A duality between "nearly attractive" quartic K3's and Z_4 orbifold limits of K3

Katrin Wendland
Department of Mathematics
Chapel Hill and Warwick

Abstract

In 1976, Hiroshi Inose found a beautiful relation between certain quartic K3 surfaces, including the Fermat quartic, and Kummer surfaces obtained from a product of two isogeneous elliptic curves. I lift this result to K3 surfaces with complexified Kaehler structures and show that it relates these "nearly attractive quartics" to Z_4 orbifold limits of K3 by a duality which can be viewed as a version of mirror symmetry. On the one hand this result allows to describe the natural Kaehler-Einstein metric on the Fermat quartic in terms of orbifold constructions, which makes it accessible to numerical investigations. On the other hand it allows to explicitly construct superconformal field theories associated to these smooth "nearly attractive quartics". Hence for this family of superconformal field theories both the conformal field theoretic and the algebraic description in term of smooth K3's are completely under control. It is the first known example of that type.