

Théorie conforme des champs et systèmes quantiques à plusieurs corps
21 août – 9 septembre 2022

Conformal field theory and quantum many-body physics
August 21 – September 9, 2022

Sung-Sik Lee
(McMaster University)

Functional renormalization group formalism for non-Fermi liquids and the antiferromagnetic quantum critical metal

We develop a field-theoretic functional renormalization group formalism for non-Fermi liquids and apply it to the anti-ferromagnetic quantum critical metal in two space dimensions. As all gapless degrees of freedom are included within a low-energy effective theory, one can describe momentum dependent scaling properties of Fermi surface and the emergence of superconductivity within the unified description. Due to the presence of the intrinsic scale set by the Fermi momentum and the associated UV/IR mixing, the notions of renormalizability, low-energy observables and scale invariance need to be generalized from those in relativistic field theories.