Universität Münster

Aktuelle Fragen der Nanophysik

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Spin-polarized bands in superconducting bilayer crystals formed on solid surfaces

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Elucidating the origin of spin-polarized electronic states of 2D atomic layer crystals (ALCs) is one of the hottest topics in both fundamental science and applications. Among ALMs, atomic-layer superconductors with strong spin-orbit coupling have the potential to become topological superconductor [1], and a complete understanding of the spin-polarized electronic states of these materials is an interesting research target. In this talk, I will present the spin-polarized electronic states of two bilayer superconducting ALCs, In bilayer formed on Si(111) [2] and Tl bilayer formed on Ag(111) [3], and discuss their origins. The effect of organic molecule adsorption on the Tc of one of these superconducting ALM [4,5], the In bilayer, will also be presented.

[1] D. Sau *et al.*, Phys. Rev. Lett. **104**, 040502 (2010).
[2] T. Kobayashi *et al.*, Phys. Rev. Lett. **125**, 176401 (2020).
[3] T. Kobayashi *et al.*, Nano Lett. **23**, 7675 (2023).
[4] S. Yoshizawa *et al.*, Nano Lett. **17**, 2287 (2020).
[5] S. Inagaki *et al.*, Phys. Rev. Materials **7**, 024805(2023).