# The Life of William Dansgaard: A "sight-and sound" tribute


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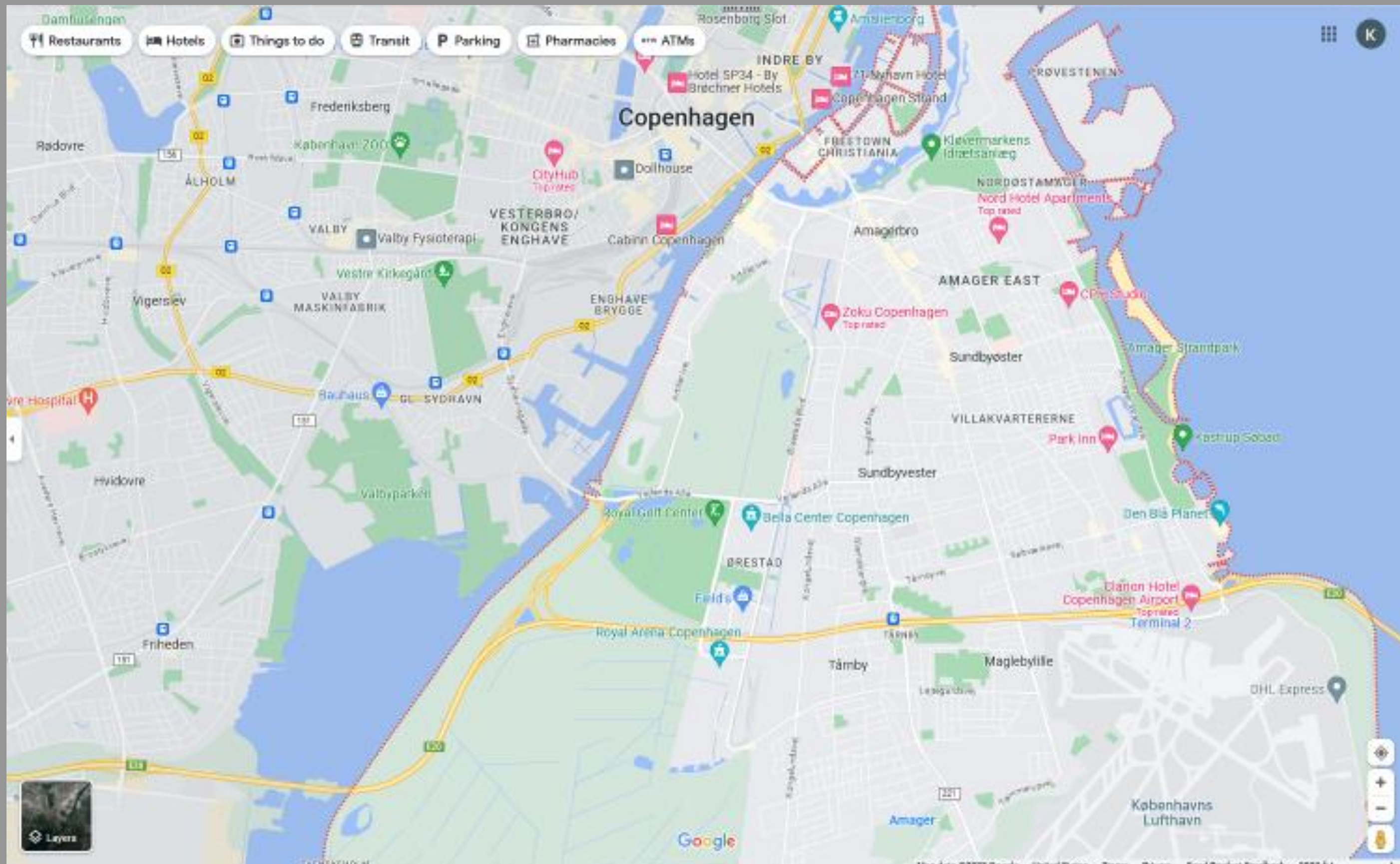
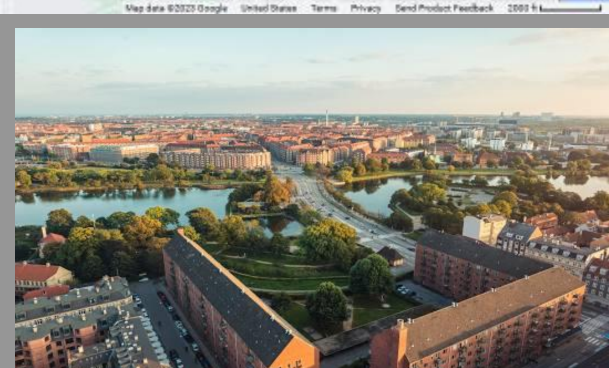
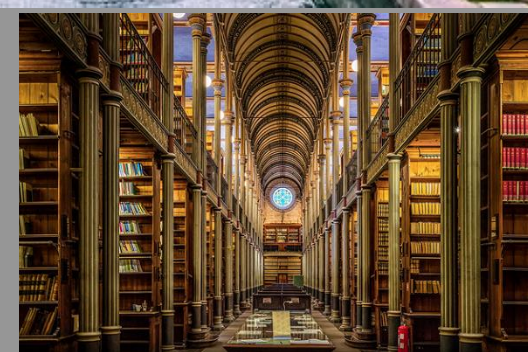
# AMAGER/COPENHAGEN: BIRTHPLACE



