

UNIVERSITÀ DI PADOVA

Dipartimento
dei Beni Culturali: Archeologia, Storia
dell'Arte, del Cinema e della Musica - DBC



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WELCOME MEETING 2026

Master's Degree in
Applied Sciences to Cultural Heritage Materials and Sites



- Italian **World-Class** University
- **Multidisciplinary** and **Interdisciplinary**
- **Research-Intensive**



- **Best University in Italy** for Teaching and Research Quality

- **Top 250** University in the world





- **City-campus**
- **Student-centred** town
- Unique setting: **UNESCO World Heritage Site**
- **Strategic** position

Master's degree in
Applied sciences to cultural heritage materials and sites

- **International Curriculum of the Master's degree in *Archaeological sciences***
- **Fully in English**
- **Launched in October 2021**
- **Location: University of Padua, Italy**
- **Duration: 2 years**
- **120 CFU**

The aim of the course is to provide a platform for training in the area of state-of-the-art techniques and methods applicable in heritage science, in order to realise the full potential of these synergies.

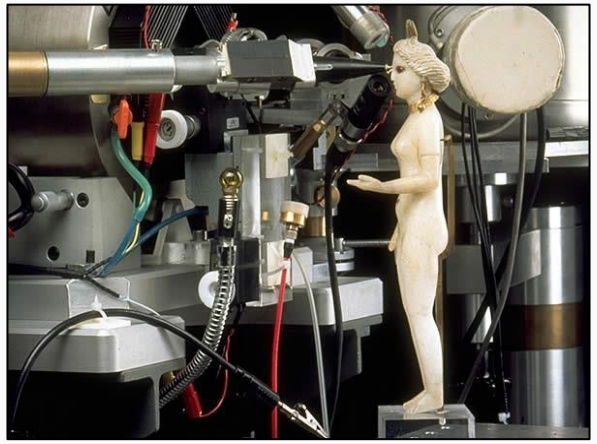












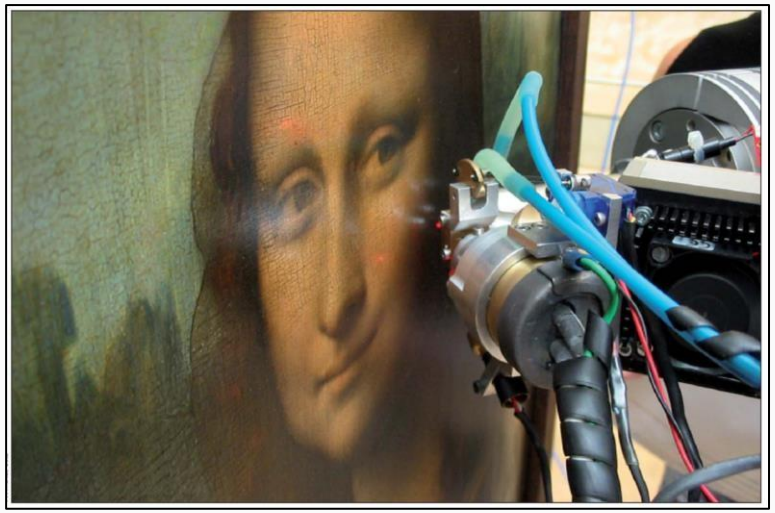






Science and art history/conservation



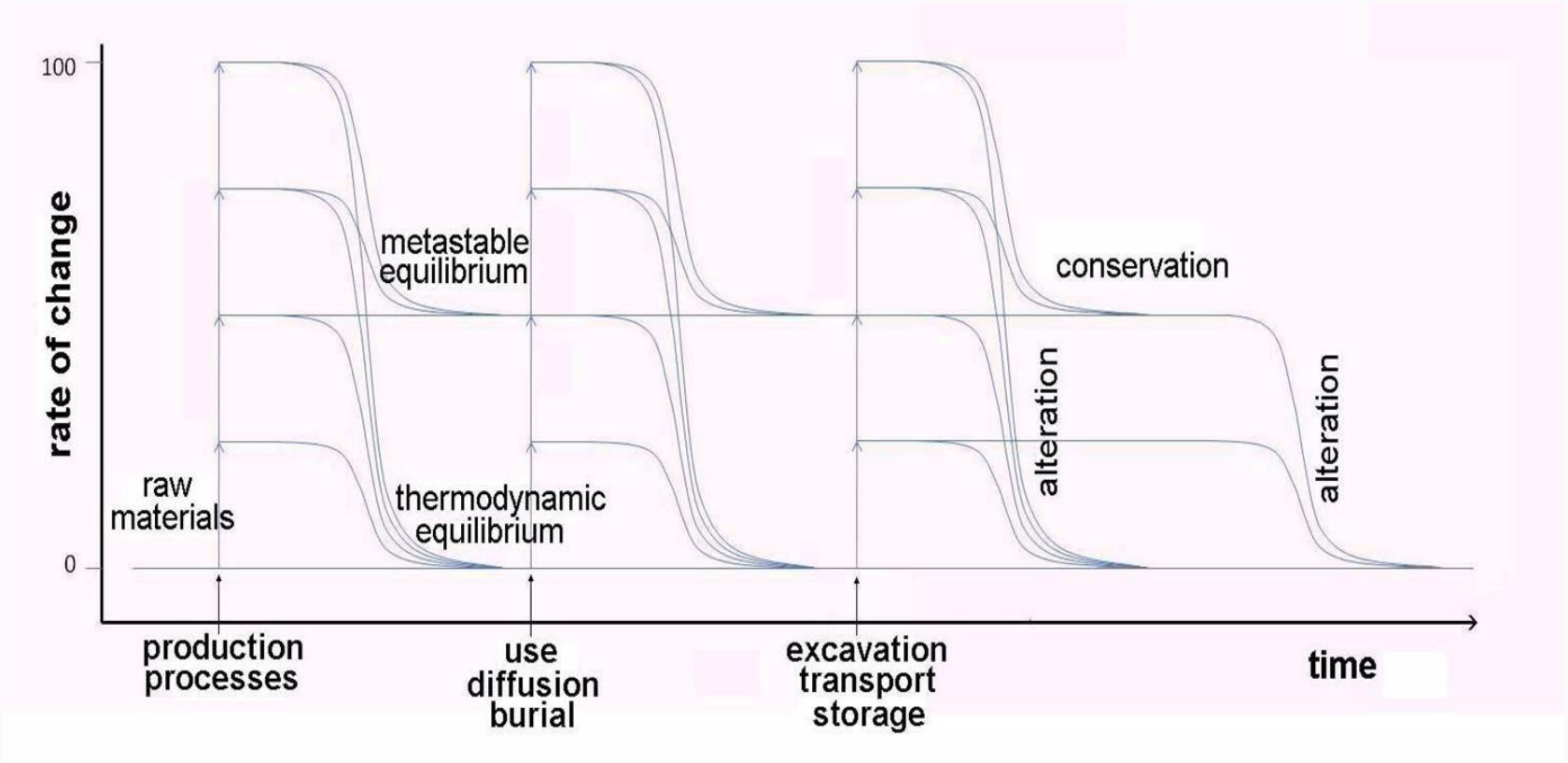


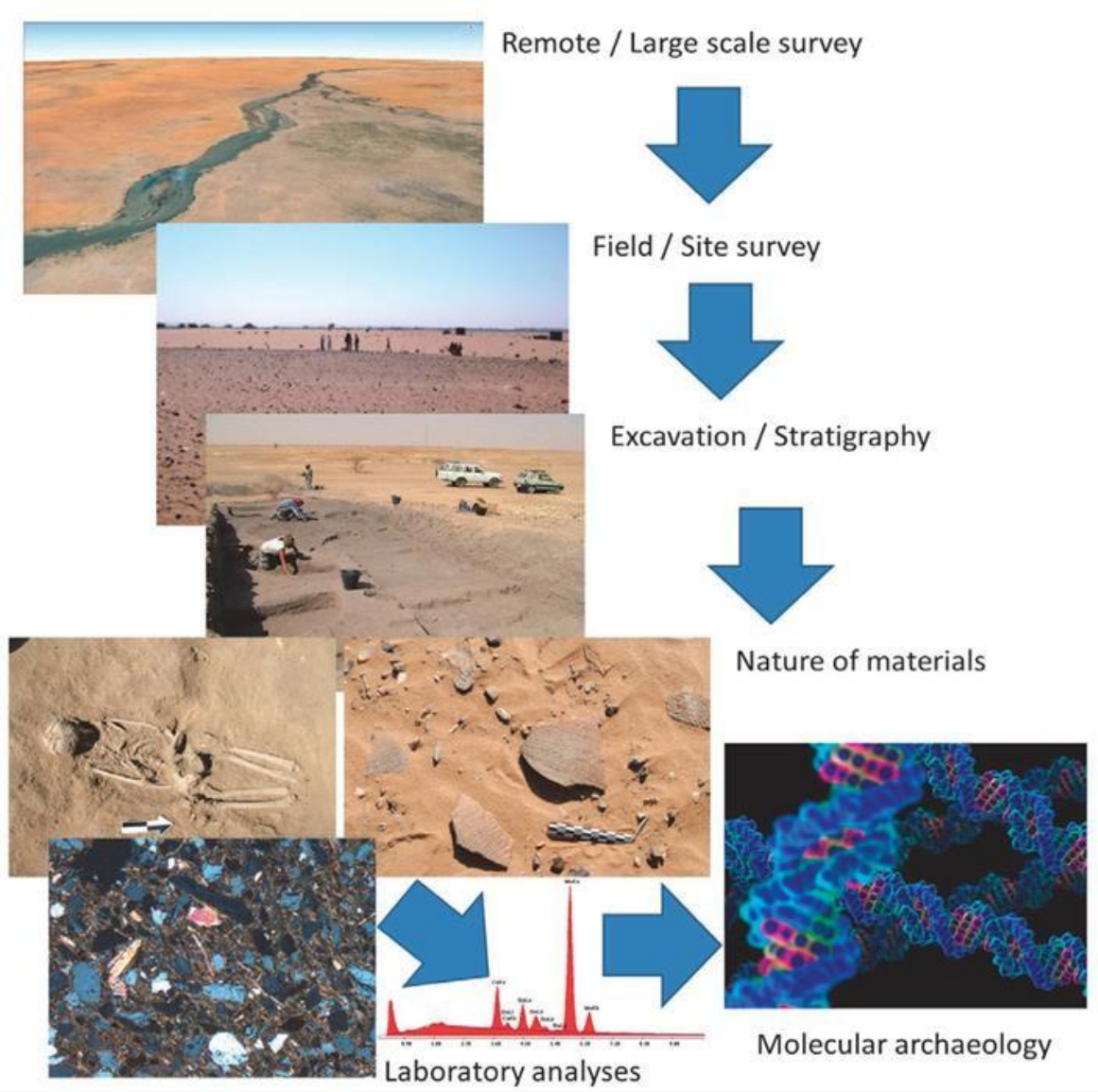


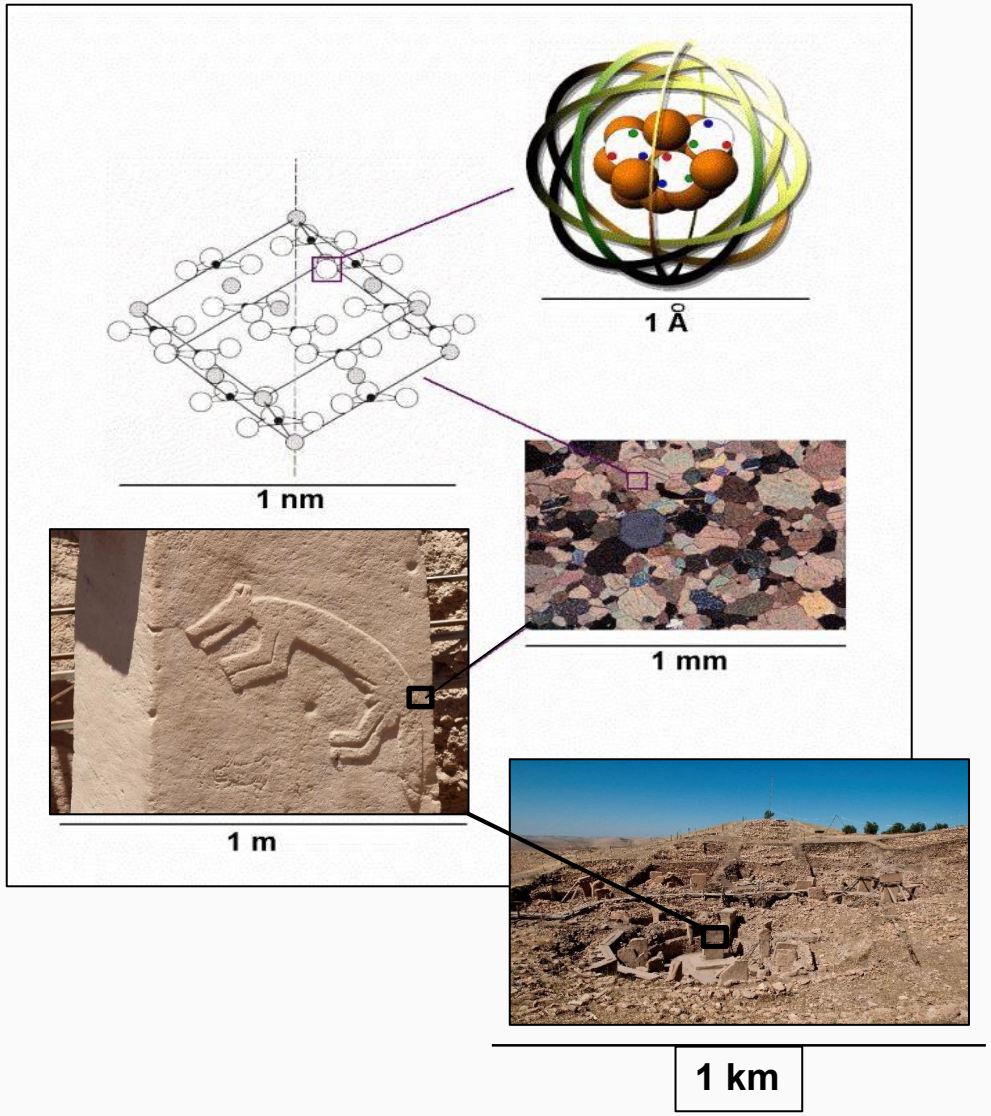
- The course wishes to emphasise **the role of materials** in human history and prehistory, showing how modern and state-of-the-art archaeometric techniques and methods may efficiently extract tangible and intangible information from cultural heritage materials.

- The resulting/measurable scientific information must be interpreted in the context of the physical chemistry properties of the material itself, the production process, the economic framework, the conservation process, and finally properly inserted into the historical / social / anthropological / artistic timeline.

- The **cultural heritage materials** must be understood as having a **past, a present, and a future life**, always connected with the ever shifting values of human cultures.

