Abstract: A classic result of G. A. Dirac in graph theory asserts that every n-vertex graph \((n > 2)\) with minimum degree at least \(n/2\) contains a spanning (so-called Hamilton) cycle. G. Y. Katona and H. A. Kierstead suggested a possible extension of this result for k-uniform hypergraphs. There a Hamilton cycle of an n-vertex hypergraph corresponds to an ordering of the vertices such that every k consecutive (modulo n) vertices in the ordering form an edge. Moreover, the minimum degree is the minimum \((k - 1)\)-degree, i.e. the minimum number of edges containing a fixed set of k - 1 vertices. V. Rodl, A. Rucinski, and E. Szemeredi verified (approximately) the conjecture of Katona and Kierstead and showed that every n-vertex, k-uniform hypergraph with minimum \((k - 1)\)-degree \((1/2 + o(1))n\) contains such a tight Hamilton cycle. We study the similar question for Hamilton r-cycles.

A Hamilton r-cycle in an n-vertex, k-uniform hypergraph \((1 < r < k)\) is an ordering of the vertices and an ordered subset of the edges such that each such edge corresponds to k consecutive (modulo n) vertices and two consecutive edges intersect in precisely r vertices. We prove sufficient (and approximately best possible) minimum \((k - 1)\)-degree conditions for Hamilton r-cycles if \(r < k/2\) and minimum 1-degree conditions for Hamilton 1-cycles in 3-uniform hypergraphs. This is joint work with E. Buss and H. Han.

Friday, December 3, 2010, 4:00 pm
Mathematics and Science Center: W306