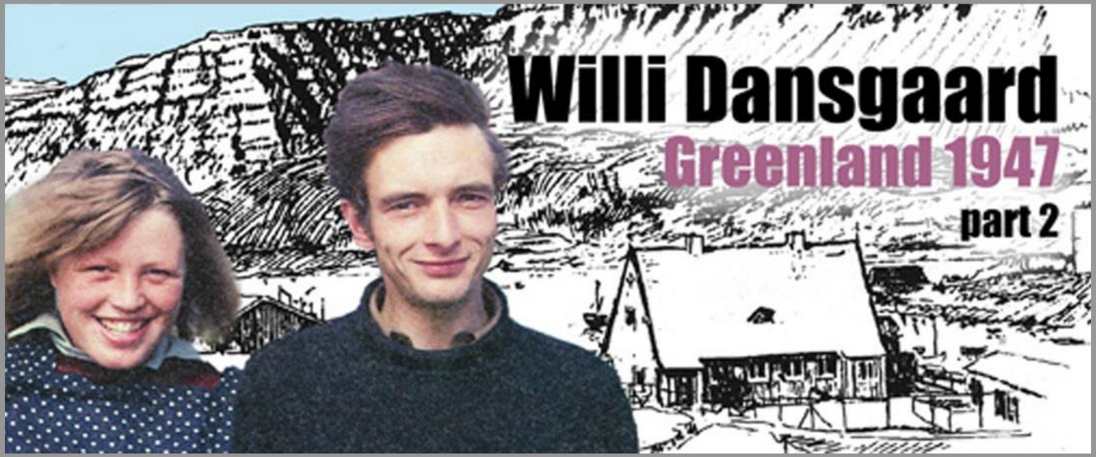
# AMAGER/COPENHAGEN: BIRTHPLACE


# COLLEGE: UNIVERSITY OF COPENHAGEN



*B.Sc. Physics, Chemistry, Astronomy; Ph.D. Physics*

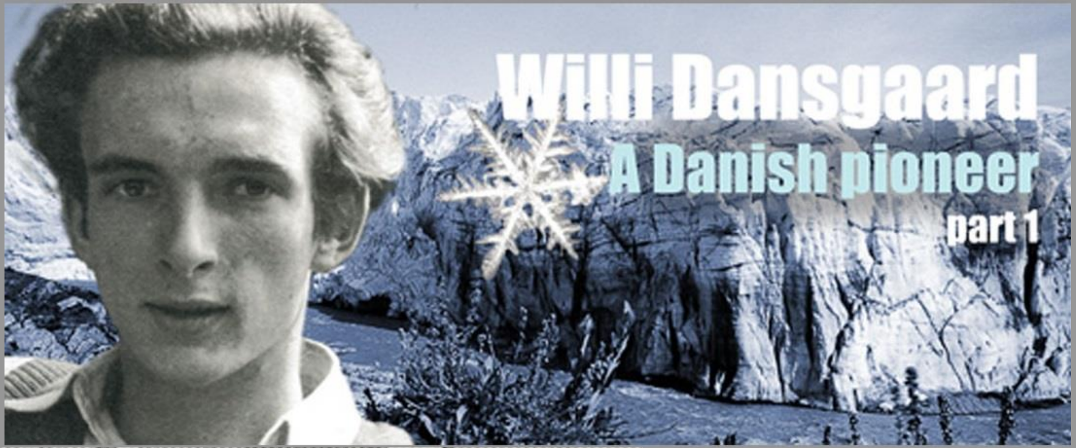
# FIRST VOYAGE TO GREENLAND (1947)





