



Example of Microstructure Mapping image (Photo: Ilka Weikusat, Alfred-Wegener-Institut)

An essential part of ice core research at the AWI consists of mapping the microstructural parameters (grain size, shape and crystal orientation [[The effect of deformation mechanisms for ice sheet dynamics >](#)], air bubbles and porosity [[Ice-CT >](#)], and clathrate hydrates [[Raman Spectroscopy >](#)]). The crystal orientation is measured with the automated [fabric analyser >](#) , while the grain and subgrain boundaries are mapped at high resolution with the LASM method (Large area scanning microscope) and optical light microscope. Mapping of the pore structure of firn and ice is conducted in 3D with the [Ice-CT >](#) . The processing of the ice cores and the described mapping methods are being performed in the [cold laboratory >](#) in Bremerhaven as well as on site in Greenland or Antarctica immediately after recovering the core.