



Contribution ID: 333

Type: **Plenary Talk (Invitation Only)**

## Nuclear shape dynamics in low-energy heavy-ion reactions

*Wednesday, 28 May 2025 10:00 (30 minutes)*

It has been well known that nuclear collective excitations significantly affect heavy-ion reactions at energies around the Coulomb barrier in several different ways. One of the most well known examples is a large enhancement of fusion cross sections at subbarrier energies due to nuclear deformation. Nuclear deformation is relevant also to fusion for superheavy elements as well as reaction cross sections at intermediate energies. Recently, there have also been many discussions on relativistic heavy-ion collisions from a view point of a possible probe of nuclear deformation. In this contribution, I will discuss recent theoretical developments in low-energy heavy-ion reactions, putting emphasis on nuclear deformation. This includes, i) a new attempt to visualize nuclear scattering, ii) fusion of odd-mass systems, and iii) a shell model approach to nuclear shape dynamics in heavy-ion reactions. I will also discuss the role of nuclear shape dynamics with several adiabaticity, which would be important in discussing relativistic heavy-ion collisions.

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**Session Classification:** Plenary Session

**Track Classification:** Nuclear Reactions