

MICHIGAN STATE  
UNIVERSITY

EMPOWER  
**EXTRAORDINARY**

THE CAMPAIGN *for* **MICHIGAN STATE UNIVERSITY**

Supporting the  
**COLLEGE OF ENGINEERING**



# Sparking Technological Innovation *in* Michigan, *and* **for the World**

*“Technology is at the core of how we experience life in the 21st century and the transformational changes in the world have happened at a rapid pace, especially in recent decades. Our job is not just to prepare students to ride the wave of change, but to actually cause that wave to occur.”*

**LEO KEMPEL**  
DEAN, COLLEGE OF ENGINEERING

“American ingenuity” was the phrase that defined our nation in the 20th century, when Michigan became the hub of economic development fueled by technological innovation. The Michigan State University College of Engineering helped power the rise of our state by engaging in research that resulted in practical solutions to our most pressing challenges while educating problem solvers for the future. Today, we are committed to being the catalyst for Michigan’s growth as an international center of technological innovation.

This college is a pipeline of creativity, new knowledge, and people who know how to put it to work. We are enjoying tremendous success—the size of our entering class has more than doubled since 2006—and our research funding has surged from \$29 million in 2007 to \$53 million in 2012. We have a powerhouse of faculty and are attracting top students, who are together engineering a healthier, safer, and more sustainable world.





## OUR CAMPAIGN **VISION**

The 21st century finds us in a hardball, global marketplace full of challenging problems that are very different from the problems we were facing 20 or 50 years ago. The easy ones have already been solved; the difficult ones remain for us to tackle, and many will involve achieving new levels of collaboration and working across disciplines.

To this end, the College of Engineering seeks to raise \$80 million during the Empower Extraordinary campaign. We will achieve this ambitious goal through a combination of endowment, current use, and capital funds. Endowment resources are critical because they provide permanent funding for faculty and programs that college leadership can count on. An endowment makes a donor's impact last forever. Current use funds provide the kind of strategic, flexible funding that enables the college to invest in innovations that fall outside of traditional budget cycles.



*Researchers at the College of Engineering developed a new material that can be placed over windows and absorb nonvisible wavelengths of sunlight to create solar energy.*

Our campaign priorities dovetail with those of our great university. We will create real-world engineering solutions that will solve global problems; which means we must be a force for creativity, discovery, and learning. We will remain an engine of opportunity by attracting and retaining the very best graduate and undergraduate students through scholarships and fellowships, and by providing an outstanding student experience. And, we will create a vibrant community of scholar-engineers by providing them funding and state-of-the-art facilities in which to work and innovate.



