June Huh from Princeton University

Friday, April 22, 2016 - 2:30pm
MEB 248

Hard Lefschetz theorem and Hodge-Riemann relations for combinatorial geometries

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A conjecture of Read predicts that the coefficients of the chromatic polynomial of a graph form a log-concave sequence for any graph. A related conjecture of Welsh predicts that the number of linearly independent subsets of varying sizes form a log-concave sequence for any configuration of vectors in a vector space. In this talk, I will argue that two main results of Hodge theory, the Hard Lefschetz theorem and the Hodge-Riemann relations, continue to hold in a realm that goes beyond that of Kahler geometry. This implies the above mentioned conjectures and their generalization to arbitrary matroids.

Joint work with Karim Adiprasito and Eric Katz. The talk will be accessible to a general audience, see [http://matroidunion.org/?p=1664](http://matroidunion.org/?p=1664) for some details.

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