1035-11-1490 **David Y Jao*** (djao@math.uwaterloo.ca), 200 University Ave. W, Dept. of Combinatorics & Optimization, University of Waterloo, Waterloo, ON N2L 3G1, Canada. *Constructing Expander Graphs using the Generalized Riemann Hypothesis.*

We present an infinite family of expander graphs obtained from prime degree isogenies between ordinary elliptic curves. Our graphs exhibit near-Ramanujan spectral expansion properties under the assumption of the Generalized Riemann Hypothesis. We show that our graphs admit an interpretation as Cayley graphs of ideal class groups, and that this characterization leads to remarkably simple constructions of infinite families of expander graphs under GRH. We also discuss the role of these graphs in the study of elliptic curve cryptography, and explain the relationship between the graph theoretic properties of these graphs and the security attributes of elliptic curve cryptosystems. (Received September 20, 2007)