

## Seminar Propagation of Singularities

Sommersemester 2025

**Veranstalter:** Prof. Dr. Alexander Strohmaier

The famous propagation of singularity theorem describes how singularities of solutions of partial differential equations propagate. It ultimately explains why light travel along light-like geodesics and is therefore the precise mathematical counterpart of important phenomena in nature.

The seminar will look at various versions of propagation of singularity estimates that constitute the theorem. Topics include: Semiclassical wavefront sets and Sobolev spaces, semi-classical pseudo-differential operators, Egorov's theorem, positive commutator estimates.

Preliminary requirements: knowledge of distribution theory and Fourier transforms is required (for example from the PDE lecture), knowledge of (semi-classical) pseudodifferential operators desirable.

### Literature:

- Hörmander: The Analysis of Linear Partial Differential Operators I
- Dyatlov, Zworski: Mathematical theory of scattering resonances
- Dimassi-Sjöstrand: Spectral Asymptotics in the Semi-Classical Limit

Participants will work out a topic, give a presentation, and prepare a short write-up.

Registration: in addition to registration please write a short e-mail to [a.strohmaier@math.uni-hannover.de](mailto:a.strohmaier@math.uni-hannover.de) indicating your background and, if applicable, if you have a particular topic that interests you.

First meeting is on April 10 2025. Communication via studip.