Selberg's Central Limit Theorem

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Abstract

This talk will start with an introduction to the theory of the Riemann zeta-function $\zeta(s)$. The main topic of this talk, Selberg's central limit theorem, is an influential probabilistic result in analytic number theory. It roughly states that the logarithm of the Riemann zeta-function has an approximate two-dimensional Gaussian distribution on the line $\operatorname{Re} s = \frac{1}{2}$ as $\operatorname{Im} s \to \infty$. We will review some ideas in the proof of this theorem and give some heuristics towards it. Towards the end of the talk, we will also mention its variants and generalizations.