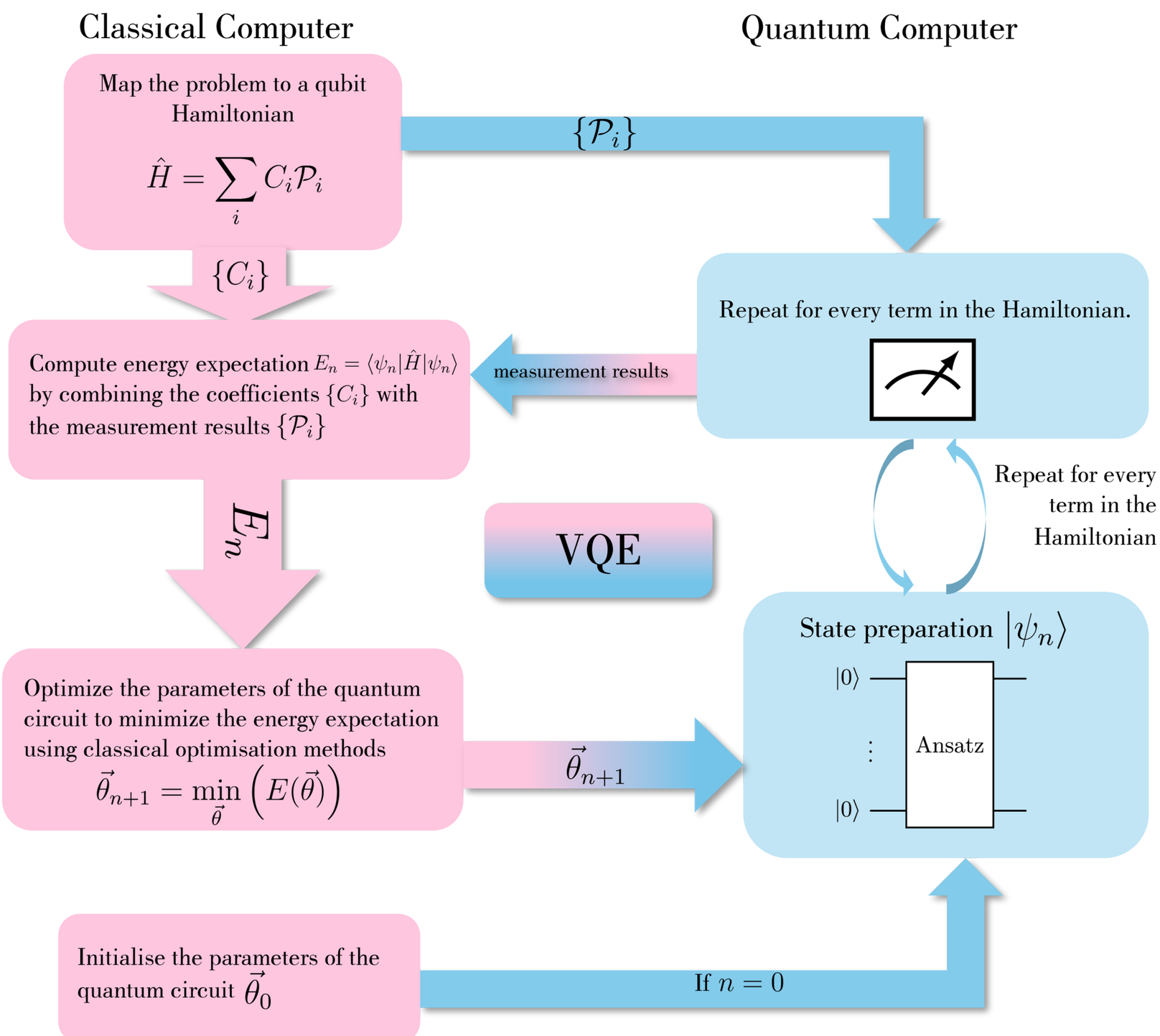
Classical Computer
Quantum Computer
Map the problem to a qubit Hamiltonian
$\hat{H} = \sum_i C_i \mathcal{P}_i$
$\{\mathcal{P}_i\}$
$\{C_i\}$
Repeat for every term in the Hamiltonian.
Compute energy expectation $E_n = \langle\psi_n|\hat{H}|\psi_n\rangle$ by combining the coefficients $\{C_i\}$ with the measurement results $\{\mathcal{P}_i\}$
measurement results
Repeat for every term in the Hamiltonian
E_n
VQE
State preparation $|\psi_n\rangle$
$|0\rangle$
$|0\rangle$
Ansatz
Optimize the parameters of the quantum circuit to minimize the energy expectation using classical optimisation methods
$\vec{\theta}_{n+1} = \min_{\vec{\theta}} \left(E(\vec{\theta})\right)$
$\vec{\theta}_{n+1}$
Initialise the parameters of the quantum circuit $\vec{\theta}_0$
If $n = 0$