

THE MATHEMATICS DEPARTMENT PRESENTS

A MATHEMATICS COLLOQUIUM

THURSDAY, October 2, 2008

BOND HALL 217

4:00 pm

Title: On the local equatorial characterization of zonoids

Speaker: Artem Zvavitch, Kent State University

Abstract: A zonoid is one of the most natural geometric objects. A finite Minkowski (vector) sum of line segments is called a zonotope (an easy example is a cube) and a zonoid is defined as a limit of zonotopes (a Euclidean ball is a zonoid). Using this definition one can easily construct a lot of interesting and useful examples of zonotopes and zonoids. But it leaves one question open: given a convex body, how can we determine whether it is a zonoid or not? For example, can you characterize zonoids “locally”, i.e. if you look at the boundary of convex body K and see that in the neighborhood of each point the body K is a zonoid, can you conclude that K is a zonoid?

In this talk we will discuss a number of geometric properties of zonoids and will show that there is no local equatorial characterization of zonoids in odd dimensions. This gives a negative answer to the conjecture posed by W. Weil in 1977 and shows that a local equatorial characterization of zonoids may be given only in even dimensions. (Joint work with Fedor Nazarov and Dmitry Ryabogin.)

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