1086-11-252 **Cassie L Williams*** (willi5cl@jmu.edu). *Enumerating abelian varieties using matrix groups.* Preliminary report.

The Frobenius endomorphism of an abelian variety $A/\mathbb{F}_q$ acts as a symplectic similitude on the torsion subgroups $A[\ell^n](\overline{\mathbb{F}}_q)$. In 2003, Gekeler used an equidistribution assumption on the elements of $\mathrm{GL}_2(\mathbb{Z}/\ell^r)$ to show that the number of elliptic curves with certain characteristics is related, via results of Sato-Tate and the class number, to the Euler factors of the L-function of a quadratic imaginary field. By determining the sizes of conjugacy classes of Frobenius elements in the groups $\mathrm{GSp}_{2g}(\mathbb{Z}/\ell^r)$ and applying a theorem of Everett Howe, we will extend Gekeler's heuristic to higher dimensional abelian varieties. (Received August 13, 2012)