

Climate Change: The Karst Record IX (KR9)

July 17th-20th, 2022, University of Innsbruck, Austria



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Cave Records of Human History

Convenors: Dirk Hoffmann (University of Göttingen, Germany) & Kerstin Braun (Arizona State University, USA)

Description: Caves played a significant role in human (pre)history and today many caves are home to important archaeological sites. We find evidence for past human presence in cave environments, mainly in the entrance areas, but sometimes also in deeper parts of the caves, where remains of human activities are often captured in sediments that accumulated inside or outside caves. Excavations at such cave sites yielded, for example, human bones, tools or portable art and provided important insights into human evolution and prehistory. Prehistoric cave paintings or engravings inside caves are further examples for evidence of early human behaviour.

Speleothems can serve as constraints to interpret archaeologically relevant materials. For example, age constraints for archaeological excavations or artefacts can be obtained by dating associated speleothem formations. Furthermore, speleothem records of environmental variability can provide important information about boundary conditions for human activities. This session invites presentations on cave records in an archaeological context. The focus of the session is on speleothem research, but we also welcome presentations in related fields like rock shelters, dolines or travertine / tufa formations.

Open Session

Convenors: Andrea Columbu (University of Bologna, Italy) & Oana Dumitru (Lamont-Doherty Earth Observatory)

Description: Surface and underground features in karst regions are rich records of past climatic and environmental changes. This session will showcase the diverse array of studies focused on these records. A partial list of relevant topics includes sea level fluctuations, river incision and base-level oscillations, hydrology and floods, palynology, microbiology, paleontology, petrography and mineralogy, speleogenesis, and the evolution of karst landscapes. There is essentially no restriction on the methods, the archive, or the type of study, as long as it diverges from “classical” paleoclimate time-series based on clastic, speleothem, or cave ice proxies. Multi-disciplinary approaches and novel techniques are strongly welcomed.

A speleothem-based reconstruction of Early Holocene the climate-environmental-human nexus in the Fertile Crescent

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At the beginning of Holocene, the Fertile Crescent (FC) – and particularly the Kurdistan Region of Iraq (KRI) – was the scenario of several fundamental cultural events such as the origin of agriculture, the beginning of urbanization, and the formation of the first state entities. The role played by climate and environmental changes on these cultural processes is highly debated, but local, continuous, and well-dated palaeoclimatic records are still scarce. In this contribution, we present the results of a palaeoclimatological and palaeoenvironmental investigation in this area, derived from a speleothem covering the Early Holocene Early (ca. 11 to 7.3 ka), and encompassing the Neolithic to Early Chalcolithic periods. The speleothem record shows multi-centennial hydroclimatic fluctuations that can be related to changes in the intensity of the Siberian High (SH). The SH affected regional synoptic conditions, influencing the amount of winter precipitation, and modulating the length of wet season. The comparison of our data with the local archaeological record suggests a link between these hydroclimatic fluctuations with changes in settlement patterns and a re-organization of subsistence strategies, particularly to the exploitation of water resources.