

GSI - FAIR Colloquium

Main Lecture Hall (SB1 1.120), 64291 Darmstadt, Planckstraße 1

Tuesday, April 19, 2016,
16:15 Uhr (Tee ab 15:45)

Pre-colloquium for students at 15:30

Dorthe Dahl-Jensen – Niels Bohr Institute Copenhagen

Studying the Greenland ice sheet: Implications for climate past and present

The Greenland ice sheet is reacting to the recent climate change and is losing more and more mass for every year. One of our challenges in the future is to adapt to rising sea levels [1]. Looking into the past gains us knowledge on how the ice sheets react to changing climate of the past and this knowledge can be used to improve predictions of sea level rise in the future. The deep ice cores from Greenland contain information on the past climate more than 130.000 years back in time.

Results from the Greenland ice cores are presented and are used to extract information on the climate during the glacial period where 25 abrupt climate changes named Dansgaard-Oeschger events are discussed [2,3].

All the ice cores drilled through the Greenland ice sheets show that they all contain ice from the previous warm Eemian climate period, 130.000 to 155000 years before present. Is it thus clear that the Greenland Ice Sheet did exist for 120.000 years ago in this warm climate period where it was 5 °C warmer over Greenland [4] and the sea level has been estimated to have been 6-9 m [5] higher than the present sea level?

- 1 Shepherd, A. *et al.* A Reconciled Estimate of Ice-Sheet Mass Balance. *Science* **338**, 1183-1189, doi:10.1126/science.1228102 (2012).
- 2 Johnsen, S. J. *et al.* Oxygen isotope and palaeotemperature records from six Greenland ice-core stations: Camp Century, Dye-3, GRIP, GISP2, Renland and NorthGRIP. *Journal of Quaternary Science* **16**, 299-307 (2001).
- 3 Buizert, C. *et al.* Greenland temperature response to climate forcing during the last deglaciation. *Science* **345**, 1177-1180, doi:10.1126/science.1254961 (2014).
- 4 Dahl-Jensen, D. *et al.* Eemian interglacial reconstructed from a Greenland folded ice core. *Nature* **493**, 489-494, doi:10.1038/nature11789 (2013).
- 5 Kopp, R. E., Simons, F. J., Mitrovica, J. X., Maloof, A. C. & Oppenheimer, M. Probabilistic assessment of sea level during the last interglacial stage. *Nature* **462**, 863-U851, doi:10.1038/nature08686 (2009).

Einladender: Bengt Friman

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