

# Nonlinear Eigenvalue Problems on Graphs and Images

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This talk will present recent work on Eigenvalue Problems for nonlinear operators in Banach spaces, in particular focusing on operators arising as the subdifferential of a  $p$ -homogeneous functional. The canonical examples are  $p$ -Laplacian operators and their analogues on graphs, it turns out the most interesting cases being the limit  $p=1$  and  $p=\infty$ . We will discuss connections to variational problems and evolution equations, with applications in image and data analysis. Moreover we highlight the issues arising in computing eigenfunctions and solutions of variational problems on large graphs. We discuss the use of cut pursuit algorithms for this sake, which can be interpreted as an abstraction of adaptive discretization methods to graph structures.

The talk is based on joint work with Leon Bungert, Daniel Tenbrinck (FAU) and Fjedor Gaede (WWU Muenster)