

**Ph D in Materials for Sustainable Development**  
**Teaching Activity 2023/24**

**MATERIALS CHARACTERIZATIONS WITH NEUTRONS**

Professor Giovanni Romanelli (giovanni.romanelli@uniroma2.it)

*Location:*

**TO BE DEFINED**

*Calendar:*

8 July 14:00 - 16:00

9 July 14:00 - 16:00

12 July 14:00 - 16:00

15 July 14:00 - 16:00

18 July 14:00 - 16:00

***Syllabus***

Fundamentals of the neutron scattering technique: the interaction of neutrons with condensed matter, coherent and incoherent scattering; elastic and inelastic scattering.

Neutrons to study the structure and dynamics of materials: examples of vibrational spectroscopy on organic molecules and polymers, molecular diffusion in porous materials, neutron diffraction using isotope substitution, small angle scattering with neutrons.

Industrial applications: neutron induced radioactivity and transmutations, neutron activation analysis, neutron imaging for in-situ and operando investigations.

Access to neutron facilities: reactor and spallation neutron sources, picking the best beamlines for an experiment, user programs and proposal writing.