**Classical physics predicts that a particle can cross a potential energy barrier only if it has higher energy than barrier height. The quantum theory predicts that particle with less energy may pass from one side of the barrier to the otherside if the particle has very low mass.**

**Protons are associated with wavelengths between 1-2 Å. These wavelengths are comparable with the width of an energy barrier in a proton transfer reaction.**

**Tunneling is a consequence of wavelike property of the mater.**

**The umbrella inversion of $NH_3$, whereby the hydrogens tunnel through the potential barrier and which is responsible for the pyramidal shape – Quantum mechanical tunneling.**

**Hydrogen transfer reactions: $AH+B \rightarrow A+BH$**

**Emission of electrons from metals at low temperature under high electric field**

**Scanning Tunneling Microscope.**