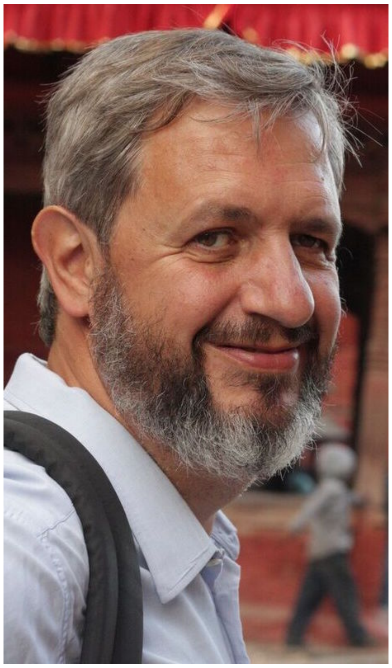

Lethbridge Number Theory and Combinatorics Seminar

Wednesday — January 27, 2016

Room: C630

Time: **10:00 to 10:50 a.m.**

Francesco Pappalardi

Università Roma Tre

The Distribution of Multiplicatively Dependent Vectors

Abstract: Let n be a positive integer, G be a group and let $\nu = (\nu_1, \ldots, \nu_n)$ be in G^n. We say that ν is a *multiplicatively dependent n-tuple* if there is a non-zero vector $(k_1, \ldots, k_n)$ in $\mathbb{Z}^n$ for which $\nu_1^{k_1} \cdots \nu_n^{k_n} = 1$.

Given a finite extension K of $\mathbb{Q}$, we denote by $M_{n,K}(H)$ the number of multiplicatively dependent n-tuples of algebraic integers of K^* of naive height at most H and we denote by $M^*_{n,K}(H)$ the number of multiplicatively dependent n-tuples of algebraic numbers of K^* of height at most H. In this seminar we discuss several estimates and asymptotic formulas for $M_{n,K}(H)$ and for $M^*_{n,K}(H)$ as $H \to \infty$.

For each ν in $(K^*)^n$ we define m, the *multiplicative rank of* ν, in the following way. If ν has a coordinate which is a root of unity we put $m = 1$. Otherwise let m be the largest integer with $2 \le m \le n+1$ for which every set of $m-1$ of the coordinates of ν is a multiplicatively independent set.

We also consider the sets $M_{n,K,m}(H)$ and $M^*_{n,K,m}(H)$ defined as the number of multiplicatively dependent n-tuples of multiplicative rank m whose coordinates are algebraic integers from K^*, respectively algebraic numbers from K^*, of naive height at most H and will consider similar questions for them.

EVERYONE IS WELCOME!

Visit the seminar web page at http://www.cs.uleth.ca/~nathanng/ntcoseminar/

Pacific Institute *for the* Mathematical Sciences