1093-35-366 **Nilima Nigam*** (nigam@math.sfu.ca), Nilima Nigam, Department of Mathematics, Simon Fraser University, 8888 University Driv, Burnaby, BC V5C 2V3, Canada. *Fast and efficient numerical methods for eigenproblems with mixed data.*

The numerical approximation of eigenvalues and eigenfunctions of elliptic operators with either Dirichlet or natural boundary conditions is rather well-understood, with a variety of available algorithms. The numerical analysis for elliptic eigenproblems with mixed data - that is, Dirichlet on part of the boundary, natural on the rest - is less well understood. In particular, the eigenfunctions exhibit singularities even for smooth boundaries. In this talk we quickly review some interesting features of these eigenproblems. We then describe a novel boundary-integral equation based solver for these problems which is both highly accurate and efficient. This is joint work with Eldar Akhmetgaliyev and Oscar Bruno. (Received August 20, 2013)