

1135-05-1350      **David Galvin\*** (dgalvin1@nd.edu), Department of Mathematics, University of Notre Dame.  
*The non-locality of graph coloring.*

Graph coloring — assigning colors to vertices of a graph, with adjacent vertices receiving different colors — seems local (the color of a vertex is influenced only by those of its immediate neighbors), but turns out to be highly non-local. A classical result illustrating this is Erdős' construction of locally tree-like (so 2-colorable) graphs that require an arbitrarily large palette to color completely.

I'll talk about some work (of and/or with Engbers, Feldheim, Kahn, Peled, Randall, Sorkin and Spinka) on the non-locality of coloring bipartite graphs in general and portions of the hypercubic lattice in particular, with ramifications for some problems in statistical physics and theoretical computer science.

A theme will be our precipitous drop in knowledge in going from 3 colors to 4 or more. (Received September 21, 2017)