowed Chair in the Department of Electrical and Computer Engineering at MSU.

**BEAL AWARDS**

MSU’s William J. Beal Outstanding Faculty Award honors a comprehensive and sustained record of scholarly excellence in research and/or creative activities, instruction, and outreach.

- **2015:** Lalita Udpa, professor of electrical and computer engineering
- **2014:** Christina Chan, George W. Bissell professor, chemical engineering and materials science, and computer science and engineering; and Shanker Balasubramaniam, professor of electrical and computer engineering

**TEACHER-SCHOLAR AWARD**

Nelson Sepúlveda, assistant professor of electrical and computer engineering and mechanical engineering, was awarded a 2015 MSU Teacher-Scholar Award. The award is given to faculty members who early in their careers have earned the respect of students and colleagues for their devotion to and skill in teaching, and whose instruction is linked to and informed by their research and creative activities.

**ASME HONORS MUKHERJEE**

Professor Ranjan Mukherjee was honored with the 2014 Charles Stark Draper Innovative Practice Award, presented by the American Society of Mechanical Engineers (ASME). ASME presents the award once every two years. They honored Mukherjee in October 2014 for his “fundamental contributions to the modeling and control of underactuated systems with applications to robotics.”

**INAUGURAL IEEE AWARD**

Professor Linos J. Jacobides, whose visionary development of electric drives and systems set the foundation for the technologies that power today’s electric and hybrid vehicles, became the first recipient of the IEEE Transportation Technologies Award. Six IEEE societies combined to present the award to Jacobides in June 2014 for his pioneering contributions.

**BRIDEDIS NAMED ASEE FELLOW**

Daina Briedis, associate professor of electrical engineering and materials science and assistant dean of student advancement and program assessment, was named a fellow of the American Society for Engineering Education (ASEE) in June.

The fellow designation is conferred upon ASEE members who have outstanding qualifications and experience in engineering and related fields.

She is a fellow of both the American Institute of Chemical Engineering (AIChE) and ABET, Inc. She is an ABET adjunct director and serves as a facilitator of ABET Program Evaluator Training and ABET Program Assessment Workshops.

She joined MSU in 1982.

**NEW NATIONAL ACADEMY OF INVENTORS CHAPTER**

When MSU launched its own chapter of the National Academy of Inventors (NAI) in April, more than half of the 19 honored were from the College of Engineering.

The academy is dedicated to recognizing excellence in academic invention, enhancing the visibility of university and nonprofit research institute technology, academic innovation, and educating and mentoring innovative students.

MSU’s inaugural class included:

- Evangelyn Alocilja, biosystems and agricultural engineering,
- Dean Aslam, electrical and computer engineering,
- Jes Asmussen, electrical and computer engineering,
- Bruce Dale, chemical engineering and materials science,
- Larry Drzal, chemical engineering and materials science,
- Anil Jain, computer science and engineering,
- Dennis Miller, chemical engineering and materials science,
- Norbert Mueller, mechanical engineering,
- Ramani Narayan, chemical engineering and materials science,
- R. Mark Worden, chemical engineering and materials science,
- Ning Xi, computer science and engineering, and
- Satish Udpa, a University Distinguished Professor of electrical and computer engineering, former dean of the college, and current executive vice president for administrative services at MSU.

The induction of new members preceded MSU’s annual Innovation Celebration. It was hosted by the MSU Innovation Center.
Eight distinguished alumni honored for bringing pride to MSU

The 12th Annual MSU College of Engineering Alumni Awards Banquet honored a teacher who inspires her junior high students to explore science and engineering, and a group of eight distinguished alumni whose accomplishments have brought pride to MSU and the College of Engineering. They were recognized during an awards ceremony at MSU’s Kellogg Hotel and Conference Center on May 9, 2015.

Receiving the Claud R. Erickson Distinguished Alumni Award was Alton L. Granger of Dimondale, Mich., co-owner and chairman of the Granger Construction Company of Lansing. The Erickson Award is the highest honor conferred by the College of Engineering.

