Ice core processing and analysis laboratories at AWI

Date: June 10 afternoon or June 11 morning
Travel to AWI (in Bremerhaven): to be organised by yourself
Accommodation in Bremerhaven: to be organised by yourself (please approach us for a list of hotels)

Please note that AWI is <u>located in the N of Germany</u> (ca. **<u>600km from Tübingen</u>**). Closest airport: Bremen, flight distance to Tübingen: ca. 2 hours, train distance to Tübingen: 7-8 hours) June 11 afternoon/evening will be needed to travel to Tübingen.

Ice cores from polar ice sheets have been drilled since the 1960s with increased activity in the 1990s when climate warming questions and their causes became widely discussed. Paleo-climate records from ice cores are unique as they are the only direct archive of paleo-atmosphere preserved in entrapped air inclusions in ice. Water isotopes as paleo-thermometers complement paleo-climate data from lower latitude records. Trace impurities are used as markers for climate model validations and constraints, e.g. to reconstruct past atmospheric circulation patterns or past sea ice extent.

Structural data from ice cores on meso- to micro-scales have been analysed in various polar ice cores, however obtained a focus (e.g. funding- and man-power wise) only in the last decade. Questions concerning the ice material itself, concerning e.g. the rheology of natural ice and the integrity of records, were considered important when large-scale ice sheet models reached a certain level of sophistication with evolving computer power. The need to evolve the basis of the physical description of ice flow became recognised and promoted our field of “structural glaciology”.

In this context we analyse the physical properties of ice core samples with respect to their electric, di-electric and mechanic properties. We employ optical methods on the meso- and microscale, e.g. visual stratigraphy in a mesoscopic dark field application, polarisation microscopy in automated application (Russel-Head Instrument) and electron back-scattered techniques (in cooperation with Utrecht partners, not in AWI).

We will have a tour through the freezer facilities at the Alfred-Wegener-Institute, Helmholtz Center for Polar and Marine Science. With footage material and experienced colleagues we will report on our general glaciological research and in particular from field work with ice drilling and sample processing, geophysical methods on the ground and airborne as well as insight into large scales of ice sheets from remote sensing and modelling approaches.