

## STANFORD PROBABILITY SEMINAR

**Manjunath Krishnapur**, Berkeley

**Monday, 20 March 2006**

**4:15pm** (Refreshments at 4pm in the 1st Floor Lounge)

Sequoia Hall, Room 200

### **Zeroes of Random Analytic Functions and Determinantal Point Processes in Two Dimensions**

**Abstract.** Determinantal (Fermionic) processes are a kind of point process that arise a lot in Random Matrix Theory and Combinatorics. Most of these processes studied have been in one dimension. The only interesting examples known in two dimensions are: (a) Eigenvalues of a matrix with i.i.d Complex Gaussian entries (Ginibre,1965); (b) Zeroes of an analytic function with i.i.d Complex Gaussian coefficients (Peres and Virag, 2003). In this lecture we exhibit a one parameter families of determinantal processes, one each on the Complex plane, the Sphere and the Unit disk (Hyperbolic plane) that are invariant in distribution under the action of the corresponding group of isometries (these correspond to the classical Bargmann-Fock Hilbert spaces of analytic functions). We ask for a probabilistic origin for these processes and show that: (1) The Spherical determinantal processes arise as the eigenvalues of a new random matrix ensemble; (2) Give partial evidence that the Hyperbolic determinantal processes arise as singular points of a random matrix valued analytic function.