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Abstract for an Invited Paper
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Why black holes may be useful for condensed matter physics

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I will give an overview of recent applications of black hole physics to strongly correlated electron systems, via the holographic correspondence. I will briefly review the thermodynamic nature of black hole horizons and explain how black holes exhibit quantum critical dissipation. I proceed to argue that black holes are associated with fractionalized phases of matter and provide a simple setting in which transport and other properties of such phases can be nonperturbatively studied. Black holes furthermore have natural instabilities to superconducting phases. The onset of superconductivity is described in a qualitatively different way than in BCS-derived theories of pairing. The superconductivity emerges from a non-Fermi liquid state of matter, without well-defined quasiparticles, and may suggest emphasis on different classes of observables.