$12 MILLION GIFT LAUNCHES
THE CAMPAIGN TO
TRANSFORM MEB
From the Department Head

As MechSE’s new Department Head, I welcome you to enjoy our Fall 2015 magazine. I joined the department in 1992, and over the past 23 years I have developed a deep appreciation of our very special department. I am truly honored to now lead MechSE, with our incredible students, alumni, faculty, and staff.

What an exciting time it is in MechSE! As you saw on the cover and will read throughout the pages that follow, the “Transform MEB” project has received an enormous boost and is now a reality. In April, we held a press event to announce and celebrate a $12 million gift from alumnus Sidney Lu (BSME ‘81). His generosity and dedication to MechSE and its students have enabled us to launch the Transform MEB project, which includes the east-wing addition that will be known as the Sidney Lu Center for Learning and Innovation.

You can read much more about Transform MEB in the pages that follow. I am certain you will be as excited as we are for the students who will become engineers here and the world-class education they will receive. As proud as we are of what the department offers our students today, it is the potential for tomorrow’s education, innovation, and community that has us truly inspired. Please read more about the project and consider partnering with us as we realize this shared vision.

In other news that exemplifies the impressive standing of the MechSE Department and its people, the National Science Foundation announced in August a new, $18.5 million Engineering Research Center to be headquartered at the University of Illinois and led by MechSE professor Andrew Alleyne. Called P.O.E.T.S., the Power Optimization for Electro-Thermal Systems center will attack the thermal and electrical challenges surrounding mobile electronics and vehicle design. The center’s work will have profound societal impacts, and we are proud to count Professor Alleyne among our faculty.

Assuming the role of Department Head at this critical time, with such exciting initiatives starting, is humbling indeed. I promise to work with all my energy to sustain and build on the high level the department reached under the direction of my predecessor, Professor Placid Ferreira. He was an incisive and visionary leader of the department for the past six years, and we are all incredibly thankful for his dedication to MechSE.

I hope you enjoy reading this issue of our magazine and discovering even more about MechSE and its students, alumni, faculty, and staff.

Best regards,

Anthony Jacobi
Department Head
Richard W. Kritzer Distinguished Professor

MechSE takes over as Department Head

On August 16, 2015, Richard W. Kritzer Distinguished Professor Anthony Jacobi became the Department Head for Mechanical Science and Engineering at Illinois. He took over this role from Tonghao Ji (BSME ’81) Professor Placid Ferreira, who had served as Department Head since August 2009.

A Fellow of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (2009) and of the American Society of Mechanical Engineers (2011), Jacobi has been an Illinois faculty member since 1992 and has been honored with numerous faculty teaching and research awards within the College and the MechSE Department. Since 2001, he has shared his effective leadership talents as co-director at the Air Conditioning and Refrigeration Center (ACRC), overseeing a multidisciplinary research program involving more than a dozen faculty members, 60 graduate and undergraduate students, post-doctoral and visiting scholars, and companies from around the world. The ACRC is the largest center in the nation devoted to research in heating, ventilating, air conditioning and refrigeration; its research program is supported by approximately 30 industrial sponsors.

Jacobi also served as MechSE’s Associate Head of Graduate Programs from 2008 to 2011 and for the 2014-15 academic year.
Gesture-recognition technology

Rithmio, the company of PhD candidate Adam Tilton (BSME ’10) and Associate Professor Prashant Mehta, announced that it has secured $3 million in seed round funding. In 2014, Rithmio’s gesture-recognition platform for wearable devices won the university-funded category of the annual Cozad New Venture Competition at Illinois. The company has opened offices in both Champaign and Chicago.

Robotic lawnmower

Mowing the lawn may soon change from an insurmountable chore to a favorite spectator sport. Junho Yang, a PhD candidate in MechSE, is working on “an omnidirectional-vision-based system to detect the containment status of a robotic lawn mower.” The vision-based aspect is key, as there are currently robotic lawnmowers on the market, but owners need to stake and wire all lawn boundaries for these versions. John Deere is funding the project.

Hand prosthetic

MechSE undergrad Patrick Slade won the university-funded track in the 2015 Cozad New Venture Competition, teaming up with neuroscience PhD candidate Aadeel Akhtar to form the company PSYONIC. They created a 3D printed prosthetic hand that uses electrical impulses generated by forearm muscles to perform multiple grasping movements, and costs 10 times less than existing prosthetic hands. They hope to improve the lives of people with amputations worldwide; their work already has been tested successfully by amputees in Ecuador.

Touchless faucet

A hands-free system to deliver clean water through a touchless faucet design took first place at MechSE’s 2014–2015 Innovation Trophy Competition. Danielle Courvois, Timothy Jones (shown here), and Kevin Kienitz brainstormed ways to control a faucet’s temperature and pressure using a motion sensor. Moving forward, the team is interested in patenting, marketing, and implementing their product in residential kitchens and then launching it to industrial kitchens and hospitals.

