

# Photodisintegrations using High Energy $\gamma$ -beam at HI $\gamma$ S: Endeavours to Address the Few and the Many

Dr. Rajarshi Raut

*UCC-DAE Consortium for Scientific Research, Kolkata Centre, LB8, Sector-III, Bidhannagar, Kolkata-700098.*

High Intensity  $\gamma$ -ray Source (HI $\gamma$ S) of Triangle Universities Nuclear Laboratory (TUNL) is the most intense source of monoenergetic  $\gamma$ -beam in the world. HI $\gamma$ S, thus, presents diverse experimental possibilities with relevance in a multitude of domains ranging from few-body physics, nuclear astrophysics, nuclear structure studies and photo-activation measurements. In this presentation, we shall discuss two different experiments on the cross-section measurements of  $\gamma$ -induced reactions. One of them is the  ${}^4\text{He}(\gamma, p){}^3\text{H}$  photodisintegration reaction that is of significance in the domain of few-nucleon physics, for instance, in the understanding of the three-nucleon force. The other is the  ${}^{86}\text{Kr}(\gamma, n){}^{85}\text{Kr}$  reaction which is important for probing the  $s$ -process branching point at  ${}^{85}\text{Kr}$  that has a profound impact on the  $s$ -process modelling in Asymptotic Giant Branch (AGB) stars.