1093-11-233 **Djordje Milićević*** (dmilicevic@brynmawr.edu), Bryn Mawr College, Department of Mathematics, 101 North Merion Avenue, Bryn Mawr, PA 19010. *p-adic analytic twists and strong subconvexity (joint work with Valentin Blomer).*

One of the principal questions about L-functions are the so-called subconvex estimates on the size of their critical values, deeply arithmetic both in proofs and in the often spectacular consequences. For a fixed cuspidal (holomorphic or Maaß) newform f, we prove a subconvexity bound $L(f \otimes \chi, 1/2 + it) \ll_{p,t} q^{1/3+\epsilon}$ for the twisted L-function of f with a Dirichlet character χ of prime power conductor $q = p^n$ (with an explicit polynomial dependence on p and t). The Weyl subconvexity exponent achieved is the strongest available in any family of L-functions of degree higher than one. Our results, which showcase the structural relationship between p-adic analysis and the depth aspect, are obtained by exhibiting strong cancellation between the Hecke eigenvalues of f and the values of χ, which act as twists by exponentials with a p-adically analytic phase. Among the tools, we develop a general result on p-adic approximation by rationals (a p-adic counterpart to Farey dissection) and a p-adic version of van der Corput's method for exponential sums. (Received August 16, 2013)