High-performance car

Led by MechSE students, the Illinois Formula SAE team produced one of its best cars and top performances ever in 2015, placing 3rd out of 80 teams at the SAE organization’s event in Lincoln, Nebraska. The Illini team outpaced all other Big Ten entries, including historical top competitors Michigan, Michigan State, Ohio State, and Wisconsin. The team was consistent across the different event categories, placing 3rd in Autocross, 19th in Skidpad, 11th in Acceleration, and 4th in Endurance.

Hydraulic cycle

This year’s student team (including Iain Brearton, left, and Ian O’Leary) performed very well in the national Parker Hannifin Chainless Challenge—taking second place overall and placing in the top three in nine other categories. The annual competition for fluid-power bicycles was held in Irvine, California, and stipulates that bikes must be chainless and human powered; use hydraulics, pneumatics, and electronics; and weigh less than 225 pounds.

Wheelchair lift

A Chicago-based startup—run by Chris Delaney, Jake How, and Anando Naqui (all BSME ’12)—has developed a technology to make it much easier and cost-effective for wheelchair users to get up and down stairs in their homes without needing attendants. EscaWheel, Inc., which began as a 2012 senior design project in ME-471, has a long-range goal to mass-produce the final product and sell it for around the cost of the chairlift.

Biomedical

MechSE PhD candidate Ritu Raman has won the 2015 Illinois Innovation Prize, a campus-wide competition among student entrepreneurs. Raman uses 3D printing to manufacture biological building blocks that can harness the innate abilities of biological materials to sense, process, and respond to a variety of dynamic environmental signals in real time. Such building blocks can be used to design bio-integrated machines that can self-organize, self-heal, and self-replicate in response to a complex array of environmental cues.
Oh, the places they’ll go!

Every year, approximately 200 graduating seniors leave MechSE and head to industry or graduate programs across the country and around the world. While this snapshot is by no means comprehensive, it offers a look at the impressive places some of our 2015 grads have gone.
Senior 100

The Senior 100 Honorary is a program of the University of Illinois Alumni Association that recognizes notable seniors across campus for both their past achievement and future commitment to the university. The program honors what the students have accomplished and acknowledges the great impact they will have on the world at large after graduation. Only 100 seniors from the entire campus are chosen.

Back row: Andrew Horton, Ruben Robles, Alex Grubele, Mason Blake.
Front row: Jenny Lin, Davis Born, Michael Lynch.

NSF winners

MechSE has seven graduate students who have received graduate research fellowships from the National Science Foundation.

Main photo: Dingqiao Benjamin Sui, Herschel C. Pangborn, Jonathan A. Schiller, Anthony Fan, Kaegan Moore.
Top right: Sneijder Steenkiste. Bottom right: Ashley Armstrong.
As leader of Foxconn Interconnect Technology, Sidney Lu (BSME ’81) is an excellent example of the world-class success MechSE alumni can attain. He credits much of his achievement to his MechSE education and degree from Illinois. “I learned hard work here, and I learned how to learn.”

In support of the campaign to transform MEB, Lu pledged a $12-million cornerstone gift to help fund the new east-wing addition—the largest part of the overall project—which has been named the Sidney Lu Center for Learning and Innovation.

“We have to give our students the space—physical and intellectual—to collaborate. We have to give them hands-on opportunities to solve real-world problems.”
— Andreas Cangellaris
Dean of the College of Engineering

This historic project includes a five-story addition to the east of MEB, a single-story addition to the north, and 66,000 square feet of existing space reimagined, reengineered, and optimized for education, innovation, and community. More than ever before, MEB will be the place where successful careers are launched and the seeds of innovation are sown. It will be truly transformational.
Active Learning Classrooms

Classrooms in the transformed MEB will enable an optimal learning environment—designed to utilize our faculty’s advanced teaching methods and hands-on, project-based instruction. Movable desks and group seating centered around state-of-the-art technology support small group discussion and interactive, collaborative teamwork. Proven “blended learning” techniques of face-to-face instruction combined with online adaptive learning result in a more meaningful classroom experience. Our students are motivated to take ownership of their education—becoming engaged and critical thinkers with a true understanding of how to solve real-world engineering problems.

Instructional Laboratory Complex

The new state-of-the-art complex will encompass the entire lower level of MEB and include lab space for many MechSE disciplines: fluid mechanics, heat transfer, manufacturing processes, mechatronics, metrology, motion control systems, robotics, and other specialty areas. Working in an open-architecture complex of instructional labs that share one massive space, students will better grasp how projects often cross boundaries and will find unique solutions to challenging engineering problems.

Education

The world-class education our students receive is at the heart of the MechSE Department. Today, engineering education is being revolutionized with new ways of integrating instruction and technology. We teach advanced concepts for solving the world’s grand challenges and assign hands-on design projects that reinforce classroom learning. Rooted in the fundamentals of engineering, our curriculum emphasizes teamwork, creativity, and the skills to thrive and grow in a technology-intensive world. The new facility’s inspiring and innovative environment—featuring active-learning classrooms and a state-of-the-art complex of integrated, instructional, and project laboratories—will set a new standard for engineering departments everywhere.

