Abelian fibrations, string junctions and type IIA duals of $T^6/Z_2$

MICHAEL SCHULZ, Bryn Mawr College, RON DONAGI, University of Pennsylvania, PENG GAO, University of Toronto — In previous work, it was argued that the type IIB $T^6/Z_2$ orientifold with a choice of flux preserving $N=2$ supersymmetry is dual to a class of purely geometric type IIA compactifications on abelian surface ($T^4$) fibered Calabi-Yau manifolds. In this talk, I provide two concrete descriptions of the resulting manifolds. The first is a monodromy based description, which generalizes the F-theory technology of 7-branes and string junctions to the case of a $T^4$ rather than $T^2$ fiber. The second is an explicit algebro-geometric construction which the $T^4$ fibers arise as the Jacobian tori of a family of genus-2 Riemann surfaces. After describing some applications of this work, I close with a speculation on a relation between the latter construction and the dimensional duality of Silverstein et al.