

OPERATION ICEBRIDGE – ARCTIC 2012



Research Experience for Teachers
Kangerlussuaq, Greenland
April 13-24, 2012



In mid-April, teachers from the United States, Denmark and Greenland joined Operation Ice-Bridge personnel in Kangerlussuaq, Greenland.

- Sine Madsen, Sisimiut Building and Construction School, Sisimiut, Greenland
- Tim Spuck, Oil City High School, Oil City, Penn.
- Erik Jakobsen, Aalborg Gymnasium, Aalborg, Denmark
- Tom Koch Svennesen, Aasiaat GU, Aasiaat, Greenland
- Peter Gross, Roskilde Tekniske Gymnasium, Roskilde, Denmark

These five educators had the opportunity to ride along on survey flights and interact with Ice-Bridge personnel to learn more about polar science and IceBridge's various instruments.





DMS instrument team member James Jacobson (left) explains the basics of the P-3's Digital Mapping System to teachers Tom Koch Svennesen (top) and Peter Gross (right)

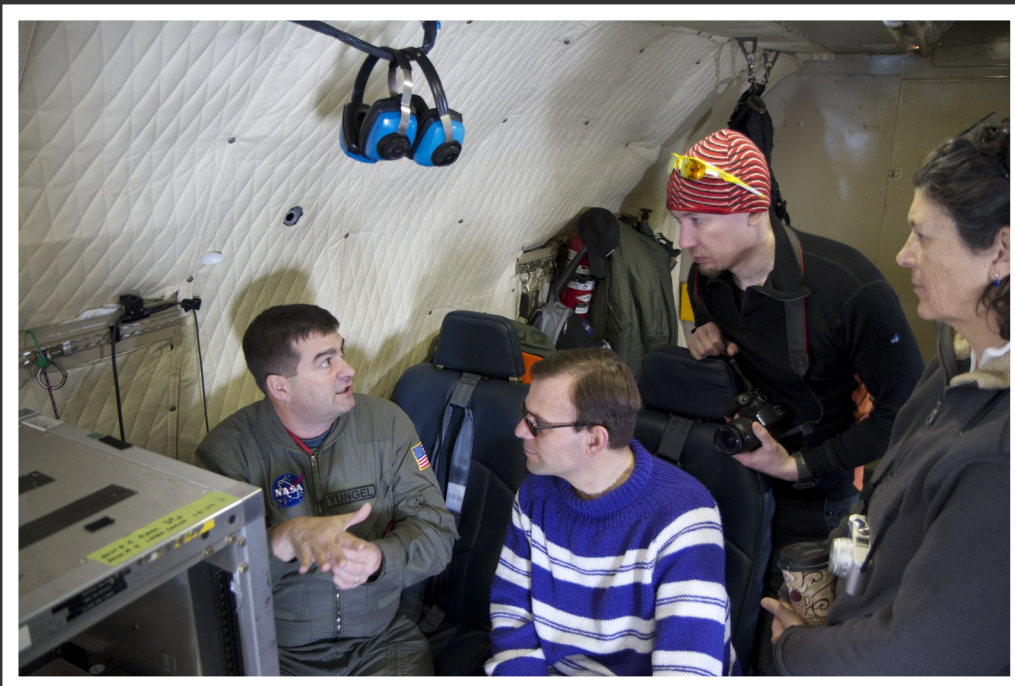


Jim Yungel shows Erik Jakobsen an example of output from the Airborne Topographic Mapper (ATM)

Jim Yungel opens a floor hatch to show (from left) Erik Jakobsen, Tim Spuck, Peter Gross and Sine Madsen the ATM instrument



Jim Yungel tells Erik Jakobsen, Peter Gross, Tim Spuck and Sine Madsen more about the inner workings of ATM



Peter Gross, Tom Koch Svennesen and Columbia University education coordinator Margie Turrin listen to Jim Yungel's lesson on ATM



CReSIS team member Kevin Player points out areas highlighted on the day's flight map to teachers Peter Gross, Erik Jakobsen and Tim Spuck.

