



ISGC 2016

Ubiquitous e-infrastructures and Applications

Taipei, 2016 March 16th

EUROPEAN RESEARCH INFRASTRUCTURES FOR HERITAGE SCIENCE

Luca Pezzati, CNR

Italy



Coordinating Country
Italy

11 Member Countries

Belgium
Cyprus
Czech Republic
France
Germany
Greece
Hungary
Portugal
Spain
The Netherlands
United Kingdom

8 Participating Countries

Brazil
Bulgaria
Denmark
Ireland
Israel
Poland
Slovenia
Sweden



E-RIHS

EUROPEAN RESEARCH INFRASTRUCTURE
FOR HERITAGE SCIENCE

*distributed research infrastructure for heritage
interpretation, preservation, documentation and
management*

a cross-disciplinary collection of advanced tools and services

serving a cross-disciplinary community of researchers



MOLAB

Mobile laboratory for
in-situ diagnostics



FIXLAB

Access to large-
scale facilities



ARCHLAB

Scientific archives for
heritage science



DIGILAB

Digital scientific datasets
for heritage science

2016-2019
preparatory phase

2021-2025
implementation phase

www.e-rihs.eu

what is a research infrastructure?

infrastructure:

- *the basic systems and services that are **necessary for a country** or an organization **to run smoothly**, for example buildings, highways, transport and water and power supplies*

what is a research infrastructure?

infrastructure:

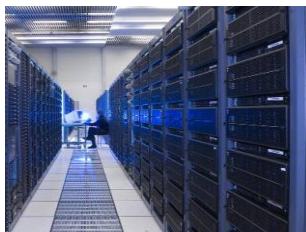
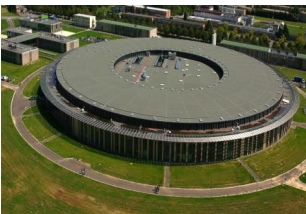
- *the basic systems and services that are **necessary for a country** or an organization **to run smoothly**, for example buildings, highways, transport and water and power supplies*

research infrastructure:

- research infrastructures are the highways that make it possible **for research to run smoothly** and advance

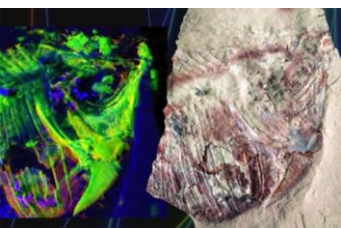
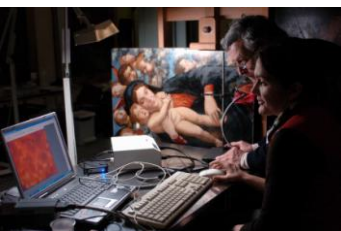
European research infrastructure

- state-of-the-art **facilities**, **resources** and **services** used by the scientific community and by enterprises to conduct top-level research in a specific domain
- examples of RIs:
 - synchrotrons and accelerators
 - large-scale research installations (e.g. CERN, LNGS)
 - **integrated** arrays of small research installations
 - infrastructural centres of competence providing services for the research community based on an assembly of **techniques and know-how**
 - collections, libraries, **archives**, **databases**
 - virtual-access **data infrastructures**





Heritage Science



- heritage science is science for **access** to cultural heritage and for its **preservation, documentation, interpretation** and **management**
- heritage science is founded on the **interdisciplinary combination** of knowledge
 - from **arts and humanities** (conservation, archaeology, history, art history, architecture, ethics, ...)and
 - from **science and technology** (chemistry, physics, mathematics, biology, anthropology, palaeontology, earth sciences, computer sciences, engineering, ...).



LANDSCAPE
OF RESEARCH INFRASTRUCTURES FOR
HERITAGE SCIENCE



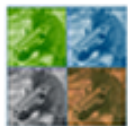
PARTHENOS

Pooling Activities, Resources and Tools
for Heritage E-research Networking,
Optimization and Synergies



E-RIHS

EUROPEAN RESEARCH INFRASTRUCTURE
FOR HERITAGE SCIENCE



IPERION CH





ARIADNE AND PARTHENOS



ARIADNE Advanced Research
Infrastructure for Archaeological Data
Networking in Europe



PARTHENOS Pooling Activities,
Resources and Tools for Heritage E-research
Networking, Optimization and Sinergies

Franco Niccolucci, Project Coordinator



ARIADNE



- A Research Infrastructure project aiming at the integration and **interoperability of archaeological datasets** in Europe (and beyond)
- Concept: **defragment** archaeological data and make them **discoverable, accessible, usable**



- Outcomes:
 - Standardization and metadata mapping
 - The ARIADNE **Registry** of archaeological **datasets**, with tools for faceted searches
 - **>1,600,000** resources available (documents, drawings, images, 3D, GIS, databases)
 - Data mining, Natural Language Processing and Linked Open Data
 - Experimental **integrated database** (numismatics)



Accessing the ARIADNE Registry

The screenshot displays the ARIADNE portal interface. At the top, a browser window shows the URL 'ariadne-portal.dcu.gr'. Below the browser, a navigation bar contains links for 'Catalog', 'Services', 'Experiments', and 'About'. The main content area features the ARIADNE logo, a search bar with a dropdown menu set to 'All fields', and a search button. Below the search bar, there are three sections: 'Welcome', 'Browse the Catalog', and a filter section. The 'Welcome' section contains a paragraph about the portal's purpose. The 'Browse the Catalog' section includes a map of Europe, a timeline graph, and a 'What' filter button.

