

# Number Theory & Combinatorics Seminar

Monday—October 22, 2012

Room: E575

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

*Speaker:* Nathan Ng (University of Lethbridge)

*Title:* Additive Divisor Sums

*Abstract:* The divisor function  $d(n)$  equals the number of divisors of an integer  $n$ . In this talk I will discuss what is known about additive divisor sums of the shape

$$D(N, r) = \sum_{n \leq N} d(n)d(n+r)$$

where  $r$  is a fixed positive integer. These sums were introduced by Ingham in 1926, who proved an upper bound for  $D(N, r)$ . This was later refined to an asymptotic formula by Estermann and over the years was further sharpened by a succession of authors, including Heath-Brown, Deshouillers and Iwaniec, Motohashi, and Meurman. More recent evaluations of  $D(N, r)$  makes use of the spectral theory of automorphic forms. I will also discuss more general additive divisor sums of the shape

$$D_k(N, r) = \sum_{n \leq N} d_k(n)d_k(n+r)$$

where  $k$  is a natural number larger than 2 and where  $d_k(n)$  equals the number of ordered  $k$ -tuples  $(n_1, \dots, n_k)$  such that  $n = n_1 \cdots n_k$ .

**EVERYONE IS WELCOME!**

Visit the seminar web page at

<http://www.cs.uleth.ca/~nathanng/ntcoseminar.html>