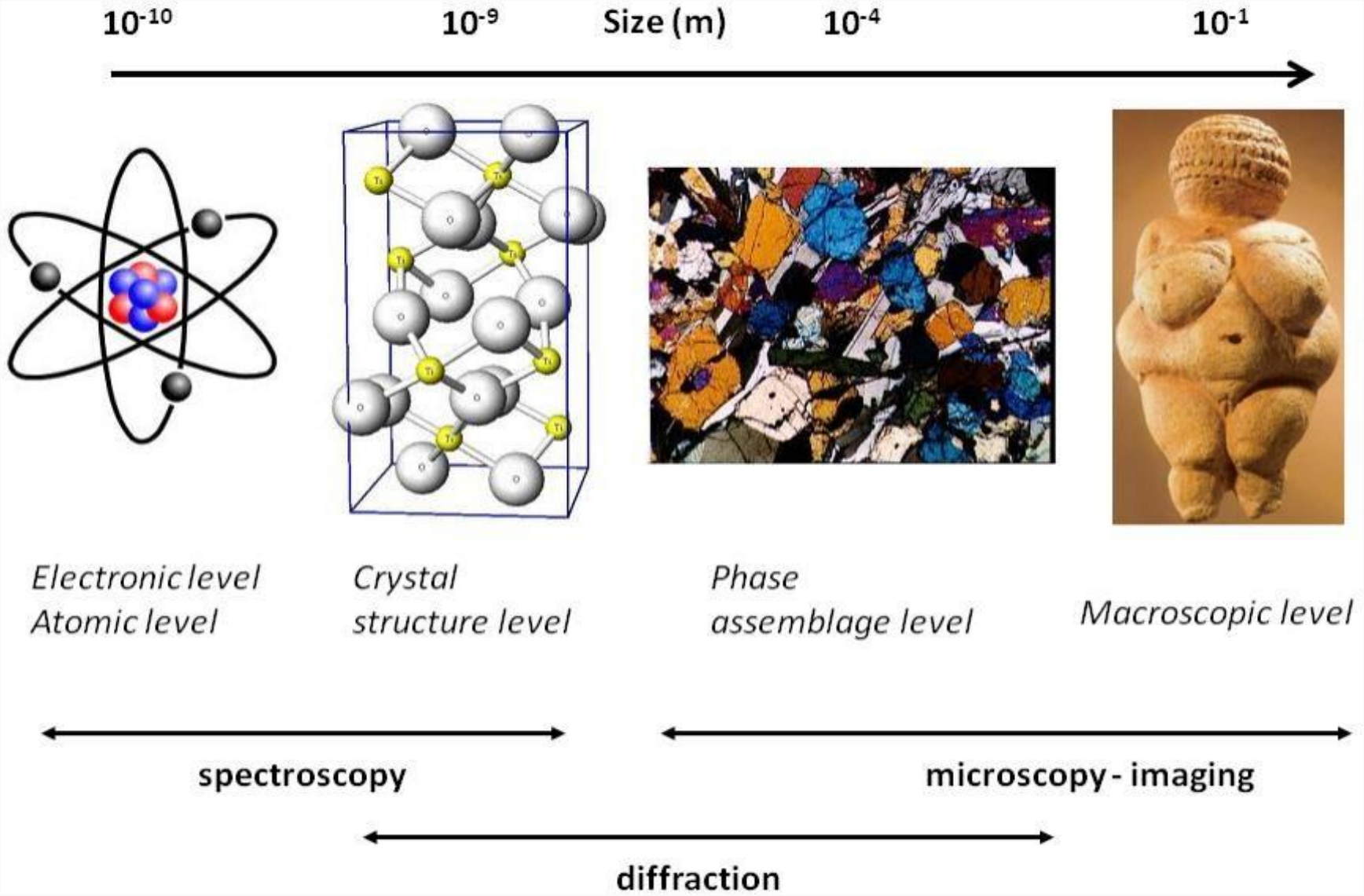


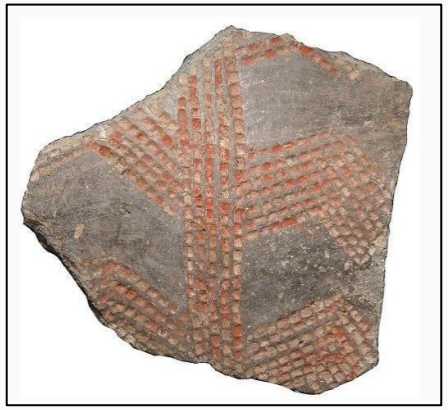

Remote / Large scale survey
Field / Site survey
Excavation / Stratigraphy
Nature of materials
Laboratory analyses
Molecular archaeology



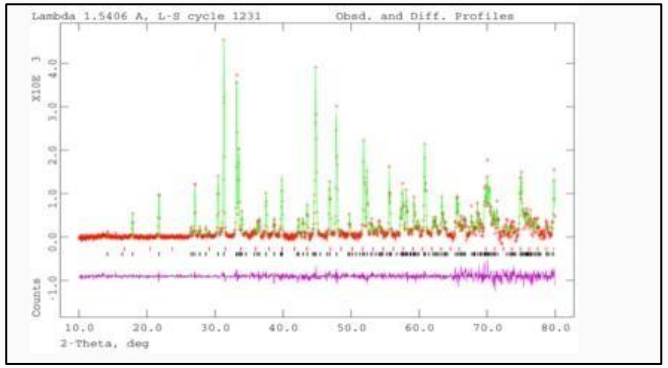


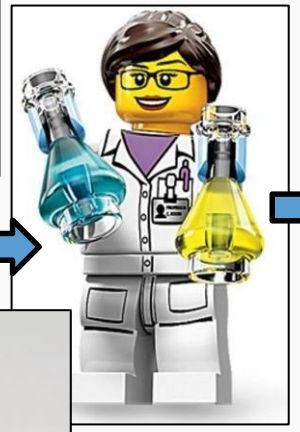
Explore the world of ancient materials and sites!

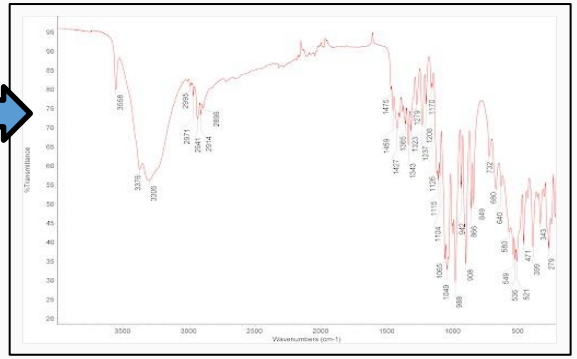

10-10
10-9
Size (m)
10-4
10-1
Electronic level
Atomic level
Crystal
structure level
Phase
assemblage level
Macroscopic level
spectroscopy
microscopy - imaging
diffraction

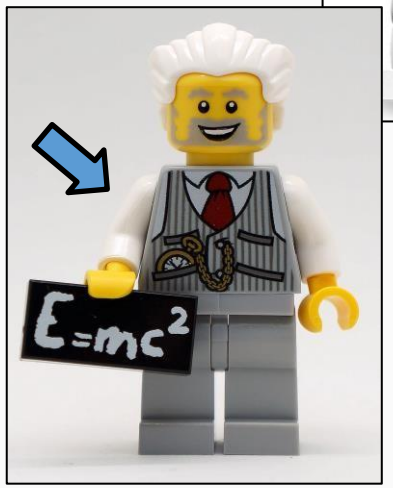


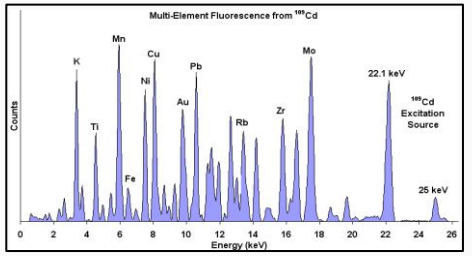



Lambda 1.5406 A, L-S cycle 1231
Obsd. and Diff. Profiles
X10E 3
Counts
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
2-Theta, deg






