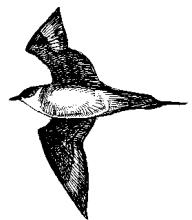


## News

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# Ny-Ålesund Newsletter

12<sup>th</sup> edition  
June 2003

## A joint French – German polar research platform on Spitsbergen

In order to extend the usability of their stations, AWI and IPEV, the operators of the German and French stations in the Ny-Ålesund area join their highly complementary investments and form a Joint French – German Polar Research Platform. This was announced at a conference in Brest on May 26, 2003, commemorating the 40<sup>th</sup> anniversary of the Elysée-contract about French - German co-operation and friendship. In Ny-Ålesund the stations “Charles Rabot”, “Jean Corbel”, “Carl Koldewey”, and the atmospheric “NDSC-Observatory” will merge into one common administered Arctic research platform. This will include:

- Common announcements of opportunities for research at the platform
- Common evaluation of research proposals
- Conducting of joint research projects
- Sharing of personnel, logistics, and instrumentation

A common station leader will be equally responsible for both the German and the French installations and for the station personnel.

The new platform allows research in the areas (among others) of atmospheric chemistry, climate change, marine and terrestrial biology, geophysics. It builds upon infrastructures and equipment, which have been permanently installed by France and Germany in Ny-Ålesund, including accommodation, storage, office, and computer facilities, wet and dry laboratories, a balloon launching facility, remote and in situ sensing instrumentation within an atmospheric observatory, a new clean air station, and field and laboratory equipment for eco-physiology studies.

### Future Projects:

AWI and IPEV will continue to provide state of the art technical solutions to the scientific community. In this aim, the French Polar Institute intends to develop at the Corbel Station a “clean power” system (hydrogen fuel cells), to allow high sensitivity measurements for atmospheric chemistry. On the same way, “clean” logistics are planned to be developed too, to minimize the impact of gas exhausts on atmospheric measurements.

Both institutes actively support the establishment of a modern marine laboratory in Ny-Ålesund. Within the VIth framework programme of the European Commission, AWI and IPEV contribute to the new Ny-Ålesund Research Infrastructure proposal co-ordinated by NP.

Roland Neuber and Franck Delbart

## The research activities in Svalbard – Mapping survey

The Norwegian Institute for Studies in Research and Higher Education (NIFU) is presently carrying out a mapping survey of the research activities in Svalbard. The project aims at developing new indicators of polar research and is financed by the Research Council of Norway. The project will also include a description of the various research, stations, and facilities in Svalbard and give a quantitative

overview of the research activities according to fields of science, regions, etc. A previous survey focused on the resources devoted to polar research in Norway. As one part of the study representatives for the institute will visit Ny-Ålesund and Longyearbyen. The visit takes place in the period 15-21 July. For further information contact Dag W. Aksnes ([Dag.W.Aksnes@nifu.no](mailto:Dag.W.Aksnes@nifu.no))

## Successful Mercury campaign

From 15th of April to 15th May a big mercury campaign were held in Ny-Ålesund. Scientist from Germany, USA, Italy, Canada and Norway participated. The objectives in the campaign were intercalibration of instruments and observing episodes of the depletion of elementary mercury (gas phase) during polar sunrise (first time observed for only few years ago in Canada). There where several of such episodes observed during the campaign and all the research groups measured these episodes successfully.

The campaign was co-ordinated by NILU. For more information, contact Torunn Berg, [Torunn.Berg@nilu.no](mailto:Torunn.Berg@nilu.no)

## Activities at the Korean station

KORDI enlarged its rental space to the ground floor of the building that is being shared with France to meet the need of laboratory space from scientists.

It adds 100 square meters to the existing 116 square meters. The space was allocated to biology, geophysics and atmospheric research laboratories including scuba diving shop. A team of biologists will stay in Ny-Ålesund for a month in the summer of 2003 to study ecology, microbiology and plankton.

## Research Plan 2003

The goals of the study are to: 1) contribute scientifically for protecting the Arctic environment as a member of IASC; 2) monitor environmental changes by continuous database with constructing long-term monitoring system; and 3) construct monitoring system for global environmental changes which is final goal of the Arctic research and secure sustainable living resources in the Arctic.

Detailed research items are as follows.

