

# A Novel Multimodal Optical Microscope for the comprehensive mapping of micro-samples in Cultural Heritage: integrating Raman and Photoluminescence spectroscopy with Multivariate Analysis

Alessia Di Benedetto<sup>(1)</sup>, Serena Benelli<sup>(2)</sup>, Gianluca Valentini<sup>(1)</sup>, Daniela Comelli<sup>(1)</sup>

<sup>(1)</sup> Physics Department, Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133 Milan, Italy

<sup>(2)</sup> Department of Architecture, Built Environment and Construction Engineering, Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133 Milan, Italy

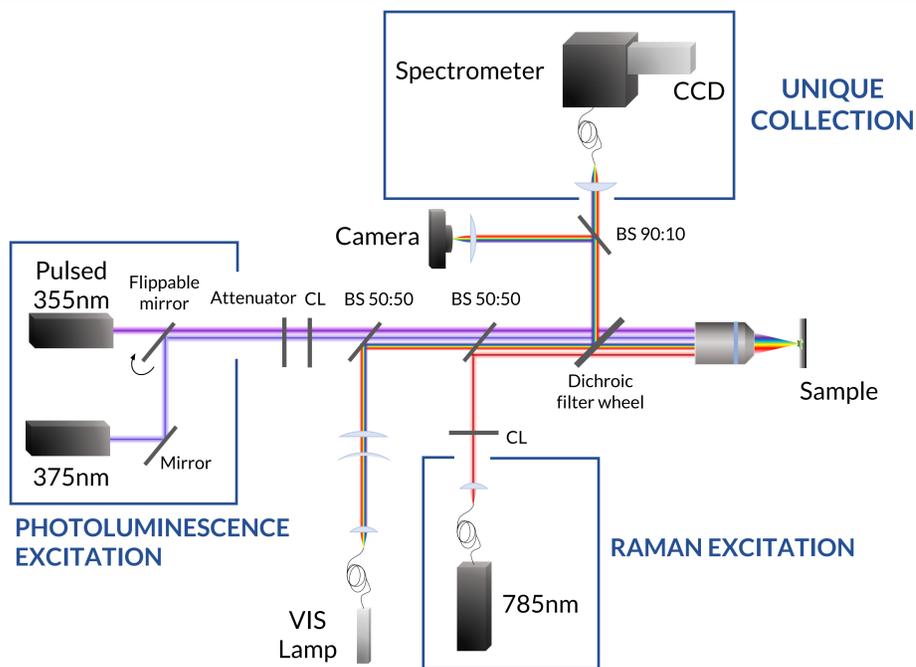
## INTRODUCTION

- Multimodal imaging
  - comprehensive understanding of complex samples
  - Raman and photoluminescence spectroscopies complementary optical techniques
  - Mapping spatial distribution
- Retrieve the chemical mapping of a  $\mu$ -sample surface through a raster scanning approach

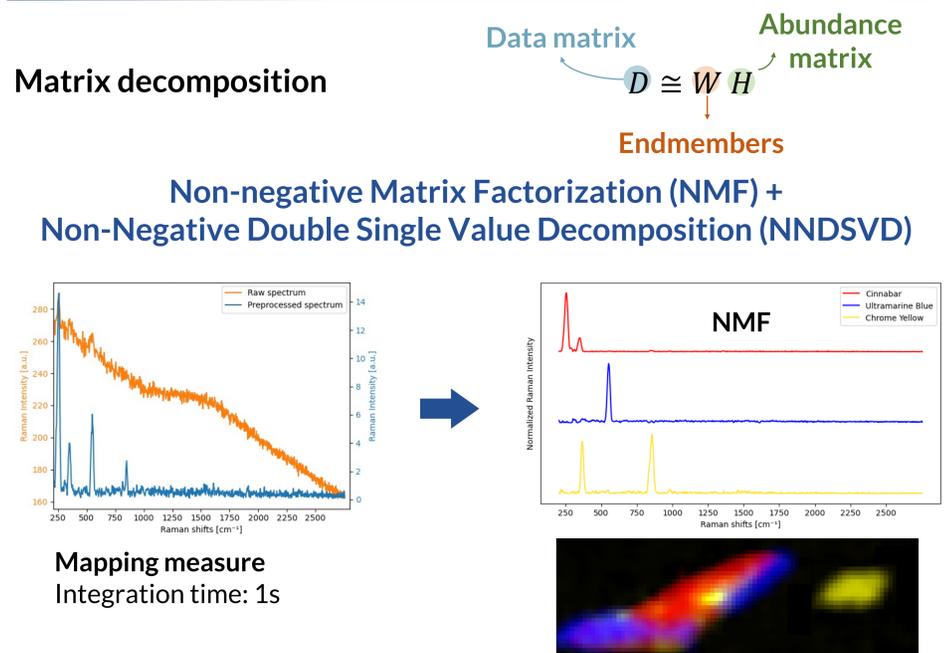
IN A SINGLE SETUP!