Welcome - Ariadne portal

ariadne-portal.dcu.gr

Cerca

Catalog Services Experiments About

ARIADNE

All fields Search for resources in

Welcome

ARIADNE brings together and integrates existing archaeological research data infrastructures so that researchers can use the various distributed datasets and new and powerful technologies as an integral component of the archaeological research methodology.

Browse the Catalog

Where

When

What



- **Cluster** of all EU Research Infrastructures on Humanities and Heritage Science (Cultural Heritage, Archaeology)
- Concept: develop **common solutions** to common (digital) issues



- Developing
 - Policies, strategies and tools concerning data management, e.g. identity federation; data life-cycle, including preservation; data quality
 - Standardization and semantics
 - Joint Resource Registry (like the ARIADNE one)
 - Foresight studies, conceptual ‘landscaping’ and research agenda: what will be the research scenarios in 5-10-20 years?
- 1st report on user needs published online

<http://www.parthenos-project.eu>





DARIAH

DIGITAL RESEARCH INFRASTRUCTURE FOR THE ARTS AND
HUMANITIES









European Research Infrastructure Consortium




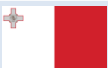



Launched in Paris, 2014, Nov. 17th



Emiliano Degl'Innocenti, PhD (FEF)
DARIAH-IT Communication Officer

Founding members

| Founding Members | |
|------------------|---|
| Austria |  |
| Belgium |  |
| Croatia |  |
| Cyprus |  |
| Denmark |  |
| France |  |
| Germany |  |
| Greece |  |

| Founding Members | |
|------------------|--|
| Ireland |  |
| Italy |  |
| Luxembourg |  |
| Malta |  |
| Netherlands |  |
| Serbia |  |
| Slovenia |  |

| Candidate countries and associated members | |
|---|---|
| Lithuania |  |
| Poland |  |
| Portugal |  |
| Spain |  |
| Switzerland |  |

DARIAH-PL and DARIAH-PT (ROSSIO) became new members in 2015, Nov. 6th

www.dariah.eu

Purpose of DARIAH?

...to enhance and support **digitally-enabled research** across the **arts and humanities** by offering a **portfolio of services and activities** centred around **research communities ...**



Who is DARIAH for?



Literary Studies

- Education
- Environmental studies
- Gender studies
- Geography
- History
- Hist.-Phil.-Soc. Sciences
- Law
- Linguistics



Archaeology

- Archaeology-Prehistory
- Architecture
- Art and art history
- Biological anthropology
- Classical studies
- Communication sciences
- CH-museology
- Demography
- Economies and finances



Medieval Studies

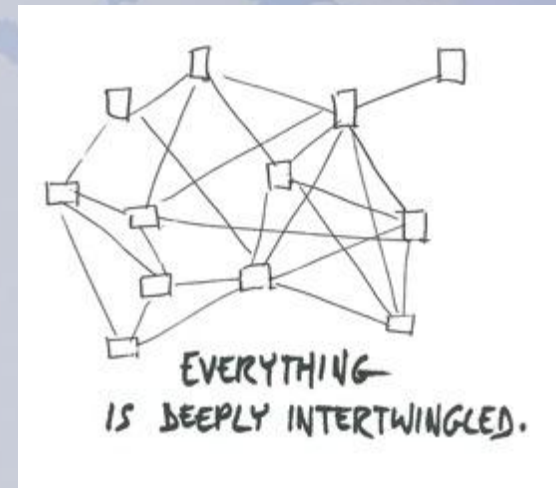
- Literature
- Management
- Methods and statistics
- Musicology-perf. arts
- Philosophy
- Political science
- Psychology
- Religions
- Soc. Anthrop.-ethnology
- Sociology

Digital Ecosystem

The **digital ecosystem** is

- **big** and **rich** but
- fragmented and full of walled gardens:

i.e.: we have now a lot of data and tools but it's still the same mess as in the old days of printed catalogues and cards



Digital Ecosystem

represent a complex body of knowledge in a connected and interoperable way, and provide a platform for applying sophisticated discovery and analytical tools to data across the whole humanities digital ecosystem