Seven other alumni received departmental awards:

• **Maura Frances McDonald** of Midland, Mich., an export compliance specialist for Dow Corning Corp. in Midland, received the Applied Engineering Sciences Distinguished Alumni Award.
• **Elaine P. Scott** of Seattle, Wash., dean of the School of Science, Technology, Engineering and Mathematics at the University of Washington Bothell, received the Biosystems and Agricultural Engineering Distinguished Alumni Award.
• **Craig A. Rogerson** of Philadelphia, Pa., president, chief executive officer, and chairman of the board of Chemtura Corp., received the Red Cedar Circle Award in Chemical Engineering and Materials Science.
• **Penny Wirsing** of Redondo Beach, Calif., environmental manager for ExxonMobil Corporation’s Torrance Refinery in Southern California, received the Civil and Environmental Engineering Distinguished Alumni Award.
• **Louise Hemond-Wilson** of Owosso, Mich., IBM Distinguished Engineer and Chief Technology Officer for IBM’s Systems Lab Services group, received the Computer Science and Engineering Distinguished Alumni Award.
• **Steven H. Noll** of Chicago, partner in the firm of Schiff Hardin LLP in Chicago, received the John D. Ryder Electrical and Computer Engineering Alumni Award.
• **Dennis C. McLaughlin** of Forney, Texas, who retired as senior vice president of development at Kosmos Energy in Dallas, received the Mechanical Engineering Distinguished Alumni Award.
• A seventh-grade science teacher at MacDonald Middle School in East Lansing was also honored. **Janelle M. Orange** of East Lansing received the Green Apple Teaching Award. The award was established in 2006 to honor K–12 teachers who have inspired students to study in the STEM fields.
Like father, like son. Regular attendees of the college’s GOLD Club celebration are Martin Saper (BS MECH EGR ’41) and his son, Roy Saper (BS COMP SCI ’73). Martin Saper is usually the oldest alumnus at the annual spring ceremony, where 50-year pins are handed out.

Mary Mertz-Smith, who has served as the college’s alumni director for more than seven years, presided at her last GOLD Club ceremony this spring. She will retire from MSU in September after 33 years. Here, she presents the 50-year alumni pin to Lewis Greenberg, who received electrical engineering degrees in 1964, 1965, and 1970.

A special reunion on April 24 honored four alumni who graduated 50 years ago from the college. They received their 50-year alumni pins during ceremonies at MSU’s Kellogg Hotel and Conference Center. Celebrating the induction of new GOLD (Graduates of Lasting Distinction) Club members were Associate Dean Thomas F. Wolff, Anthony Cairo (BS MECH EGR ’65), Gerald Esmer (BS ELEC EGR ’65), Lewis Greenberg (BS ’64, MS ’65, PHD ’70 ELEC EGR), and George Pearce (BS ELEC EGR ’65).
Disabilities need not preclude

Kurt Driscoll (BS MECH EGR ’97) exemplifies the power of higher education to solve problems and improve quality of life. Or, as Michael Hudson, director of the MSU Resource Center for Persons With Disabilities (RCPD) noted, “He is a beacon to help us realize that disabilities need not preclude the achievement of goals and dreams.”

Driscoll was presented the Outstanding Alumnus Award at the 2015 Resource Center for Persons With Disabilities (RCPD) ceremony April 24 at MSU’s Kellogg Hotel and Conference Center. The Outstanding Alumnus Award recognizes the accomplishments, leadership, and dedication of MSU graduates who have made significant contributions to their field—and who as Spartans apply their education to the betterment of society.

Hudson said Driscoll is a pioneer in engineering. “Kurt is living a career characterized by noteworthy contributions, despite the challenges he lives daily,” he said. “His physical challenges, as one prevailing despite quadriplegia, demands creativity and effective problem solving to develop solutions throughout his life.”

Driscoll earned an associate’s degree in mechanical drafting at Kirkland Community College in Roscommon, Mich., in 1994, a bachelor’s degree in mechanical engineering at MSU in 1997, and an MBA in international business from Lawrence Technological University in 2011.

