DEPARTMENT OF MATHEMATICAL SCIENCES

Colloquium

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The protean chromatic polynomial

ABSTRACT: Let t be a positive integer and let G be a combinatorial graph with vertices V and edges E. A *proper coloring of G from a set with t colors* is a function $c : V \to \{1, 2, \ldots, t\}$ such that if $uv \in E$ then $c(u) \neq c(v)$, that is, the endpoints of an edge must be colored differently. These are the colorings considered in the famous Four Color Theorem. The *chromatic polynomial* of G, $P(G; t)$, is the number of proper colorings of G from a set with t colors. It turns out that this is a polynomial in t with many amazing properties. One can characterize the degree and coefficients of $P(G; t)$. There are also connections with acyclic orientations, increasing spanning forests, hyperplane arrangements, symmetric functions, and Chern classes in algebraic geometry. This talk will survey some of these results.

Friday, April 5, 2019
11:00AM-12:00PM
Stratton Hall 203