

On the strong coloring of graphs with bounded degree

Date Tuesday, October 4

Time 4:30 pm

Location 303 Mudd

Abstract: Let G be a graph with n vertices and let r be a number dividing n . We say that G is strongly r colorable if for every partition of the vertices of G to sets of size r , there exists a proper coloring of G in which every set in the partition is colored in all colors. Alon is the first who showed that if $r > cd$ then G must be strongly r colorable, where d is the maximal degree in the graph and c is some constant number. This result raises the question, for a fixed number d , what is the minimal number $s(d)$, with the property that every graph with maximal degree d is strongly $s(d)$ colorable. It is not hard to show that $s(d) \geq 2d$ and the natural conjecture is $s(d) = 2d$. The result closest to this conjecture is Haxell proof that $s(d) \leq 11d/4 + o(d)$. In this talk I will describe the arsenal of methods used to attack this problem and show that $s(2) = 4$.

This is joint work with Abeer Shkerat