During their time in the MechSE Department, students become fearless, confident, and independent learners who willingly take on intellectual challenges. They develop into highly effective collaborators who embrace teamwork; sophisticated and discriminating users of information and technology; and creative problem solvers. At the same time, they become generous teachers who share their knowledge, experiences, and perspectives with others.

“At Illinois, I learned through my courses and research, individual study, and interactions with others. The practice I received on presenting to groups has served me well in my career at Xerox, and the teamwork skills I learned through study groups and lab groups have proven to be invaluable. Having a space that encourages such interaction and enables collaborative efforts is essential and will definitely enhance students’ experience and prepare them to thrive in their careers.”

— Marina Tharayil
Manager, Business Process Modeling and Optimization Group at Xerox

“A view of the transformed MEB from the corner of Green and Mathews. 
The new Innovation and Design Commons will offer MechSE students opportunities for communication and exchange of ideas. We’ll learn the importance of teamwork as we collectively labor to meet both project deadlines and standards. Personally, I have gained practical experience in the present Innovation Studio, which I am certain will be beneficial towards becoming a control engineer.

— Obinna Onyemepu (BSME ’16)

The transformed MEB’s Innovation and Design Commons.

Senior Design team takes on Hyperloop challenge

In June 2015, well-known inventor and innovator Elon Musk announced his SpaceX company is sponsoring a competition to see who could design the perfect Hyperloop pod. The Hyperloop is a conceptual high-speed transportation system that incorporates reduced-pressure tubes in which pressurized capsules ride on an air cushion driven by linear induction motors and air compressors.

This announcement resulted in a flurry of media attention around the globe for the MechSE Department, where students already had made a working prototype in this new technology.

In recent semesters, Senior Design teams have tackled the challenge of designing a small-scale but functional prototype of a Hyperloop system. More students will continue to work on the project next year and continue to make improvements.

“Small steps is the way to go,” said Associate Professor Carlos Pantano-Rubino, a MechSE faculty member and advisor to these teams. “That is how engineers learn to build complicated things. Nobody just learns to build complicated things the first time.”

YouTube views of the students’ six-second demonstration video surpassed 80,000 at press time. This year’s team included Nate Anderson, Andrew Horton, Rohan Khanna, Karen Lipa, and Ruben Robles. They also collaborated with ECE students on the prototype’s electrical components.

Musk’s contest is aimed at students and will be hosted at the SpaceX headquarters in Hawthorne, California, in June 2016.

Simply put, MechSE students are leaders in innovation. They set records in international competitions. Their senior design projects are immediately implemented by sponsoring companies. They win campus-wide innovation contests, and they start successful businesses—often before graduation! The innovation-rich environment of the new MEB will equip our students for even greater success. This facility’s 3,000-square-foot Senior Design Project Studio and 6,000-square-foot Innovation and Design Commons—a 24/7 “maker space”—will inspire creativity and foster teamwork, opening up a world of possibilities and new ideas. Our students will work, interact, learn, play, and grow in an environment optimized for true innovation.

“Innovation.”

The transformed MEB’s Innovation and Design Commons.
My home away from home

Those who know me know I have always struggled with the answer to “Where are you from?” or “Where is home?” Four years ago, I left Beijing, China, to come to the University of Illinois in pursuit of a degree in mechanical engineering. I had no idea just how many incredible opportunities I would be given and the number of talented, passionate, and inspiring people I would meet.

One of the most notable things I felt at Illinois, and specifically at MechSE, was a strong sense of community. This was important to me, as I grew up moving every couple of years because of my dad’s job. By the time I graduated high school, I had lived in five different countries across North America, South America, and Asia. I’m used to change and making new friends quickly, but I don’t think it ever came as naturally as it did at Illinois. I know people with so many different cultures, backgrounds, and experiences. Everyone belongs, and everyone brings something new and important to the table.

Getting to a top engineering program in the country (and the world!), there’s the stereotype that students are cut-throat competitive and that everyone is fighting for the top of the curve. The reality is, I never once felt that way. Whether it’s helping each other with tough homework problems, reviewing for upcoming exams together, or working on projects outside of class, collaboration is everywhere. The community of giving and taking results in something incredible: everyone benefits.

I can’t even begin to imagine what the transformation of MEB will add—especially the student center. Student societies meeting in larger numbers to work on their projects. More opportunities for corporate after-hours and recruiting events. A place to test out and showcase projects to friends and classmates. Heck, even just more space to get together, socialize, and take breaks.

Getting involved and being an active part of the MechSE and College of Engineering communities through student organizations, leadership, and really just being present was truly the best decision I made in college. Suddenly, looking at it now, the answer to that question, “Where is home?” becomes much more clear. Urbana-Champaign is my home, and I’m going to miss it like crazy.

