Scientific Service Project Z02

Material-Scientific Methods for Reconstructing the History of Manuscripts

Prof. Dr. Oliver Hahn

Prof. Dr. Ira Rabin
Dr. Olivier Bonnerot

Project goals

Emphases of the first period of funding:

Development of a mobile, nondestructive laboratory (prerequisite for carrying out natural-scientific analyses)

Natural-scientific service project to support the scientific sub-projects

Investigation is carried out with procedures and methods **especially** suited to **cultural-historical** questions

Precondition: close cooperation with the scientific sub-projects to transpose cultural-scientific questions into natural-scientific research tasks

Further development and optimization to result in a **universal natural-scientific mobile laboratory**

Approach and task

Identification of the substances (materials) and attribution to individual layers makes it possible to reconstruct the object's history.

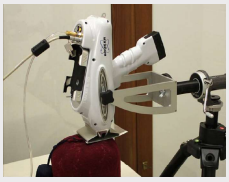
Restauration	
Storage	
Use	
Production	**Production**
	Fingerprint: raw materials, traces of processing, formulas
Use	Use
	Characteristic traces
Storage	Storage and aging
	Deposits of corrosion products
Restauration	Restoration / preservation
	Traces in outer layers

Instrumentation

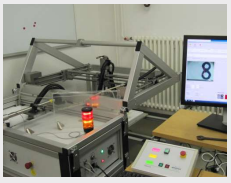
Element-specific characterization of manuscripts

- X-ray fluorescence spectroscopy (XRF)

existing mobile technologies will be integrated and further developed (further development of quantification, based on fundamental parameters)



XRF *Tracer* (Ø 1 cm)



XRF *JetStream* (Ø 50-850 µm)

XRF *ARTAX* (Ø 100 µm, Ø 1 cm)

Chemical characterization of manuscripts

- Microscopy

- Infrared spectroscopy (FTIR)

FTIR *EXOscan* (Ø 0,5 cm)

UV-, VIS, NIR-Microskope

- Raman spectroscopy

No existing apparatus fulfills the requirements yet!

Technologies to be developed will be validated by existing bench methods.

Field work
Manuscript analysis in the National Archives, Kathmandu, Nepal