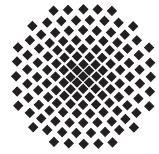


Stuttgarter Physikalisches Kolloquium

Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme
Fachbereich Physik, Universität Stuttgart

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Dienstag, 29. Oktober 2019

16.15 Uhr

Hörsaal 2D5

Stuttgarter Max-Planck-Institute, Heisenbergstraße 1, 70569 Stuttgart-Büsnau

Applied string theory: Understanding strange metals in the lab with virtual black holes

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Abstract

The Anti-de-Sitter/Conformal Field Theory correspondence, also known as AdS/CFT, has given us an unprecedented new holographic window in strongly coupled physics. In particular the existence of charged black holes in AdS predicts the existence of novel quantum critical fixed points distinct from the conventional theory of critical phenomena. I will review how the distinct features of these novel quantum critical points show a remarkable resemblance with the profoundly mysterious behavior of exotic strange metal states of quantum matter, e.g. in high T_c superconductors. Recent experiments of the past two years strongly indicate that this resemblance is more than superficial. This has put us at the cusp of a new era in theoretical physics: we will present the case that current experiments can and will test a holographic gravity model as the theory of the strange metal state.