

Toric Varieties (L16)

Dr R. Picciotto

This examinable Part III course will provide an introduction to Toric Varieties. These varieties are accessible through combinatorial methods, and provide a large class of examples in Algebraic Geometry for which explicit computations are often possible. I will cover the basic constructions of toric varieties from fans and polytopes, as well as toric morphism. Further topics will include toric bundles and divisors and an introduction to GIT theory.

The course will cover a selection of topics including:

- Toric varieties from fans and polytopes;
- Toric morphisms and their properties;
- Quotients and coordinate rings;
- Toric divisors and line bundles;
- Toric surfaces and resolutions of singularities.

Prerequisites

A course in Algebraic Geometry, at the level of the Part II or Part III course.

Literature

1. *D. Cox, J. Little, H. Schenck*, Toric Varieties. Graduate Studies in Mathematics 124, 2011.
2. *W. Fulton*, Introduction to Toric Varieties. AM-131, Princeton University Press, 1993.
3. Lecture notes by David Cox, 'Lectures on toric varieties'.
4. Lecture notes by Frank Sottile, 'Ibadan lectures on toric varieties'.

Additional support

Three examples sheets will be provided and three associated examples classes will be given. There will be one revision class in the Easter Term.