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SEMINAR

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304 Whitehead Hall
Refreshments: 3:30 p.m.
Seminar: 4:00 p.m.

THE NUMBER OF LINEAR EXTENSIONS OF THE BOOLEAN LATTICE

Abstract

We consider an old question of Richard Stanley concerning the asymptotics of the number of linear extensions of the t-dimensional boolean lattice Q_t. We prove that

$$\frac{\log L(Q_t)}{2^t} = \log \binom{t}{\lfloor t/2 \rfloor} - \frac{3}{2}\log e + o(1),$$

where the logarithms are to base 2 and the $o(1)$ term goes to zero as $t \to \infty$.

Our proof uses various elementary properties of entropy as valuable tools. No prior background in entropy nor in lattices is required.

(This is joint work with Graham Brightwell, London School of Economics.)