

Quantum Technologies

Physics

Where quantum effects are already engineering, not theory.

Quantum mechanics in working technology.

Established

Laser — stimulated emission between levels

Semiconductor — band structure and doping

MRI — nuclear spin resonance

Atomic clock — a caesium transition

LED — electron-hole recombination

Emerging

Quantum computing on superposed qubits

Quantum key distribution

Quantum sensing and gravimetry

Single-photon sources for metrology

The second is defined as 9,192,631,770 periods of a caesium-133 transition. Time itself is measured quantum mechanically.