“Being on the P-3 was like being a kid in a candy store.”

-Tim Spuck

The teachers found the survey flights to be as enjoyable as they were informative.











Adventures at the Russell Glacier

On Sunday April 15 these five visiting educators joined the IceBridge team in taking advantage of a rare day off and visiting the nearby Russell Glacier.









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Resources » Event

Tim Spuck and the NASA IceBridge Project

Description

In this one hour webinar PolarTREC teacher Tim Spuck explains his work with the NASA IceBridge Project, the largest airborne survey of Earth's polar ice ever conducted.

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Event Details

Date: 23 April 2012
 Event Type: PolarConnect
 Related Expeditions: Airborne Survey of Polar Ice
 Related Members: Tim Spuck, Michael Stüdinger


Archive Audio

Download Audio File (MP3 - 15MB)

Event Video

Russell Glacier

- Responsible for carving out the "Kanger" valley
- Land terminating glacier
- A tourist attraction



Details

Resource Type	Event
Collection	Earth Science
Region	Arctic
Completion Time	About 1 period
Date authored	2012 » April 2012 » 25 April 2012

Keyword search

Search More options

Guided search

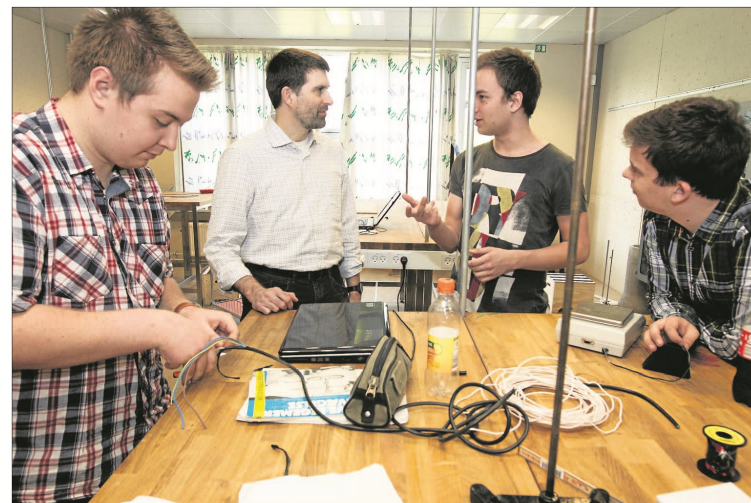
Click a term to initiate a search.

Resource Type

- Activity (36)
- Article (134)
- Audio (13)
- Event (133)
- Fast and Fun Fact (18)
- Image (1)
- Lesson (80)
- Polar Profile (10)
- Presentation (7)
- Video (54)
- more...

Nasa lagde vejen forbi htx

Htx-lærer Peter Gross har i en uge fløjet over indlandsisen med Nasa for at følge med i, hvordan de måler isens bevægelse. Tirsdag var Nasa så med i undervisningen på htx.



Jefferson Beck, videnskabsjournalist fra Nasa, følger tirsdagens fysikundervisning på Roskilde Tekniske Gymnasium, hvor han kunne følge elevernes egne projekter. Han er meget imponeret over elevernes niveau, som nok ikke bliver ringere af inputtet fra Nasas flyvninger over indlandsisen. Foto: Ebner Madsen

Roskilde: En fysikklasse på Roskilde Tekniske Gymnasium havde tirsdag deltaget i en af de berømte amerikanske rumfartsorganisationer Nasa, da videnskabsjournalist Jefferson Beck var med i tre timers undervisning. Det havde dog ikke meget med rumsonder at gøre. Blandt andet, at fysiklærer Peter Gross i sidste uge var på Grønland med Nasa i en uge, hvor han deltog i Nasas flyvninger over isen for at måle dens tykkelse og bevægelse over tid.

