1057-53-225 **Julie Marie Miker*** (Julie.Miker@arbor.edu), 3310 Trillium Lane Apt 22, Jackson, MI 49201.
Eigenvalue Inequalities for a Family of Spherically Symmetric Riemannian Manifolds. Preliminary report.

We will consider two isoperimetric inequalities for the eigenvalues of the Laplacian on a family of spherically symmetric Riemannian manifolds. The Payne-Pólya-Weinberger Conjecture (PPW) states that for a bounded domain Ω in Euclidean space $\mathbb{R}^n$, the ratio $\lambda_1(\Omega)/\lambda_0(\Omega)$ of the first two eigenvalues of the Dirichlet Laplacian is bounded by the corresponding eigenvalue ratio for the Dirichlet Laplacian on the ball B_Ω of equal volume. The Szegö-Weinberger inequality states that for a bounded domain Ω in Euclidean space $\mathbb{R}^n$, the first nonzero eigenvalue of the Neumann Laplacian $\mu_1(\Omega)$ is maximized on the ball B_Ω of the same volume. In this talk, we will look at a family a spherically symmetric manifolds given by $\mathbb{R}^n$ with a spherically symmetric metric determined by a radially symmetric function f. We will then give a PPW-type upper bound for the eigenvalue gap, $\lambda_1(\Omega) - \lambda_0(\Omega)$, and also the Szegö-Weinberger inequality for this family of manifolds on a restricted class of domains in this space. This is joint work with Peter Hislop. (Received January 23, 2010)