1096-35-1874 **Svitlana Mayboroda*** (svitlana@umn.edu), School of Mathematics, 206 Church st SE, Minneapolis, MN 55455, and **Marcel Filoche** (marcel.filoche@polytechnique.edu).

Localization of eigenfunctions.

The property of the localization of the eigenfunctions in rough domains or rough materials permeates acoustics, quantum physics, elasticity, to name just a few. Localization on fractal domains was used for noise abatement walls which up to date hold world efficiency record. Anderson localization of quantum states of electrons has become one of the most studied subjects in quantum physics, harmonic analysis, and probability alike. Yet, no deterministic results could predict specific spatial location of the localized waves.

In this talk I will present recent results which demonstrate a universal mechanism governing localization of the eigenfunctions of an elliptic operator. We prove that for any operator on any domain one can reveal a "landscape" which splits the domain into disjoint subregions. Starting from this landscape, we recover location, shapes, and frequencies of the localized eigenfunctions of low energy, and describe the effects of delocalization taking place as energy increases. (Received September 16, 2013)