

Kodaira-Spencer theory from B-model Categorical Enumerative Invariants via Kontsevich formality

Jakob Ulmer

Categorical enumerative invariants (CEI) are defined for abstract Calabi-Yau categories, conjecturally recovering the all genus Gromov-Witten (GW) invariants of a symplectic manifold when inputting its Fukaya category. The CEI of the category of coherent sheafs $\text{Coh}(X)$ of a Calabi-Yau manifold X allow to define “all genus enumerative” invariants; no candidate for a geometric definition is yet known, unlike for GW-invariants. In this talk, we explain how the genus zero CEI of $\text{Coh}(X)$ recover the Kodaira-Spencer deformation theory of complex structures; the higher genus CEI of $\text{Coh}(X)$ providing a quantization. We do so by studying a Calabi-Yau version of Kontsevich's formality theorem, following Willwacher-Calaque, and inspired by Costello-Li's work on coupling BCOV theory with holomorphic CS theory. We further use Amorim-Tu's theory of open-closed CEI, applied to the genus zero open-closed string vertices.