



2nd IPERION CH TRAINING CAMP

## HERITAGE SCIENCE IN PRACTICE

Non-destructive tools for the diagnosis of paintings in  
immovable Cultural Heritage



**March 19<sup>th</sup>-23<sup>th</sup> 2018**

**at St Ayoul Church in Provins (France)**

**Organized by the French Laboratory of Research on Historical Buildings (LRMH)  
and the French National Centre for Scientific Research (CNRS)**

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The National Centre for Scientific Research (CNRS) and the French Laboratory of Research on Historical Buildings (LRMH) are organizing the 2st IPERION CH Training Camp, which is to be held at St Ayoul Church in Provins (France) from 19th-23th March 2018.

IPERION CH ([www.iperionch.eu](http://www.iperionch.eu)) is a consortium that brings together major European centres of research in Heritage Science. It consists of 23 partners from 12 Member States plus one in the US, together with a large network of affiliations and collaborations. Its high status is supported by the significance of their facilities and by the international reputation of their scientists and experts for cutting edge research, combining high level technical expertise with an outstanding historical and archaeological knowledge of cultural heritage materials of all types.

The Training Camp will offer the opportunity for a hands-on training regarding the functioning of the MOLAB platform (The MOBILELABORATORY) of IPERION CH, which gives access to an impressive collection of advanced mobile analytical instrumentation for non-invasive measurements on precious, fragile or immovable objects, archaeological sites and historical monuments. The MOLAB allows its users to implement complex multitechnique diagnostic projects, facilitating the most effective in situ investigations. This Training Camp will offer practical training for the MOLAB, and will show trainees and students how science can contribute to the identification and evaluation of conservation posed by all kind of immovable artefacts (paintings, architectural painted decorations, stones etc...).

## Approach

This Training Camp is part of the activities contained within the IPERION CH Work Package 10 (WP10) on Training and Education, the aim of which is to organize training and educational activities in order to develop highly skilled professionals within the wider Cultural Heritage community. The WP10 will try to foster cooperation between the academic community and institutions that specialize in the conservation and research. Both the Training Camps and the Doctoral Summer Schools, are designed for potential users of the IPERION CH trans-national access (TNA). With such programs the advances in knowledge, methodologies and instrumentation achieved by CHARISMA and IPERION CH will be transferred back to an academic environment and transmitted to the researchers. Overall, the aim of WP10 is to create models for training initiatives and an academic education that will be multidisciplinary and sustainable. Thus WP10 will contribute to shaping new professional profiles for the Cultural Heritage sector.

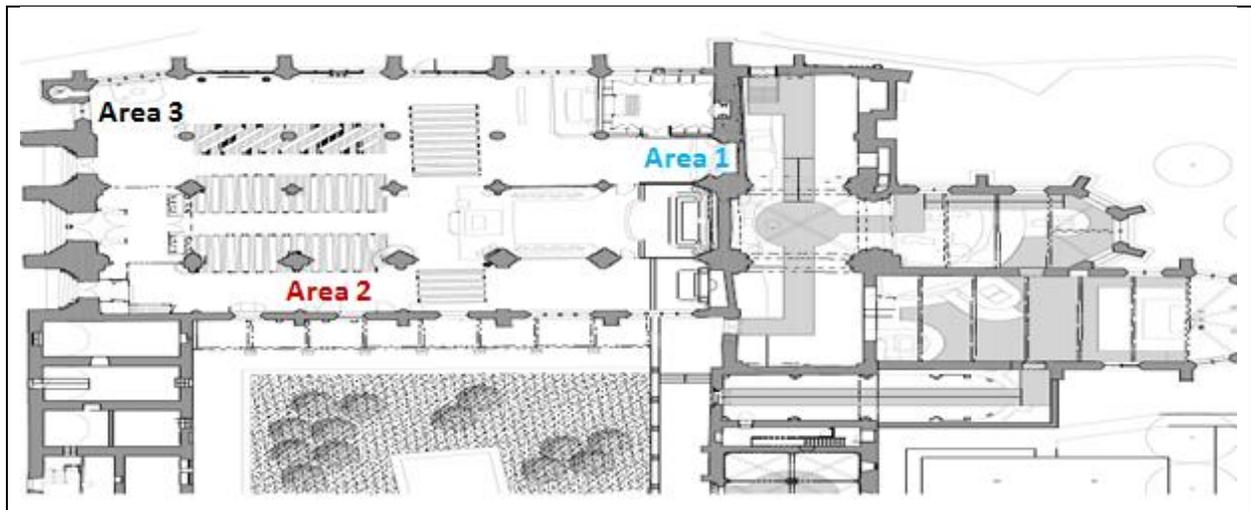
The Training Camp will be based in a problem-solving approach. Three areas were identified as relevant for the training camp. The general map of the chapel is presented in figure 1, where the 3 zones are located.