Services







DARIAH.it



RETE

OBIETTIVI

ORGANIZZAZIONE

CONTATTI

SERVIZI ▾

BIBLIOTECA▼

NOVITÀ / EVENTI



Istituti partecipanti

Visita



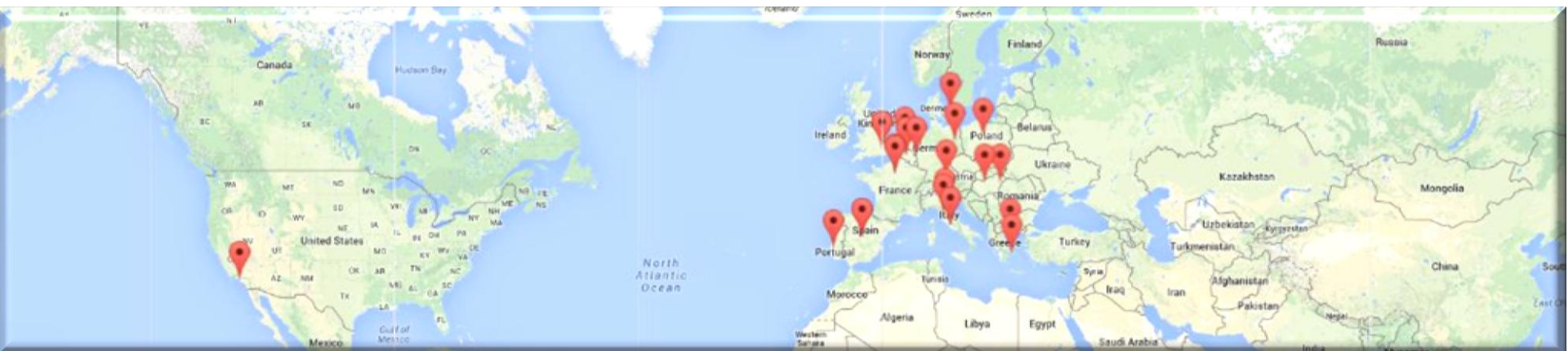


IPERION CH

INTEGRATED PLATFORM FOR THE EUROPEAN RESEARCH
INFRASTRUCTURE ON CULTURAL HERITAGE

IPERION CH, H2020-INFRAIA-2014

- integrating activity project started on May 1st, 2015
- joins more than 35 research groups from **24** partners (**12** EU Member States - Belgium, Denmark, France, Germany, Greece, Hungary, Italy, Poland, Portugal, Spain, The Netherlands, United Kingdom and the USA)
- coordinated by CNR – IT
- 8 Meuro contribution by EC on H2020



200 years of history

15 years of European cooperation

- 1999–2002 : ICN Labs-Tech
11 members, 8 countries
- 2004–2009 : I3 EU-Artech
12 members, 8 countries
- 2009–2014 : I3 CHARISMA
21 members, 12 countries
- 2014 : “Advanced community”
- 2015 : I3 IPERION CH
24 members, 13 countries

1807 : Jean
Chaptal publishes
*La chimie appliquée
aux arts*



1888 : création of the first
laboratory within a museum in
Berlin by Friedrich Rathgen



1938 : creation of
the Istituto centrale
del restauro, by
Cesare Brandi



1957 : creation of the
Institut royal du
patrimoine artistique in
Brussels by Paul
Coremans



IPERION CH mission

- provide access to cutting-edge scientific tools for advanced diagnostics, conservation and restoration
- contribute to the establishment of a permanent **European Research Infrastructure for Heritage Science**
- help structuring the international scientific community of Heritage Science



IPERION CH activities

- **Trans-National Access** for advancing knowledge on cultural heritage and helping a better preservation
- **Joint Research**: advancing the state-of-the-art of access services, facilities and tools
- **Networking**: operating the infrastructure services and providing to its needs in a coordinated way, exchanging knowledge and experiences between partners



trans-national access: core activity of IPERION CH

- access to the most advanced facilities, competences and data through three integrated platforms:
 - **ARCHLAB** - access to collections held by prestigious European museums and conservation institutions
 - **MOLAB** - access to advanced mobile analytical equipment and expertise for in situ measurements
 - **FIXLAB** - access to large-scale facilities



ARCHLAB



MOLAB



FIXLAB



trans-national access: modalities

- publication of calls for Trans-National Access every 6 months
www.iperionch.eu/calls-for-trans-national-access
- submission of a request (research project) by users
- evaluation of proposals:
 - technical feasibility (internal review by the representatives of the access-providing organizations)
 - scientific excellence and originality (external peer-review panels)
- winning projects get free access to the infrastructure
- the cost of the access provided to users is covered by the European Commission (ca. 30% of the project budget)

