We study graphs whose vertexes are supersingular elliptic curves with level structure over a field of fixed positive characteristic, and edges are isogeny of fixed degree. Looking at the convenient moduli space in mixed characteristic, we will relate the eigenvalues of the adjacency matrix of the graph to the eigenvalues of a Frobenius on a convenient cohomology group. Combining this with the Weil conjecture, we will obtain a bound on the norm of the eigenvalue of the adjacency graph. This bound shows that the graph is Ramanujian, which, among the other things, means that random walks on it have an optimal mixing time. More generally, we will show that the specturm of the adjacency matrix behaves as the spectrum of the adjacency matrix a random graph. We will also present some applications of these results to cryptography. This is a joint work with Guido Maria Lido.