— Chris Nobre (BSME ’15), Project Engineer, Amazon
MechSE professor to lead $18.5 million center for power optimization in mobile electronics

Heat is the enemy for people designing cars, construction machinery, aircraft, and mobile electronics. When their electrical systems do more work, they get hotter. When they get too hot, they operate inefficiently, fail, or even melt. Your cordless drill won’t fire up. Bulldozer buckets don’t lift. Planes are grounded. Electric cars sit on the side of the road.

A new, $18.5 million Engineering Research Center led by MechSE professor Andrew Alleyne is out to pack more power into less space for electrical systems. The center is funded by the National Science Foundation and will be headquartered at the University of Illinois at Urbana-Champaign.

Called P.O.E.T.S., the Power Optimization for Electro-Thermal Systems center will attack the thermal and electrical challenges surrounding mobile electronics and vehicle design as a single system. Partners from around the world will build new technologies like three-dimensional thermal circuitry for cooling, next-generation power converters, and algorithms for coordinating the technologies automatically. They will look at those technologies from the microchip level all the way up to an entire vehicle.

“We want to increase the total power density in vehicles by 10 to 100 times. That would translate into billions of liters of fuel saved and nearly double an electric car’s range,” said Alleyne, Ralph & Catherine Fisher Professor. “Today’s electrical technologies are at their thermal limit. A systems approach is the only way we’ll push beyond the current state of the art.”

While the exact physical location on the Illinois campus has not yet been finalized, one thing is certain: MechSE students will benefit from P.O.E.T.S.

“Students will be very, very heavily involved,” Alleyne said. “The goal is to have students from different departments co-located in a common, shared space. The whole goal is to break down some of the disciplinary silos that lead to constraints and barriers that can show up.”

The undergrads, grad students, and post-docs who get involved may receive more than just the obvious educational benefits from the center. Alleyne envisions the possibility of student start-up businesses emerging, which he welcomes and will encourage.

“There will definitely be opportunities for students to try their hand at spinning out these technologies into a product or a business,” he said.

More than a dozen companies across the United States will also take part, testing the ideas and hiring students trained through P.O.E.T.S. The center will also engage with school districts to transition the breakthrough interdisciplinary STEM concepts to K-12 classrooms and inspire young people to pursue careers in these fields.

“As part of the Caterpillar team, it’s a privilege to work on electric drives as part of my day job and also serve on the Industrial Advisory Board for the P.O.E.T.S. project,” said Bryan Lammers, a technical manager who also leads heavy equipment manufacturer Caterpillar’s involvement with the program.

This is an opportunity to help grow world-class engineers in our own backyard, and drive collective innovation through a valuable federal and academic partnership. We look forward to sharing industry knowledge with these great researchers to help explain how these technologies could be most useful.”

The National Science Foundation began supporting Engineering Research Centers like P.O.E.T.S. in 1985, to create and sustain integrated interdisciplinary research environments that advance fundamental engineering knowledge, enable technology and engineered systems, and prepare U.S. engineering graduates for success in the global economy. Academe and industry are joined in partnership through the ERC to achieve these goals.

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Breakthrough technology could lead to safer air travel

MechSE Professor, University Scholar, and Scholar Faculty Scholar, Naira Hovakimyan, and her research team (posing: Enric Xargay and PhD students Kasey Ackerman and Ronald Gloss) in the Advanced Controls Research Laboratory have developed a flight control system that was successfully tested for the first time on a manned aircraft—representing an important step toward the introduction of the technology into commercial aviation.

Predicatable, reliable, repeatable, and safe: These four response criteria define a successful flight control system—and could set the stage for certification by the Federal Aviation Administration.

The flight control system is, perhaps, the soul of an aircraft—it consists of the necessary operating mechanisms to control its actions and direction in flight. The flight control systems on today’s commercial aircraft have been tested and matured for decades and are considered very safe for the millions of passengers traveling on airplanes every day. But despite their safety, there is still great need for new technologies that could prevent more accidents.

In early March, students in the U.S. Air Force Test Pilot School flew Hovakimyan’s L1 adaptive control technology on Calspan’s variable stability Generic Transport Model aircraft. Of the groups that qualified for flight testing, Hovakimyan’s control system was the only one cleared by pilots for stall and post-stall flight conditions, and the only one able to provide a predictable and reliable response over the entire flight envelope.

All of these flight tests serve as in-flight validation of the underlying mathematical theory, which provides guaranteed, consistent, and uniform performance, regardless of the nature of the failure configuration. The implications for both airplane safety and new aircraft R&D are dramatic.

“Surprisingly, this took much longer than we expected,” Hovakimyan said. “But our last test flight was absolutely perfect.”

Everyone remembers Audrey II, the famous man-eating plant in the musical comedy horror film The Little Shop of Horrors. While carnivorous plants can’t eat humans, it turns out they can make interesting subjects for the study of various mechanical and material phenomena.

