962-20-969 **Terrell L. Hodge*** (terrell.hodge@wmich.edu), Department of Mathematics, Western Michigan University, Kalamazoo, MI 49008. *Involutions on Algebraic Groups and Modular Harish-Chandra Modules.*

Take k to be an algebraically closed field, $p = \text{char}\,(k) > 2$. For G a semisimple, simply connected linear algebraic group over k, defined and split over $\mathbb{F}_p$, we study some structures related to the fixed point group $K = G^\theta$ of an involution θ of G, θ defined over $\mathbb{F}_p$. Such subgroups K arise, for example, in the study of symmetric varieties. For G_r the r^{th} Frobenius kernel of G, we classify the irreducible KG_r-modules and their injective envelopes. For T (resp., B) a maximal torus (resp., Borel subgroup) of G, representations of TG_r and BG_r have been well-studied; here, we use the special nature of K as the fixed point group of an involution to obtain a link between the root systems of K and G, whence the classification. Next, by letting K play, for algebraic groups, the role accorded to the (complexification of) a maximal compact subgroup of a Lie group, we introduce into modular representation theory a category of Harish-Chandra modules for G. Such modules are simulaneously modules for K and for $\mathfrak{g} = \text{Lie}(G)$, subject to certain compatibility conditions. We then prove that the irreducible finite-dimensional modular Harish-Chandra modules are exactly the irreducible KG_1-modules. (Received September 29, 2000)