Bologna Workshop on:
CFT AND INTEGRABLE MODELS
and their applications from gauge/gravity dualities to statistical mechanics and quantum information

Contribution ID: **92** Type: **Talk (20 min)**

N=8 supergravity as a theoretical laboratory for gravitational scattering

Tuesday, September 5, 2023 11:40 AM (20 minutes)

Scattering amplitudes in gravitational theories provide useful tools for the calculation of observables associated to encounters of compact objects, such as black holes and neutron stars. In this talk, I will discuss recent progress in exploring the classical limit of scattering amplitudes and their connection to gravitational observables in $\mathcal{N} = 8$ supergravity, which serves as a theoretical laboratory for developing such tools in a technically simpler arena compared to Einstein gravity. An interesting point concerns the integrability of bound orbits of binary half-BPS black holes in maximal supergravity, which as pointed out by Caron-Huot and Zahraee, prohibits orbital precession in the probe limit. I will illustrate how the eikonal phase obtained from the two-loop $2 \to 2$ amplitude determines the deflection angle for hyperbolic encounters and, via analytic continuation, the precession angle for bound orbits, yielding nontrivial precession beyond the strict probe liimit.

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