

Unconventional ordering of correlated electrons: new examples and improved techniques

The emergence of unconventional ordering tendencies in interacting electron systems can be studied theoretically with the functional renormalization group (fRG). Here we describe some classic examples for unconventional ordering found with fRG, and discuss the ongoing improvements of the scheme: The fermionic flow can now be continued into regimes with spontaneously broken symmetry, avoiding the unphysical divergence of the interactions at nonzero renormalization group scale.

Furthermore, as a tribute to celebrated graphene physics, we present our recent fRG results for interacting electrons on the honeycomb lattice. Here electronic interactions can give rise to new examples of unconventional pairing and non-trivial insulators.

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