

Angkana Rüland

University Bonn, Germany

On Some Instability Mechanisms in Inverse Problems

Many inverse problems are notoriously ill-posed, leading to very ill-conditioned reconstruction schemes. In this talk, I will discuss three mechanisms behind the ill-posedness in inverse problems based on mapping properties of the associated forward operators and a robust functional analytic framework based on capacity and entropy numbers. More precisely, I will discuss analytic regularization, a minimal amount of elliptic regularization and only microlocal regularization as underlying mechanisms. Examples include the ill-posedness of the backward heat equation, of the Calderón problem as well as of the (geodesic) X-ray transform.

This is based on joint work with Mikko Salo (Jyväskylä) and Herbert Koch (Bonn).