



## **Major climate events of the last 130 ka recorded in Corchia Cave (Italy) speleothems**

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In recent years, speleothems have emerged as one of the most significant sources of terrestrial palaeoclimate information. Their sensitivity to climatic change and their ability to be dated with great precision makes them ideal for establishing the ages of key climatic events recorded in ice and marine cores.

We present new high-resolution geochemical data from multiple speleothems collected from Corchia Cave (Alpi Apuane, Italy). These speleothems grew intermittently over much of the last 130 ka, and provide ages on the timing of many key climatic events during this period, particularly through MIS 5 and MIS 4. Major stable carbon and oxygen isotope excursions of millennial-scale duration were dated precisely by applying the MC-ICPMS U/Th technique to 100-300 micron thick sample layers. These excursions correlate with well-known North Atlantic cold events.

We also performed U/Th dating using laser ablation MC-ICPMS on several stalagmite sections rich in growth interruptions (hiatuses). These sections are normally avoided by speleothem researchers because of the difficulty of extracting useful information, and problems of dating brief growth phases without transgressing hiatuses and introducing cross-contamination. The laser results, although of lower precision com-

pared to conventional solution-based ages, show that many of these brief bursts of speleothem growth correspond to Greenland interstadials.

Finally, we applied laser-based trace element and strontium isotopic analysis to one speleothem known to have grown through two major North Atlantic cold events during MIS 5. The results not only allow us to develop a set of multi-proxy geochemical signatures that may be used to support interpretations of suspected cold events in other speleothems from this cave, but also provide insights into changes in regional circulation patterns during cold events.