Driscoll has spent the past decade as a validation engineer for safety and regulation compliance for all of Faurecia’s new seating products in North America. “Without the people around me, I wouldn’t be able to do what I do,” Driscoll said. “With the steadfast support from my wife, Marissa, and the support of friends and family—I have been able to do this because of the support I’ve been able to get. I can’t express how much that means,” he added.

Hudson summarized it this way: “Throughout the past 20 years, Kurt never lost sight of possibility. He has delivered a noteworthy set of accomplishments that make us proud to call him an outstanding Spartan.”

Celebrating with Kurt Driscoll (BS MECH EGR ’97) were his college friend Fred Harrington (BS ELEC EGR ’96), Professor Emeritus Robert Hubbard, and Associate Dean Thomas Wolff.
1873 graduate inducted into 2015 ASHRAE Hall of Fame

In a contemporary twist to a historical story, a Spartan Engineer from 1873 was inducted into the 2015 ASHRAE Hall of Fame.

ASHRAE, an international organization that advances the arts and sciences of heating, ventilation, air conditioning and refrigeration, inducted Rolla C. Carpenter (1852–1919) into its Hall of Fame during its winter conference in Chicago in January 2015.

Carpenter is considered one of MSU’s most revered early faculty members. He received a bachelor’s degree from Michigan Agricultural College (MAC) in 1873 and a civil engineering degree from the University of Michigan in 1875. He returned to MAC as a professor of mathematics and civil engineering. Carpenter designed and supervised much of the construction of the young MAC, including construction of a dam on the Red Cedar River.

In 1887, along with Professor William J. Beal, Carpenter helped design “Collegeville,” a neighborhood that later became East Lansing.

Carpenter was considered an expert in his time in the field of engineering and was appointed by the Academy of Science in 1915, at the request of the President of the United States, to investigate the slides at the Panama Canal. He passed away in 1919.

Elizabeth Hinds named to NIH Medical Research Scholars Program

Elizabeth A. Hinds (BS CHEM EGR ’12) is among 55 students named to the 2015–16 National Institutes of Health (NIH) Medical Research Scholars Program (MRSP). This is NIH’s fourth and largest MRSP class. Her MRSP experience began July 20.

The one-year residential program introduces medical, dental, and veterinary students to cutting-edge research as part of NIH’s goal of training the next generation of clinician-scientists and biomedical researchers. MRSP places creative, research-oriented students in NIH laboratories and clinics to conduct basic, clinical, or translational research in areas that match their career interests and research goals.

Hinds will spend the 2015–16 academic year at the National Institutes of Health in Bethesda, Md. She has spent the past three years at the Cleveland Clinic Lerner College of Medicine at Case Western University in Ohio.

“I am interested in primary care and would like to someday be able to be a primary care physician-researcher as this is an under-researched field despite being the future of healthcare and medicine,” Hinds explained. “I enjoy direct patient care, but understand the importance of research in determining the best way to provide that patient care and would like to continue to contribute to this knowledge.”

A 2012 graduate of MSU’s Department of Chemical Engineering and Materials Science, she is the daughter of Tim Hinds, academic director in the MSU College of Engineering Cornerstone and Residential Experience (CoRe).
in remembrance

FACULTY
Associate professor emeritus of electrical engineering Robert O. Barr Jr. of Providence, R.I., died Aug. 13, 2014
Retired computer science professor Martin “Glen” Keeney, East Lansing, Mich., died June 9, 2015
Associate professor of mechanical engineering Craig Somerton of East Lansing, Mich., died May 9, 2015 (see page 3)