New assistant professor Yuhang Hu, who started at MechSE in January, studies pitcher plants—carnivorous plants with modified leaves that form a deep, prey-trapping cavity—to analyze certain bio-inspired systems and soft materials. The phenomenon with these particular plants is that their surface becomes very slippery when wet, causing ants, for instance, to slide down inside and get digested. However, the pitcher plant’s surface is slippery only occasionally. When dry, that same surface acts as a sort of adhesive, allowing insects to walk easily on it and access the nectar from the plant.

This varying surface property is what led to Hu’s development of a new material system with optical properties and wettability that can be continuously tuned by mechanical stimuli.

Carnivorous plants inspire new professor’s research

Hu said he sees a lot of potential in his work for future study in biology and bioengineering—on one hand, utilizing the bio-inspired material and device to tailor the morphology of cells and tissues, while, on the other hand, applying the mechanical testing technique to characterize these delicate materials.

She said she sees a lot of potential in her work for future study in biology and bioengineering—on one hand, utilizing the bio-inspired material and device to tailor the morphology of cells and tissues, while, on the other hand, applying the mechanical testing technique to characterize these delicate materials.

Based on this central idea, she and other researchers successfully developed a synthetic material that has continuously adjustable characteristics.

“Such a material is made of a liquid film supported by a nanoporous elastic substrate. As the substrate deforms, the liquid flows within the pores, causing the smooth and defice-free surface to throughe through a continuous range of topographies. We show that a graded mechanical stimulus can directly translated into finely tuned, dynamic adjustments of optical transparency and wettability. In particluar, we demonstrate simultaneous control of the film’s transparency and its ability to continuously manipulate various low-surface-tension droplets from freecliding to pinned. This strategy should make possible the rational design of tunable, multifunctional adaptive materials for a broad range of applications,” said Hu.

Hu also studies other biological materials or systems composed of soft solid and liquid, and the fundamental mechanisms behind the nature systems that affect adaptability and efficiency. He develops robust mechanical testing techniques to characterize these delicate materials.

She said she sees a lot of potential in her work for future study in biology and bioengineering—on one hand, utilizing the bio-inspired material and device to tailor the morphology of cells and tissues, while, on the other hand, applying the mechanical testing technique to characterize these delicate materials.

Hu earned his bachelor’s degree in engineering mechanics from Shanghai Jiao Tong University in China in 2005; a master’s degree in civil and environmental engineering from Nanyang Technological University in Singapore in 2007; an MS in applied physics from Harvard in 2009; and a PhD in solid mechanics from Harvard in 2011. She completed her postdoctoral work in Harvard’s biomechanics lab.
Andrew Alfrey won the Excellence in Graduate Student Mentoring award, an honor that recognized the quality and depth of his mentoring and the positive impact he had on his students, especially underrepresented minorities.

Gaurav Bahl discovered with his students the phenomenon of Brillouin Scattering Induced Transparency (BST). The results published in Nature Physics showed that BST can be used to slow down, speed up, and block light in an optical waveguide. Bahl was also selected as a recipient of the Young Investigator Award by the Air Force Office of Scientific Research for this research.

Leonardo Chamorro was appointed associate editor for the Journal of Energy Engineering, and new member of the editorial board of the journal Energies. He was invited to talk at the “Whither Turbulence and Big Data In the 21st Century: Understanding andLongrightarrow” Turbulence”, held in France.

Elit Etekin won the College of Engineering Dean’s Award for Excellence in Research for his participation in highly interdisciplinary research accomplishments during the previous year.

Randy Ewoldt won the Bose Award for Teaching Excellence, an honor that recognizes instructors who excel at motivating freshman and sophomore students in the College of Engineering. He was nominated for his innovative teaching methods and merit in instruction and course design and development.

Placid Ferrari was recognized and supported by the National Science Foundation for his work that uses lasers to transfer printing as a way of breaking the adhesion of tiny particles, a challenge prevalent in nanomanufacturing.

Bruce Flachsbart was honored with the Award for Excellence in Undergraduate Teaching. He was one of only three instructional staff across the entire campus to win this competitive award for his innovative approach to teaching and having an overall positive impact on student learning.

Sascha Hilgenfeldt was named a Willett Faculty Scholar by the College of Engineering, and is also the Engineering Council Award for Excellence in Advising.

Naira Hovakimyan was named Director of the new Intelligent Robotics Lab, an interdisciplinary collaboration of faculty from MechSE and other engineering departments, in the Coordinated Science Laboratory at Illinois. Research in the lab will aim to advance robot technologies in robust and smart UAVs using motion-capture technology. Hovakimyan was honored with the Society of Women Engineers Achievement Award, the organization’s highest honor, as well as the Engineering Council Award for Excellence in Advising.

William King was named to Chicago Business’ 2015 “Tech 50 List”, reflecting the magazine’s “people you should know if you care about Chicago techs.” He was an invited speaker on the topic of advanced manufacturing at the National Academy of Engineering “Frontiers of Engineering” workshop in June 2015. King was also named to ChicagoNXT, a council of business and technology leaders focused on new venture formation and rapid expansion of science, innovation, and technology-driven entrepreneurship in the Chicago area.