E=mc²

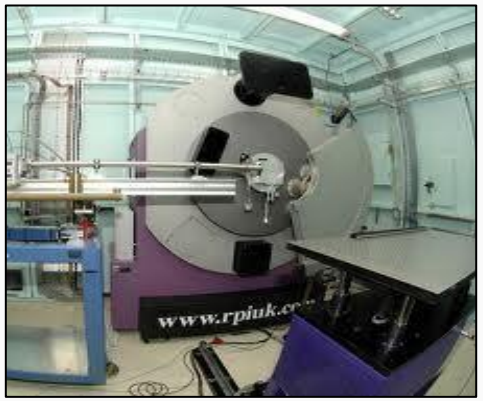

Multi-Element Fluorescence from ¹⁹⁹Cd
Counts
K
Mn
Ti
Fe
Ni
Cu
Au
Pb
Rb
Zr
Mo
22.1 keV
¹⁹⁹Cd Excitation Source
25 keV
0
2
4
6
8
10
12
14
16
18
20
22
24
26
Energy (keV)

invasive

micro-invasive

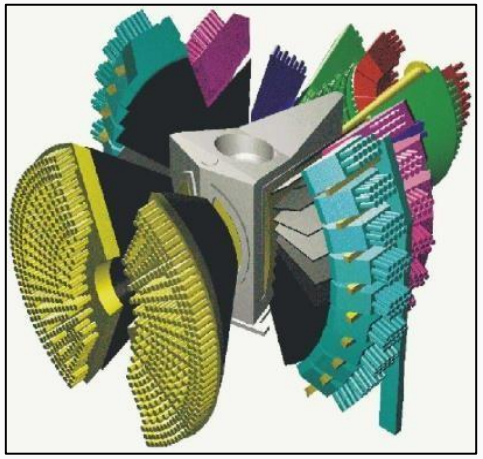
non invasive

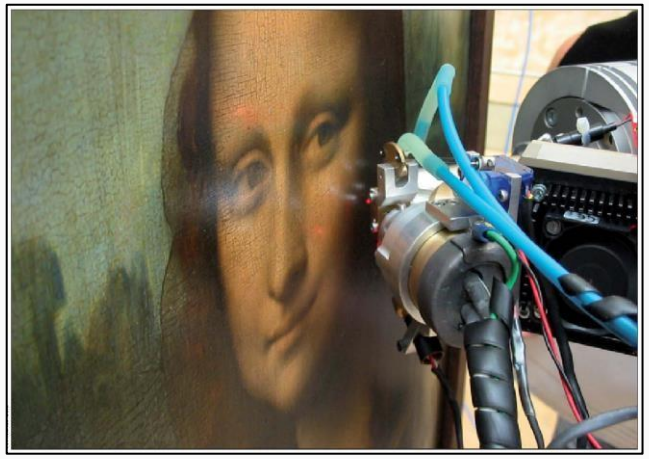












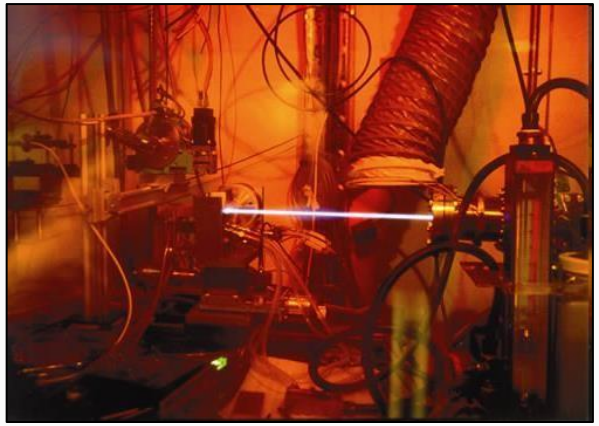
time / manpower / cost



Synchrotron
X-rays



Penetrating beams
Large objects
Low spatial resolution
Time of Flight mode



Microbeams
High spatial resolution
Small samples



Thermal / pulsed neutrons

Complex problems require multidisciniplinary/multitechniques answers.

There is a fundamental need for infrastructures/consultancy/collaboration.



PROGRAMME SPECIFIC ENTRY REQUIREMENT

- Good understanding of English language and communication.
- Strong motivation towards the application of scientific methods to cultural heritage problems.
- No specific scientific or humanistic background.
- The course foster the use of combined and complementary information from different disciplines and research areas.

Università degli Studi di Padova

Master's in Archaeological Sciences (LM-2)

Study track

Applied sciences to cultural heritage materials and sites

Double Degree

Archaeological Sciences

Master's in Archeometry

Université Bordeaux Montaigne

Double Degree

Maritime Archaeological Heritage

Master's in Maritime Civilisations

אוניברסיטת חיפה

University of Haifa

جامعة حيفا

Key numbers:

- 1 ECTS credit = 1 Italian CFU (Credito Formativo Universitario)
- 1 ECTS credit = 25/30 working hours
- 2° cycle Degree (2 year Programme) = 120 ECTS

Introduction to scientific methods and principles: Concepts of earth sciences, mineralogy, petrology, physical- chemistry	Basic knowledge on chemistry (structure of matter, chemical nomenclature and symbology, reactions and stoichiometry, basic concepts of thermodynamics) and earth sciences (plate tectonic, geodynamic environments, mineralogy and petrology).
Introduction to archaeology and art history: Concepts and methods	Introduction to the correct vocabulary of archaeology and art history, the essential chronology of Mediterranean Antiquity and Western Medieval art, key-concepts, methods and practice of archaeology and art history.
Geomorphology of archaeological landscapes and sites	Main geomorphological processes of interest for geoarchaeological applications. The geomorphological methods commonly applied to the investigation of archaeological sites and archaeological landscapes. The state-of –the art of the discipline through the discussion of relevant case studies.

