

# Stone tool hafting and use in the European Upper Palaeolithic: first results from Hohle Fels

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## Functional analysis as a key to understanding Palaeolithic technologies

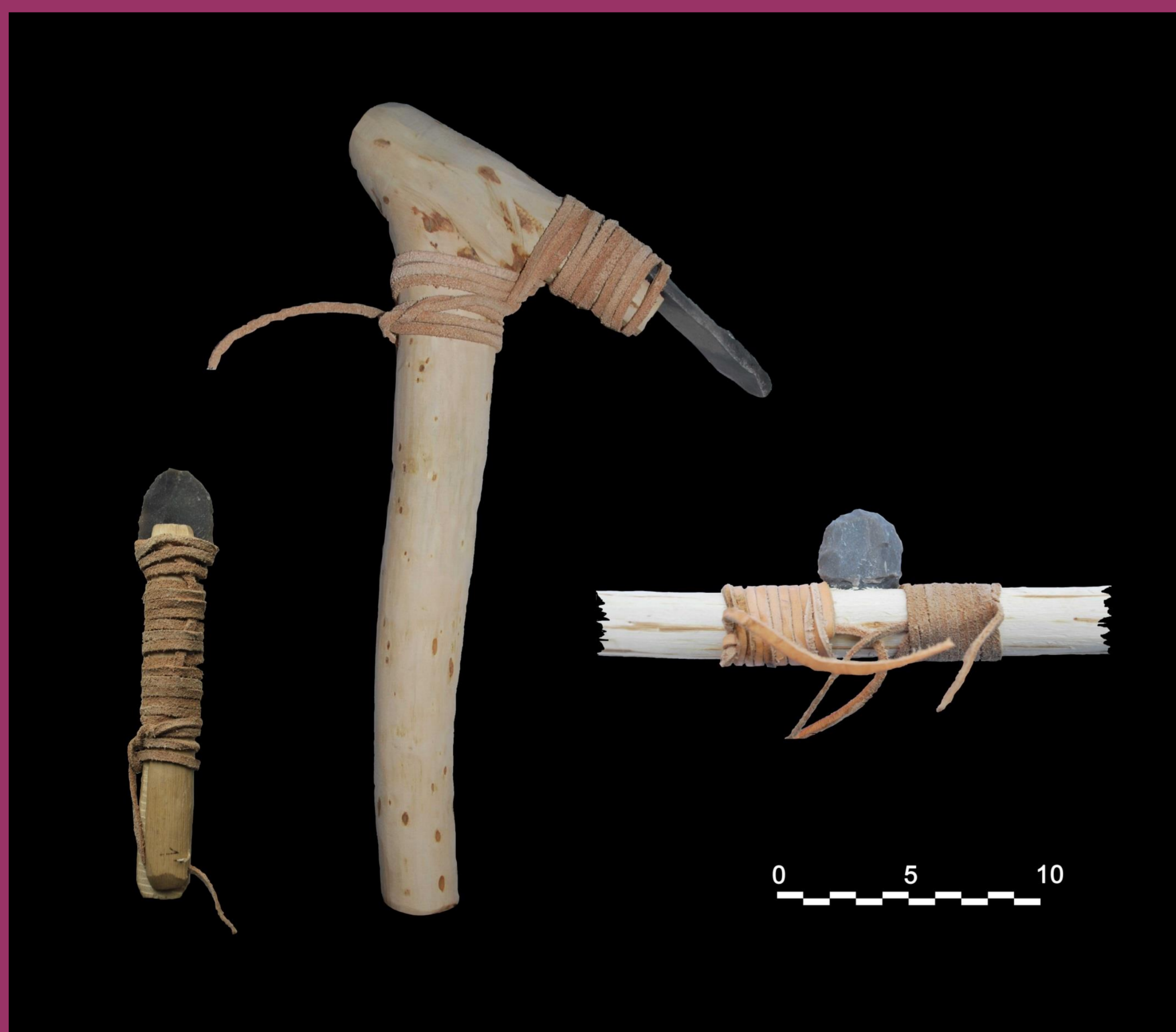
While functional analysis has traditionally been used in addressing questions about specific tool types or site function, it also has the potential to contribute to our understanding of large-scale patterns and long-term changes in human technologies. Thanks to the methodological developments in recent years, we are now able to identify hafted tools in an assemblage and even reconstruct the specific hafting modes used. Here we present the first results of a PhD project that concentrates on the Gravettian and Magdalenian of Western and Central Europe. It takes place in the framework of the project "Evolution of stone tool hafting in the Palaeolithic", led by Dr. Veerle Rots at the University of Liège.