Predrag Krmija was named an ASME Fellow, the society’s highest membership grade of distinction.

Elizabeth Hisao-Weckler was honored with the Teaching Council Award for Excellence in Advising.

Yuhang Hu and a team of researchers developed a dynamic mechanism that can control the flow of materials through microscopes, using fluid to regulate their opening and closing. The article, published in Nature, was based on his research while a postdoc at Harvard University.

Emad Jaziz was honored with the Engineering Council Award for Excellence in Advising.

Nenad Mijalkovic, with researchers at MIT, published an article in Nanolett demonstrating a graphene as a promising hydrophobic surface coating on condensers during heat transfer in applications ranging from anti-friction, de-icing, mold resistance, and others.

SungWoo Nam developed a new approach for forming 3D shapes from flat 2D sheets of graphene, which could allow for graphene-MEMS hybrid devices and flexible electronics, and this work was published in Nanolett. Additionally, he was honored with the Engineering Council Award for Excellence in Advising. Nam’s research on a novel single-step process to achieve 3D texturing of graphene and graphite was also published in Nanolett.

Marina Ostoj-Storzewski became Associate Editor of MechanoResearch Communications. In February he gave an invited seminar on “Continuum mechanics beyond the second law of thermodynamics” at the University of California, San Diego. In May his paper “Scaling and bounds in thermal conductivity of planar Gaussian correlated microstructures” co-authored by Sobol Kale, Ankit Saharan, and Seid Koric, was selected for the “Editors’ Choice” in the Journal of Applied Physics.

Hisayuki Seshigoula started a new journal, Tapes Memory and Superelasticity, focused exclusively on shape memory alloys and the developments, innovative manufacturing, and novel use of these materials. Seshigoula is also editor-in-chief of the new publication, which launched under ASM. Additionally, Seshigoula’s former students will host a mini-symposium in his honor, titled “Multifaceted Research in Materials and Mechanics,” at the 2016 Plasticity Conference.

Mariana Silva was honored with the Engineering Council Award for Excellence in Advising.

Martin Ostoj-Storzewski became Associate Editor of MechanoResearch Communications. In February he gave an invited seminar on “Continuum mechanics beyond the second law of thermodynamics” at the University of California, San Diego. In May his paper “Scaling and bounds in thermal conductivity of planar Gaussian correlated microstructures” co-authored by Sobol Kale, Ankit Saharan, and Seid Koric, was selected for the “Editors’ Choice” in the Journal of Applied Physics.

Kyle Smith’s article “Design of Bi-Turnable, Anisotropic Graphite Anodes for Fast Ion-Transport in Li-Ion Batteries” was published in the Journal of The Electrochemical Society.

Kelly Stephani was accepted into the Air Force Office of Scientific Research’s Summer Faculty Fellowship Program. She and her team of graduate students spent 12 weeks at the Wright-Patterson Air Force Base, where they developed methods for computing non-equilibrium flows, indicated by strong, abrupt changes in velocity, temperature, and other characteristics over a short distance.

Scott Stewart was named an ASME Fellow, the society’s highest membership grade of distinction.

Daniel Tortorelli was honored with the Engineering Council Award for Excellence in Advising.

Kimani Toussaint’s article “Planar graphene on nanowires: from nanoelectronics to plasmonic photography” was published as the cover story in the June 2015 issue of Optics and Photonics News. Toussaint was also part of a team of researchers that received funding from the Carver Trust to build a first-of-its-kind optical mechanical microscope. The device will be capable of obtaining optical, mechanical, and chemical information from a biological specimen. Additionally, Toussaint demonstrated the first-ever recording of optically encoded audio onto a non-magnetic plasmonic nanostucture, indicating potential for an array of new uses for analog data storage. He also won the College of Engineering Dean’s award for Excellence in Research for his exceptional and highly interdisciplinary research accomplishments over the previous five years.

Amy Wagner Johnson was the recipient of a Chair of Excellence from the NanoSciences Foundation, Grenoble, France. The Chair is a 3-year position, the first of which she spent in Grenoble on subtitution doing research on hydroscopic and cell-material interactions in the Laboratoire des matériaux et du génomic physique (LMPG) in collaboration with Professor Catherine Picart. During this time she was a Midlands/Institute speaker—a forum for disseminating research to the broader Grenoble scientific community, was a plenary speaker at the French-American Workshop, and co-founded her research as an “invited expert” at a focused workshop on Nano and Nano Systems for Biology—Additive Manufacturing and Biomedical Applications organized by the French technology watchdog group OMNIT (Observatoire des Micro et NanoTechnologies).

MechSE announces new Master of Engineering degree program

A new graduate degree program—Master of Engineering in Mechanical Engineering (M.Eng.ME)—launched with its first class of students in Fall 2015. The new degree program aims to meet the growing demand for engineers who possess a broad mix of hard science and math tools along with a variety of professional skills—communications, teamwork, and a “big picture” understanding of project management, said Bill Hunter, associate dean of graduate and online engineering programs. “Students have also begun to realize the value and necessity of a professional master’s degree as preparation for a successful career leading innovation in industry. In fact, a master’s degree may be followed by a fellowship for obtaining Professional Engineer certification.”

