

# Shape dynamics and metastability in heavy atomic nuclei

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## **Abstract**

The nuclear shape emerging as a consequence of the shell structure modifies in turn the latter in a way that both of them in unity govern the dynamical properties and stability of the nucleus. In this talk we address the mutually complementary roles of the shapes and shells in the forming of spectroscopic properties, dynamics and metastability in certain mass regions of heavy atomic nuclei. We illustrate the interrelationship between the manifestation of reflections-asymmetric shapes and the emergence of  $K$ - isomerism, pointing out the common shell structure roots of both phenomena. An overall theoretical framework for the study of quadrupole-octupole spectra and  $K$ - isomeric states with the attendant transition rates will be outlined. Some current advances and further development of collective and microscopic approaches to the problem will be discussed.