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Voronoi, Sierpinski, Eratosthenes

We show how to carry out a sieve of Erastosthenes up to N in space $O(N^{1/3})$ and essentially linear time. This improves over the usual versions, which take space about $O(\sqrt{N})$ and essentially linear time. The algorithm – which, like the one in (Galway, 2000), is ultimately related to diophantine approximation – can also be used to factorize integers n, and thus to give the values of arithmetical functions such as the Möbius function μ and the Liouville function λ for all integers up to N.