MARRIES INGE THOMSEN…HONEYMOON ON GREENLAND

# FIRST JOB: UNIVERSITY OF COPENHAGEN

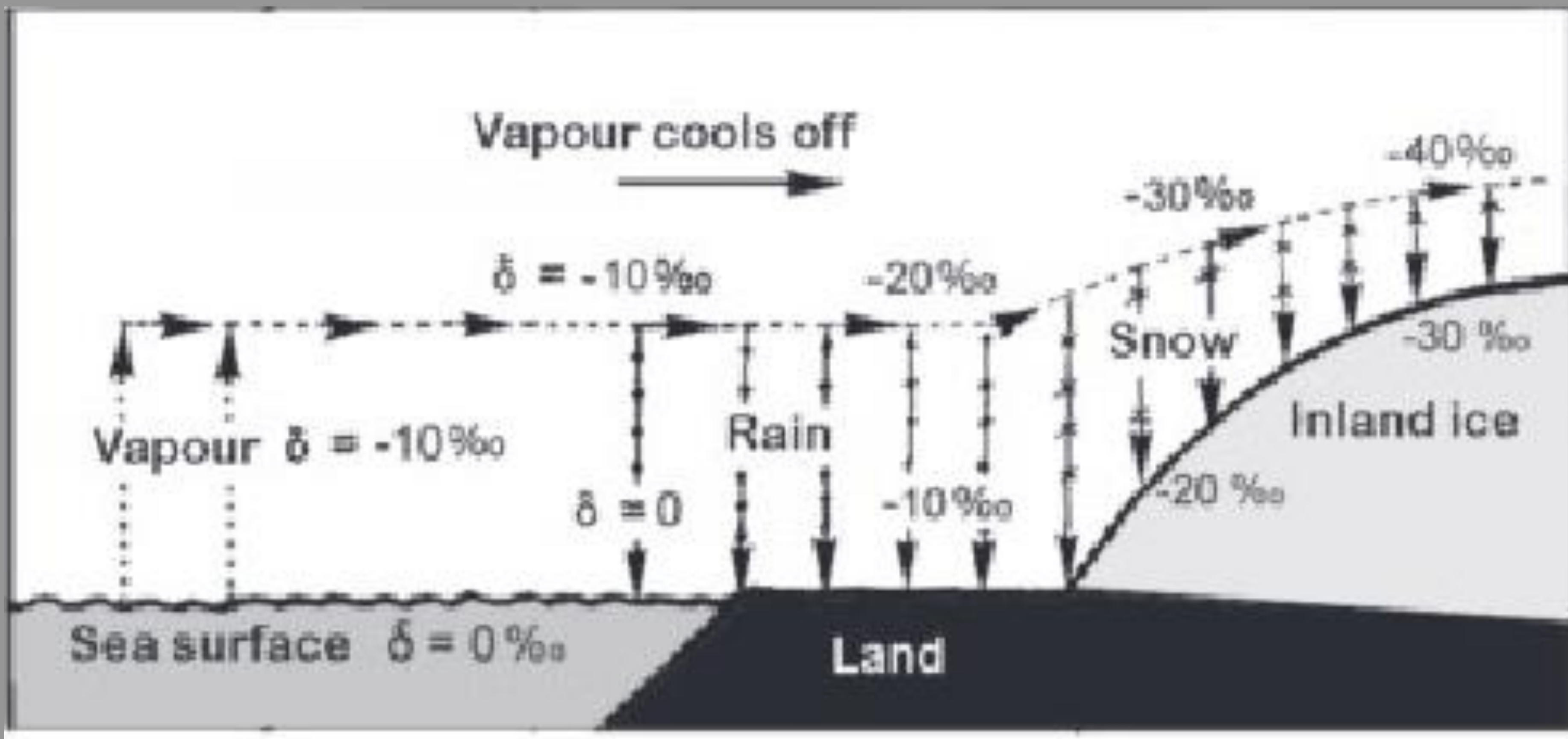



U-CPH: BIOPHYSICAL – ISOTOPE LAB (1951)

