

## **New materials search for spintronics applications**

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A prospect of devices using both charge and spin of electrons continuously gives impetus to the activities in the field of *spintronics*, whose central theme may be put as understanding and exploitation of electronic spin degrees of freedom in matter on the nanometer scale. While the metallic magnetism research flourishes with nanostructures, many new frontiers are appearing in spintronics. For instance, various attempts of turning conventional semiconductors magnetic are actively being made, since the semiconductor materials of current charge-based technology is inherently nonmagnetic. New materials search forms an important avenue in the spintronics field, and our recent efforts for new spintronic materials were directed towards oxide materials. Transition metal oxides manifest a variety of exciting properties, which can be taken advantage of in novel devices; room temperature magnetic semiconductors and ferroelectromagnets are nice examples. In this talk, we will first describe the synthesis and characterization of oxide materials in general, and then focus on ZnO and BiMnO<sub>3</sub> for interesting physics these systems offer.