THE WEIZMANN INSTITUTE OF SCIENCE  
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE  

Geometric Functional Analysis and Probability Seminar  

Room 290C ,Ziskind Building  
on Thursday, Jan 12, 2017  
at 11:00  

Ran Tessler and Assaf Naor  
Ran Tessler (ETH), Assaf Naor (Princeton)  

Double lecture !  

Abstract:  

**First Speaker: Ran Tessler (ETH)**  
Time: 11:00  
Title: A sharp threshold for Hamiltonian spheres in a random 2-complex.  
Abstract: We define the notion of Hamiltonian sphere - a 2-complex homeomorphic to a sphere which uses all vertices. We prove an explicit sharp threshold for the appearance of Hamiltonian spheres in the Linial-Meshulam model for random 2-complexes. The proof combines combinatorial, probabilistic and geometric arguments. Based on a joint work with Zur Luria.  

**Second Speaker: Assaf Naor (Princeton)**  
Time: 12:00  
Title: A new vertical-versus-horizontal isoperimetric inequality on the Heisenberg group, with applications to metric geometry and approximation algorithms  
Abstract: In this talk we will show that for every measurable subset of the Heisenberg group of dimension at least 5, an appropriately defined notion of its "vertical perimeter" is at most a constant multiple of its horizontal (Heisenberg) perimeter. We will explain how this new isoperimetric-type inequality solves open questions in analysis (an endpoint estimate for a certain singular integral on $W^{1,1}$), metric geometry (sharp nonembeddability into $L_1$) and approximation algorithms (asymptotic evaluation of the performance of the Goemans-Linial algorithm for the Sparsest Cut problem). Joint work with Robert Young.