# GARDEN EXPERIMENT: HUMBLE BEGINNING

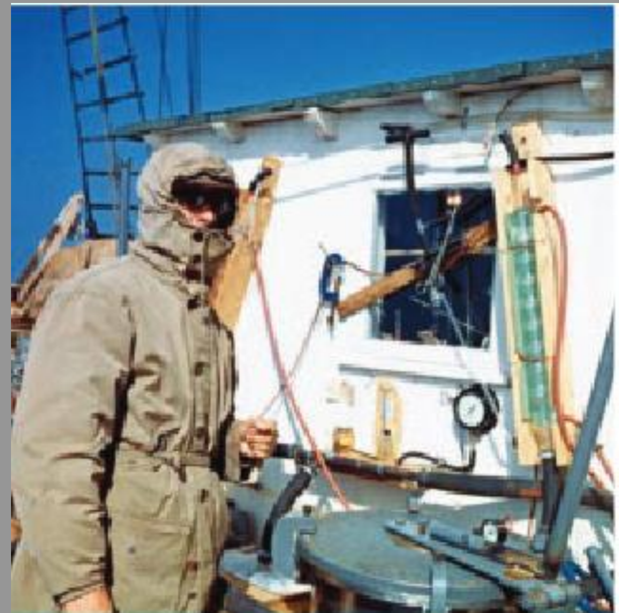
GARDEN RAINFALL COLLECTION – MANY SAMPLES (1952)

# GREENLAND FIELD RECONNAISSANCE



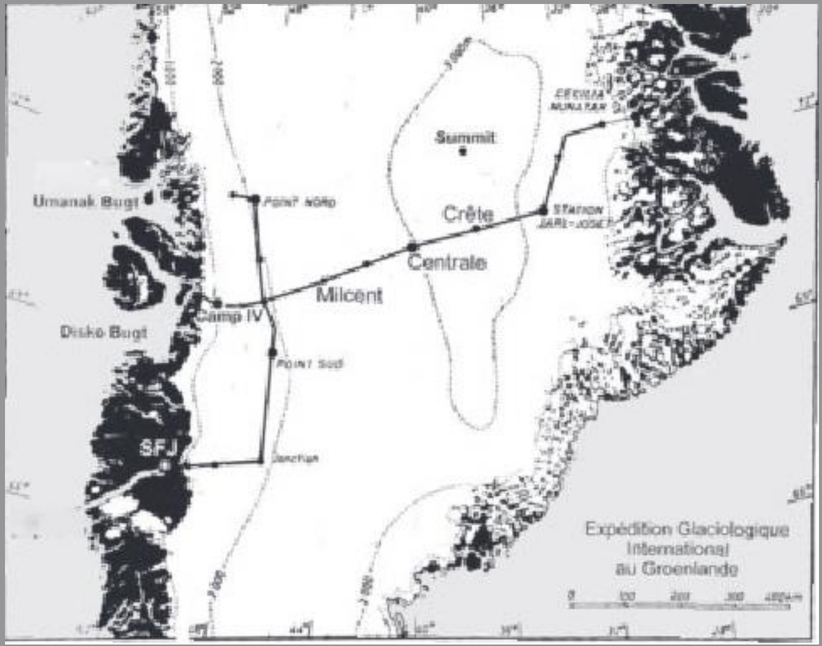

DISCOVERS THE RAINFALL OXYGEN-ISOTOPE RELATIONSHIPS (1953)

# GREENLAND: THE BUBBLE EXPEDITION



SAMPLING GLACIAL ICE MICRO-CHEMISTRY (1958)

