Stanford University  
Departments of Mathematics and Statistics  

PROBABILITY SEMINAR  
4:30pm, Monday, April 24, 2017  
Sequoia Hall Room 200  
Refreshments served at 4pm in the Lounge.  

Speaker:  Riddhipratim Basu, Stanford Mathematics  

Title:  Longest Increasing Subsequence Under a Curvature Constraint  

Abstract:  
Motivated by extremal isoperimetric problems in percolation, I shall describe a model which puts a global curvature constraint on the classical Ulam’s problem in the plane, and studies the longest increasing path from (0,0) to (n,n) trapping atypically large area. As is typical in these models, the first-order behaviour of this random contour is determined by a variational problem which we explicitly solve. More interesting are exponents related to local fluctuation properties which capture the competition between the global curvature constraint and the behaviour of an unconstrained path governed by KPZ universality. These can be studied via maximal facet lengths of the convex hull of the contour and the Hausdorff distance from the hull for which we identify scaling exponents $3/4$ and $1/2$ respectively. I shall also discuss connections to different models and several open problems.  

This is joint work with Shirshendu Ganguly and Alan Hammond.