For each area, some questions have been raised:

- The first zone will be used for an exercise in diagnosis regarding the different deterioration patterns resulting from capillary rises of water and subsequent salt efflorescences on the plaster/painting surface. The arising questions are: What is the water content in the wall? Can we localize the defaults? Are they still active? Can we characterize the salts in non-destructive ways?
- The second zone will be used to characterize wall paintings and try to answer questions: What is the composition of the pigments? What is the stratigraphy? Are there hidden figures behind the visible surface?



- The third zone will be situated on an easel painting. The following problems will be treated: What is the stratigraphy? Are the underdrawings present? Where is the signature?



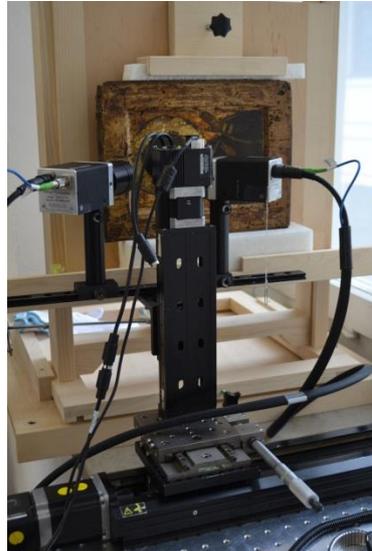
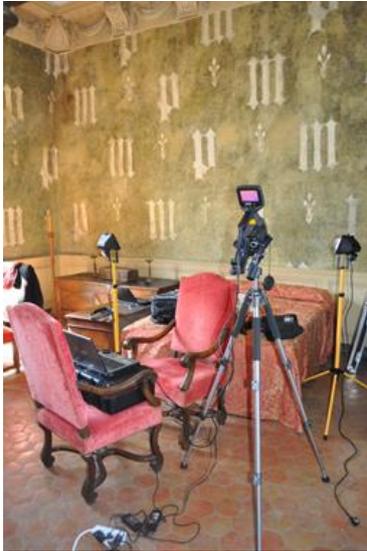
**Figure 1 :** Map of the Church

These case studies will be addressed in small (5 people max.) groups and will lead to the use of different combined MOLAB techniques. They will involve direct interactions with the reference expert scientist for each technique, encouraging thorough discussions and constructive debate amongst the participants.

After a short theoretical introduction to the different case studies and techniques, the Training Camp will be structured around 5 days of practical analytical sessions, and group discussions about the obtained results and proposed conclusions.

### **Description of the MOLAB platform**

The MOLAB enables European users to develop and pursue their research under conditions that ensure the complete safety of the Heritage objects under examination. Indeed, MOLAB investigations are performed in situ without the need to move fragile artworks or precious archaeological objects to a laboratory and using only non-invasive techniques, i.e. without any kind of sampling. The MOLAB also enables the study of immovable objects like sculptures, monuments and historical buildings. The full list of techniques/instruments offered by the MOLAB (with their respective contributors, a description of the techniques and some examples of successful application) can be found in the IPERION CH website: <http://www.iperionch.eu/molab/>



To inspect the areas, 7 different tools from the Molab will be used:

- Portable Nuclear Magnetic Resonance (NMR MOUSE), from the German MOLAB (RWTH)
- Terahertz Time Domain Imaging (THz-TDI), from the French MOLAB (CRC Team LRMH)
- Stimulated Infra-Red Thermography (SIRT), from the French MOLAB (CRC-Team LRMH)
- Integrated X Ray Diffraction and Fluorescence (XRD-XRF), from the French MOLAB (CNRS-C2RMF)
- Optical Coherence Tomography (OCT), from the Polish MOLAB (NCU)
- Digital Holographic Speckle Pattern Interferometry (DHSPI), from the Greek MOLAB (FORTH),
- NIR hyperspectral imaging, from the French MOLAB (CRC-Team CRCC)

