

1097-14-79

Washington Taylor*, 6-317, CTP, MIT, 77 Massachusetts Ave., Cambridge, MA 02139.

Classifying and enumerating elliptically fibered Calabi-Yau threefolds and associated singularities.

Motivated by the physics of F-theory, a systematic classification is given of the set of smooth complex surfaces that can act as bases for an elliptically fibered Calabi-Yau threefold with section. This classification enables a systematic analysis of such Calabi-Yau threefolds with large Hodge numbers, which is illuminated by the close correspondence between geometry and the physics of six-dimensional supergravity theories. A complete enumeration of all elliptically fibered Calabi-Yau threefolds with section requires a systematic understanding of codimension two singularities associated with singular elliptic fibrations. The study of such singularities suggests a mysterious formula relating the arithmetic genus of certain singular curves to the representation theory of Lie algebras. This talk describes a number of results and open questions, including work carried out with Sam Johnson, Vijay Kumar, David Morrison, and Daniel Park. (Received January 11, 2014)