



***01<sup>st</sup> December 2021 - 2:00 p.m.***

**[Virtual meeting room in ZOOM](#) (ID: 992 7237 2470 / PW: 755622)**

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## **Lattice, correlations and order: Controlling (with) Dirac fermions**

The interplay of electronic correlations, lattice degrees of freedom and topology holds the promise for the realization of exotic states of quantum matter. Here, we discuss how to disentangle and how to control this interplay on the atomic scale. We will first address doping fingerprints of superconductivity arising from spin and lattice fluctuations in moiré superlattice systems [1]. We will show how confinement and deconfinement present pathways to create and control correlated Dirac fermions via superlattice engineering [2]. In turn, we show how in turn “Diracness” can control the spontaneous emergence of superlattices in charge density wave compounds [3].

### References

- [1] N. Witt, J. M. Pizarro, T. Nomoto, R. Arita, and T. O. Wehling, arXiv:2108.01121 (2021).
- [2] J. M. Pizarro, S. Adler, K. Zantout, T. Mertz, P. Barone, R. Valentí, G. Sangiovanni, and T. O. Wehling, npj Quantum Materials 5, 79 (2020).
- [3] J. Berges, E. G. C. P. van Loon, A. Schobert, M. Rösner, and T. O. Wehling, Phys. Rev. B 101, 155107 (2020).