MechSE Faculty Updates
Alumni News

Outstanding Young Alumni

In 2015, MechSE established the Outstanding Young Alumni award to recognize recent graduates who have given off to a great start in industry, academia, and/or entrepreneurship. There were nine standout alumni who received the award this year.

Kira Barton
BSME 2006, PhD ME 2010
Assistant Professor
University of Michigan
Ann Arbor, MI

Scott Bugle
BSME 2009, MSME 2011
Co-Founder & CEO
EmiWheels, Inc.
Champaign, IL

Diana Dascalescu
MSME 2008
Mechanical Product Engineer
Ricardo, Inc.
Burr Ridge, IL

Morgan Hawker
MS TAM 2008
Project Engineer
Chemical & Industrial Engineering, Inc.
Louisville, KY

Andrew Kenney
BSME 2003, MSME 2005
Vice President & Owner
Microlution, Inc.
Chicago, IL

Tony Califano (BSME ’14) has received his selection for Officer Training School in the United States Air Force for the specialty of General Engineering Officer. This specialty gives him the opportunity to locate nearly anywhere in the world. “I had decided to work toward joining the U.S. Air Force as an officer in June of 2014, a month after graduating,” he said. “However, I had to take a few months to meet the fitness standards. Many months and negro 50 pounds later, I was ready to begin my application. I have had many people help and encourage me on this road, and I have turned both my career and my health around.”

Marcus Crotts (MSME ’56) has been recognized by North Carolina State University with a lifetime achievement award. He has distinguished himself as an outstanding mechanical engineer in private practice and as a dedicated supporter of engineering as a profession. He is a partner of Crotts & Saunders Engineering, Inc., of Winston-Salem, a consulting firm recognized throughout the country and abroad for its impact on manufacturing processes through improved design methodologies in the machine tool and manufacturing industries.

Sean Hopkins (BS ME ‘11) is a reliability engineer at the design and manufacturing company Dyson. Based in his hometown of Chicago, he oversees the quality and reliability of the entire product line, from heaters to fans to hand dryers to vacuums. “I volunteer with the James Dyson Foundation, giving talks and workshops to encourage students from the Chicago area who aspire to be engineers,” he said in an interview for the New York Times in May 2015. “In college I rarely met minority engineers from Chicago, so I am showing minority students that this is a viable career.”

College of Engineering Alumni Award for Distinguished Service

This award is conferred upon exceptional alumni and recognizes them for professional distinction through outstanding leadership, contributions to the field of engineering, creativity, and entrepreneurship, as well as service to society, the professional community, and to the department, college, or university.

Sidney Lu
BSME ’91
Chairman & CEO
Foxconn Interconnect Technology
Taiwan

Lawrence Ziember
BSME ’71
Executive Vice President
Phillips 66
Houston, TX

Danny Caruso (BSME ’86), Cofounder, Chairman & CEO, Zayo Group

“As an engineering student, I learned what it was like to work around very smart, talented, hard-working people, both fellow students and faculty, and what it takes to be successful and to be able to contribute in that environment. That foundation has lasted with me throughout my career. I’ve learned that the intersection between technology and business, which I view as entrepreneurship, does so much in creating opportunities for individuals and for society in general. It’s the key to prosperity. So when you look forward at what’s next for you in your career, reflect on how you can work with others who don’t have the technical backgrounds but who bring to the table other types of creativity around business or liberal arts, and together how you can create the next generation of companies and ideas that will change society in ways we can’t imagine today.”

Michael Sutton (PhD TAM ’81), Carolina Distinguished Professor, University of South Carolina

“Because of the opportunity I had to be educated here and at other institutions, this is beyond my wildest expectations. Much of what I’ve accomplished has been due in large part to my education in the TAM Department, now part of MechSE. The professors I had there made a big difference in my life. They provided me with the ability to think outside the box and do things that I really didn’t think were possible.”

Xuemin (Lisa) Xu (PhD ME ’91), Professor, Vice President, Associate Dean of Biomedical Engineering, and Director of the Med-X Research Institute—all at Shanghai Jiao Tong University

“The education I received here has transformed me and transformed my view of the whole world. As the world is becoming smaller and smaller, striving for excellence and working hard are the most important things. Additionally, Illinois’ multicultural environment that this campus embraces you students are very fortunate to be here, to get your education here, which will make a future for you. As an alumna I would do anything I could to help students to know that Illinois is the best in the world!”

News from MechSE’s Alumni Board

At the spring Alumni Board meeting, outgoing board president Eric Brown (BSME ’96, MS TAM ’01, PhD TAM ’06) handed over his duties to incoming president Thomas Donovan (BSME ’92, Master Tharaldsen (BSME ’98, PhD TAM ’05) took over the position of Vice President. Donovan and Tharaldsen look forward to working closely with the MechSE Department as it navigates through the exciting challenges that are quickly upcoming, including the fundraising efforts for the Campaign to Transform MEUR.

