

LTCC Advanced Course

Title: Cohomology of Abelian Varieties.

Abstract: We will give an overview of various cohomology theories attached to abelian varieties defined over a number field and their explicit descriptions that appears in the context of algebraic geometry and number theory.

Basic Details:

- Targeted to Phd students in pure mathematics.
- Course Format (**Extended:** 5 x 2hr lectures)

Course Description:

Key words: Abelian variety, Singular cohomology, de Rham cohomology, etale cohomology and crystalline cohomology. Tate module, Dieudonne module.

Syllabus: The basic definitions and short proofs will be covered, and reference will be mentioned for detailed exposure. Their explicit descriptions and relevance in the context of number theory and algebraic geometry will be discussed.

Recommended reading:

Milne's notes on "Abelian varieties." for singular and etale cohomology.

For p-adic cohomology Katz's book on "crystalline cohomology, Dieudonne modules and Jacobi sum."

Additional Optional reading: I will mention in the class as we go along.

Prerequisites: I will assume familiarity algebraic variety, and first courses in algebraic geometry, topology and p-adic arithmetic.

Format:

- No of discussion/problem sheets: 2
- Electronic lecture notes: will be provided as we go along
- Necessary support facilities: None

Lecturer Details:

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