

# Welcome

Center for Ice and Climate, University of Copenhagen

**SVALI phd course/workshop**

**Applications of radar data from ice sheets to understand ice flow processes**



**Juliane Maries Vej 30, 2100 København Ø**

**[www.icecores.dk](http://www.icecores.dk)**



## Stability and Variations of Arctic Land Ice

### **Nordic Centre of Excellence SVALI**

SVALI is a Nordic collaboration under the Nordic Council research programme: “Interaction between Climate Change and the Cryosphere”, which aims to improve our understanding of stability, variations and dynamics of the cryosphere.

Read more at the SVALI homepage: [www.ncoe-svali.org](http://www.ncoe-svali.org)



Thanks to

Prasad Gogineni (CReSIS, Kansas University)

Dorthe Dahl-Jensen, Michelle Koutnik and Nanna Karlsson (University of Copenhagen)

# Applications of radar data from ice sheets to understand ice flow processes

## Overview:

The aim of this course/workshop is to discuss radar data and how they can be interpreted to inform about ice processes.

Radio-echo sounding (RES) of ice sheets provides information on ice thickness, stratigraphy, and bedrock conditions. Radar data are also used to characterize the physical properties of the ice, and InSAR techniques are used to generate surface velocity maps.

*Themes to be discussed:* understanding the nature and limitations of radar data, the physical properties causing radar reflections, snow radar, applications of radar data to reveal ice flow processes, such as folding, basal melting and refreezing, incorporation of basal material, and inferring the ice thickness and accumulation rate history from radar data.

# Applications of radar data from ice sheets to understand ice flow processes

## Overview of week:

- Monday:**            **Radar data – overview of radar principles, measurements and limitations**  
Ice core research at Center for Ice and Climate by Anders Svensson  
Welcome reception and pizza
- Tuesday:**           **Interpretating the radar signal and relating it to physical properties of ice and firn**  
**Posters**
- Wednesday:**       **Ice flow pattern and past accumulation rates**  
**Surface velocity and fast flowing glaciers**
- Thursday:**           **Deep radar: Basal conditions and processes**  
Workshop Dinner
- Friday:**             **Deep radar: Development of folds and patterns**



# Center for Ice and Climate

## University of Copenhagen



NEEM Camp, July 2010



# Ice cores from Greenland

Camp Century, 1962-66, 1390 m



Dye-3, 1979-80, 2037 m



NGRIP 1996-2004, 3085 m



GRIP 1989-92, 3029 m





## About Center for ice and climate:

**64 people:**            *9 senior scientists (2 emeritus, 1 visiting)*  
                              *18 postdocs (3 visiting)*  
                              *8 office and technicians*  
                              *20 phd students*  
                              *9 Master students*

