

Algebraic Geometry I

Prof. Dr. Timo Richarz

Contact

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Consultation hour: Mondays, 15:20-17:00

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Time and Place

Mondays, 11:40-13:20 in S2|15-404K (except: 08.07 in S1|15-138) -> New Room!

Wednesdays, 13:30-15:10 in S1|03-110

Starting: 15.04.2019

Contents

The course is an introduction to basic scheme theory (Schemes, Morphisms, Dimension, Singularities) which lies at the foundation of most areas in modern algebraic geometry and number theory. Some familiarity with commutative algebra is assumed, e.g., as covered in Chapter 1-3 of Introduction to commutative algebra, by M. Atiyah and I. MacDonalD. Further tools from commutative algebra are stated (usually without proof) during the lectures whenever we need them. It is recommended to cross read the book of Atiyah-MacDonald. Also it is helpful to know some basic categorical language as in the first paragraphs of Mac Lane's book, Categories for the Working Mathematician.

Literature

- R. Hartshorne: Algebraic Geometry, Springer GTM 52.
- D. Mumford: The Red book of varieties and schemes, Springer LN 1358.
- P. Scholze: Algebraic Geometry I. Skript
- R. Vakil: Foundations of algebraic geometry. Skript
- J. de Jong et. al.: The Stacks Project
- U. Goertz, T. Wedhorn: Algebraic Geometry I, Vieweg.
- D. Eisenbud, J. Harris: The Geometry of Schemes, Springer GTM 197.
- Q. Liu: Algebraic Geometry and Arithmetic Curves, Oxford GTM.
- A. Grothendieck, J. Dieudonné: Éléments de géométrie algébrique.

Exercise sheets

- Exercise sheet 1

- [Exercise sheet 2](#)
- [Exercise sheet 3](#)
- [Exercise sheet 4](#)
- [Exercise sheet 5](#)
- [Exercise sheet 6](#)
- [Exercise sheet 7](#)
- [Exercise sheet 8](#)
- [Exercise sheet 9](#)
- [Exercise sheet 10](#)
- [Exercise sheet 11](#)

Exercise session

Dr. Ulrik Buchholtz

Mondays, 13:30-15:10 in [S1|02-34](#)

Starting: 29.04.2019 (see below)

There are weekly exercise sessions accompanying the lecture. In order to participate in the final exam it is necessary to attend the exercise session. Please hand in the solutions to the exercises on Wednesdays during the lecture.

On Monday, 22.04 are Easter holidays, so there is no session on this day. The first exercise session takes place on Wednesday, 24.04 at 11:40-13:20 in Room [S3|06-146](#), and is a short repertorium recollecting some facts from commutative algebra.

Exam

This is an oral exam. For further information contact the lecturer.