

The George Washington University Combinatorics Seminar

Friday, March 14, 11:30 a.m. - 12:30 p.m.

Monroe Hall, Room 267
2115 G Street, N.W., Washington, D.C.

Simplicial maps and the generic rigidity matroid

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The generic rigidity matroid of a graph G (in dimension d) has as bases all subgraphs of G that are isostatic, that is, that are minimal sets of edges forming subgraphs that are rigid in general position in d -dimensional space.

Everything there is to be known about 2-isostatic graphs has been known for decades, but 3-isostatic graphs have no known combinatorial characterization.

We endeavor to shed some light on this subject by investigating simplicial maps from graphs to the simplex K_4 . The existence of a single such map that is shellable (in the sense that vertices mapped to the same vertex of K_4 can be gradually separated) suffices to establish that a graph is isostatic. The converse problem involves a detailed analysis of obstacles to shellability.