BOSE INSTITUTE COLLOQUIUM

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Google Meet platform
Link: meet.google.com/ssy-uhgn-pjm

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will present

Manifestation of Classical Motions in the Quantum World of Nuclei

All the objects in the Universe can be divided in to two broad categories. First, the relatively large “classical objects”, the motions of which are described by the Newtonian mechanics, for example, the motion of earth around the sun or the rotational motion of a top. On the other hand, the tiny objects like, atoms and nuclei obey an entirely different mechanics, the quantum mechanics. It was the genius minds of Aage Bohr, Ben Mottelson and James Rainwater who were able to describe discrete quantum energy levels of certain nuclei, which deviate from their spherical symmetry, in analogy with the motion of a classical top. They got Nobel Prize in Physics in 1975 for their work and it remains, since then, an intense field of research in nuclear structure physics, both theoretically and experimentally. With the technological advancement, it is now possible to experimentally identify different manifestations of their simple model in nuclei. With the help of the Cyclotron accelerator at VECC, Kolkata, we use nuclear reactions with energetic light- and heavy-mass projectiles, to excite different modes in deformed (both axially symmetric and axially asymmetric) nuclei and identify them by detecting the gamma rays, they emit, in an array of clover HPGe detectors, a state-of-the-art modern semiconductor detector for the detection of gamma rays. I shall discuss about our very recent findings of wobbling motion in ^{183}Au nucleus, which is a common phenomenon for an asymmetric top in the classical world but an extremely rare one in atomic nuclei.