



Wintersemester 2026/2027

Lecture course

Geometry in Physics

Lecturer: Prof. Dr. Gerhard Huisken

Start: Wednesday, 14th October 2026

Time: Wednesdays and Fridays, 10:00-12:00

Place: Hörsaal N16 / M3 (C-Bau [Mathe/Physik])

Tutorial: 2 hours/week **Tutors:** Tejal Bhattarai and Colin Kühner

Start: Friday, 16th October 2026

Group 1: Time: Fridays, 8:00-10:00 **Place:** Hörsaal N16 / M3 (C-Bau [Mathe/Physik])

Group 2: Time: Fridays, 12:00-14:00 **Place:** Hörsaal N14 / M1 (C-Bau [Mathe/Physik])

Study programs: Master in Mathematics and in Mathematical Physics

Modul number: MAT- 65-11; 9 ECTS points

Description:

The modul introduces into basic structures and methods of Differential Geometry and their relevance to Physics. Topics concern manifolds and submanifolds, Riemannian metrics, intrinsic and extrinsic notions of curvature, vectorbundles and connections. There will be examples of associated concepts in theoretical physics.

Prerequisites:

Bachelor level knowledge of Analysis and Linear Algebra, e.g. MAT-20-04.

Literature:

John Lee: Introduction to smooth manifolds. Springer 2012.

John Lee: Riemannian manifolds: An introduction. Springer 1997.

Chris Isham: Modern differential geometry for physicists. World Scientific 1999.

Mikio Nakahara: Geometry, Topology and Physics. IOP Publishing 2003.

O'Neill, Semi-Riemannian Geometry, Academic Press, Mathematics 103.

Exam: Written or oral exam depending on course size.