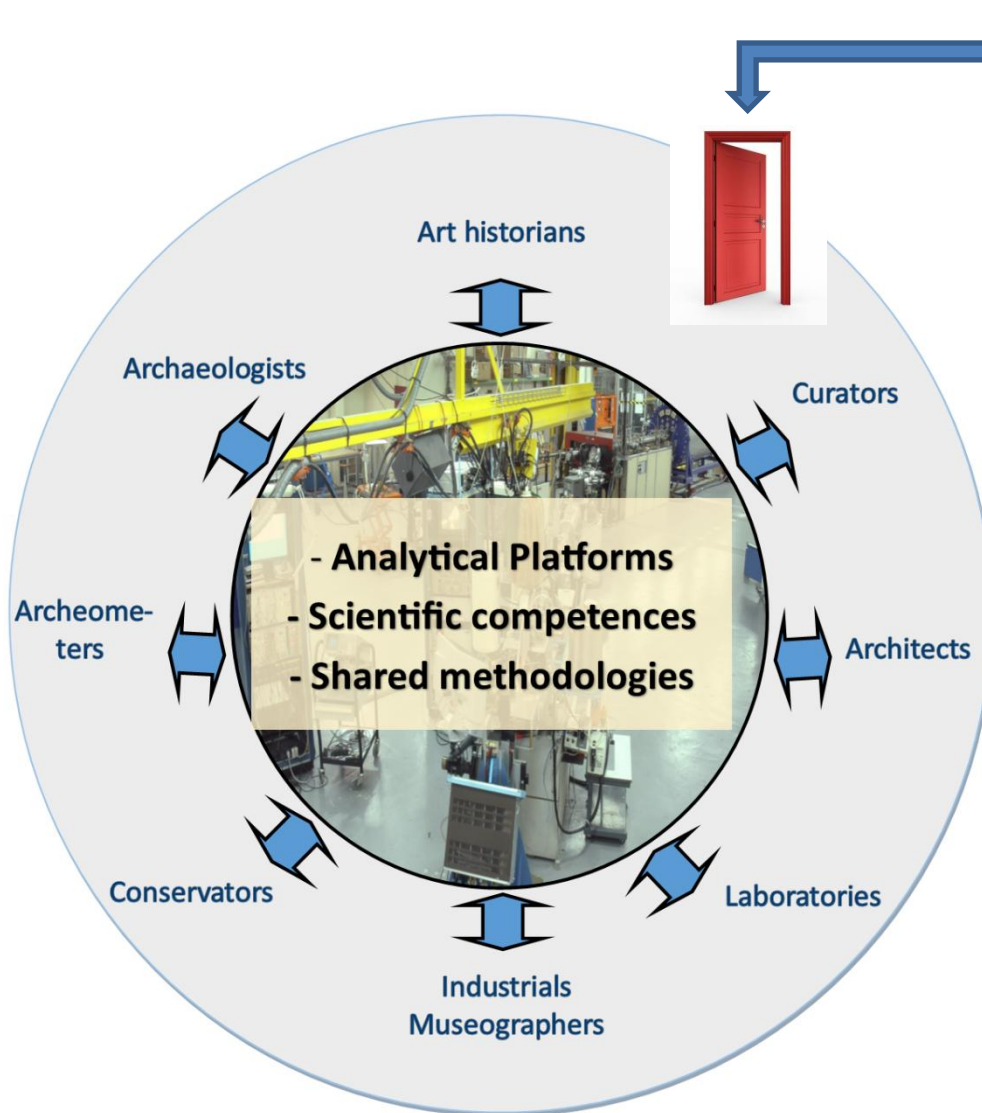
ARCHLAB

MOLAB

FIXLAB



serving a large community of users



*up to 20% of TNA
budget can be spent
for international
users*

IPERION CH joint research activities

| Diagnostic Instruments | | | | Diagnostic Methods | | | | Data | | | |
|------------------------|--|--|--|--------------------|--|--|--|------------------------|--|--|--|
| Non-Linear Microscopy | | | | Paintings | | | | Digital documentation | | | |
| New Mobile Instruments | | | | Metals | | | | Semantics | | | |
| Positioning System | | | | Stone | | | | Structures and formats | | | |
| Safe Boundaries | | | | Organics | | | | Databases | | | |

IPERION CH networking activities

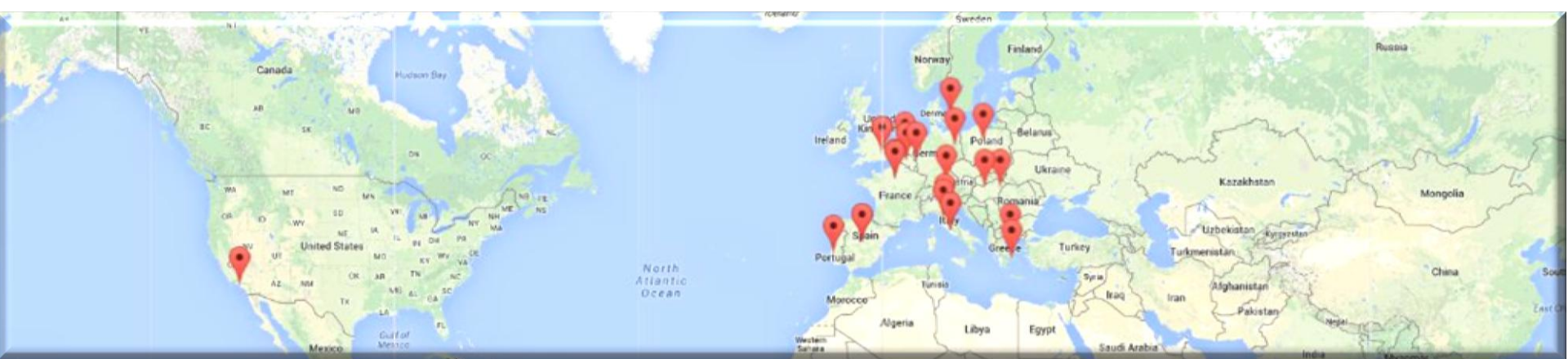
- **knowledge exchange** and best practices
- **international cooperation**
- **impact:** dissemination, communication, support to social and industrial innovation
- **education and training**
 - to develop high-skilled professionals in the wider cultural heritage community
 - to train users and make them aware of the potentialities of competencies, tools, and data offered by the research infrastructure
- **sustainability**
 - supporting long-term running of the activities after the end of the project
 - help building a permanent European RI for heritage science



