NEWS

Ice sheet collapse 135,000 years ago to help scientists explain dramatic climate changes

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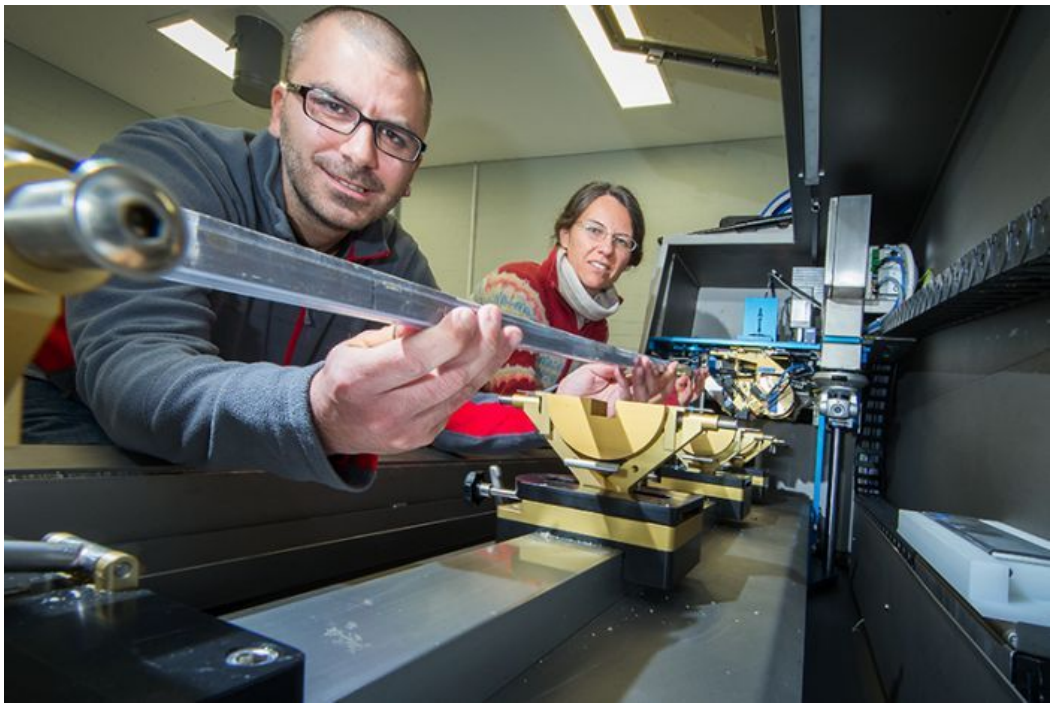

PHOTO: ANU researchers Gianluca Marino and Katharine Grant were part of an international team looking into climatic changes. (Supplied: Stuart Hay)

MAP: Canberra 2600

The discovery of a massive ice sheet collapse 135,000 years ago could help scientists understand the processes that control the planet's dramatic climate changes.

An international team of scientists has found that the dramatic collapse at the end of the penultimate ice age caused extensive changes in the climate and triggered the last interglacial sea level peak, which well exceeded its present levels.

The team, which included scientists from the Australian National University (ANU), disproved the theory that all ice age cycles "superficially" looked the same.

Using precisely dated cave recordings and marine sediment from the Mediterranean region, scientists were able to find that the events of 135,000 years ago caused the planet to warm differently to the way it did at the end of the most recent ice age, about 20,000 to 10,000 years ago.

Study leader Dr Gianluca Marino, from the ANU Research School or Earth Sciences, said a strong link between rapid changes in continental ice sheets, the ocean, and the atmosphere, led to sea levels rising - something that did not occur at the end of the latest ice age.

"At the end of the last ice age, there was no apparent link between rapid melting of the Northern Hemisphere ice sheets and episodes of dramatic climate change," he said.

"On the contrary at the end of the penultimate ice age 135,000 years ago, dramatic melting of the Northern Hemisphere ice sheets [meant they] were releasing enough fresh water into the North Atlantic to impact the ocean's circulations and to cause climate change to both the north Atlantic and in the Southern Ocean."

Co-author Professor Eelco Rohling, from the ANU and the University of Southampton, said the climate changes in both areas counterbalanced each other.

"The North Atlantic cooled while the Southern Ocean warmed and this eventually caused the Antarctic ice sheet to melt and this caused the high sea level of the last interglacial period."

Dr Marino said previously scientists had only been able to reconstruct in detail the changes at the end of the last ice age.

"Unfortunately marine sediments cannot be directly dated beyond 40,000 years ago," he said.

"So for looking at ice ages before the last one, which ended about 20,000 [years ago], we had to think of other approaches that allow us to actually date the marine sediments and establish a chronology for a sequence of events.

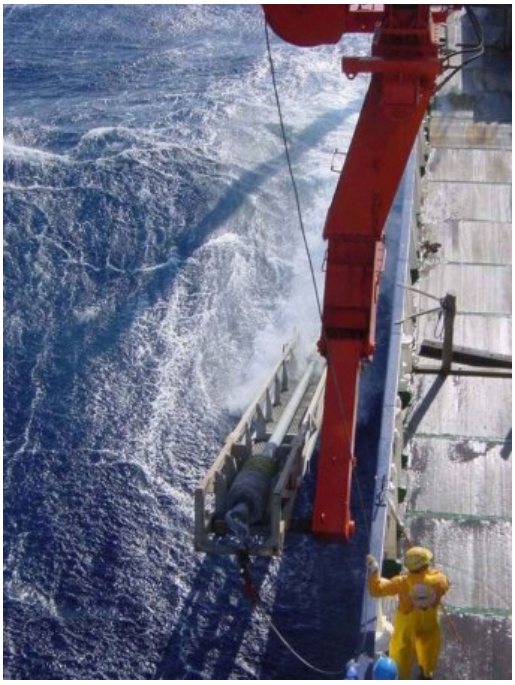

PHOTO: Coring was conducted in the Mediterranean Sea to gather samples of deep sea sediment. (Supplied: Eelco Rohling)

"We constructed a precise sequence of events for the end of the earlier ice age... and we could look at the interaction between solar radiation, the melting of the Northern Hemisphere ice sheets, ocean circulation, changes in powerful greenhouse gases like carbon dioxide and methane, and changes in the Antarctic climate."

Their findings can now be used to investigate other ice ages further back in time, which will reveal in greater detail the history of the ice ages.

The findings have been published in science journal Nature.

PHOTO: Marine sediment was collected from areas in the Mediterranean Sea. (Supplied: Eelco Rohling)

Topics: science-and-technology, climate-change, earth-sciences, canberra-2600, act

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