For a large family of real-valued Radon measures m on  $\mathbb{R}^d$ , including the Kato class, the operators  $-\Delta + \varepsilon^2 \Delta^2 + m$  tend to the Schrödinger operator  $-\Delta + m$  in the norm resolvent sense as  $\varepsilon$  tends to zero. If the measure is moreover finite and the dimension smaller than four, the former operator can be approximated by a sequence of operators with point measures in the norm resolvent sense. The combination of both convergence results thus gives an efficient method for the numerical computation of the eigenvalues of Schrödinger operators. We illustrate the approximation by numerical calculations of eigenvalues for one simple example of measure m. This is a joint work with Johannes Brasche.