



GP-Spin Seminar

“Electrical control of orbits and magnetism in oxides”

日時： 2016年9月30日（金）
10:30-12:00

場所： 工学研究科マテリアル・開発系
教育研究棟セミナー室 2 (407室)



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Abstract:

Electrical control of magnetism with profound physics and enormous potential applications has provoked extensive research activities. In this talk, I will present the reversible orbital reconstruction driven by ferroelectric polarization modulates the magnetic performance of ferroelectric/ferromagnetic [BaTiO₃/(La,Sr)MnO₃] heterostructure. In-plane Mn orbital occupancy and related interfacial magnetic state are enhanced and weakened by the negative and positive electric-field, respectively. Furthermore, with the aid of ionic liquid, the modulation of magnetism extends to bulk part of the ferromagnet. The Ti-O-Mn covalent bond at the interface controls the field effect by enhancing or blocking the channel for electron injection and extraction in the bulk of film, serving as an orbital switch at atomic scale for the manipulation of magnetism. Our findings thus not only present a broad opportunity to fill the missing member—orbital in the mechanism of electrical control of magnetism, but also make the orbits straight forward to the application in microelectronic device.

1. B. Cui, C. Song, et al. *Adv. Mater.* 27, 6651 (2015).
2. B. Cui, C. Song, et al. *Adv. Funct. Mater.* 25, 864 (2015).
3. Y. Y. Wang, C. Song, et al. *Adv. Mater.* 27, 3196 (2015)
4. B. Cui, C. Song, et al. *Adv. Funct. Mater.* 26, 753 (2016).