

Research options available for topic B

Research topics a) and b) offered by every Doctoral Course involved in UNIPHD are frameworks within which every applicant has to present an original research project in collaboration with a Supervisor at the University of Padua.

Potential Supervisors at Unipd have proposed the following detailed research options, which are related to the research topic. They are offered as a guideline and should facilitate your contact with potential Supervisors. Supervisors' e-mail is specified in every research option table. You are welcome to contact them directly.

Note that this research option list is not at all exhaustive and, within the topic you have chosen, you are free to propose a different research project.

Doctoral Course	HISTORY, CRITICISM AND PRESERVATION OF CULTURAL HERITAGE
Macro-area	Humanities
Department name	Department of Cultural Heritage: Archaeology and History of Art, Cinema and Music
Webpage	https://www.beniculturali.unipd.it/www/corsi/dottorati-di-ricerca/presentazione/
Research topic B	<p>Transdisciplinary and innovative approaches to cultural heritage</p> <p>Innovative scientific methodologies and challenging projects are marking present and future trends in the study and protection of cultural heritage. The utilization of digital documentation technologies, innovative analytical, non-invasive non-destructive techniques, archaeometric methods among others is enhancing and revealing a critical dimension of the preservation of cultural heritage along with social participation and communication. Particular specific lines of research ranging from the study of the ancient and historic architectural heritage to the material are being developed at the CH department in order to achieve a more sustainable preservation of cultural heritage.</p>
Link to the UNIPHD Call (Academic Year 2022/2023)	https://www.unipd.it/en/uniphd
Latest Update	12.01.2022
#Number of available Research Options	5 <i>Scroll down to see all the Research Options</i>

#1 Research Option Description

Doctoral Course	History, criticism and preservation of cultural heritage
Department name	Department of Cultural Heritage: Archaeology and History of Art, Cinema and Music
Research topic B	Transdisciplinary and innovative approaches to cultural heritage
Research option	Digital Anastylis and Interactive Spatial Interpretation: New Methodologies for Studying and Communicating Cultural Heritage
Supervisor	Cristina GUARNIERI cristina.guarnieri@unipd.it
Webpage	https://www.beniculturali.unipd.it/www/dipartimento/personale/personale-docente/profilo-docente/?Id-DocDid=10635&ruolo=doc
Context of the research activity and objectives	This line of research aims to develop a new methodology for the digital reconstruction and communication of cultural heritage, with a focus on European religious buildings of the Middle Ages. It pursues a cross fertilization of art-historical research with virtual visualisation technologies in order to digitally reconnect artworks and architecture. The main aim is to recompose a select number of Italian late medieval churches which have been altered throughout history, while also establishing fresh methodologies and tools. More specifically, it combines diverse disciplinary fields and research tools, including art and architectural history, digital surveying, semantic databases, and 3D virtual visualisation, hence developing a multidisciplinary approach.
Infrastructures	<ul style="list-style-type: none"> - Biblioteca di Scienze dell'Antichità Arte Musica Liviano - Biblioteca Statale di Santa Giustina - Biblioteca del Centro Studi Antoniano - Archivio di Stato di Padova - Biblioteca Universitaria di Padova - CIBA ('Centro per i Beni Culturali' - Center for Cultural Heritage) at the University of Padua, interdepartmental center for research, study and conservation of archaeological, architectural and historical-artistic heritage.
Skills and competencies for the development of the activity	<p>The ideal candidate is an Art Historian with a background in Medieval Art History (13th – 15th century) and an experience in the study of religious art and architecture. He will cooperate with IT experts that will support and train him in the use of digital tools for surveying artworks and buildings, creating digital reconstructions and 3D modelling, and organising all the collected data.</p> <p>He will hence acquire, develop and enhance new skills in the field of digital humanities, that will be complementary to those already possessed in the Art History. Such a combination will allow him to go beyond disciplinary boundaries, combining diverse methodologies, and opening up new research paths and strategies of communication.</p>

