

## **On the Paramodular Conjecture**

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After reviewing modularity for abelian surfaces, we'll focus on two results:

- i) Serre's "quartic method" of 1984, used to check modularity of some elliptic curves, is adapted to do the same for abelian surfaces  $A$  of prime conductor with  $A[2]$  irreducible.
- ii) (with Ken Kramer) If, in addition,  $A[2]$  is biconnected over  $\mathbb{Z}^2$ , we give a criterion for the uniqueness of the isogeny class of  $A$ .

Both apply, in particular, to the smallest case, namely  $p = 277$ .