"And our result says that [the Top-Heavy] conjecture is true, and if you happen to know me, then you will probably be able to guess how the proof works because no matter what problem I have, I always use one same tool: the proof is by hard Lefschetz theorem"

—June Huh, during a talk

The Trivial Notions Seminar

Proudly Announces

Hodge theory and combinatorics

A talk by

Josh Wang

Abstract

The chromatic polynomial of a finite graph G is defined by the property that its value at an integer n is the number of proper colorings of the vertices of G with n colors. June Huh proved that for any graph G, the absolute values of the coefficients of this polynomial are unimodal: they increase, peak somewhere in the middle, and then decrease. Later Adiprasito, Huh, and Katz generalized this result from graphs to combinatorial objects called matroids. To do this, they developed a version of Hodge theory for matroids and proved analogues of Poincaré duality, the hard Lefschetz theorem, and the Hodge-Riemann relations. I'll explain formal features of this remarkable proof, which has led to the solution of a number of other conjectures in the field.

Friday, April 9th, at 2:30 p.m.