Training offer	The PhD Candidate will be involved in all the Doctoral Activities envisaged for PhDs at the Dipartimento dei Beni Culturali. These include a variety of multidisciplinary seminars, workshops and lectures; interdisciplinary Winter and Summer schools; international multidisciplinary conferences; mentoring and supervising.
Possible Secondments	<ul style="list-style-type: none">- Mosaico Group – Design and Technology (Padua).- Visit Lab: Visual Information Technology Lab at CINECA (Casalecchio di Reno, Bologna).- Wired!Lab, Duke University (Durham, North Carolina, USA)

#2 Research Option Description

Doctoral Course	History, criticism and preservation of cultural heritage
Department name	Department of Cultural Heritage: Archaeology and History of Art, Cinema and Music
Research topic B	Transdisciplinary and innovative approaches to cultural heritage
Research option	Multimetodological approach to recover ancient degraded decorative systems
Supervisor	Rita Deiana rita.deiana@unipd.it
Webpage	https://www.unipd.it/en/contatti/rubrica?ruolo=1&checkout=cerca&persona=deiana&key=EE451CE254786877A505439A931F4613
Context of the research activity and objectives	<p>The possibility of reconstructing the decorative systems significantly compromised (e.g. degradation, restoration) in historical buildings (e.g. wall frescoes, mosaics) and, more generally in artefacts of historical and artistic interest in the field of cultural heritage, must pass through a multidisciplinary approach involving first of all humanists and experts in diagnostics. The presence of different materials, sometimes ancient and modern (in the case of restorations), and the difficulty in interpreting the traces of old decorations no longer visible to the naked eye, or the possibility to read the ancient and original remains in a wholly compromised context, requires a synergy between different expertises. The collection of historical documents, restorations and interventions and the analysis and validation of the reconstructive interpretation obtained, for example, with modern non-invasive techniques, also require both humanistic and technical competencies. Nowadays, there are numerous applications of imaging techniques, spectroscopic or high-resolution radar techniques for the analysis and studies of decorative systems or compromised pictorial/stratigraphic palimpsests. In this context, the proposed research would deal with the application of non-invasive techniques, such as those indicated above, and the development of innovative systems for non-contact measurements to study degraded decorative systems or palimpsests resulting from restorations and transformations no longer readable. The research here proposed will be based on real case studies. Thanks to the synergy between experts in non-invasive diagnostics and humanists, with a transdisciplinary approach and international collaborations between academic and non-academic institutions, also involved in restoration, will aim to identify and validate new protocols that can also support possible restoration works. The final aim will be to provide indications on the possibility of recovering and making readable the ancient decorative systems, few visible or</p>

	hidden underneath restored or modern surfaces, restoring the complete clarity to the interventions and the original parts still present.
Infrastructures	Non- Invasive instruments, software and devices for cultural heritage analysis - Department of Cultural Heritage – University of Padova Lab instruments offered by the support of the PHOTONICS FOR HERITAGE SCIENCE GROUP at IESL-FORTH (see proposed non-academic secondment)
Skills and competencies for the development of the activity	Basic knowledge of non-invasive methods applied to cultural heritage analysis.
Training offer	Non-invasive measurements and development of no-contact solutions for cultural heritage analysis of decorative degraded systems in real case studies and lab models. Development of recovering and restoring strategies for decorative degraded systems, in synergy with international academic and non-academic partner institutions (see proposed secondments).
Possible Secondments	Université de Lausanne (Switzerland) – Faculté des lettres Section d'histoire de l'art – Prof. Nicolas Bock Institute of Electronic Structure and Laser, Foundation for Research and Technology - Hellas, P.O. Box 1527,GR-711 10 Heraklion, Greece. (IESL-FORTH) PHOTONICS FOR HERITAGE SCIENCE GROUP (Dr. Vivi Tornari) (https://www.iesl.forth.gr/en/research/photronics-heritage-science)

