



**E-RIHS.it**

EUROPEAN RESEARCH INFRASTRUCTURE  
FOR HERITAGE SCIENCE

## TRAINING CAMP 2024

Digital Heritage Camp:  
3D Surveying Training in  
Sermoneta Castle and Ninfa Park

**August 26 - September 7**

**SERMONETA**  
Latina, Lazio, Italy

organised by

CNR | DSU

Consiglio Nazionale  
delle Ricerche

ISPC Istituto di Scienze del  
Patrimonio Culturale

Consiglio Nazionale  
delle Ricerche

ISTI Istituto di Scienza e Tecnologie  
dell'Informazione "A. Faedo"





## TRAINING CAMP 2024

### Digital Heritage Camp:

### 3D Surveying Training in Sermoneta Castle and Ninfa Park

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Sermoneta, Latina, Lazio, Italy

Learn about three-dimensional survey technologies for cultural heritage documentation and understand the best strategies and techniques for planning, executing and completing a large-scale 3D survey campaign.

The intensive training program, promoted by E-RIHS.it, the Italian node of the European Research Infrastructure for Cultural Heritage Science, and born from the collaboration between CNR DSU, CNR ISPC, CNR ISTI and the Roffredo Caetani Foundation, will take place in the beautiful architectural and naturalistic setting of Ninfa Gardens and Sermoneta Castle in Italy. The E-RIHS.it Training Camp 2024 is under the patronage of the Unione Italiana Disegno (UID) and boasts a technical-scientific partnership with prestigious Italian universities and high-tech companies. The camp offers you a dynamic training through the combination of lectures, seminars and the opportunity to personally participate in field activities, in face-to-face dialog with expert tutors specialized in each type of activity.

The wide variety of solutions for the acquisition, management and integration of three-dimensional survey data, both open source and proprietary, offers a panorama of techniques and tools whose choice depends on numerous factors, in particular the objects or contexts to be surveyed and the conditions of use in the field. However, a single tool and software is almost never sufficient to meet the descriptive and analytical needs of a larger project. In fact, there is an increasing need to integrate data from multiple scanning tools and methods into a single project.

To meet these requirements, E-RIHS.it offers the Digital Heritage Camp: 3D Surveying Training at Sermoneta Castle and Ninfa Park, an intensive course of 80 hours of face-to-face training delivered by 19 senior teachers to utilize the technical and theoretical tools:

- Evaluate the use of active and passive measurement tools in real applications.
- Plan and carry out a measurement campaign using photogrammetry and 3D scanners.
- Process, manage and integrate data sets from different sources.
- Publish and disseminate the results of measurement campaigns.

## WHO CAN APPLY

College students, experts, researchers and scientists working in the following fields: 3D survey with active and passive sensors, Terrestrial Laser Scanning, LIDAR, SLAM, Structured Laser Scanning, Photogrammetry.

## HOW TO PARTECIPATE

Registration for participation is possible on the corresponding website **[www.trainingcamp-erih.it](http://www.trainingcamp-erih.it)**

Registration is considered complete if the candidate can present the following documents:

1. Fill in the online application form.
2. Upload the Curriculum vitae and the cover letter.
3. Submit your application by **May 31, 2024** at the latest.

### Note

The maximum number of participants admitted is 20. The selection of the applications received will take between fifteen and twenty days to determine the winning profiles. The winning TRAINING CAMP participants will be notified by email and will receive full details for payment of the fee, which must be made within one week of receipt of notification.

The TRAINING CAMP includes a one-off participation fee of 700 euros. The participation fee includes:

- Breakfast, lunch and dinner
- Coffee break
- 1 social event
- Accommodation at Sermoneta Castle\*
- Transfer to/from the training locations

\*Participants will be accommodated in the castle's hostel, where they will share a room with 3 beds and 3 shared bathrooms in the complex. However, participants have the option of booking a room in a Bed and Breakfast (BnB) of their choice if they wish. In this case, they will receive a €200 discount on the fee.

