

PHD PROGRAMME TABLE 38TH CYCLE

Section “Available Positions and Scholarships” integrated on 17/05/2022

PROGRAMME'S NAME	CULTURAL AND ENVIRONMENTAL HERITAGE
DURATION	3 years
PROGRAMME START DATE	01/11/2022 (DD/MM/YYYY)
LANGUAGES	Italian, English
MANDATORY STAY ABROAD	No
COORDINATOR	Prof. Roberto Pasini (roberto.pasini@unibo.it)
CURRICULA	1. Cultural and environmental heritage: memory, protection, rights 2. Science and Technologies for Cultural Heritage
RESEARCH TOPICS	Detailed list at the bottom of the present document
PHD POSITIONS	8
ADMISSION PROCEDURE	Qualifications and research proposal evaluation Oral examination

Available Positions and Scholarships

Pos. n.	Financial Support	Description	Curriculum	Positions linked to research topics
1	PhD Scholarship	Totally funded by the University of Bologna general budget	1	Development of AI-based methods for facial identification in the field of art and for the restoration of skeletal remains and archaeological finds
2	PhD Scholarship	Totally funded by the University of Bologna general budget	1	Metamorphosis of Italian Bibliography in the Twentieth Century: subjecting and linking the Knowledge
3	PhD Scholarship	Totally funded by the University of Bologna general budget within the Progetti di Sviluppo Strategico dei Dipartimenti (PSSD) initiative	1	For a multidisciplinary approach to the work of art: historical artistic issues, conservative problems and virtual reconstructions of wall paintings of the Emilian seventeenth-century.
4	PhD Scholarship	Co-funded by the University of Bologna general budget and by the Department of Cultural Heritage	2	Temporal evolution of the atmospheric composition in association with climatic and environmental effects: historical reconstruction and current conditions
5	PhD Scholarship	Funded by the Department of Legal Studies	1	Prospects for reforming legislation on deepening the seabed with a view to simplification and sustainability
6	PhD Scholarship	Totally funded by the University of Bologna general budget within the Progetti di Sviluppo Strategico dei Dipartimenti (PSSD) initiative	1	Water Resources Management in Romagna in an Age of Climate Change (13th-15th C)
7	PhD Scholarship	Co-funded by the University of Bologna general budget within the Progetti di Sviluppo Strategico dei Dipartimenti (PSSD) initiative and by Department of Cultural Heritage within the ALMARIE CURIE 2021 project (CUP J45F21001470005)	1	Archaeozoogenetics and historical ecology of Mediterranean marine mammals

8	PhD Scholarship	Co-funded by the University of Bologna general budget within the Progetti di Sviluppo Strategico dei Dipartimenti (PSSD) initiative, by Department of Cultural Heritage, by the Department of Chemistry "G. Ciamician" and by the Department of Civil, Chemical, Environmental, and Materials Engineering	2	Advanced geomatic techniques for Cultural Heritage
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Admission Exams

	DATE AND TIME	RESULTS
Qualifications and research proposal evaluation	Applicants' participation is not required	Available from 15/06/2022**
Oral examination	Date: starting from 27/06/2022 – 9.00 a.m. CEST* Place: In presence, Aula Conferenze – third floor, Department of Cultural Heritage, Via degli Ariani 1, Ravenna. Remotely, using Microsoft Teams	Available from 08/07/2022**

* In case that the oral examination cannot be completed in one day due to the large number of applicants, the oral examination detailed schedule shall be made available on the webpage [Studenti Online](#) together with the results of the qualifications and research proposal evaluation. **During the oral examination, applicants may express their interest in one or more positions linked to specific research topics.**

** The **results of the admission exams** will be available on the webpage [Studenti Online](#) (select "summary of the requests in progress" > "see detail" and open the .pdf file at the bottom of the page). **No personal written communication will be sent to applicants concerning the examinations results.**

Required and Supporting Documents to be attached to the application

All the documents listed below **shall be drawn up in English or in Italian**. In case of documents originally issued in any other language (e.g. identity document, qualifications), an official English translation is required.

Only qualifications obtained **during the last 5 calendar years** shall be taken into consideration, except for the University Degree. The Admission Board will assess the relevance of the supporting documents to the PhD Programme.

