



Contribution ID: 693

Type: **Invited Talk for Parallel Sessions (Invitation Only)**

The solid state Physics programme at ISOLDE-CERN: materials for the society

Tuesday, 27 May 2025 11:00 (25 minutes)

An important scientific challenge to obtain renewable energy-harvesting solutions for a sustainable future requires the investigation of materials functionalities down to the atomic scale. ISOLDE-CERN is the worldwide reference facility for the production and delivery of radioactive ion beams of high purity. The produced beam is dedicated to many different purposes for, e.g., atomic and nuclear physics, astrophysics, material science, biophysics, and medical research. 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 (ASCII) [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 [5] with green materials.

[1] <https://doi.org/10.1088/1361-6471/aa81ac>

[2] <https://doi.org/10.3390/cryst12050626>

[3] <https://cds.cern.ch/record/2845935/files/INTC-I-249.pdf>

[4] <https://doi.org/10.1016/j.nima.2020.163973>

[5] <http://cds.cern.ch/record/2705975/files/INTC-I-211.pdf>

Primary author: SCHELL, Juliana (ISOLDE-CERN, Universität Duisburg-Essen)

Presenter: SCHELL, Juliana (ISOLDE-CERN, Universität Duisburg-Essen)

Session Classification: Parallel Session

Track Classification: Applications Based on Nuclear Physics