Intersection Theory in Algebraic Geometry (L24)

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Intersection theory plays a similar role in algebraic geometry as cohomology does in the theory of manifolds. It is the starting point for many areas of modern research, notably enumerative geometry. The first part of the course will develop the theory of Chow groups, including cycles, rational equivalence, flat pullbacks, Chern classes, Segre classes, and intersection products. Along the way, we will introduce important concepts in algebraic geometry, such as flatness, projective bundles, and Grassmannians, as needed by the theory. We will conclude the course by proving the Riemann-Hurwitz formula, computing the Chow ring of Grassmannians, and, time permitting, counting 27 lines on a cubic surface.

Prerequisites

It is required that the students have a previous knowledge of the language of schemes and sheaves, i.e. the contents of the Part III Algebraic Geometry course. Algebraic topology may be helpful for context but is not essential.

Literature

- 1. W. Fulton Intersection Theory. 2nd edition. Springer.
- 2. D. Eisenbud and J. Harris, 3264 & All That. Intersection Theory in Algebraic Geometry. Cambridge University Press.

Additional support

Four examples sheets will be provided.