Stephan Ramon Garcia and George Todd* (toddg@union.edu). Supercharacters, Elliptic Curves, and the Sixth Moment of Kloosterman Sums.

We employ supercharacter theory to realize Kloosterman sums as eigenvalues of a certain matrix. We then realize the sixth Kloosterman power moment in terms of the sum of Frobenius traces of a one-parameter family of elliptic curves. As an application, we provide a simple proof that Kloosterman sums $K_u$ with $p \nmid u$ are $O(p^{2/3})$, breaking the naive $O(p^{3/4})$ barrier. (Received September 25, 2018)