Graduate Seminar

Daniela Silvesan,
Memorial University

Thursday, January 9, 2014
1:00pm., HH-3017

Cyclic BIBD$(v, 3, \lambda)$ from Skolem-Type Sequences-Constructions and Properties

Abstract:

A *Skolem-type sequence* is a sequence $(s_1, \ldots, s_t)$ of positive integers $i \in D$ such that for each $i \in D$ there is exactly one $j \in \{1, \ldots, t-i\}$ such that $s_j = s_{j+i} = i$. Positions in the sequence not occupied by integers $i \in D$ contain null elements. A *balanced incomplete block design* or a *block design*, denoted by BIBD(v, k, λ) is a pair (V, B) where V is a v-set of points and B is a set of k-subsets in B called blocks such that any 2-subset of V appears in exactly λ of the k-subsets.

It is known that Skolem-type sequences may be used to construct cyclic BIBD$(v, 3, 1)$ as well as cyclic BIBD$(v, 3, 2)$. The main result of this talk is an extension of former results onto cyclic triple systems with $\lambda > 2$. In addition we introduce a new kind of Skolem-type sequence. Then, we use our construction for $\lambda = 3$ to generate BIBD$(v, 3, 3)$ having three properties in the same time: cyclic, simple and indecomposable.

This is joint work with my supervisor, Dr N. Shalaby.