Innovative digital technologies open up new perspectives of research in ancient cultures. In particular, the 3D digitization of artefacts, built structures and landscapes provides unique opportunities for the documentation, interpretation, preservation and presentation of our cultural heritage.

The DIP&P Research Group, an international collaboration of researchers from Germany, Italy, Turkey and the UK, develops and tests new digital tools for the study of the ancient civilizations of Turkey, in particular the culture of the Hittites and the Hittite capital Ḫattuša-Boğazköy.

The group includes archaeologists, architects, epigraphists, philologists and IT specialists who work in close collaboration with engineers, restoration specialists and museum authorities. The technologies associated with 3D digitization bring momentous changes to all concerned with the study of ancient cultures:

- 3D digitization takes the documentation of archaeological data – whether yielded by survey, excavation or the study of individual artefacts in museum collections – to new levels of precision and allows an integrated recording of the usually highly complex evidence. Digital visualization tools facilitate the interpretation of the data and enhance the options for the presentation and dissemination of the archaeological discoveries, be it buildings, architectural assemblages, settlements, rock reliefs or landscapes.

- 3D digitization offers new opportunities for the decipherment and interpretation of ancient inscriptions, especially inscriptions on stone and clay, such as rock inscriptions, cuneiform tablets or seal impressions. Digital visualization tools provide the epigraphists with enhanced images that allow improved readings even of very worn inscriptions. Newly developed software allows the automated analysis of the metrological characteristics of individual cuneiform fragments, opening up new avenues for the reconstruction of fragmented manuscripts and for the identification of scribal hands.

- 3D digitization will change the modes of dissemination of archaeological data and widen the opportunities of participation significantly, as the examination of the objects is no longer restricted to researchers with immediate access to the originals.

- Once digitized, the current condition of an object or landscape can be preserved for posterity. Thus, 3D digitization has an important role to play in cultural heritage preservation. This is especially true for archaeological evidence at risk of deterioration or destruction, whether due to its fragile character or environmental conditions.

- Innovative digital technologies give rise to new opportunities for the presentation of ancient civilizations in museums and by means of electronic media. Spaces can be recreated, objects can be displayed in context. Thus, the work of the DIP&P Research Group will present knowledge about ancient Turkey, the world of the Hittites, to a wide audience and thereby encourage cultural tourism.

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**Germany**

- **BMBF-Projekt 3D-joins und Schriftmetrologie**
  - Prof. Gerfried Müller (epigraphist & IT development)
  - Akademie der Wissenschaften und der Literatur, Mainz
  - Hethitische Forschungen
  - Dr Michele Cammarosano (epigraphist & IT development)
  - Julius-Maximilians-Universität Würzburg
  - Prof. Daniel Schwemer (epigraphist & philologist)
  - Institut für Altertumswissenschaften – Altorientalistik
  - Dipl. Inform. Denis Fisseler (computer graphics engineer)
  - Dipl. Surv. Sven Tilia (surveyor)

**Italy**

- **Università degli Studi Suor Orsola Benincasa, Napoli**
  - Dipartimento Scienza Nuova
  - Centro Interistituzionale Euromediterraneo
  - PON Research & Competitiveness National Project SINAPSIS
  - Prof. Massimiliano Marazzi (epigraphist & philologist) in collaboration with Polo Laboratoriale Heritage 2.0, Prof. Giovanni Coppola

**Turkey**

- **İstanbul Üniversitesi, İstanbul**
  - Edebiyat Fakültesi – Hititoloji
  - Prof. J. David Hawkins (epigraphist & philologist)

**UK**

- **School of Oriental & African Studies, London**
  - Department for the Near & Middle East
  - Prof. Mark Weeden (epigraphist & philologist)
Public Programme

Tue, 24 March
Digital Technologies at the UNESCO World Heritage Site Ḫattuša (Boğazköy)
9–10 Andreas Schachner (İstanbul/Würzburg)
3D-Technologie in Ḫattuša-Boğazköy: Erfahrungen und Perspektiven
10–11 Massimiliano Marazzi (Naples)
3D-Aufnahmen und Untersuchungen 2014: Südburg und Nişantaş
11–12 Michele Cammarosano (Würzburg)
3D-scans and Analyses 2014: Cuneiform Tablets and Seal Impressions
Lunch break
15–16 J. David Hawkins (London)
The Nişantaş Inscription: History of Research and Specific Challenges
16–18 Plenary Session
Discussion of Future Research Perspectives

The lectures on Tue, 24 March, are open to the public. There is no participation fee, but informal prior registration is required (email Ms Ursula Kraft: l-altorientalistik@uni-wuerzburg.de).

DIP&P Research Group Workshop

Wed, 25 March
Review and Validation of Research Methods, Identification of Requirements and Objectives
9–12 DIP&P Research Group
Südburg and the Nişantaş Inscription
Lunch break
14–18 DIP&P Research Group
Südburg and the Nişantaş Inscription

Thur, 26 March
Identification of Funding Opportunities, Application Roadmap
9–10 Daniel Schwemer (Würzburg) and Angela Esgen (Servicezentrum Forschung und Technologietransfer, Würzburg)
Forschungs- und Förderungsperspektiven im Kontext von Horizon 2020 (Deutschland)
10–11 Massimiliano Marazzi (Naples)
Forschungs- und Förderungsperspektiven im Kontext von Horizon 2020 (Italien)
11–12 DIP&P Research Group
Funding Opportunities and Research Network
Lunch break
14–18 DIP&P Research Group
Application roadmap:
• research questions and objectives
• participants, collaborators and partners
• distribution of tasks and workload

Goals of the DIP&P Workshop

• Explore opportunities for the use of innovative digital technologies in the study of Hittite culture, ancient Turkey
• Review and validate the 3D digitization in 2014 of a hieroglyphic Luwian inscription at the Hittite capital Ḫattuša-Boğazköy (Nişantaş)
• Review and validate the 3D digitization in 2014 of hieroglyphic Luwian inscriptions on seal impressions and of cuneiform tablets in the Boğazkale museum
• Explore the potential of 3D visualization tools for the decipherment of Hittite hieroglyphic and cuneiform inscriptions and identify future requirements
• Evaluate current digital technologies (components, protocols, programmes) and identify future requirements
• Establish a research network and strategy for the exploration and documentation of Hittite culture by means of innovative digital technologies

Participation in the Research Group Workshop is by invitation only.