Ricardo Mejia-Alvarez
MS TAM 2010, PhD TAM 2010
Scientist
Los Alamos National Laboratory
Los Alamos, NM

Benjamin Newell
BSME 2002, MBA 2008
President
Newell Instruments
Urbana, IL

Andrew Phillip
MSME 2005
Founder & President
Microlution, Inc.
Chicago, IL

Dr. Marcus Crotts (MSME ’56) has over 100 patents to his name, and is the founder of Engineering Innovation, a national engineering firm headquartered in Winston-Salem, NC. He joined the University of Illinois’s Illinois Alumni Board in 2011 and is currently serving as its President. His goal as President is to bridge the gap between the University of Illinois and the world of industry, to bring together the University’s best and brightest and make sure that they are making the most of the education that they receive. “I’m proud to be a part of this vibrant community of alumni and students,” he said. “We’re working hard to make sure that the University of Illinois continues to be one of the best universities in the world.”

The department recognized four distinguished alumni at its annual banquet on April 17, 2015. Each recipient shared their thoughts on how their Illinois education helped shape their personal and professional lives, and offered career advice to the MechSE students who were in attendance.

Tony Califano (BSME ’14) has received his selection for Officer Training School in the United States Air Force for the specialty of General Engineering Officer. This specialty gives him the opportunity to locate nearly anywhere in the world. “I had decided to work toward joining the U.S. Air Force as an officer in June of 2014, a month after graduating,” he said. “However, I had to take a few months to meet the fitness standards. Many months and negative 50 pounds later, I was ready to begin my application. I have had many people help and encourage me on this road, and I have turned both my career and my health around.”

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Message from the Advancement Office:
Join Us in Transforming MEB

Dear Alumni & Friends,

When we visit with our outstanding alumni across the nation, many people comment on how much campus has changed since they were students. From the high-rise apartment buildings popping up on Green Street to the newly renovated (and air-conditioned!) Ikenberry Commons Residence Halls, change is nearly constant in Champaign-Urbana. Many of our alumni have also correctly noted that there has been one exception to this flurry of change: Mechanical Engineering Building (MEB). While alumni share that it is nostalgic to walk through the halls of MEB when they are visiting, it is evident that they realize the significance of renovating this facility.

As you have read throughout this magazine, now is the time to transform MEB. This historic project is the department’s largest endeavor to date. The Campaign to Transform MEB will allow our faculty members to utilize creative teaching methods in active learning classrooms and state-of-the-art teaching laboratories where students will learn from real-world, hands-on activities. The new MEB will be a hub for innovation; students will have the chance to learn, create, collaborate, design, and make, all within one space. Lifelong connections and memories will be made as students meet in the new open-design student center to grab a coffee, study for a midterm, or simply take a break to socialize between classes. The new MEB will be a “home” for our students, a home that they will return to as proud alumni.

This important transformation of MEB cannot happen without the generosity of our alumni and friends, like you. We ask that you consider partnering with us by supporting the Campaign to Transform MEB. Making a gift to this project is easy: visit transformMEB.mechse.illinois.edu, click the “Give now” button, and select the first option under “Featured Opportunities”; The Campaign to Transform MEB. Every gift matters. Every gift is cherished. Every gift helps us build our new home.

If you would like to learn more about how to support this essential project, please feel free to contact us. Thank you in advance for your consideration to join us in transforming MEB!

Go Illini!

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Help us Transform MEB today!

This is the department’s largest undertaking ever, with an estimated cost of $37 million. Once it is completed, MechSE’s education, innovation, and community will bolster the department’s place among the nation’s elite engineering programs for decades to come.

And the campaign has already begun in a big way: we have secured $10 million from the U of I and an inspiring $12 million pledge from alumnus Sidney Lu! This is an incredible start, but $15 million is still needed to complete the project.

We are asking you, our alumni and friends, to partner with us in reaching this goal.

To give online or find out more about the project, visit: transformMEB.mechse.illinois.edu

To get involved, call 217-333-4109 or email mechse-advancement@illinois.edu

THE CAMPAIGN TO TRANSFORM MEB

Education. Innovation. Community.

Give a Gift
Giving a gift to MechSE online is simple and secure. Just go to mechse.illinois.edu/giving.

Keep in Touch
Keep up to date with the MechSE Department! Just go to mechse.illinois.edu/contact to sign up with your current contact information or email us at mechse-advancement@illinois.edu.

Attention Entrepreneurs!
MechSE wants to hear from all of our alumni who have started their own businesses. Please contact Bob Coverdill at mechse-advancement@illinois.edu and provide a short description of your company. We will share this information in a future publication.

If you have a smart phone, you can access these pages by scanning the accompanying QR code.
An incredibly generous gift from alumnus Sidney Lu has changed MechSE’s future—look inside to read about it and how you can get involved!