

# The Nuclear Shell Model; a Long and Winding Road

*Monday, July 22, 2024 9:30 AM (25 minutes)*

In my presentation commemorating the 75 years gone since the founding papers of Maria Goeppert-Mayer and Hans Jensen, I will give a personal view of the evolution of the shell model approach to the structure of the atomic nucleus. The virtues and the limitations of the original independent particle model (IPM) and its microscopic justification will be discussed, as well as its fundamental role providing the natural basis in the Fock space for the present shell model with configuration interaction (SM-CI) approaches. I will stress the importance of the SU(3)-like underlying symmetries of the IPM, discovered by Elliott. Our modern understanding of the effective interactions will be highlighted as well. I will review the recent advances that have made of the SM-CI description an unified view of nuclear structure, able to describe deformed and superdeformed states at the same footing than single particle degrees of freedom. A final word will be said about shape coexistence and the occurrence of Islands of Inversion in (neutron) semi-magic, very neutron rich nuclei.

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**Session Classification:** Reflections on the Shell Model