



# **EXPEDITION PROGRAM ANTARCTICA (ANT – Land 2005/2006)**

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## **STATIONS AND FLIGHT MISSIONS**

**Neumayer Station**

**Kohnen Station**

**Flight Missions**

**Dallmann Laboratory**

**Other Activities**

**Co-ordination**

**Heinz Miller**

**Christian Wiencke**

**Hartwig Gernandt**

**Guido Kleffel**

**Thomas Matz**

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**ALFRED WEGENER INSTITUTE  
FOR POLAR AND MARINE RESEARCH  
HELMHOLTZ ASSOCIATION**

**November 2005**

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## **STATIONS AND FLIGHT MISSIONS**

### **Neumayer Station**

**03 November 2005 – 13 February 2006**

### **Kohnen Station**

**06 November 2005 – 08 February 2006**

### **Flight Missions**

**16 December 2005 – 13 February 2006**

### **Dallmann Laboratory**

**28 October 2005 – 07 April 2006**

### **Other Activities**

### **Co-ordination**

**Heinz Miller**

**Christian Wiencke**

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# 1. ANT – LAND 05/06: NEUMAYER / KOHNEN

## 1.1 Summery and Itinerary

### Activities at Neumayer Station

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The Neumayer Station is permanently occupied. The exchange of the wintering staff will be performed as a regular task during summer season. In parallel technical works are planned for maintenance of the station buildings and technical facilities.

Likewise the scientific observatories for air chemistry, meteorology, and geophysics will be maintained and advanced data management and instrumentation will be replaced as well. These activities will include the maintenance of the infrasound station IS27DE.

The assembly of the new long-term observatory for bio-acoustic studies (Perennial Acoustic Observatory in the Antarctic Ocean – PALAOA) will be completed by the deployment of acoustic sensors. During summer season audiometric measurements will be performed. Medical studies of the Berlin Centre for Space Medicine (ZWMB) will be continued the second year.

Neumayer Station will be used as the operational base for the Dornier 228-101 aircraft and the supply traverse for Kohnen Station. As a contribution to the international project Dronning Maud Land Air Network (DROMLAN) the regular weather forecast service is provided to all national operators within the Dronning Maud Land region.

Additional activities comprise the visit of a TV-team (Eikom), which works on a long-term documentary “Working and Living in Antarctica” for German and French television. Furthermore a group of five officials from AWI, Ministry of Education and Research (BMBF) and Federal Government of Bremen will visit Neumayer, Kohnen and other stations in the region.

### Activities at Kohnen Station

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The 4<sup>th</sup> deep drilling season within the European Project for Ice Coring in Antarctica (EPICA) is planned at Kohnen Station. This activity is part of the program co-ordinated by ESF and funded by the EC and national contributions of the partners. It is the 1<sup>st</sup> field season in Dronning Maud Land (DML) of the Specific Targeted Research Project “Enhanced paleo-reconstruction and integrated climate analysis through marine and ice core studies (EPICA-MIS)” within the 6<sup>th</sup> Framework Program of the EU (Proposal no. 003868). During the season 2003/04 the EPICA deep drilling at Kohnen station in DML reached a depth of 2565 m and an ice age of appr. 200 kyrs. The aim for this season is to drill through the remaining 216 m of ice, down to bedrock.

The air chemistry program is focussed on maintenance of the automated aerosol sampler designed for year-round measurements.

The meteorological observations will include balloon-borne radio soundings optical aerosol measurements, and measurements of spectral surface albedo in order to determine the optical properties of aerosols and snow surface as well as to investigate precipitation events.

Furthermore a group of five officials from AWI, the ministry of education and research (BMBF) and federal government of Bremen will visit Neumayer, Kohnen and other stations in the region.

### **Itinerary, international coordination and transport facilities**

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The season ANT - Land 2005-2006 is scheduled for the period from 06 November 2005 until 12 February 2006. The 26<sup>th</sup> wintering staff will stay at Neumayer Station until summer season 2006/2007. Also for Kohnen Station an extended season is planned lasting from 07 November 2005 until 04 February 2006. Altogether about 54 persons including both wintering staffs will stay at Neumayer station. At Kohnen Station 26 persons will be accommodated for to carry out the technical and scientific works.

In total 71 scientists and technicians are working or temporarily staying at both stations during the expedition ANT – Land 2005/2006. The majority of participants will fly to Neumayer and Kohnen stations within the scope of intercontinental and feeder flights of DROMLAN and return the same way at the end of season. Aircraft will also transport a substantial part of freight in order to get technical and scientific equipment available at stations in the beginning of season. Altogether 7 intercontinental flights have been scheduled in the scope of DROMLAN. The final flight for return personnel and freight is scheduled on 12 February 2006.

RV Polarstern (ANT XXIII/2) ships the majority of freight and fuel for Neumayer and Kohnen. A group of 7 scientists and technicians will travel on board as well. The call at Atka Bay is scheduled between 2 and 7 December 2005.

The supply traverse for Kohnen Station will depart from Neumayer on 11 December and is to arrive Kohnen Station with provisions, consumables and heavy equipment on 20 December 2005. The resupply is scheduled between 15 and 24 January 2006.

The ship BBC Singapore will perform the back-loading operation at the end of season between 07 and 11 February 2006. Further ship calls at Atka Bay are planned for S.A. Agulhas in the frame of the South African National Antarctic Program (SANAP).

The logistic operations have been coordinated with the South African National Antarctic Program (SANAP), the British Antarctic Survey (BAS) and the national programs within DROMLAN, mainly with RAE, ALCI, NPI, and SPRS. Following aircraft are scheduled to land at Neumayer during the season:

Basler (BT-67) operated by ALCI for feeder flights in the scope of DROMLAN

Antonov (ANT-2) operated by ALCI for feeder flights in the scope of DROMLAN

Dornier (Do 228-101)	operated by AWI for science and logistics
Twin Otter (DHC-6)	operated by BAS for EPICA
Helicopter (Bell 212)	operated by SANAP for support of AWI feeder flights.

Ship calls for Atka Bay during the season:

RV Polarstern	operated by AWI/Reederei F. Laeisz
BBC Singapore	operated by AWI/Briese Schifffahrt GmbH
S.A. Agulhas	operated by SANAP



## **1.2 Neumayer Station**

### **1.2.1 Logistics**

This season, extensive works will be carried out to maintain technical and scientific facilities at Neumayer Station: The roof of the vehicle garage and the ramp will be heightened. The eastern ramp, the Radom, and numerous platforms of the observatories in the outer area also have to be elevated. Likewise the sensor arrays of the infrasound station IS27DE will be removed at the snow surface.

The deformation of the steel tubes continued because of the increasing ice pressure. Already during the last season, some steel plates had to be removed from the ceiling of the fuel store in the cross tube. It is necessary to remove further steel plates of the tube due to progressive deformation. In the western tube, the containers have to be re-adjusted. Technicians of AWI supported by 6 technicians from a subcontractor (ManPower) will perform these works.

During the season technicians and scientists of the new wintering staff, five women and four men, will finally be trained to their tasks. At the end of season the 26<sup>th</sup> staff will replace the former wintering team and operate the station until summer season 2006/2007.

### **1.2.2 Observatories and services**

#### **1.2.2.1 Air Chemistry Observatory**

Weller, Dick, Brüggemann (AWI), Wagenbach (IUPH)

During the forthcoming summer campaign, our activities at the Air Chemistry Observatory of Neumayer Station will focus on maintenance of the equipment, validation of the measured data, as well as practice of the new over-winterer. Special project activities are not planned for this summer season.

#### **1.2.2.2 Meteorological Observatory**

Dr. König-Langlo, Anastu (AWI)

The meteorological observatory program at Neumayer is planned to be ongoing. It includes:

- 3-hourly routine synoptic observations,
- daily upper-air soundings,
- weekly ozone soundings,
- continuous surface radiation and mast measurements,
- satellite picture reception (HRPT, DMSP).

During the summer season maintenance works and replacement of advanced data management system is planned. The new wintering will be practiced during summer season.

