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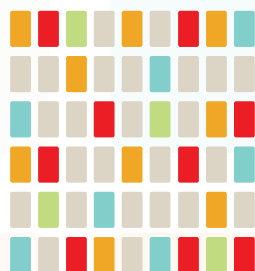
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**3rd Annual Conference
of the Slovenian Node
of the European Research
Infrastructure
for Heritage Science**

E-RIHS Slovenia
Koper, 18–19 November 2025

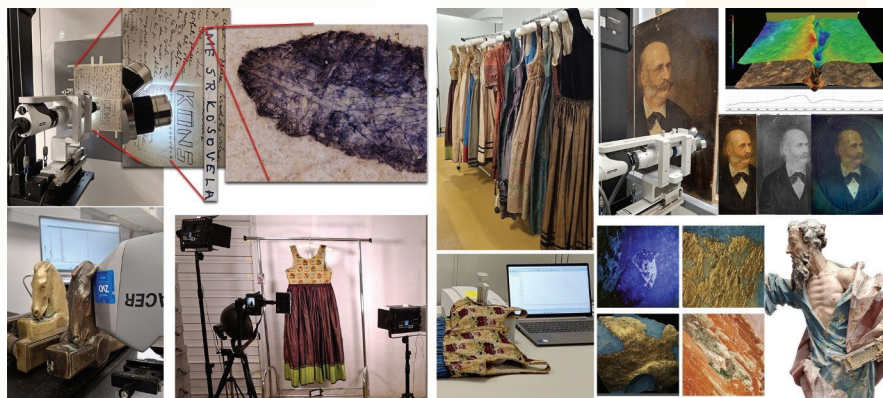
**Lecture**

E-RIHS.si Multi-Analytical Approach to Heritage: Insights from the Heritage Science Lab Ljubljana

The European Research Infrastructure for Heritage Science (E-RIHS) provides state-of-the-art facilities, advanced methodologies, and interdisciplinary expertise for the heritage science community. Within its Slovenian national node, E-RIHS.si, the Heritage Science Laboratory Ljubljana (HSL) plays an active role with a particular research focus on heritage collections, visualisation, and digitisation. This abstract highlights the utilisation of E-RIHS.si services and network-building for collaborative research between Slovenian academic and heritage institutions. Recent examples of this collaborative research include HSL's extensive investigations into textile heritage, linked with an ongoing doctoral research project. Non-destructive and in situ multi-analytical surveys using technical imaging, FTIR spectroscopy, microscopy, and XRF were carried out on textile collections from the Slovene Ethnographic Museum and the Maribor Regional Museum. These analyses enabled the identification of fibres, mordanting, weighting, and dyeing techniques, adding a new layer of information to museum collections. This multi-analytical approach has significantly advanced our understanding of textile degradation mechanisms and informed conservation strategies.

Beyond textiles, investigations into diverse heritage objects have been conducted through E-RIHS.si access projects for high-resolution imaging, scientific documentation, material characterisation, training, and education. At the National Museum of Slovenia, FTIR spectroscopy and digital microscopy identified a casein plastic inlay in a Baroque chair. At the National and University Library (NUK), a comprehensive, multi-faceted investigation was conducted on a selection of manuscripts by the renowned Slovenian poet Srečko Kosovel. The study integrated advanced analytical techniques including multispectral and hyperspectral imaging, near-IR and FTIR spectroscopy. This was complemented by high-resolution photographic documentation and ultra-high-resolution digital microscopy, utilising automated image stitching to create a single gigapixel-scale representation for micro-scale analysis. This integrated approach, supported by data-analysis tools, allowed for the detailed examination of material composition, ink formulation, and the micro-topography of the substrate, providing unprecedented insight into the work's creation and preservation state.

Additionally, at NUK, XRF analysis was applied to three historical metal door handles. One is suspected to be a later copy, and elemental analysis is expected to help identify any compositional differences that could support their classification. At the Posavje Museum Brežice, XRF and FTIR analyses were used to investigate the composition of a historical Baroque sled and to explore the pigment palette used on the walls of the Knights' Hall in the castle. At the Academy of Fine Arts and Design of the University of Ljubljana, technical documentation, sci-



<https://doi.org/10.26493/978-961-293-546-7-9>

entific imaging, and microscopic analysis have been applied to paintings, sculptures, and historical artefacts.

A core element of our work is the production and management of high-quality imaging and analytical data, forming the foundation for research, documentation, and heritage preservation. The integration of digital imaging, spectroscopy, and data processing not only facilitates object-level analysis but also supports broader efforts in digitisation, comparative studies, and long-term digital preservation. These datasets are compiled into rich digital corpora and delivered to heritage institutions as comprehensive technical reports, raw source files, and, in some cases, scientific publications.

Through in-depth studies of diverse heritage materials, this collaborative research demonstrates the versatility, reach, and impact of the E-RIHS.si network. It shows how a coordinated national infrastructure can effectively support academic research, cross-institutional collaboration, and heritage conservation.