1153-14-148 **Harold Williams*** (hwilliams@math.ucdavis.edu), **David Treumann** and **Eric Zaslow**.
Kasteleyn operators from mirror symmetry.

In this talk we explain an interpretation of the Kasteleyn operator of a doubly-periodic bipartite graph from the perspective of homological mirror symmetry. Specifically, given a consistent bipartite graph G in T^2 with a complex-valued edge weighting E we show the following two constructions are the same. The first is to form the Kasteleyn operator of (G, E) and pass to its spectral transform, a coherent sheaf supported on a spectral curve in $(\mathbb{C}^*)^2$. The second is to take a certain Lagrangian surface L in T^*T^2 canonically associated to G, equip it with a brane structure prescribed by E, and pass to its homologically mirror coherent sheaf. This lives on a toric compactification of $(\mathbb{C}^*)^2$ determined by the Legendrian link which lifts the zig-zag paths of G (and to which the noncompact Lagrangian L is asymptotic). As a corollary, we obtain a complementary geometric perspective on the cluster integrable systems associated to lattice polygons, studied for example by Goncharov-Kenyon and Fock-Marshakov. This is joint work with David Treumann and Eric Zaslow. (Received August 23, 2019)