

Friday, February 10, 2017, 4:10 pm

COLLOQUIUM TALK

Speaker: Hal Schenck (UIUC)

Old Main 2231

## Hyperplane Arrangements: Algebra, Combinatorics, Geometry, Topology

### Abstract:

Abstract: A hyperplane arrangement is a collection  $\mathcal{A} = \bigcup_{i=1}^n H_i \subseteq k^n$ , where typically  $k = \mathbb{R}$  or  $\mathbb{C}$ . The complement  $X = k^n \setminus \mathcal{A}$  has very interesting topology. In 1980 Orlik and Solomon determined the cohomology ring;  $H_*(X, \mathcal{Z})$  is a quotient of an exterior algebra  $E$  with a generator for each hyperplane. Surprisingly, all relations are determined by the combinatorics of  $\mathcal{A}$ . Nevertheless, there remain many interesting open questions, which involve a beautiful interplay of algebra, combinatorics, geometry, and topology. I'll spend much of the talk discussing this interplay, and close by discussing several conjectures in the field, along with recent progress on those conjectures, where the Bernstein-Gelfand-Gelfand correspondence plays a key role. Parts of the talk are joint work with D. Cohen (LSU) and A. Suciu (Northeastern).

SNACKS IN FACULTY LOUNGE AT 3:30 PM.  
EVERYONE WELCOME (EVEN IF YOU ARE UNABLE TO ATTEND THE TALK)

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