*A Force for*

# **CREATIVITY, DISCOVERY, AND LEARNING**

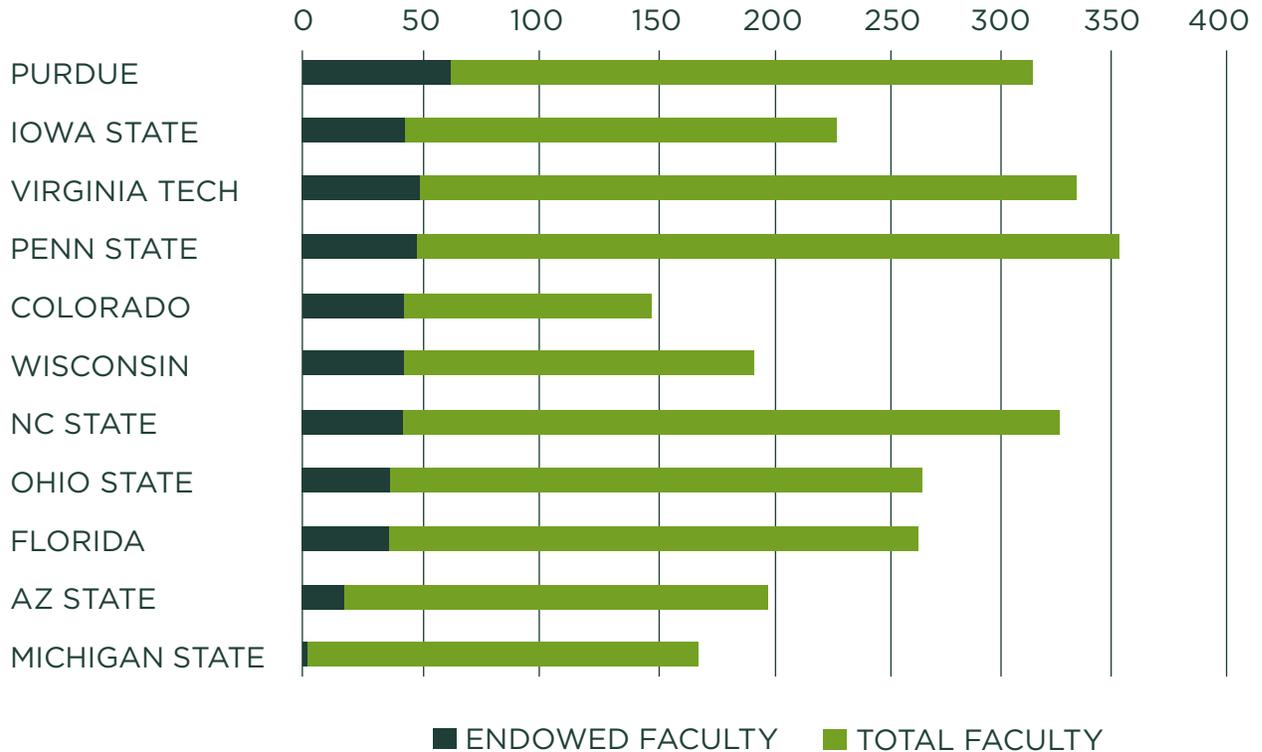


The center of the college's creative enterprise is our faculty. To maintain and elevate the high level of talent and achievement, we seek to recruit as well as retain men and women who are on the cutting edge of discovery, the foremost in their fields—or who are well on their way to becoming so. We expect our academic leaders to assemble research teams of the most accomplished graduate students, and work collaboratively to create new knowledge. We demand talented teachers who can educate and encourage undergraduates, and who can also inspire younger students to enter the field of engineering.

We have several advantages in pursuing and retaining the very best faculty. We are embedded in a major research university, and have a high-quality collection of faculty members, graduate students, and undergraduates—the final element that will give us a competitive advantage is endowed chairs and professorships. Endowed chairs are one of the few critical areas where we lag significantly behind our peers. We need these positions to retain our best faculty, and recruit our competition's best talent.

Endowed chairs and professorships are very prestigious, reflecting highly not only on the holder, but on the college. The endowment provides funding that the chair can use to investigate new ideas, fund pilot projects, or support graduate students. Endowing a chair or professorship offers a donor the opportunity to have a powerful and lasting impact in perpetuity.

NUMBER OF FACULTY AND ENDOWED POSITIONS  
at Select **ENGINEERING PEER INSTITUTIONS**



*“The Herman Koenig Chair in Electrical and Computer Engineering was a key factor in my decision to join the faculty of the College of Engineering. It signaled the importance that the College of Engineering places on the field. And, it provides a level of research support in terms of funding and graduate students that is critical to the progress of my research in evolutionary computation.”*

