1106-20-365 **Ellen Ziliak*** (eziliak@ben.edu), **Catherine Buell** (catherine.a.buell@gmail.com), **Loek Helminck** (loek@ncsu.edu), **Vicky Kilma** (klimavw@gmail.com), **Jennifer Schaefer** (schaefje@dickinson.edu) and **Carmen Wright** (carmen.m.wright@jsums.edu). *Symmetric Spaces for $SL_n(\mathbb{F}_q)$ and Finitely Presented Groups.* Preliminary report.

Symmetric spaces were introduced by Élie Cartan as a special class of homogeneous Riemannian manifolds. These spaces have since been generalized and a rich theory has been developed that plays a role in many fields of research. In this talk we will focus on generalized symmetric spaces which can be defined as the homogeneous spaces G/H with G an arbitrary group and H the fixed point group of an involution. The map $\tau : G \to G$ defined by $\tau(g) = g\theta(g)^{-1}$ where θ is the involution induces an isomorphism of the coset space G/H onto the image $\tau(G) = Q$. In addition we can consider the extended symmetric space $R = \{g \in G|\theta(g) = g^{-1}\}$. In general $Q \subseteq R$ but typically $Q \neq R$. However in this talk it will be shown that for $G = SL_n(\mathbb{F}_q)$, if θ is an outer automorphism it is the case that $R = Q$ however when θ is an inner automorphism the theorem is not always true. A similar analysis can be done for finitely presented groups, I will end by explaining this process. (Received September 09, 2014)