



## LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

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Summer Term 2022

# Symplectic geometry

I. Chrysikos

### Course Description:

The course offers an introduction to basic notions of symplectic geometry. Symplectic geometry is by now a highly developed research area, which has its origins in the study of classical mechanical systems. The course covers preliminaries of smooth manifolds and differential forms, and provides a systematic introduction to symplectic geometry for graduate students with some knowledge of differential geometry, de Rham theory and classical Lie groups. The famous theorems of Darboux and Weinstein, the theory of symplectomorphisms and the interactions with submanifolds of symplectic manifolds, Hamiltonian and symplectic vector fields, Hamiltonian actions and moments maps will be discussed in details. We will also analyse many examples of symplectic manifolds, as the cotangent bundle, Kähler manifolds, co-adjoint orbits and other.

### Prerequisites:

Background on smooth manifolds and Lie groups.

**Date and Place:** Tue, 8:15 – 10:00, Lecture Hall H5, Geomatikum,  
Bundesstr. 55  
Thu, 8:15– 9:15, Lecture Hall H3, Geomatikum, Bundesstr. 55  
**Problem Classes:** Thu, 9:15 – 10:00, Lecture Hall H3, Geomatikum,  
Bundesstr. 55  
**Starting on:** 5 April, 2022

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