DR. KALYANMOY **DEB**

**OUR FUNDING PRIORITY FOR ENDOWED CHAIRS AND PROFESSORSHIPS IS \$28 MILLION.**



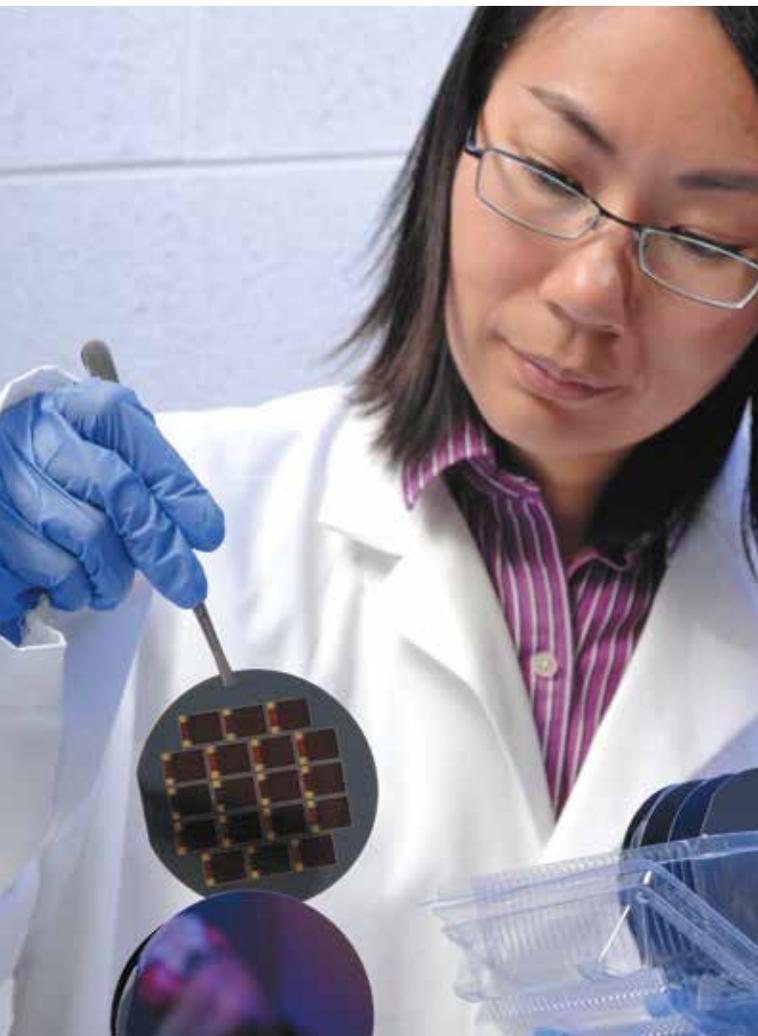
## *A Global* **PROBLEM SOLVER**

One of the big challenges that we as a society are addressing is sustainability. Today, half of the world's inhabitants live in urban areas. Cities such as Mumbai or Karachi already have populations approaching 15 million—and are growing daily. By 2050, 70 percent of people on earth will be city dwellers, creating serious issues in water and air quality, and food supply.

Our faculty are currently conducting important research projects in issues of sustainability, including geo-engineering, to improve efficiency and reduce the environmental impact of landfills, understanding influences on the chemistry of water, developing new methods to minimize and treat waste, and detecting and treating human health threats in environmental systems.



In the area of health, we are evolving next-generation tools for detecting and treating devastating diseases like cancer and cardiovascular disease. In energy, we are building new technologies to produce power from sustainable sources, including biofuels, new energy storage and conversion materials, and systems and wind energy extraction devices. We are creating new materials and imaginatively deploying them in medicine, infrastructure security, energy sources, and manufacturing. Our faculty and students are limited only by their imaginations.





# *An Engine of* **OPPORTUNITY**

The field of engineering embodies the problem-solving, practical land-grant mission of MSU. Our college has admitted generations of young men and women, given them a top-flight engineering education, and watched them succeed all over the world. Their work has transformed entire industries, including ones that did not exist when they graduated.

We have also transformed lives. Thousands of our students grew up in humble circumstances—many the first in their families to go to college. We have proudly seen them go on to important and well-paying careers in settings ranging from large corporations to companies they founded themselves—adding value and creating jobs for others in Michigan communities and beyond.

Undergraduate scholarships make it possible for deserving students to afford higher education without incurring large student loans or spending valuable study time working excessive hours. The college offers both need- and merit-based scholarships that enable us to successfully compete for the very top students.

Graduate students play a critical role in research and teaching, and share their knowledge with colleagues around the world through publications, conferences, and professional development opportunities. Graduate students are key to propelling the college to the next level of excellence, and we must be able to offer competitive packages to every top-tier student admitted into the graduate program.

Sometimes, the most intense learning takes place outside of the classroom. Currently, 90 percent of engineering students participate in experiential learning—including internships, undergraduate research, study away, and study abroad. These experiences give students the opportunity to take what they learn in class and apply it to real-world situations. Students discover their passion and life's work, while building resumes that make them more competitive for graduate school or jobs.

Endowed support will enable the college to provide support for scholarships, fellowships and experiential learning in perpetuity, while expendable funds will make it possible for us to have an impact now.



