

Séminaire AXE 1 - Sciences et Matériaux Quantiques



Mardi 05 Novembre 2024 | 11:00 | Auditorium de l'IPCMS

Cyrille Solaro

European Center for Quantum Sciences (CESQ-ISIS)

Université de Strasbourg, CNRS

solaro@unistra.fr

Testing fundamental physics via precision spectroscopy of trapped and cold molecular ions

In recent years, remarkable achievements in the cooling, trapping and quantum state control of atoms and ions enabled spectroscopic measurements with unprecedented precision. Similarly precise spectroscopic measurements on molecules would open up a range of new scientific perspectives for applications in fundamental physics as well as in quantum technologies. In this context, molecular ions, which can be trapped independently of their internal structure and “sympathetically” cooled via their Coulomb interaction with co-trapped laser-cooled atomic ions, provide a rich playground.

In this talk, I will present the research direction I am taking at the European Center for Quantum Sciences to search for time-variations of the proton-to-electron mass ratio. In particular, I will discuss complementary spectroscopic methods based on action spectroscopy and photon recoil spectroscopy of trapped and cold molecular ions. Finally, I will present results obtained while working at Aarhus University on high-resolution frequency-comb-driven Raman spectroscopy to search for bosons beyond the standard model.