REQUIRED DOCUMENTS	
Identity document	Valid identity document with photo (i.e. identity card, passport)
Curriculum Vitae	No specific CV format is required
Degrees	Documents attesting the awarding of the first and second cycle degrees, the exams taken and the marks obtained (see Art. 3 of the Call for Applications)
Research proposal	Multi-annual research proposal, with special emphasis on the activities to be completed during the first-year course . The proposal must meet the following requirements: <ul style="list-style-type: none"> - it must include a cover page (see form in Attachment 1 to the present PhD programme table) indicating the Curriculum and the position related to a research topic in which the applicant is interested and that is associated to the research proposal (<u>research proposals without this indication will receive an evaluation of zero points</u>); - it cannot exceed 20,000 characters, including spaces and formula possibly used. This figure does not include: the title of proposal, the outline, references and images (such as graphs, diagrams, tables, etc. - if present); - it must include: the state of the art; description of the proposal; expected results; articulation of the proposal and implementation times; references.
SUPPORTING DOCUMENTS	

Thesis abstract	Abstract of the second cycle degree thesis . Graduands applicants may submit the draft of the thesis. Abstracts cannot exceed 5,000 characters, including spaces and formula possibly used. The above figure does not include: the title of the thesis, the outline, references, and images such as graphs, diagrams, tables etc.
Reference letter/s	No more than 2 reference letters signed by Italian and international academics and professionals in the research field, which do not form part of the Admission Board, attesting the suitability of the applicant and his/her interest in the scientific research. Letters shall be uploaded following the procedure on Studenti Online , detailed in the Call for Applications (Art. 3.2).
Personal statement	This must include the reasons prompting the applicant to attend the PhD Programme and those relevant experiences and research interests , that make the applicant suitable for the specific PhD Programme (3,000 characters maximum, including spaces).
Publications	Lists of publications (i.e. monographs, articles on scientific journals, book chapters), abstracts and posters presented during national and international conferences, etc.
Other documents	<ul style="list-style-type: none"> - Postgraduate vocational training programmes and/or specialisation programmes relevant to the PhD Programme main research topics - Specialisation programmes thesis (in full text) - Teaching activities carried out at university level - Research activities of any kind - whether basic, applied, translational, etc. - carried out in any capacity, including when covered by research grants, and as a staff member of research projects - Curricular and non-curricular training internships - Documents attesting the knowledge of foreign languages - Study periods completed by applicants outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes) - Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc.)

Evaluation criteria*

Scores will be expressed in points out of 100, as follows.

1. Qualifications and research proposal evaluation

Minimum score for admission to the oral examination: 30 points, Maximum score: 50 points

Qualifications evaluation	First (Bachelor's) and second cycle (Master's) degrees final mark/s and Weighted Average Mark (WAM). Graduands shall be evaluated according to the Weighted Average Mark (WAM)	15 points max
	Publications	5 points max
	Reference letters and other supporting documents	5 points max
Research proposal evaluation	Scientific value and ground-breaking nature of the proposal	15 points max
	Structure of the proposal	5 points max
	Proposal feasibility	5 points max

2. Oral examination

Minimum score for eligibility: 30 points, Maximum score 50 points

English language proficiency	5 points max
Research proposal presentation	25 points max
General knowledge of issues encompassed by the PhD Programme	20 points max

Oral examination aims to assess the suitability of the applicant for scientific research as well as the general knowledge of issues encompassed by the PhD Programme (see the list of [research topics](#) at the bottom of the present document).

During the oral examination, the applicant's English proficiency shall be assessed.

The oral examination is carried out in Italian or English.

* Possible further evaluation criteria will be available on the [University website](#), selecting the relevant PhD Programme > "More information", at the bottom of the page in the section "Notices".

Research Topics

Curriculum 1: Cultural and environmental heritage: memory, protection, rights

- **Cultural heritage:** Historic, social, economic, and cultural processes in European, Mediterranean, and Western Asian contexts; public history; conservation of ethno-cultural heritage and management of cultural resources in endangered areas.
- **Environment, objects, rights** diagnostic analysis of monumental and portable artefacts of historical interest; musealisation through digital and virtual modelling; promoting the appreciation and use of bio-environmental goods as common goods; legal and regulatory consequences.
- **Environment and landscape, cities and architecture:** tools for the analysis and conservation of the environment, biological and anthropological heritage, archaeology, urban settings, industrial archaeology, consolidation and restoration of historical architecture; the historical relationship between urban areas and their territories, sustainable development of tourism, fruition of historic towns.
- **Governance and management of common goods:** risk assessment and risk management, efficient use of resources, definition and quantification of ecosystemic service value, assessment of natural resource consumption and of production of solid, liquid, and gaseous waste.