### ***Ice core laboratory groups:***

Isotope-lab, Gas-lab, Chemistry-lab

### ***Modelling groups:***

Ice sheet modelling group

Earth and atmosphere & statistical modelling group

CO<sub>2</sub> modelling group

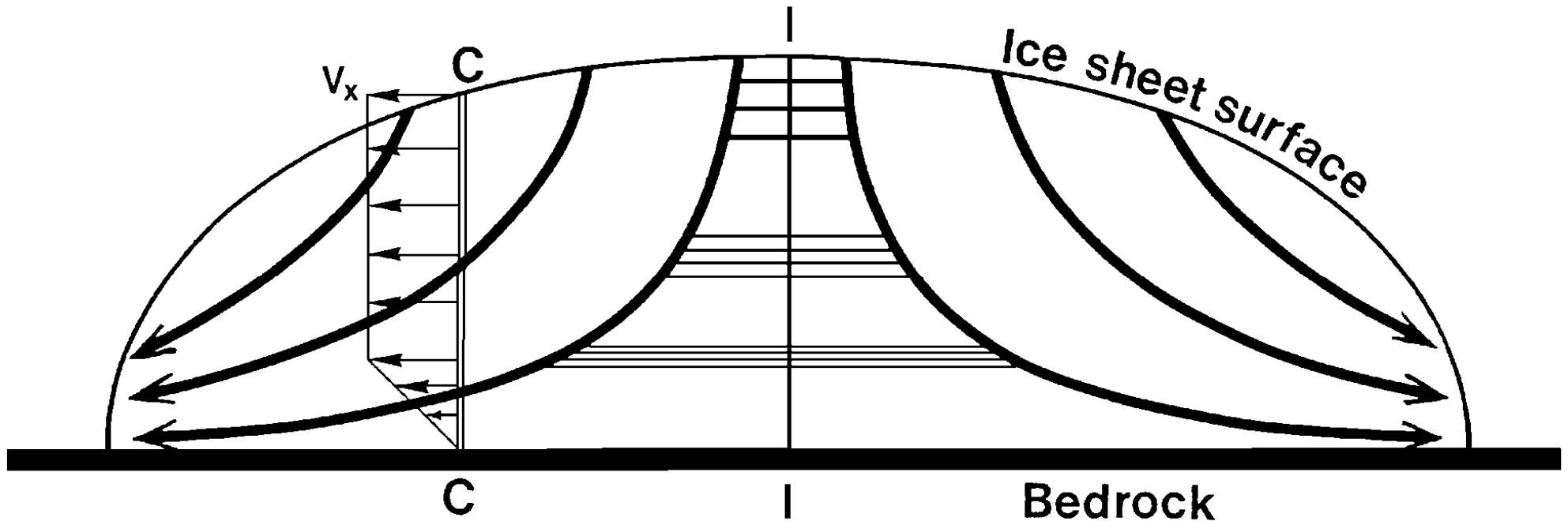
