COLLOQUIUM
UNIVERSITY OF PITTSBURGH
TUESDAY, JANUARY 22, 2008

704 THACKERAY HALL

3:00 P.M.

PROFESSOR BRENT DORAN

SCHOOL OF MATHEMATICS
INSTITUTE FOR ADVANCED STUDY

"SAY $X \times A^1 = A^n$.
PLEASE SOLVE FOR X**" ... AND RELATED QUESTIONS**

ABSTRACT: Starting with the problem of the title – in algebraic geometry, this is known as the Zariski Cancellation problem – we will show how it touches upon a number of deep problems in mathematics. Classification of contractible manifolds (and an historic mis-proof of the Poincare conjecture), non-reductive group actions and quotients, classical invariant theory, Hilbert's 14th problem, algebraic vector bundles, counting rational curves, the extent to which detailed algebraic geometry can be captured by new techniques from algebraic topology ... all of these emerge naturally, and at heart are rather simple to explain, at least conceptually. Indeed, the basic object of study is quite friendly: free additive group actions on affine space. Pretty examples abound.

**Refreshments served at 2:30 p.m.
in the Math Dept. COMMON ROOM, Thackeray 705**

*The speaker is a candidate for a position in the Department.