1139-60-499 **Maurice Duits***, duits@kth.se. *Random tilings with periodic weights and matrix orthogonal polynomials.*

In this talk we will discuss certain random tilings with periodic weightings, such as the two periodic Aztec diamond. Due to the periodicity new features may appear, such as a gas phase. In order to study the fine asymptotic structure, one would like to have a formula for the correlation kernel that is amenable for asymptotic analysis. In this talk, an approach will be discussed for finding such a formula in case one can reformulate the random tiling in terms of non-intersecting paths with periodic transition matrices. We then express the correlation kernel in terms of a double integral formula where the integrand is constructed out of matrix orthogonal polynomials. In special situations, in particular for the two periodic Aztec diamond, this formula can be simplified further leading to an expression that is tractable for asymptotic analysis. The talk is partly based on joint work with Arno Kuijlaars. (Received February 19, 2018)