The meteorological observatory provides the necessary support for the forecast service for DROMLAN, aircraft missions and field works will be provided. The meteorological observatory of Neumayer will act as the DROMLAN weather forecast centre.

### **1.2.2.3 DROMLAN weather forecast service**

Möller, Brauner (DWD)

Since season 2002/2003 the DROMLAN weather forecast service has been established at Neumayer station. As in previous years the weather forecast is organized by AWI in co-operation with German Weather Service (DWD) as a contribution to DROMLAN. Individual forecasts will be provided for station activities, aircraft operations and field activities (traverses). The covered region is the area between Halley (UK) and Syowa (Japan) stations.

This season the weather forecast service will start with the first intercontinental DROMLAN flight on 3 November 2005 and is to be continued until the last intercontinental DROMLAN flight on 12 February 2006. Two forecasters will subsequently share the season.

Next to the data of the meteorological observatory up to 300 MByte of meteorological data of other stations and automatic weather stations as well within the Dronning Maud Land and forecast data products will be daily received via the permanent satellite data link (128 kB) at Neumayer station. Thus the forecaster gets access to numerical weather forecast models of the ECMWF, AMPS and GME at any time. A satellite image receiving station (SeaSpace) will be available for high spatial and temporal resolution of multi-channel images from the NOAA- and DMSP-satellite platforms. These images with a horizontal resolution down to 500 meter are very crucial for the individual service for intercontinental and intra-continental aircraft missions.

### **1.2.2.4 Geophysical Observatory**

Wellmann, Giedke, Bock, Müller-Wrana (AWI), Müller (Fielax)

- Planned activities:
- Service works at the Geophysical Observatory.
  - Service works at remote seismological stations located on Halvfar Ryggen (VNA2), Søråsen (VNA3) and at Kohlen Station.
  - Temporary deployment of a seismological station at Weigel Nunatak.

#### Geomagnetism

The geomagnetic field and its time dependent variations are recorded continuously. Absolute hourly means of the three field components and the total field intensity are reported on a monthly schedule to the World Data Center (WDC) in Copenhagen, Denmark. The results of these measurements are

incorporated into the calculation of the International Geomagnetic Reference Field (IGRF) performed by WDC.

### Seismology

The main task of seismological observations at Neumayer Station is continuously monitoring the local, regional and global seismic activity. The seismological network at Neumayer Station (including the broad band station SNAA at Sanae IV) contributes substantially to the worldwide monitoring system because global network is rather wide-meshed in the southern hemisphere, especially in Antarctica. Onset times and the arrival times of later seismic phases of detected earthquakes are determined regularly and reported to the National Earthquake Information Center (NEIC), USA. Investigation of local and regional seismicity is a point of special interest. Antarctica is not that aseismic as it is generally believed. Monitoring this seismicity over many years revealed that there exist certain regions which show a weak, but distinct seismic activity.

### Others

To determine the amount of ice melting at the bottom of the Ekström Ice Shelf a thermistor chain, frozen in into the ice, is monitored since 1993.

To improve the ephemerides of the ERS-2 satellite a PRARE ground station is operated at Neumayer Station.

### Area of activity

Ekström Ice Shelf, Halvfar Ryggen, Søråsen, Kottas Mountains, Amundsenisen (see map).

#### **VNA1 (observatory)**

70° 38.838' S    8° 15.935' W

#### **VNA2 (Halvfar Ryggen)**

70° 55.524' S    7° 23.575' W

#### **VNA3 (Søråsen)**

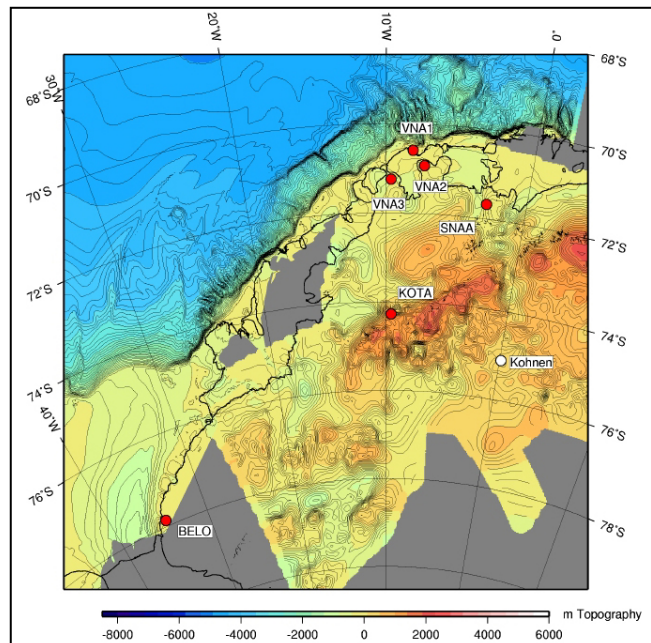
71° 14.512' S    9° 40.112' W

#### **Weigel Nunatak**

74.27° S    9.62° W

#### **Kohnen Station**

75.00° S    0.00° E



### 1.2.2.5 Maintenance of the infrasound station IS27

Grasse (BGR), Vorschellen, Medenwald, Eron (ManPower)

#### Responsible organisations

Federal Institute for Geosciences and Natural Resources (BGR), Hannover, Germany

Alfred Wegener Institute for Polar and Marine Research (AWI), Bremerhaven, Germany

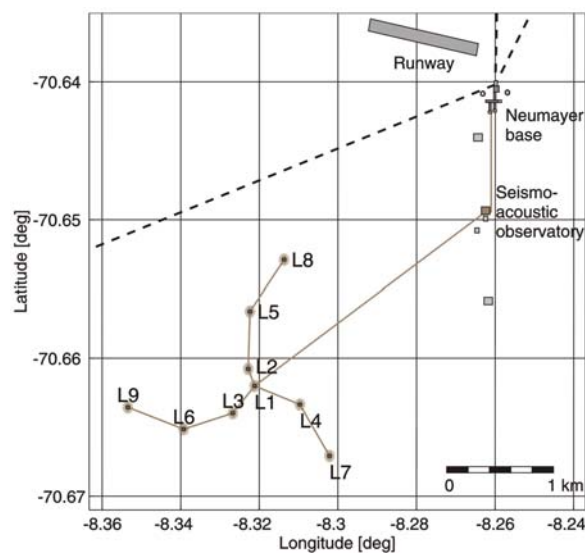
Provisional Technical Secretariat (PTS) of the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO), Vienna, Austria

#### Scientific goals

According to the Comprehensive Nuclear Test Ban Treaty (CTBT), the IS27 infrasound station is to be operated continuously with at least 98 % data availability over a year's time. Routine maintenance of the array has to be carried out every year. The nine array elements have to be recovered from the snow and re-installed on the surface. The condition of the equipment has to be checked and hardware and software upgrades have to be installed.

#### Area of activity

The IS27 array is located at 70.66°S, 8.32°W, about 3 km southwest of the Neumayer base (see figure below). The aperture of this array is about 2 km. The central array control system is installed in the seismo-acoustic observatory about 800 m south of the Neumayer base.



Location of the IS27 infrasound array

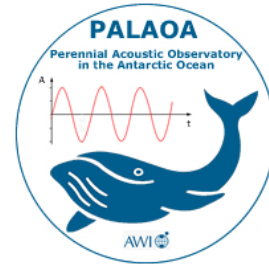
## 1.2.3 Projects

### 1.2.3.1 Perennial Acoustic Observatory in the Antarctic Ocean (PALAOA)

H. Klinck, O. Boebel, L. Kindermann, H. Bornemann, J. Plötz, A. Ziffer (AWI),  
H. Schubert (Laeisz)

#### Scientific background:

Marine mammals use sound for communication, navigation and prey detection. Acoustic sensors therefore allow the detection of marine mammals, even during polar winter months, when restricted visibility prohibits visual sightings. The animals are surrounded by a permanent natural soundscape, which, in polar waters, is mainly dominated by the movement of ice. In addition to the detection of marine mammals, acoustic long-term recordings provide information on intensity and temporal variability of characteristic natural and anthropogenic background sounds, as well as their influence on the vocalization of marine mammals.



