SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA

Uprzejmie zawiadamiamy, że w **środę**

1 lipca 2020 r., o godz.10:00

odbędzie się seminarium **on-line (link podany jest na stronie IFPAN)**,

na którym

dr Zurab Guguchia

Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institute, CH-5232 Villigen PSI, Switzerland

wygłosi referat zatytułowany:

Tunable Anomalous Hall Conductivity Through Volume-wise Magnetic Competition in a Topological Kagome Magnet $Co_3Sn_2S_2$

Magnetic topological phases of quantum matter are an emerging frontier in physics and material science. Along these lines, several kagome magnets have appeared as the most promising platforms. However, the magnetic nature of these materials in the presence of topological state remains an unsolved issue. I will make an introduction on novel topological metals and present our recent results on magnetic correlations in the kagome magnet $Co_3Sn_2S_2$ [1,2]. Using muon spin rotation, we show the evidence for competing magnetic orders [1] in the kagome lattice of this compound. Our results reveal that while the sample exhibits an out-of-plane ferromagnetic ground state, an in-plane antiferromagnetic state appears at temperatures above 90 K, eventually attaining a volume fraction of 80% around 170 K, before reaching a nonmagnetic state. Strikingly, the reduction of the anomalous Hall conductivity above 90 K linearly follows the disappearance of the volume fraction of the ferromagnetic state. We further show that the competition of these magnetic phases is tunable through applying either an external magnetic field or hydrostatic pressure. Our results taken together suggest the thermal and quantum tuning of Berry curvature field via external tuning of magnetic order. Our study shows that $Co_3Sn_2S_2$ is a rare example where the magnetic competition drives the thermodynamic evolution of the Berry curvature field, thus tuning its topological state.

[1] Z. Guguchia et. al., Nature Communications **11**, 559 (2020).
[2] J.-X. Yin, S.S. Zhang, G. Chang, Q. Wang, S. Tsirkin, Z. Guguchia et. al., Nature Physics **15**, 443 (2019).

Serdecznie zapraszamy
Roman Puźniak / Andrzej Szewczyk