international cooperation in IPERION CH



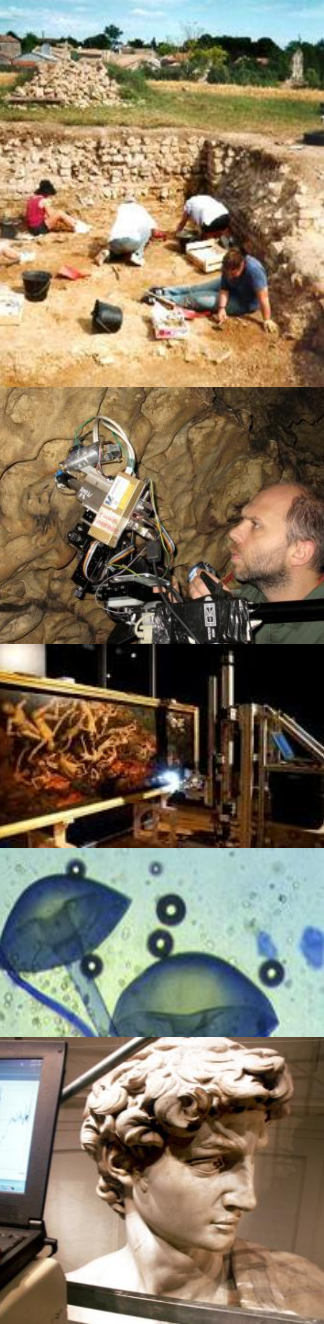
- more than 20 proposals for affiliation received from EU and international institutions in Brazil, Canada, Cape Vert, China, India, US, Qatar, Taiwan and from the **ICCROM-International Centre for the Study of the Preservation and Restoration of Cultural Property**
- bilateral/multilateral cooperation initiatives to be developed as project activities (WP2, task 2.3)





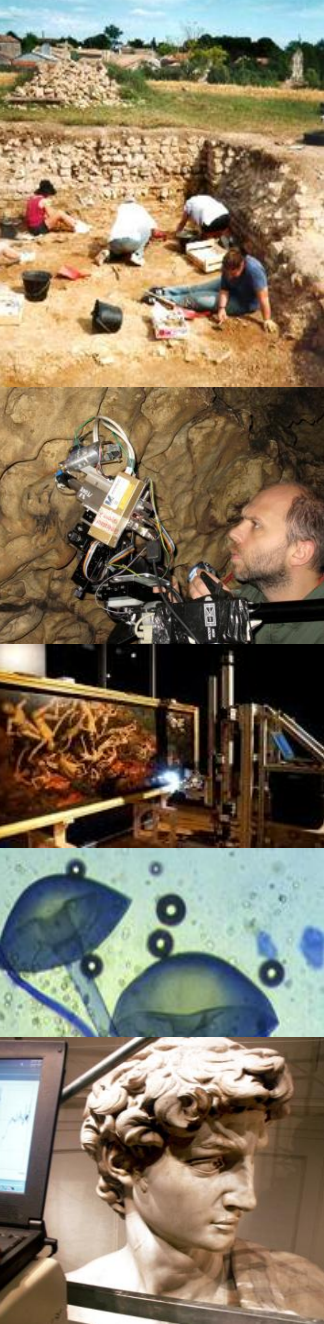
E-RIHS

EUROPEAN RESEARCH INFRASTRUCTURE
FOR HERITAGE SCIENCE



E-RIHS principles

- a distributed research infrastructure for heritage interpretation, preservation, documentation and management
- a cross-disciplinary collection of advanced tools and services for advancing understanding and preservation of global cultural and natural heritage...
- ...serving a cross-disciplinary community of researchers in heritage science



E-RIHS mission

- **cross-disciplinary access:** **inclusive** RI offering cutting-edge services for HS communities:
 - cultural heritage (IPERION CH),
 - archaeology (ARIADNE),
 - paleontology, paleoanthropology
 - natural sciences
- **interoperability:** fostering **alignment** of diagnostic methodologies and practices
- **knowledge sharing:** establishing a **common data infrastructure** for scientific digital heritage