#### Scientific objectives:

The **PerenniAL Acoustic Observatory in the Antarctic Ocean** (PALAOA, Hawaiian “whale”) near Neumayer Station is intended to record the underwater soundscape in the vicinity of the shelfice-edge for several years. These long-term recordings will allow studying continuously the acoustic repertoire of whales and seals in an environment almost undisturbed by humans. The data will be analyzed to (1) register species specific vocalizations, (2) infer the approximate number of animals inside the measuring range, (3) calculate their movements relative to the observatory, and (4) examine possible effects of the natural soundscape (ice motion and calving of glaciers) and the sporadic shipping traffic on the acoustic and locomotive behaviour of marine mammals.

The data, which are largely free of anthropogenic noise, provide also a base to develop automated passive acoustic mitigation systems. Noise-free bioacoustic data thereby represent the foundation for the development of pattern recognition procedures in the presence of interfering sounds, e.g. propeller noise.

#### Work at Neumayer

The assembly of the long-term observatory near Neumayer Station will be carried out in two steps. During the austral summer 2004/05 the energy module of PALAOA including the WLAN connection to Neumayer Station was set up at the Ekström shelf ice @ 70° 31' 23" S, 8° 13' 49" E. After a one year's test stage, the acoustic measuring sensors (4 hydrophones) and a CTD sensor will be deployed under

the shelf ice during this season. To this end, three hot water drillings through the 140 m thick shelf ice will provide access to the water below the shelf ice to insert the sensors into the water column.

The recording system and the control technology of PALAOA are placed in an isolated 10 foot container. A Savonius wind generator for power supply, a WLAN antenna for data transfer to Neumayer Station and a Webcam for visual observations of the sea surface are mounted on a pylon of 3 m height fixed on top of the container. In addition, solar panels are mounted directly on the container wall oriented towards the north. To be energy self-sufficiency – especially during polar winter – a methanol fuel cell complements the energy module of PALAOA.

The recorded data will be pre-processed using an embedded PC and send via WLAN to Neumayer Station. At Neumayer Station the transferred data will be processed online and stored on LTO tapes. Selected and highly compressed data packets can be transmitted via satellite directly to the Alfred Wegener Institute in Bremerhaven.

### **1.2.3.2 Audiometric measurements of Antarctic seals**

Kindermann, Bornemann, Plötz (AWI)

#### **Scientific background:**

Knowledge about the basic hearing abilities of marine mammals is fundamental for all further auditory and bio-acoustic research and also for the evaluation and mitigation of possible impacts of anthropogenic noise. The audible frequency range and corresponding hearing thresholds are the most characteristic properties of the auditory system for any species. They are typically displayed in the form of an audiogram as the function of minimal audible sound level in respect to frequency. For about 90% of marine mammal species including all Antarctic seals audiograms have not been measured yet. In addition the maximal tolerable sound levels are mostly speculative so far.

#### **Objectives:**

We intend to register audiograms of Weddell, crabeater, leopard and Ross seals. Audiograms can either be obtained by training subjects to react in a deterministic manner to any sound stimulus within their hearing range, or by using neurophysiological techniques to measure the brain's bioelectric response to a given acoustic input. Behavioural audiograms, which are the common method to test human hearing abilities, are impossible to obtain from wild animals. Hence we will measure auditory evoked potentials (AEP), especially the auditory brainstem responses (ABR) of immobilised seals with Electro-Encephalogram (EEG) electrodes attached to their scalp. This non invasive method is frequently used in neonatology to test for hearing disabilities of newborn humans.

#### **Work at Neumayer:**

The experiments will be conducted on the sea ice at Atka Bay in November and December 2005. Weddell seals will be studied primarily; other species are included on occasion. The bio-acoustic

studies are designed to provide results by four hearing tests. We intend to measure (1) pure tone sensitivity from 60 Hz to 120 kHz to obtain the basic audiograms, (2) sensitivity changes in respect to variations in signal duration from 500 msec down to 1 msec to determine the detection threshold in view of sound emissions of scientific sonars, (3) masking effects of broadband white noise across the main frequencies and (4) minimum sound levels necessary to induce a temporary threshold shift (reversible hearing loss, "disco effect") along frequencies of scientific sonars.

### **1.2.3.3 Change of body weight, body composition and adaptation of the cardiovascular system during wintering over in Antarctica 2006**

H.-C. Gunga (ZWMB, Berlin) and E. Kohlberg (Laeisz/AWI)

Participants: wintering over personnel 2006/2007

During last summer season 2004/2005 a medical study started at Neumayer Station in co-operation with the Berlin Centre for Space Medicine (ZWMB) and the Alfred-Wegener-Institute. Data collection has been continued during the complete wintering over period 2005. The 26<sup>th</sup> wintering over team should resume the project in 2006. Measurements will be made during the whole wintering over period focused on the nine months lasting phase of isolation. All members of the wintering over team will be involved.

The project derives from the space medicine which made it possible to study the impacts of extreme environments referring on the human organism. In the same way Antarctica presents the opportunity to do research on change of body weight, body composition and adaptation of the cardiovascular system under isolated conditions. It is intended to record the body composition of the wintering over personnel with the non invasive body impedance analysis. Conditionally on dehydration of the organism in Antarctic climate there is an increased loss of water through respiratory tract and skin. This potential dehydration can be recorded by the measurement of the impedance. Additional monthly taken blood samples should give information about possible correlation between changes of the autonomus nervous system and some metabolic parameters.

The autonomus nervous system is always involved in adaptation to extreme environments. That may become apparent in sleeplessness, loss of appetite, nausea and heart trouble. Early symptoms can be found in changes of the variability of heartbeat. These variabilities should produce knowledge about influence on the autonomus nervous system during isolation. There is a direct correlation between variability of heart frequency and actual state of reaction of the autonomus nervous system. All members of the wintering over team will be introduced to the method and record an electrocardiogram weekly before getting up in the morning. The data are saved on a data logger; the medical officer of Neumayer Station will transmit the data via computer and internet to the Berlin Centre for Space Medicine (ZWMB). Due to these periodical checkups the state of health of the personnel can be followed. The data loggers are developed by the Berlin Centre for Space Medicine. They record the beat to beat intervals of the heart to find out the variability.

### **1.2.3.4 Working and Living in Antarctica**

Duecker, Rauch (Eikom)

A long term documentary for public German and French German television

We know the pictures of spectacular landscapes in the southern polar regions, we love penguins, and sometimes we see scientists studying ice drilling cylinders and measuring the ocean-whole. But we have no idea, what is behind working on antarctic ice. To show the amazing logistics necessary to enable surviving on the 6th continent is the aim of our project for ARD and ARTE, produced bei Eikon-filmproductions in Stuttgart. We accompany the crew going to run the Neumayer-Station of Alfred Wegener Institute for one year. We have filmed their training and preparation, we have seen tons of material prepared to be shipped to Neumayer Station, and now we join the new station's crew on their way to Dronning Maud Land. Flying from Capetown via Novolazarewskaja to the Atka-Bay. We'll stay 10 weeks at Neumayer with our cameras, crane and sound equipment and film our AWI-protagonists getting used to live and work at the station. And at the end of next year's winter we'll come back to see what happened to them. To the crew, the station and the research taking place there.



## 1.3 Kohnen-Station

### 1.3.1 European Project on Ice Coring in Antarctica (EPICA)

- Science: Oerter, Dick, Wilhelms, Freitag, Frenzel, Fritzsche, Gerasimoff, Kipfstuhl, Lawer, Miller, Twarloh, Valero-Delgado (AWI), Faria (NPI), Karlin (Univ.-Stockholm), Kaufmann (Univ. Bern), Weiler (Univ. Bern)
- Logistics: Druecker, Stoof, (AWI), Blattner (Käsbohrer), Ackermann, Beiersdorf, Brehme, Koehler, Krischat, Lambrecht, Trimborn (Reederei F. Laeisz)

The Antarctic season 2005/06 will be the 4<sup>th</sup> deep drilling season within the European Project for Ice Coring in Antarctica (EPICA), a program co-ordinated by ESF and funded by the EC and national contributions of the partners. It is the 1<sup>st</sup> field season in Dronning Maud Land (DML) of the Specific Targeted Research Project "Enhanced paleo-reconstruction and integrated climate analysis through marine and ice core studies (EPICA-MIS)" within the 6<sup>th</sup> Framework Program of the EU (Proposal no. 003868).

