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# ”Archaeology of light”: an essential approach to understanding the Palaeolithic Cave Art.

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## Résumé

The earliest and most reliable data of ”paleospeleology”, that is, the presence of ancient humans in deep caves has been related to Neanderthals. In the Upper Paleolithic, the combustion residues related to the lighting are proliferating in the inner of the caves, especially associated with paleolithic graphic activity in this dark context. However, the archaeological research here has focused on the preferential analysis of a singular kind of subterranean anthropic evidence: the Paleolithic Art. The analysis of the Internal Archaeological Context (where the remains of the paleolithic lighting system would be included), began on the second half of the 20th century. Yet, this subject is currently growing and it is beginning to be addressed in a holistic and interdisciplinary way for the global knowledge of the paleolithic anthropization of caves.

The study of paleolithic lighting is essential to apprehend the symbolic human behaviours that occurred in the darkness of the caves. Lighting is a *sine qua non* resource used to enter the underground environment and its physical characteristics (duration, intensity, gas secretion, ...) determine human actions carried out inside the caves strongly. Currently, there is an ideal study framework to delve into this topic, thanks to the comprehensive and interdisciplinary approach which the underground contexts are being faced with. Likewise, the improvement of various microscopic and physical-chemical analytical observation tools provides a promising context for this incipient subject of study, occasionally including traces of difficult detection.

We will present a synthesis of the doctoral thesis developed by the first author, as well as some new research on this topic. Specially, the results from **Atxurra cave (Bizkaia, Spain) and Nerja cave (Málaga, Spain)** will be presented.

The *Archeology of Light* combines a methodology interdisciplinary and it includes the surveying and integral cataloguing of the combustions remains, the archaeological-spatial study of them through G.I.S., the anthracological identification of the charcoals, from the taxonomic, taphonomic and dendro-anthracological aspects; the characterization of the different phases of prehistoric use and occupation of the internal zones of these deposits through the

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<sup>14</sup>C-AMS dating of the charcoals and the management of radiocarbon results with Bayesian statistics; together with other complementary analytics, especially those of physical-chemical nature, for optimal identification and study of the different remains of combustion/lighting of the endokarstic context. Also, the methodology includes an Experimental Archaeology section where we present qualitative and quantitative results on the light characteristics of prehistoric lighting systems.

All in all, this study has allowed us to advance in the knowledge of the activities developed by the prehistoric groups in the underground environment, beyond the work directly linked to the execution of Paleolithic Art, and especially about the different pyrotechnic solutions used in the underground environment. In addition, the main conclusions confirm that the prehistoric anthropization of the endokarst is heterogeneous and multifunctional, that it has an important cross-cultural nature and that responds to generally planned actions, such as those related to the selection and provision of certain woody fuels or the location of the systems of light in the cave.

**Mots-Clés:** Lighting, Paleolithic Cave Art, interdisciplinary