N=4 SYM amplitudes and cosmic Galois theory

Wednesday 5 September 2018 14:30 (1 hour)

Scattering amplitudes in planar N=4 super-Yang-Mills theory are dual to light-like polygonal Wilson-loop expectation values. In many cases their perturbative expansion can be expressed in terms of multiple polylogarithms that also obey certain single-valuedness conditions or branch cut restrictions. The rigidity of this function space, together with a few other conditions, allows one to construct the six-point amplitude – or hexagonal Wilson loop – through 6 loops. Derivatives of the amplitude can then be used to explore the minimal space of functions expected to contain all such amplitudes, and the structure of the coproduct (or coaction) of its associated Hopf algebra. There is strong evidence that a certain co-action principle is obeyed, which restricts in particular the number of multiple zeta values and alternating sums that can appear.

Presenter: DIXON, Lance (SLAC)

Session Classification: Research Talks