

Tunnelling

Physics

Passing through a barrier without the energy to climb it.

Where tunnelling matters.

In nature

Alpha decay — escaping the Coulomb barrier

Stellar fusion at sub-classical temperatures

Enzyme proton transfer

Spontaneous DNA base tautomerism

In technology

Scanning tunnelling microscope imaging atoms

Flash memory writing through an oxide

Tunnel diodes for fast switching

Josephson junctions in superconductors

Probability falls exponentially with barrier width and height. A slightly thicker barrier can cut the rate by orders of magnitude.