Bernoullis Tafelrunde

Graduate Student Seminar

Thursday, 3 March, 12:15-13:00
Seminarraum 00.003, Spiegelgasse 1

Fabian Müller

ETH Zürich

Finite Element Methods in piecewise smooth domains

Abstract

The goal of a numerical analyst who deals with partial differential equations (PDEs) is to approximate solutions of the PDE, i.e. functions which are not a-priori known. In this context, it is vital to know the smoothness of the solution such that precise predictions on the quality of approximation can be made. This largely depends on the smoothness of given data, especially on the domain D on which the PDE is posed. If the boundary of D is piecewise smooth but globally not more than a Lipschitz-continuous manifold (e.g. if D is a polyhedral domain), the solution exhibits localised singular behaviour at the corners. The talk will start with an overview on the well-known theory of this type of singular behaviour for simple linear elliptic equations and the so-called Kondrat'ev method. In the second part, I will present my own research on linear hyperbolic PDEs. For the sake of simplicity, the focus will be kept on two space dimensions, i.e. polygonal domains.