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A New View of the Mott-Hubbard Transition: Renormalization of the Fermi-Surface Topology LUCA FAUSTO TOCCHIO, Goethe University Frankfurt, FEDERICO BECCA, SISSA Trieste, CLAUDIUS GROS, Goethe University Frankfurt — We present the renormalization of the (underlying) Fermi-surface topology in the Hubbard model on a square lattice with frustrating hopping, that is relevant for the physics of high-temperature superconductors. With the help of novel high precision variational tools, including Jastrow factors and back-flow correlations, we show that the Fermi surface renormalizes to perfect nesting at the interaction-driven Mott-Hubbard transition and in the large interaction limit. Moreover, we present new results for the density-driven Mott-Hubbard transition, investigating the Fermi-surface renormalization flow as a function of doping, where the renormalization occurs only when the half-filled case is insulating. We associate the flow to the appearance of a van Hove singularity at the Fermi level at small doping, that is interpreted as an instability to magnetic order. Finally, we show also that Fermi surface renormalization is associated to a strong crossover at finite doping for the critical U corresponding to the Mott-Hubbard transition.

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