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What is the surface of a (dynamical) black hole?

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Black holes in equilibrium are fundamental objects predicted by General Relativity. However, real black holes form, evolve and eventually evaporate, thus they are dynamical. Do they have a well-defined boundary? Where? The usual Event Horizon is global and teleological, thus not well defined for dynamical black holes. The concepts of dynamical and trapping horizons, based on closed trapped surfaces, are promising alternatives. I will show, however, the fundamental problems inherent to dynamical or trapping horizons. I will then introduce the concept of Core of a black hole, and discuss the possibility that they can select a unique horizon.

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