# GREENLAND: THE EGIG PROJECT




Coastal geodetic survey, drill/auger firn/ice-cores (1959-60)

# GREENLAND: CAMP CENTURY (1964)

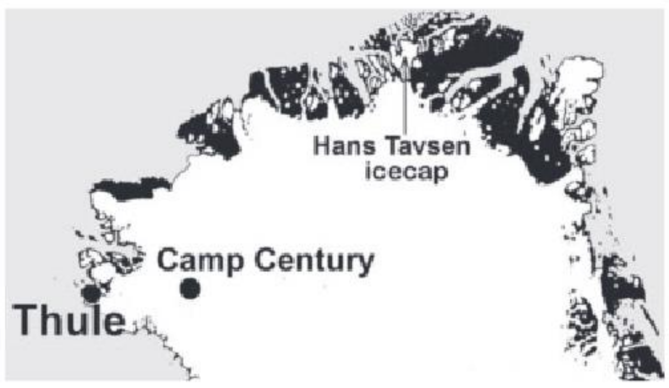
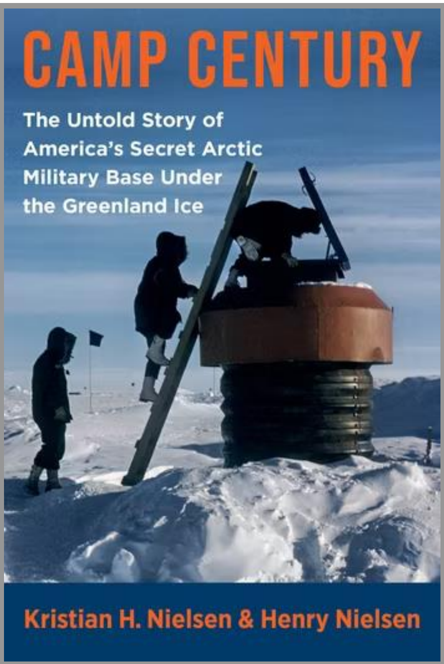



Fig. 5.1 *Map of northern-most Greenland*




U.S. MILITARY RESEARCH STATION…FIRST COLLABORATION

# GREENLAND: DYE-3 (1973)

**Fig. 7.6** *We were called The Three Musketeers. Chester Langway between Hans Oeschger and myself. Chet told a story well, here on how he let himself be lowered*

U.S. RADAR STATION…SOUTHERN GREENLAND

# GREENLAND: GISP EXPEDITION (1973)


DEEPER ICE CORING WORK

# GREENLAND: ISTUK EXPEDITION (1978-1981)

**Fig. 10.2** *The drill hall. ISTUK is being tilted by a hydraulic pump system.*

**Fig. 10.3** *An ice core from great depth is released from the core barrel. Note that it is transparent. The air bubbles are dissolved in the crystal lattice at great pressures. When the ice relaxes at normal pressure they re-appear, but now around micro-parti-*

**Fig. 10.4** *Saturday nights were devoted to studies of experimental physics*

DANISH LED COLLABORATIVE DRILL PROJECT

# GREENLAND: GRIP PROJECT (1988-1992)

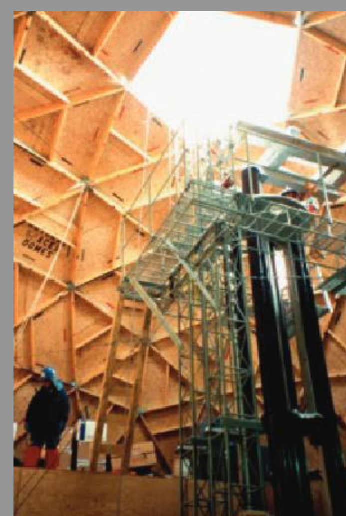


Fig. 12.10 *Drill master Sigfus Johnsen with the last ice core increment from a depth of 3029 m.*

COLLABORATIVE DRILLING (EVEN DEEPER): Belgium, Denmark, France, Germany, Great Britain, Iceland, Italy, and Switzerland

# GREENLAND: NORTH GRIP (1996-2003)

Fig. 14.6 *Dorthe Dahl-Jensen enjoying the sight of the last "core" of refrozen bottom water that came up in the next run. Photo: Lars Berg Larsen.*