Integrated analysis of cultural heritage materials	Introduction to the main analytical methods for characterizing cultural heritage materials. Invasive e non-invasive analytical techniques, their limitations and application range: XRD, electron microscopy and point analyses, optical microscopy, XRF, vibrational spectroscopies, MS, chromatography. Awareness of state-of-the-art characterization techniques: their potential, applicability and limitations. Advanced imaging techniques, surface probes, ion beams, neutron beams, synchrotron radiation. Identification of the best techniques to be applied to each material.
Dating laboratory	Concept of time and the measurement of time. Time scales and chronologies. Relative and absolute techniques for dating, with special emphasis on radiocarbon. Laboratory of 14C preparation samples.

History and prehistory of anthropic landscape	Understanding fundamental factors, activities, and trends influencing the appearance of anthropic landscapes in the Ancient Mediterranean World. Distinguishing common trends from regional differences and diachronic changes in the relationship between human communities and their environment. Understanding ancient ideas and theories about the construction and preservation of landscapes. Connecting acquired knowledge about ancient landscapes with modern theoretical and practical approaches.
Geoarchaeology and soil micromorphology	Basic concepts in geoarchaeological research. Specific scientific terminology in geoarchaeology and in the integration of scientific methods within archaeological excavation. Basic skills in thin section description and interpretation.
Geophysics for cultural heritage and civil engineering	Field prospection and survey, architectural prospection and survey, geophysical methods and techniques.

Language requirements	B2 English (or B2 Italian) → ASCH students are required to choose English!
Field laboratory work	Practical introduction to integrated analytical and diagnostic activities in the field. Use of diagnostic instrumentation in the field and in the laboratory.
Historical buildings and sites	Construction techniques for walls, arches, vaults and horizontal diaphragms. Actions on structures and equilibrium conditions. Fundamentals of statics of vertical and horizontal elements. Main types of soils, foundations and soil-structure interaction. Earthquakes and seismic effects on sites and buildings. Introduction of construction principles and techniques which spread in ancient times to realise foundations, hydraulic structures, etc. Principles of statigraphy in standing buildings, identification of the chronological sequence and its interpretation particularly on post classical buildings.

Materials properties, use and conservation: **Natural stone materials and tools**	**Materials properties, use and conservation:** **Ceramics**
Materials properties, use and conservation: **Construction materials and binders**	**Materials properties, use and conservation:** **Pigments and dyes**
Materials properties, use and conservation: **Biomaterials and biominerals**	**Materials properties, use and conservation:** **Metals and metallurgical processes**
Materials properties, use and conservation: **Macromolecules and genetics**	**Materials properties, use and conservation:** **Glass, glazes, faiences, mosaics**

Remote Sensing for geoarchaeology	**Authentication: Concepts and methods**
Databases and data processing	**History and theory of restoration**
Cultural heritage, cultural goods, cultural market: Legal assessment in a European perspective	**3D Survey Methods and Technologies for Cultural Heritage**
Management and valorization of cultural heritage	**Virtual reconstruction and digital dissemination in Cultural Heritage**
Urban history: Methodologies of Historic Research for Cultural Heritage sites	**Methods, approaches and applications of archeological material analysis**
Integrated knowledge approach for the conservation of heritage building and sites: diagnosis, monitoring and interventions	

1st year - 1st semester

- **Introduction to scientific methods and principles**: Concepts of Earth sciences, mineralogy, petrology, physical-chemistry ***OR***
- **Introduction to archaeology and art history**: Concepts and methods (6 CFU)
- **Geomorphology of archaeological landscapes and sites** (6 CFU)
- **Integrated analysis of cultural heritage materials** (8 CFU)
- **History and prehistory of anthropic landscape** (6 CFU)
- **Dating laboratory** (4 CFU)

1st year - 2nd semester

- **Geoarchaeology and soil micromorphology** (6 CFU)
- **Geophysics for cultural heritage and civil engineering** (6 CFU)
- Materials 1 (6 CFU)
- Materials 2 (6 CFU)
- **Field laboratory work** (3 CFU)
- Language course (3 CFU)

2nd year - 1st semester

- **Historical buildings and sites** (6 CFU)
- Materials 3 (6 CFU)
- Materials 4 (6 CFU)
- Free choice course (6 CFU)

2nd year - 2nd semester

- Materials 3 (6 CFU)
- Materials 4 (6 CFU)
- Free choice course (6 CFU)
- **Thesis work** (30 CFU)

The programme structure and the focus on materials are very different from existing programmes in Italy and in most EU countries.

Selected students also have the possibility to achieve a double degree with the University of Haifa - Maritime Archaeological Heritage (*currently suspended*) and with the University of Bordeaux Montaigne - Archaeological Sciences.

Students enrolling in Padova in academic year 2026/2027 will be able to select the double degree with Bordeaux in 2027/2028.

