BOSTON UNIVERSITY GEOMETRY AND PHYSICS SEMINAR

LOOIJENGA'S CUSP CONJECTURE AND MIRROR SYMMETRY

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October 7, 2015, 4:00 – 5:00pm
Math/Computer Science, Room 148
111 Cummington Street, Boston

Tea: 3:45pm in Room 144

Abstract: A cusp singularity is a surface singularity whose minimal resolution is a reduced cycle of smooth rational curves meeting transversely. Cusp singularities come in naturally dual pairs. In 1981, Looijenga proved that whenever a cusp singularity is smoothable, the minimal resolution of the dual cusp is an anticanonical divisor of some smooth rational surface. He conjectured the converse. We will outline a proof of Looijengas conjecture based on a combinatorial criterion for smoothability given by Friedman and Miranda in 1983. The key step is the construction of a certain punctured 2-sphere endowed with transition functions in the integral-affine transformation group. Such a sphere can be constructed via Symington's surgeries as the base of a Lagrangian torus fibration on a rational surface with the appropriate anticanonical divisor. If time allows, we will discuss the relationship to mirror symmetry and Gross-Hacking-Keel's proof of Looijenga's conjecture, whose "polytope" construction of a smoothing is Legendre dual to our "fan" construction.

See http://math.bu.edu/research/geom/seminar.html or contact Siu Cheong Lau *lau@math.bu.edu* for more information.