Floquet engineering of quantum materials

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Time-periodic light-field can dress the electronic states of quantum materials, providing a fascinating controlling knob for transient modifications of the electronic structure with light-induced emergent phenomena [1]. In this talk, I will present a summary of our recent experimental progress on the Floquet engineering of quantum materials using time- and angle-resolved photoemission spectroscopy (TrARPES). In particular, experimental results from black phosphorus upon resonance pumping [2] and below-gap pumping [3] will be presented, from which some insights about Floquet engineering will also be discussed.

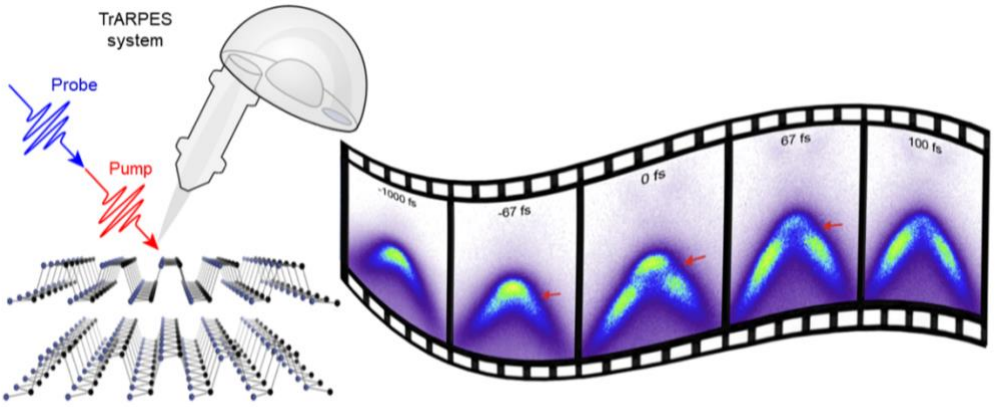

Fig.1: Schematic illustration of TrARPES measurements, and snapshots of the transient electronic structure of black phosphorus upon mid-infrared pumping.

Related reference:

[1] C. Bao *et al*., Nat. Rev. Phys. **4**, 33 (2022)
[2] S. Zhou^{+}, C. Bao^{+} *et al*., Nature **614**, 75 (2023)
[3] S. Zhou^{+}, C. Bao^{+}, B. Fan^{+} *et al*., Phys. Rev. Lett. **131**, 11640 (2023)