



Cultural Heritage Identity Card


Alma Mater Studiorum Università di Bologna (UNIBO) Italy



Steering Committee Member
Rocco Mazzeo






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Basic Facts

- The University of Bologna (*Alma Mater Studiorum*) is recognised as the oldest university in the western world.
- Organised as a multi-campus structure with 5 operating branches (Bologna, Cesena, Forlì, Ravenna and Rimini).
- More than 100.000 enrolled students, 23 faculties, 69 departments, 3000 academics and 3000 administrative staff.
- 14 Ph.D. Schools, more than 300 graduate-level programs for 1800 PhD students.

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Basic Facts

- It ranks second in Italy for competitive research funding from the Italian Government and has also participated in more than 150 EU projects in both FP5 and FP6.
- The scientific research in conservation of cultural heritage is an integral part of the University and is recognised through the recent establishment of an Integrated Research Team:

ALMA HERITAGESCIENCE




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INTEGRATED
RESEARCH TEAM

ALMA
HERITAGESCIENCE

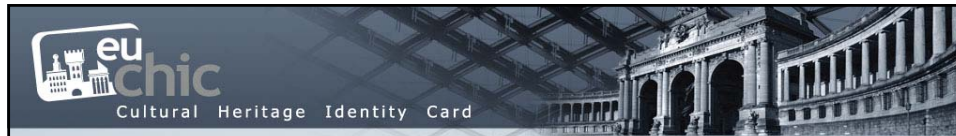



Science & Technology for Cultural Heritage

Conservation Ethics and History
Diagnostics and Monitoring
Surveying
Environment and Energy
Constituent Materials
Restoration materials and methods
Structural Issues
Territorial Aspects
BioArchaeology & BioTechnologies
Documentation/cataloguing (ICT based)
Management





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INTEGRATED RESEARCH TEAM

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The first aim of the **Integrated Research Team** is to provide a unique interface towards National and International Research Programmes and different Stakeholders in the CH field

64 Professors, Researchers, PhD, Technicians belonging to 18 Departments




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INTEGRATED RESEARCH TEAM

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Equipment / Labs

<p>Microscopy and microanalysis</p> <ul style="list-style-type: none"> • Extended Pressure Scanning Electron Microscopy (EP SEM) with EDS and Raman microscope • Atomic Force Microscope (AFM) - digital area, dual area and polarized Light Optical Microscopy (LOM) and Stereomicroscopy (SM) • Scanning laser microspectrometry FTIR microscopy (ATR, micro-ATR, diamond cell, mapping) and Raman microscopy <p>Phase identification and chemical analysis</p> <ul style="list-style-type: none"> • X-Ray Diffractometry (XRD) • Atomic Absorption Spectrophotometry (AAS) • Inductive Coupled Plasma Spectroscopy <p>Electrochemical equipment</p> <ul style="list-style-type: none"> • Potentiostat/Galvanostat • Electrochemical Impedance Spectroscopy (EIS) <p>Image Analysis</p> <ul style="list-style-type: none"> • Multi-Spectral Scanner Imaging System • Image analysis system for aesthetical and physical slab characterization <p>Mechanical testing:</p> <ul style="list-style-type: none"> • Compressive, Tensile, impact, fatigue, superplasticity, hardness/microhardness, friction/wear testing <p>Thermal Methods</p> <ul style="list-style-type: none"> • Differential Scanning Calorimetry (DSC) • Thermogravimetry (TG) • Infrared Thermography (IRT) <p>Environmental Analysis</p> <ul style="list-style-type: none"> • Gas Chromatography • Particle matter analysis • Spectroscopic analysis <p>Geo-engineering lab</p> <ul style="list-style-type: none"> • International standards testing (CEN...) 	<p>NMR Equipments</p> <ul style="list-style-type: none"> • Portable NMR Relaxometer for in-situ analysis • NMR Tomograph ARTOSCAN (Isotope SpA), for samples up to 12 cm in diameter • Rf coils for large samples, to be used with the console of the portable device and the magnet of the Tomograph • NMR Relaxometers operating at variable Larmor frequency <p>Materials and Decay Characterisation</p> <ul style="list-style-type: none"> • X-Ray Digital Radiography (DR) • X-Ray Fluorescence • 3D Computed Tomography (CT) • Wet-Dry ageing device • Chromatographic Techniques (IC, HPLC, PG-CMS) • Microstructural characterization (mercury porosimeter, water/helium pycnometers, permeability equipment, grain size distribution) • On-site diagnostic equipments (concrete testing, ancient timber testing, soaic testing, etc.) • Electric/electrokinetic measurements • Assessment of materials durability: UV rays exposure, abrasion tests, freeze-thaw ageing • On-site moisture measurements <p>Geomatics:</p> <ul style="list-style-type: none"> • High precision total stations and levels, equipments for engineering surveying • Photogrammetric instruments: cameras, analytical and digital workstations, plotters • Geodetic dual frequency GPS receivers • Software for GIS, Remote Sensing, Photogrammetry, 3D modelling, Image Processing
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Basic Facts

