Search by adiabatic evolution

- The **adiabatic theorem** ensures that under certain conditions if a system evolves slow enough, it remains in its ground state
- It is used to solve computational problem via a **time-dependent evolution**:

$$H(s) = (1-s)H_i + sH_f$$

Global adiabatic search

- Adiabatic theorem is applied globally
- Linear $s(t)$
- Time scaling: $O(N)$

Local adiabatic search

- Adiabatic theorem is applied locally
- Non-linear $s(t)$
- Time scaling: $O(\sqrt{N})$

J. Roland and N. Cerf, Quantum search by local adiabatic evolution. *Physical Review A*