#3 Research Option Description

Doctoral Course	History, criticism and preservation of cultural heritage
Department name	Department of Cultural Heritage: Archaeology and History of Art, Cinema and Music
Research topic B	Transdisciplinary and innovative approaches to cultural heritage
Research option	From macro to micro: advanced and experimental methods for the analysis of finishing techniques and post-firing treatments on ancient ceramics
Supervisor	Lara Maritan, lara.maritan@unipd.it
Webpage	https://www.geoscienze.unipd.it/category/ruoli/personale-docente?key=3EC6CF65AA1B838B2E353A79A77FC0C0
Context of the research activity and objectives	<p>The research activity will focus on the analysis of various types of finishing coatings and possible post-firing treatments on ceramic materials, typical of different geographic regions, periods and material cultures. Graphite-based, slip-based and gloss coatings will be analysed according to a multi-scale approach, consisting in the spectroscopic, multispectral, microscopic, mineralogical and microstructural analysis. The results will allow to define the type of raw materials used, their preparation (possible grinding, pre-firing), and experienced firings in terms of redox and thermal conditions, to reconstruct their <i>chaîne opératoire</i>. Moreover, they will disclose possible post-firing treatments such as retouching or application in antiquity of conservation products (e.g. oils, waxes) A series of experimental firings in both controlled conditions (using laboratory furnaces with controlled temperature programs and atmosphere/oxygen fugacity) and in “field” will be done to better constrain the ancient production technologies. The project will, therefore, aim to disclose the production technology of some specific ceramic coatings using modern and advanced techniques, supplying a complete experience to a PhD candidate for the study of not only ceramics, but also of other silicate-based materials.</p>
Infrastructures	Department of Geosciences – University of Padova Department of Cultural Heritage – University of Padova
Skills and competencies for the development of the activity	Basic knowledge of scientific non-invasive and destructive methods applied to cultural heritage materials, critical analysis of data, capacity of planning experimental reproductions in laboratory environment (controlled).
Training offer	Use of various non-destructive and destructive analytical methods, available both here in Padova and at the partner institutions where the PhD candidate will spend the secondments.
Possible Secondments	University of Tübingen (Germany) – Dr.ssa Silvia Amicone THETIS AUTHENTICS LTD

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#4 Research Option Description

Doctoral Course	History, Criticism and Conservation of Cultural Heritage
Department name	Department of Cultural Heritage: Archaeology and History of Art, Cinema and Music
Research topic B	Transdisciplinary and innovative approaches to cultural heritage
Research option	Transdisciplinary approaches to documentation, preservation, and analysis of archaeological textiles of Egypt
Supervisor	Margarita GLEBA, margarita.gleba@unipd.it Research group: Ivana ANGELINI Paola ZANOVELLO Massimo VIDALE External supervisor: Ina VANDEN BERGHE (KIK/IRPA)
Webpage	https://www.beniculturali.unipd.it/www/corsi/dottorati-di-ricerca/presentazione/
Context of the research activity and objectives	<p>Thanks to its arid climate, Egypt has produced large quantity of textiles – a material that was ubiquitous and essential throughout human history yet is rarely preserved in archaeological contexts. Egyptian textiles of the Pharaonic period, however, have rarely been investigated using the most modern suite of scientific approaches that allow their characterisation, dating and provenancing, necessary for their documentation, preservation and interpretation. Through a development and training in a transdisciplinary and innovative methodology for textile analysis, the proposed PhD project will develop a minimally invasive approach to the study of fragile and highly degradable artefacts.</p> <p>Liquid Chromatography Coupled to Diode Array Detection, Electrospray Ionization Tandem Mass Spectrometry, and multispectral imaging using Ultraviolet and Infrared light will be used to identify dyes. Fourier-Transform Infrared Spectroscopy, Transmitted Light Microscopy and Scanning Electron Microscopy with Energy Dispersive X-ray Spectroscopy will be used to identify fiber types and their condition.</p> <p>The results of the analysis will be used to provide broader interpretations of textile material culture. The project will have three significant outcomes:</p> <ol style="list-style-type: none"> 1) It will generate substantive information about ancient Egyptian textile production, particularly those during the Amarna period. 2) It will provide substantial information to modern day curators to preserve these and other historical fabrics worldwide. 3) The project will demonstrate the applicability of non-invasive and multi-spectral techniques to specialists working in other archaeological contexts regardless of time period or geographic location.
Infrastructures	Libraries of the University of Padova

