

SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA

Uprzejmie zawiadamiamy, że w **środę**

27 listopada 2024 r., o godz.10:00

odbędzie się seminarium w sali 203, budynek I

na którym

dr. Ashutosh S. Wadge

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wygłosi referat na temat:

“Single crystal growth and electronic properties of topological nodal line semimetal ZrAs₂”

Materials with topologically non-trivial electronic states and diverse symmetry properties have gained significant attention in condensed matter physics. Among these, ZrAs₂ stands out as a notable example, exhibiting nodal lines that form closed loops in momentum space, governed by several symmetries such as inversion symmetry, time reversal symmetry and non-symmorphic symmetries [1-3]. This study explores the electronic properties of ZrAs₂ using a combination of angle-resolved photoemission spectroscopy (ARPES) and density functional theory (DFT) calculations (see Figure 1).

ARPES measurements revealed a well-defined nodal loop structure, particularly prominent at lower excitation energies of 30 and 50 eV. These findings, corroborated by DFT calculations, highlighted symmetry-enforced Dirac-like band crossings at specific points within the Brillouin zone, notably near the S point. Slab calculations further delineate the surface bands and bulk states associated with these crossings, aligning well with experimental data [4].

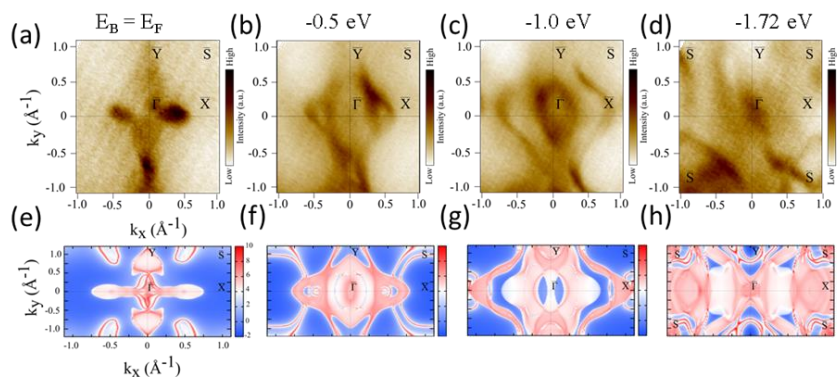


Figure 1 Comparison between constant energy contours obtained by ARPES and DFT calculations at binding energy equal to: (a, e) E_F , (b, f) -0.5 eV, (c, g) -1.0 eV and (d, h) -1.72 eV.

[1] P. E. R. Blanchard, R. G. Cavell, and A. Mar, *J. Alloys Compd.* **505**, 17 (2010).

[2] X. Zhou, C. H. Hsu, H. Aramberri, M. Iraola, C. Y. Huang, J. L. Mañes, M. G. Vergniory, H. Lin, and N. Kioussis, *Phys. Rev. B* **104**, 125135 (2021).

[3] S. Nandi, B. B. Maity, V. Sharma, R. Verma, V. Saini, B. Singh, D. Aoki, and A. Thamizhavel, *Phys. Rev. B* **109**, 075155 (2024).

[4] A. S. Wadge, K. Zberecki, B. J. Kowalski, D. Jastrzębski, P. K. Tanwar, P. Iwanowski, R. Diduszko, A. Moosarikandy, M. Rosmus, N. Olszowska, A. Wiśniewski, *Phys. Rev. B* **110**, 035142 (2024).

Wykład będzie prowadzony w języku angielskim w sali 203.

Dostępna będzie również transmisja ZOOM - link podany jest na stronie IF PAN.

Serdecznie zapraszamy

Roman Puźniak / Andrzej Szewczyk / Henryk Szymczak