Compact complex surfaces

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Timetable: 20 hours. March-April 2018, Torre Archimede,

Course requirements: Basic notions from complex analysis and algebraic topology. Preferably also some basic knowledge of algebraic geometry.

Examination and grading: Oral exam, tailored to the research interests of the students.

SSD: MAT/02, MAT/03, MAT/05, MAT/07

Aim: Describing the classification of compact complex surfaces (both algebraic and non-algebraic).

Course contents:

In a course on Riemann surface one usually shows that every compact complex curves is algebraic (i.e., a projective curve). This statement is false in higher dimension. In the first part of the course we discuss the classification of compact complex surfaces which are not projective. Compact complex curves are classified by their genus, in the second part of the course we discuss a similar classification (due to Enriques) of compact complex algebraic surfaces. In the two final lectures we discuss a few examples of compact complex surfaces with a particular rich geometry such as Del Pezzo surfaces, K3 surfaces, Enriques surfaces and elliptic surfaces.