# ◈ ALGEBRA SEMINAR TALK ◈

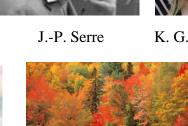### WITH

## NGUYEN DUY TAN

### (Western University)

### Friday, October 18, 2013 – 2:30 p.m., MC 108

### "Triple Massey products in Galois cohomology"

This is joint work with Ján Mináč. Let $F$ be a field. We show that any triple Massey product in Galois cohomology of $F$ with coefficient $\mathbf{F_2}$ contains 0 whenever it is defined. This extends a recent theorem of M. J. Hopkins and K. G. Wickelgren, from a global field to an arbitrary field.



N. D. Tan          J.-P. Serre          K. G. Wickelgren          J. P. May          M. J. Hopkins



J. Labute

In classical, beautiful work beginning with S. P. Demushkin, J.-P. Serre, I. R. Shafarevich and J. Labute – Galois groups of maximal $p$-extensions of local fields were determined. If they are not free, they are Demushkin pro-$p$ groups, and their generators can be chosen such that their relations are products of commutators and powers of some generators. The structure of Galois groups of maximal $p$-extensions of general fields remains mysterious, but some questions about the shape of relations in the case $p = 2$ which seemed out of reach until now, were recently answered. This is due to a number of miracles. One of these was the visit of Kirsten Wickelgren to Western in January of 2013. Kirsten's work with Mike Hopkins on "*Vanishing triple Massey products in the case of algebraic number fields*" is so inspiring! That one can extend their theorem to any field, is another miracle. This is the first time when the vanishing of any $n$-Massey product for some prime $p$ has been established. Together with the extension of the transgression method of J.-P. Serre, and triple Massey products, this has led to some remarkable consequences. Last but not least were the previous visits to Western of S. Chebolu and I. Efrat, as well as their joint work and continuous support. Nguyen Duy Tan is a young, powerful mathematician with whom it is a delight to work and to learn from. Come and enjoy a stimulating talk this Friday afternoon!

**Western** ❖ **Science**

**ALL ARE WELCOME!** ☺