A3TEX Research Center
Summer School

ARCHAEOMETRY, CONSERVATION, AND DIGITIZATION OF ARCHAEOLOGICAL TEXTILE

Sapienza University of Rome & TEXTaiLES European Consortium
June 30 – July 5, 2025
Sapienza Campus, P. Aldo Moro 5, 00185 Roma

Organized by Dep. Scienze dell'Antichità & A3TEX Sapienza Research Center in cooperation with TEXTaiLES European Consortium

Introduction and Objectives

The **A3TEX** *Archaeology & Archaeometry of Ancient Textile* Summer School aims to provide participants with theoretical and practical training in the methodologies for studying, analyzing, and preserving archaeological textile artifacts. The program employs an interdisciplinary approach, bringing together expertise from archaeology, materials science, and advanced diagnostic techniques. In collaboration with the **TEXTaiLES** project, the **A3TEX Summer School** introduces participants to cutting-edge digital tools and methods for documenting and communicating textile heritage.

Through a combination of lectures, laboratory exercises, and direct analysis of diverse textile artifacts, participants will acquire theoretical and practical knowledge in documenting, analysing, and preserving archaeological textile remains. Emphasis will also be given to conservation protocols and musealization strategies. The program will also delve into the technical and scientific aspects of textile research, providing critical insights into analytical procedures based on material types and conservation status.
To further enrich the training experience, participants will visit the Museum of Roman Ships in Nemi, where they will attend seminars and engage on hands-on activities on experimental and digital archaeology.

Program

The A3TEX Summer School program is structured into five thematic modules:

Module 1: Archaeological Study of Ancient Textile Artifacts

- Historical-archaeological introduction to textile production: ancient craftsmanship practices, textile chaîne opératoire, and contexts.
- Analytical protocols based on textile research: approaches and methodologies to address historical and archaeological questions.
- Interdisciplinary approaches: strategies for fostering collaboration between experts from multiple disciplines and research fields to achieve accurate and meaningful results.

Module 2: Enhancement and Communication of Textile Heritage

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- Strategies for exhibiting and communicating archaeological textiles in museums.
- Digital technologies: 3D modeling, augmented reality, and other innovative solutions for virtual reconstruction and accessibility.

  Camera Properties Definition: Learn to optimize camera settings (focal length, aperture, shutter speed, and ISO) for capturing high-quality images, ensuring precision in the 3D digitization process.

  Data Collection: Engage in hands-on exercises to capture overlapping images from multiple angles, creating a comprehensive dataset essential for robust Structure from Motion processing.

  3D Reconstruction: Utilize photogrammetry algorithms to align images, generate dense point clouds, and reconstruct detailed, textured 3D models from real-world textile artifacts.
- Focus on emblematic case studies related to strategies for musealizing and communicating textile artifacts to different audience types.

Module 3: Preventive and Interventive Conservation Techniques

- Assessing the state of preservation of archaeological textiles.
- Techniques for preventive conservation: environmental conditions, support materials, and packaging techniques.
- Development of interventive conservation plans for archaeological textile artifacts.

Module 4: Archaeometric Analysis for research and conservation

- Analytical techniques for characterising textile materials:
- Optical, digital, and scanning electron microscopy.
- FT-IR spectroscopy, Ramans Sers and Raman spectroscopy.
- Liquid chromatography for dye analysis.
- Extraction techniques for proteomic identification.

Module 5: Enhancing Analytical Skills in Laboratory Practice

- Documentation and identification of textiles.
- Analysis and characterization of textile fibers and metal threads.
- Dye extraction and analysis using mass spectrometry.
- Interpretation of spectra obtained from spectroscopy and proteomic analyses for fiber characterization.

Methodology

The program includes theoretical lectures, seminars, case study analysis, and laboratory activities. Participants will integrate theoretical knowledge with hands-on experience while engaging with experts from various disciplines, developing skills applicable to academic, museum, and conservation fields.

Target Audience

The A3TEX Summer School is designed for master's degree students, PhD candidates, post-docs, researchers, and professionals in the cultural heritage sector, including archaeologists, art historians, conservators, museum curators, and specialists in diagnostics, conservation, or restoration of cultural heritage and materials science interested in advanced methodologies for studying archaeological textile heritage.

