Logic and Combinatorics Seminar

UNIVERSITY OF NOTRE DAME
Department of Mathematics

Speaker: Jesse Johnson
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Thursday, May 5, 2011
11:00 AM
125 Hayes-Healy Hall

Title: The Chromatic Number of the Plane : How Close are We to Solving It?

Abstract:

The chromatic number of the plane problem is one of the easiest questions to formulate, but it is also proving to be one of the most difficult to answer. The question is this: what is the minimum number of colors required to color the plane in such a way that no two points exactly unit distance apart have the same color? Sounds simple, doesn't it? So far the best lower bound for this number is 4, and the best upper bound is 7. While the search is on for better bounds, it seems that the answer may actually depend on the acceptance of the Axiom of Choice. We will begin with some history of the problem. We will follow Falconer's proof that the **measurable** chromatic number of the plane is at least 5, concluding that the chromatic number has the possibility of being 4 in the presence of non-measurable sets, (e.g., in the presence of the Axiom of Choice), but must be at least 5 if all subsets of the plane are measurable.