ARAS ERZURUMLUOGLU, University of Ottawa

Hamiltonian Properties of 2-Block-Intersection Graphs of Twofold Triple Systems

(joint work with David Pike)

A *balanced incomplete block design* (BIBD(v, k, λ)) $(V, \mathcal{B})$ is a combinatorial design in which (i) $|V| = v$, (ii) for each block $B \in \mathcal{B}$, $|B| = k$, and (iii) each 2-subset of V occurs in precisely λ blocks of $\mathcal{B}$. A BIBD$(v, 3, 2)$ is a *twofold triple system* (TTS(v)).

Given a combinatorial design $\mathcal{D}$ with block set $\mathcal{B}$, the *i-block-intersection graph* (i-BIG) of $\mathcal{D}$ is the graph having $\mathcal{B}$ as its vertex set, where two vertices $B_1 \in \mathcal{B}$ and $B_2 \in \mathcal{B}$ are adjacent if and only if $|B_1 \cap B_2| = i$.

Recently we have settled the spectrum of TTSs with connected non-Hamiltonian 2-BIGs, as well as the spectrum of TTSs with Hamiltonian 2-BIGs. In this talk I will present some of the techniques that were used to obtain these results.