The magic number N=28 and the spin-orbit interaction.

O. Sorlin

GANIL, Caen, France

The N=28 shell closure is the first arising from the spin-orbit forces. Therefore, its evolution in nuclei with large neutron to proton excesses is intimately connected to that of the spin-orbit interaction. From the doubly magic $^{48}_{20}Ca_{28}$ to the close to drip line $^{42}_{14}Si_{28}$ nucleus, a wealth of nuclear structure modifications is occurring, starting from spherical, prolate-spherical co-existence to oblate shapes. Surprisingly this dramatic structural change does not occur for the *N=20* isotones which remain remarkably spherical between the $^{40}_{20}Ca_{20}$ and $^{34}_{14}Si_{20}$ nuclei. By using up to date experimental data along the N=28 isotonic chain, such as (d,p) transfer reaction, in-beam γ-ray spectroscopy, Coulomb excitation, isomeric transitions, the underlying physics origin for the dramatic structural modifications at the N=28 shell clsoure will be emphasized. Among these, the action of tensor forces and the central density dependence of the spin-orbit interaction will be commented.