## IMPORTANT DATES

Opening of Call for applications	May 02, 2024
Closing of Call for applications	May 31, 2024
Communication to the TRAINING CAMP participants	June 17, 2024
Payment of the participation fee	June 24, 2024

## APPLICATION AREAS

The knowledge gained will be useful in many areas of application: Documentation, conservation and valorization of cultural heritage, restoration, simulation, teaching, animation, cartography, territorial management (GIS), quantitative landscape monitoring, computer graphics, etc.

Topographic surveying and the use of LeonardoXE365 software for the integration of TPS and GPS will be discussed in detail, aerial photogrammetric surveying and data processing with 3D Zephyr, surveying with laser scanners both static with TLS and mobile with SLAM, surveying with SLS of objects and architectural details.

An in-depth analysis of the use of Faro Scene, MeshLab and Cloud Compare is also given, with particular attention to scan alignment, metric error control and remeshing techniques. Methods for publishing extensive 3D surveys online using open source tools are also covered.

At the end of the training camp, participants will be able to:

- Plan and execute a topographic survey campaign using TPS and GPS.
- Plan and execute a photogrammetric survey campaign, both at close range and from UAS, from object to architectural scale.
- Plan and execute a laser scanner survey campaign, both with TLS and SLAM.
- Integrate point clouds from photogrammetric and laser scanner surveys into the same project.
- Digitize objects and architectural details by integrating 3D close-range scanning and photogrammetry.
- Manage survey data by processing both two- and three-dimensional results.
- Publish 3D datasets online in interoperable formats with open access by using the E-RIHS infrastructure and open source tools for interactive cross-device use.

## TEACHING METHODOLOGY

The educational methodology of the training camp follows the logic of learning-by-doing and teamwork. To live up to these assumptions, a considerable number of learning and process activities are accompanied by the necessary theoretical frontal teaching by the course instructors.

In detail:

- 20% theoretical lessons and frontal teaching
- 40% on-site activities
- 40% practical activities on data processing and digital output

The program of activities is structured according to the logic of group work: students always work in groups of 5, followed by a tutor, and take turns with the activities, each group being assigned a quadrant of the Castle. The groups alternate in their area of data collection and processing.

If they complete the task before the end of the day, they are brought back to class to begin processing the data, followed by their tutor.

## SCIENTIFIC BOARD

### Scientific direction

Daniele Ferdani | CNR ISPC

Diego Ronchi | CNR ISPC

### Scientific board

Nicodemo Abate | CNR ISPC

Andrea Angelini | CNR ISPC

Filippo Calcerano | CNR ISPC

Michele Calvano | Sapienza Università di Roma

Marco Callieri | CNR ISTI

Stefano Campana | Università degli Studi di Siena

Enzo D'Annibale | CNR ISPC

Nicolò Dell'Unto | Lund University

Domenica Dininno | CNR ISPC

Bruno Fanini | CNR ISPC

Elisa Farella | Fondazione Bruno Kessler

Elena Gigliarelli | CNR ISPC

Elena Ippoliti, Sapienza Università di Roma

Marco Limongiello | Università degli Studi di Salerno

Nicola Masini | CNR ISPC

Costanza Miliani | CNR ISPC

Luca Morelli | Fondazione Bruno Kessler

Fabio Remondino | Fondazione Bruno Kessler

Graziano Mario Valenti | Sapienza Università di Roma

### Contact

Alfonsina Pagano | CNR ISPC

Silvia Iachello | CNR ISPC

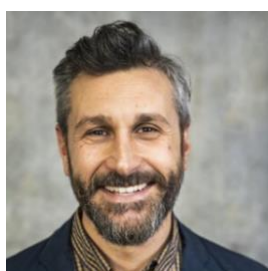
[ispc.socialboard@ispc.cnr.it](mailto:ispc.socialboard@ispc.cnr.it)



## KEYNOTES



**Stefano Campana** has been working for the past twenty years at the University of Siena (Italy) and the University of Cambridge (UK). He has built a sound reputation as an international authority in the field of landscape and digital archaeology. He is particularly interested in the understanding of past historic landscapes from the 1st millennium BCE to the Middle Ages through the medium of landscape archaeology. The principal context for his work has been Italy but he has also participated in and led research work in the UK, Spain, Turkey, Palestine, Iraq, Mozambique and Asia.



