Monday November 3, 2003

Speaker: Gerald Schwarz (Brandeis)

Title: When Does a Real Polynomial have Real Roots?

Abstract:

Let $f = x^n + a_1 x^{n-1} + \cdots + a_n$ be a monic polynomial with real coefficients. One can ask the following questions:

(1) When are all the roots of f real?
(2) How many positive (negative) real roots does f have?

We discuss methods to attack these questions. The results are all classical. The solutions to these problems are related to more general questions such as

(1) Let $p: \mathbb{R}^n \to \mathbb{R}^m$ be a polynomial mapping. Describe the image of p.
(2) Let G be a compact (e.g. finite) group acting linearly on a vector space. Describe the space of orbits of G.