Fixed-energy harmonic functions

Richard Kenyon, Brown University

We solve the Dirichlet problem for networks, fixing energies rather than fixing conductances. More precisely, we show that for any given choice of edge energies there is a choice of conductances for which the resulting harmonic function realizes those energies. In fact the set of solutions is the number of compatible acyclic orientations of the graph.

As an application we study fixed-area rectangulations of planar domains.
This is joint work with Aaron Abrams.