

Black holes as probes for fundamental physics

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ABSTRACT

Confronting general relativity (GR) with observations, thus supporting its role as our standard model of gravity is almost as old as the theory itself. Although GR has passed all experimental tests so far, most of which were limited to solar system or weak gravity scales, both cosmological observations and the quest for a unified theory of quantum gravity strongly motivate extensions to it in the strong gravity regime.

After entering the gravitational wave era in 2016 we are now in the unique position to test gravity in its most challenging, highly dynamical regime using black holes. To do so, however, we need to understand the black hole binary problem in extensions of GR. In this talk I will give an update on the latest progress concerning this problem.