- a) Monitoring on the marine environment and phytoplankton of Kongsfjorden, Svalbard
  - Physical environment for phytoplankton in Kongsfjorden
  - Distribution pattern of phytoplankton
  - Sea-ice microalgae
  - Impacts on human activities and environmental changes
- b) The Physical Environment of Kongsfjorden, An Arctic fjord in Svalbard
  - Environment around Dasan Station
  - Physical factors of Kongsfjorden
- c) Distribution of Zooplankton community in King's Bay, Svalbard
  - Species composition of zooplankton
  - Community structure of zooplankton
- d) A Study on the Development of Novel Substances from the Arctic
  - Study on metabolites on Arctic land plants

- e) Isolation and Identification of the Arctic Microorganisms inhabited around Korean Arctic Research Station Dasan located at Ny-Ålesund, Svalbard, Norway
  - Study on isolation of cold-adapted microorganisms
  - Construction of gene bank on cold-adapted microorganisms
- f) Study on annual observation using geothermometer
  - Annual monitoring on geo-temperature around Dansan Station using geothermometer

## Sounding rocket campaign from Ny-Ålesund

Andøya Rocket Range is conducting a sounding rocket campaign from their SvalRak facility in Ny-Ålesund in June/July this year.

The campaign is called ROMA (Rocket-borne Observations in the Middle Atmosphere) and aims at investigating the thermal and dynamical structure in the vicinity of the mesopause at high latitudes as well as studies of dynamical and physical parameters of Noctilucent Clouds (NLC) and Polar Mesosphere Summer Echoes (PMSE), using a combination of in-situ rocket experiments and ground-based optical, radar and lidar. The radar measurements will be performed by the SOUSY-radar in Adventdalen outside Longyearbyen and the lidar-measurements will be performed by the Potassium Lidar located close to the SvalSat satellite station at the Plateau Mountain outside Longyearbyen. The project is a bi-lateral German-Norwegian project with participation from several research organizations in the two countries. Project scientists are Dr. Tom A. Blix from Norwegian Defence Research Establishment (FFI) and Prof. Dr. F.-J. Lübken from Leibnitz-Institut für Atmosphärenphysik (IAP), Kühlungsborn, Germany. In addition, scientists from the University of Oslo, Norway, Technical University Graz, Austria also participate in the campaign.

The ARR staff and some payload engineers will arrive Ny-Ålesund mid June to start campaign preparations. Principal Investigator and his science team arrive some days later. The launch window is from 29 June to 15 July. Three single stage rockets will be launched in this period. The rockets will reach an altitude of approximately 100 km. The payloads have a recovery system onboard and at 3.5 km altitude on the down leg (re-entry) a parachute will be deployed and the payload will land safely in the Greenland Sea. The payload will be kept afloat with an inflatable flotation system until it is picked up by the recovery ship. The recovery ship is the same ship ARR use during recovery operations from Andøya. The ship is an old ship and was originally used for passenger transport in Lofoten and Vesterålen, but is now modified and equipped to a modern ship and capable for different type of operations. The ship will be based in Ny-Ålesund during the campaign.

## China has signed contract with KB

Chinese Arctic and Antarctic Administration will rent "Ungkarsheimen 1" and the first Chinese are expected to arrive in Ny-Ålesund September this year. The station will be manned all-year.

## Fuel cells in Svalbard at Corbel station: A tool for atmospheric chemistry

### Project presentation

The international scientific community invested in climate and its short-term changes, large-scale topical theme for the planet's future, met at IPEV on May 2002, so as to confirm the scientific interest of Corbel base in the realization of atmospheric chemistry research programmes on an easy access "clean" site (report available on request). The stakes are of great importance, because a "clean" base in Arctic by 80° North (that is to say in the middle of the Arctic climatic complex) close to an easy logistic servicing and accommodation (Ny-Ålesund facilities), could represent a significant contribution to science on atmospheric research in polar areas.

### Technical views

The core of the project is the installation of hydrogen fuel cells in summer 2004, from an initial prototype developed by the French company AIR LIQUIDE. This prototype will be readapted to cold areas using the knowledge of a 3 months experience during a French expedition on the sea ice in 2002, which will be followed by tests in a freezer (May 2003) and finally a "in-situ" test : continuous utilisation for 5 months (winter 2003/2004) at the Corbel Station of the first "polar" prototype.

The global power requested is at least 12 KW (6 fuel cells \* 2 KW), using hydrogen bottles filled from a hydrogen generator installed at Ny-Ålesund Station. The French Polar Institute will include into this project some constraints and development, in the aim to satisfy as much as possible the needs of the scientific community:

- the project integrates the idea of setting up separate and carriable fuel cells. Indeed, coupling with sufficient hydrogen bottles to provide the hydrogen needed, a "2KW-clean-carriable-energy" system could be created, to notably be used on glaciers.
- The project is linked to the development of clean logistics (snow-scooters notably), using also hydrogen fuel cells.

Contact : Project leader Franck Delbart, f.delbart@ifrtp.ifremer.fr

## The oxygen-transport systems of polar fish

The team of the Institute of Protein Biochemistry, CNR, Naples, Italy (G di Prisco, PI; M Balestrieri, V Carratore, E Cocca, D de Pascale, C Verde) has initiated a detailed investigation on the oxygen-transport system of Arctic fish, in comparison with the knowledge gathered on Antarctic species.

