



Quantum Tunneling + Nuclear Fusion



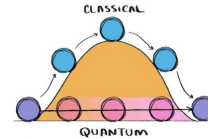
What is Quantum Tunneling?

probability of "leaking" through a barrier it classically shouldn't be able to cross. Defying classical physics, allowing fusion at lower temperatures, this is vital for stars like the Sun. In fact, our lovely Sun would have died years ago & we would have frozen our asses off if it wasn't for this

Why Quantum Tunneling? What even IS it's significance?

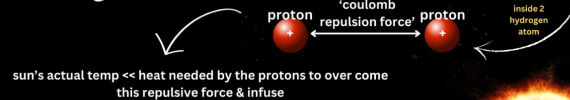
Imagine you're trying to roll a ball over a hill. In classical physics, if the hill is too high and the ball doesn't have enough energy so it won't make it over the top. However, in quantum mechanics, there's a small chance that the ball could magically appear on the other side of the hill without actually rolling over it.

Quantum mechanics: Work smart, not hard



OKAY BUT HOW DOES QUANTUM TUNNELING IN NUCLEAR FISSION TAKE PLACE IN THE SUN?

Sun= 90% Hydrogen= source of its energy



As each proton also behaves like a wave (wave-particle duality) therefore, sometimes. SOMETIMES. these protons overcome this force & overlap which is called QUANTUM TUNNELING. Although this doesn't need the excess energy like shown before, it does need extremely low temperature. And even though the rate is slow, since sun is MASSIVE, fusion happens.



CONCLUSION

Sun's core (which acts like a nuclear fusion plant), hydrogen nuclei fuse into helium. Protons overcome repulsion via quantum tunneling, initiating the process. This releases energy, sustaining the Sun's light and heat (called Nuclear Fusion), vital for life on Earth. Even though they should repel each other, they come together, releasing energy that keeps stars shining.