BI-CO MATHEMATICS COLLOQUIUM

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"The Redei--Berge symmetric function of a directed graph"

Monday, November 6, 2023

Talk at 4:30 – Hilles 109

Tea 4:00 – Foyer outside of H109

Abstract:

In 1934, Laszlo Redei observed a peculiar property of tournaments (directed graphs that have an arc between every pair of distinct vertices): Each tournament has an odd number of Hamiltonian paths. In 1996, Chow introduced the ``path-cycle symmetric function'' of a directed graph, a symmetric function in two sets of arguments, which was later used in rook theory. We study Chow's symmetric function in the case when the y-variables are 0. In this case, we give new nontrivial expansions of the function in terms of the power-sum basis; in particular, we find that it is p-positive as long as the directed graph has no 2-cycles. We use our expansions to reprove Redei's theorem and refine it to a mod-4 congruence.

This is joint work with Richard P. Stanley.

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