Large values of the Riemann zeta function in the critical strip

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One of the major aims of contemporary number theory is to understand the behavior of the Riemann zeta function in the critical strip. A famous open problems is the so-called Lindelf hypothesis, which asserts that the order of the zeta function along the line 1/2+it is bounded by an arbitrarily small power of t. In the opposite direction, lower bounds for extremal values of the zeta function are known but have not been improved for more than 40 years. In this talk we present the so-called resonance method, introduced by K. Soundararajan, which is a tool for obtaining such lower bounds for large value of the zeta function. We will explain the functionality of the method in an accessible way, discuss the relation to problems from Diophantine approximation, and indicate how a recent refinement of the method has finally lead to improved lower bounds for large values of the zeta function.