Loop-the-Loop-2: Feynman calculus and its applications to gravity and particle physics

Monday 10 November 2025 - Wednesday 12 November 2025

Scientific Programme

The development of advanced mathematical methods for perturbative Quantum Field Theory has dramatically expanded our ability to compute scattering amplitudes and physical observables at higher orders. Today, amplitudes form an interdisciplinary area uniting physicists, mathematicians, and computer scientists, with broad impact across particle physics, gravity, and cosmology.

Loop-the-Loop aims to bridge these communities—connecting particle physics, gravitational-wave physics, and cosmology with cutting-edge mathematical techniques and computational methods—to catalyze new ideas at the interface of theory and applications.

Day 1: Applied Mathematics for Feynman Calculus

-Computational Techniques for Feynman Integrals
-Analytic Structures of Feynman Integrals

Day 2: Scattering Amplitudes in Gravity

-Harnessing Classical gravity for Integrals
-Post-Minkowskian Integrals

Day 3: Scattering Amplitudes in Particle Physics

-Scattering Amplitudes
-Differential Equations