### ***Other groups:***

Stratigraphic analysis group

DNA studies group

# The Greenland Ice Sheet – a climate archive

A schematic cross section from West to East



Width – appr. 900 km

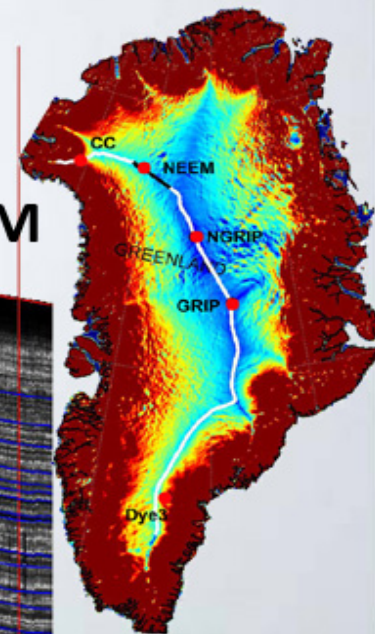
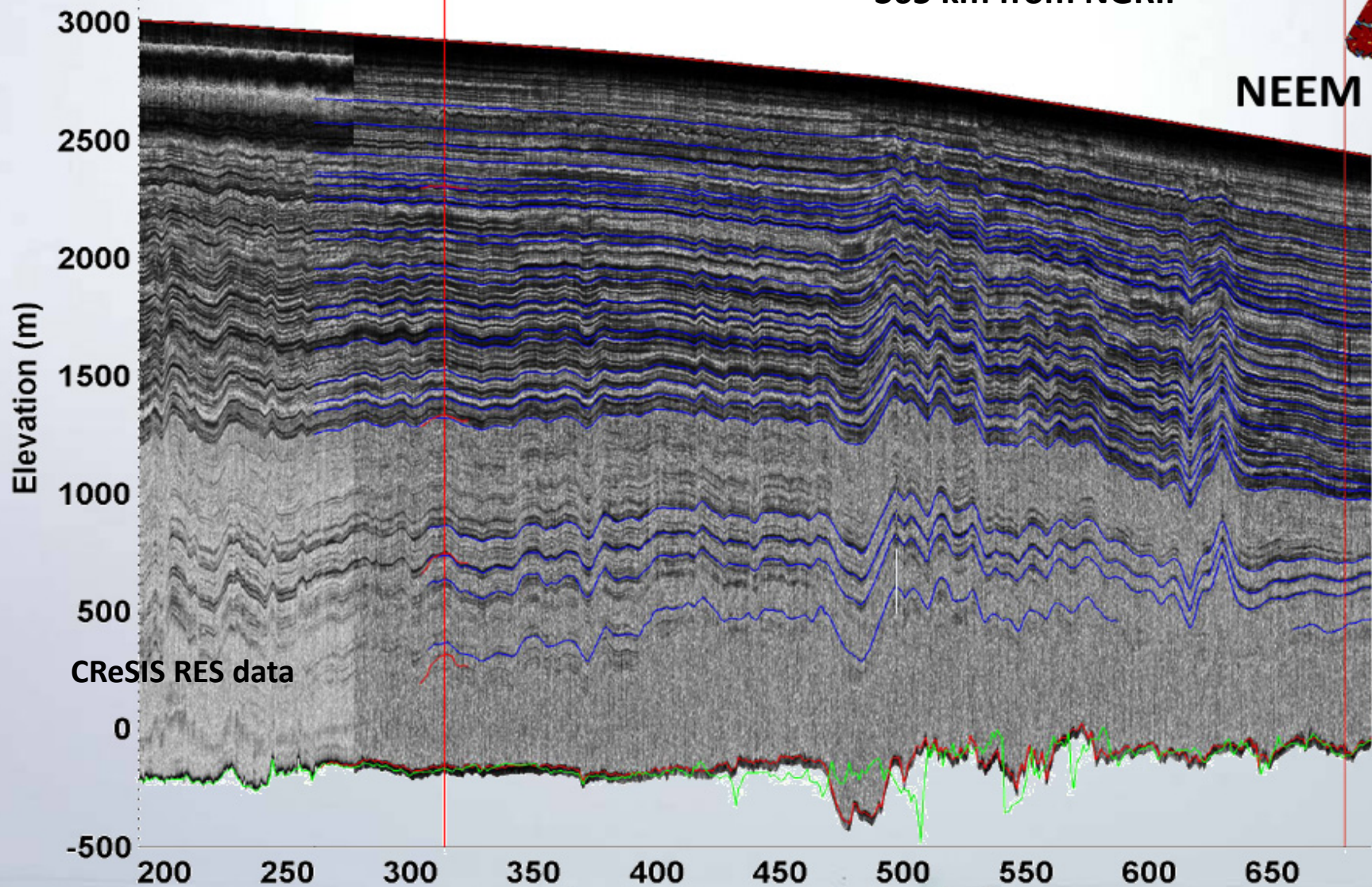
Thickness – appr. 3 km