ALUMNI
Melvin Dean (BS CIV EGR ’43), Grand Rapids, Mich., died Feb. 11, 2015
William Buehler (BS ’44, MS ’47, CHEM EGR), New Bern, N.C., died Nov. 9, 2014
Guy Spencer Vissing (BS CIV EGR ’48), Derwood, Md., died Sept. 12, 2014
David Corwin Wolf (BS MECH EGR ’48), Summerfield, Fla., died Sept. 20, 2014
Carl E. Christenson (BS CIV EGR ’49), Grand Blanc, Mich., died July 13, 2015
Thomas Keith Clay (BS MECH EGR ’49), Shelbyville, Ind., died Aug. 8, 2014
Howard E. Cloyd (BS ELEC EGR ’49), Frankfort, Ky., died Nov. 8, 2014
William F. Minard (BS ELEC EGR ’49), Warner Robins, Ga., died Oct. 22, 2014
Merwin “Murray” Revoldt (BS ELEC EGR ’49), Jackson Township, Ohio, died Feb. 7, 2015
Wendell Glen Champion (BS ELEC EGR ’50), Cascade Township, Mich., died July 23, 2014
Robert Rowland (BS MECH EGR ’50), Wacousta, Mich., died March 12, 2015
Larry G. Stimac (BS CIV EGR ’50), Hibbing, Minn., died Aug. 11, 2014
Clifford W. Holfoty (BS CIV EGR ’50), Novi, Mich., died June 15, 2014
Homer Boughner (BS MECH EGR ’51), Cadillac, Mich., died Dec. 6, 2014
John “Jack” Hilton Busch (BS CIV EGR ’51), Grand Rapids, Mich., died June 2, 2015
John W. Potter (BS CIV EGR ’51), Grand Rapids, Mich., died Jan. 14, 2015
George Stasevich (BS MECH EGR ’51), Gaylord, Mich., died Feb. 22, 2015
Frederick Lebrecht Johns (BS CHEM EGR ’52), Clearwater, Fla., died May 31, 2015
Elwyn L. Kitchen Jr. (BS MECH EGR ’52), Pawleys Island, S.C., died March 25, 2015
Frank E. Caruso (BS ELEC EGR ’55), West Long Branch, N.J., died July 29, 2015
Don Gordon Stormzand (BS METALLURGY ’55), Bradenton/Sarasota, Fla., died March 21, 2015
John “Jack” Ord Griggs Jr. (BS ELEC EGR ’57), Mineral, Va., died April 12, 2015
Richard Quig Roelofs (BS MECH EGR ’57), Saco, Maine, died Oct. 13, 2014
Hayes M. “Carl” Hobolth (BS AG EGR ’58), Fowlerville, Mich., died Sept. 28, 2014
Glenn Eugene Hall (BS MECH EGR ’59), Maumee, Ohio, died Dec. 29, 2014
Thomas Arthur Holz (BS METALLURGY ’59), Tiffin, Ohio, died Sept. 12, 2014
Hiremaglur Krishnaswamy (H.K.) Kesavan (PHD ELEC EGR ’59), Waterloo, Ontario, died Nov. 26, 2014
Charles Raymond Barnes (BS CIV EGR ’60), Boca Raton, Fla., died April 12, 2015
Lee Ward Burgett (BS ’61, MS ’62 MECH EGR), La Crosse, Wisc., died Dec. 21, 2014
James R. Postema (BS ELEC EGR ’63), Byron Center, Mich., died March 8, 2015
Robert E. Yant (BS CHEM EGR ’63), Parma, Ohio, died Feb. 1, 2015
Herman Christian Feikema (BS ’64, MS ’65, ELEC EGR), Rockford, Mich., died Jan. 25, 2015
Philip J. Akers (BS MECH EGR ’65), Alexandria, Va., died May 20, 2014
Charles “Chuck” Sturm (BS ELEC EGR ’68), Bay City, Mich., died Jan. 22, 2015
Tommie R. Thompson (PHD MECHANICS ’68), Waco, Texas, died June 29, 2015
Jack Martinic (BS MECH EGR ’71), Granger, Ind., died Sept. 22, 2014
Anthony E. Ash (BS MECH EGR ’78), Lansing, Mich., died Dec. 13, 2014
Howard “Scott” J. Haselschwardt (BS CIV EGR ’79), Charlevoix, Mich., died Aug. 25, 2014
Daniel W. Brandt (BS CHEM EGR ’81), Stillwater, Minn., died Aug. 12, 2014
William Christopher Pearson (BS ELEC EGR ’82), San Jose, Calif., died Sept. 25, 2014
Timothy Glennon Connors (BS EGR ’83), Rochester, Mich., died May 23, 2015
Lenora Kaye (Mack) Jadun (BS ’83, MS ’85 CIV EGR), East Lansing, Mich., died March 10, 2015
Patricia Anne (Constine) Schafer (BS CIV EGR ’87), Holt, Mich., died Nov. 15, 2014
1967
Roy Link (BS MECH EGR ’67) was presented with the Engineering Society of Detroit’s highest honor, the Horace H. Rackham Humanitarian Award, in Detroit June 24. He is chairman and CEO of Link Engineering and Link Testing Laboratories of Plymouth, Mich.

