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Research Interest:



Structural, electronic, magnetic, caloric and transport properties of different classes of materials, bulk, thin films, core-shell like:

- rare-earth 3d transition metals intermetallic compounds
- half metals
- nanostructured materials
- transition metals oxides

We are interested in:

1. preparation of new classes of materials
2. complete characterization by means of:
 - X-ray diffraction,
 - X-ray photoelectron spectroscopy (XPS)
 - Transmission electron microscopy
 - susceptibility,
 - magnetization,
 - specific heat, electric properties,
 - Mossbauer effect,
 - muon spin rotation and relaxation (μ SR)
3. possible technical application like permanent magnets, sensors, magnetic refrigeration, nanomedicine (magnetoplasmonic și nanolipozomes magnetic nanoparticles for the separation and detection on exosomes derived from tumors, magnetoelectric nanoparticles for cancer treatment), spintronics

Equipments:

- preparation: arc melting, induction furnace melting, high energy ball milling, magnetron sputtering, spin coating, 1200°C Vacuum Furnace
- Bruker D8 Advance X-ray diffractometer (structure, texture, internal stress and particles distribution in the temperature range of 77-1000 K
- 12 T VSM Cryogen free magnetometer from Cryogenics for magnetic and caloric measurements: Temp. range 4.2-700 K
- 7 T VSM Cryogen free for magnetotransport measurements
- Faraday type balance, max. 1 T, temp. up to 1000K
- Hyperspectral microscope
- XPS (in collaboration)
- TEM, SEM, EDX (in collaboration)
- μ SR (In collaboration)
- Neutron diffraction (In collaboration)

Supplementary informations: <http://www.phys.ubbcluj.ro>
<http://www.phys.ubbcluj.ro/ursu/ccfscm.htm>