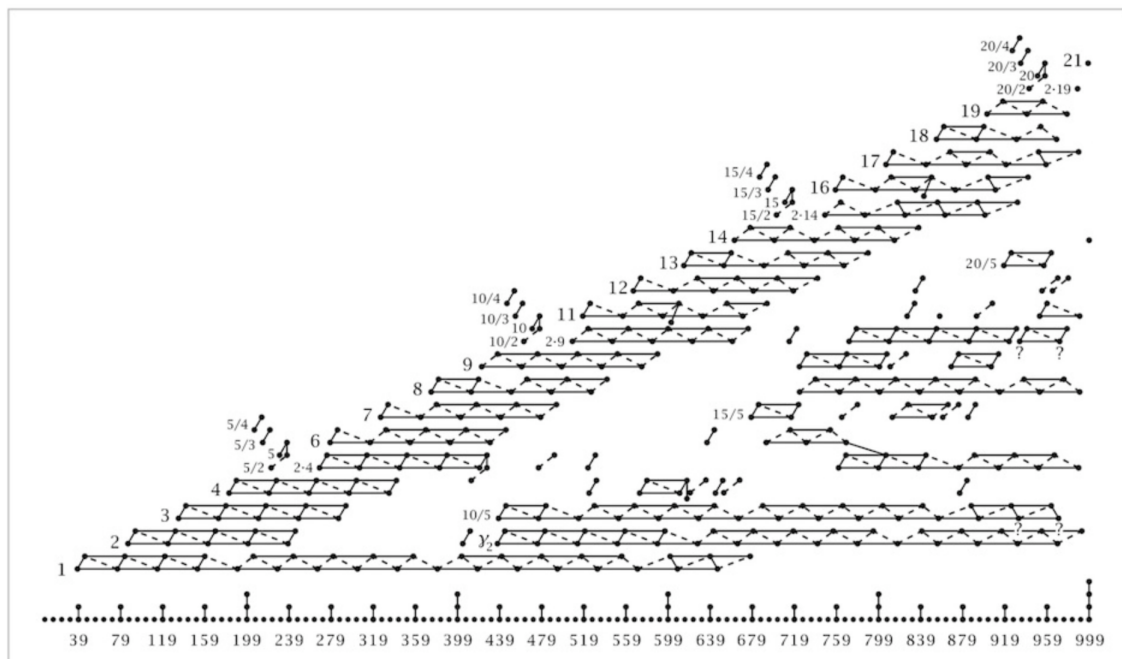


Summer Term 2026

Seminar “Stable Homotopy Theory”



The E_2 -page of the Adams Spectral Sequence for the 5-primary stable homotopy groups of spheres (taken from Hatcher's Pictures of Stable Homotopy Groups of Spheres).

Content: *Stable homotopy theory* is the study of generalised cohomology theories, or of spaces up to taking suspensions. It originated within algebraic topology in the second half of the twentieth century, but has since also found numerous applications outside of it, such as in geometric topology, algebraic geometry, and number theory.

The purpose of this seminar is to introduce the central objects of stable homotopy theory—spectra—and get to know their basic properties and properties, and to get know applications. Depending on the number of participants, we will cover a variety of topics within stable homotopy theory, such as the equivalence between spectra and generalised cohomology theories, Spanier–Whitehead and Atiyah duality, the Steenrod algebra, the Atiyah–Hirzebruch and Adams spectral sequences, and the connection between stable homotopy theory and the classification of smooth manifolds.

Prerequisites: Knowledge of the content covered in the previous lecture courses *Algebraic Topology* (Winter Term 2024/2025), *Topics in Algebraic Topology* (Summer Term 2025), and *Topics in Homotopy Theory* (Winter Term 2025/2026) will be assumed. The lecture notes for these courses are available on the Ilias page of the seminar referred to below.

Organisational meeting: Talks will be distributed on **Thursday 19/02/2026 at 15:45** (SR 2.058).

Dates: The seminar takes place during Summer Term on **Tuesdays 15:45 – 17:15 Uhr** (SR 2.059).

**If you are interested in attending, please join the associated ILIAS course
0176200 – Seminar (Stable Homotopy Theory).**