Non-vanishing of automorphic $L$-functions of prime power level
Olga Balkanova, ICERM Semester Postdoc

Consider the family of $L$-functions associated to holomorphic new forms of fixed even integral weight and level $N \rightarrow \infty$. When $N$ is square-free and $\phi(N) \sim N$, Iwaniec and Sarnak proved that at the minimum $25\%$ of $L$-values do not vanish at the critical point.

This problem for the prime-power level $N=p^v$, $v \geq 2$ was investigated by Rouymi. He showed that at least $\frac{p-1}{p}\frac{1}{6}$ of all $L$-functions in the family are non-zero when $v \rightarrow \infty$ and $p$ is fixed.

In this talk, we show how to replace $\frac{p-1}{p}\frac{1}{6}$ by $\frac{p-1}{p}\frac{1}{4}$.

This is a joint work with Dmitry Frolenkov.