

Department of Mathematics, BGU

BGU Probability and Ergodic Theory (PET) seminar

On Thursday, December, 13 2018

At 11:00 – 12:00

In 101-

Ron Peled (Tel-Aviv University)

will talk about

On the site percolation threshold of circle packings and planar graphs, with application to the loop $O(n)$ model

Abstract: A circle packing is a collection of circles in the plane with disjoint interiors. An accumulation point of the circle packing is a point with infinitely many circles in any neighborhood of it. A site percolation with parameter p on the circle packing means retaining each circle with probability p and deleting it with probability $1-p$, independently between circles. We will explain the proof of the following result: There exists $p > 0$ satisfying that for any circle packing with finitely many accumulation points, after a site percolation with parameter p there is no infinite connected component of retained circles, almost surely. This implies, in particular, that the site percolation threshold of any planar recurrent graph is at least p . It is conjectured that the same should hold with $p=1/2$. The

result gives a partial answer to a question of Benjamini, who conjectured that square packings of the unit square admit long crossings after site percolation with parameter $p=1/2$ and asked also about other values of p . Time permitting, we will discuss an application of the result to the existence of macroscopic loops in the loop $O(n)$ model on the hexagonal lattice. Portions joint with Nick Crawford, Alexandar Glazman and Matan Harel.