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Non-toric brane webs, Calabi-Yau 3-folds, and 5d SCFTs

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One of the most remarkable predictions of string/M-theory is the existence of 5-dimensional superconformal field theories (5d SCFTs). There are two main approaches for constructing these 5d SCFTs, using either M-theory on canonical 3-fold singularities, or intersecting branes in Type IIB string theory. A natural question is to compare these two approaches. The answer is well-known for webs of 5-branes in Type IIB string theory, where the M-theory dual canonical 3-fold singularity is a toric Calabi–Yau 3-fold. In this talk, building on recent advances in mirror symmetry and enumerative geometry, I will provide an answer for the more general case of webs of 5-branes with 7-branes and explain how to construct the M-theory dual non-toric Calabi-Yau 3-fold. This is joint work with Valery Alexeev and Hulya Arguz.

Presenter: BOUSSEAU, Pierrick