

Deputy Head: Dr I.E. Stamatelatos, Physicist (MSc, PhD), Researcher A' [ion\(at\)ipta.demokritos.gr](mailto:ion(at)ipta.demokritos.gr)

 2106503712  2106533431

R&D activities at Research Reactor Laboratory:

- Nuclear Technology & Radiation Protection
 - Neutronic analysis of reactor core
 - Criticality, safety, fuel burn-up
 - Thermohydraulics
 - Nuclear Instrumentation
 - Shielding optimization
 - Characterization of radioactive waste using non-destructive techniques
 - Development of nuclear techniques for analysis of large volume environmental and cultural heritage samples and biomedical applications
 - Study of leaching mechanisms of ions incorporated in blocks of solidified waste
- Materials and Nanotechnology
 - Magnetic thin films studied by neutron scattering techniques and magnetic measurements
 - Electrical, magnetic and structural properties of ITER and other Fusion related materials
 - Radiation damage in SiC/SiC fusion materials
 - Porosity of graphites by neutron scattering techniques
 - Oxidization resistance in multilayered structures
 - Oxidization phenomena studies of thin films of SiC
 - Oxidization of ITER first wall materials studied by neutron reflectivity
 - Development of multilayered structures for aerospace applications
 - Neutron scattering on rare-earth molybdates
 - Amorphous bulk magnetic materials
 - Trace element analysis and induced activity evaluation of fusion related materials (Eurofer 97, SiC/SiC)
- Environment
 - Study of nanomaterials for environmental applications using neutron and X-ray techniques
 - Study of surface phenomena
 - Study of interactions of geological materials with selected actinides
 - Trace element determination in environmental samples using neutron activation techniques
- Health
 - Determination of extra-cellular space in children with burn injuries via neutron activation analysis of bromine
 - Toxic trace elements in tissues and biological fluids
 - Small animal body composition studies
 - Elemental analysis of large volume biomedical samples using neutron activation technique
- Cultural Heritage
 - Non-destructive, multi-element analysis of whole artifacts for provenance and authenticity studies using large sample neutron activation technique
- Infrastructure development
 - Design and development of neutron Time-of-Flight apparatus
 - Neutron optical devices
 - Neutron detection electronics
 - Neutron monochromatization
 - Automation and control of micro-positioning devices
 - Development of data acquisition systems
 - High and low temperature apparatus

- Software development for
 - Data acquisition
 - Neutron scattering data analysis
 - Neutron detection
 - Instrument control