Bounding the chromatic number of claw-free graphs

Date Tuesday, March, 11

Time 4 pm

Location 317 Mudd

Abstract:

The chromatic number χ of any graph is bounded from below by its clique number ω and from above by its maximum degree plus one, $\Delta + 1$. Reed conjectured that modulo a round-up, the average of these two bounds gives an upper bound for the chromatic number. That is, for any graph G, $\chi(G) \leq \left\lceil \frac{1}{2}(\Delta(G) + 1 + \omega(G)) \right\rceil$.

A graph is *quasi-line* if the neighbours of any vertex can be covered by two cliques, and a graph is *claw-free* if it contains no induced $K_{1,3}$. Chudnovsky and Seymour recently completed a powerful structural characterization of both quasi-line and claw-free graphs; much of their work is in the more general setting of trigraphs. In this talk I will explain how the structure theorems allow us to prove Reed's conjecture for claw-free graphs. I will also discuss several related problems, including a strengthening of the conjecture which holds if it holds for line graphs.

This is joint work with Bruce Reed.