The Number of 3-SAT Functions

Date Tuesday, December 1

Time 3 pm

Location 303 Mudd

Abstract: A *k-SAT function* of (Boolean) variables $x_1, \ldots, x_n$ is one that can be expressed as
$$C_1 \vee \ldots \vee C_t,$$
with each C_i a *k-clause* (that is, an expression $y_1 \wedge \ldots \wedge y_k$, with $y_1, \ldots, y_k$ literals corresponding to different variables x_i). Writing $G_3(n)$ for the number of 3-SAT functions of $x_1, \ldots, x_n$, we prove

Theorem
$$G_3(n) \sim 2^{n + \binom{n}{3}}.$$

This is a strong form of a conjecture of Bollobás, Brightwell and Leader stating that $\log_2 G_3(n) \sim \binom{n}{3}$.

(This is joint work with Jeff Kahn.)