1089-05-343 **Oleg V. Borodin** (brdnoleg@math.nsc.ru), **Alexandr V. Kostochka** (kostochk@math.uiuc.edu), **Bernard Lidický*** (lidicky@illinois.edu) and **Matthew Yancey** (yancey1@illinois.edu). *Short proofs of coloring theorems on planar graphs.*

A recent lower bound on the number of edges in a k-critical n-vertex graph by Kostochka and Yancey yields a half-page proof of the celebrated Grötzsch Theorem that every planar triangle-free graph is 3-colorable. In this talk we use the same bound to give short proofs of other known theorems on 3-coloring of planar graphs, among whose is the Grünbaum-Aksenov Theorem that every planar with at most three triangles is 3-colorable. We also prove the new result that every graph obtained from a triangle-free planar graph by adding a vertex of degree at most four is 3-colorable. (Received February 18, 2013)