## OUR FUNDING PRIORITY FOR STUDENT OPPORTUNITIES IS **\$24.5 MILLION.**

ENDOWED GRADUATE FELLOWSHIPS  
**\$15.5 MILLION**

ENDOWED UNDERGRADUATE FINANCIAL AID  
**\$6 MILLION**

ENDOWED STUDENT EXPERIENCE SUPPORT  
**\$500,000**

EXPENDABLE GRADUATE FINANCIAL SUPPORT  
**\$500,000**

EXPENDABLE UNDERGRADUATE FINANCIAL AID  
**\$1 MILLION**

EXPENDABLE STUDENT EXPERIENCE SUPPORT  
**\$1 MILLION**

# *A Vibrant* **COMMUNITY**

When potential new faculty members, undergraduate students, or graduate students visit the College of Engineering, they already know our great reputation and that of our faculty leaders. They come to campus to see our facilities and the places in which they will be working and learning.

We seek to enhance and modernize the undergraduate teaching laboratories as well as the research laboratories beyond what we can do through research grants. Some of these labs are crowded or are “making do” with equipment that is not on the cutting edge. Renovating these labs will improve the educational experience and make us more competitive in research.



## FUNDING PRIORITY FOR A VIBRANT COMMUNITY IS **\$2.5 MILLION.**

ENDOWED FUNDS FOR  
CONTINUOUS LAB  
IMPROVEMENTS  
**\$1 MILLION**

EXPENDABLE FUNDS  
FOR LAB UPGRADES  
AND EQUIPMENT  
**\$1.5 MILLION**



We also seek support for entirely new facilities such as the Quantitative Health Sciences and Engineering Institute, a bioengineering research facility that will house collaborative research efforts in biological engineering and engineering health sciences. The QHSEI will integrate technological discoveries into medical practices and will result in improved, lower cost health care for all citizens.

In addition to support for facilities, we need endowed discretionary funds that will allow our departments to meet unanticipated needs or opportunities as they arise. Such resources can be critically important to providing small scholarships and grants to students, replacing or upgrading computing resources, and offering support to faculty for equipment purchases.

For example, if a team of undergraduates wins a regional engineering contest and needs support to travel to the national competition, having discretionary funding makes it possible for them to go. While our college receives many research grants, these dollars are restricted to their stated purposes and cannot be used for unexpected discoveries. Discretionary funding can help our faculty and students pursue new ideas as soon as they emerge.

