



Mathematisches Institut, Sidlerstrasse 5, CH-3012 Bern

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**UNIVERSITÄT  
BERN**

Philosophisch-  
naturwissenschaftliche Fakultät  
Departement Mathematik und Statistik  
**Mathematisches Institut**

## Mathematical Colloquia

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**Monday, 30 September 2019**

17:15 h, Lecture Room 228

**Prof. Dr. Fabian Ziltener, Universiteit Utrecht**

# What is symplectic geometry?

### Abstract:

Symplectic geometry originated from classical mechanics, where the canonical symplectic form on phase space appears in Hamilton's equation. It is related to dynamical systems and algebraic geometry, among other fields.

After explaining the notion of a symplectic form and its origin in classical mechanics, I will discuss the following highlights of symplectic geometry:

1. a famous conjecture by V. Arnol'd, which states a lower bound on the number of periodic orbits of a Hamiltonian system,
2. M. Gromov's celebrated nonsqueezing theorem, which states that a ball in  $\mathbb{R}^{2n}$  of radius bigger than 1 cannot be symplectically embedded into a symplectic cylinder of radius 1.
3. I will also mention related contributions by myself regarding the existence of leafwise fixed points and spherical nonsqueezing.