ANTHONY METCALFE, KTH, Royal Institute of Technology, Sweden
Universality classes of lozenge tilings of a polyhedron

A regular hexagon can be tiled with lozenges of three different orientations. Letting the hexagon have sides of length n, and the lozenges have sides of length 1, we can consider the asymptotic behaviour of a typical tiling as n increases. Typically, near the corners of the hexagon there are regions of "frozen" tiles, and there is a "disordered" region in the center which is approximately circular.

More generally one can consider lozenge tilings of polyhedra with more complex boundary conditions. The local asymptotic behaviour of tiles near the boundary of the equivalent "frozen" and "disordered" regions is of particular interest. In this talk, we shall discuss work in progress in which we classify necessary conditions under which such tiles behave asymptotically like a determinantal random point field with the Airy kernel, and also with the Pearcey kernel. We do this by considering an equivalent interlaced discrete particle system.