Mathematics Department Colloquium

Organizer(s): Kenneth Ribet

Thursday, 4:10–5:00pm, 60 Evans

Oct. 22 **Alberto Grunbaum**, UC Berkeley

Quantum and classical random walks

Both quantum and classical random walks provide a nice playground for the use of such mathematical tools as harmonic analysis, the theory of special functions, combinatorics, group representation theory and functional analysis to deal with applied problems that arise from physics, biology, finance, network theory, computer science, and other sciences.

I plan to give an *ab initio* description of both quantum and classical random walks, emphasizing similarites and differences between the two subjects. The classical case is *very* classical, with papers going at least back to 1770. The quantum case started developing in 1993 under the impetus of quantum computing. For an excellent introduction, see "Quantum random walks: an introductory overview" (*Contemporary Physics* **2003**) by Julia Kempe (Berkeley PhD, 2001).