Geometry Seminar
October 26, 2004, Tuesday, 6:00 p.m.
Room 613, Courant Institute
251 Mercer Street, New York

A new proof of Stanley's reciprocity theorem

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Abstract

We begin by presenting a miraculous identity involving one-variable Laurent series. This incantation is actually the simplest case of a remarkable theorem due to Richard Stanley regarding generating functions for polyhedral cones: if $f(x_1, \ldots, x_n)$ is the generating function for the points inside a rational polyhedral cone in R^n pointed at zero, then $f(1/x_1, \ldots, 1/x_n)$ is the generating function for the interior points in this cone. We present a new, elegant proof of Stanley's theorem using elementary techniques in contour integration. No prior knowledge will be assumed. This is joint work with Matthias Beck (SFSU) and Sinai Robins (Temple).

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