**Nicolò Dell'Unto** is Professor of Archaeology in the Department of Archaeology and Ancient History at Lund University, Sweden. His research focuses on archaeological practices, with a particular emphasis on the impact of 3D visualisation and spatial technology on the process of knowledge production. He is currently the director of the Lund University Digital Archaeology Laboratory (DARKLab) <https://www.darklab.lu.se/>



**Costanza Miliani**, interim director of CNR ISPC, is a senior research scientist at CNR ISTM where she heads the Heritage Materials Science group. Additionally, she serves as an Adjunct Professor of Conservation Science at the Department of Art and Humanities, University of Perugia, Italy. Miliani has also held positions as a visiting research scientist at Princeton Materials Institute, Princeton University, NJ, USA, and as a research scientist and post-doc at CNR-ISTM. With over 140 articles and an H-index of 43, she co-edited "Science and Art: The Painted Surface" by the Royal Society of Chemistry. As Principal Investigator of numerous research projects in Heritage Science, she coordinates the European MOLAB mobile platform and the Italian node of E-RIHS. Additionally, Miliani sits on the board of the SMAArt Center of Excellence at the University of Perugia and the scientific committee of the Center for Scientific Studies in the Arts at Northwestern University of Chicago.



**Fabio Remondino** is the head of the 3D Optical Metrology research unit at FBK - Bruno Kessler Foundation, a public research center located in Trento, Italy. He holds a laurea in Environmental Engineering from Politecnico of Milano and a PhD in Photogrammetry from ETH Zurich. His main research interests are in the field of reality-based surveying and 3D modeling, sensor and data fusion and 3D data classification. He is working in all automation aspects of the entire 3D reconstruction pipeline for applications in the industrial, environmental and heritage field. He is author of more than 200 articles in journals and conferences. He is involved in knowledge and technology transfer, organizing more than 30 conferences, 20 summer schools and 5 tutorials. Fabio has served as President of the ISPRS Technical Commission II (2016-2020) and Commission V (2012-2016), Vice-President of EuroSDR (2017-2023) and Vice-President of CIPA Heritage Documentation (2015-2019).

## RESIDENT TEACHERS



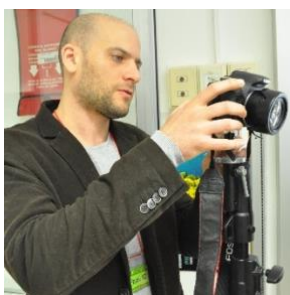
**Marco Callieri** is a senior researcher at the Visual Computing Lab of CNR ISTI. His main field of work is the use of digital technologies 3D models to support the study, conservation and presentation of CH artifacts. Strong expertise in 3D digitization, 3D data processing and visualization, web-based visualization and interaction. Has coordinated and carried out numerous 3D scanning campaigns, in important museums and sites both in Italy and abroad. Developer of MeshLab and 3DHOP. <https://vcg.isti.cnr.it/~callieri>



**Enzo d'Annibale**, a Ph.D. holder in geomatics, and researcher at CNR ISPC is renowned for merging technology with cultural heritage. His expertise in real-time 3D visualization and immersive experiences has led to significant contributions in research, sponsored projects, and museum exhibitions. Enzo's skills span various techniques, enabling detailed 3D reconstructions of historical artifacts, targeting both experts and museum audiences. Enzo embraces new technologies like virtual reality and projection mapping, paving the way for a future where technology enhances our understanding and appreciation of the past.



**Daniele Ferdani**, archaeologist Ph.D, is a researcher at CNR ISPC. His activities are oriented to the definition and experimentation of methodologies and integrated digital technologies for the acquisition, interpretation, and 3D reconstruction of cultural heritage and dissemination through VR systems. He has contributed to numerous National and EU-funded research projects and published articles and books on these topics. Currently, he is the coordinator of WP6 within the EU project PERCEIVE and as a Task Leader in the PON SHINE project, where he leads efforts to enhance the Italian nodes of E-RIHS.



