1056-53-101   **Alexander Diaz** and **Nathan Harman*** (`nateharman1234@yahoo.com`), 1203 S. Fernandez
Ave., Arlington Heights, IL 60005, and **Sean Howe** and **David Thompson**. *Manifolds with
Density as Quotients of Riemannian Manifolds.*

A manifold with density is a Riemannian manifold equipped with a positive density function that weights both volume
and hypersurface area. One place these come up naturally is as quotients of Riemannian manifolds by a subgroup of their
isometry group. First, we use this interpretation to solve the isoperimetric problem in certain manifolds with density by
looking at the problem in a suitable Riemannian manifold modulo symmetry. Second, we discuss conditions under which
solving the isoperimetric problem in a Riemannian manifold can be reduced to solving it in a manifold with density of
lower dimension. (Received July 27, 2009)