

Western Illinois University

# Math Club

Wednesday, April 27

Morgan 202

5:30 pm

## Borsuk-Ulam Theorem and its Applications

By Dr. Mokhtar Aouina

The Borsuk-Ulam Theorem is a useful and remarkable result from algebraic topology. It states that any continuous function mapping an  $n$ -sphere into  $n$ -dimensional Euclidean space identified a pair of antipodal points.

An interesting interpretation for a 1-dimensional version of this theorem is that at any given moment, there is always a pair of antipodal points on the Earth's surface with equal temperature and, at the same time, identical air pressure (here for the case  $n=2$ ). One of the numerous exciting applications is to evenly halve two irregularly shaped pizzas lying on the same plate with one stroke of the knife.

In my talk I will provide a 1-dimensional proof for the Borsuk-Ulam theorem and show you how I can use this theorem to bisect these two delicious pieces of pizzas. If the clock goes slower, then we will have time for dessert, and I have an interesting mathematical statement for that too!

Please join the Math Club to enjoy this harmony between mathematics, nice weather, and tasty food.

If you have any questions please email Malone Wall at [ma-wall@wiu.edu](mailto:ma-wall@wiu.edu)