



Contribution ID: 92

Type: **Talk (20 min)**

## **N=8 supergravity as a theoretical laboratory for gravitational scattering**

*Tuesday, 5 September 2023 11:40 (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  $2 \rightarrow 2$  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 limit.

**Primary author:** HEISSENBERG, Carlo (Uppsala University and Nordita)

**Presenter:** HEISSENBERG, Carlo (Uppsala University and Nordita)

**Session Classification:** Bologna Workshop CFT-IM