European dimension of the **E-RIHS**

Coordinating Country

Italy

11 Member Countries

Belgium

Cyprus

Czech Republic

France

Germany

Greece

Hungary

Portugal

Spain

The Netherlands

United Kingdom

8 Participating Countries

Brazil

Bulgaria

Denmark

Ireland

Israel

Poland

Slovenia

Sweden

International dimension of the E-RIHS



ICCROM

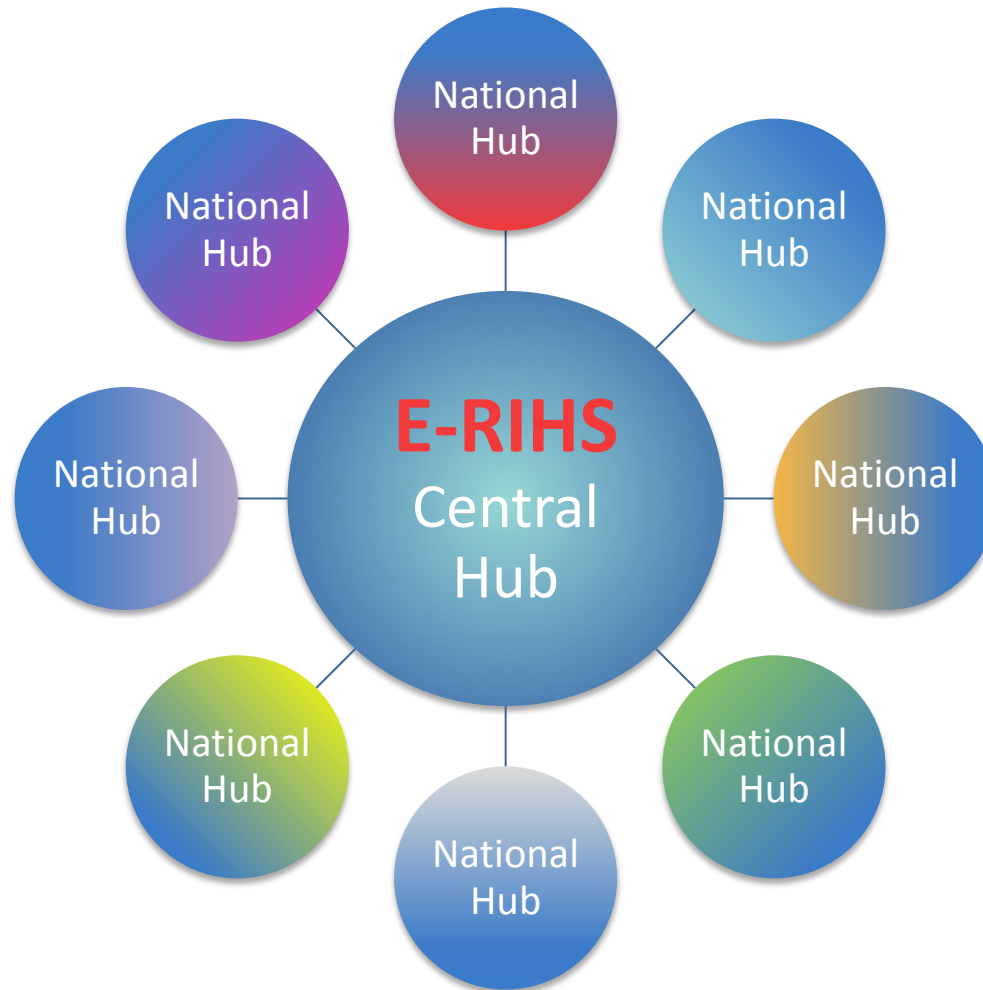


E-RIHS

EUROPEAN RESEARCH INFRASTRUCTURE
FOR HERITAGE SCIENCE

www.e-rihs.eu

E-RIHS star structure



E-RIHS access



MOLAB



FIXLAB



ARCHLAB

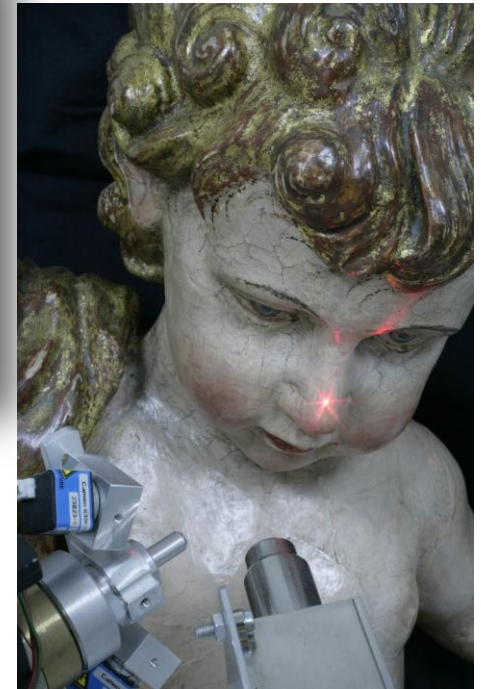
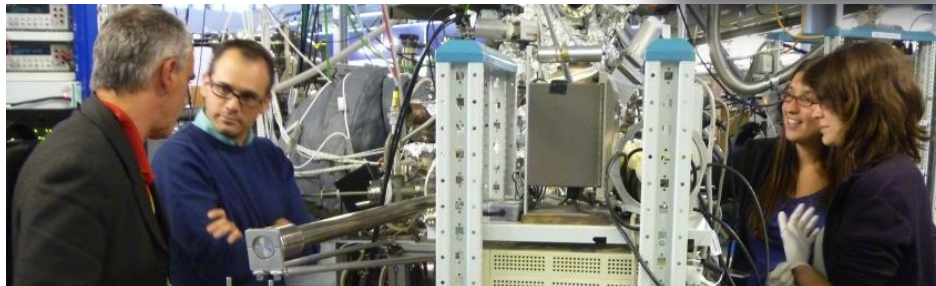
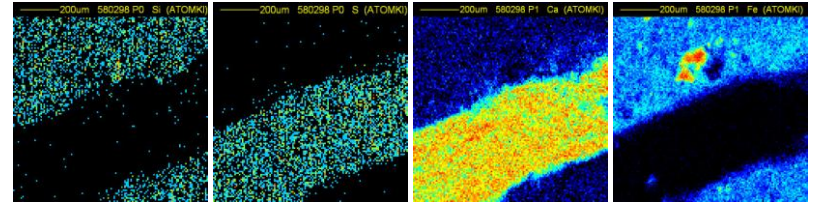


