

Borel multi-transforms, and quantum differential equations of P^1 -bundles

Monday, June 3, 2024 3:20 PM (50 minutes)

The qDEs define a class of ordinary differential equations in the complex domain, whose study represents a challenging and active area in both contemporary geometry and mathematical physics. The qDEs define rich invariants attached to smooth projective varieties. These equations encapsulate information not only about the enumerative geometry of varieties but also, conjecturally, about their topology and complex geometry. The way to disclose such a huge amount of data is through the study of the asymptotics and monodromy of their solutions.

In this talk, the speaker will address the problem of explicitly integrating the quantum differential equations of varieties and will report on his progress in a long-term project on this topic. Focusing on the case of projectivizations of vector bundles, he will first introduce a family of integral transforms and special functions (the integral kernels). Then, he will show how to use these tools to find explicit integral representations of solutions. Based on arXiv:2005.08262 (Memoirs of the EMS, 2022) and arXiv:2210.05445 (Journal Math. Pures et Appl. 2024).

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