מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Seminar in Geometry and Topology

on Monday, Aug 03, 2020
at 16:00

Zoom:
https://weizmann.zoom.us/j/92678677338?pwd=T00rNnIxRFg1UlRYQkJIZDRuZ09aQT09

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GOOD COMPACTIFICATION THEOREM FOR (C*)^n

Abstract:

The ring of conditions of (C*)^n is an intersection theory for algebraic cycles in (C*)^n. It was introduced by De Concini and Procesi. BKK [Bernstein-Kouchnirenko-Khovanskii - S.Y.] theorem, which computes the number of solutions of generic system of equations with given Newton polyhedra fits nicely into this theory. The ring of conditions can be reduced to cohomology rings of smooth toric varieties via the good compactification theorem. According to the good compactification theorem for any algebraic variety X ⊂ (C*)^n there is a complete toric variety M ⊃ n such that the closure of X in M does not intersect orbits in M of codimension bigger than dim_C X. All proofs of this theorem I met in literature are rather involved.

I will present an elementary transparent proof this important theorem. It is based on a simple geometry of Newton polyhedra and on elementary algebra. If time permits I will discuss two geometric descriptions of the ring of conditions. Tropical geometry provides the first description. The second one can be formulated in terms of the volume function on the cone of convex polyhedra in R^n.

Based on: https://arxiv.org/abs/2002.02069

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