



# NATO Advanced Research Workshop

RPTU

## Functional Spintronic Nanomaterials for Radiation Detection and Energy Harvesting



### **Tailoring the magnetic and spintronic properties of materials by ion beam irradiation and doping**

<sup>1</sup>\*Facsco, S.

\*lead presenter

<sup>1</sup>s.facsco@hzdr.de, Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf e.V., Germany

The Ion Beam Center (IBC) at the Helmholtz-Zentrum Dresden-Rossendorf is a leading European user facility for basic and application-oriented studies in the field of physics and materials science with ion beams. The IBC operates various accelerators, implanters and low-energy machines with dedicated end-stations for ion beam analysis and ion beam modification. Broad, focused and highly charged ion beams of almost all stable elements in a wide energy range from eV to MeV are provided free of charge to users from academia.

The research focus of the IBC together with the colleagues from the center is on the modification and analysis of novel materials for information technology, electronics, spintronics or energy systems.

Ion irradiation and implantation are used since many decades as a “universal tool” for materials modification and thus ion beams have great potential for current materials research and industrial applications. The magnetic and spintronic properties of thin films can be tailored by controlled doping, defect creation and by means of focused ion beams, also by creating complex, hybrid structures. In my talk, I will present general aspects of ion-solid interaction, methods of ion induced materials modifications, and prominent examples of applications in magnetism and spintronics.