1112-05-282 **Karim Adiprasito**, **Eran Nevo** and **Jose Alejandro Samper***
(samper@math.washington.edu). *The geometric lower bound theorem.*

We study the relationship between the g-theorem and polytopes that approximate convex bodies with smooth boundary. In 1994 Kalai posited a visionary conjecture stating that if K is a convex body whose boundary is C^1 and P is a simplicial polytope that gives a good approximation of K, then the face numbers of P must be far from extremal in the sense of the g-theorem. We will explain this conjecture, sketch a proof of the lower bound part of the conjecture for general C^1-convex bodies, give a tight (up to a constant) lower bound on the g-numbers of P in terms of the quality of the approximation (when K is C^2), and use this lower bound to resolve the conjecture in general for polytopes that arise from randomly sampling points from K. (Received August 06, 2015)