Lektoren fra Roskilde Tekniske Gymnasium var udvalgt som den eneste htx-lærer i Danmark sammen med en aalborgensisk lærer fra det almen gymnasium (stx). Med på turen var også to grønlandske lærere og en amerikansk.

Lærernes deltagelse var dels en måde for Nasa at vise, at de er åbne med deres informationer, dels at inspirere undervisningen i gymnasierne som en slags langsigtet rekruttering, så der på længere sigt kommer nye videnskabsfolk med interesse for at udforske polerne.

Der er mange ting, der ligger inden for vores fysikundervisning i gymnasiet, og ved at arbejde med den slags kan vi gøre ting meget mere levende. Vi har selvfølgelig ikke målestyr i

den kaliber, men vi kan godt gøre tingene efter, siger Peter Gross.

Varm på is

Jefferson Beck er tydeligt imponeret af, hvad han har set og hørt til de teknisk interesserede gymnasieelever.

Da jeg gik i High School tror jeg ikke, vi nogensinde

kom til det niveau, hvor Peter Gross er i dag, siger na-

samanden, der også personligt fik noget ud af at have

den danske lektor med på Grønland.

Peter var fantastisk at have med i flyet. Han havde så meget entusiasme, at det fik mig til at værdsætte hele oplevelsen mere.

At is i den grad kan optage folk hænger ifølge både Jefferson Beck og Peter Gross sammen med, at det på trods af sit gule ydre hele tiden bevæger sig, nærmest som

en levende organisme. Peter Gross er selv et godt eksempel på den entusiasme.

Når du ser på isen, ser det statisk ud, og alligevel hører du pludselig et ubøje, og is der falder, og så er det stille igen, siger Peter Gross med opspilede øjne og hænder, der gør maleriske fagter.

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After returning from Kangerlussuaq, the teachers started putting their IceBridge experiences to work in the classroom.

- The Danish newspaper *Dagbladet*, ran a story about Peter Gross's trip to Greenland and how he plans to use what he learned to be a better teacher.
- Tim Spuck hosted an hour long webinar while still in Greenland where he talked to students about his experiences and answered questions about everything from his daily schedule to local wildlife.
- Tom Koch Svennesen is planning to use what he learned in efforts by the Greenland Education Ministry to revamp science education and wrote a letter to the U.S. Embassy in Copenhagen about his experience.

NASA IceBridge Mission

NASA IceBridge Mission; the combination of the words NASA and Mission certainly fills me with some expectations about astronauts, space and the Hubble Space telescope as I arrive at Kangerlussuaq Airport on April 13th.

I have been selected as one of two teachers from Greenland to spend a week with NASA's team of scientists and air crew forming IceBridge Mission. Shortly after my arrival the 2 Danish teachers, Peter Gross and Erik Jakobsen, and the second teacher from Greenland, Signe Madsen from Sisimiut, team up with me. The next day the last participant Tim Spuck, a high school teacher in Oil City, Pennsylvania arrives.

We are all accommodated in the Kiss-building (Kangerlussuaq International Science Support) along with the rest of the IceBridge Mission team. We have already completed extensive forms about our health and it is now followed up with a longer video about safety on the plane. At the 18.00's briefing we were briefed by the Science Manager Michael Studinger and the meteorologist John Sonntag gives a forecast pointing to the East Coast as the target for next day's flight.

It is confirmed next day when we at 07.15 board the plane and see the map of today's mission posted. The morning is hectic, the aircraft and the science instruments must be checked before take off at 08.15.

Up in the air a world of ice and snow opens up and soon we only see the ice-cap all around the horizon while we move eastwards towards Helheim Glacier on the east coast of Greenland. The ice cap shines completely barren and white, a desert of ice that rises from the coast to 3200 m above sea level at the Camp Summit which I visited in 2009. We fly at an altitude of 200-500 m above the ice-cap's surface, so it is possible to see the details in the snow and many crevasses and sure enough the pilots tell us that they occasionally have seen polar bears from the cockpit! Crossing the ice cap takes about 2 hours and when the scientists have settled we can move around and get detailed descriptions of the researchers' methods.

