The Ohio State University Center for Exploration of Novel Complex Materials (ENCOMM) was established in 2006 to address global issues around the development of new materials that will form the foundation for future technological innovation and economic competitiveness.

**AT A GLANCE**

ENCOMM is comprised of more than 100 researchers in physics, chemistry, electrical and computer engineering, mechanical engineering, materials science and engineering and biomedical engineering.

The Center provides shared research infrastructure through partnering with the NanoSystems Laboratory and seed funding for innovative research in partnership with the Institute for Materials Research (IMR) and the NSF-funded Center for Emergent Materials (CEM).

ENCOMM builds on the broad strengths at Ohio State in electronic, magnetic and organic materials to address challenges in understanding and developing complex multicomponent materials.

To date, ENCOMM has played a central role in generating more than $30 million in federal funding, including awards from the National Science Foundation, the Department of Energy and the Department of Defense.

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**THE ENCOMM NANOSYSTEMS LABORATORY**

ENCOMM is partnered with the NanoSystems Laboratory, an open user facility that provides academic and industrial users with access to advanced materials characterization and fabrication tools for research and development applications. Research capabilities available at the laboratory include focused ion beam/scanning electron microscopy, e-beam lithography, nanomanipulation, EDS X-ray microanalysis, X-ray diffractometry, SQUID magnetometry, atomic force/magnetic force microscopy, low temperature magnetotransport measurements and EPR/FMR magnetic resonance.

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encomm.osu.edu

asc.osu.edu
ACHIEVING HIGHEST-RESOLUTION OF MRI OF A MAGNET

In a development that holds potential for both data storage and biomedical imaging, ENCOMM researchers have used a new technique to obtain the highest-ever resolution MRI scan of the inside of a magnet.

- Studying the material’s behavior is key to incorporating it into computer chips and other electronic devices
- Computer chips equipped with tiny magnets might one day provide high-density data storage
- Technique could be a useful tool in biomedical research labs
- Shrinking magnets to the nanoscale and building them directly inside electronics would enable devices to do more, with less power consumption

USHERING IN A NEW ERA

The growth in ENCOMM’s ability to fabricate, manipulate, characterize, understand and model multicomponent solids comprised of dissimilar materials and with complex structures is ushering in a new era for materials with advanced functionality and exceptional levels of performance.

Fashioning such hybrid materials with nanometer-scale precision opens a new frontier for conception and implementation of new devices with a vast range of capabilities.

“Computer chips equipped with tiny magnets might one day provide high-density data storage; computers with magnets in their central processing units (CPUs) would never have to boot up. The entire computer would be contained inside the CPU, making such devices even smaller and less power-hungry as well.”

(Chris Hammel, Ohio Eminent Scholar, Departments of Physics and Electrical Engineering)