



# Physics Colloquium

## Exotic metals, fractionalization, and quantum criticality



**December 3, 2025 (Wednesday)**



**4:30 p.m.**



**KB132,1/F, Knowles Building,  
Main Campus, HKU**



**Prof. Matthias VOJTA**

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### Abstract:

The quest for novel states of matter is important both on fundamental grounds and in view of possible applications, with superconductivity and the various quantum Hall effects being outstanding examples. This talk will summarize recent developments in the field, with an emphasis on the effects on frustration and intrinsic topological order. I will highlight frustration-based routes to novel forms of order and disorder, non-Fermi liquid metals and exotic superconductivity, and I will discuss aspects on quantum phase transition between the various phases. Connections to experiments on kagome and pyrochlore metals as well as cuprate high-temperature superconductors will be made.

### Biography:

Matthias Vojta received his Ph.D. from Dresden Technical University, Germany, in 1998. After postdoctoral positions at Yale and Augsburg and faculty appointments at Karlsruhe and Cologne, he is now Professor of Physics at Dresden. His research interests are in theoretical condensed-matter physics and include topological phases, quantum phase transitions, high-temperature superconductors, frustrated magnets, heavy fermions, as well as the physics of quenched disorder. He is the spokesperson of the Würzburg-Dresden Cluster of Excellence "ct.qmat - Complexity and Topology in Quantum Matter".