Victor Batyrev

Selected topics on toric varieties

Lectures for the Winter School
Homogeneous Spaces and Geometric Representation Theory
February 27 – March 2, 2012
Ruhr University Bochum

Toric varieties provide a very useful class of algebraic varieties for investigations of different topics in algebraic geometry and mathematical physics. The purpose of my lectures is to explain some topics on toric varieties that I expect to be interesting for generalizations in more general context of spherical varieties. These topics include:

- toric varieties as GIT-quotients and Cox rings;

- toric varieties from the symplectic point of view;

- toric Fano varieties and Mirror Symmetry;

- toric varieties over nonclosed fields and diophantine problems.