Category $\mathcal{O}$ for symplectic resolutions

Nick Proudfoot
(University of Oregon)

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Tea 2:45-3 in MCS 153

Abstract:

Symplectic algebraic varieties can be quantized–this means roughly that we have a noncommutative ring R that deforms the ring of functions on a symplectic variety M, along with a non-commutative sheaf of rings on M that deforms the structure sheaf and has R as its ring of global sections. The most well-known example is when M is the cotangent bundle to the flag variety G/B, and R is a central quotient of the universal enveloping algebra of $Lie(G)$. Other important examples arise in representation theory (Nakajima quiver varieties, Hilbert schemes) and combinatorics (hypertoric varieties). We introduce a category $\mathcal{O}$ of R-modules, generalizing blocks of Bernstein-Gelfand-Gelfand category $\mathcal{O}$ in the Lie theoretic setting, and we conjecture that many of the beautiful properties of BGG category $\mathcal{O}$ hold in much greater generality.

This is joint work with Tom Braden, Anthony Licata, and Ben Webster.