Curriculum 2: Science and Technologies for Cultural Heritage

Production techniques, material characterization, state of conservation:

- Development of: advanced analytical protocols (spectroscopy, immune chemistry, DFT, chemometrics), micro and non-invasive diagnostic methods, intervention methods on humidity phenomena of historical buildings, interaction with pollutants, tomographic systems (digital radiography, X-Ray computer tomography, software for real-time tomography and 3D rendering).
- Development of innovative restoration materials and methods. Design, development, testing and performance evaluation of innovative materials (nanomaterials, polymers, biopolymers, composite materials) and methods for the consolidation, cleaning and protection of both movable and immovable cultural heritage.

Survey, monitoring and representation technologies:

- Definition of protocols and standards for the production of 3D contents aimed at monitoring cultural heritage, methods and protocols for the production of 3D models with semantic structure to be applied to cognitive systems
- Design of web-based application for the archiving and use of technical-scientific data related to conservation and restoration projects
- Production contents and design of augmented reality systems, efficient workflows, survey and monitoring multiscale
- Integrated techniques integrated by topographic, photogrammetric, laser scanner and special positioning
- UAV survey for data management
- Acquisition with multispectral sensors and scanners
- GIS applications
- 3D models (development of new procedures for the collection and optimal elaboration)
- ICT methodologies and techniques for the creation, analysis and representation (virtual reality and augmented/mixed reality) and multi sensorial interaction by means of digital data.

Research fields

Research fields are topics related to each PhD position. Applicants shall choose a research field during the application procedure, indicating it in the first page of the research proposal (see [Attachment 1](#)).

Curriculum 1 - PhD Scholarship n.1: Development of AI-based methods for facial identification in the field of art and for the restoration of skeletal remains and archaeological finds

In recent years, Artificial Intelligence (AI) has enabled an increasing evolution of new analysis techniques in Cultural Heritage, as well as greater precision and reproducibility of the results obtained in the various disciplines to which it is applied (restoration, conservation and preservation of cultural heritage). In particular, in history of art there are frequent questions about the identity of unknown subjects or of subjects whose parental relationships are not entirely clear. Moreover, in Osteoarchaeology, Palaeoanthropology and Archaeology the restoration of human remains and of testimonies of material culture is fundamental for their valorisation and musealisation, as well as for a better analysis of the remains themselves. The line of research presented here, which is strongly interdisciplinary and innovative, aims to apply, in the field of Cultural Heritage, new methods related to AI for 1) facial identification and 2) digital

reconstructions of human remains and archaeological finds for their study, valorisation, musealisation and dissemination.

Curriculum 1 - PhD Scholarship n.2: Metamorphosis of Italian Bibliography in the Twentieth Century: subjecting and linking the Knowledge

Bibliography is the science that deals with identifying, selecting, registering, organizing and systematizing the published documents and the related literary and semantic information and that, therefore, has functions of both safeguarding ideas and intellectual products, and mediation and interpretation of all the other sciences, ensuring their permanence and diffusion in the entire society. Bibliographic theory and practices have been deeply affected by the constant technological evolution of communication media, especially the 'recorded' ones, that we have been witnessing in the last decades. This process, since the end of the 19th cent., and especially from the first decades of the 20th cent. on, led to a mutation of the disciplinary structure of Bibliography through its specialization in many other derivative and interlinked disciplines: Library Science, Theory of Documentation, Information and scientific Communication Science, History of Book, History of Libraries, and History of Bibliography.

The disciplinary structure evolution is in need to be clarified for Italy, where in the last century the documentary and bibliographic disciplines were concerned by an important development and debate - as highlighted by some of the recent Italian manuals of Bibliography and Information Sciences and also recently international conferences and scientific confrontation have demonstrated.

