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JOHANNES GUTENBERG
UNIVERSITÄT MAINZ



RIND seminar on Mathematical Physics and String Theory

Oct. 24, 2022 at 4 p.m. c.t.
Munich

Joint seminar series on Mathematical Physics and String Theory

Albrecht Klemm
Bonn U.

Feynman integrals, Calabi-Yau geometries and integrable systems

Recently it has been realized that the parameter dependence of Feynman integrals in dimensional regularisation can be calculated explicitly using period- and chain integrals of suitably chosen Calabi-Yau motives, where the transcendentality weight of the motive is proportional to the dimension of the Calabi Yau geometry and the loop order of the Feynman graphs. We exemplify this for the Banana graphs, the Ice Cone graphs and the Train Track graphs in two dimensions. In the latter case there is a calculational very useful relation between the differential realisation of the Yangian symmetries and the Picard-Fuchs system of compact Calabi-Yau spaces M as well as between the physical correlations functions and the quantum volume of the manifolds W that are the mirrors to M .

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