

Categorification of Donaldson-Thomas invariants via Perverse Sheaves

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Abstract:

I will talk about a joint work (arXiv: 1212.6444) with Jun Li, where we showed that there is a perverse sheaf on a fine moduli space of stable sheaves on a smooth projective Calabi-Yau threefold, which is locally the perverse sheaf of vanishing cycles for a local holomorphic Chern-Simons functional. The Euler number of the hypercohomology of this perverse sheaf is the Donaldson-Thomas invariant. We further show that this perverse sheaf lifts to a mixed Hodge module and enables us to define the Gopakumar-Vafa invariants mathematically.