

USC Department of Mathematics
PROBABILITY & STATISTICS SEMINAR

3:30 PM, Friday 6.Nov.09
414 Kaprielian Hall
(Tea beforehand in 410)

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A proof of Aldous' spectral gap conjecture

Aldous' spectral gap conjecture asserts that on any finite graph the random walk process and the random transposition process (which is also known as stirring process or interchange process) have the same spectral gap. I will give a proof of this conjecture using a recursive strategy. The approach is a natural extension of the method already used to prove the validity of the conjecture on trees. The novelty is an idea based on electric network reduction, which reduces the problem to the proof of an explicit inequality for a random transposition operator involving both positive and negative rates. The proof of the latter inequality uses suitable coset decompositions of the associated matrices on permutations. (Joint work with Tom Liggett and Pietro Caputo.)