Examples of scrapers from Hohle Fels, all used for hide-working. From left to right: 1) Jurassic chert, Gravettian 2) green radiolarite, Gravettian 3) Jurassic chert, Gravettian 4) red radiolarite, Magdalenian 5) Bohnerz jasper, Magdalenian.

## Dynamics of scraper use at Hohle Fels

A number of scrapers have been analysed from the Gravettian (n=6) and Magdalenian (n=7) levels of the cave. Hide working seems to be the dominant function in the sample: 12 out of 13 scrapers examined so far have been identified as hide-working tools, with most showing evidence of resharpening. A preliminary hypothesis is that scrapers would have been more often maintained and hafted than burins. This will be tested through the analysis of burins from the same levels. For some of the scrapers included in the present sample, the reason for final discard clearly seems to be unsuccessful resharpening, either due to the edge angle getting too obtuse or, in a couple of cases, possibly due to the proximity of the haft.

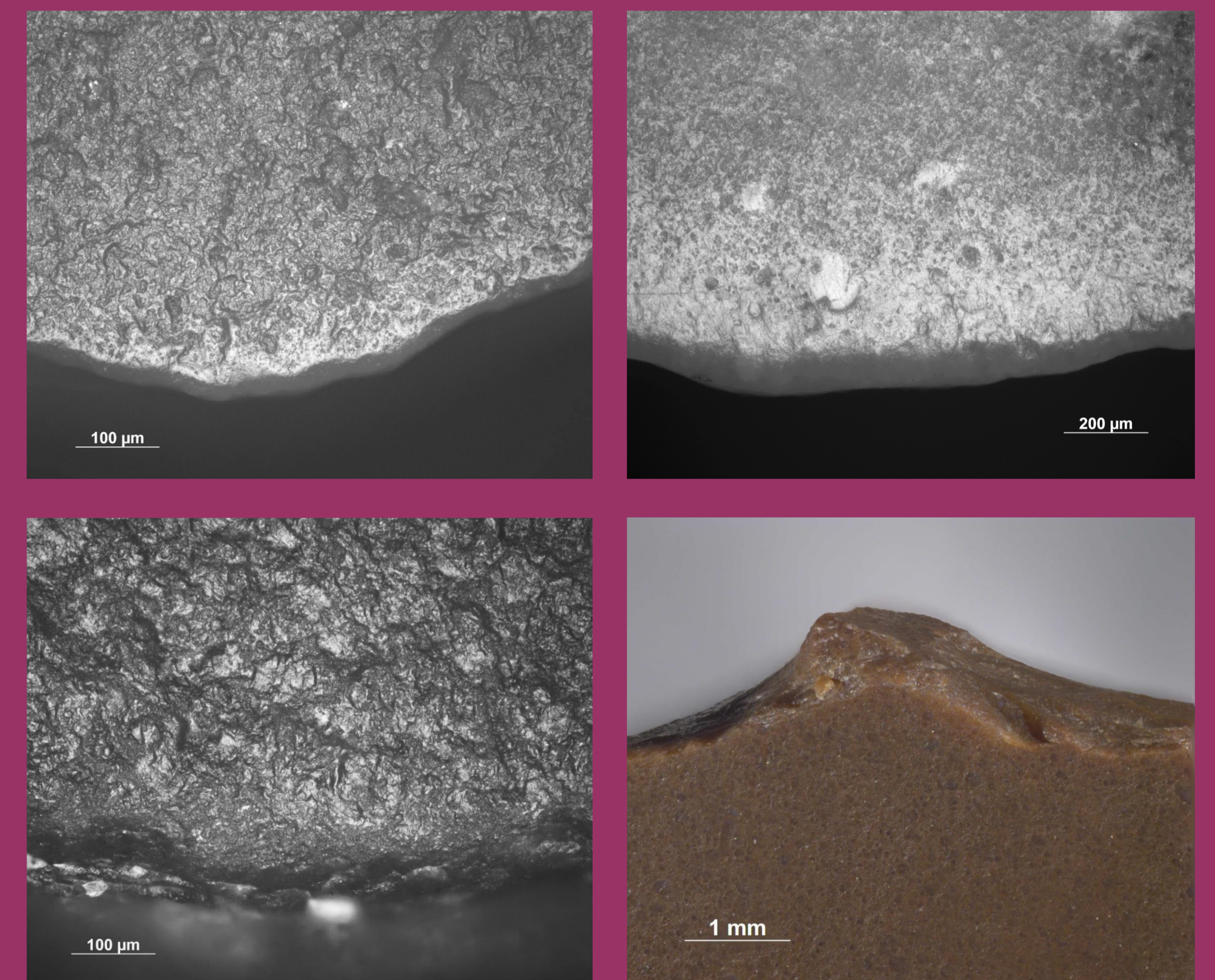


## Indications of hafting

Experimental work has shown that hafted tools can be identified on the basis of patterned wear occurring on them. The co-occurrence of certain features, such as polish, edge damage (scarring) and bright spots and/or striations, can be considered specific to hafting. In the Hohle Fels sample analysed so far, evidence of scraper hafting consists of patterned macroscopic and microscopic wear traces (scarring, rounding) associated with features visible with high (>100x) magnifications. Further support for scraper hafting has been found in the form of blank modification: a Gravettian endscraper on blade has its butt and bulb removed by retouch, and several Magdalenian scrapers show proximal breaks that may have served the same purpose.

Left: Examples of experimental scrapers mounted on wooden handles.