The research will give concrete start to such disciplinary rearrangement, reconstructing the most recent metamorphosis and identifying its articulations and forms (methodologies, tools and objectives) both in diachronic and synchronic terms. The problem can also be tackled through different approaches, distinct or combined: a qualitative approach, based on a terminological-definitional and historical-content investigation, and a quantitative approach, to be developed with the most recent tools made available by data linking technologies, such as linked open data and semantic web, to support qualitative analysis with the best way to manage, use, publish, reuse, and visualize the large amounts of data available today. The research will have to focus on the disciplinary development in Italy from the end of the 19th cent. to today in the awareness that a clarified disciplinary history in the national context is a prerequisite for a wider international research, both on a possible current common conceptual language and on a scientific historical international comparison. A corollary result of the research could also be of a methodological type if the development of the double method of disciplinary investigation is chosen, as it can then be declinable and applicable to any other disciplinary area of the human and social sciences.

Curriculum 1 - PhD Scholarship n. 3: For a multidisciplinary approach to the work of art: historical artistic issues, conservative problems and virtual reconstructions of wall paintings of the Emilian seventeenth-century

A correct and more modern approach towards the work of art should take into account, beyond the most specific and certainly basic artistic and attributive historical issues, even of those multiple problems related to the history of conservation and restoration that necessarily interfere with the material life of artifacts through the centuries. Precisely for this reason there is a need to promote new surveys on the rich sample of wall paintings of the Emilian seventeenth century, but conducted with a broader and multidisciplinary methodological approach, which finally takes into account, not only the historical stylistic analysis, but also the documentary materials, the sources of the artistic literature, the reasons for the commission, the contexts of space and use, as well as the problems related to conservative events and restoration. The objective is to start from a direct and analytical knowledge of the pictorial cycles to investigate the stylistic and material aspects, with a particular attention to the state of conservation, but also allowing their effective exploitation also through the use of the most innovative digital technologies, so as to be in line with the provisions of the PNR and the National Recovery and Resilience Plan. The new technologies of digital investigation and reconstruction allow in fact to give account of the original location of the artifacts and to thoroughly examine their characteristics, highlighting the restoration interventions suffered over the centuries and other peculiarities: for example how the history of taste has sometimes changed the appearance of works of art and how current conditions are often the result of choices that do not respond to our current idea of conservation. By adopting appropriate digital storytelling strategies, it is possible to disseminate the results of the research to a non-specialist audience, in full compliance with the current National Research Plan (PNR 2021-2027) which encourages the intensive and extensive application of digital technologies to heritage and the interoperability of the data produced, also with a view to making this heritage accessible to the widest possible public and thereby encouraging social participation, educational practices, creative and expressive processes, community life and democratic citizenship.

Curriculum 2 - Temporal evolution of the atmospheric composition in association with climatic and environmental effects: historical reconstruction and current conditions

The PhD project will concern the characterization of the low troposphere chemical composition and its consequent effects on its chemical, physical and biological properties in association with the environment and materials, especially in the field of Cultural heritage. The atmosphere, in fact, is a system in continuous compositional evolution, mainly as a result of anthropogenic emission which in turn evolve as a function of both technological evolution and of the economic and productive scenarios. Given the tight connection between air quality and climate change, the study synergically evaluate the relationships among these aspects on the studied region, namely Northern Italy.

This project therefore will be focused on two juxtaposed aspects of the problem:

- a) Analysis of time series of air pollution data in the Emilia-Romagna region and in general in Northern Italy, will be analysed with focus on the most recent three decades, with the aim of understanding the potential impact in current conditions as compared with the past.
- b) In parallel, sampling campaign will be planned and carried out with the aim of collecting deposition of both airborne particulate and hydrometeors (including occult precipitation) using either specific samplers or material samples to be exposed to the atmosphere, followed by a range of analytical characterizations (redox potential pH, ion chromatography, FT-IR, PIXE, oxidant capacities, Optical Particle Counting, low-cost sensors) in order to define reactivity and the consequent degradative/corrosive effects. Special attention will be paid to coastal sites, wherein the interactions between air pollution and salinity are expected to accelerate/amplify the degradative processes with detrimental outcomes on the environment and materials.

Curriculum 1 - Prospects for reforming legislation on deepening the seabed with a view to simplification and sustainability

The deepening of the seabed is outlined as the real challenge with which Italian port system has to be measured. On the basis of Law no. 84/1994 (regulating the reorganisation of legislation on port matters) and subsequent regulations approved by Ministerial Decree no. 172 and 173 on 15th of July 2016 (respectively regulating the modalities and technical standards for dredging operations in sites of national interest and the modalities and technical criteria for the authorisation of the immersion in the sea of seabed excavation materials), the issue relating to dredging and/or seabed deepening has seen considerable contributions to improvement and implementation. Last but not least, in the light of the recent objectives set by the Recovery and Resilience Plan (RRP), Law n. 156/2021, converting DL 121/2021, intervened to insert into the Environmental Code (Legislative Decree no. 152/2006) the new paragraphs 5-bis and 5-ter of article 184-quarter concerning the use of dredging materials.

