1020-05-95          **Jon McCammond\*** (`jon.mccammond@math.ucsb.edu`). *Moebius inversion and combinatorial curvature.*

The Charney-Davis conjecture for simplicial triangulations of n-spheres was arrived at by calculating the local curvatures of a non-positively curved cube complex using a theorem from differential geometry. Another result, that is perhaps less well known to geometric combinatorialists, is a theorem in geometric group theorem that is a combinatorial version of the classical Gauss-Bonnet theorem that calculates local curvatures once arbitrary angles (even negative ones!) have been assigned to the corners of the polygons in a 2-complex. In this talk I will discuss a common generalization of these two theorems. In particular, there is a high-dimensional version of the combinatorial Gauss-Bonnet theorem that essentially states that given any way to factorize the zeta functions of the polytopes in a regular cell complex, there is a corresponding way to decompose the euler characteristic as a sum of local curvatures. (Received August 18, 2006)