

SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA

Uprzejmie zawiadamiamy, że w **środę**

8 maja 2019 r., o godz.10:00

w sali 203 (bud. 1) odbędzie się seminarium, na którym

dr Carmine Autieri

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wyłosi referat zatytułowany:

„Low-connectivity and interface effects in spin-orbit coupled iridium oxides”

Iridates supply fertile ground for unconventional phenomena and exotic electronic phases. We investigate the electronic, structural and magnetic properties of some iridium oxides compounds with d^4 and d^5 electronic configuration in the low connectivity regime.

We study the thickness-dependent electronic properties of ultrathin SrIrO_3 and discover a transition from a semimetallic to a correlated insulating state below 4 unit cells. Low-temperature magnetoconductance measurements show that spin fluctuations in the semimetallic state are significantly enhanced while approaching the transition point. The electronic properties are further studied by scanning tunneling spectroscopy, showing that 4 unit cell SrIrO_3 is on the verge of a gap opening. Our density functional theory calculations reproduce the critical thickness of the transition and show that the opening of a gap in ultrathin SrIrO_3 requires antiferromagnetic order.

Recently the anomalous Hall effect (AHE) was observed at the $\text{SrIrO}_3/\text{SrRuO}_3$ interface.

In contrast to the quantum Hall effect, which is characterized by a topological invariant and is robust against perturbations, the AHE depends on the Berry curvature of occupied bands at the Fermi level and is therefore highly sensitive to subtle changes in the band structure.

We demonstrate that the Berry curvature can be manipulated by interface engineering of the correlated itinerant ferromagnet. Using theoretical calculations, we show that the tunability of the AHE at interfaces arises from the competition between two topologically non-trivial bands.

Serdecznie zapraszamy

Roman Puźniak / Henryk Szymczak / Andrzej Szewczyk