Departmental Colloquium

Planck's constant, time and topography of stationary states

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Abstract: Quantum mechanics solved the problem of how an electron can be moving and stationary at the same time, by replacing the classical motion of the electron by the wave function. The wave function satisfies Schrödinger's eigenvalue problem, formally like the equation for vibrational modes of a drum. But how can the stationary state be 'visualized' and related to the motion of the classical particles as the Planck constant tends to zero?

My talk will review this background and then discuss new results (jointly with J.J. Jung, John Toth, and/or Chris Sogge) on the size and shapes of stationary states. In particular, I will discuss L^p norms of eigenfunctions and the distribution of the nodal (zero) sets of eigenfunctions. Nodal sets are somewhat similar to real algebraic varieties of degree equal to the square root of the eigenvalue and most problems and conjectures regarding nodal sets are similar to ones in real algebraic geometry.

Friday, March 13 at 3:00 PM in SEO 636