

Moments of L -functions

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Establishing asymptotic formulae for moments of L -functions is a central theme in analytic number theory. This topic is related to various non-vanishing conjectures and the generalized Lindelöf Hypothesis which is a statement about the size of L -functions in the critical strip $0 < \Re(s) < 1$. A major breakthrough in analytic number theory occurred in 1998 when Keating and Snaith established a conjectural formula for moments of the Riemann zeta function using ideas from random matrix theory. The methods of Keating and Snaith led to similar conjectures for moments of many families of L -functions. These conjectures have become a driving force in this field which has witnessed substantial progress in the last two decades.

In this talk, I will review the history of this subject and survey some recent results. If time permits, I will discuss recent joint work with Nathan Ng on the mean values of long Dirichlet polynomials which could be used to model moments of the zeta function.

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