Contribution ID: **34** Type: **not specified**

One integral to rule them all: an algorithm to compute Feynman integrals

Thursday 24 September 2020 13:45 (20 minutes)

Differential equations are a powerful tool for computing Feynman integrals. Their solution is straightforward if one can find a transformation to a certain 'canonical'form, where the answer is manifestly given in terms of iterated integrals, such as multiple polylogarithms. An algorithmic way to construct the necessary transformation is therefore highly desired, and recent years have seen numerous works in this direction.
In this talk, I will first introduce the relevant set of differential equations for a given scattering problem and then provide a new algorithm for finding the corresponding transformation. To prove the applicability of the new method to multi-variable and large-scale problems, I present the successful application to two-loop five-particle scattering and four-loop heavy-quark integrals, respectively. The latter are relevant for the computation of the cusp-anomalous dimension in QCD and maximally supersymmetric Yang-Mills theory.

Primary authors: Mr DLAPA, Christoph (Max Planck Institute for Physics); Prof. HENN, Johannes (Max Planck Institute for Physics)

Presenter: Mr DLAPA, Christoph (Max Planck Institute for Physics)

Session Classification: Strings & Mathematical physics session on Zoom and in Main Auditorium.

Track Classification: Strings & Mathematical Physics