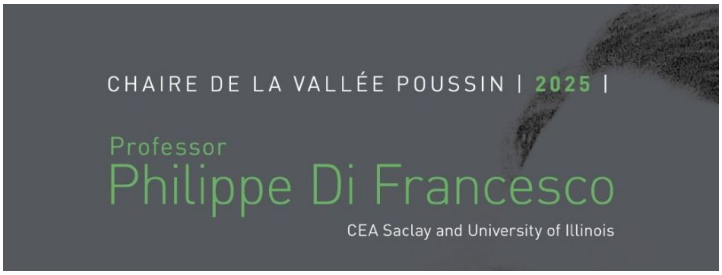

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Invited lecture 6: Limit Shape of Random Lozenge tilings of a Hexagon with q-Volume weights

Thursday 20 November 2025 11:30 (1 hour)

We will introduce the q-Volume weight for random lozenge tilings in a hexagon. The probability of each configuration is associated with its total volume. More generally we can assign q-Racah weight to the tiling model. These are natural generalisation of the random tilings with uniform weights. However, one can also fine tune the parameters to see singular behaviours.

One fascinating object to study about these models is the counting statistics which is called the height function of the tilings. In non-singular cases, it concentrates near a deterministic limit shape and that the global fluctuations are described by the Gaussian Free Field.

There are some remarkable relations between limit shapes and variational problems. A particular motivation for studying the q-Volume/Racah model is that the variational characterisation of the limiting height function has an inhomogeneous term. The study of the regularity properties of the minimizer for general variational problems with such inhomogeneous terms is a challenging open problem.

Presenter: LIU, Wenkui