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Quadratic twists of an elliptic curve admitting a 3-isogeny

I'll present joint work with Manjul Bhargava, Zev Klagsbrun, and Robert Lemke Oliver. Let E be an elliptic curve over a number field, and assume E has a rational subgroup of order 3. We prove that as you vary over all quadratic twists of E , the average rank of these twists is bounded. Over \mathbb{Q} , we further show that a positive proportion of twists have rank 0 and, assuming finiteness of Sha , that a positive proportion have rank 1. We also construct many twist families with a large proportion of twists having large Sha . The bounds in these results depend on the reduction types of the curves and are completely explicit.