Double Degree Programmes:

- University of Haifa, Israel *(currently suspended)*
- University of Bordeaux Montaigne, France

Teaching Collaborations:

- Getty Conservation Institute

Collaborations for internships and field work:

- University of Granada, Spain
- Weizmann Institute, Israel
- University of Tubingen, Germany

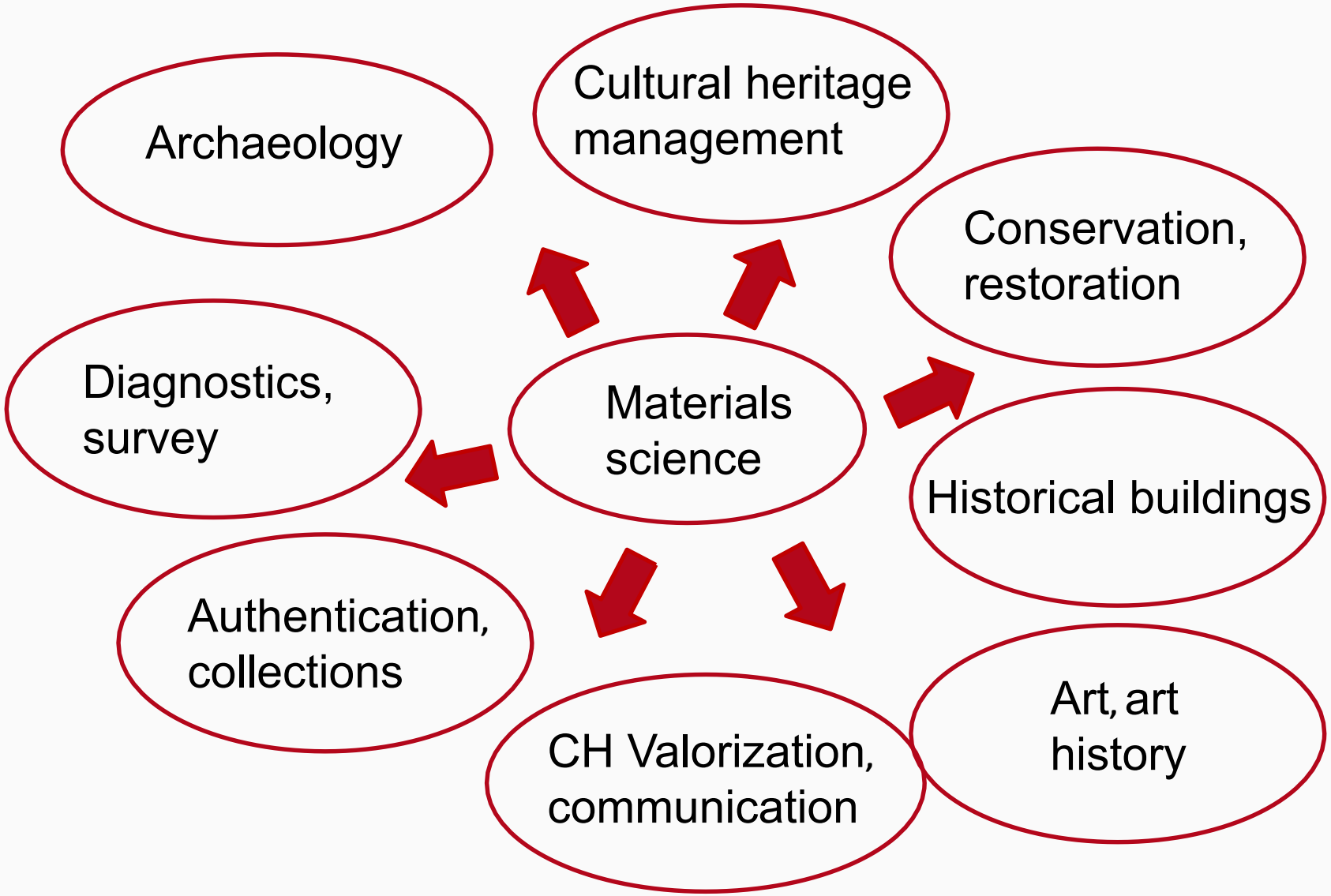
Field work on archeological sites, excavations and historical buildings in Italy and abroad.

Graduates could work as:

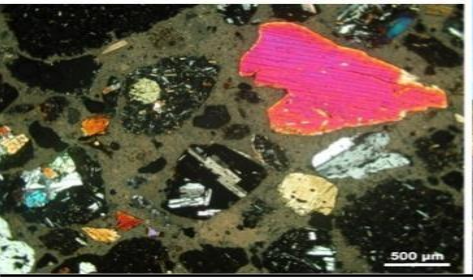
- Archaeologists
- Archaeological scientists
- Consultants
- Planners for diagnostic programmes of sites and CH objects
- Managers of archaeological sites
- Consultants and planners of museums
- Consultants and planners for conservation programmes



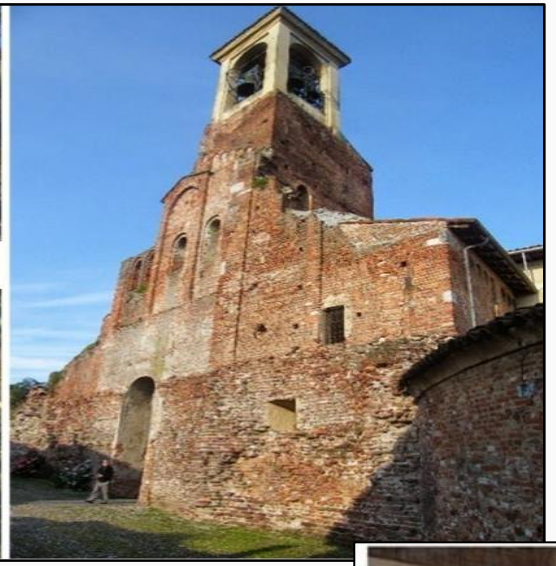
Their competences and knowledge will be unique for the interpretation and valorization of archaeological and CH materials.


