Meeting: 1003, Atlanta, Georgia, SS 24A, AMS Special Session on Design Theory and Graph Theory, I

1003-05-117 **Nicholas B. Weininger*** (nweininger@pobox.com), 127 Selbey Court, Somerset, NJ 08873. *On correlation properties of random graph homomorphisms.* Preliminary report.

Given a bipartite graph G and an integer $q \geq 2$, pick a proper q-coloring of G uniformly at random. An old, apparently folkloric result says that the resultant distribution exhibits pairwise positive correlation, in the sense that if x, y are two vertices in the same color class of G, knowing x is red makes y more likely to be red. We may naturally ask whether this correlation property also holds for random homomorphisms from G to some more general class of target graphs H. It turns out that there are pairs (G, H) for which it does not hold, leaving the question: what are the necessary restrictions on G and/or H to make it hold? We will discuss some possible answers to this question and state a few recent results. (Received August 09, 2004)