4th GEORES and 10th Arqueológica 2.0 Symposium
Organized by CHEDAR project

Digital Ecosystems for Heritage 4.0.
Artificial Intelligence, Values, and Risk Assessment for Conservation

Florence, 27–29 August 2026

In 2026, speaking about cultural heritage, tangible and intangible, means engaging with a profound transformation. Artificial Intelligence (AI), Digital Twins, cloud platforms and FAIR (Findable, Accessible, Interoperable, Reusable) data infrastructures are reshaping the ways we document, interpret and protect heritage, aligning with emerging agendas on sustainability, risk management and responsible innovation.

The joint 4th GEORES and 10th Arqueológica 2.0 Symposium, organized by CHEDAR (Cultural Heritage Digitalization and Reconstruction) project and supported by ICOMOS Italia (International Council on Monuments and Sites), and CIPA-Heritage Documentation (Icomos International Scientific Committee), positions itself as a strategic laboratory: three days to outline a shared roadmap toward a coherent and sustainable digital ecosystem for heritage, integrating research, advanced training and long-term policy. In line with CHEDAR's mission, focused on 3D digitization, Digital Twins, AI and extended reality for risk management, the Symposium invites participants to conceive Cultural Heritage as a dynamic relational system rather than a static collection of objects.

At the center of this vision is the idea of an ecosystem for Heritage 4.0, where data, 3D models, knowledge graphs, sensor networks and immersive platforms interact to support conservation, management and public engagement. Advanced applications, from AI-based predictive monitoring to Digital Twins simulating degradation or intervention, now raise crucial questions: How do we guarantee transparency, verifiability and traceability? How can these tools be embedded in the daily practices of heritage professionals?

This is why the Symposium emphasizes genuine interdisciplinarity: shared workspaces where restorers, archaeologists, architects, engineers, museum conservators, data scientists and developers collaborate on practical cases. Experience in geomatics and digital heritage demonstrates that cross-fertilization among disciplines leads to real methodological progress and higher professional standards.

Training and capacity building are therefore central. Shaping a roadmap for Heritage 4.0 requires rethinking professional profiles, hybrid skills and educational models, consistent with evolving international frameworks for advanced learning in the digital heritage field.

A human-centered approach remains fundamental. Technology matters only when it strengthens relationships between people, places and cultural values, fostering inclusion, empathy and shared responsibility.

This principle resonates strongly in 2026, the 60th anniversary of the Arno River flood, an event that reshaped Florence's cultural identity and global awareness of heritage vulnerability, reminding us that resilience is rooted in communities, memory and care.

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Sapienza Università di Roma
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Università degli Studi di Cassino e del Lazio Meridionale
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Digital Ecosystems for Heritage 4.0 invites the international community to a collective design exercise: to envision strategies and tools that combine technological innovation, ethical responsibility and long-term sustainability, through close dialogue between heritage practitioners and the creators of the digital solutions transforming their work.

TRACKS

1. AI, Governance and Critical Futures of Cultural Heritage: Trust, Bias and Accountability

Heritage 4.0: Can We Trust Artificial Intelligence?
A track exploring how AI intersects with ethics, policies and the governance of digital ecosystems.

Topics include but are not limited to:

- International standards, regulations and policies for digital heritage;
- Data governance, responsibility and digital rights;
- Ontologies, knowledge graphs and semantic models as the backbone of Heritage 4.0;
- AI for segmentation, classification and decay prediction: opportunities vs. risks;
- Generative AI for virtual reconstructions: how far can we go?
- Automation, transparency, and accountability in heritage processes.

2. Digital Twins and Computational Realities: Beyond 3D Modelling

Digital Twins: New Frontier or New Constraint for Cultural Heritage?
A track focused on Digital Twins as dynamic, critical tools for the lifecycle of heritage.

