Geometry Seminar
Tuesday, Feb 24, 2009
Room 317 WWH at 6:00 P.M.

Polynomial hierarchy, Betti numbers and a real analogue of Toda's theorem

Saugata Basu
Purdue University

We study the relationship between the computational hardness of two well-studied problems in algorithmic semi-algebraic geometry – namely the problem of deciding sentences in the first order theory of reals with a constant number of quantifier alternations, and that of computing Betti numbers of semi-algebraic sets.

We obtain a polynomial time reduction of the compact version of the first problem to the second. As a consequence we obtain an analogue of Toda's theorem from discrete complexity theory for real Turing machines (in the sense of Blum, Shub and Smale). (Joint work with Thierry Zell).

For more information please visit the seminar website at:
http://www.math.nyu.edu/seminars/geometry_seminar.html.