In this context, starting from the current international, community and national legislation and from the felt national need to have an ad hoc legislation respecting the principle of environmental sustainability and in line with other EU countries, in order to make Italian ports accessible and, therefore, competitive, the research project aims to identify and propose regulatory and operational solutions that can reconcile the implementation of dredging operations and the protection of the marine environment involved; to deepen and compare the different national regulations with regard to both the subdivision between SIN (site of national interest) and non-SIN areas, and to the issues related to the immersion and reuse of dredging materials; to propose the definition of a single normative of legislation that brings together the existing legislation and new regulatory proposals with a view to simplification and sustainability. Specific legal training is required.

Curriculum 1 - Water Resources Management in Romagna in an Age of Climate Change (13th-15th C)

Due to current ecological challenges, it is necessary to promote the study of which water resources management strategies were implemented in the late Middle Ages, a period of climate change.

Since the 12th century, flooding phenomena began to intensify, probably in connection with the increasing anthropization and cultivation of the land. Medieval chronicles describe the devastating consequences of phenomena of hydrogeological instability, thus witnessing a breaking of the ecological balance, connected to the drastic contraction of uncultivated land, and aggravated by a general worsening of climatic conditions. These phenomena became even more frequent in the 14th century.

Between 13th and 14th century, city authorities developed policies to control the hydrographic structure of the territory: either hydraulic works for the defense of crops, and statutory regulations on the maintenance of natural and artificial waterways. Water resource assumed political centrality, which was also linked to a multiplicity of functions: not only basic ones, as food and irrigation uses, but also defense of settlements, waste disposal, protection of urban hygiene. Until the Industrial Revolution, water constituted an incomparable source of energy, as well as an essential means of transport.

Medieval municipalities carefully regulated the use of water resources, aiming to a proper exploitation, and granting, at the same time, the necessary protection of this asset, important for the entire society. The study of the efforts made to preserve city waters from any possible contamination, and to ensure their sustainable use, with a focus on the whole of the community, brings us to historically frame and better understand today's management strategies of water

resources. As in the past, the protection of water resources is a necessary step to make them available to future generations.

Thus, the research focuses on case studies of water control policies enacted by various city governments in the area. Ravenna will be the first case, with special attention to the 14th century, when - for the first time – magistrates were appointed to supervise and manage the city's water resources. The systematic recollection of data offered by the documents (Statutes, Chronicles and Archival sources), either published and unpublished, will make it possible to evaluate how these resources were managed during time and by different subjects in a context of climatic and environmental crisis, aggravated by wars, plagues and famine. The analysis of these various documents, mainly unpublished and not yet exhaustively investigated (despite the important surveys published by Francesca Roversi Monaco, Osiride Guerrini, Oreste Delucca), will be carried on in the frame of methodological suggestions provided by recent international historiography, especially Anglo-Saxon.

The perspective of the research will be transdisciplinary, crossing data emerging from written sources analysis with architectural evidence, archaeological data, and results of scientific investigations on the evolution of glaciers and riverbeds. The study of how men in the past reacted and responded to an environmental challenge of the past will help us to identify today's tools for the protection of ecosystem and biodiversity, for the prevention of natural disasters, and for a reduction of the impact of current climate change (probably, through a more prudent management of water resources and a more careful monitoring of the territory).

Curriculum 1 - Archaeozoogenetics and historical ecology of Mediterranean marine mammals

The Mediterranean Sea has played a crucial role for millennia, as a major highway for ideas and people as well as source and trade of goods and services to coastal civilizations, including marine key-resources such as for example anchovies and tunas. Mediterranean and Black Sea marine ecosystems have been dominated for millennia also by large epipelagic fish (e.g. sharks, tunas) and by marine mammals (monk seals, whales and dolphins). Therefore, the millennial, shared history between human and organisms living in the *mare nostrum* led to prolonged and severe impacts to coastal and shore marine ecosystems and their apex dominating predators.

Most of the Mediterranean marine mammals (prevalently they are cetaceans) are all of conservation concern.

