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Microscopic derivation of GL theory for magnetism and superconductivity in multiband electronic systems<sup>1</sup> VLADIMIR CVETKOVIC, OSKAR VAFEK, National High Magnetic Field Laboratory, Florida State University — The superconductivity in pnictides arises due to interband scattering between Cooper pairs belonging to hole and particle Fermi surfaces. The amplitude of the scattering, while weak at bare level, is enhanced under RG flow, and competes with the SDW to become the leading instability when the hole and particle FS's are nearly, but not perfectly, nested. This motivates us to construct a GL theory with multiple order parameters from the microscopic action. It allows us to study the two competing orders and their interplay including a possible coexistence. The presence of both attractive and repulsive pairing terms requires a novel approach to the derivation with imaginary terms in the action as one consequence. The construction of the GL theory is a two-step process, with RG flow to an intermediate cut-off scale, determined by the deviations from the nesting, as the first step.

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