In fact, organisms living in the polar regions are exposed to strong constraints, however the northern and southern polar oceans have very different characteristics and the climatic features of the Antarctic habitat are more extreme than those of the Arctic.

We know that, during cold adaptation, the evolution of Antarctic fish has led to unique specialisations, including

modification of the hematological characteristics. In the Arctic, isolation is less stringent; the range of temperature variations is wider, facilitating migration and redistribution of the ichthyofauna. The Arctic is the connection between the more extreme, simpler Antarctic system and the more complex temperate and tropical systems. Thus, organisms from both poles are useful tools for evolutionary studies.

We are investigating the evolutionary adaptation of a vital process, namely respiration, in polar fish. The oxygen carrier hemoglobin (Hb), being a direct link between the exterior and body requirements, has experienced a major evolutionary pressure to adapt and modify its features at molecular/functional levels. Our studies on the evolutionary history of Hb are focused on the structure, function and phylogeny of the protein.

*Boreogadus saida* (polar cod), *Gadus morhua* (atlantic cod) and *Anarhichas minor* (spotted wolffish) are among the Arctic fish species investigated. They display higher Hb multiplicity (three components) than most Antarctic species. The Hbs of the three species have been characterised in terms of primary structure, function and molecular phylogeny. In addition, the globin gene organisation has been characterised.

Our results suggest that the Hb multiplicity and structure/function is correlated with the distinct life style of Arctic vs Antarctic fish. Furthermore, they clearly indicate that Arctic and Antarctic species follow distinct pathways of evolution.

Thanks to the cooperation with colleagues of the Norwegian College of Fishery Science, Tromsø (SE Fevolden and JS Christensen), D de Pascale collected specimens during a cruise between Svalbard and Greenland onboard R/V Jan Mayen (autumn 2002). Collaborations are also envisaged with NP (S Falk-Petersen); D de Pascale and G di Prisco will participate in another cruise onboard R/V Jan Mayen October 2nd-17th, 2003.

## Test drilling for gold - Svansen

On June 11<sup>th</sup> Store Norske Gull AS was given permission to perform exploratory drilling at Svansen during the summer of 2003. The decision could be appealed to the Environmental Ministry within 3 weeks.

Based on a paragraph of the law the Governor also decided that since there are so large conflicts of interest Store Norske Gull AS is not allowed to commence the work before the appeal period has ended. If the work is further inhibited also until the appeal has been treated will be decided if any appeals are received.

Both Kings Bay and NySMAC have forwarded their appeals within the deadline.

## New director of Kings Bay

Oddvar Midtkandal replaced Monica Kristensen Solås as director of Kings Bay when her term of years ended in June.

## Calendar of Arctic Meetings

**ACSYS Final Conference** to be held in St. Petersburg 11-14 November 2003. Preparations are in progress.  
<http://acsy whole.npolar.no/meetings/final/conf.htm>

For a comprehensive list of published meetings, look at **SAM** (Survey of Arctic Meetings) on the IASC home page:  
<http://www.iasc.no/>

## Staff News

### Alfred Wegener Institute (AWI):

#### Koldewey station:

**Dr Jens Kube**, station leader April 2003 – March 2004. **Barbara Lahnor**, station engineer September 2003 – August 2003.

#### Kings Bay (KB):

**Oddvar Midtkandal** replaced **Monica Kristensen Solås** as director of KB June 2003.

#### Norwegian Polar Institut (NP):

**Arnild Ramseng** replaced **Jan Erling Haugland** as director of NP Svalbard April 2003.

## Publications

Ahlstrøm, Ø., **Fuglei, E.** and Mydland, L.T. 2003. Comparative nutrient digestibility of arctic foxes (*Alopex lagopus*) on Svalbard and farmed-raised blue foxes (*Alopex lagopus*). Comparative Biochemistry and Physiology A 134(1): 63-68

**Fuglei, E.**, Mercer, J. B. & Arnemo, J. M. 2002. Anesthesia and surgical implantation of radio transmitters in arctic foxes (*Alopex lagopus*) on Svalbard. Journal of Zoo and Wildlife Medicine 33(4): 342-349.

**Fuglei, E.**, Ørntsland, N. A. & Prestrud, P. 2003. Local variation in arctic fox abundance on Svalbard, Norway. Polar Biology 26: 93-98.

For more publications see the electronic version of Newsletter June 2003  
<http://npolar.no/nysmac>

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**Next edition of Ny-Ålesund Newsletter:**  
**Winter 2003**  
**Editor:** Marit R. Pettersen