



## LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

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Summer Term 2021

# Algebraic Curves

Helge Ruddat

### Course Description:

After an introduction into elementary algebraic geometry, we study various operations and structures that can be used to understand and modify algebraic curves. The course culminates in the resolution of singularities for algebraic curves and the Riemann–Roch theorem. Itemized topics are:

- Affine Algebraic Sets
- Affine Varieties
- Local Properties of Plane Curves
- Projective Varieties
- Projective Plane Curves
- Varieties, Morphisms, and Rational Maps
- Resolution of Singularities
- Riemann–Roch Theorem

### Prerequisites:

This course is suitable for bachelor students.

The course will introduce students with a little algebra background to a few of the ideas of algebraic geometry and to help them gain some appreciation both for algebraic geometry and for origins and applications of many of the notions of commutative algebra.

### Literature:

*Algebraic Curves* by William Fulton

### Date and Place:

Tue 14:15–15:45, Thu 14:15–15:45, Zoom  
<https://uni-hamburg.zoom.us/j/5406259591>  
Meeting ID: 540 625 9591, Passcode: 732543

### Problem Classes:

Fri 8:15–9:45, same Zoom as lecture

### Starting on:

6 April 2021

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