Contribution ID: **178** Type: **Plenary Presentation (by invitation only)**

Spin-polarized exotic nuclei and beta-NMR: from fundamental interactions, via nuclear structure, to material science, biology and medicine.

Tuesday, 19 October 2021 17:20 (30 minutes)

This talk is devoted to versatile studies with spin-polarized radioactive nuclei, which make use of asymmetric emission of decay radiation. This feature is often combined with nuclear magnetic resonance, resulting in the beta-NMR technnique, which is up to 10 orders of magnitude more sensitive than conventional NMR. In my CERN-ISOLDE experiment we have just used it to determine magnetic dipole moments of short-lived nuclei with part-per million accuracy.
In this talk I will introduce the principles of laser polarisation, asymmetric beta decay, and beta-NMR. I will then concentrate on recent highlights from different fields of research: mirror decays for CKM-matrix unitarity studies, beta-NMR in solids for material science and in liquids to determine accurate nuclear magnetic moments, and to perform studies in chemistry and biology. I will also mention the gamma-MRI approach, which can combine the high sensitivity of PET and SPECT techniques with high spatial resolution of MRI.

Primary author: KOWALSKA, Magdalena (CERN)

Presenter: KOWALSKA, Magdalena (CERN)

Session Classification: Plenary Presentations

Track Classification: Plenary sessions: Plenary presentations