Fig. 14.5. *Only in early July, the drill came up with a well sized ice core in the core barrel. The cutter knives, are numbered 1, 2 and 3. Photo: Lars Berg Larsen.*

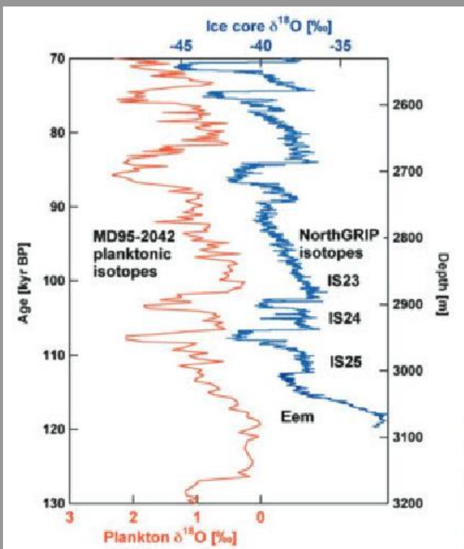
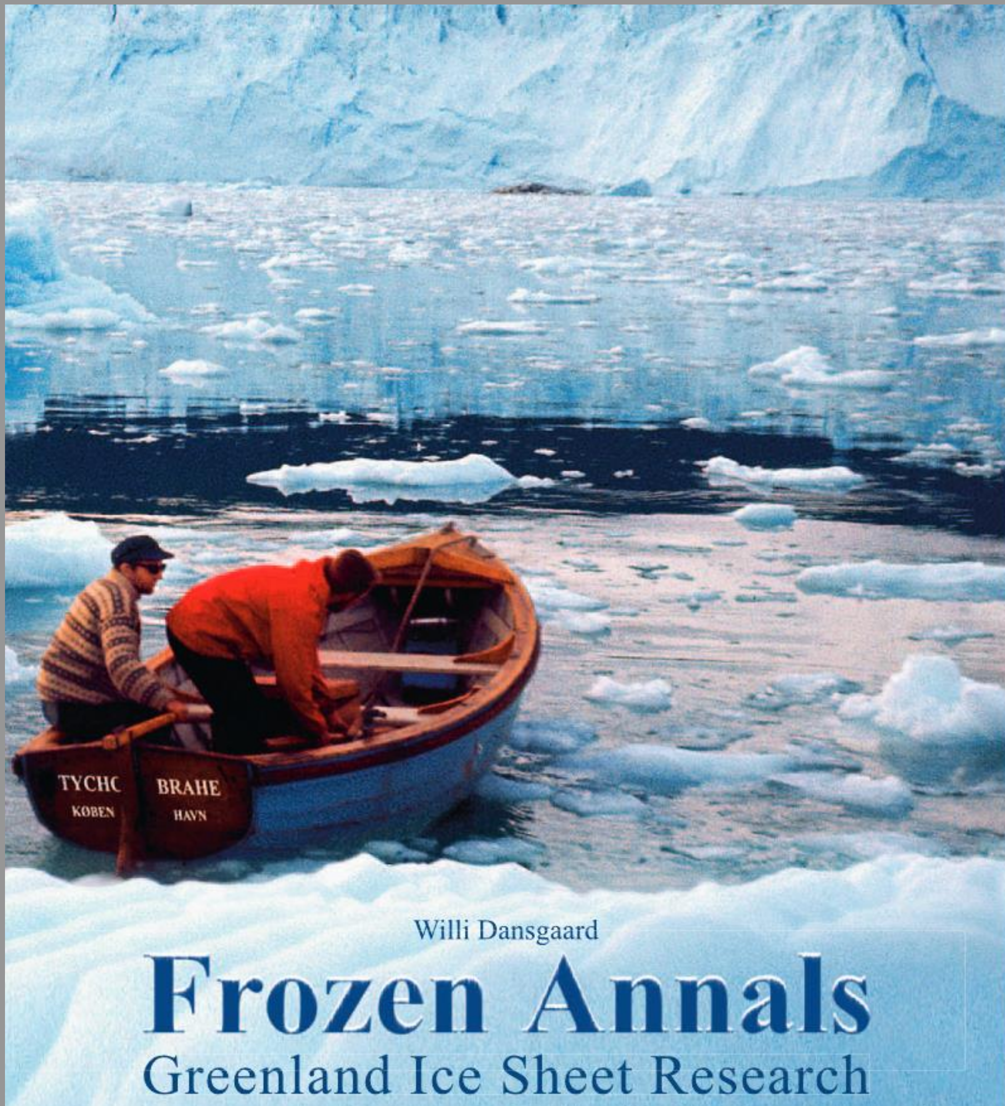


