1122-19-257 **Shmuel Weinberger** and **Zhizhang Xie***, Department of Mathematics, Mailstop 3368, Texas A&M University, College Station, TX 77843, and **Guoliang Yu**. *Additivity of higher rho invariants and nonrigidity of topological manifolds.*

Let X be a closed oriented topological manifold of dimension n. A main purpose of this talk is to prove that the higher rho invariant is a group homomorphism from the structure group $\mathcal{S}^{\mathrm{TOP}}(X)$ of X to the analytic structure group $K_n(C^*_{L,0}(\widetilde{X})^\Gamma)$ of X. Here $\widetilde{X}$ is the universal cover of X, $\Gamma = \pi_1 X$, and $C^*_{L,0}(\widetilde{X})^\Gamma$ is a certain C^*-algebra. We then apply this result to study non-rigidity of topological manifolds. More precisely, we give a lower bound for the size of the *reduced* structure group of a closed oriented topological manifold, by the number of torsion elements in the fundamental group of the manifold. Furthermore, we introduce a notion of homological higher rho invariant, which can be used to detect nontrivial elements in the structure group of a closed oriented topological manifold, even when the fundamental group of the manifold is torsion free. The talk is based on joint work with Shmuel Weinberger and Guoliang Yu. (Received August 15, 2016)