

Multi-modal non-destructive investigation of the wall paintings of the Magdalen Chapel of St. Emmeram, Regensburg.

A methodology to address the material complexity of a palimpsest

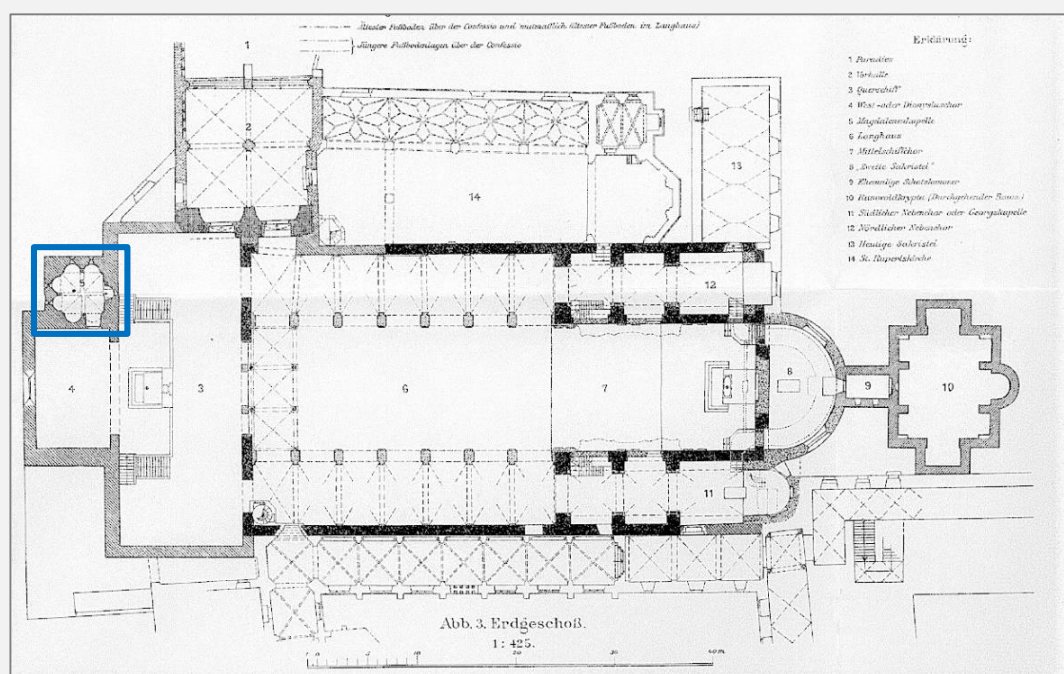
Nadia Thalgut, Simon Mindermann, Eva Mariasole Angelin, Thomas Danzl, Clarimma Sessa*

Chair of Conservation-Restoration, Art Technology and Conservation Science, Technical University of Munich, Munich, Germany
email: clarimma.sessa@tum.de

The wall paintings of the Magdalen chapel in St.Emmeram, Regensburg, are being systematically investigated in the frame of three years interdisciplinary research project.

The Magdalen Chapel

The Magdalen Chapel is a part of the monumental church of St. Emmeram in Regensburg (Germany), built in the 11th century. The Chapel was used for liturgical purposes until the monastery was dissolved in 1810. After that, it was used a storage room.



The palimpsest of the wall paintings

The Magdalen Chapel shows a unique palimpsest made of overlapping and unrelated **wall paintings from four different painting phases simultaneously visible**, dated between the 12th and the 17th centuries. At some point, the walls were whitewashed and only partially uncovered in the 1980s. Nowadays, the chapel is closed to the public and the fragmentary status of the wall paintings hinders their readability posing queries about their conservation.

The four different painting phases

I Phase

mid-12th century

It depicts the life of holy penitents, among others Saint Mary of Egypt.

II Phase

early-15th century

It shows the Man of Sorrows, Christ on the Mount of Olives.

III Phase

end-15th century

It includes several standing saints.

IV Phase

second half-17th century

It presents decorative painting with putti and fruit festoons.

NEVER STUDIED BEFORE

How are the four painting phases distributed ? Which artistic materials were used in each phase ? Are there conservation issues ?

N. Thalgut PhD project

Archival research In situ mapping Digital mapping (metigo MAP)

METHODOLOGY

Reflected and photo-induced luminescence images (fokus GmbH Leipzig)

HSI (HySpex, NEO) MA-XRF (Elio, Bruker) Raman (i-Raman, BWTek) ER FT-IR (Alpha II, Bruker)

PRELIMINARY RESULTS

IV Phase

III Phase

I Phase

II Phase

possible stratigraphy?

HSI Data Processing:

- Calibration with spectral reflectance standard (Spectralon ©)
- Geometric correction using calibrated reference image
- Classification of pigments using the SAM-algorithm (Spectral Angle Mapping)

The color palette



I Phase

Lead white Goethite Massicot Hematite Cinnabar Minium Lapis lazuli Egyptian blue

II Phase

Lead white Lead tin Massicot Hematite Cinnabar Minium

III Phase

Lead white Cinnabar Azurite Malachite

IV Phase

Lead white Goethite Hematite Carbon-based Malachite

Secondary products

I Phase

Laurionite Pb(OH)Cl

III Phase

Libethenite Cu₂PO₄OH

were identified as possible degradation products indicating conservation issues