IWR Colloquium
Winter Semester 2024 / 2025

January 15, 2025 • 16:15
Mathematikon • Conference Room / 5th Floor

Speaker:
Prof. Sara Zahedi
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Title:
"Cut Finite Element Methods (CutFEM)"

Abstract:
In this talk, I will introduce Cut Finite Element Methods (CutFEM) for interface problems and present recent developments, such as mass conservation, within this class of unfitted finite element techniques. Finite Element Methods (FEM) are widely used to approximate solutions to partial differential equations (PDEs) in complex geometries, but they typically require conforming computational meshes. The goal of CutFEM is to allow interfaces or boundaries to intersect the computational mesh arbitrarily while preserving desirable properties of standard FEM. I will explain how CutFEM maintains accuracy and avoids ill-conditioning of linear systems, even with unfitted meshes. I will begin with stationary problems, and then present our approach for discretizing time-dependent PDEs in evolving domains, and demonstrate its application to simulations of surfactant dynamics in incompressible two-phase flow systems.

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Website IWR Colloquium:
www.iwr.uni-heidelberg.de/events/iwr-colloquium