Right: Hafting wear on a Gravettian scraper in local Jurassic chert from Hohle Fels, 100x. Left: a scar associated with a striation (a thin white line running upwards from the high part of the negative), a typical feature on hafted tools. Right: a spot of polish on the bulb caused by friction in the haft. Coarse-grained, highly reflective and lightly patinated raw material is responsible for the hazy appearance of the pictures.



Wear from hide working. Top left: edge rounding and use polish on an experimental scraper used on wetted hide, magnification 200x. Top right: heavy edge rounding and polish on a hide scraper in Bohnerz jasper, 100x. Magdalenian, Hohle Fels. Bottom left: edge rounding on a hide scraper in red radiolarite, 200x. Gravettian, Hohle Fels. Bottom right: evidence of resharpening on a scraper in red radiolarite, 40x. Use-related rounding in the protruding part of the edge is cut through by retouch on both sides. Magdalenian, Hohle Fels.

## Wider research context

The possibility to reconstruct tool use and the tools themselves in their entirety, i.e., the haft included, allows us to gain more insight into the shared features and differences among various sites, and thus permits us to better understand tool design, goals of blank production, and lithic industries in general. To reach these goals, material from four other sites – Abri Pataud (France), Maisières-Canal (Belgium), Geißenklösterle and Vogelherd (Germany) – will be analysed in the current project. The main questions are as follows:

- which kinds of tools have been hafted at the sites, and how?
- does tool use influence the choice to haft a tool?
- are there major differences in tool use and hafting strategies among the sites and/or across time?
- how are these patterns reflected in tool morphologies and assemblage composition?

The overall aim is to examine whether the differences observed on the level of tool morphologies, tool frequencies and production methods reflect significant differences in the logic of stone tool hafting and use. This kind of information is crucial to our understanding of lithic assemblages and technological evolution.