- Activity in CHIC is carried out by researchers coming from two Faculties:
 - **M2ADL: MICROCHEMISTRY AND MICROSCOPY ART DIAGNOSTIC LABORATORY**, Faculty of Natural Science
 - **DISTART: DEPARTMENT OF STRUCTURAL, TRANSPORT, HYDRAULIC, SURVEY AND TERRITORY ENGINEERING**, Engineering Faculty




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Basic Facts

- M2ADL has acquired a wide experience on studies of polychrome surfaces and bronzes belonging to both important Italian masterpieces (Giotto, Beato Angelico, Palmezzano, Giambologna, Verrocchio) and Far East Asia (Nepal, North Korea, China).
- The department's activities range from consulting and research to professional training as well as the organisation of national and international meetings.








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Basic Facts

- These scientific investigations are devoted to the **characterization of manufacturing technique and of processes and causes of alteration**, by means of the integrated use of non destructive and micro destructive techniques.
- Studies on conservation treatments performance have been also carried out.



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Basic Facts

DEPARTMENT
 STRUCTURAL, TRANSPORT, HYDRAULIC,
 SURVEY AND TERRITORY ENGINEERING - DISTART

- DISTART performs research and didactic activities in the fields of: structures, hydraulics and hydraulic constructions, surveying & geomatics, road, railways & airport constructions, transportations, geology and geotechnics.

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Basic Facts

DEPARTMENT
STRUCTURAL, TRANSPORT, HYDRAULIC,
SURVEY AND TERRITORY ENGINEERING - DISTART

- In the Surveying & Geomatics area, DISTART has a complete laboratory with state of-the-art equipment:
 - topographical high precision instruments for engineering surveys
 - digital photogrammetric workstations, scanners, cameras
 - laserscanning
 - satellite surveying
 - satellite remote sensing, numerical cartography and GIS.

supporting different surveying and monitoring applications for movable and immovable Heritage at different scales and by integrated approaches





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Major relevant references

- CHARISMA (Cultural Heritage Advanced Research Infrastructures: Synergy for a Multidisciplinary Approach to Conservation/Restoration) FP7
- EPISCON (European PhD in Science for Conservation)
 
- EU-ARTECH (Access, Research and Technology for the conservation of the European Cultural Heritage) FP6
- EU ALFA - Guidelines for post Graduated Education and Training in Conservation Science
- Large number of experiences and cases in Italy, Mediterranean area, Near East and Far East






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Project Team

- **Prof. Rocco Mazzeo:** Associate Professor at the Faculty of Natural Science.
- **Prof. Gabriele Bitelli:** Full Professor at the Engineering Faculty.
- **Prof. Luca Vittuari:** Associate Professor at the Engineering Faculty.
- **Dr. Silvia Prati:** Researcher at the Faculty of Natural Science.

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Links in benefit of CHIC

- Partnering and other stakeholders which will be suggested for the Advisory Network or on any other way linked or informed about CHIC:
 - CHARISMA Network
 - ICCROM
 - CARTA DEL RISCHIO [Istituto Superiore per la Conservazione e Restauro (former ICR), Rome]
 - Institutions responsible for monument conservation
 - ...






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Other information

- M2ADL is organizing the 1st International Congress on Chemistry for Cultural Heritage, to be held in Ravenna from 1-3 July, 2010

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