

Basic idea of quantum computer

Quantum computing is the use of **quantum** phenomena such as **superposition** and **entanglement** to perform **computation**. Computers that perform quantum computations are known as **quantum computers**.^{[1]:1-5} Quantum computers are believed to be able to solve certain **computational problems**, such as **integer factorization** (which underlies **RSA encryption**), substantially faster than classical computers. The study of quantum computing is a subfield of **quantum information science**.

Quantum Superposition bit :- Contrary to a classical **bit** that can only be in the state corresponding to 0 or the state corresponding to 1, a qubit may be in a superposition of both states. This means that the probabilities of measuring 0 or 1 for a qubit are in general neither 0.0 nor 1.0, and multiple measurements made on qubits in identical states will not always give the same result.

Quantum entanglement :- Quantum entanglement is the property where 2 particles are inter-related in quantum space. This means that if a qubit is in a state in one place, then somewhere in the quantum realm, another particle will replicate the same state. This means that both are inter-dependent. This "Quantum entanglement" property is used in Quantum cryptography, where the QKD is transferred from one laptop to another using quantum entanglement

Quantum Tunneling :- Quantum tunnelling is a quantum mechanical phenomenon where a subatomic particle disappears from one side of a potential barrier and appears on the other side without any probability current (flow) appearing inside the barrier. Quantum tunnelling is not predicted by the laws of classical mechanics where surmounting a potential barrier requires enough potential energy.