

GAGC 2019
CIRM, NOVEMBER 25TH – 29TH 2019

Nicolas Perrin: Around Dubrovin's conjecture.

Let X be a smooth Fano variety. In these lecture I will explain some conjectural relations between

- $D^b(X)$ the bounded derived category of coherent sheaves on X and
- $\mathrm{QH}(X)$ the quantum cohomology algebra of X and its associated D -module.

I plan to give a detailed description of Dubrovin's original conjecture, especially the second and third parts of the conjecture relating monodromy data of the quantum D -module with numerical invariants of exceptional collections in $D^b(X)$. Then I will discuss generalizations of the original conjecture in several directions:

- a conjectural description of the central connection matrix using Γ -classes (Cotti-Dubrovin-Guzzetti/Galkin-Golyshev-Iritani) : Γ -conjecture II
- a more general statement (not assuming semi-simplicity of $\mathrm{QH}(X)$): (Galkin-Golyshev-Iritani) : Γ -conjecture I
- a conjecture of Kuznetsov-Smirnov on residual Lefschetz categories.