Paul SEIDEL (MIT)

Title: *Recent progress on the exponential type conjecture*

Abstract: Take a Fano variety (or closed monotone symplectic manifold). Gromov-Witten theory associates to it a linear differential equation in one variable, with poles at zero and at infinity. One of those poles is very well understood, the other less so: at the most basic level, our expectations are encoded into the exponential type conjecture.

There are now two partial proofs of this conjecture. One uses a geometric assumption, the existence of a smooth anticanonical divisor (Pomerleano-Seidel 2023); the other involves a homological algebra assumption (Chen 2024). The proofs use quite different strategies, but have some philosophical ingredients in common, none of which are apparent from the formulation of the problem: reduction to mod p coefficients; and (different kinds of) Fukaya categories. The outcome is a slightly confusing situation, where we have clearly made some progress, but don't yet see how the puzzle pieces fit together.

I will try to explain what the problem is; what basic tools about differential equations can be useful; and then say a bit about what enters into the proofs.