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Phase diagram of the honeycomb bilayer from functional renormalization MICHAEL SCHERER, STEFAN UEBELACKER, CARSTEN HONERKAMP, Institute for Theoretical Solid State Physics, RWTH Aachen University — The phase diagram for interacting electrons on the honeycomb bilayer with Bernal stacking is explored by means of the functional renormalization group. For half-filling and including a range of repulsive onsite, nearest-neighbor and next-to-nearest neighbor interactions we analyze the emergent instabilities and find antiferromagnetic, two types of charge-density-waves and quantum spin Hall order. The presented phase diagram covers the relevant region for the bilayer graphene parameters which overlaps with the phase boundary between the antiferromagnetic state and the quantum spin Hall state. We comment on the effect of small dopings.

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