One more tool from the LRMH will be used:

- Evanescent-Field Dielectrometry (SUSI)<sup>1</sup>

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<sup>1</sup> Evanescent-field dielectrometry (EFD) is a recent diagnostic method based on dielectric spectroscopy at 1 to 1.5 GHz microwave frequency. The measuring instrument is a portable resonant microwave device for mapping in a non-destructive way the moisture content and salinity on walls up to a depth of 2–3 cm in real time. It detects the MC and the salt concentration in frescoes and walls by estimating the dielectric properties of a wall that is viewed as a “binary” dielectric mixture consisting of bulk material and water, for the contrast between the dielectric constant  $\epsilon$  of a dry wall (e.g.  $\epsilon < 4$  for mortar, plaster, brick) and water ( $\epsilon \sim 80$ ). (Olmi et al. Measurement Science and Technology, Volume 17, Number 8, 2006)



### Who should attend the Training Camp?

The IPERION-CH Training Camp is aimed at professionals in the field of Cultural Heritage (either individuals or teams from public and/or private institutions). These professional should be interested furthering research on conservational and analytical problems.

Possible questions to be studied include:

- questions related to art history and archeology techniques, dating, under-drawings in paintings etc.),
- the assessment of the state of conservation of artefacts,
- the definition and testing of optimal preservation strategies in order to slow down alteration processes,
- the monitoring of conservation treatments, risk assessment, etc.



It is specifically aimed at young researchers. Thanks to the small number of participants a thorough interaction with the scientists and the other participants will be strongly encouraged. Participants must willing to actively partake in the discussions, and must attend the Training Camp for its whole duration. All sessions will be conducted in English and therefore fluency in speaking and writing is essential. A certificate of attendance will be provided to all participants.

At the end of the week, the participants should be able to produce a table to describe the different tools used on the field (with their advantages and limits). Moreover, for each zone, the students will be asked to produce a short article which might be found valuable by Journal of Cultural Heritage, Studies in Conservation or which could be published with the proceedings of a conference in the field of Cultural Heritage.



## Practical information

### Schedule

Lectures start on Monday 19th March at a 13:00h, and will end on Friday 23th March at about 12:00h. A visit of the town will be organized at the end of the training camp.

### Programme and registration

Registration is open until February the 15<sup>th</sup>. Due to the practical nature of the course, registration is limited to **20 participants**. Attendees will be selected by the Training Camp Organization from the candidate applications based on merit and background.

### Travel and accommodation

The 11<sup>th</sup> Century Saint-Ayoud church is situated in the charming medieval town of Provins, 80 km South-East from Paris. Provins was listed on the **UNESCO's World Heritage List** on the 13th of December 2001. The town's architectural heritage is an illustration of the emergence of commerce in early Western European history in relation to the growth of trade and cultural exchanges throughout Europe. Provins contains a great variety of medieval architecture (military, religious and civil) and it is one of the few towns in France where one may find more than fifty Monuments that have been listed because of their historical value.

For more information see website: [www.provins.net/en/](http://www.provins.net/en/)





The costs of travel, accommodation and subsistence will need to be met by the participants. The organization strongly recommends contacting the organizing committee for the reservations, as soon as possible.

Provins is connected with Paris via the SNCF Transilien, which leaves from Paris Gare de l'Est. It is possible to travel to Provins using the Passe Navigo temporal public transportation card, Mobilis railcard or the Paris Visite Card (5 zones). The fastest journey is about 1h30 by direct train leaving Gare de l'Est at least once per hour.

Information can be found on the Provins Touristic info webpage: [www.provins.net/en/how-to-come.html](http://www.provins.net/en/how-to-come.html).

For train schedule and prices see website: [www.transilien.com/en](http://www.transilien.com/en)

### **Organizing committee (organized under the patronage of the deputy, Mr C. Jacob and the mayor of Provins Mr O. Lavenka):**

Dr. Aline Magnien

Dr. David Giovannacci ([david.giovannacci@culture.gouv.fr](mailto:david.giovannacci@culture.gouv.fr))

Mr. Luc Duchamp

Dr. Thierry Zimmer

Dr. Witold Nowik

Prof. Rocco Mazzeo (UNIBO, IPERION WP10 leader)

Dr. Cecilia Frosinini (OPD, IPERION Task 10.2 leader)

