

Institute for Analysis and Scientific Computing, and Doctoral Program "Dissipation and Dispersion in Nonlinear PDEs"

Course Announcement:

Microlocal Analysis and Boundary-Value Problems

by
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Overview:

Consider an elliptic boundary-value problem such as the Dirichlet problem for the Laplace equation. It is known that the solution to this BVP can be written in terms of potential operators (single and double layer potentials, Newton potentials) that act upon the given data. In this course, we will see that the elliptic operator (here the Laplacian) and these potential operators all can be subsumed under the term "Pseudodifferential operators", and the theory of such operators is called "Microlocal Analysis".

This theory is useful for PDEs of all kinds (elliptic, parabolic, dispersive,

hyperbolic), and we will also discuss applications.

Brief Syllabus:

- *Pseudodifferential operators and their mapping properties*
- *Elliptic operators in the full space and their inverses*
- *Boundary conditions and BVPs*
- *Applications to fluid dynamics (QHD)*
- *Hyperbolic problems and Fourier integral operators.*

Location and times:

Thursday (7/4-28/4)

10:00-13:00 at Sem. R. DA grün 03 C

Friday (8/4-29/4)

14:00-17:00 at Sem.R. DA grün 03 A