

The role of quantum mechanics in modern technology

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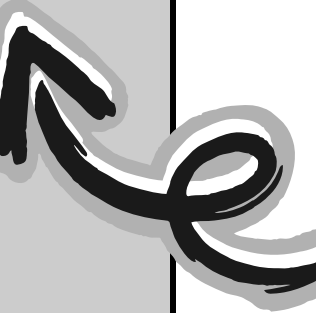
Wave-Particle Duality: Particles as Both Waves and Particles

Dual Behavior

Particles like electrons exhibit both wave and particle characteristics, demonstrating their dual nature in various experiments such as the double-slit experiment, highlighting their complexity.

Quantum Tunneling

This unique duality allows particles to tunnel through barriers, enabling significant applications in technology such as semiconductors, which form the basis of modern electronics.



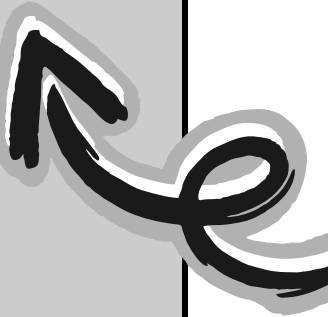
Quantum Tunneling and Semiconductors.

Concept of Quantum Tunneling

Quantum tunneling allows particles to pass through potential barriers, defying classical physics expectations. This phenomenon occurs at quantum scales where particles behave with wave-like properties.

Real-World Applications

Quantum tunneling is crucial in modern technologies, enabling the function of semiconductors and transistors. This principle underpins the operation of devices like computers and smartphones.



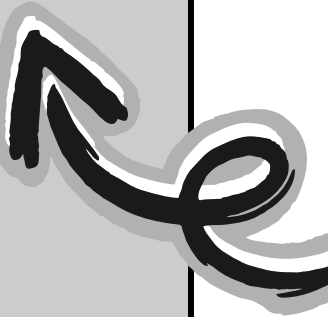
Quantum Computing: Qubits and Superposition

Qubits Explained

Qubits are the basic units of quantum information, capable of representing both 0 and 1 simultaneously due to superposition, vastly increasing computational potential.

Advantage of Speed

This unique property allows quantum computers to process complex problems much faster than classical computers, offering solutions to challenges previously deemed intractable.

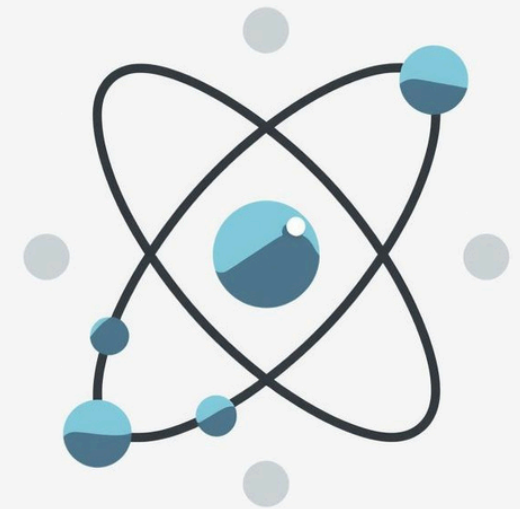


Quantum Computing: Superposition Explained



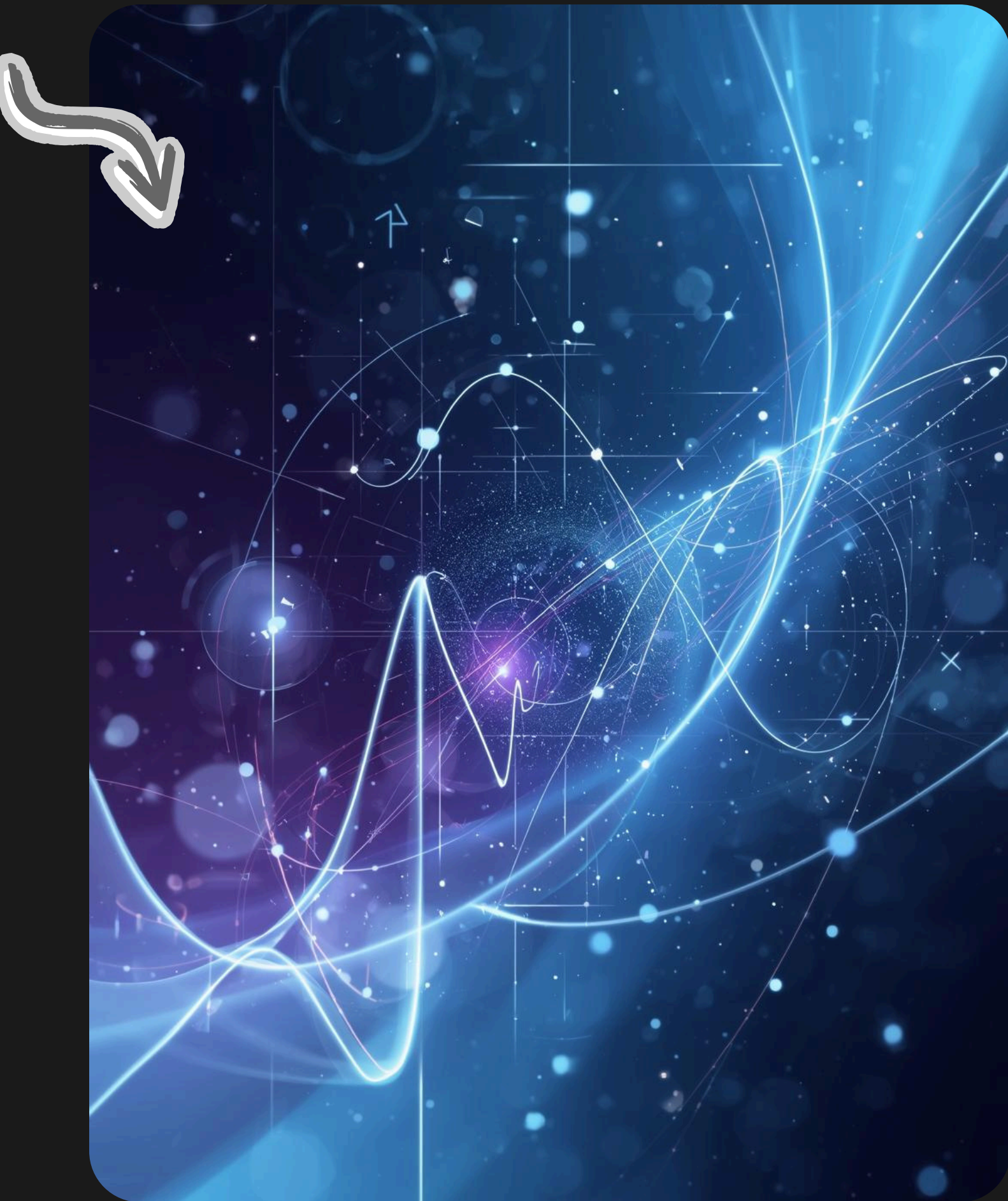
Superposition

**Represents 0 and 1
simultaneously in qubits**



Qubit

**Fundamental unit of
quantum information
processing**



THANK YOU

Any question?

References: <https://github.com/Mistouch/Informative-Speech->