Phil White, PE (BS MECH EGR ’67) is president of AE Group Mechanical Engineers in Ventura, Calif., and has been with AE Group since 1976. It provides architectural-related mechanical engineering services to architects and facilities managers in Southern California. He previously was director of the Ventura County Air Pollution Control District. Prior to that he worked as a development engineer at Rocketdyne, developing combustion devices and ignition systems for the Apollo and space shuttle programs.

1968
Richard “Dick” Sage (BS CIV EGR ’68) received the Person of the Year Award from the Construction Management Association during the annual industry recognition dinner in October 2014. He was honored for his significant contributions to the profession. Sage is director of Sound Transit Construction Management, which plans, builds, and operates regional transit systems and services to improve mobility in the Central Puget Sound in Washington.

1977
Ronald A. Frisbie (BS CHEM EGR, Honors College ’77) was appointed vice president of North American operations at Cooper-Standard on May 4. Frisbie oversees the company’s North American operations and is based in Novi, Mich.

1980
Brian M. Kent (BS ELEC EGR ’80), internationally recognized scientific expert in radar technology, joined Applied Research Associates, Inc. (ARA) as senior scientist and science and technology lead for electromagnetic, radio frequency, and sensing systems in March 2015. He retired in June 2014 as chief technology officer of the Air Force Research Laboratory in Dayton, Ohio, after a distinguished 37-year civilian engineering career in the Air Force.

1981
Bob Matthews, PE, SE (BS CIV EGR ’81) joined RailPros in March 2015 as vice president, Irvine, Calif., headquarters office manager, to lead the RailPros engineering team and grow the company’s structural division. He has been a prominent leader in the civil engineering industry for the past 30 years.

Tim Roels (BS MECH EGR ’81) joined the project-engineering firm Sigma Design in December 2014 as a mechanical engineer as part of the Vancouver-based business’s ongoing expansion. He brings to the position 30 years of experience in product design and manufacturing and has been a part of development teams for medical devices, printer technology, and battery technologies.

1983
Tim Emmitt (BS MECH EGR ’83) is the new president of Belwith Products, a maker of decorative and functional hardware, and will work out of Belwith’s Grandville, Mich. headquarters. Most recently, he served as the president of 52nd Street Advisors. Emmitt also spent 15 years working in various financial and leadership positions at Chrysler.

1985
SAE International honored Roger W. Reini (BS COMP EGR, Honors College ’85) with the 2014 James M. Crawford Technical Standards Board Outstanding Achievement Award. The award recognizes individuals for outstanding service in the technical committee activities of the society. Reini is a senior engineer at Ford Motor Company in electrical and electronic systems engineering. He joined Ford in 1985.

1986
Pat D’Eramo (BS MECH EGR ’86) became the president and chief executive officer of Martinrea International Inc. on Nov. 1, 2014. D’Eramo has had a long and successful career in the automotive business, with extensive metalforming and parts manufacturing experience. Most recently, he was president of Dana Corporation’s Commercial Vehicle Technology group, leading the global heavy truck driveline business, with presence in the Americas, Europe, India, and Australia, and a major joint venture in China.

