Titel: A Galerkin-type approach to shape optimisation in the space of convex sets

Abstract: In this talk, I will discuss spaces of polytopes with fixed outer normals and their use in theoretical and practical shape optimization. These spaces possess a natural system of coordinates, and all admissible coordinates can be characterized by a linear inequality, which is handy both from an analytical as well as from a computational perspective.

The polytope spaces approximate the space of all nonempty convex and compact subsets in Hausdorff distance uniformly on every bounded set, so they behave like classical Galerkin approximations to function spaces. I will show that for simple shape optimization problems, the set of global minimizers of auxiliary problems posed in the polytope spaces converges to the set of global minimizers of the original problem.