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Limits of Dimer models

The dimer model has a very simple definition: counting weighted perfect matchings on a graph. (A perfect matching of a graph is a set of edges covering all the vertices exactly once.) The dimer model on planar graphs has many connections with other parts of modern mathematics, for example random matrices, Young tableaux, SLE, random surfaces, and many others.

This talk will survey some of these connections, showing in particular how by taking various limits one can use the dimer model to model crystal surfaces, the Gaussian free field, SLE_k for $k = 2, 4, 6, 8$, Dyson Brownian motion, annihilating/coalescing Brownian motions, and a number of other processes.