



Quantum Mechanics

The strange rules of the very small that run your phone

Four strange ideas



Wave-particle duality

Light and electrons act as both waves and particles



Uncertainty

You can't know position and speed exactly at once



Superposition

A particle can be in a mix of states until measured



Entanglement

Linked particles share one state, even far apart

Quantum in everyday life

Technology	Quantum effect
Transistors and computer chips	Electrons in semiconductors
Lasers	Atoms releasing matched light
LED lights	Electrons dropping energy levels
MRI scanners	The quantum spin of atoms
GPS atomic clocks	Exact atomic energy levels

Much of today's economy runs on devices designed with quantum physics.

A short history

1

1900

Max Planck: energy comes in small packets, or quanta

2

1905

Einstein explains light as particles (photons)

3

1920s

Bohr, Heisenberg and Schrödinger build the theory

4

Today

Quantum computers are an active area of research

Sources: American Physical Society; Nobel Prize archives

Remember

Quantum rules seem strange, but they are among the best-tested ideas in science and they power modern electronics.