In the season 2003/04 the EPICA deep drilling at Kohnen station in DML had reached a depth of 2565 m and an ice age of appr. 200 kyrs. No drilling activities took place in the season 2004/05. The ice thickness determined by radio-echo sounding measurements is 2781 ±5m. Thus, the aim for this season is to drill through the remaining 216 m of ice, down to bedrock. The EPICA drill and its electronics were improved for this purpose by AWI in co-operation with LGGE, Grenoble, and University of Copenhagen. Numerical modelling suggest the ice temperature at the bottom to be still 1°C below the pressure melting point. Temperature logs in the borehole will be carried out before and after finishing the drilling operation.

In-situ measurements at the ice core comprise logging of the core, dielectrical profiling (DEP), a non-destructive measurement, and thin sections at selected ice samples every 10 metres for investigation of physical properties. The ice cores will be cut into 1 m pieces and stored in insulated boxes. These boxes will be flown under frozen condition to Neumayer station and from there shipped via Cape Town to Bremerhaven.

Deep drilling will be accompanied by firn-air sampling in a satellite hole. At the same time the structure of the firn will be studied by means of computer tomography and the chemical composition of the firn by continuous flow analysis.

In the surroundings of the drill camp, upstream of the drill hole, snow pit studies shall reveal the chemical and isotopic composition of the recent snow cover. The automatic aerosol sampler, which was in operation for another year, will be maintained. GPS surveys for determining ice flow velocity will be repeated.

Aside the overland traverse from Neumayer to Kohnen station the accumulation stake line between Neumayer station and Kottasberge will be remeasured.

The drill camp is supposed to be in operation from 05 November 2005 through 04 February 2006. Reduction of drill camp facilities for post-drilling activities and removal of excess material back to Germany will take place as far as possible.

Science and logistics personnel will fly from Cape Town, South Africa, to Kohnen station with DROMLAN via Novolazerevskaja and back again.

### **1.3.2 Air Chemistry Program**

Weller, Dick, Brüggemann (AWI), Wagenbach (IUPH)

The main focus of our work at Kohnen Station (EPICA-DML) is maintenance of the automated aerosol sampler designed for year-round measurements. The equipment was set up during summer campaign 2002/2003 in a purpose-built container located in the clean-air sector about 300 m north-easterly of the drilling trench. Electric power supply is realized by a combination of a wind turbine and solar panels, buffered by Ni/Cd batteries. A sophisticated version of the automated aerosol sampler has been installed during the last summer campaign in January 2005. The aerosol sampler consists of 22 filter holders, each one equipped with a teflon/nylon filter combination. Hence in total 22 aerosol samples per year are achievable with an individual sampling period of 15 days. Now the filters have to be exchanged and the samples will be analysed by ion chromatography. The project is a close cooperation with the Institut für Umweltphysik, University of Heidelberg (IUPH). From November 2005 to February 2006 a complementary aerosol sampling program including impactor measurements are scheduled. The samples are destined for analysis of trace elements by ICP-MS (inductive coupled plasma mass spectroscopy) and the ionic composition by ion chromatography.

### **1.3.3 Meteorological Measurements**

Birnbaum, Herber, König-Langlo (AWI)

The measurement program focuses on the determination of optical properties of aerosols and snow surfaces and the analysis of precipitation events.

Radiation fluxes play an important role in the energy budget of the Antarctic atmosphere. Aerosols influence solar radiation directly by scattering and absorption. However, their quantitative impact on radiation fluxes is still not well understood, especially over the Antarctic plateau, because most aerosol related measurements have been carried out in coastal regions so far. Limited measurements of aerosol optical depth only exist from Dome C and from Kohnen Station in seasons 2000/01 and 2001/02. The present campaign will continue these observations, and additional measurements aim at enlarging the data base for deriving optical properties of aerosols over the plateau. In regard to scattering, for example, columnar values of the aerosol size distribution, real part of refractive index, and phase function will be retrieved. Together with chemical analyses of aerosols performed by other

groups and in consideration of the synoptic conditions, we will obtain a comprehensive data set to describe aerosol at Kohnen Station.

For a better understanding of the mass balance of the ice sheet and for a better interpretation of ice cores drilled at Kohnen Station it is vital to improve our knowledge about precipitation events on the plateau. During the campaign, we will focus on investigating clear-sky precipitation ('diamond dust') events. In case studies, these observations will be later combined with synoptic material, satellite images, and trajectory calculations to understand conditions for the occurrence of diamond dust better.

In detail, the following activities are planned:

- Routine synoptic observations will be performed hourly, except during night. Daily radio soundings will provide vertical distributions of basic meteorological parameters to interpret and model measured radiation fluxes.
- Optical aerosol measurements require cloudless conditions at least in the direction of the sun. If this is the case, aerosol optical depth will be measured by means of a lattice spectrometer during 10-min periods hourly between 8 UTC and 16 UTC. In the morning and evening, when sun elevation is between 15° and 20°, measurements of angular sky brightness in the almucantar will be performed to allow the retrieval of scattering aerosol properties.
- Measurements of spectral surface albedo will be carried out regularly independent from cloudiness.
- Data on broad-band shortwave and longwave radiation fluxes will be continuously received from upward and downward looking pyranometers and pyrgeometers. Hence, surface radiation balance can be continuously calculated.
- Precipitation events will be documented with respect to kind of precipitation, frequency and duration. In case of diamond dust events, additional optical measurements and radio soundings will be performed.

The measurement program also serves as a preliminary survey for the coming aircraft campaign ANTASYO II - AGAMES (Antarctic trace Gas and aerosol Airborne MEasurement Study) 2006/2007 focussing on detailed aerosol studies in Dronning Maud Land.

## 2. ANT – LAND 05/06: FLIGHT MISSIONS

### 2.1 Summary and Itinerary

#### Dronning Maud Land Air Network (DROMLAN)

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AWI has co-ordinated the air transport of personnel and freight to Neumayer and Kohnen within the frame of DROMLAN, which is organized by 11 national operators. Altogether 7 intercontinental flights are planned. DROMLAN performs 6 flights from Cape Town to Novo-Airbase (Russia) and back, 3 flights in November 2005 and 2 flights in February 2006 as well as one flight from Cape Town to Troll Station (Norway) and back in January 2006.

Feeder flights to the stations Neumayer and Kohnen will be performed with Basler (BT-67) aircraft. Additional flights are scheduled with this aircraft for AWI logistics and support of Polar 2 operations at S17/Syowa in November, January and February.

#### AWI aircraft Dornier 228-101 (Polar 2)

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One aircraft Do228-101 (DAWI) - Polar 2 will perform scientific and logistic flight missions within the ANT – Land 05/06 program. The aircraft will be operated for ANTSYO flight missions from Neumayer and S17/Syowa. The preliminary schedule is as follows:

Ferry flight southbound in 2005:	30 November:	departure Braunschweig, Germany
	12 December:	Ushuaia, Argentina
	14 December:	Rothera station (UK)
	16 December:	Halley station (UK)
	16 December:	arrival at Neumayer

At Neumayer Polar 2 will perform one logistic flight between Neumayer and Kohnen on 21 December. The ANTSYO mission is scheduled at S17/Syowa from 03 January until 05 February. Polar 2 will be positioned for the visit of AWI officials at Kohnen Station between 09 and 11 January 2006. A final flight for Kohnen Station is planned when the station is closed after 5 February 2006 (schedule detail in 5.1.2).

