Lethbridge Number Theory and Combinatorics Seminar

Monday — January 20, 2014

Room: **B650** ← *Note change of room!*

Time: 12:00 to 12:50 p.m.

Eric Naslund

(Princeton University)

A density increment approach to Roth's theorem in the primes

Abstract: By combining Green and Taos transference principle with a density increment argument, we show if A is a set of prime numbers satisfying

$$\sum_{a\in A}\frac{1}{a}=\infty,$$

then A must contain a 3 term arithmetic progression. The previous methods of Helfgott and De Roton, and the speaker, used the transference principle to move from a set of primes to a dense subset of integers by considering the L^2 and L^p-norms of a smoothed version of the indicator function of A. Instead, we work directly with the L^∞-norm, and exploit the structure of A to obtain increased density on a large subprogression when A contains no arithmetic progressions. By iterating we show that for any constant $B>0$, if A is a subset of primes contained in $\{1,\ldots,N\}$ with size at least

$$|A|\gg_B\frac{N}{(\log N)(\log\log N)^B},$$

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EVERYONE IS WELCOME!

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