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Mirror Symmetry for Fibrations and Degenerations

In a 2004 paper, Tyurin briefly hinted at a novel relationship between Calabi-Yau mirror symmetry and the Fano-LG correspondence. More specifically, if one can degenerate a Calabi-Yau manifold to a pair of (quasi-)Fanos, then one expects to be able to express the mirror Calabi-Yau in terms of the corresponding Landau-Ginzburg models. Some details of this correspondence were worked out by C. F. Doran, A. Harder, and I in a 2017 paper, but much remains mysterious.

In this talk I will describe recent attempts to better understand this picture, and how it hints at a broader mirror symmetric correspondence between degeneration and fibration structures. As an example of this correspondence, I will discuss the question of finding mirrors to certain exact sequences which describe the Hodge theory of degenerations.

The material in this talk is joint work in progress with C. F. Doran.