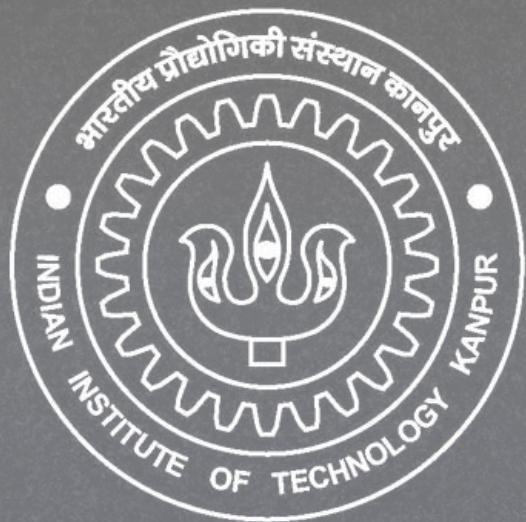
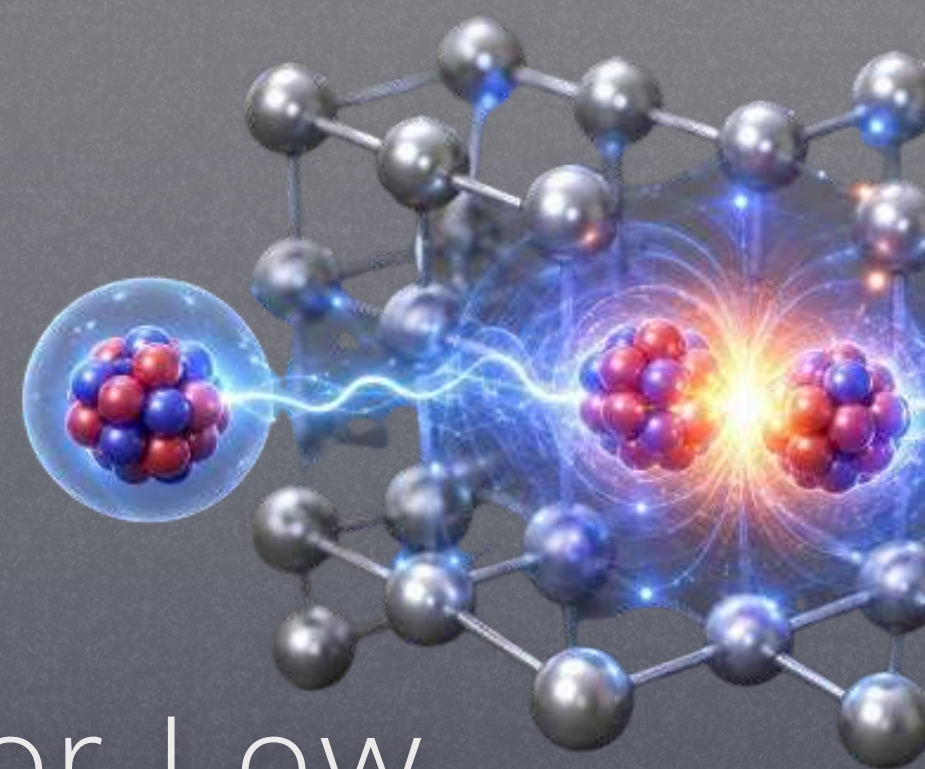
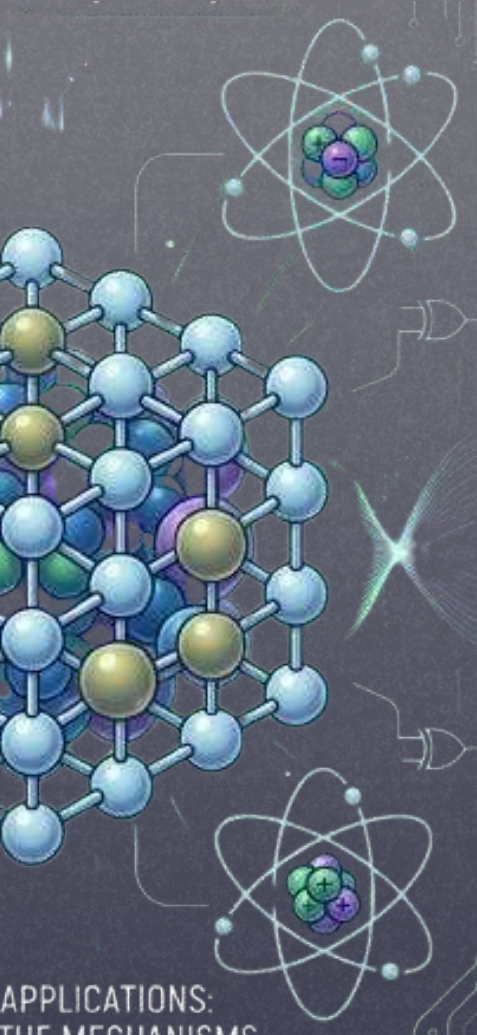




DEPARTMENT OF **PHYSICS**

INDIAN INSTITUTE OF TECHNOLOGY

KANPUR



PHYSICS COLLOQUIUM

ON

Theoretical Explanation for Low Energy Nuclear Reactions

ABSTRACT

Many experiments show that nuclear fusion reactions may take place even at very low energies at which they are expected to be very strongly suppressed due to the Coulomb barrier. We show that, at second order in perturbation theory, new processes open up in which the barrier suppression term is not as prohibitive.

One possibility is the presence of a low energy resonance. We find a fairly large cross section for these processes if the initial energy is higher than the resonance energy. If the resonance is at a higher energy than the initial state energy, we find substantial rates only in special circumstances. We also consider the inverse process of the decay of a nucleus if the initial state corresponds to a quasi-bound state of sufficiently low energy. For low energies the decay rate of such nuclei is extremely small. However, we find that presence of medium or external potential leads to considerable enhancement of decay rate of the state.

We comment on the application of our theory to the many surprising effects seen in low energy nuclear reaction experiments.

SPEAKER



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FB-382 (Prof. Amal Kumar
Raychaudhuri Seminar Room)



Friday, August 14, 2026, at 5:15
PM (Refreshments at 5:00 PM)

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