Abstract: An $L$-function is a type of generating function with multiplicative structure which arises from either an arithmetic-geometric object (like a number field, elliptic curve, abelian variety) or an automorphic form. The Riemann zeta function $\zeta(s) = \sum_{n=1}^{\infty} n^{-s}$ is the prototypical example of an $L$-function. While $L$-functions might appear to be an esoteric and special topic in number theory, time and again it has turned out that the crux of a problem lies in the theory of these functions. Many equidistribution problems in number theory rely on one’s ability to accurately bound the size of $L$-functions; optimal bounds arise from the (unproven!) Riemann Hypothesis for $\zeta(s)$ and its extensions to other $L$-functions. I will discuss some motivating equidistribution problems along with recent work (joint with K. Soundararajan) which produces new bounds for $L$-functions by proving a suitable "statistical approximation" to the (extended) Riemann Hypothesis.

Tuesday, February 26, 2019, 4:00 pm
Mathematics and Science Center: W201