1154-11-1439 **Caleb J. Springer*** (cks5320@psu.edu). *Computing the endomorphism ring of an ordinary abelian surface over a finite field.*

The endomorphism ring of an abelian variety is an important object which is useful in many contexts, including understanding isogeny graphs, computing class polynomials, and other cryptographic applications. If A is a simple ordinary abelian variety over the finite field $\mathbb{F}_q$, then the endomorphism ring $\mathrm{End}(A)$ is isomorphic to an order in a CM field K. In this talk, we will first review an algorithm of Bisson and Sutherland for computing the endomorphism ring of an ordinary elliptic curve, then present a generalization for certain simple ordinary abelian surfaces which have maximal real multiplication. Both algorithms are subexponential in $\log q$. The main idea is to probe the ideal class group of $\mathrm{End}(A)$ by computing certain isogenies. By comparing the class groups of $\mathrm{End}(A)$ and various known orders $\mathcal{O} \subseteq K$, one can then deduce $\mathrm{End}(A)$. (Received September 15, 2019)