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Title: On fourth order elliptic problems and domains with corners

Abstract: For the second order Dirichlet-Laplace problem, that is, $-\Delta u = f$ in Ω and $u = 0$ on $\partial\Omega$, one usually thinks of smooth domains and whenever the domain has corners one expects similar results after using at most some extra technical tools such as the weighted Sobolev spaces by Kondratiev. For fourth order problems the same tools may be helpful, but there some structural issues appear. For example $\Delta^2 u = f$ in Ω and $u = \Delta u = 0$ on $\partial\Omega$ on a domain with a nonconvex corner will still have a unique solution, but only when the right function space is chosen. Moreover, different natural choices for those spaces may have different unique(!) solutions. Similar issues appear in the eigenvalue problem. There will be a unique first eigenfunction, but also that will depend on the space. The different settings will also have implications for some engineering problems.

The talk is based on joint work with S.A. Nazarov and A. Stylianou.