Ferry flight northbound in 2006:	13 February:	departure Neumayer
	13 February:	Halley station (UK)
	16 February:	Rothera station (UK)
	19 February:	Punta Arenas, Chile
	01 March:	arrival at Bremerhaven, Germany

## **International cooperation**

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Aircraft missions for AWI needs close co-operation with other national operators. Beside DROMLAN co-operation special support is given by BAS, SANAP, NIPR and ALCI.

The Dornier 228-101 (Polar 2) ferry flights is supported by the British Antarctic survey with ground service at stations Rothera and Halley. Transportation of the ski equipment for Polar 2 is also made by BAS shipment from Rothera back to UK. Furthermore one BAS aircraft (Twin Otter) is planned to fly on request about 3 ton of ice cores from Kohnen to Neumayer at the end of January 2006.

Ground service for scientific missions provides NIPR staff at S17/Syowa.

Beside the DROMLAN co-operation additional logistic flights will be performed in the scope of AWI by BT-67 (ALCI) and by helicopters (Bell 212) in co-operation with SANAP.

### **2.2.1 Dronning Maud Land Air Network (DROMLAN)**

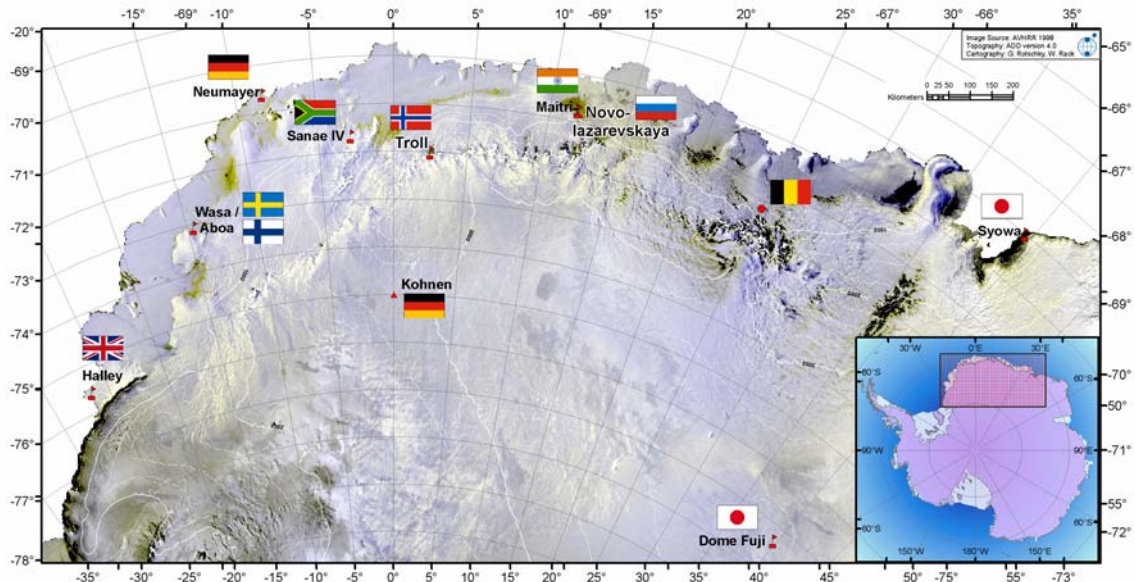
#### **DROMLAN performance**

The aim of the Dronning Maud Land Air Network (DROMLAN) is to provide an intercontinental air-link from Cape Town to destinations within Dronning Maud Land (DML) to any member country of COMNAP and SCAR in science related activities, including logistics. This regularly operated air-link improves the accessibility and extends the time period for summer season activities. DROMLAN has been established as an international project by Belgium, Finland, Germany, India, Japan, Norway, Russia, South Africa, Sweden and UK.

Each summer season runways are prepared at Novo-Airbase close to the Russian station Novolasarevskaya and, firstly for season 2005/2006, at the Norwegian station Troll for landing of heavy aircraft. The runway at Novo Airbase consists of compacted snow and is elevated about 500 m a.s.l. Because of surface melting this runway cannot be used for intercontinental flights from mid December until mid January. The new runway at Troll station consists of blue ice at elevation of about 1300 m a.s.l. Because of higher altitude this runway is operational for greater aircraft during the whole summer period. The Russian Antarctic Expedition (RAE) operates Novo-Airbase. The Norwegian Antarctic Research Expedition (NARE) maintains the runway at Troll. The weather forecast for intercontinental and internal flight operations is organized at Neumayer Station (AWI, DWD). This service covers the region between Halley and Syowa for all intercontinental and internal flights in the scope of DROMLAN.

Since the establishment of DROMLAN the Antarctic Logistics Centre International (ALCI) as the logistic operator of the Russian Antarctic Expedition (RAE) organizes and performs intercontinental flights with cargo aircraft Iljushin (IL-76TD) between Cape Town and Novo Airbase every summer season. Internal feeder flights are performed with smaller ski-equipped aircraft as Basler (BT-

## Dronning Maud Land Air Network



67), Dornier 228 or Twin Otter. The map shows destinations within Dronning Maud Land. DROMLAN members co-ordinate the feeder flights with ALCI and provide necessary services, fuel and facilities at their stations.

The number of flight missions depends on logistic and scientific requirements of the national programs. Every season DROMLAN generally aims to perform 6 to 7 intercontinental flights with connecting flights to the various destinations.

### **DROMLAN for 2005/2006**

For season 2005/2006 altogether 7 intercontinental flights are scheduled in order to carry personnel and cargo for AWI (Germany), BAS (UK), BELARE (Belgium), FIMR (Finland), NARE (Norway), NIPR (Japan), and RAE (Russia). Also the Spanish Polar Committee (SPC) intends to use this intercontinental air-link for the first time.

For DROMLAN 6 flights are planned with IL-76TD from Cape Town to Novo Airbase, three flight in November 2005 and two flights in February 2006. The first time one flight is scheduled with aircraft LC-130 (Hercules) from Cape Town to Troll runway in mid-summer, beginning of January 2006. The Norwegian Polar Institute (NPI) and the Swedish Polar Research Secretariat (SPRS) are organizing the performance of this flight. At Troll runway flight management is arranged by NARE. Pre-flight assistance in Cape Town will be provided by ALCI for all DROMLAN intercontinental flights.

This season scientists, technicians and other personnel from 7 DROMLAN members and external national operator intend to join the intercontinental flights. In total - including support personnel, pilots and others for Novo-Airbase - 181 persons will fly into Antarctica and 176 persons back. About 42.2 ton airfreight has to be carried in and about 14.4 ton out.

DROMLAN intercontinental transport					AWI share	
Aircraft - number of flights	Persons in / out	Cargo (ton) in / out	Novo-Airbase support personnel, pilots, others in / out	Novo Airbase cargo (ton) including waste back in / out	Persons in / out	Cargo (ton) in / out
IL-76TD – 6 flights	112 / 121	40.0 / 13.2	44 / 34	18.2 / 6.9	52 / 52	12.2 / 2.4
LC-130 – 1 flight	25 / 21	2.2 / 1.2	none	none	9 / 15	0.2 / 0.2

The BT-67 will carry out the majority of feeder flights to various stations and summer camps in Dronning Maud Land. Several flights are planned with AN-2 in the beginning of season. ALCI coordinates and performs feeder flights according to the requirements for DROMLAN as well as for RAE activities at the Russian stations Progress and Vostok.

#### **DROMLAN for AWI activities**

Altogether 61 scientists and technicians with about 12.4 ton cargo will be carried from Cape Town to Neumayer and Kohnen, and 66 persons with about 2.6 ton cargo back from the stations to Cape Town (schedule details in 5.1.1). Among them 26 persons and about 9 ton scientific equipment and provisions have to be transported by BT-67 feeder flight from Novo-Airbase to Kohnen station (EPICA). Additionally BT-67 flights are scheduled in order to assist logistic and scientific activities at Kohnen as well as in connection with the Polar 2 scientific missions at S17/Syowa (ANTSYO).

Helicopters (Bell 212) based at station SANAE IV will perform additional feeder flights between Troll and Neumayer stations for the LC-130 flight in the beginning of January 2006. This assistance is in the scope of bilateral co-operation between DEAT/SANAP and AWI.

