Northeastern University  Mathematics Department

Geometry, Physics, and Representation Theory Seminar

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Thursday, April 18, **2:50-3:50 pm**, Lake Hall 509

Multiple zeta values in deformation quantization

Abstract

In 1997, Kontsevich gave a universal solution to the "deformation quantization" problem in mathematical physics: starting from any Poisson manifold (the classical phase space), it produces a noncommutative algebra of quantum observables by deforming the ordinary multiplication of functions. His formula is an example of a Feynman expansion, involving an infinite sum over graphs, weighted by volume integrals on the moduli space of marked holomorphic disks. The precise values of these integrals are currently unknown. I will describe recent joint work with Banks and Panzer, in which we develop a theory of integration on these moduli spaces via suitable sheaves of polylogarithms, and use it to prove that Kontsevich's integrals evaluate to integer-linear combinations of special transcendental constants called multiple zeta values, yielding the first algorithm for their calculation