**Diego Ronchi**, archaeologist Ph.D, is a researcher at CNR ISPC. He directed several 3D survey projects of both archeological sites and museum collections. His research and background focus on the integration of active and passive 3D sensor data for the documentation and study of ancient buildings and landscapes, as well as on technical and methodological research on cultural heritage in natural parks and protected landscapes. [https://www.ispc.cnr.it/it\\_it/team/ronchi-diego/](https://www.ispc.cnr.it/it_it/team/ronchi-diego/)

## TEACHERS



**Nicodemo Abate** is Medieval archaeologist, specialised in ICT for cultural heritage. He did a PhD in Remote Sensing applied to the discovery, monitoring and protection of cultural and natural heritage. Today, he is a technologist at CNR ISPC in Potenza site. In the laboratory he deals with the acquisition and processing of remote sensing data from drones and satellites, with active and passive sensors, for applications in the field of archaeology, landscape archaeology and the study and assessment of risk factors of the archaeological heritage.



**Andrea Angelini** is a researcher at CNR ISPC and is a member of the Digital Survey and Representation Lab (RDR LAB). He holds a degree in Letters, Classical Archaeology, from the University of Rome La Sapienza and a Ph.D in Science of Representation and Surveying from the Faculty of Architecture, University of Rome La Sapienza. Author of more than 60 scientific articles in journals and conferences in the field of archaeological and architectural surveying, some of them related to territorial surveying with GNSS systems, since 2019 he has been professor of Thematic Cartography at the School of Specialization in Natural and Territorial Heritage in agreement with La Sapienza University of Rome, Faculty of Architecture, Department of Planning, Design, Technology of Architecture.



**Filippo Calcerano**, architect, and researcher at CNR ISPC. Expert in energy and environmental improvement of built heritage through diagnostics, building performance simulation, HBIM and interoperability. He consolidated a sensitivity to interdisciplinary research and the role of knowledge-gaps closer between different research fields and stakeholders in order to streamline digital workflows applied to the built heritage, focusing on integrating the environmental design and conservation perspectives, leveraging the potential of IT management and decision support tools.

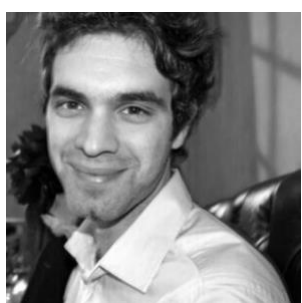


**Michele Calvano**, architect and Ph.D. in Representation Science; currently researcher at the Department of History (DSDRA), Representation and Restoration of Architecture at the Sapienza University of Rome. He specialises in 3D modelling for architecture and design. He has written articles and books on reverse modelling, shape design, digital representation of architecture and urban space, also using BIM techniques. Among his various activities, he develops VPL processes aimed at the information modelling of the built heritage, combining Visual Programming Language and Building Information Modelling (BIM). He works with companies in the AEC sector to support them in the construction of complex forms designed.





**Domenica Dininno** is currently a researcher at CNR ISPC in Rome. Her research topics are digital archeology and also building archaeology. In particular, she is an expert in three-dimensional survey techniques. In recent years she has collaborated on projects in which machine learning is used for archeology and is developing a line of research that allows it to be used to quantify the construction costs of Roman entertainment buildings. For many years she was involved in various fieldwork activities with the Archaeological Superintendence of Rome. She has contributed to numerous international and EU-funded projects.



**Bruno Fanini**, Computer scientist, PhD and researcher at CNR ISPC - focuses his research and development activities on real-time 3D, WebXR and open standards, immersive virtual reality and spatial interfaces. He has developed open tools and services for creating online Web3D/WebXR applications (such as the "ATON" framework), serious games, virtual museums, and interactive applications targeting Cultural Heritage. He is responsible for several projects related to interactive 3D visualization targeting HS infrastructures, Web3D services, interaction models and immersive XR. He is leader of WP6 in PNRR project "H2IOSC"; Scientific responsible for unit #14 in SHINE DigiLab (Strengthening the Italian Nodes of E-RIHS) and Responsible of RM Research Unit within the PNRR PRIN project "MetaMic"



**Elisa Mariarosaria Farella** has a PhD in Architecture received at the University Federico II of Naples, and she has been a researcher at FBK - Bruno Kessler Foundation (3DOM unit) since 2017. Her research interests span several fields related to geomatic, 3D surveying and modelling, GIS applications, and the use of AI for data enrichment and data processing automation.



