

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

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Uncovering Singularities in Feynman Integrals via Machine Learning

Monday 10 November 2025 11:00 (30 minutes)

In this talk, I will present a machine-learning framework based on symbolic regression that systematically extracts the complete symbol alphabet of multi-loop Feynman integrals. Rather than relying on singularity analysis, the method directly targets the analytic structure, making it broadly applicable and highly interpretable across different families of integrals. I will begin by outlining the relevant background and then show how the framework successfully reconstructs nontrivial symbol alphabets in practice. Beyond improving individual computations, this approach offers a fresh perspective on the analytic organization of multi-loop amplitudes and points toward new directions for symbolic and data-driven methods in quantum field theory.

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Session Classification: Applied Mathematics for Feynman Calculus