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## **Topological String on Non-Commutative Resolutions**

Based on a project with Sheldon Katz, Thorsten Schimannek and Eric Sharpe we describe a simple example of a non-commutative resolution namely the one of a singular double cover of  $P^3$ . This exhibits 84 nodes whose small blow ups give rise to torsion classes in  $H_2(\hat{M}, Z)$ . The torsion classes support a non-trivial B-field and can be described in terms of non-commutative geometry. We argue that this geometry corresponds to the Landau-Ginzburg phase of the complete intersection of four quadrics in  $P^7$ . Like the mirror of the double cover of  $P^3$  the mirror of the latter has a one parameter hyper-geometric Picard-Fuchs equation, albeit with a second point of maximal unipotent monodromy. It is this second MUM point that yields the B-model description of the non-commutative resolution and allows detailed studies of the higher genus BPS invariants on the non-commutative resolution which are obtained from the wave function transform of the standard string partition function Z at the first MUM point. We provide some geometric checks for the BPS states and some implications for the arithmetic understanding of one parameter families that is recently developed.

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