

## Spectroscopic Techniques Applied to the Study of Heritage

### Non Destructive Spectroscopic Techniques Applied to the Study of Heritage Materials

#### Need or problema that solves

Cultural heritage is an asset to be protected, restored and preserved. These processes require the characterisation of these materials without destroying them or accelerating the processes of deterioration.

- Design and characterisation of materials
- In situ characterisation techniques
- Surface-enhanced Raman Spectroscopy (SERS)
- Sensor design
- New tools for data generation, fusion and exchange.

#### Innovative aspects

- Characterise and identify both organic and inorganic compounds
- Perform non-destructive and in situ analysis
- Detection of low concentrations ( $10^{-6}$  -  $10^{-9}$  M)
- Counterfeits identification

#### Equipment

Raman and infrared laboratory equipped with:

- Renishaw InVia Reflex Raman spectrophotometer with 325 and 442 nm (HeCd laser), 532 nm (Nd:YAG laser), and 785 nm (diode laser) excitation lines. It has a streamline mapping system.
- Infrared spectroscopy, ATR and reflection (Compact Spectrometer, Bruker Alpha II).
- NIKON optical stereomicroscope (SMZ800N)
- Confocal micro-Raman equipped with 514.5 nm (Ar<sup>+</sup> laser), 632.8 nm (He/Ne laser), and 785 nm (diode laser) lasers.
- FT-Raman spectrophotometer with a 1064 nm excitation line (Nd:YAG laser).
- Portable Raman equipped with 785 nm excitation line (diode laser).

UV-Vis laboratory consisting of:

- UV-VIS spectrophotometer with integrating sphere. Spectral region (200-3300nm).

#### Contact

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#### KEYWORDS

- Raman
- SERS
- Portable techniques
- FTIR

#### POTENTIAL END USERS

Restoration, conservation and building companies.

Nanotechnology companies.

#### TECHNIQUES

- Micro Raman
- Portable Raman
- FT-Raman
- UV-vis
- Infrared spectroscopy