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EMSL In Brief

Environmental Molecular Sciences Laboratory

Spintronics Research Featured on Cover of *Materials Today*

Spintronics research conducted in part at the Environmental Molecular Sciences Laboratory (EMSL) was highlighted on the cover of the November 2006 issue of *Materials Today* [9(11):28-35].

In their article “Ferromagnetism in Oxide Semiconductors,” EMSL researchers and users from the Pacific Northwest National Laboratory, Argonne National Laboratory, and the University of Washington seek to answer the question: “Is it possible to create magnetic semiconductors that work at room temperature?” This is one of 125 critical unanswered questions recently posed in *Science Magazine*.

The researchers worked to answer this question by exploring the relationship between donor electrons and the alignment of the magnetic spins in oxide semiconductors using two well-characterized materials, cobalt-doped zinc oxide and titanium-doped iron oxide, grown as crystalline films at EMSL. They obtained tantalizing, but very different results for both oxides. These results provide an important step towards the significant work remaining in creating a new generation of computer chips that are faster, use less power, and lead to new functionality to carry out complex calculations beyond the scope of current computers.

Materials Today, published by Elsevier, is read by more than 14,000 scientists in industry, academia, and government agencies. The research was supported by the U.S. Department of Energy’s Office of Science, the National Science Foundation, the Research Corporation, the Dreyfus Foundation, and the Sloan Foundation.

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