DIGILAB

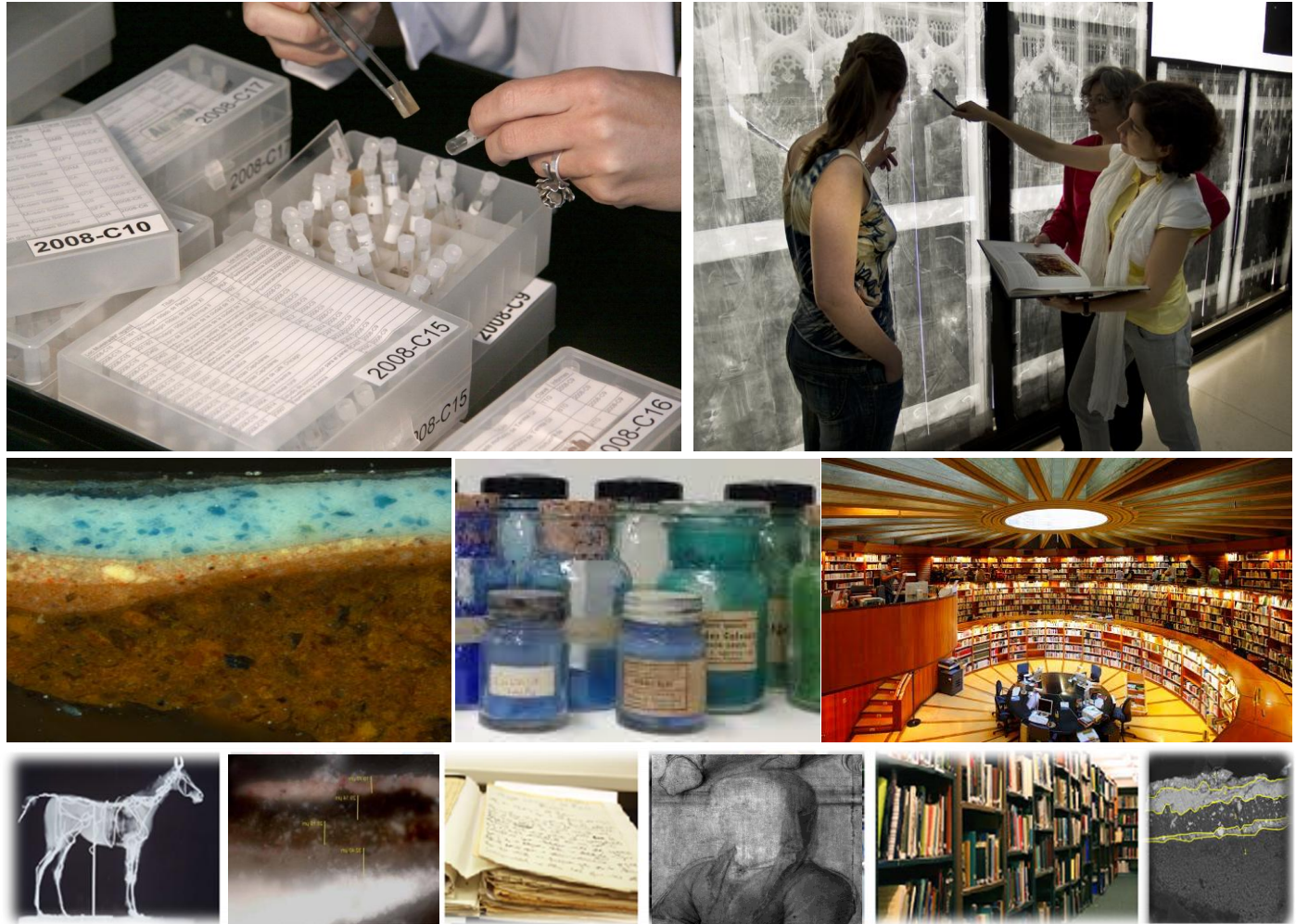
E-RIHS mobile laboratory for *in-situ* diagnostics



