Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-05-1255 **Jack W Huizenga*** (huizenga@uchicago.edu), Department of Mathematics, University of Chicago, 5734 S. University Avenue, Chicago, IL 60637. *Chromatic capacity and graph operations.*

The *chromatic capacity* $\chi_{\text{cap}}(G)$ of a graph G is the largest integer k for which there exists an edge coloring $c\colon E(G) \to \{1,\ldots,k\}$ such that for any vertex coloring $b\colon V(G) \to \{1,\ldots,k\}$ there is an edge $vw \in E(G)$ with $b(v) = b(w) = c(vw)$. We prove that there is an unbounded function $f\colon \mathbb{N} \to \mathbb{N}$ such that $\chi_{\text{cap}}(G) \geq f(\chi(G))$ for almost every graph G, where χ denotes the chromatic number. We show that for any positive integers n and k with $k \leq n/2$ there exists a graph G with $\chi(G) = n$ and $\chi_{\text{cap}}(G) = n - k$, extending a result of Greene. We obtain bounds on $\chi_{\text{cap}}(K_n^r)$ that are tight as $r \to \infty$, where K_n^r is the complete n-partite graph with r vertices in each part. Finally, for any positive integers p and q we construct a graph G with $\chi_{\text{cap}}(G) + 1 = \chi(G) = p$ that contains no odd cycles of length less than q. (Received October 04, 2004)