

# Temple/Penn Probability Seminar

## *Longest increasing path within the critical strip*

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Tuesday, November 17, 2015  
2:30-3:30pm, DLR 3C8 (Penn)

Consider a Poisson Point Process of intensity one in the two-dimensional square of side length  $n$ . In Baik-Deift-Johansson (1999), it was shown that the length of a longest increasing path (an increasing path that contains the most number of points) when properly centered and scaled converges to the Tracy-Widom distribution. Later Johansson (2000) showed that all maximal paths lie within the strip of width  $n^{2/3+o(1)}$  around the diagonal with high probability. We consider the length  $L(n, w)$  of longest increasing paths restricted to lie within a strip of width  $w$  around the diagonal and show that when properly centered and scaled it converges to a Gaussian distribution whenever  $w \ll n^{2/3}$ . We also obtain tight bounds on the expectation and variance of  $L(n, w)$  which involves application of BK inequality and approximation of the optimal restricted path by locally optimal unrestricted path. Based on joint work with Matthew Joseph and Ron Peled.