

News from the functional renormalization group for fermions: truncated unity expansion and nematic ordering in multi-orbital systems

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Abstract:

After an introduction, in the first part of the talk, I discuss a new fermionic functional renormalization group variant for two-dimensional lattice models that combines a physically appealing truncation of the wavevector dependence of the running interactions with certain numerical advantages. This allows for an efficient parallelized evaluation in which, e.g., the convergence of the expansion can be checked. In the second part of talk, I present new results on a model for iron superconductors that show that nematic orbital ordering occurs in different forms as competitor but also concomitant ordering tendency to the more conventional antiferromagnetic ordering and spin-fluctuation-induced pairing at low energies.