**Elena Ggliarelli** is architect and senior researcher at CNR ISPC, she coordinates the Built Heritage Innovation Lab. Leading various regional, national, and international projects, she focuses on researching, conserving, and promoting historical built heritage, archaeological sites, and museums. Her expertise extends to environmental architectural design for energy efficiency in historic buildings and digital methodologies for built heritage (Heritage BIM). Currently, she serves as the VCC3 Head for the DARIAH-EU research infrastructure, where she is a member of the Joint Research Committee – JRC



**Marco Limongiello** holds an European PhD in "Risk and sustainability in Civil Engineering, Architecture, Environmental Engineering systems". He is Technical Supervisor of the "Laboratorio Modelli -Surveying and Geo-Mapping for Environment and Cultural Heritage " and he is also Adjunct Professor in "Drawing, CAD and BIM" at the Department of Civil Engineering - University of Salerno. His research activity focuses on infographic technologies for the survey and representation of architectural, archaeological and environmental heritage.



**Nicola Masini** is research director at the CNR ISPC. Since 1993, his scientific activity has focused on integrated multiscale remote sensing methods in Archaeology, non-invasive sensing technologies for architectural and archaeological heritage conservation, and sciences for conservation and architectural restoration. Currently, he is a CNR Research Director and Deputy Director of CNR ISPC in Potenza. He also directs the Italian Archaeogeophysics and Heritage Conservation Mission (ITACA) in Peru and holds professorships at the University of Basilicata in Matera. Additionally, he serves as Editor-in-Chief and co-founder of Heritage.



**Luca Morelli** is a PhD student at FBK - Bruno Kessler Foundation (3DOM unit) and University of Trento. His research focuses on integrating advancements in computer vision, global navigation satellite systems (GNSS), and other positioning techniques into conventional photogrammetric procedures, with a specific emphasis on enhancing the accuracy and efficiency of data acquisition.

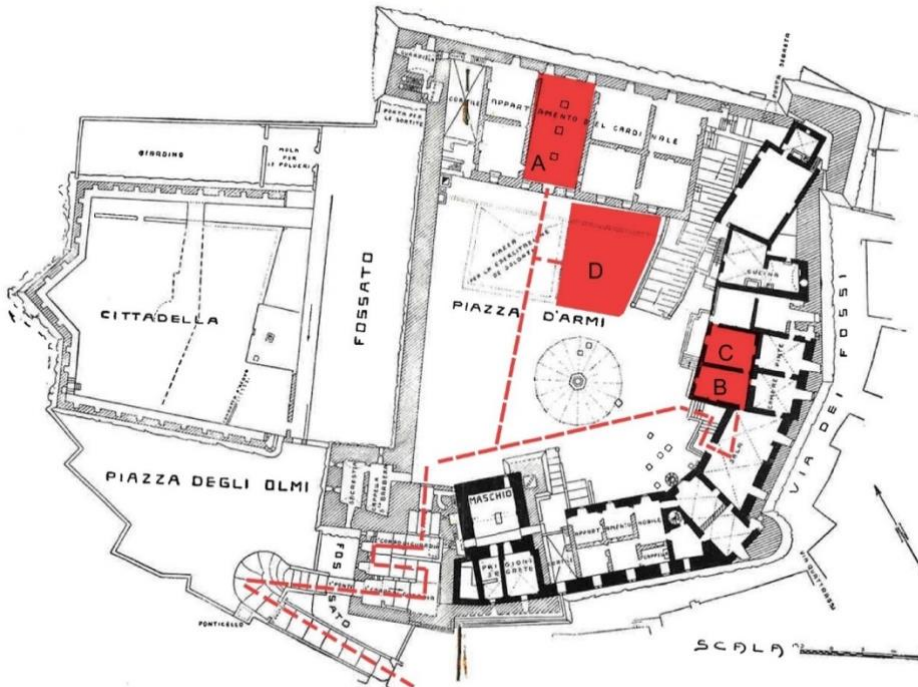
## THE LOCATION



Sermoneta Castle



Ninfa Natural park



Pianta del castello di Sermoneta.

A) keynote and lesson; B) laboratory; C) charging deck for instrumentation; D) lunch e coffee break

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