מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Geometric Functional Analysis and Probability Seminar

Room 155 ,Ziskind Building
on Thursday, May 17, 2018
at 13:30

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The fluctuations of random surfaces

Abstract:

Random surfaces in statistical physics are commonly modeled by a real-valued function phi on a lattice, whose probability density penalizes nearest-neighbor fluctuations. Precisely, given an even function V, termed the potential, the energy H(phi) is computed as the sum of V over the nearest-neighbor gradients of phi, and the probability density of phi is set proportional to exp(-H(phi)). The most-studied case is when V is quadratic, resulting in the so-called Gaussian free field. Brascamp, Lieb and Lebowitz initiated in 1975 the study of the global fluctuations of random surfaces for other potential functions and noted that understanding is lacking even in the case of the quartic potential, V(x)=x^4. We will review the state of the art for this problem and present recent work with Alexander Magazinov which finally settles the question of obtaining upper bounds for the fluctuations for the quartic and many other potential functions.