



ALGEBRA SEMINAR TALK



WITH

MEHDI GARROUSIAN

Department of Mathematics
The University of Western Ontario

FRIDAY, NOVEMBER 11, 2011

2:30 P.M. – Middlesex College Room 107

“A random walk around Koszul algebras”

Abstract: A connected graded algebra is called Koszul if the ground field has a linear resolution, i.e. differentials are defined by matrices that only have linear entries. This condition has less than a million equivalent descriptions. In this survey talk, I will mention a few of these characterizations and examine the resulting homological behavior. As a motivation, I start off by showing the LCS formula for the pure braid group. This is an instance of a more general result about the cohomology ring of a nice class of hyperplane arrangements. I am also planning to describe more examples with origins in quantum groups and show a quick proof for the classical PBW theorem. If there is time left, I will say a few words about the interaction of the Koszul property with the Bloch-Kato conjecture. At last but not least, I will mention the biggest open problem of this area which asks for the correct pronunciation of the word Koszul.



M. Garrouisian



S. Chebolu



S. Tohaneanu



A. Polishchuk



B. Streisand and L. Armstrong in
“Hello Dolly”



L. Positselski



They are called Koszul but also wonderful algebras, and privately also, miraculous and happy! Indeed we are so happy when we find a new instance of Koszulity possibly lurking behind deep and fundamental facts in current combinatorics, Galois cohomology, and algebraic geometry. Mehdi is a perfect mathematician to raise the curtain on the stage and to show us the beauty and the mystery of this subject. This is a lecture you will not forget. :-)