

## Analysis on polyhedral domains

The analysis of partial differential equations (PDEs) on smooth, bounded domains is well understood and has numerous applications, many outside mathematics. By contrast, the behavior of PDEs on domains with non-smooth boundary can be quite different from the one on smooth boundary, and is not so well understood. In my talk, I will survey an approach to the analysis on polyhedral domains that is based on replacing the usual Sobolev spaces with a variant, called "Sobolev spaces with weights." The analysis on polyhedral domains using Sobolev spaces with weights turns out to be more similar to that on smooth domains (using ordinary Sobolev spaces). In particular, I will present a joint result with Bacuta and Zikatanov proving an unrestricted "shift theorem" for strongly elliptic systems on polyhedral domains. This result has potential applications to, for example, the Finite Element Method (FEM) and extends earlier results of Dauge, Kondratiev, Mazya and others.

The talk is meant to be accessible to a mathematically literate audience, including graduate students.