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Seminar: Scattering Waveforms with QFT and WQFT

Wednesday 2 July 2025 15:45 (45 minutes)

What can scattering amplitudes teach us about the gravitational waves we hope to hear? This talk outlines why accurate waveform models are vital for upcoming gravitational wave detectors and how the post-Minkowskian (PM) expansion supports that goal.
I present the computation of the waveform observable through order G^3S^2 within the PM framework, comparing two strategies: a traditional QFT treatment and a worldline QFT formalism. Special emphasis is put on the worldline QFT construction that lets us lift seven-point tree amplitudes to the one-loop integrand, and on the cross-checks against standard scattering-amplitude. I conclude with a discussion on the IR- and UV-divergent terms, tracing their origins and showing how they cancel to leave a finite, physical waveform.

Presenter: BOHNENBLUST, Lara