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Scattering on self-dual black holes

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Tree-level graviton scattering amplitudes provide an on-shell model for wave-wave scattering in general relativity, but computing them with traditional perturbative methods is hard due to the non-polynomial nature of the Einstein-Hilbert action. This is particularly true for the study of graviton scattering in curved spacetimes, like black holes, which remains an extremely difficult problem. In this talk, I will discuss a simplification of this problem: graviton scattering on a self-dual black hole (in particular, a self-dual Taub-NUT space). This lets us bring powerful integrability methods to bear while still exhibiting the non-linear and non-perturbative hallmarks of 'real world' graviton scattering on black holes.

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