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Feynman integrals beyond Polylogarithms

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Feynman integrals whose associated geometries extend beyond the Riemann sphere, such as elliptic and Calabi–Yau, are increasingly relevant in modern precision calculations. They arise not only in next-to-next-to-leading order (NNLO) corrections to collider cross-sections but also in the post-Minkowskian expansion of gravitational wave scattering. A powerful approach to compute such integrals is via differential equations, particularly when cast in canonical form, which simplifies their ε-expansion and makes analytic properties manifest. In this talk, I will present a method to systematically construct canonical differential equations even for integrals that evaluate beyond multiple polylogarithms, including elliptic and Calabi–Yau, highlighting its utility in both quantum field theory and gravitational physics.

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