Ergodic Theory

Bachelor Seminar, SoSe 2026

Organizer

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This seminar will cover introductory material in ergodic theory and topological dynamics and will focus on the study of measure-preserving transformations of probability spaces and continuous transformations of compact Hausdorff spaces. The main resources are the books [**?**, **?**, **?**]. The outline of topics is as follows:

(1) definitions and basic constructions (products, factors, induced transformations)
(2) examples (Bernoulli actions, odometers, circle rotations)
(3) ergodicity, freeness, recurrence, weak mixing, mixing, compact transformations
(4) the Rokhlin lemma
(5) mean and pointwise ergodic theorems
(6) entropy for probability-measure-preserving and continuous transformations
(7) possible advanced topics: multiple recurrence, Ornstein theory

There will be an organizational meeting on February 19, 2026, at 14:00 in room 503. If you are unable to attend in person, you may participate via Zoom. Please contact the organizer for the Zoom coordinates.

References

[1] W. Parry. *Topics in Ergodic Theory.* Reprint of the 1981 original. Cambridge Tracts in Mathematics, 75. Cambridge University Press, Cambridge, 2004.

[2] K. Petersen. *Ergodic Theory.* Cambridge Studies in Advanced Mathematics, 2. Cambridge University Press, Cambridge, 1989.

[3] P. Walters. *An Introduction to Ergodic Theory.* Graduate Texts in Mathematics, 79. Springer-Verlag, New York-Berlin, 1982.