

Open Postdoctoral Research Position – Hyperspectral Imaging Application and Data Analysis in Heritage Science

Technical University of Munich (TUM)
School of Engineering and Design (ED)
Chair of Conservation-Restoration, Art Technology and Conservation Science
insiTUMlab – Analytical Infrastructure for Non-Destructive In-Situ Studies of Cultural Heritage
∞ <https://www.arc.ed.tum.de/rkk/forschung/insitumlab/>

The insiTUMlab is a DFG-funded Core Facility dedicated to the non-destructive, in-situ investigation of cultural heritage. The lab operates at the interface between heritage science, material science, and engineering, focusing on a broad range of historical materials while assuring their contextualization through an interdisciplinary approach. Official partners are the Doerner Institut, the Deutsches Museum, the TUM Chair of Non-Destructive Testing, IFAC-CNR Florence, the TUM Chair of Biopolymers, the State Academy of Fine Arts Stuttgart, and the Scientific Department of the British Museum.

We are seeking a **highly motivated Postdoctoral Researcher (TV-L E13, 100%)** to join our interdisciplinary team at the earliest possible date. The position is limited to **two years** (renovation for one year is possible depending on founding availability) and is funded by the **Deutsche Forschungsgemeinschaft (DFG)**.

Your Responsibilities

- Develop and implement Hyperspectral Imaging (HSI) methodologies for *in-situ* investigation of cultural heritage objects and architectural surfaces, covering VNIR and SWIR spectral ranges.
- Design and optimize HSI data-processing workflows, including spectral calibration, preprocessing, classification, and mapping.
- Integrate HSI with complementary spectroscopic techniques (Macro-XRF, Raman, FTIR in reflection mode) to enable multimodal data fusion and automated material characterization.
- Apply and further develop machine-learning and statistical models (e.g. PCA, SAM, clustering, neural networks) for spectral interpretation, segmentation, and material identification.
- Create and curate a dedicated HSI spectral library for cultural heritage materials, linking reference samples, mock-ups, and *in-situ* data, and defining standardized metadata and interoperability formats.
- Maintenance and development of the insiTUMlab data repository in MediaTUM.
- Participate in and coordinate national and international in-situ analytical campaigns, performing on-site documentation and analysis in collaboration with partner institutions.
- Support students supervision (Bachelor's, Master's and PhD), and contribute to capacity-building activities.
- Prepare scientific publications, technical reports, and standard operating procedures, and participate in dissemination and outreach activities.

Candidate Requirements

- ✓ PhD degree in Engineering, Computer Science, Systems & Control, Statistics, Computational Physics, Computational Chemistry, Analytical Chemistry, or Heritage Science, or any field related to the lab's research topics.
- ✓ Proven experience with Hyperspectral Imaging or related spectroscopic imaging methods.
- ✓ Strong background in data processing, image/signal analysis, and machine learning.
- ✓ Familiarity with instrument control, calibration, and automation workflows.
- ✓ Excellent written and oral communication skills in English (German is an advantage).
- ✓ Strong analytical and problem-solving abilities and motivation to work in an interdisciplinary environment.

- ✓ Creative, open-minded, and proactive attitude with a high degree of autonomy.
 - ✓ High interest in cultural heritage applications.
-

Our Offer

- Dynamic and interdisciplinary research environment bridging heritage science, materials science, and computational imaging.
- Access to state-of-the-art HSI and spectroscopic instrumentation (HySpex VNIR/SWIR systems, Macro-XRF, Raman, FTIR, etc.).
- Active participation in international in-situ research campaigns on cultural heritage sites.
- Collaboration with leading research institutions and museums (Doerner Institut, Deutsches Museum, etc.).
- Flexible working hours, supportive research environment, and strong mentoring culture.
- Salary according to TV-L (E13, 100%), including full social benefits.
- Career development opportunities and support for publications and conference participation.

TUM strives to increase the proportion of women in its scientific staff; applications from qualified women are strongly encouraged. Disabled applicants with equal suitability and qualification will be given particular consideration.

Application Procedure

Please send your application in **one PDF file** including:

- Cover letter describing your motivation and research interests
- Curriculum Vitae (CV)
- Publication list, indicating three selected main papers and explaining shortly your *own contribution*
- Two letters of recommendation
- Supporting documentation (certificates, transcripts, etc.)

Shortlisted candidates will be invited for an interview, which will include a max. 10-minute presentation of their own research work.

✉ **Send applications by 31 January 2026 to:**

Dr. Clarimma Sessa

Head of the insiTUMlab – Analytical Infrastructure for Non-Destructive In-Situ Studies of Cultural Heritage, Chair of Conservation-Restoration, Art Technology and Conservation Science
Technical University of Munich
Oettingenstraße 15, 80538 München

Email: clarimma.sessa@tum.de

Data Protection Notice

By submitting your application, you consent to the collection and processing of your personal data in accordance with Art. 13 GDPR. Please review TUM's privacy policy at:

🔗 <https://portal.mytum.de/kompass/datenschutz/Bewerbung/>