

## **Title: Black holes as point particles: from amplitudes to self-force**

Abstract: For the inspiral phase of the two-body dynamics, compact objects essentially behave like point particles interacting through the gravitational force. This allows to harness the power of particle physics, like effective field theory techniques and modern scattering amplitude methods, to study analytically the evolution of the binaries in the weak field expansion but with extremely efficient computational tools. A resummation of these perturbative results is possible in the small mass-ratio expansion by making contact with the self-force framework, valid also for strong gravitational fields. We develop this connection further and we propose new analytic continuation methods to compute observables for bound orbits from results valid for scattering orbits.

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