



IPANEMA ANCIENT MATERIALS RESEARCH PLATFORM



PhD position

Multidimensional characterization of the ZnO pigment-binder interaction over time and impact on the physico-chemical properties

Published: 30/06/2020

Application deadline: 20/07/2020

Zinc oxide has been widely used as a white pigment in paintings during the 19th and early 20th century paintings, as an alternative to the traditional, toxic lead white.

This project consists in the multi-dimensional characterization of zinc white paints over time, from their making to their drying and aging, to shed light on how they were used by artists and which specific properties lead artists to employ them despite their significant drawbacks (slow drying, brittleness, zinc soap formation and subsequent alterations).

The analytical methodology will be developed first on mock-ups samples before being applied to historic samples. The research will focus on a selection of paintings and artists, including especially Vincent Van Gogh and Amedeo Modigliani, for which there are also authentication issues.

The research will include the followings:

- Macroscopic investigation of **artworks from museum collections**;
- **Preparation of mock-ups samples** (synthesis of zinc oxide and of zinc white paints);
- Use of a combination of physico-chemical techniques to characterize reconstructed and ancient paint samples, including especially:
 - o diffraction, fluorescence and spectroscopic techniques on **synchrotron radiation beamlines** at SOLEIL/IPANEMA (AFM-IR, XRD, photoemission) and **table-top experiments** at the C2RMF (MEB-EDX, XRD, FTIR)
 - o **rheological** and **mechanical** studies

Hosting team and partners: This PhD will be developed at IPANEMA (Paris-Saclay Campus, Gif-sur-Yvette, www.ipanema.cnrs.fr) and the C2RMF (Musée du Louvre-Paris www.c2rmf.fr). The travelling time between IPANEMA and the laboratoires in Paris is about 1h20min by public transportation. This work will be done also in collaboration with the following laboratories: PCMTH-IRCP UMR 8247-Chimie ParisTech ; SIMM-UMR 7615-ESPCI ParisTech ; Art Institute of Chicago-USA.

Starting date: October 1st, 2020 (ideally)

Contract duration: 36 months

Funding source: Fondation des Sciences du Patrimoine (FSP)

PhD supervisors

- Prof. Dr. Victor ETGENS - victor.etgens@uvsq.fr (UVSQ/IPANEMA)
- Dr. Johanna SALVANT - johanna.salvant@culture.gouv.fr (C2RMF/Chimie ParisTech)

Applicant profile and qualifications

- Candidates should hold a Master's degree in Physics, Chemistry or Materials Science.
- Solid skills on Materials Science (Physics, Chemistry) or in Chemistry-Physics.
- A strong interest for multidisciplinary and for Cultural Heritage would be appreciated.
- Previous experience in Conservation Science is a plus, but not required.
- Good knowledge of English is required.

We are seeking a highly motivated, enthusiastic and hard-working candidate with the ambition to gain new insights and to present the results in leading, international journals. The applicant must show good interpersonal skills and be willing to work in close collaboration with the hosting team and other partners, as well as have the ability to work independently.

How to apply?

Application should submit the following documents to the two PhD supervisors:

- Cover letter including a description of scientific interests and the motivation for applying for the position (max. 2 pages)
- CV (summarizing education, positions and academic work - scientific publications)
- Letters of recommendation (at least two recommended)
- Transcripts of records and copy of Master's degree diploma when available

Further information may be obtained directly with the PhD supervisors.

