

\$15.6M Materials Research Center to Revolutionize Computer Memory and Wearable Medical Devices

University of Illinois College of Engineering
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Innovative materials are the foundation of countless breakthrough technologies, and the Illinois Materials Research Science and Engineering Center will develop them. The new center is supported by a six-year, \$15.6 million award from the National Science Foundation's Materials Research Science and Engineering Centers program. It is led by Professor Nadya Mason of Engineering at Illinois' Department of Physics and its Frederick Seitz Materials Research Laboratory.

By building highly interdisciplinary teams of researchers and students, the Illinois Materials Research Center will focus on two types of materials. One group will study new magnetic materials, where ultra-fast magnetic variations could form the basis of smaller, more robust magnetic memory storage. The second group will design materials that can withstand bending and crumpling that typically destroys the properties of those materials and even create materials where crumpling enhances performance.

"This is very fundamental research, but it could have enormous long-term impact for a variety of industries and for society," said Mason. "If we can control the dynamics of these magnetic materials, we could revolutionize flash storage. And if we can make typically hard electronic materials ultra-flexible, we could create completely new wearable devices that could even interface with skin and cells.

"But before we can create applications, we need to understand and control the fundamental materials properties that are limiting progress in these areas. And that is why we need this collaborative team, drawn from all different areas of science and engineering."

The research activities of the Illinois Materials Research Center will be tightly integrated to educational and outreach activities. Advanced training for a diverse group of undergraduates, graduate students, and postdoctoral researchers in science communication and in creating high-impact partnerships will produce well-trained scientists who can push the boundaries of materials research in industry

and academia and increase the pipeline for the future scientific workforce. The Center will also strengthen Illinois' role as a regional and national hub for materials facilities and infrastructure.

"Illinois routinely earns more National Science Foundation research funding than any other university, but our work cannot and absolutely does not stop there," said Andreas Cangellaris, dean of the University of Illinois at Urbana-Champaign's College of Engineering. "The team that Nadya has built and the vision that she has established embraces that whole-heartedly. The Illinois Materials Research Center is going to improve our world and our students' educational experiences."

The Departments of Materials Science and Engineering, Physics, Mechanical Science and Engineering, Electrical



Nadya Mason, professor of physics, is the Director of the \$15.6 million Illinois Materials Research Center.

and Computer Engineering, Bioengineering, Chemistry, and Media Studies are collaborating on the center. Illinois' I-STEM Educational Initiative and the Department of Energy's Argonne National Laboratory are also partners.

Materials Research Science and Engineering Centers support interdisciplinary and multidisciplinary materials research and education of the highest quality while addressing fundamental problems in science and engineering that are important to society. They require outstanding research quality, intellectual breadth, interdisciplinarity, flexibility in responding to new research opportunities, support for research infrastructure, and they foster the integration of research. There are about 20 Materials Research Science and Engineering Centers across the country.