## METHODS

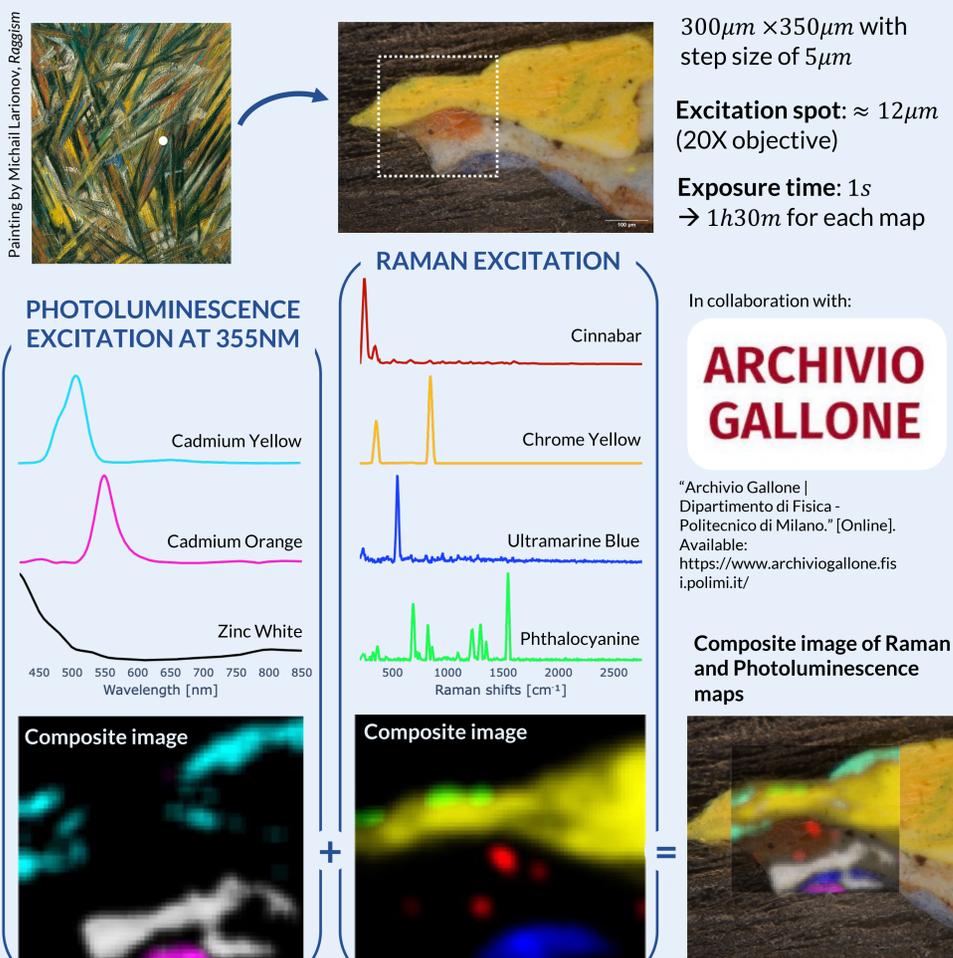


## MULTIVARIATE ANALYSIS



## RESULTS

### LARIONOV'S STRATIGRAPHY



### ULTRAMARINE BLUE POWDER