Kirk Goins (BS MECH EGR ’86) is the chief executive officer for the Paslin Company, a turnkey systems integrator focused on robotic automation in the automotive market. Before joining Paslin, Goins was CEO of Comau in North America, a global leader in manufacturing assembly systems that is based in Italy.
Alexander Shen (BS COMP SCI ’86) was appointed president of Ranor, a wholly owned subsidiary division of TechPrecision Corp., effective July 21, 2014. He has more than 30 years of experience in a broad range of industries, including metal fabrication, automotive, contract manufacturing, safety and security, and industrial distribution.

1988
Kevin T. Conroy (BS ELEC EGR ’88) was named an EY Entrepreneur of the Year in the Midwest during a black-tie gala at Navy Pier in Chicago on June 18, 2014. Conroy is president and CEO of Exact Sciences Corp. in Madison, Wisc.

Virginia (Ginger) Juncker (BS EGR ARTS ’88) became the executive director, programs and member services, of the Original Equipment Suppliers Association (OESA), on March 17, 2015. She joined OESA with a wealth of project management, organizational development, and automotive experience, most recently with Devon Facilities Management and C4 Consulting, LLC, as well as past roles with Visteon Corp., Ford Motor Co., and General Motors.

1990
Tyler Best (BS COMP SCI ’90) was appointed executive vice president and chief information officer (CIO) of Hertz Global Holdings, Inc., in January 2015. He oversees the company’s global Information Technology (IT) functions. Best previously held senior IT roles at Vanguard Car Rental (Alamo and National brands) and at Budget Rent-a-Car. He has also served in senior executive IT roles at YP (formerly Yellow Pages) and Ally Financial Inc. (formerly General Motors Acceptance Corporation or GMAC).

Mitzi Montoya (BS AES ’90) began as the new Sara Hart Kimball Dean of the Oregon State University College of Business on Aug. 31, 2015. Most recently, she was vice president and university dean of entrepreneurship and innovation at Arizona State University.

1991
Kara Farnandez Stoll (BS ELEC EGR ’91) became a federal judge on July 7, when she was confirmed to serve on the U.S. Court of Appeals for the Federal Circuit. She is a partner at Finnegan, Henderson, Farabow, Garrett and Dunner, LLP, in Washington, D.C., where her practice focuses on patent litigation, primarily in the consumer electronics, computers, software, and medical devices industries. She earned her J.D. in 1997 from Georgetown University Law School.

1992
Thomas Nelson Jr., PE, (BS CIV EGR ’92) was named Federal Highway Administration (FHWA) Kentucky Division Administrator in April 2015. He had served as the special assistant to the administrator of the FHWA in Washington, D.C., since August 2012. In that role, he was a key advisor on program and policy issues having national, regulatory, and legislative implications.

1993
Tracy Young (BS CHEM EGR ’93) works at Dow Chemical Company as a growth technologies director. For the past five years, she has worked in Dow’s Water and Process Solutions business. She helps the business explore new technologies, build alliances in the industry, and bring new technology to the market.

1994
Evan W. Schumann (BS ’94, MS ’96 CIV EGR) was named executive director of the Ohio Emergency Management Agency on Jan. 8, 2015. He had been the program manager for Ohio Task Force 1 (OH-TF1), which is the State of Ohio’s Urban Search and Rescue (US&R) Task Force. Stationed in Dayton, it is also one of the 28 US&R Task Forces in FEMA’s National US&R System.

1995
Chad J. Mitts (BS MECH EGR ’95) became executive vice president of Mayville Engineering Company Inc. in Mayville, Wisc., on Jan. 25, 2015. He is responsible for the operations of MEC’s fabrications, performance structures, and tank business groups. He also oversees the Greenwood, S.C., manufacturing facility. He has more than 20 years of professional experience, including his previous position as general manager of Meritor’s North American brake and driveline business.

1997
Texas Instruments (TI) announced the election of Robert Furtaw (bs
MECH EGR ’97) to vice president of Worldwide Semiconductor Quality, an organization within TI’s Technology and Manufacturing Group, in November 2014. He oversees a global team responsible for product and process technology development through manufacturing and delivery. His team is also accountable for developing and driving the use of methodologies, tools, and statistical processes across the company to deliver global, robust products, processes, and services.

