Accelerating research

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Engineering, cybersecurity, and big data selected for new Global Impact Initiative

Michigan State University will accelerate key research areas – including engineering, cybersecurity, and computational science -- through the recruitment of 100 new faculty members as part of the university’s newly launched Global Impact Initiative.

The Global Impact Initiative will bolster areas in which MSU already has a strong foundation, such as plant science, engineering, physical science and STEM education, while expanding research in genomics, cybersecurity, computational science and precision medicine. The priority research areas were developed from nearly 90 proposals submitted by MSU faculty members. Those areas are discussed at http://research.msu.edu/global-impact/.

“This bold investment by the Board of Trustees will pay huge dividends by growing MSU’s capacity for cutting-edge research,” said MSU President Lou Anna K. Simon. “Targeting emerging areas of scholarship will leverage Michigan State's considerable strengths and enhance our reputation as a top-100 world research university.”

It’s MSU’s mission to take on challenges such as this, said June Pierce Youatt, MSU Provost.

"It’s our land-grant legacy to take on today’s most-urgent challenges, working toward solutions that have far-reaching impact," she said. “Our new colleagues through Global Impact will join MSU’s exceptional faculty in accelerating and expanding our work in critical areas of research that will improve life and well-being in Michigan, the nation and the world."

Funding for the Global Impact Initiative was approved by the Board of Trustees in 2014. Careful and continuing stewardship of the university budget allowed MSU to dedicate $17.5 million in recurring funds for the initiative.

MSU already has begun fulfilling the Global Impact Initiative’s goals with the creation of the Department of Computational Mathematics, Science and Engineering. Embodying the current emphasis on “big data,” the growing field of computational science focuses on the construction of mathematical models and quantitative analysis techniques, to rapidly analyze and solve any number of complex scientific problems across disciplines.

The Global Impact Initiative also will further MSU’s plant science research efforts. With global population projected to reach 9 billion by mid-century, food security in the face of a changing climate has long been a priority at MSU. Harnessing new genetic expertise to enhance food crops and build the bioeconomy will help MSU continue its role as an international plant science leader, said Stephen Hsu, MSU vice president for research and graduate studies.

In the past 10 years, the cost of sequencing genomes has dropped dramatically. MSU is already capitalizing on the ever-increasing affordability of genomics to open many doors in plant and animal sciences. Scientists can pinpoint genes that allow plants to fend off drought and cold, while other research can improve animal breeding by using new genotypes.

Advances in genomics have also led to the creation of precision medicine for humans, which analyzes variations in genes, environment and lifestyle. Research in this arena will dramatically improve doctors’ ability to tackle autism, revolutionize cancer treatments and address myriad health issues.

“The best research universities are adept at identifying and investing in promising new scholarship as it first emerges,” Hsu said. “Global Impact gives us an opportunity to do precisely that.”
For example, innovative faculty scholarship in accelerators, electromagnetics and computational physics will capitalize on the new U.S. Department of Energy-MSU Facility for Rare Isotope Beams and lead to new discoveries in energy as well as medicine.

MSU’s engineering strengths in composite materials will have future impact on lightweight vehicles and stronger roads, while pioneering work in power electronics, biometrics and cybersecurity will keep self-driving cars, businesses and personal data safe.

The new and enhanced research efforts brought forth by the Global Impact Initiative will also provide a rich learning experience for both undergraduate and graduate students at MSU. This, along with investments in senior faculty members to lead science, technology, engineering and mathematics courses, will increase the university’s stature as a center for STEM education.

“Over the next four years we are making a significant investment, seeking to make dramatic institutional gains in a relatively short period of time,” said Youatt. “I believe the impact will be felt around the globe, and that we will reap the benefits right here in Michigan as we add to our already impressive list of researchers who call East Lansing home.”

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