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Scalar Black Hole Love numbers to O(G^7)

Tuesday 11 November 2025 16:10 (30 minutes)

At wavelengths large compared to the source size, any compact object admits a point-particle EFT whose finite-size effects are encoded by Love numbers. In this talk I will discuss a novel method to compute gravitational wave amplitudes by reinterpreting the Feynman diagram expansion as a Born series, solution of an effective wave equation. This method enables efficient, systematic calculations of scattering amplitudes off any compact object, yielding new predictions for scalar black-hole Love numbers and their renormalization-group equations up to O(G^7).

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Session Classification: Scattering Amplitudes in Gravity