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Elliptic Curves with Complex Multiplication and a Relation to their Quadratic Twist.

This presentation will give a proof that every elliptic curve E over the rational numbers is isogenous to a quadratic twist if and only if E admits complex multiplication. To prove this, we use a famous result of Faltings comparing local and global isogenies of elliptic curves over number fields, and a famous theorem proven by Serre on the density of supersingular primes for elliptic curves over the rational numbers. While this result was certainly known to experts, a proof seems to not appear in the literature, my Master's thesis had for objective present this.