

*Science Up Close & Personal:
Conversations with the North Pole*

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Introduction



- *We will describe and demonstrate the use of videoconferencing at AWI to make high school students aware of highly interesting scientific work*
- *First, I will show how we stretched some classical technologies and connected them to Internet2*
- *Some words about our “local” use of videoconferencing, within the institute*
- *Maybe we can give some useful hints to the Quality of Service implementors...*
- *Most importantly, we hope to show : Working with students and doing **Polar & Marine Research is fun***

Connect scientists at remote sites to students “at home”



- *AWI has permanent stations in Antarctica and on Spitsbergen in the Arctic, inhabited by at least nine and two persons - respectively - in winter*
- *First of all, they have to survive (do house-keeping)*
- *That done, they study the atmosphere, ice and the biosphere*
- *We began connecting them via videoconference to high school students, visitors of museums and a studio at the World EXPO at Hannover in 2000*
- *As early as 1995, we connected the ship “Polarstern” being at 78°S to a G7 summit at Brussels*

Why ?

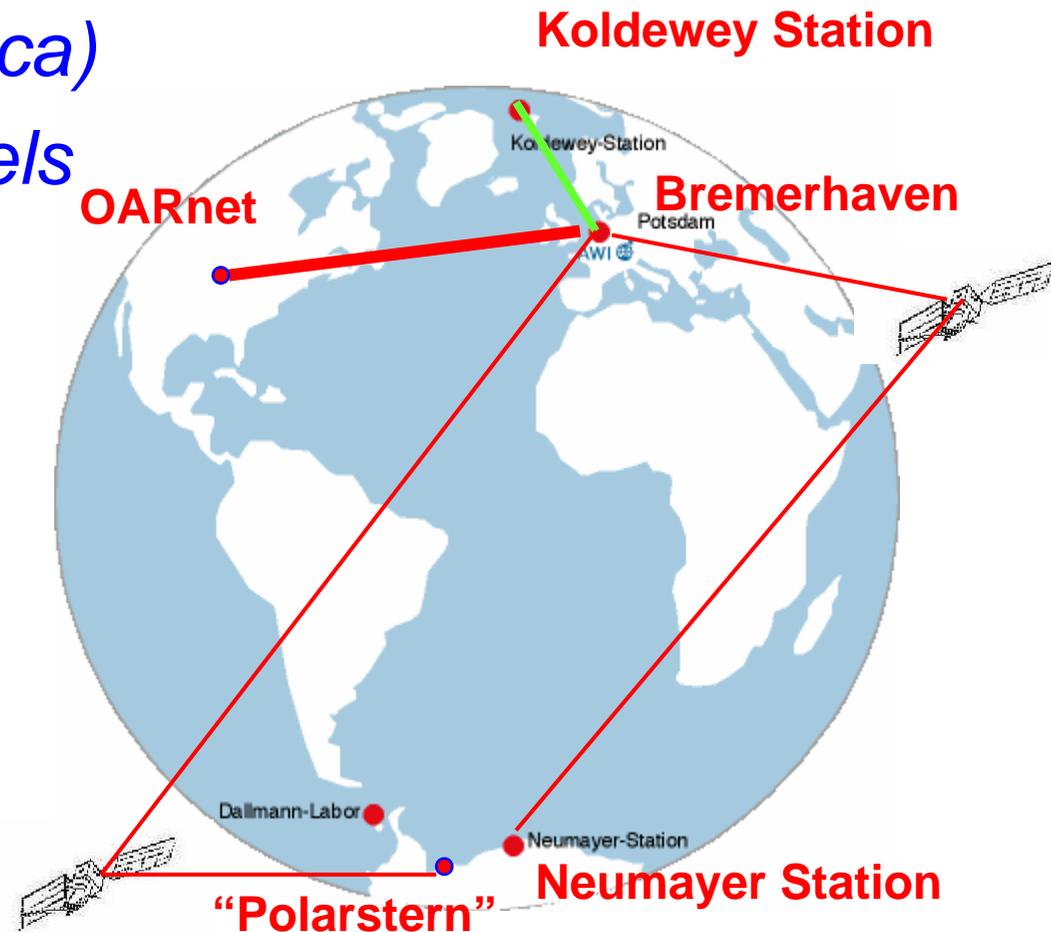
- *Interest in the sciences has been declining for some years...*
- *AWI has interesting and important topics as well as exotic locations to offer*
- *Thus, Public Relations - Claudia Müller - and IT departments made a team to stage events designed to raise interest*
- *...among all age groups, but especially among children and students*



