Lower bounds for Dirichlet Laplacians and uncertainty principles

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We prove lower bounds for the Dirichlet Laplacian on possibly unbounded domains in terms of natural geometric conditions, with near optimal constants. This is used to derive uncertainty principles for low energy functions of Schrödinger operators and general elliptic second order divergence form operators with not necessarily continuous main part. Applications include localization in the fluctuation boundary regime of continuum Anderson-type models, under the condition that the single site potentials are supported on a “fat” relatively dense set.

This talk is based on joint work with Peter Stollmann.

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