	Laboratories of the University of Padova Experimental Laboratory
Skills and competencies for the development of the activity	MA in Archaeology or Archaeological Science
Training offer	Thematic and multidisciplinary courses of the Doctoral School of Padua Training in scientific methods and equipment (including HPLC, SEM, FTIR) and experimental archaeology Practical application of scientific methods to archaeological textiles from Egypt
Possible Secondments	<u>Academic secondments:</u> 4 months 1) Royal Institute for Cultural Heritage - Koninklijk Instituut voor het Kunstpatrimonium - Institut Royal du Patrimoine Artistique (KIK/IRPA) – 3 months Cinquantenaire Park 1, 1000 Brussels, Belgium 2) CNR, Italy – 1 month <u>Non-Academic secondments:</u> 4 months 1) Grand Egyptian Museum, Cairo, Egypt - 3 months 2) Museo Egizio di Torino, Torino, Italy - 1 month

#5 Research Option Description

Doctoral Course	History, Criticism and Conservation of Cultural Heritage
Department name	Department of Cultural Heritage: Archaeology and History of Art, Cinema and Music
Research topic B	Transdisciplinary and innovative approaches to cultural heritage
Research option	The evolution of Roman Architecture through innovative and transdisciplinary perspectives: shapes and functions of structural elements
Supervisor	Jacopo Bonetto (jacopo.bonetto@unipd.it), Maria Stella Busana Caterina Previato, Andrea Ghiotto, Michele Secco
Webpage	https://www.beniculturali.unipd.it/www/homepage/
Context of the research activity and objectives	The research aims to renew the study of Roman building techniques and the analysis of ancient architecture. It will focus on structural elements (e.g., foundations, openings, elevations), whose typology and evolution will be specified over a broad chronology (2nd century BC - 3rd century), taking into account a given territory (Italy and Gaul). Special attention will be paid to the morphology of the elements and the characterisation of building materials, in order to highlight innovations and cultural transfers. The archaeological study will be based on the protocol of the international ACoR project and will rely on its online database and GIS (https://acor.huma-num.fr/). The textual testimonies of the Roman period on the construction techniques will be put into perspective with the data obtained by the field research. The approach will be multidisciplinary, involving numerical modelling, archaeometry for the analysis of building materials (wood, stone, terracotta), and structural engineering for the characterisation of elements.
Infrastructures	Liviano Library, Padua University Laboratory of Relief for Cultural Heritage, Padua University Laboratory of Digital Archaeology, Padua University
Skills and competencies for the development of the activity	Solid background in classical archaeology and specialisation in the study of Roman architecture. Good familiarity with the corpus of Latin texts. Knowledge of database management and computer-assisted drawing. The candidate will have already participated in various excavations on Roman sites. An openness to multidisciplinary dialogue with other disciplines (geology, engineering) is expected.
Training offer	Thematic and multidisciplinary lessons of the Doctoral School of Padua Lectures at the Ecole Normale Supérieure – PSL University (Paris) Survey and excavation activities in the framework of missions on sites (Pompeii, Gortyna of Crete, Aquileia, Nora)
Possible Secondments	1) Ecole normale supérieure – PSL University (Paris) 2) Scuola Archeologica Italiana ad Atene