There is room for a crew of 24 onboard the aircraft, including a meteorologist and an aircraft mechanic (!) and NASA's in-house photographer. The plane, a P-3, is said to be very stable, and Mission Manager Allan says reassuringly that it has been used to fly through hurricanes!

IceBridge is a 6-year NASA mission and the most comprehensive study of the Arctic ice from an aircraft ever. These flights will provide the best-ever 3-dimensional view of the Arctic and Antarctic ice, icebergs and sea ice. IceBridge fills the survey gap left by NASA's ICESat satellite that stopped in 2009 until the new ICESat-2 satellite is active, ICESat-2 is scheduled to launch in 2016.

Photographs are continuously taken out through the bottom of the plane; gravity is measured with 7 decimals accuracy. Variations in the magnetic field is measured and can tell us about the content of iron in bedrock beneath the ice and thereby the possibility of finding other metals.

The distance to the ice is measured with laser and radar while the ice and sea ice thickness are measured with radar and all measurements are combined with GPS mapping. By measuring the ice thickness with a very high precision, the amount of ice has melted since last year can be calculated and used by researchers ex. in the climate debate.

We see mountains protrude on the horizon and are thus approaching the east coast of Greenland and the flat monotone ice landscape is now being superseded by mountains with peaks, deep crevices and huge glaciers that "flows" through the valleys towards the sea. It is truly a magnificent sight

that meets us here on the east coast of Greenland and immediately there is great activity among all of us watching out the windows and taking pictures. We fly several times along the east coast in order to cover the area with the planned measurements (mowing the lawn, as they said). The flight takes about 8 hours and we make three flights, Wednesday we talk to reporters from Sermitsiaq, (a Greenlandic newspaper) Danish media and NASA.

NASA's IceBridge Mission has been a great personal experience and has provided valuable examples of applied research in Greenland. One of the goals of the new Greenlandic reform of College Education (upper secondary) starting in August 2012 is that teaching should be more culture-based, which can be done using examples from Greenland in the classroom.

IceBridge fits nicely into the new subject Science, which is introduced in August 2012. Science is an introduction to science that combines chemistry, physics, geography and biology; it is taught by only one teacher and will be focussing on projects. One of these projects could be ice where IceBridge mission can be used as a basis and students can work with data from NASA's website.

I have made a PowerPoint presentation and showed it to the students in my chemistry classes and used it as a starting point to talk about the different measurement methods, ice motion and ablation. It was not meant to be part of a longer course, but worked well because the students knew that I was going to leave with NASA and was therefore very interested and curious. Next year, it must fit into a scenario where we work with isotopes, ice cores, density, CO2 and climate, and in this context, I will also include my trip in 2009 to U.S. research station Camp Summit on middle of the ice sheet where the ice is thickest (ca.3200 m).

I have put the pictures on the school website which I edit and showed the presentation in a video-conference in a science course where the other science teachers from the four high schools participated in Greenland (14-16 May).

In connection with the new science subject, all teachers in Greenland have the opportunity to contribute with projects (modelled after a template to ensure uniformity). There I will try to put together a project on ice, where I will use my experience from NASA IceBridge and Camp Summit. Moreover it has incited me to raise funding to a training in science teaching as NASA offers (<http://www.us-satellite.net/endeavor/index.cfm>)

It is very possible that I can use it in my work with science talents that I am starting after summer.

I would like to thank the IceBridge team, the U.S. embassy in Copenhagen and IIN in Nuuk for this productive and inspiring opportunity.

Tom Koch Svennesen
Aasiaat GU
Aasiaat, Greenland



