Universität Hamburg
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CHAMPP
CENTER IN HAMBURG FOR ASTRO-, MATHEMATICAL AND PARTICLE PHYSICS

LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

Winter Term 2022/2023

Riemann Surfaces and Algebraic Curves

Murad Alim

Course Description:

Riemann surfaces and algebraic curves are an active topic of research in many areas of mathematics ranging from classical complex and algebraic geometry to current research in the geometric Langlands program as well in the study of the geometry of quantum field and string theories. The subject's interplay between algebra, geometry, topology and analysis is a beautiful example of the interconnectedness of mathematics. This course will introduce basic concepts of Riemann surfaces and algebraic curves including functions on Riemann surfaces, integration, monodromy and the Riemann-Roch theorem.

Prerequisites:

A course on complex analysis (Funktionentheorie) is an absolute must, good knowledge of basic differential geometry, algebra and topology is required.

Literature:

- O. Forster, Lectures on Riemann surfaces, volume 81, Springer, 2012.
- F. Kirwan, Complex algebraic curves, Number 23, Cambridge University Press, 1992.
- R. Miranda, Algebraic curves and Riemann surfaces, volume 5, American Mathematical Soc., 1995.
- M. Schlichenmaier, An introduction to Riemann surfaces, algebraic curves and moduli spaces, Springer, 2010.

Date and Place:	Tue, 14:15–15:45, SR 431, Geomatikum Wed, 08:15–09:45, Hörsaal H5, Geomatikum
Problem Classes:	Wed, 10:15–11:45, SR 428, Geomatikum
Starting on:	18 October 2022