



NUSTAR special Seminar

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<https://indico.gsi.de/event/25890/>

Monday, September 21 2026 at 01.30 pm CEST

Theory seminar room SB3 3.170a

<https://gsi-fair.zoom-x.de/j/67700560800>

Meeting-ID: 677 0056 0800

Kenncode: 906737

Deformed nuclei at rest and in motion

I will talk about the motion of deformed objects in quantum mechanics from two different viewpoints.

One viewpoint is as to how a deformed object shows rotational features. Does it rotate as a rigid body does in classical mechanics, or is there a different mode? Both are YES! In quantum mechanics, there are dual modes of rotational motion, and one of the two has a link to classical mechanics. These modes are called compact-object rotation and distant-object rotation. The former occurs with ellipsoidal shapes (many deformed nuclei), while the latter with clustering (^8Be , Hoyle state & many atomic molecules) with a classical link.

Both are formulated in the same way, but different parts of the Hamiltonian are responsible for them.

The second viewpoint is the time evolution of the deformed object. The eigenstate is a superposition of the so-called intrinsic state oriented in different directions. This superposed state is a stationary solution. What about the individual intrinsic state? Does it stay like that forever? I would like to discuss this subject with a new concept, standing time. This may be related to Relativistic Heavy-Ion Collision, sub-barrier fusion as well as many other cases such as fission and alpha decay/emission, etc.

Convener: M. Gorska
Secretary: R. Krause
Organized by: T. Dickel