

Seminar of the Work Group  
Nonlinear Partial Differential Equations  
WS 2020/21

**Zoom Link:** [//kit-lecture.zoom.us/j/7143665630](https://kit-lecture.zoom.us/j/7143665630)  
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## Functional analytic study of ergodic theory

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### Abstract

Ergodic theory studies the statistical properties of dynamical systems. Even if the systems are deterministic, their long-term behaviors are often unpredictable and chaotic. In this talk, we will study “topological dynamical systems” and “measure-preserving dynamical systems.” For these systems, the “Koopman operators” on some appropriate functional spaces play an important role in analyzing systems’ statistical properties (e.g., transitivity, ergodicity, and so on). By virtue of central theorems in operator theory, we can go and back between topological and measure-preserving settings and deepen our understanding of dynamical systems.

The contents of this talk will be based on Chapter 1 – 12 of the book “Operator Theoretic Aspects of Ergodic Theory” by T. Eisner, B. Farkas, M. Haase, and R. Nagel.

### References

- [1] Eisner, Tanja, et al. Operator theoretic aspects of ergodic theory. Vol. 272. Springer, 2015.