## FUNDING PRIORITY FOR FACILITIES AND UPCOMING DISCOVERIES IS **\$25 MILLION.**

FACILITIES  
**\$14 MILLION**

EXPENDABLE  
DISCRETIONARY FUNDS  
**\$3.5 MILLION**

ENDOWED  
DISCRETIONARY FUNDS  
**\$7.5 MILLION**



# At the End of *the* **Day**

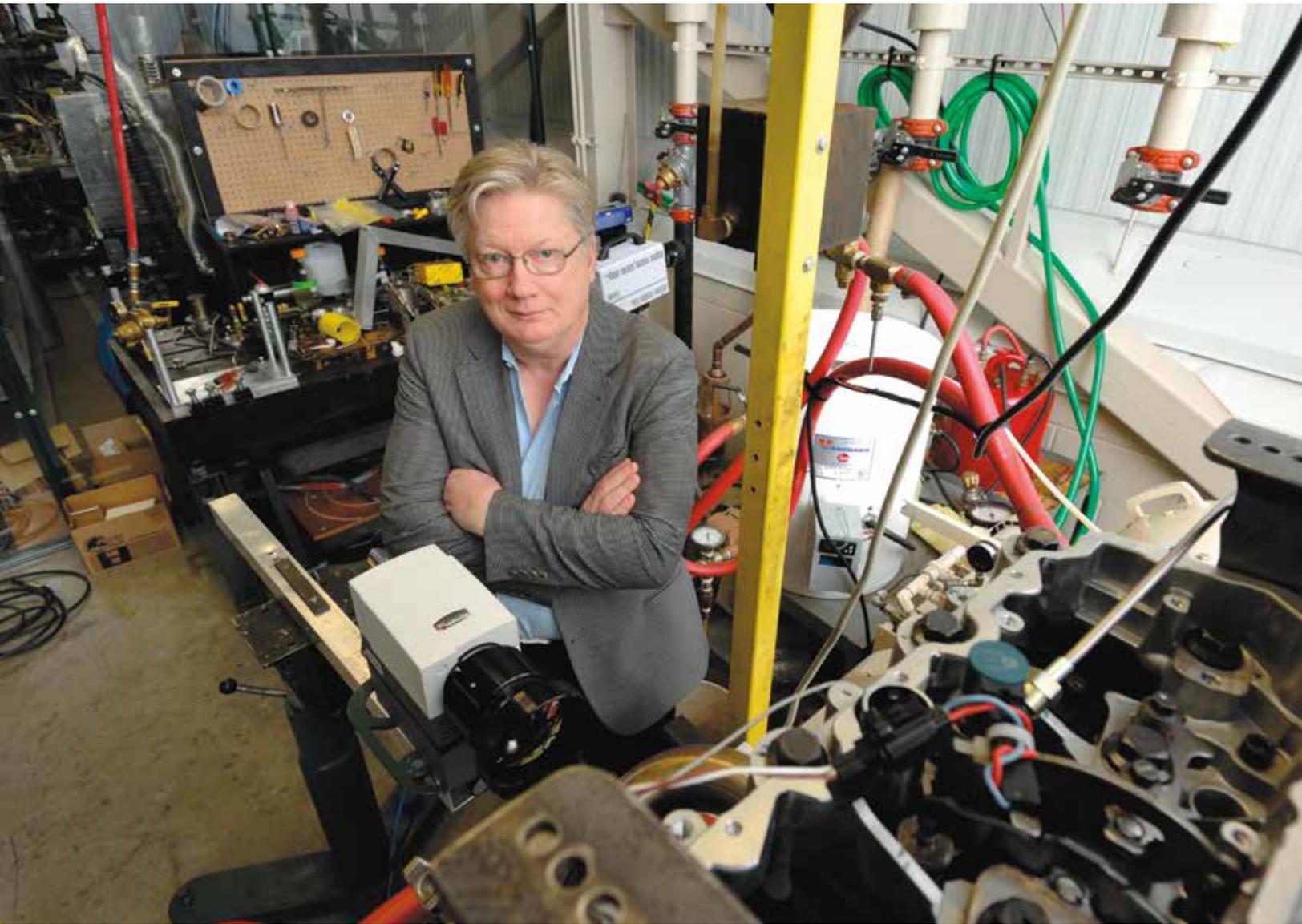
Engineering know-how played a large role in making the United States an economic power and in making Michigan a center of technological accomplishment. The College of Engineering at Michigan State University continues to make a difference in Michigan, where half of our students choose to stay after graduation.

We live in a time when change, driven by technology, is abundant. People who have the knowledge and capacity to drive the technology change itself are scarce. We need those who can apply that knowledge to creating real-world engineering solutions that contribute to economic development in Michigan and throughout the world. This college produces such people every year.

Generous support of the college has a wide and positive impact. First you will benefit our students, who receive a top-flight education that prepares them for careers of accomplishment. Second, producing world-class engineers contributes to economic success, in Michigan and in our country. Finally, you will fuel groundbreaking research that will help solve the great problems facing our world.

This moment is one of the most exciting times to be in engineering education. The pace of change, the technology at our disposal, and the challenges facing us combine to create great opportunities for our college and our people. We invite you to join us as we continue our upward trajectory of achievement.

**LEO KEMPEL**  
DEAN, COLLEGE OF ENGINEERING



*Professor Harold Schock serves as director of the Energy & Automotive Research Laboratories, where research is focused on innovative engine design, power electronics for hybrid vehicles, and on the development of thermoelectric devices for harvesting waste energy from tailpipe emissions.*



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**COVER IMAGE:**

*A statue of the Tau Beta Pi Engineering Honor Society badge, the Bent, at the south entrance to the Engineering Building honors Professor Lester P. Breckenridge, who founded the Michigan Alpha Chapter in 1892. Tau Beta Pi is the oldest engineering honor society in the United States and the second oldest collegiate honor society in America; the MSU chapter was the second to be established.*

# SPARTANS WILL.

MAKE A DIFFERENCE *and*  
EMPOWER EXTRAORDINARY TODAY.

**EMPOWER.MSU.EDU**

**#EmpowerMSU**