BOSTON UNIVERSITY GEOMETRY AND PHYSICS SEMINAR

TORIC DEGENERATIONS AND HAMILTONIAN TORUS ACTIONS

Kiumars Kaveh
University of Pittsburgh

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Math/Computer Science, Room 148
111 Cummington Street, Boston

Tea: 3:45pm in Room 144

Abstract: First I explain the notion of a toric degeneration namely degenerating a variety to a toric variety. In algebraic terms, it corresponds to deforming a given algebra to a monomial algebra. Then I will explain some recent general results about symplectic geometry of projective varieties using toric degenerations (motivated by commutative algebra and the theory of Newton-Okounkov bodies). The two main results are the following: Let X be a smooth n-dimensional complex projective variety equipped with an integral Kahler form. (1) If X admits a "toric degeneration", then there is an n-dimensional Hamiltonian torus action on a dense open subset of X which extends continuously to the whole X. (2) More generally (without assuming existence of a toric degeneration) for any $\epsilon > 0$, the manifold X has an open subset U (in the usual topology) such that $\text{vol}(X) - \text{vol}(U) < \epsilon$, and moreover U is symplectomorphic to the algebraic torus $(\mathbb{C}^*)^n$ equipped with a "toric" Kahler form. As applications one obtains lower bounds on the Gromov width of X. We also get a full symplectic ball packing of X by d balls of capacity 1 where d is the degree of X. I will try to use minimum knowledge from algebraic geometry. The first result is joint with Megumi Harada.

See http://math.bu.edu/research/geom/seminar.html or contact Yoosik Kim (*yoosik@bu.edu*) or Siu-Cheong Lau (*lau@math.bu.edu*) for more information.