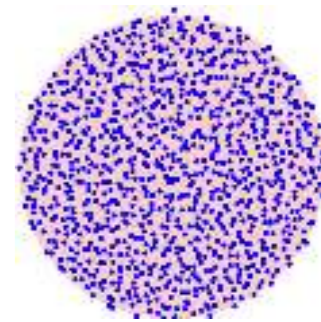# Michigan Math Club

Meeting virtually for Winter 2021
Thursdays at 4pm EST

From the Manhattan Project to Elliptic Curves

Steven J. Miller
Math Corps and
Williams College

21 January 2021

Stick around after the talk to discuss different opportunities for math REUs!

Physicists developed Random Matrix Theory (RMT) in the 1950s to explain the energy levels of heavy nuclei. A fortuitous meeting over tea at the Institute in the 1970s revealed that similar answers are found for zeros of L-functions, and since then RMT has been used to model their behavior. The distribution of these zeros is intimately connected to many problems in number theory, from how rapidly the number of primes less than x grows to the bias of primes to be congruent to 3 mod 4 and not 1 mod 4. We discuss classical RMT and report on some recent progress on understanding the zeros near the central point, emphasizing the advantages of some new perspectives and models. Much of this work is joint with Michigan students during the Williams College SMALL Summer REU.