The following aircraft will perform transportation of AWI personnel and cargo:

Ilyushin (IL-76-TD)	operated by ALCI for DROMLAN
Hercules (C-130)	operated by Swedish Air Force for DROMLAN
Basler (BT-67)	operated by ALCI for feeder flights in the scope of DROMLAN
Antonov (ANT-2)	operated by ALCI for feeder flights in the scope of DROMLAN
Dornier (Do 228-101)	operated by AWI for science and logistics
Twin Otter (DHC-6)	operated by BAS for EPICA
Helicopter (Bell 212)	operated by SANAP for support of AWI feeder flights.

## 2.2.2 Airborne Geophysics with Polar 2 in East Dronning Maud Land

Steinhage, Riedel (AWI), Boebel, Hoeltig (Optimare), Berns, Gemsa, Wolf, Gebhard(DLR)

For the Antarctic season 2005/06 airborne geophysical measurements are planned with Polar2 in collaboration with Japanese colleagues from the National Institute for Polar Research (NIPR), Tokyo, within the frame of ANTSYO. The ferry of Polar2 to Neumayer starts on 30/November/2005 via South America and the British wintering stations Rothera on the Antarctic Peninsula and Halley on the Brunt Ice Shelf. The scientific equipment will be installed at Neumayer shortly after arrival on 16/December/2005. The instrumentation consists of a radio-echo sounding system (RES), gravimeter, altimeter, magnetometer, and 2 GPS receivers. The ferry back home is scheduled from 13/February/2006 until 1/March/2006.

The scientific equipment will be shipped by RV Polarstern to Neumayer and by RV Shirase to S17/Syowa. The aircraft crew travel by Polar2, while scientists, engineers and an additional aircraft mechanic are travelling by RV Polarstern as well as with the intercontinental link Cape Town – Novolazarevskaya to Neumayer. Further necessary logistic support for the movement from Neumayer to S17 and back as well as search and rescue back-up for the operation from S17 is given by a BT67 aircraft operated by ALCI. The airborne operation will be supported by the weather forecast service based at Neumayer.

Neumayer Station will be the base for installing the scientific instruments as well as for some logistic flight to Kohnen Station in support of the EPICA deep ice core drilling. The base for the scientific flights will be S17, a camp near the Japanese wintering base Syowa (40E/69S). The logistic flights are planned at the beginning, the middle of the field season, and at the end of the stay of Polar2 in Antarctica. In total 150 h are planned, the scientific projects of ANTSYO, WEGAS and DISTINCT, encompass 103 h, 47 h are needed for logistic and test flights as well as for the transfer to and from S17/Syowa.

In order to evaluate the exact flight track of the Polar2 three GPS reference stations will be deployed at the camp site S17, Padda Island, and along the traverse route towards Dome Fuji. Magnetic reference stations will be set-up at the camp and further inland on the ice sheet. For orientation see map below.

For DISTINCT 3 flights will be carried out on the Shirase glacier to determine its ice thickness along the main flow line and along several contour lines perpendicular to the ice flow. Based on the ice thickness measurements combined with surface velocities derived from interferometric data evaluation of satellite images the mass flux of the glacier will be determined. There will be no gravity measurements carried out on these profiles.



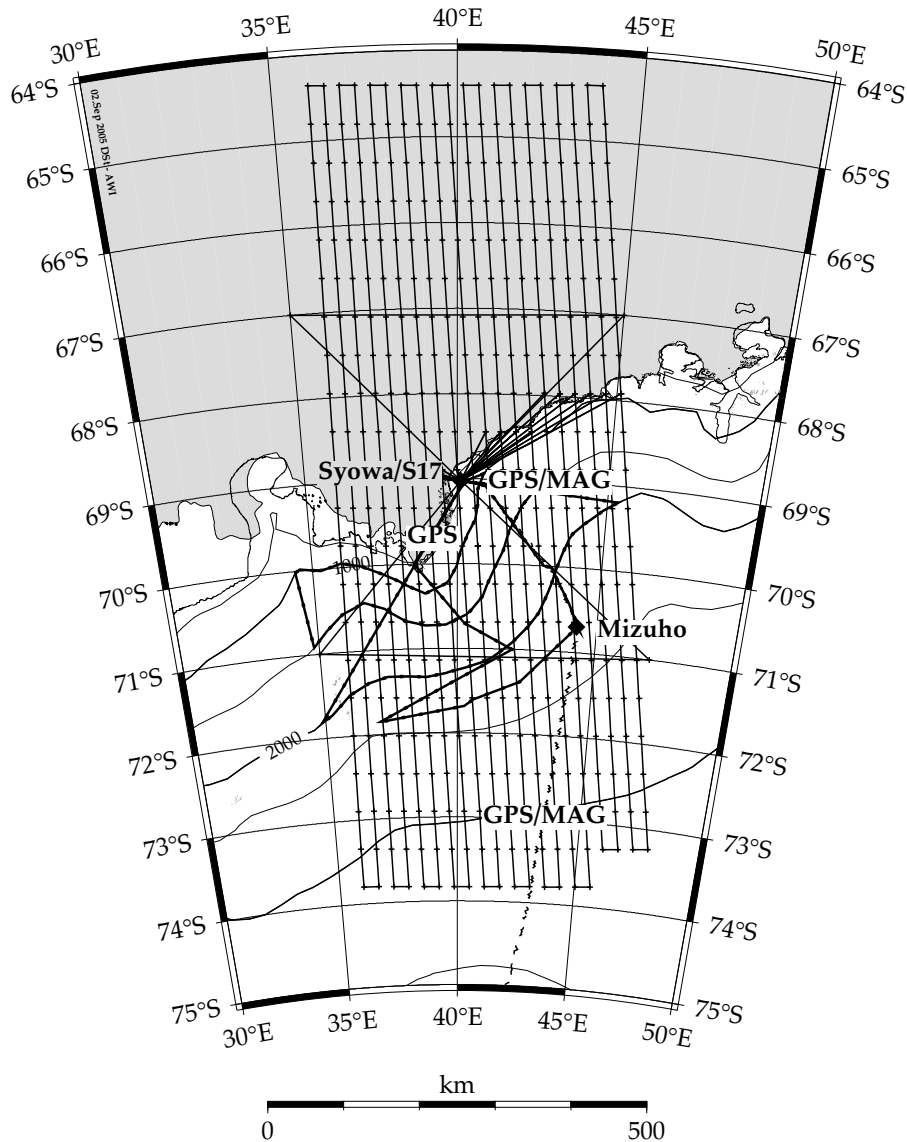


Fig. ABB.AERO: Flight lines of the measurement flights for WEGAS, straight lines north-south orientated, and DISTINCT, bold lines, 2005/06 as well as the planned positions of GPS and magnetic ground stations. The dashed line shows the traverse route from the ice edge to Dome Fuji.

The survey flights for WEGAS can be divided into two groups. The flights south onto the ice sheet will be flown at a constant elevation of approximately 3500 – 4000 m with all system on-board while those to the north above the ocean are carried without RES at 150 m height. On the latter flights a nadir looking video camera will be used for the observation of whales and pack ice seals. The focus of the WEGAS project is on the geological evolution of the region around Syowa. In order to obtain a first overview on the tectonics a regular flight pattern with a profile separation of 20 km has been chosen. Based on the data evaluation of this season forthcoming surveys within ANTSYO are intended in order to study the geological evolution of the Gondwana break-up in this area and its relation to the tectonic structures detected north of central Dronning Maud Land.

The map shown in figure ABB.AERO shows the planned flight lines of WEGAS (straight lines north-south orientated) and DISTINCT (bold lines) as well as the position of the reference stations. Some 30 km south-west of S17 is the ASPA 141, Yuidori Valley, located which will not be touch by the airborne survey.

