TECHNISCHE UNIVERSITÄT WIEN

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EINLADUNG zum IFP-SEMINAR

Flat-band superconductivity - a new arena for band structure designing?

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Host:	Prof. Karsten Held
Termin:	Dienstag, 02 Juli 2019, 10 Uhr
Ort:	Institut für Festkörperphysik, TU Wien
	Wiedner Hauptstraße 8-10, 1040 Wien
	Seminarraum DB gelb 09 (gelber Bereich, 9. OG)

I shall describe superconductivity in flat-band systems. A basic idea is that flat bands give unique opportunities for enhancing Tc with (i) many pair-scattering channels between the dispersive and flat bands, and (ii) an even more interesting situation when the flat band is topological.

We start with multi-band systems where a flat band coexists with dispersive one(s), and superconductivity is previously shown to be induced when the flat band is "incipient" (close to, but away from, the Fermi energy) [1]. We then explore a simplest possible one-band case in which a portion of the band is flat to show that a superconductivity emerges when the flat portion is incipient, with many pair-scattering channels between the flat and dispersive portions [2]. The flatness makes the superconductivity sensitively dominated by the Fermi energy with curious pairing symmetries arising. We also detect non-Fermiliquid behaviour.

[1] K. Kobayashi et al, Phys. Rev. B 94, 214501 (2016).
[2] S. Sayyad et al, arXiv:1903.09888.