

THE MATHEMATICS DEPARTMENT PRESENTS

A MATHEMATICS COLLOQUIUM

THURSDAY, October 18, 2007

BOND HALL 227

4:00 pm

Title: Gaussian Brunn-Minkowski inequalities

Speaker: Richard Gardner, WWU

Abstract: The Brunn-Minkowski inequality is one of the most important in mathematics. In one of its variations, it says that for convex bodies K and L in \mathbb{R}^n and $0 < t < 1$,

$$V((1-t)K + tL)^{1/n} \geq (1-t)V(K)^{1/n} + tV(L)^{1/n},$$

where V denotes n -dimensional volume and

$$(1-t)K + tL = \{(1-t)x + ty : x \in K, y \in L\}.$$

From the Brunn-Minkowski inequality, the famous isoperimetric inequality can be obtained in a few easy lines. The talk is a report on joint work with Artem Zvavitch on inequalities, some already known and some new, of the Brunn-Minkowski type for Gauss measure γ_n in \mathbb{R}^n . The Gauss measure $\gamma_n(E)$ of a set E in \mathbb{R}^n is defined by

$$\gamma_n(E) = (2\pi)^{-n/2} \int_E e^{-\|x\|^2/2} dx;$$

in other words, it is just the integral over E of the standard multivariate Gaussian or normal probability density function. The subject matter is unavoidably a bit technical but as usual I'll do my best to introduce it with non-specialists in mind.

Refreshments will precede the talk at 3:30pm in Bond Hall 300
courtesy of Richard Gardner.