Topics include but are not limited to:

- Digital workflows for heritage conservation;
- From integrated surveying to living, interoperable Digital Twins;
- Digital Twins for management, monitoring and decision-making;
- Data traceability, versioning and reuse in 3D ecosystems;
- AI-enhanced modelling, sensor integration and predictive platforms;
- Costs, limitations and sustainability of Digital Twins in heritage.

3. Heritage Under Pressure: Risk, Monitoring and Resilience Strategies

Resilience 4.0: Are We Ready to Protect Heritage in a Changing World?
This track explores how digital tools, analytical models and data-driven approaches can support the understanding, prediction and mitigation of risks affecting cultural heritage, across scales and typologies.

Topics include but are not limited to:

- Digital diagnostics and multi-scale monitoring;
- Suitable patterns for describing hazard and vulnerabilities;
- Predictive modelling and early warning systems;
- Digital tools and contents for the definition of natural and anthropic risks;
- Digital strategies for emergency preparedness and mitigation.

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4. Museums After Digital: Accessibility, Hybrid Experiences and New Audiences

How will Museums of the Future rethink access, experience and mediation?
A forward-looking track addressing what museums will become in the next decade.

Topics include but are not limited to:

- Immersive XR and hybrid physical–digital environments;
- New forms of accessibility: sensory, cognitive, remote and social inclusion;
- Computational storytelling and multisensory narratives;
- Ethical issues in digital museums: privacy and digital visitor rights;
- Participatory and community-driven digital engagement;

5. Skills for Heritage 4.0: Training, New Professions and Knowledge Transmission

Who Will Safeguard the Digital Heritage? Educating Tomorrow's Professionals
A track examining the transformation of competencies and learning models in the digital heritage sector.

Topics include but are not limited to:

- Emerging professional profiles and evolving skillsets;
- Interdisciplinary training: combining humanities, engineering and data science;
- Experiential and lab-based education, simulations and hands-on learning;
- Institutional strategies for capacity building and continuous training;
- Skill gaps between research, practice and public administration.

SPECIAL SESSION 1

The Arno River and the 60th Anniversary of the 1966 Flood.
Memories, Digital Documentation and Risk Awareness

Sixty years after the devastating 1966 flood, the Arno river remains both a symbol of vulnerability and a laboratory for innovation in risk monitoring, documentation and landscape management. This special session invites contributions that reflect on the historical event while exploring new digital strategies for understanding river dynamics, modelling flood scenarios and preserving related cultural heritage.
A guiding question frames the session: how can digital ecosystems help transform the memory of the Arno flood into a proactive framework for awareness, preparedness and long-term resilience?

Topics

- Digital reconstructions of the 1966 flood;
- Archival sources, visual memories and immersive storytelling;
- River monitoring, hydrological modelling and predictive tools;
- Landscape-scale vulnerability analysis;
- Community engagement and cultural memory preservation;
- Policies and digital frameworks for river-related heritage risks.

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SPECIAL SESSION 2

The Arab and Mediterranean Regions as a Living Heritage Laboratory.

Digital ecosystems, Fragility and Innovation in the CHEDAR Project

The Arab and Mediterranean Regions are a complex cultural and environmental mosaic, marked by intense human activity, fragile coastal systems, critical desert ecosystem, rich archaeological landscapes and contemporary socio-political challenges. Within the framework of the CHEDAR project, this session highlights the region as a critical testing ground for innovative digital approaches to documentation, monitoring, resilience and cross-border collaboration.
Central to the session is the question**:** how can digital ecosystems support a shared, transnational vision for safeguarding the Arab and Mediterranean cultural heritage in a rapidly transforming environment?

Topics

- Digital documentation and interpretation of the Arab and Mediterranean heritage landscapes;
- Coastal and underwater heritage monitoring;
- Climate-related risks and environmental stressors across the region;
- Interoperable platforms and cross-border data governance;
- Community-based digital narratives and oral histories and know-how;
- Case studies from CHEDAR pilot areas.

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