1049-53-97 **J. McGowan*** (jmcgowan@howard.edu), Howard University, Department of Mathematics, Washington, DC 20059, and **C. Searle**. *Cohomogeneity 3 Actions on the Sphere.*

In their classic paper, Hsiang and Lawson gave a nearly complete list of all cohomogeneity 1 and 2 irreducible maximal linear actions on the standard sphere [HL]. Their classification was later completed by Straume in his comprehensive work on the subject [S1] and [S2]. With C.Searle, we have begun the classification of irreducible maximal linear actions of cohomogeneity 3, as well as a study of the associated spherical orbit spaces. This outstanding problem is interesting and useful for the same reasons that the 1- and 2-dimensional problems were: we gain greater understanding of the sphere, a basic model space for any space of constant curvature; the exploration of these actions can lead to the discovery of new structures and new descriptions of existing structures; and we can learn more about the properties of symmetric spaces.

[HL] Hsiang, W.-Y. and Lawson, Minimal Submanifolds of Low Cohomogeneity, J. Diff. Geometry, Vol. 5, (1971) pp. 1-38.

[S1]Straume, E., Compact Connected Lie Transformation Groups on Spheres with Low Cohomogeneity, I, Memoirs of the AMS, Vol. 119, No. 569 (1996).

[S2]Straume, E., Compact Connected Lie Transformation Groups on Spheres with Low Cohomogeneity, II, Memoirs of the AMS, Vol. 125, No. 595 (1997). (Received February 25, 2009)