1108-57-345 **Ryan Kowalick**, **Jean-François Lafont** and **Barry Minemyer*** (minemyer.1@osu.edu), 231 W. 18th Ave, MW458, Columbus, OH 43210. *A Combinatorial Systolic Inequality.*

The systole of a Riemannian manifold M, denoted $\mathrm{sys}_{\pi_1}(M)$, is the length of the shortest noncontractible closed geodesic in M. Gromov proved that for any n-dimensional essential manifold M

$$\mathrm{sys}_{\pi_1}(M) \leq C_n \sqrt[n]{\mathrm{Vol}(M)}$$

where the constant C_n depends only on n and *not* on M. The property of a manifold being essential is a topological condition, and for simplicity one may instead consider M to be aspherical (all aspherical manifolds are essential).

In this paper we consider tuples $(M, \mathcal{T})$ of manifolds equipped with a fixed smooth triangulation, and we consider an analogous combinatorial systolic inequality. We prove that a topological class of smooth manifolds satisfies this combinatorial systolic inequality if and only if it satisfies Gromov's systolic inequality. In particular, the class of smooth triangulations for essential smooth manifolds satisfies a combinatorial systolic inequality. (Received January 18, 2015)