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## **CRIS: A Toolbox for Exploring Quantum Many-body Problems**

*Tuesday 5 December 2017 14:10 (30 minutes)*

The Collinear Resonance Ionization Spectroscopy (CRIS) apparatus at ISOLDE-CERN [1] provides a powerful tool to perform highly-efficient and precise hyperfine structure measurements on isotopes produced at rates lower than 100 ions/s [2]. Such measurements allow the extraction of observables that are key for our understanding of the nuclear many-body problem: nuclear ground-state spins, electromagnetic moments, and changes in the root-mean square charge radii. Moreover, a precise knowledge of the interaction between the atomic nucleus and the surrounding electrons offers an important benchmark to test the validity of atomic many-body methods and weak interaction Hamiltonians used in studies of fundamental symmetries [3].

This contribution will present the recent developments that have allowed the extension of collinear resonance ionization spectroscopy in the potassium, copper and indium isotopic chains at extreme regions in the nuclear chart. The relevance of these results in connection with the recent advances in nuclear and atomic theory will be discussed. Future experimental programs focused on studying exotic isotopes around doubly-magic nuclei will be presented.

[1] K.T. Flanagan et al. Phys. Rev. Lett. 111, 212501 (2013).

[2] R.P. de Groote et al. Phys. Rev. C 96, 041302(R) (2017).

[3] R.F. Garcia Ruiz et al. Submitted (2017).

**Authors:** Dr GARCIA RUIZ, Ronald Fernando (The University of Manchester); CRIS COLLABORATION

**Presenter:** Dr GARCIA RUIZ, Ronald Fernando (The University of Manchester)

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