Operator Theory and Analytic Function Spaces

Large GCD sums and extreme values of the Riemann zeta function

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We prove that for every c, $0 < c < 1/\sqrt{2}$, there exists a β, $0 < \beta < 1$, such that the maximum of $|\zeta(1/2 + it)|$ on the interval $T^\beta \le t \le T$ exceeds $\exp\left(c\sqrt{\log T \log\log\log T/\log\log T}\right)$ for all T large enough. Our proof uses Soundararajan's resonance method and a special multiplicative function arising from our study of certain GCD sums.
This is joint work with Andriy Bondarenko.