Contemporary assessment of the present conservation status of marine mammals involved numerous research and monitoring activities in the field, at broad geographical scales and over a few decades (e.g. the [web platform Intercet](#)), carried out by hundreds of people, among scientists, undergraduate students, voluntaries and citizens.

However, for various marine mammal species very little is known either about the intensity of the past anthropogenic pressures or the historical biocomplexity of the Mediterranean populations. Scientific and management questions for more appropriate pristine 'baselines' of biocomplexity against which to compare present human-impacted populations and biodiversity are now urgently on the floor. Therefore, there is a growing interest toward understanding interaction between both anthropogenic and climatic drivers on marine mammal populations over the long-term. Disciplines as archaeology and natural history on the one hand, and marine sciences and conservation biology on the other, should be merged into interdisciplinary initiatives at the interface between archaeology, historical ecology and marine biology to improve the understanding of the intensity of human and climate change impacts on a range of key marine mammals —including those of the most notably endangered taxa in the Mediterranean and Black Sea (see the Marie Skłodowska-Curie Actions Innovative Training Network PhD program [Seachanges - Thresholds in human exploitation of marine vertebrates](#)).

Readings:

- Andrews, A. J., et al. (2022). *Exploitation history of Atlantic bluefin tuna in the eastern Atlantic and Mediterranean—insights from ancient bones*. ICES Journal of Marine Science 79(2): 247-262. DOI: 10.1093/icesjms/fsab261
- Karamanlidis, A. A., et al. (2016). *The Mediterranean monk seal *Monachus monachus*: status, biology, threats, and conservation priorities*. Mammal Review 46(2): 92-105.
- Nelms SE, Alfaro-Shigueto J, Arnould JPY, Avila IC and others (2021). *Marine mammal conservation: over the horizon*. Endang Species Res 44:291-325. DOI: 10.3354/esr01115
- Thomas, P.O., Reeves, R.R. and Brownell, R.L., Jr. (2016). *Status of the world's baleen whales*. Mar Mam Sci, 32: 682-734. DOI: 10.1111/mms.12281

Curriculum 2 - Advanced geomatic techniques for Cultural Heritage

The research is devoted to surveying, monitoring and representation methods and technologies for Cultural Heritage. Geomatics is the scientific framework to develop and setup new approaches and workflows dealing with the different aspects of Cultural Heritage, from the analysis at territorial level (Earth Observation) to the scale of the single objects. The PhD research can be oriented towards data acquisition, processing and visualization, exploitation of the products.

Acquisition techniques can include different advanced technologies, ranging from topographic instrumentation, digital photogrammetry, laser scanning and other 3D high-resolution scanners, UAV, satellite remote sensing by optical multispectral or radar imagery. A main aim is the data fusion and integration of data coming from different techniques. Data processing and exploitation can be oriented to advanced 3D modeling and GIS-HBIM applications or VR/AR applications, using point clouds data management, and digital image analysis (on satellite or terrestrial imagery) with computer vision derived methods.

The issues related to different aspects of risk management, diagnosis and long-time monitoring for Cultural Heritage can be taken also in consideration.

The PhD candidate will concentrate the research on the quality characterization of the achieved data and on the possibility to use them for multi-scale, multi-resolution and multi-temporal analyses, working on selected case studies.

Attachment 1 – First page of the research proposal

Name:

Surname:

Date of birth:

Title research proposal:

Curriculum of the PhD programme and positions linked to research topic (select only one topic)

1. Cultural and environmental heritage: memory, protection, rights

- Development of AI-based methods for facial identification in the field of art and for the restoration of skeletal remains and archaeological finds
- Metamorphosis of Italian Bibliography in the Twentieth Century: subjecting and linking the Knowledge
- For a multidisciplinary approach to the work of art: historical artistic issues, conservative problems and virtual reconstructions of wall paintings of the Emilian seventeenth-century
- Prospects for reforming legislation on deepening the seabed with a view to simplification and sustainability
- Water Resources Management in Romagna in an Age of Climate Change (13th-15th C)
- Archaeozoogenetics and historical ecology of Mediterranean marine mammals

2. Science and Technologies for Cultural Heritage

- Temporal evolution of the atmospheric composition in association with climatic and environmental effects: historical reconstruction and current conditions
- Advanced geomatic techniques for Cultural Heritage