



Mathematics & Computer Science

**NUMBER THEORY &  
COMBINATORICS SEMINAR**

*Dr. Hadi Kharaghani*

*Wednesday - October 26, 2011*

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

*E575*

Everyone is welcome.

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TITLE: Mutually unbiased Hadamard matrices

ABSTRACT: Two unit Hadamard matrices  $H, K$  of order  $n$  are called unbiased, if  $H K^* = \sqrt{n} L$ , where  $L$  is a unit Hadamard matrix. Time permitting, I will do all or part of the following:

- If there are  $m$  mutually unbiased unit (real) Hadamard matrices of order  $n$ , then  $m < n$  ( $m < n/2$ ).
- The above upper bound is sharp for  $n$  a prime power.
- Discuss the literature for composite orders  $n$ .
- Talks about mutually unbiased real Hadamard matrices and their applications to association schemes.

EVERYONE IS WELCOME!

Visit the seminar page at <http://www.cs.ulthe.ca/~nathann/ntcoseminar.html>