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Massive Integrability: From Fishnet Theories to Feynman Graphs and Back

Thursday 29 July 2021 09:50 (20 minutes)

Since the rise of the AdS/CFT duality, integrability has proven to be an important tool to advance our understanding of massless QFT. In this talk we demonstrate that integrability is also present in massive QFT in D>2 spacetime dimensions. We show that large classes of massive Feynman integrals are highly constrained by an infinite dimensional Yangian symmetry. When translated to momentum space, this leads to a novel massive generalization of conformal symmetry. Finally, we argue that these features of Feynman integrals can be understood as the integrability of planar scattering amplitudes in a massive version of the so-called fishnet theory, which is obtained as a double-scaling limit of N=4 super Yang-Mills theory on the Coulomb branch.

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Collaboration / Activity

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