1096-11-493 **Chantal David**, **Derek Garton**, **Zachary Scherr**, **Arul Shankar**, **Ethan Smith** and **Lola Thompson*** (lola.thompson@oberlin.edu). *Abelian surfaces over finite fields with prescribed groups.*

Let A be an abelian surface over $\mathbb{F}_q$. The rational points on $A/\mathbb{F}_q$ form an abelian group $A(\mathbb{F}_q) \simeq \mathbb{Z}/n_1\mathbb{Z} \times \mathbb{Z}/n_1n_2\mathbb{Z} \times \mathbb{Z}/n_1n_2n_3\mathbb{Z} \times \mathbb{Z}/n_1n_2n_3n_4\mathbb{Z}$. We are interested in knowing which groups of this shape actually arise as the group of points on some abelian surface over some finite field. For a fixed prime power q, a characterization of the abelian groups that occur was recently found by Rybakov. One can use this characterization to obtain a set of congruences modulo the integers n_1, n_2, n_3, n_4 on certain combinations of coefficients of the corresponding Weil polynomials. We use Rybakov's criterion to show that groups $\mathbb{Z}/n_1\mathbb{Z} \times \mathbb{Z}/n_1n_2\mathbb{Z} \times \mathbb{Z}/n_1n_2n_3\mathbb{Z} \times \mathbb{Z}/n_1n_2n_3n_4\mathbb{Z}$ do not occur if n_1 is very large with respect to n_2, n_3, n_4, and occur with density zero in a wider range of variables. (Received September 04, 2013)