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Binary Kerr black-hole scattering at 2PM from quantum higher-spin Compton

Tuesday 11 November 2025 11:00 (30 minutes)

In this talk, I'll discuss how the dynamics of spinning sources are incorporated when computing post-Minkowskian (PM) observables within the quantum field theory framework. Our goal is to capture the dynamics of a Kerr black hole rather than a generic compact object. I will present our candidate tree-level amplitude for gravitational Compton scattering, fixed using tools from massive higher-spin quantum field theory. Using this as a building block, we compute the classical 2PM impulse and eikonal phase, obtaining new all-orders-in-spin results for certain contributions, and the remaining ones up to $O(S^{11})$. Since Kerr 2PM dynamics beyond $O(S^5)$ remain unsettled, our results provide a useful reference point for future work.

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Session Classification: Scattering Amplitudes in Gravity