

Stanford Algebraic Geometry

— Seminar —

FROM AFFINE GEOMETRY TO COMPLEX GEOMETRY: INSTANTON CORRECTIONS VIA TROPICAL DISKS

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Abstract

One basic problem in our current understanding of mirror symmetry is the following: we believe mirror symmetry is controlled by integral affine manifolds, *i.e.* a real manifold B whose transition functions lie in the affine linear group $Aff(\mathbb{Z}^n)$. Such a manifold gives rise to “semi-flat” mirror pairs which are described as dual torus bundles over B , one of which is a complex manifold and one of which is a symplectic manifold. However, to obtain interesting examples, one has to allow singular fibres, and this means allowing “singularities” in the affine structure. It is then no longer clear how to produce a complex manifold from such a B . In joint work with Bernd Siebert, we explain how to do this once one chooses some additional combinatorial data on B . Essentially, this extra data allows us to construct an explicit degeneration of Calabi-Yau varieties which generalises the Mumford construction of degenerations of abelian varieties. This explicit construction is controlled by “tropical disks” on B . Since one expects such objects to also control holomorphic disks on the mirror side, this offers a real hint as to the ultimate explanation of mirror symmetry.

Friday, October 27

3:15 p.m.

Room 383-N

<http://math.stanford.edu/ag/s0607/>