Abstract: The Riemann zeta function plays a central role in our understanding of the prime numbers. In this talk we will review some of its amazing properties as well as properties of other similar functions, the Dirichlet $L$-functions. We will then see how the method of moments can help us in the study of $L$-functions and some surprising properties of their values. Finally we will discuss some recent results about $L$-functions associated with cubic characters.