COLLOQUIUM

DEPARTMENT OF MATHEMATICS AND STATISTICS
OAKLAND UNIVERSITY
ROCHESTER, MICHIGAN 48309

László Lipták
Oakland University

Decomposing Facets of the Stable Set Polytope

Abstract: A set of vertices in a graph is *stable* if no two of them are adjacent, and the size of a maximum stable set is called the stability number. If the deletion of any edge increases the stability number, the graph is called $\alpha-$critical. Wade conjectured that in a connected $\alpha-$critical graph deleting two vertices of degree at least 2 cannot decrease the stability number. Later Surányi proved a weaker form of this conjecture by showing that after deleting one such vertex, the graph can be decomposed into $\alpha-$critical subgraphs, none of which is an isolated vertex.

We give a counterexample to Wade's conjecture, then consider the weighted case, the facets of the stable set polytope. Chvátal proved that for a connected $\alpha-$critical graph the stable set polytope always has a corresponding rank facet. We generalize Surányi's theorem for these facets, and prove a weaker version for all facets by showing that after deleting a vertex we can write the remaining inequality as a positive linear combination of nontrivial facets. We will discuss examples when this decomposition is integral, and mention some open problems.

372 Science and Engineering Building
Tuesday, November 9, 2004
3:00–4:00 p.m.

(Refreshments at 2:30 p.m. in Room 368, Science and Engineering Building)

László Lipták received his PhD in mathematics from Yale University in 1999. After being a post-doc at the Fields Institute in Toronto and the University of Waterloo, he joined Oakland University in 2003, where he is an assistant professor of mathematics.