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Full Classification of Feynman Integral Geometries at Two Loops

Tuesday 2 September 2025 09:30 (1 hour)

In this talk I will discuss ongoing work on the complete classification of the Feynman Integral geometries that can appear in two-loop corrections to scattering amplitudes in any quantum field theory, including the standard model. We systematically categorize all graphs that may contribute in four dimensions, finding 79 in total. We then investigate them for generic mass configurations, in order to find their corresponding integral geometry. We approach this both with maximal cuts performed in the Baikov representation, as well as using Picard-Fuchs operators.

We uncover a plethora of geometries, such as elliptic curves, hyperelliptic curves, and K3 manifolds, of which some are known, but many have not been investigated until now.

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