Eleny Ionel, 57th Texas Topology and Geometry Conference

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Title:

The Gopakumar-Vafa conjecture for symplectic manifolds

Abstract:

In the late nineties physicists Gopakumar and Vafa conjectured that the Gromov-Witten invariants of Calabi-Yau 3-folds have a hidden structure: they are obtained, by a specific transform, from a set of more fundamental "BPS numbers", which are integers. In joint work with Tom Parker, we proved this conjecture by decomposing the GW invariants into contributions of ``clusters'' of curves, deforming the almost complex structure and reducing it to a local calculation. This talk presents some of the background and geometric ingredients of our proof, as well as recent progress, joint with Penka Georgieva, towards proving that a similar structure theorem holds for the real GW invariants of Calabi-Yau 3-folds with an anti-symplectic involution.