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The Donaldson–Thomas and Gromov–Witten theory of orbifolds and their resolutions

There are two primary theories of “curve counting” on a Calabi–Yau threefold, Donaldson–Thomas theory and Gromov–Witten theory. Both theories extend to Calabi–Yau orbifolds. A three dimensional Calabi–Yau orbifold X has a canonical Calabi–Yau resolution Y . The four curve counting theories $DT(X)$, $DT(Y)$, $GW(X)$, and $GW(Y)$ are expected to be equivalent. We give an overview of these theories and conjectural equivalences.