1077-14-960          **Reinier Broker\*** (`reinier@math.brown.edu`), Brown University, Box 1917, 151 Thayer Street, Providence, RI 02912, and **Kristin Lauter** and **Marco Streng**. *Abelian surfaces with extra endomorphims.*

For elliptic curves, the modular polynomial $\Phi_p(X, Y)$ parametrizes elliptic curves together with a $p$-isogeny. The polynomial $\Phi_p(X, X)$ parametrizes elliptic curves together with an endomorphism of degree $p$. Kronecker discovered already that the irreducible factors of $\Phi_p(X, X)$ are Hilbert class polynomials. In this talk we will consider abelian surfaces with extra endomorphisms. We will show which factors occur when you factor the 2-dimensional analogue of the modular polymial $\Phi_p(X, X)$. In the case $p = 2$, everything can be explicitly computed and we will give a complete classification of abelian surfaces admitting a $(2, 2)$-endomorphism. (Received September 14, 2011)