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**Tony Shaska\*** (shaska@risat.org) and **Andrew Obus**. *Superelliptic curves with many automorphisms and CM Jacobians*.

Let  $\mathcal{X}$  be a smooth, projective, genus  $g \geq 2$  curve, defined over  $\mathbb{C}$ . Then  $\mathcal{X}$  has *many automorphisms* if its corresponding moduli point  $\mathbf{p} \in \mathcal{M}_g$  has a neighborhood  $U$  in the complex topology, such that all curves corresponding to points in  $U \setminus \{\mathbf{p}\}$  have strictly fewer automorphisms than  $\mathcal{X}$ . We compute completely the list of superelliptic curves  $\mathcal{X}$  for which the superelliptic automorphism is normal in the automorphism group  $\text{Aut}(\mathcal{X})$  and  $\mathcal{X}$  has many automorphisms. For each of these curves, we determine whether its Jacobian has complex multiplication. As a consequence, we prove the converse of Streit's complex multiplication criterion for these curves. (Received January 15, 2022)