1056-53-509 **Corey A. Hoelscher*** (`coreyah@math.rutgers.edu`), Department of Mathematics, 110 Frelinghuysen Road, Piscataway, NJ 08854. *Low dimensional cohomogeneity one manifolds.*

In essence, a cohomogeneity one manifold is a manifold with lots of symmetry, to the degree that it is almost a homogeneous space. More precisely, it is a Riemannian manifold M with a compact group G of isometries which acts on M with a one dimensional orbit space M/G. Such manifolds are important in many areas of geometry and in mathematical physics. In this talk we will describe the classification of compact simply connected cohomogeneity one manifolds in dimensions 5, 6, and 7. We will also discuss the topological properties of these manifolds including the diffeomorphism characterization of them in dimensions 5 and 6. (Received September 10, 2009)