**NGRIP**

**77.449N, 51.056W  
365 km from NGRIP**

**NEEM**

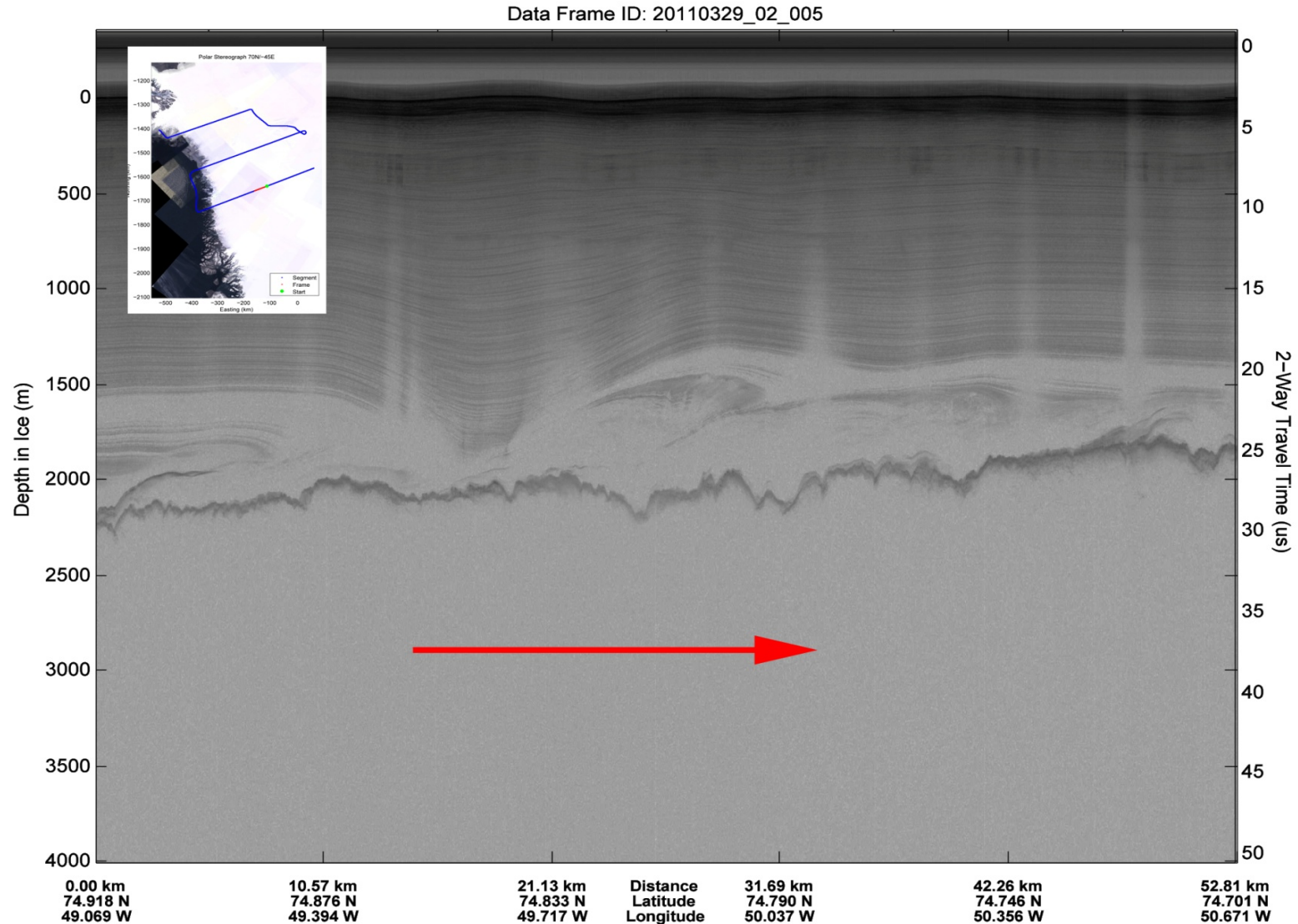


**CRISIS 2007 RES data**





# New views of deep Greenland ice



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SVALI phd course/workshop at Center for Ice and Climate, University of Copenhagen:  
**Applications of radar data from ice sheets to understand ice flow processes**

Dates: **12-16 March 2012 (week 11).**

Location: Center for Ice and Climate (CIC), Niels Bohr Institute, University of Copenhagen, Denmark.

**Overview:**

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Participants: Phd students, postdocs, other scientists interested in radar data and interpretations.

Credit: 2.5 ECTS (attending), additional 2.5 ECTS if there is a presentation during the course.

Format: Overview lectures, lectures, moderated discussions, presentations by the participants, poster session.

All participants are invited to present their current work and results, and to suggest topics for discussion sessions.

Excursions: CIC ice core laboratory and ice core collections.

Niels Bohr Institute and Archives (depending on the interest).

Registration: Send email to: [ch@gfy.ku.dk](mailto:ch@gfy.ku.dk) with your name and contact details.

Please indicate whether you are planning to present your work (oral or poster), and the title of your presentation.

No registration fee. Travel, accommodation and meals are paid by the participants, except a few informal meals during the week. Updated information will be available through the SVALI homepage.