From ISDN to Internet2

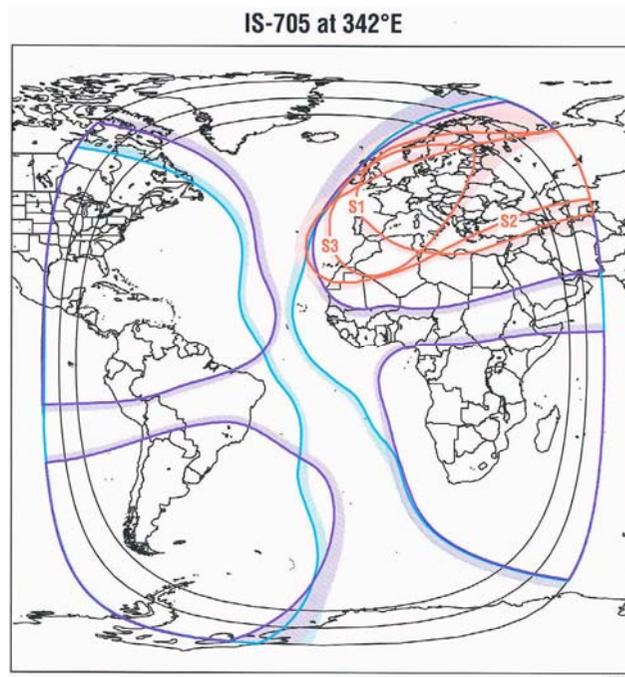


- Leased line @ 384 kBit/s and dialup @ 64 kBit/s via satellite (Antarctica)
- up to 6 ISDN channels (Arctic)
- Internet2 Bremerhaven-Ohio via
 - G-WiN,
 - Interchange by Dante, NY
 - Abilene



Antarctic Internet

- *In 2000, with the help of a sponsor, bandwidth between Bremerhaven and Antarctica was raised to 384 kBit/s - which is enough for good H.323*



Examples - Munich



- *Munich, Nov 2000,
at the
Technical Museum*

Ex. - Megaconference II

- *As seen from Neumayer station, Antarctica*
- *Two students interview a geophysicist 10 meters below the ice surface*
- *Seen at 100 places around the world, Oct 2000*



„Local“ Use of H.323



- *AWI has sites at Potsdam, some 400 km from here, and on Helgoland and Sylt, two islands in the north sea, 50 and 150 km distant*
- *Coordinating research needs many days of travel...*
- *The connection to Potsdam is via G-WiN, the German Gigabit research network*
- *Both islands, however, are connected with leased lines at 2 MBit/s only, so that*
- *Even one videoconference needs 16 to 33 % of the available bandwidth and could easily be destroyed by a small number of competing applications*

QoS Bottlenecks



- *Certainly, end to end Quality of Service would be fine, but: How long do we have to wait?*
- *Bandwidth to isolated sites, esp. Satellite links, will remain scarce and costly resources and may involve fallback to non-standard technologies and „tricks“. These have to be managed individually and, thus, locally*
- *The backbones - G-WiN and Abilene, f.e. - are likely to work by over provisioning, but their interconnects - transatlantic capacity and Dante links, f.e. - are not!*
- *Please find pragmatic fixes, for the time being!*

Going live...

- *to Koldewey station at the research village of Ny Ålesund, Spitsbergen*
- *Mareile Wolff, station manager, speaking to Julia Fischer, Christine Fischer and Valerie Lutzebäck, students at the highschool of Stuhr, near Bremen*



Conclusions



- *Conversations with scientists and technicians “on site” proved to have a much higher impact - fascination even - on visitors (sic!) than*
 - *speaking to them “after the fact” or*
 - *speaking to them over telephone*
- *There was no hesitation to use this technology - the least with children of kindergarten age - even when there are artifacts like seconds of delay between question and answer*
- *We hope to have inspired more curiosity and interest in science at least in some of our guests*
- *Global scientific cooperation will benefit too, but: We also **hope to see you in person, again, and soon!***