

INVITATION to IFP-SEMINAR

Re-entrant superconductivity in Eu-doped infinite layer nickelate films

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Host: Marta Gibert

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Place: TU Wien, Freihaus Building
Wiedner Hauptstraße 8-10, 1040 Wien
Seminar Room DC red 07 (red section, 7. OG)
Zoom: <https://tuwien.zoom.us/j/66182616976>

Abstract:

I will discuss our recent results on the synthesis and study of superconductivity in infinite-layer nickelate thin films, focusing on Eu-doped NdNiO₂. Superconductivity was first reported in infinite layer nickelates by Danfeng Li et al. in Sr-doped NdNiO₂ films obtained from perovskite nickelates via a topotactic reduction using CaH₂ [1]. Following the solid-state route proposed by W. Wei et al. [2,3], we used in our case an aluminum “cap” to obtain the infinite layer phase and Eu as a dopant. We observe in these samples a striking re-entrant superconducting behavior in the B_{c2}-T magnetic phase diagram [4], consistent with a Jaccarino–Peter like effect [5]. Such a re-entrant behavior was also observed in references given in 6. Our very recent observations, in the very underdoped and overdoped regimes, reveal that these samples are only superconducting at high magnetic field.

References.

- [1] D. Li et al., Nature 572, 624 (2019)
- [2] W. Wei et al., Physical Review Materials 7, 013802 (2023)
- [3] W. Wei et al., Sci. Adv. 9, eadh3327 (2023)
- [4] L. Varbaro et al., Nature Communications (2026) – in press.
- [5] V. Jaccarino & M. Peter, Phys. Rev. Lett. 9, 290 (1962)
- [6] Charles H. Ahn, MRS fall meeting 2023; Mingwei Yang et al., Nature April 2026; Dung Vu et al., Nature Communications 17, 3480 (2026); Km Rubi et al., arXiv:2508.16290 [cond-mat]

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