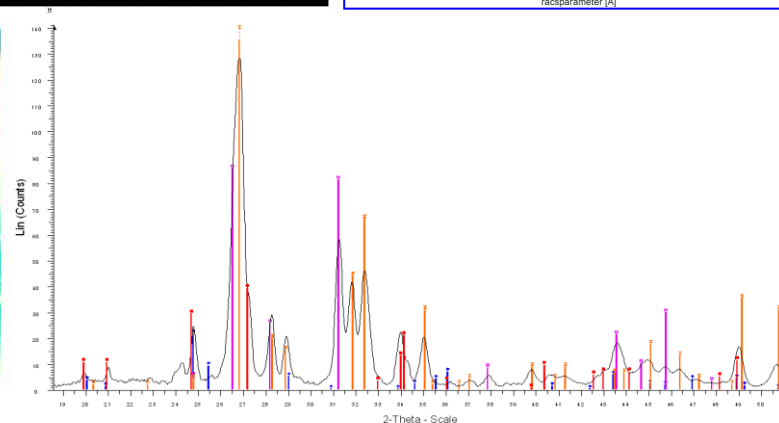
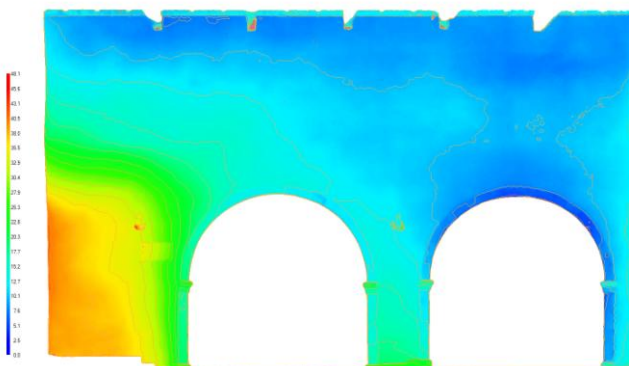
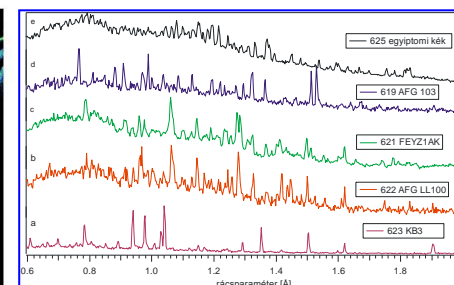
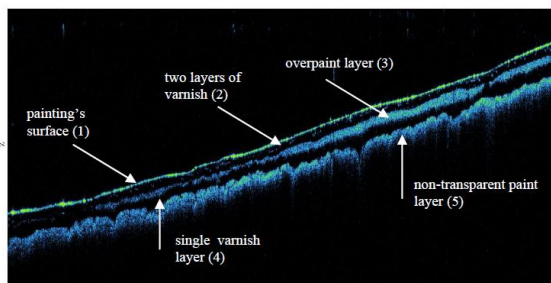
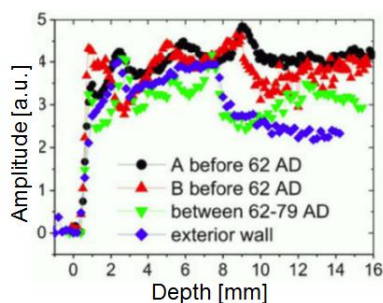
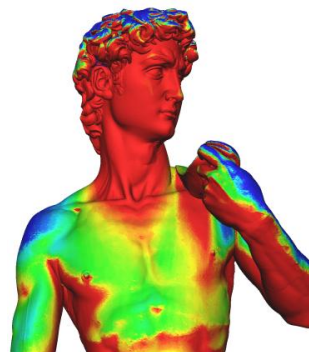
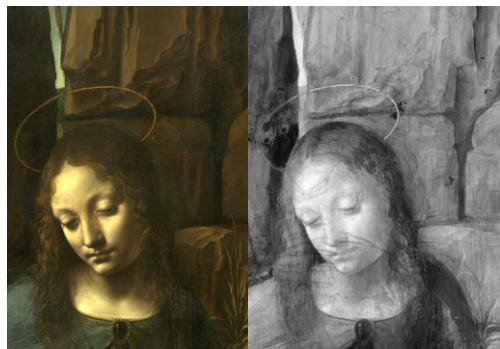
E-RIHS access to large-scale facilities



E-RIHS scientific archives for heritage science



E-RIHS digital scientific datasets for heritage science



Impact of the E-RIHS

Advancing knowledge and fostering innovation:

- **creating** and **spreading** knowledge by sharing cutting-edge resources and data
- **transferring** knowledge and technologies to industry

Enabling long-term strategies:

- developing and promoting **common practices, protocols** and **standards**
- **sustainability** and **preservation** of tools, data and expertise
- reference for scientific and technological **innovation**

Structuring the community of heritage science:

- **cross fertilisation** among HS disciplines
- joining teams and facilitating **researchers mobility**
- establishing **collaborations** with other HS initiatives
- interoperability requires **synergy** and **collaboration**



E-RIHS timeline

2016

- Today: launch of the ESFRI Roadmap 2016
- June 22nd: deadline of call INFRADEV2-2016



2016-2019

- preparatory phase (subject to winning INFRADEV2)

2020

- submission of the proposal to establish **E-RIHS**



2021-2025

- **E-RIHS** implementation phase

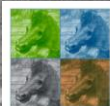


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IPERION CH

www.iperionch.eu



DARIAH-IT

it.dariah.eu

...thank you for your attention!