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SÉMINAIRE

Nuclear-structure studies using ion traps and lasers at ISOLDE/CERN

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ISOL TRAP

Since their introduction to nuclear physics more than thirty years ago, ion traps have gradually become key tools for low-energy experiments with radioactive ion beams, either in the preparation or in the final measurement stage. During the last years, the development of new ion-trap devices and measurement methods at ISOLDE has helped measure the masses of very neutron-rich nuclides, coming tantalizingly close to 78Ni, a doubly closed-shell nucleus of crucial importance for understanding the fate of nuclear shell structure towards the dripline. The alliance of ion traps to other techniques has also allowed performing new types of experiments, a recent example being the trap-assisted laser spectroscopy of mercury isotopes, in a large ISOLDE campaign which has mapped one of the most spectacular regions of nuclear deformation and shape coexistence of the nuclear chart.

In this talk, I will present some of these recent developments involving the ISOLTRAP experiment of ISOLDE/CERN and its ion traps, as well as some of the resulting physics with mass measurements and laser spectroscopy. In the end I will present the S3 low energy branch of SPIRAL2, a new-generation setup taking the combination of laser spectroscopy and ion traps to a new level of resolution and to new regions of the nuclear chart.