Acronyms:

ANTSYO	<b>A</b> ntarctic flight missions at <b>S</b> yowa Region: airborne geophysical, glaciological, and atmospheric research in East Antarctica
CHAMP	<b>C</b> hallenging <b>m</b> inisatellite <b>p</b> ayload)
DISTINCT	<b>D</b> ronning Maud Land ice <b>s</b> heet <b>i</b> ncorporative <b>t</b> ask
EPICA	<b>E</b> uropean <b>P</b> roject for Ice <b>C</b> oring in <b>A</b> ntarctica
GPS	<b>g</b> lobal <b>p</b> ositioning <b>s</b> ystem
GRACE	<b>G</b> ravity <b>R</b> ecovery and <b>C</b> limate <b>E</b> xperiment
WEGAS	<b>W</b> est- <b>E</b> ast <b>G</b> ondwana <b>a</b> malgamation and its <b>s</b> eparation

## 3. ANT – LAND 05/06: DALLMAN LABORATORY

### 3.1 Summary and Itinerary

#### Activities at Dallmann Laboratory

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The Dallmann Laboratory at the Argentinean station Jubany will be opened at the end of October 2005. The laboratory is operated in co-operation with the Instituto Antártico Argentino (IAA). During the season 2005/06 up to 15 German scientists (5 scientific groups will work at the Potter Cove and the station area) and technicians will stay at the Dallmann Laboratory. The planned scientific activities of AWI are focused on terrestrial and shallow water biological projects.

During the last season three new laboratories and one storage container were installed. In the forthcoming season the laboratories will be connected to the local supply net and opened for scientific use mid February 2006. At the beginning of the season one technician will stay at the station to support the scientists and prepare the laboratories for the following work. This includes building up the furniture and co-ordinate the water supply inside the diving house. In the beginning of January a second group of technicians will install electricity, water supply and LAN-network. It is planned to move the laboratory facilities from the main building to the new laboratories in the beginning of February 2006. Further technical works:

- Installation of a new emergency ladder (main building)
- Substitution of the platform at the “yellow labs”
- Setting the main building
- Renovation of the “yellow labs”
- All buildings will be connected to the fire alarm system

In order to perform all planned scientific works and technical activities works up to 10 ton of cargo have to be shipped by sea and up to 1.2 ton by air.

On 7<sup>th</sup> April 2006 RV Polarstern (ANT XXIII/3) will call for King George Island and pick up 3 persons and up to 2 ton of cargo. After this operation the station will be closed till the end of October 2006.

Prof. Jörn Thiede as SCAR-President, intends to visit the Dallmann Laboratory and other stations at King George Island just before its closing. It is planned to fly from Punta Arenas to Teniente Marsh and return from Dallman Laboratory on board RV Polarstern.

#### International co-operation and transport facilities

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The transport of personnel and cargo needs close co-ordination and assistance by various national programs and commercial operators. That includes aircraft and ship transportation. German personnel

will join intercontinental flights with aircraft LC-130 (Hercules) performed by the Chilean Air Force (FACH) and Uruguayan Air Force (FAU) between Punta Arenas and Teniente Marsh at King George Island (see details on schedule 5.2.1). Feeder flights to Jubany/Dallmann are planned with helicopter BO-105 operated by the commercial company DAP Antarctica LTDA. During season various ships call for different stations at King George Island to get personnel and cargo to the Dallmann Laboratory and back (see details on schedule 5.2.2). The following ships will assist transportation:

RV Almirante Irizar	operated by DNA / Argentine Navy
MV Las Palmas	operated by SPC / Spanish Navy
MV Oscar Viel	operated by INACH / Chilean Navy
MV Hanseatic	operated by Reederei Hapag Lloyd

For ship and aircraft transportation agreements have been made with national and commercial institutions of Chile (INACH, FACH, DAP), Argentina (DNA/IAA), Russia (AARI/ALCI), Uruguay (IAU, FAU), South Korea (KORDI), Spain (SPC), and Germany (Hapag Lloyd).

## 3.2 Planned scientific projects

### 3.2.1 Stress physiology in Antarctic fishes

Heise, Weihe (AWI)

Project abstract not submitted

### 3.2.2 Stress physiology of the snail *Nacella concinna*

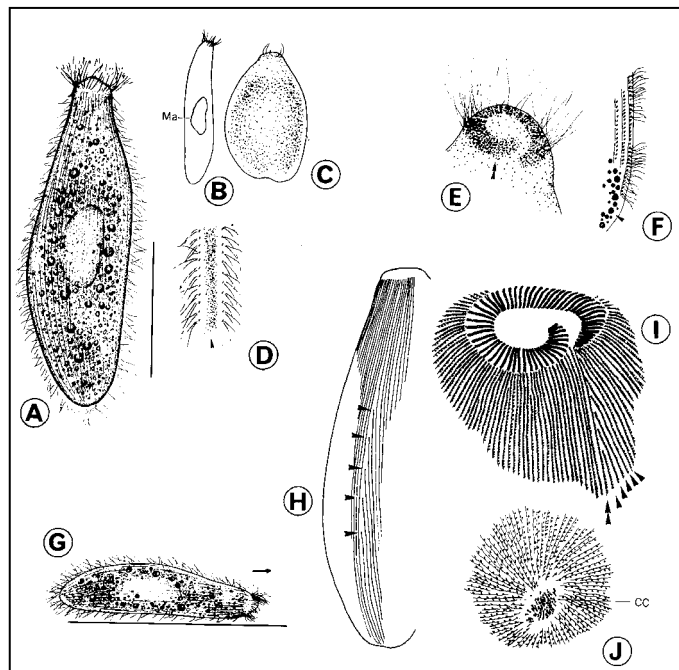
Abele, Halder (AWI)

Project abstract not submitted

### 3.2.3 Species Composition and Structure of the Ciliate Community in the Benthos at KGI

Wilbert (University Bonn)

As yet, little has been known about the ciliates in the Antarctic benthos. To fill this gap, during the Antarctic summer in the years 2000, 2002, 2004 and 2006 a thorough study was and will be made of the ecology and systematics of the ciliates in tidepools at Potter Cove on King George Island. In the laboratory of Dallmann Station the samples were examined, the ciliates they contained were identified *in vivo*, and where necessary this initial identification was extended by employing special silvering techniques to visualize the infraciliature (Figure 1).



The species composition found here until now, comprising 38 species in 30 genera, is remarkably sparse in comparison to other limnic and marine benthic communities, which often comprise well over 100 species. This finding can be ascribed in part to the relative uniformity of the tidepool biotope, but also derives from the extreme abiotic circumstances on site, such as occasional *Eisschliff* and freezing of the pools at ebb tide.

The investigations show that the two biocenotic basic principles of Thienemann (1. Diverse living conditions enable a large number of different species to exist, but with relatively few individuals in each species. 2. Uniform living conditions result in species poverty; each species comprises a large number of individuals) also apply to the benthic ciliate community in the Antarctic habitat, implying that tidepools are not an extreme habitat for ciliates.

Fourteen of these species and the genus *Hetrostentor* are new to science. The species of this genus found here, *Hetrostentor coeruleus*, is shown in Fig. 1.

### **3.2.4 Comparative taxonomic, cytological, and photophysiological studies on snow algae and higher plants from Antarctic, Arctic, and Mideuropean alpine environments.**

Leya (IBMT), Remias (Univ. Innsbruck)

#### **Background**

Snow algae are a group of freshwater microalgae that have adapted to a life in eternal snow and ice in the polar and alpine regions of our earth. As a morphological adaptation some species are capable of forming thick-walled resting stages within their annual life cycle to overcome unfavourable periods of extreme cold and drought. These cysts accumulate huge amounts of astaxanthin, a powerful radical-scavenging ketocarotenoid, which colours the cells dark red. Mass development of the cell forms on snow lead to the often observed phenomenon of “Red Snow” or “Blood Snow”. Of much more use for laboratory experiments, however, are the trophic, green-coloured cell stages, which have a fully active metabolism and proliferate continuously. Mass developments of these cell stages can be observed in the field rather rarely as the conspicuous “Green Snow”. A number of snow algal species found on snow, though not all, are strongly adapted to their habitat regarding their environmental key parameter – the temperature. These “true” or “psychrophilic” snow algae have growth optima at temperatures well below +15 °C, usually below +5 °C and will die at temperatures above +10...+20 °C. Next to basic research regarding the taxonomy and phylogeny of snow algae, the physiological and biochemical adaptations of psychrophilic algae stand in the main focus of extremophile research at the Fraunhofer IBMT.

