




ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

CRYOSPHERE

*The paleo-climate memory of
the ice.*

The glaciers and in particular the East Antarctic plateau record the paleoclimate traces of the environmental conditions of the Earth. To comprehend the influence of greenhouse gas emissions on climate system, it is essential to understand the variations occurred in the past.



The University of Bologna is present in Antarctica since 1988 and it takes part to the studies on the role of greenhouse gases concentration in mid-Pleistocene (900 to 1200 thousand years ago). **A key point to design effective mitigation and adaptation strategies to current changes** is unveiling the link among carbon cycle, ice caps, atmosphere and oceans behavior.

Deep ice cores are quantitative records of the Earth climate: **the discovery of sites with ice older than 1.5 million years is one of the scientific challenges currently underway.**

The University of Bologna is active, and equipped with geomatics instruments and Laboratories concerning:

- **site surveying using GNSS** for ice surface velocity field measurements and precise positioning of geophysical prospections
- **remote sensing and digital photogrammetry** to monitor ice surface changes and DSM production

HIGHLIGHTS

The research team of the University has participated in more than 20 scientific expeditions in Antarctica as temporary staff assigned to the International Antarctic Program (PNRA). **The University's research in the field has also been funded at international level:**

- **European Project for Ice Coring in Antarctica, [EPICA, Dome C \(East Antarctica\)](#):**
The University of Bologna was responsible for the implementation of geodetic control network around the deep drilling site. EPICA project successfully retrieved coring ice of 3270m, highlighting the paleo-climatic history of the last eight climate cycles of the planet occurred in the last 820 000 years
- Since 2016, the University of Bologna is Partner of the **H2020 Project [Beyond EPICA - Oldest Ice](#)** that has the objective to select the optimum drill site for ice older than 1.5 million of years. In case of success, a deep ice coring will be carried out in the identified site, extending the knowledge on greenhouse gases concentration in middle Pleistocene
- With the support of the **National Antarctic Program (PNRA)**, since 1988 the University contributes to several **[International Projects](#)**
- **VLNDEF** project: geodynamics of the Northern Victoria Land
- **ITASE** - Project endorsed by SCAR – The Scientific Committee on Antarctic Research that aims to establish how the modern atmospheric environment is represented in the upper layers of the Antarctic ice sheet (corresponding to a time span of about 200 years)
- Project **[TALDICE](#)**: the University has measured the ice surface velocity field in support of the deep ice cores carried out at Talos Dome