



# ALGEBRA SEMINAR TALK



**FRIDAY, JANUARY 29, 2010**  
**RICHARD GONZALES**

**Department of Mathematics**  
**The University of Western Ontario**

**2:30 P.M. – Middlesex College Room 108**

## “Group embeddings and cohomology”

Let  $G$  be a reductive group. A  $G \times G$ -variety  $X$  is called an equivariant compactification of  $G$  if  $X$  is normal, projective, and contains  $G$  as an open and dense orbit. Regular compactifications and reductive embeddings are the main source of examples. In the first case, the equivariant cohomology ring has been explicitly described by Bifet, de Concini, Procesi and Brion. Loosely speaking, it depends mostly on the torus embedding part and the structure of the  $G \times G$ -orbits. As for the second class, Renner has found that they have a canonical cell decomposition based on underlying monoid data. My goal in this talk is to give an overview of the theory of group embeddings, putting more emphasis on the monoid approach, and to describe the structure of the so called rational cells. Finally, I will explain how such cellular decompositions could lead to a further application of GKM theory to the study of reductive embeddings.

L. Renner



R. Gonzales



M. Brion



rational cell



“*Most Wanted* mathematicians with delightful monoids”

Although Richard Gonzales is young, he is an “old hand” in our Algebra Seminar celebrations. Richard is a great, popular, engaging speaker with tantalizing mathematical stories, where even torus can act in many surprising ways, and where cells can be rational and where spaces can be normal and groups and brains are open for further cohomological equivariant developments.



**ALL ARE WELCOME! ☺**