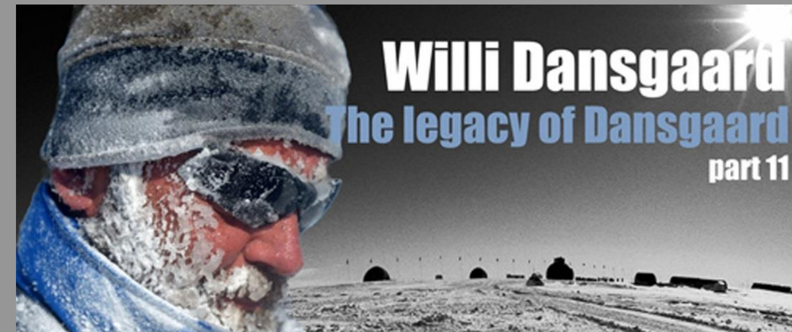

Fig. 14.8 *The NorthGRIP $\delta^{18}O$ profile (blue) over the deepest 550 m [ref.14.4] compared with a radiometrically dated profile of $\delta^{18}O$ (red) in planktonic foraminifera in an ocean sediment core (MD95-2042) from the Northeast Atlantic Ocean off Portugal [ref.14.5].*

Fig. 14.7 *The entire NorthGRIP crew celebrating the big moment in the drill hall*

COLLABORATIVE DRILLING (EVEN DEEPER): Denmark (led), Germany, Belgium, France, Great Britain, Iceland, Japan, Sweden, Switzerland, U.S.A.

# FROZEN ANNUALS (2005): THE STORY




**Paleoceanography and Paleoclimatology**

Research Article

### Synchronization of Heinrich and Dansgaard-Oeschger Events Through Ice-Ocean Interactions

Logan E. Mann, Alexander A. Robel, Colin R. Meyer

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Abstract

The cause of Heinrich events and their relationship with Dansgaard-Oeschger (DO) events are not fully understood. Previous modeling studies have argued that Heinrich events result from either internal oscillations generated within ice sheets or ocean warming occurring during DO events. In this study, we present a coupled model of ice stream and ocean dynamics to evaluate the behavior of the coupled system with few degrees of freedom and minimal parameterizations. Both components of the model may oscillate independently, with stagnant versus active phases for the ice stream model and strong versus weak Atlantic Meridional Overturning Circulation (AMOC) phases for the ocean model. The ice sheet and ocean interact through submarine melt at the ice stream grounding line and freshwater flux into the ocean from ice sheet discharge. We show that these two oscillators have a strong tendency to synchronize, even when their interaction is weak, due to the amplification of small perturbations typical in nonlinear oscillators. In synchronized regimes with ocean-induced melt at the ice stream grounding line, Heinrich events always follow DO events by a constant time lag. We also introduce noise into the ocean system and find that ice-ocean interactions not only maintain a narrow distribution of timing between Heinrich and DO events, but also regulate DO event periodicity against noise in the climate system. This synchronization persists across a broad range of parameters, indicating that it is a robust explanation for Heinrich events and their timing despite the significant uncertainty associated with past ice sheet conditions.

DR. DANSGAARD LED THE WAY WITH HIGHLY CREDIBLE PALEOCLIMATE RESEARCH USING ICE CORES – METHOD NOW USED WORLDWIDE

# *TAK FOR GODT DIN ARBEJDE*...

# "THANK YOU FOR YOUR GOOD WORK"



*Var Det Du,* Ensemble Galilei: https://www.youtube.com/watch?v=npjdIl3lXOo