# Departement de Physique Nucléaire



# Séminaire

## le vendredi 24 janvier 2020 à 11h

CEA Saclay, Orme des Merisiers, Bât. 703, Salle 135

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# Multiple shape coexistence in the cadmium isotopes

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Detailed studies of the Cd isotopes, performed over the past two decades, have revealed systematic deviations from the expected properties for vibrational excited states [1]. Recently, using high-statistics data from $\gamma$-ray spectroscopy following $\beta$-decay, we found evidence for bands built on excited $0^+$ states in both $^{110}$Cd and $^{112}$Cd, and also evidence for a sequence of states with $\Delta I = 1$ built on excited $2^+$ states [2]. Comparison with beyond-mean-field calculations provided a qualitative agreement, and led to the interpretation that the excited $0^+$ state were built on multiple shapes [2]. The possibility of multiple shape coexistence occurring in the Cd isotopes represents a fundamental change in their interpretation. To test these ideas, new studies have been initiated that will probe the shapes of the excited states.

This talk will follow the evolution of the interpretation of the structure of the mid-shell Cd isotopes, from their early identification as vibrational nuclei, the mystery posed by the additional low-lying $0^+$ states, the solution with the elucidation of the intruder excitations and their exaltation as textbook examples of nearly harmonic vibrational motion, and finally the suggestion that they posses multiple shape coexistence.

[1] P.E. Garrett, K.L. Green, and J.L. Wood, Phys. Rev. C **78**, 044307 (2008).
[2] P.E. Garrett *et al.*, Phys. Rev. Lett. **123**, 142502 (2019).

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*Le café sera servi 10 minutes avant*