Let $H(q) = H(q, V) = -\Delta - qV(x)$ be the Schrödinger operator in $\mathbb{R}^d$ containing the coupling constant q. Denote $N(H(q))$ the number of negative eigenvalues of the operator $H(q)$. In dimension $d > 2$ the sharp estimate is known, $N(H(q)) \leq C(d)q^{d/2} \int V(x)_+^{d/2} dx$, with the constant $C(d)$ depending only on the dimension (the CLR estimate). The sharpness of the estimate manifests itself in the asymptotic formula $N(H(q)) \sim \tilde{C}(d)q^{d/2} \int V(x)_+^{d/2} dx$ as $q \to \infty$. We discuss modifications of this estimate when the Laplacian operator in $H(q)$ is replaced by the Laplacian on an infinite combinatorial or quantum graph, or, more generally, some fractional Laplacian on the graph. We see which characteristics of the graph and of the potential influence the properties of the eigenvalues of the Schrödinger operator.

The talk is based mostly upon joint papers with late Professor M.Solomyak and is dedicated to his memory.