**Registration deadline: 13 February 2012.**

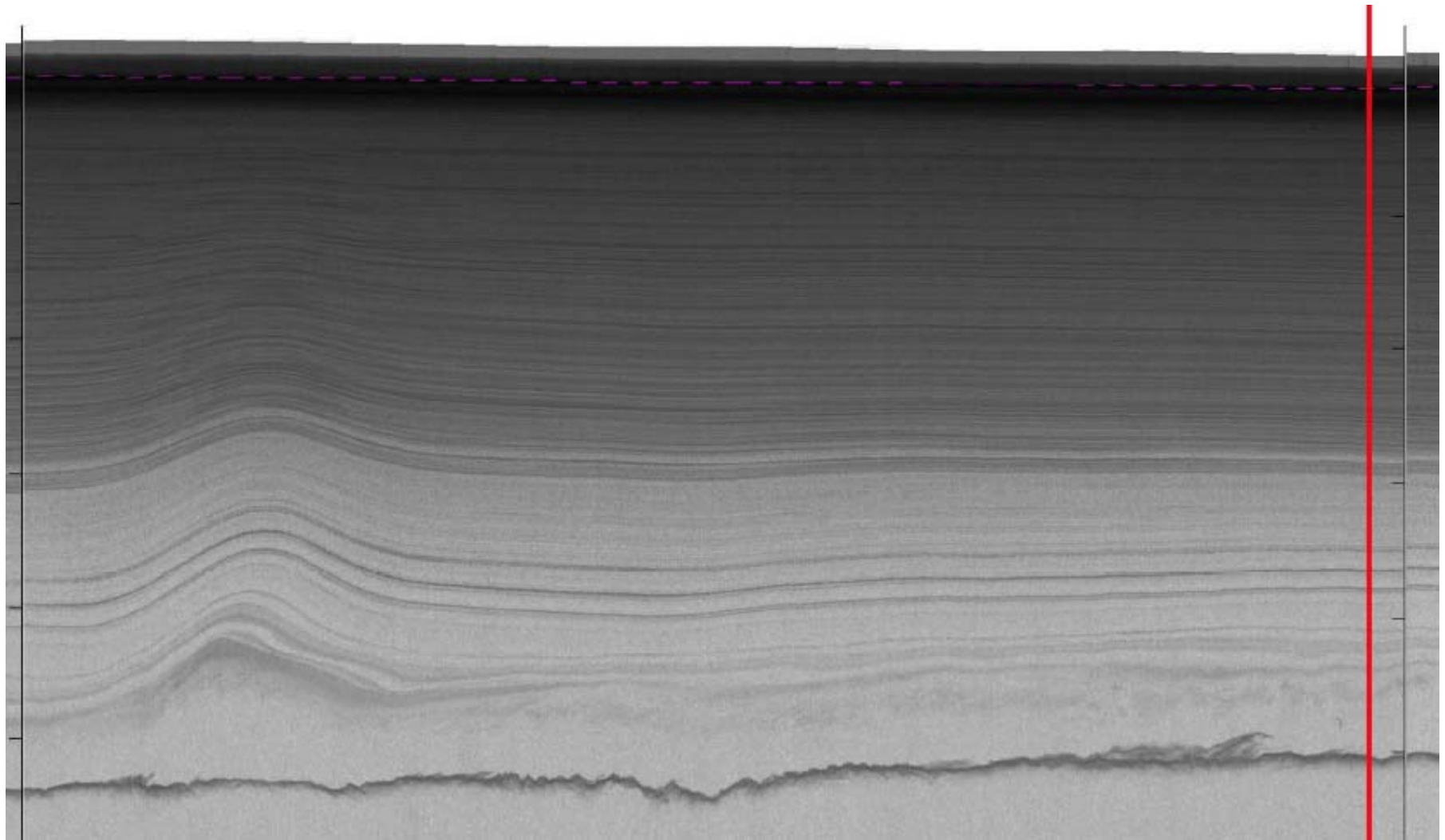
Organizer: Christine S. Hvidberg and Nanna B. Karlsson, University of Copenhagen. Contact: [ch@gfy.ku.dk](mailto:ch@gfy.ku.dk)

SVALI - The Stability and Variations of Arctic Land Ice - is a Nordic Centre of Excellence (NCoE).

**See the full announcement and read more at the SVALI homepage: [www.ncoe-svali.org/phd\\_school](http://www.ncoe-svali.org/phd_school)**

# NASA Ice bridge

a six-year NASA program to do airborne survey of Earth's polar ice



Apr. 60 km long section upstream from NEEM. Ice thickness is 2.5-2.6 km  
Radar data from CReSIS, Kansas University

**NEEM**