Discrete Mathematics Seminar

Illinois State University

2:00–2:50 pm, October 31@ STV 121

Speaker: Ryan C. Bunge, Illinois State University

On Maximum Packings of the Complete 3-Uniform Hypergraph with a 2-Regular Hypergraph of Size 4

In graph theory, a standard definition of a graph is an ordered pair of sets with the first being a set of vertices and the second a set of edges, where each edge is a 2-element subset of the set of vertices. Hypergraphs are a generalization of this concept in which the cardinality of an edge need not be 2. Indeed, if each edge is a k-element subset of the vertices, then we call the hypergraph k-uniform. In this talk we investigate strategies for finding hypergraph decompositions and, more generally, maximum packings of complete 3-uniform hypergraphs. In particular, we apply these strategies to finding decompositions and maximum packings with the 2-regular 3-uniform hypergraph with vertex set $\{a, b, c, d, e, f\}$ and edge set $\big\{\{a, b, c\}, \{b, c, d\}, \{d, e, f\}, \{e, f, a\}\big\}$.

This research conducted at the *REU Site: Mathematics Research Experience for Pre-service and for In-service Teachers* at Illinois State University.