Quantum Criticality in Twisted Bi-layer Graphene and WSe_2

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Twisted bi-layer graphene and WSe_2 share with cuprates, heavy-fermion and Fe-based anti-ferromagnets, a quantum-critical regime with linear in T or in H resistivity for whichever k_BT or $g\mu_BH$ is much larger than the other, respectively. I will show why the statistical mechanical model for all them is the quantum-xy model coupled to fermions and how these properties as well as the specific heat proportional to $T \ln T$ follows quantitatively from such a model. The d-wave symmetry of the superconductivity follows from the coupling to the fermion currents.