Title: Total Domination in Graphs with Diameter Two and Matching Critical Intersection Hypergraphs.

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Abstract: We will in this talk discuss the following two topics related to intersecting hypergraphs.

1. We will show that a graph with diameter two always has a total dominating set of size $1 + \sqrt{n \ln(n)}$. The proof of this is quite short (using a greedy algorithm for finding transversals in hypergraphs). We then show that this bound is best possible, outlining a probabilistic proof using intersecting hypergraphs.

2. A hypergraph is intersecting if and only if it has matching number one. There are a number of different definitions of being critical with respect to having matching number one. For example, the matching number may increase if we either add another hyper-edge or shrink any edge or delete any vertex (and shrink all edges containing it), etc. We will give a short survey on these different definitions of being a matching critical intersecting hypergraph. We will also include a few new results and open problems in this area.