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

$$C_1 \lor \ldots \lor C_t,$$

with each $C_i$ a k-clause (that is, an expression $y_1 \land \ldots \land y_k$, 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.)