Course Directors

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Prof. **Marco Galli**, dott.ssa **Francesca Coletti**, Dipartimento di Scienze dell'Antichità, Sapienza A3TEX *Archaeology & Archaeometry of Ancient Textile*

Associated Partners

With the TEXTaiLes Consortium HORIZON ECCCH 01_02

1. Directorate of Conservation - Hellenic Ministry of Culture, Athens (GR)
2. Athena Research Center, Athens (GR)
3. Museo delle Navi Romane, Nemi (RM).
4. Museo Nazionale Etrusco di Villa Giulia, Rome.

CALENDAR

June 30 – July 5, 2025 – **Lectures and laboratory sessions from 9:00 AM to 6:00 PM** (see the attached time schedule below).
Saturday, July 5 – Guided tour with a seminar and practical training in experimental archaeology and digitisation at the **Museum of Roman Ships in Nemi** (RM).
Tuesday, July 1 h. 18:00-20:00 ca
A **visit to the National Etruscan Museum of Villa Giulia** is scheduled to examine and discuss materials related to Etruscan textile culture, including mineralized fabrics and other artifacts, guided by the Museum's Director.

CREDITS 5 ECTS **COURSE COSTS 800,00 EU**

A limited number of single (event. double rooms) will be available (June 29 – July 6, 7 nights = 490, EU) at the Sapienza Guesthouse, located at Via Volturno, 42, with kitchen access.
Each participant is offered 5 meal/snack lunch bonuses from 30 June to 4 July.

https://www.uniroma1.it/it/pagina/foresteria-sapienza
https://youtu.be/xPtRB-morEY

ADMISSION REQUIREMENTS

Master's Degree or an equivalent university qualification + Curriculum Vitae + Motivation Letter

APPLICATION DEADLINE 29 May

. **For further information, please don't hesitate to contact: centro.a3tex@uniroma1.it**

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A3TEX SAPIENZA RESEARCH CENTER ARCHAEOLOGY & ARCHAEOMETRY OF ANCIENT TEXTILE | SAPIENZA UNIVERSITÀ DI ROMA | Research & Innovation Information Technologies ATHENA | textailes | drmi Direzione Regionale Musei Lazio | Ministero della cultura

MUSEO NAZIONALE ETRUSCO DI VILLA GIULIA

A3TEX SUMMER SCHOOL TIME SCHEDULE

Monday, June 30	Tuesday, July 1	Wednesday, July 2	Thursday, July 3	Friday, July 4	Saturday, July 5
9:00 – 13:00	**9:00 – 13:00**	**9:00 – 13:00**	**9:00 – 13:00**	**9:00 – 13:00**	**9:00 – 19:30**
Study, documenting, sampling, and analyzing fibers and textiles. Fundamentals, methods and case studies	Spectroscopy as a non-destructive approach to the analysis of textiles, fibers, and dyes	Laboratories 1.2.3.4	Laboratories 1.2.3.4	Laboratory activities and practical exercises. Overall evaluation of the topics and case studies addressed	**Museum of Roman Ships in Nemi (RM)** 1. Visit to the museum and archaeological deposits (Museum Director, Dr. Daniela De Angelis) 2. Seminar of Experimental Archaeology 3. Laboratory with demonstrations and practical exercises in ancient spinning and weaving techniques 4. Laboratory with textile digitization exercises
14:00 – 18:00	**14:00 – 18:00**	**14:00 – 18:00**	**14:00 – 18:00**	**14:00 – 19,30**	
Principles of diagnostics, conservation, and enhancement of textiles. Fundamentals and case studies	High-performance techniques for fiber and dye characterization	Laboratories 1.2.3.4	Laboratories 1.2.3.4	Techniques, methods, and protocols for the digitization of textile heritage. Fundamentals and case studies from the TEXTaiLES EU project	

Tuesday, July 1 h. 18:00-20:00 ca

A visit to the **National Etruscan Museum of Villa Giulia** is scheduled to examine materials related to **Etruscan textile culture**, including **mineralized fabrics, guided by the museum's director Dr Luana Toniolo.**

All lessons and seminars on 1st.2nd.4th July are hold in **Aula A** Department of Environmental Biology.
Laboratories 1-2. **Aula A** Dipartimento di Biologia Ambientale (Lectures and Microscopy Laboratory).
Laboratories 3. **Laboratorio di Spettroscopia Infrarossa**, IRS1, Department of Physics.
Laboratories 4. **Laboratorio di Spettrometria di Massa**, Department of Chemistry

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