Timberlake, Todd K. "Random Numbers and Random Matrices: Quantum Chaos Meets Number Theory." *American Journal of Physics* (2006) 74: 547-553.

**Abstract**. The statistical analysis of the eigenvalues of quantum systems has become an important tool in understanding the connections between classical and quantum physics. The statistical properties of the eigenvalues of a quantum system whose classical counterpart is integrable match those of random numbers. The eigenvalues of a chaotic classical system have statistical properties like those of the eigenvalues of random Hermitian matrices. The statistical properties of random numbers and eigenvalues of random Hermitian matrices are examined and the connection between these properties and the statistics of eigenvalues of quantum systems is illustrated, using the quantum standard map as an example. The relevance of these ideas to some problems in the theory of prime numbers is explored.