SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA

Uprzejmie zawiadamiamy, że w **środę**

06 października 2021 r., o godz.10:00

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

na którym

mgr Ashutosh Wadge

(International Research Centre MagTop, Institute of Physics, Polish Academy of Sciences, Warsaw, Poland)

wygłosi referat na temat:

"Topological semimetal $TaAs_2$ investigated by transport and ARPES"

We have performed electron transport and ARPES measurements on single crystals of transition metal dipnictide $TaAs_2$ cleaved along the $(\bar{2}01)$ surface which has the lowest cleavage energy. A Fourier transform of the Shubnikov-de Haas oscillations shows four different peaks whose angular dependence was studied with respect to the angle between magnetic field and the $[\bar{2}01]$ direction. The results indicate elliptical shape of the Fermi surface cross-sections. Additionally, a mobility spectrum analysis was carried out, which also reveals at least four types of carriers contributing to the conductance (two kinds of electrons and two kinds of holes). ARPES spectra were taken on freshly cleaved $(\bar{2}01)$ surface and it was found that bulk states pockets at constant energy surface are elliptical, which confirms the magneto-transport angle dependent studies. First-principles calculations support the interpretation of the experimental results. The theoretical calculations better reproduce the ARPES data if the theoretical Fermi level is increased, which is due to a small n-doping of the samples. This shifts the Fermi level closer to the Dirac point, allowing to investigate the physics of the Dirac and Weyl points, making this compound a platform for the investigation of the Dirac and Weyl points in three-dimensional materials.

Keywords: Topological semimetal; crystal growth; Electrical transport; Angle resolved photoemission spectroscopy; DFT calculations.

Serdecznie zapraszamy

Roman Puźniak
Andrzej Szewczyk
Henryk Szymczak