Archaeology
Cultural heritage management
Conservation, restoration
Diagnostics, survey
Materials science
Historical buildings
Authentication, collections
CH Valorization, communication
Art, art history



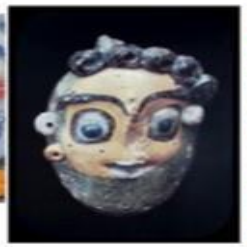


Ancient buildings and binders











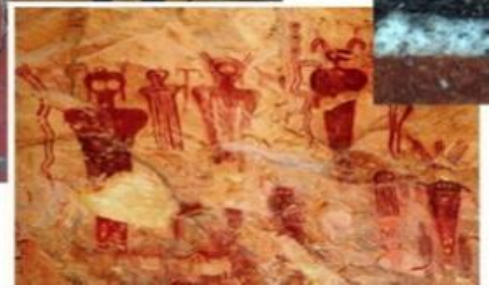
Ancient glass



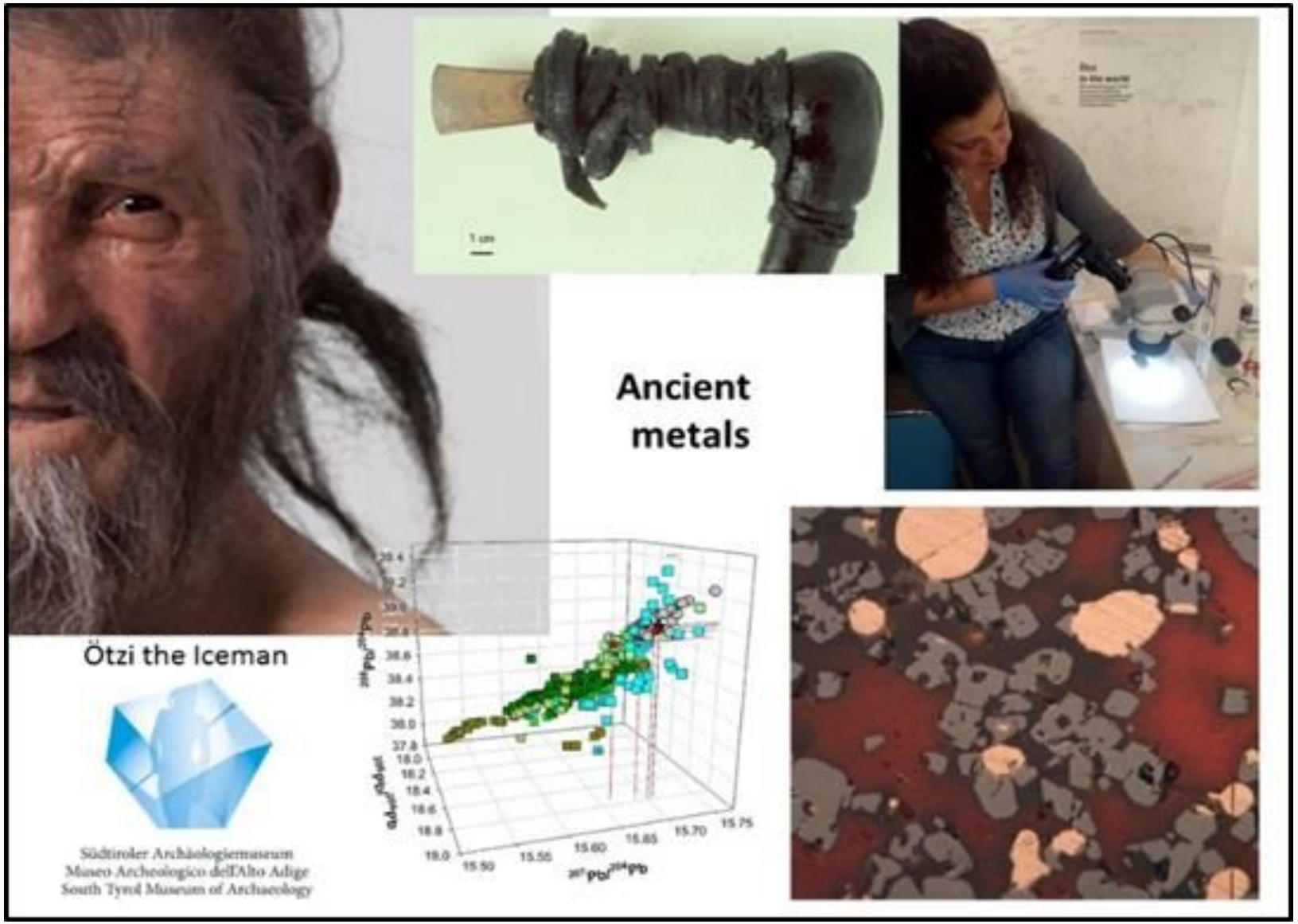








Pigments, paintings, frescoes


Ancient metals
Ötzi the Iceman
Südtiroler Archäologiemuseum
Museo Archeologico dell'Alto Adige
South Tyrol Museum of Archaeology

Head of the Master's degree in

***Archaeological Sciences*:**

Prof.ssa Silvia Paltineri (silvia.paltineri@unipd.it)

Coordinator of the study track

***Applied Sciences to Cultural Heritage Materials and Sites*:**

Prof. Gilberto Artioli (gilberto.artioli@unipd.it)

International Desks

Dedicated department-based desks for international students:

- ✔orientation/advising for degree programme choice
- ✔admissions & enrolment
- ✔students' welcome
- ✔support through academic career



international.dbc@unipd.it

Tutor Junior for Applied Sciences

tutorjunior.lettere@unipd.it

A way to connect with students for any questions related to the academic path!

Email subject: “ASCH”

Master's Degree in Applied Sciences to Cultural Heritage Materials and Sites

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Visitourapplicationplatform

international.dbc@unipd.it

UniversityPadova

Unipd and dbc.unipd

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Read what our second-year students say!

What has been the aspect of the programme you are enjoying the most?

- How helpful professors are
- Multi-disciplinary approach
- The variety of courses
- How multifaceted it is and how we are able to have a general insight on many diverse topics
- The cultural heritage part, the field trips and academic environment
- The laboratory classes
- I really enjoyed the dating laboratory that helped to understand different dating techniques for different objects and materials
- Materials elective courses; no University offers this level of detail in terms of materials (from a diagnostic and art-historical perspective)
- Working with different types of data

Thank you

Prof. Gilberto Artioli

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