Alexander Moll* (a.moll@northeastern.edu). Ribbon Paths and Random Partitions.

In this talk we introduce a new object we call ribbon paths, a generalization of Catalan paths inspired by ribbon graphs in the theory of maps on non-oriented surfaces. We show that a specific weighted enumeration problem for ribbon paths controls the behavior of Jack measures on partitions, a special case of Borodin-Corwin’s Macdonald measures. For Jack measures with specialization $v$, the $n$th joint cumulants of distinguished polynomials in its linear statistics admit an all-order expansion whose coefficients are a $v$-weighted count of connected ribbon paths on $n$ sites with $m$ slides and $n - 1 + g$ paired steps. Our expansion has the same form as the refined topological expansion in random matrix theory for $\beta$-ensembles in a one-cut potential $V$ over ribbon graphs on $n$ vertices with $m$ twists of genus $g$ in Chekhov-Eynard and Borot-Guionnet. As an immediate application of this expansion, we derive limit shapes and global Gaussian field fluctuations for these random partitions in two asymptotic regimes. (Received September 02, 2019)