UNIVERSITÀ DEGLI STUDI DI PADOVA

DiSC

Tuesday **October the 29th 2024**, at **15:30**, room E

Prof. Giorgia Sciutto

Department of Chemistry, University of Bologna
Bologna, Italy

will provide a seminar lecture about:

Chemometrics and spectral imaging: the good match!

In the last decades, spectral imaging systems have gained increasing interest as a diagnostic tool in different analytical field thanks to some attractive advantages offered by the approach, such as the possibility of obtain, in a non-invasive way, information on the spatial distribution of components. These systems acquired information across different wavelengths, including ultraviolet, visible, infrared, and near-infrared ranges, providing both chemical and spatial information about the sample.

Chemometrics is a chemical discipline that applies mathematical and statistical methods to design or optimize experimental procedures and maximize chemical information through the analysis of chemical data. Chemometric methods help to interpret the large volumes of data generated by spectral imaging, identifying chemical components, detecting anomalies, or classifying regions within a sample.

The lecture will focus on introducing the principles of multivariate data analysis and spectral imaging, with examples of their application in cultural heritage, forensic science, and environmental analytical studies.

Bibliography:

- Catelli, Emilio, et al. "Towards the non-destructive analysis of multilayered samples: A novel XRF-VNIR-SWIR hyperspectral imaging system combined with multiblock data processing." Analytica Chimica Acta 1239 (2023): 340710.Xx
- Malegori, Cristina, et al. "Near-infrared hyperspectral imaging to map collagen content in prehistoric bones for radiocarbon dating." Communications Chemistry 6.1 (2023): 54.
- Piarulli, Stefania, et al. “An effective strategy for the monitoring of microplastics in complex aquatic matrices: Exploiting the potential of near infrared hyperspectral imaging (NIR-HIS).” Chemosphere 286 (2022): 131861.
- de Oliveira, Rodrigo Rocha, et al. "PoliBrush–A user-friendly software to aid multivariate image analysis dissemination." Chemometrics and Intelligent Laboratory Systems 240 (2023): 104918.

Your attendance would be greatly appreciated.

Guested by
Lucio Litti

Il Direttore del Dipartimento
Stefano Mammi