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ISOLDE: Facility and Status

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Solid state Physics research at ISOLDE (CERN) has been running since the mid-1970s and accounts for about 10-15% of the overall physics programme. ISOLDE is the world flagship for the on-line production of exotic radioactive isotopes, with high yields, high elemental selectivity and isotopic purity. Consequently, it hosts a wide variety of state-of-the-art nuclear techniques which apply nuclear methods to research on life sciences, material science and bio-chemical physics. The ease of detecting radioactivity < 1 ppm concentrations –is one of the features which distinguishes the use of radioisotopes for materials science research. The manner in which nuclear momenta of excited nuclear states interact with their local electronic and magnetic environment, or how charged emitted particles interact with the crystalline lattices allow the determination of the location, its action and the role of the selected impurity element at the nanoscopic state. ISOLDE offers an unrivalled range of available radioactive elements and this is attracting an increasing user community in the field of nuclear solid state physics research and brings together a community of materials scientists and specialists in nuclear solid state techniques [1].

This talk will present an overview of the ISOLDE facility, along with a brief introduction to the current nuclear physics programme before concentrating on the use of radioisotopes for solid state physics research.

[1] K. Johnston, J. Schell, J. G. Correia, M. Deicher, H. P. Gunnlaugsson, A. S. Fenta, E. David-Bosne, A. R. G. Costa and Doru C Lupascu, *Journal of Physics G: Nuclear and Particle Physics*, 44 (2017) 104001

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