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**Reinier Broker\*** ([reinierb@microsoft.com](mailto:reinierb@microsoft.com)), One Microsoft Way, MSR 99/2943, Redmond, WA 98052, and **Kristin Lauter**. *Explicit models for Siegel modular varieties*.

Modular polynomials are explicit models for the modular curves  $Y_0(N)$  parametrizing elliptic curves together with a cyclic  $N$ -isogeny. These polynomials are used in many algorithms involving elliptic curves. In this talk we generalize this concept to the 2-dimensional case. We explain the theory surrounding Siegel modular varieties parametrizing  $N$ -isogenous 2-dimensional abelian varieties with level 3-structure. Furthermore, we describe a method to compute explicit models for these varieties and illustrate their use for explicit CM-theory. (Received September 02, 2008)