1998
Mark Roberts (BS ELEC EGR ’98) was named vice president of Texas Instruments Inc. (TI) on April 8, 2015. As vice president of Americas sales and applications, he is responsible for leading a large organization of sales and field applications engineers who help TI customers develop innovative products. He joined TI in 1998 and has held a number of positions, including worldwide account manager and U.S. automotive sales manager.

2001
Jason Munger (BS MECH EGR ’01) joined Roll-Kraft as general manager—operation excellence in June 2015. He is responsible for the production and operation of the Roll-Kraft regrind facility in Frankfort, Ill., and the company’s newest regrind facility in Houston, Texas.

A “first in world” iris-scanning smartphone technology introduced in Japan in June is from the startup company of Salil Prabhaker (PHD COMP SCI ’01). Fujitsu’s Arrows NX F-04G smartphone has a built-in biometric system that can scan an iris within a couple of seconds and is intended to authenticate the user for phone unlocking and mobile payment.

2005
Eric Tritch (BS AES ’05) is in the inaugural Future Farmer class of the Hall of Fame for Healthcare Supply Chain Leadership. It was announced Feb. 27. Tritch is director of Strategic Sourcing at the University of Chicago Medicine.

2006
Lia Grillo Michaels (BS CIV EGR ’06) of Hubbell, Roth & Clark Inc., is a recipient of the Institute of Transportation Engineers 2015 Rising Star Award for the Great Lakes District. Michaels, of Grosse Pointe Woods, was awarded the 2015 Young Civil Engineer of the Year Award through the American Society of Civil Engineers Southeast Michigan Branch.

2007
Ke “Coco” Zhang-Miske (BS ELEC EGR ’07) was named to the prestigious Crain’s Detroit Business “40 under 40” list in October 2014. She is the global technology planning manager, Buick & GMC, at General Motors, where she oversees global technology features for Buick and GMC around the world.

2008
Staci R. DeRegnaucourt (BS CIV EGR ’08), of Quinn Law Group PLLC, has been recognized by World Trademark Review (WTR) for inclusion in its 2015 edition of WTR 1000—World’s Leading Trademark Professionals. After receiving her civil engineering degree, she earned her juris doctorate, magna cum laude, from the MSU College of Law. She concentrates her law practice in the intellectual property areas of trademarks, patents, and copyrights.

Anthony Plummer (MS ’08, PHD ’11 ELEC EGR) was named the Most Promising Engineer in Industry at the annual Black Engineer of the Year Awards ceremony in Washington, D.C., on Feb. 7, 2015. Plummer is a communications and networking engineer at the Johns Hopkins University Applied Physics Laboratory in Laurel, Md.

2015
FOUR GENERATIONS OF SPARTAN WOMEN. In May, Erin Hoffman of Indianapolis (BS COMP SCI ’15) became the family’s fourth generation of women to graduate from MSU. Her late great grandmother Thelma Swenson (’37, liberal arts) started the legacy trail, followed by grandmother Jeanette Reeves (’60, elementary education), and mother April Hoffman (’90, zoology, MS in microbiology, and doctorate in osteopathic medicine). Erin will begin a PhD in human-centered design and engineering at the University of Washington in the fall.
Thank you to Fred Bowen, Donald Currey, and Jack Osgood for answering the “Looking Back” question from the last Currents Magazine. The photo was from approximately 1949 and showed three engines: an Oldsmobile Rocket V8 (a ground-breaking design by Oldsmobile chief engineer Charles Kettering); a single-cylinder model from an early “curved dash” Oldsmobile; and a vintage Oldsmobile Limited engine, made from 1910–1912. The display was probably from General Motors Motorama, a grand traveling auto manufacturer’s show that began in 1949.

Lab facilities have changed a lot since the 1990s when chemical engineering student Valerie Adegbite worked on experiments on microwave processing of polymer composites for her doctoral thesis. Her PhD advisor was Martin Hawley. Today, Valerie Adegbite-Calloway (PhD ’95) works in the oil and energy industry as manager of INEOS in the Chicago area.