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The solid state Physics programme at ISOLDE-CERN

Tuesday, September 23, 2025 2:00 PM (30 minutes)

ISOLDE-CERN is the worldwide reference facility for the production and delivery of radioactive ion beams of high purity. Since the late 70s the laboratory is pioneer in the use of nuclear techniques for studying local properties of materials using high-technology equipment [1]. For instance, the brand-new ultra-high-vacuum implantation chamber called ASPIC's Ion Implantation chamber (ASCI) [2] decelerates the radioactive ion beam delivered at ISOLDE-CERN allowing to perform ultra-low energy ion implantations, and local measurements on the surface and interface of materials. The new MULTIPAC setup for Perturbed Angular Correlation Experiments in Multiferroic (and Magnetic) Materials [3] consists of a unique cryogenic magnetic system that simultaneously allows to measure local magnetic and ferroelectric properties of materials in magnetic fields up to 8.5 T. Last, but not least, the eMIL-Setup [4] is an advanced emission Mössbauer spectrometer for measurements in versatile conditions of several classes of materials, thanks to the emission Magnetic Mössbauer Analyzer (eMMA) extension [5]. This presentation introduces the new setups as powerful tools and discuss the possibilities of investigations on the frontiers of solid-state physics research.

[1] K. Johnston et al., Journal of Physics G: Nuclear and Particle Physics 44 (2017) 104001.

[2] K. v. Stiphout et al., Crystals 12(5) 2022 626.

[3] J. Schell et al., Letter of Intent to the ISOLDE and Neutron Time-of-Flight Committee (2023) CERN-INTC-2023-012 / INTC-I-249.

[4] D. Zyabkin et al, Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 968 (2020) 163973.

[5] P. Schaaf et al., Letter of Intent to the ISOLDE and Neutron Time-of-Flight Committee (2020) CERN-INTC-2020-008 / INTC-I-211.

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