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Friday, November 20, 2015
3:35 – 4:30 pm
Room 115 WCharlton Hall

Limiting random operators for the Circular Unitary Ensemble

It is known that a unitary matrix can be decomposed into a product of reflections, one for each dimension, and that the Haar measure on the unitary group pushes forward to independent uniform measures on the reflections. We consider the sequence of unitary matrices given by successive products of random reflections. In this coupling, we show that powers of the sequence of matrices converge in a suitable sense to a flow of operators which acts on a random vector space. The vector space has an explicit description as a subspace of the space of sequences of complex numbers. The eigenvalues of the matrices converge almost surely to the eigenvalues of the flow, which are distributed in law according to a sine-kernel point process. The eigenvectors of the matrices converge almost surely to vectors which are distributed in law as Gaussian random fields on a countable set. This flow gives the first example of a random operator with a spectrum distributed according to a sine-kernel point process which is naturally constructed from finite dimensional random matrix theory.

Refreshments will be served 2:45 – 3:15 pm in the Faculty & Graduate Student Lounge
Room 4118 French Hall West