1084-57-152 **Frank Connolly**, **James F Davis** and **Qayum Khan*** (qkhan@indiana.edu). *Rigidity of pseudo-free group actions on contractible manifolds.*

We discuss Quinn's equivariant generalization of the Borel Conjecture. This concerns cocompact proper actions of a discrete group Γ on a Hadamard manifold X. We give a complete solution when the action of Γ is pseudo-free and when X more generally is a CAT(0) manifold. Here, *pseudo-free* means that the singular set is discrete. A rich class of examples is obtained from crystallographic groups Γ made out of isometric spherical space form groups G.

If Γ has no elements of order two, then we obtain equivariant topological rigidity of the pair (X, Γ). Hence, if Γ is torsion-free, then we generalize a recent theorem of A. Bartels and W. Lück, which validates the classical Borel Conjecture for CAT(0) fundamental groups. Otherwise, if Γ has elements of order two, we show how to parameterize all possible counter-examples, in terms of Cappell's UNil summands of the L-theory of infinite dihedral groups. In certain cases, these are detected along hypersurfaces in the orbifold X/Γ by generalized Arf invariants. (Received August 29, 2012)