

Department of Mathematical Sciences
The Johns Hopkins University

THE FOURTH ANNUAL ALAN J. GOLDMAN LECTURE

Paul Seymour
Department of Mathematics
Princeton University

Friday, October 18, 2002
301 Shaffer Hall
Seminar: **11:00 a.m.**
Reception following Lecture

STRONG PERFECT GRAPH THEOREM

ABSTRACT

Claude Berge proposed the conjecture in 1961 that, in every graph with no odd hole or odd antihole, the number of colours needed to properly colour the graph equals the size of the largest complete subgraph. (A “hole” is an induced subgraph which is a cycle of length ≥ 4 , and an “antihole” is the same in the complement graph.) This has become one of the most well-known and popular open problems in graph theory. Most attempts on it have been based on linear programming methods, studying the properties of a minimal counterexample; they go a long way, but appear eventually to get stuck. Recently, however, a new approach was initiated by Conforti and Cornuejols, an attempt to actually find explicit constructions for all the graphs not containing odd holes or antiholes, and checking directly that they satisfy Berge’s conjecture. I am happy to report that this works. In joint work with Maria Chudnovsky, Neil Robertson, and Robin Thomas, we have been able to carry out the Conforti–Cornuejols program, and thereby prove Berge’s conjecture.