EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

Mathematisch-
Naturwissenschaftliche
Fakultät
Fachbereich Mathematik

Summer Semester 2025

Seminar: On the geometry of the Kerr spacetime

Content: We will cover some parts of O'Neill's book „The Geometry of Kerr Black Holes", adding talks on necessary preliminaries from Differential Geometry/Mathematical Relativity and some newer perspectives on the Kerr spacetime from recent research papers.

Dates: We will have two in-person blocks in Tübingen on the following dates:

April 11 and 12, 2025 (Friday all day, first half of Saturday)
July 4 and 5, 2025 (Friday all or half a day, first half of Saturday)

In addition, we will schedule a few (approximately 3-4) hybrid meetings, where we meet locally in Tübingen and the Bochum students meet locally in Bochum with Stefan Suhr, with both seminar rooms connected by Zoom. These will likely happen on Tuesdays, 2-4 pm. We will try to find a better slot if there are scheduling conflicts.

The **Vorbesprechung** will take place on January 20, 2.15 pm, in S7. We warmly invite you to come if you consider participating in the seminar. For those of you attending the Mathematical Physics Colloquium: there will not be a talk on that day.

If you want to participate in the seminar, please send an email to Anna Sancassani to sign up.

Instructors: Prof. Dr. Carla Cederbaum, `cederbaum@math.uni-tuebingen.de`
Dr. Stefan Suhr, `Stefan.Suhr@ruhr-uni-bochum.de`

Teaching Assistant: Anna Sancassani, `anna.sancassani@uni-tuebingen.de`

SWS / ECTS: 2 / 3

References:

- Barrett O'Neill: *The Geometry of Kerr Black Holes*, A K Peters Ltd., Wellesley, MA, 1995.
- Carla Cederbaum: Mathematical Relativity, Lecture notes for the course Mathematical Relativity, Summer Semester 2024

Prerequisites: Real Analysis, Linear Algebra, and basic knowledge in Differential Geometry, such as e.g. *Geometry in Physics*. Knowledge of Special, General, and Mathematical Relativity will be helpful but not necessary.