Oberwolfach Seminar 1948b

Wave Phenomena: Analysis and Numerics

Organizers: Marlis Hochbruck, Karlsruhe
Andreas Rieder, Karlsruhe
Roland Schnaubelt, Karlsruhe
Christian Wieners, Karlsruhe
Date (ID): November 24–30, 2019 (1948b)
Deadline: September 15, 2019

The research on wave-type problems is a fascinating and emerging field in mathematical research with many challenging applications in sciences and engineering. Profound investigations on waves require a strong interaction of several mathematical disciplines including functional analysis, partial differential equations, mathematical modeling, mathematical physics, numerical analysis, and scientific computing.

The goal of this seminar is to present a comprehensive introduction to the research on wave phenomena by a series of lectures, student projects and software experiments. Starting with basic models for acoustic, elastic, and electro-magnetic waves we will consider the existence of solutions for linear and some nonlinear material laws, efficient discretizations and solution methods in space and time, and the application to inverse parameter identification problems. Our aim in this course is to intertwine analysis and numerical mathematics for wave-type problems which will enable students for cooperative research projects in this field.