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Type: **Poster**

Imaging band structure of novel quantum materials by ARPES

Tuesday, 17 May 2022 18:50 (1h 10m)

We will discuss several experimental approaches of imaging the band structure by ARPES and spin-polarized ARPES. We will consider various energy ranges from x-rays [1] to 6 eV [2], and various materials, from bulk crystals [1] to ultrathin films [2] and exfoliated atomically-thin flakes [3]. We will discuss technical aspects such as the angular and energy resolution, depth sensitivity, and various modes of adding spin-sensitivity to ARPES. We will compare the parameters of several synchrotron-based ARPES, micro-ARPES and spin-APRES machines, to our lab-based laser-driven high-resolution spin-ARPES system equipped with the exchange scattering spin detector. We will also discuss how to establish an intuitive relation between the initial state orbital and spin textures, and the dichroic and spin textures measured in the ARPES map, through the analysis of the photoemission matrix elements. This relationship is one of the necessary links to establish the connection between the band structure mapping and topological magneto-transport properties of novel materials.

- [1] A. X. Gray et al., Nature Materials 11, 957 (2012)
- [2] R. C. Vidal et al., Phys. Rev. Lett. 126, 176403 (2021)
- [3] E. Mlynczak et al., Phys. Rev. B 103, 035134 (2021)
- [4] M. Gehlmann et al., Nano Letters, 17, 5187 (2017)

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Session Classification: POSTER SESSION 2 - Cheese and wine