Phenomenology 2025 Symposium



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A First Look at "Continuous Spin" Gravity – Time Delay Signatures

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We consider the possibility that gravity is mediated by "continuous spin" particles, i.e. massless particles whose invariant spin scale ρg is non-zero. In this case, the primary helicity-2 modes of gravitational radiation on a Minkowski background mix with a tower of integer-helicity partner modes under boosts, with ρg controlling the degree of mixing. We develop a formalism for coupling spinless matter to continuous spin gravity at linearized level. Using this formalism, we calculate the time delay signatures induced by gravitational waves in an idealized laser interferometer detector. The fractional deviation from general relativity predictions is $O(\rho g/\omega)$ for gravitational wave frequencies $\omega > \rho g$, and the effects of waves with $\omega \boxtimes \rho g$ are damped.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

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