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On the computation of the coefficients of modular forms

Abstract: An overview will be given of joint work with J-M. Couveignes, R. de Jong, F. Merkl and J. Bosman on fast computation of Galois representations associated to modular forms. This leads, for example, to algorithms that compute $\tau(p)$ in time polynomial in $\log p$, where τ is the Ramanujan τ -function, and where p is prime. Also, an application to computing the number of vectors of a given length in certain lattices will be given. For details, see the preprint on arxiv: <http://arxiv.org/abs/math.NT/0605244>. Finally, explicit examples computed by Bosman will be discussed.