#### **Aims**

Snow algae from different snow and glacier habitats around Dallmann Laboratory and adjacent areas on King George Island will be sampled for single cell isolation to establish clonal cultures. These cultures will be added to the existing Culture Collection of Cryophilic Algae (**CCCr<sub>yo</sub>**) located in Berlin which to-date houses more than 200 strains, with the majority being cryophilic microalgae. The strains cultivated so far mainly originate from Spitsbergen (Svalbard) and some few from the Windmill Islands Region (Antarctica). During our expedition the taxon inventory of snow, glacier, and soil algae will be

documented using light and fluorescence microscopy, as well as digital and manual image acquisition and processing. Field material of trophic (green) and resting (red) cell stages as well as culture material obtained later in the laboratory from clonal cultures will be used for DNA extraction and subsequent genome analyses using SSU rDNA-/ITS-sequences and AFLP techniques. Using these molecular methods we will attempt to detect an existing or interrupted gene flow between populations at the various snow algal habitats (cold islets) between the poles. Strains will also be screened for secondary pigments (carotenoids) and metabolites (cold-active enzymes, UV-/high light protectants, natural freeze protectants) under different culture conditions, such as temperature stress, and UV-/high light stress. At Dallmann also small scale field experiments on the germination of snow algal resting stages and the formation of resting stages from trophic cells respectively are planned using UV-exclusion and different colour filters.

Our proposed studies at Dallmann Laboratory on King George Island are important for the analysis of the bipolar and worldwide distribution of snow algae, and generally for the understanding of their taxonomy and phylogeny. Hopefully our culture collection will be expanded by a high number of Antarctic snow algal strains obtained from single cell isolation of field material. Thus, **CCCryo** will further on serve as an excellent bioresource for cryophilic freshwater microalgae and extremophile research in Germany and throughout Europe.

Regarding the comparative studies of snow algae and higher plants, earlier studies by Prof. C. Lütz (campaign 2002/2003 at Dallmann Lab.) will be continued. Measurements of the damaging effects due to high light/UV-stress in connection with low temperatures will partly be repeated for confirmation of the earlier results.

### 3.2.5 Phylogeography, Hybridisation and population ecology of Antarctic Skuas

Peter, Kopp (University of Jena)

The first aim of the skua project is reached by investigating the skua population inside the hybrid zone between South Polar Skua and Brown Skua at Fildes and Potter Peninsula, King George Island. The studies will focus on chick growth in pairs of different pair assemblage, fitness of hybrids and pure species individuals and mechanisms of mate choice (morphometry, avoustics). At Potter and Fildes Peninsula the distribution of skua nests will be mapped, adults and chicks are banded and the breeding success



*South Polar Skua with satellite transmitter*

of chicks will be determined (long term program). Additional studies at Potter Peninsula will investigate in detail the consequences of hatching date for chick growth. The migration routes of skuas will be investigated by using satellite telemetry.

Additionally we will investigate the phylogeography of the southern skua complex and deepen our knowledge about processes in the hybrid zone between South Polar Skua and Brown Skua in the area of the Antarctic Peninsula. This first goal will be achieved by sequencing the HVR I region of the mitochondrial D-Loop. Many scientists cooperate in this international project and will deliver samples from populations all around Antarctica.

### **3.2.6 Effects of variable environmental conditions on breeding, feeding and population ecology of Wilson's Storm Petrel**

Peter, Nordt (University of Jena)

This project is a sequel to last year's investigations of the Wilson's Storm Petrel (*Oceanites oceanicus*) in the area around the Tres Hermanos, Potter Peninsula, King George Island. Since 1996 the of 500 marked nests consisting breeding colony is studied in terms of ecology and adaptation to the prevailing weather conditions. A central aim is the begging behaviour of the juveniles. A previous investigation suggested a close correlation between begging and the chick body condition. A supplementary feeding experiment ought to verify this hypothesis. Therefore miniature infrared cameras will be installed inside the nests to record the nocturnal feedings.

Furthermore the continuation of the monitoring program is planned which includes amongst others the ascertainment of breeding success, chick's growth rates and morphometric data of the adults as well as their ringing.



## 4. ANT – LAND 05/06: OTHER ACTIVITES

### 4.1 Summery and Itinerary

During the season 2005-2006 AWI has two external expeditions.

One expedition is a part of a joint venture of the Centre d'Écologie et Physiologie Energétiques and AWI. The French Polar Institute (IPEV) is in charge for the logistics. The AWI scientist will stay at Dumont d'Urville from 30<sup>th</sup> October until 18<sup>th</sup> December 2005.

The second expedition is a yearly expedition in the frame of the Argentine-German co-operation at the Antarctic Peninsula. The Scientist will be on board of the Alm. Irizar and check different measurement points. She will stay on board of the Alm. Irizar from 26<sup>th</sup> December till 26<sup>th</sup> of February 2006.

#### 4.1.1 Emperor penguin studies at Dumont d'Urville

Zimmer (AWI)

The biological research of marine ecosystems includes the analysis of trophic relations in the main components of the food web, including the emperor penguin as one of its top consumers. *Aptenodytes forsteri* is the most southerly ranging penguin. The circumpolar distribution 42 colonies comprising ca. 200 000 breeding pairs make the emperor penguin an important predator in the Antarctic marine environment. This implicates a great interest in a better understanding of their

foraging strategies. The inaccessibility of many of their breeding sites has limited the number of studies and consequently little is known on the trophic links between these top predators and their prey.

The present study focuses on the foraging behaviour of emperor penguins of the Pointe Géologie colony of about 3000 breeding pairs and takes place as a cooperation with a French research team. Head of the group is Dr. A. Ancel from the Centre d'Écologie et Physiologie Energétiques in Strasbourg. The wintering station Dumont d'Urville (66°40'S, 140°00'E, Fig. 1) serves as a research platform for the field campaigns.

The primary objective of the field campaign in Nov/Dec 2004 was to record diving and feeding parameters by the use of external remote sensing data loggers. During the next field campaign in Nov/Dec 2005 the project will be continued. As a new approach satellite transmitters will be employed to follow the emperor penguin foraging trips. These measurements are expected to provide new



Fig. 1 Working site Pointe Géologie at 66°40'S, 140°00'E in Terre Adélie, Antarctica.

insights into the foraging strategy of emperor penguins in relation to the diurnal vertical distribution of their prey.

#### **4.1.2 Geodesy and Geophysics in Antarctica**

Sonja Gütz (AWI)

Scientific goals: Installation & maintenance of geodetic and oceanographic equipment.

- **GPS**

AWI and IAA/DNA are operating since several years jointly three permanent GPS tracking stations at the Argentine bases Belgrano 2, Jubany and San Martin in continuation of the former GAP campaigns. The GPS-observations are used to connect geodetic points in Antarctica via the IGS-network to the International Terrestrial Reference Frame (ITRF) with highest accuracy. Other objectives are the determination of the relative motion rates and directions of the Antarctic Plate with respect to the adjoining plates and the determination of the vertical motion of the Antarctic lithosphere due to changes of the ice and ocean loading.

The project is related to the Antarctic Neotectonics (ANTEC) program of the Scientific Committee on Antarctic Research (SCAR).

During this upcoming campaign the regular maintenance and check is planned. Furthermore, depending on time and the local situation, AWI plans to carry out multiple simultaneous measurements on up to three points at all of the previously named stations.

In addition a short GPS Survey on Orcadas will be conducted for the IAA and the reference point "ESP1" at the station Esperanza will be maintained and inspected.

- **DORIS**

On Belgrano II, the 3rd generation DORIS ground station will also be maintained and checked.

- **Tide gauge station**

Once a year AWI exchanges the data storage unit of the tide gauge station at San Martin and downloads the data of the previous measurements. These long-term observation data is used for determination of the height of the mean sea level. Having had several problems with one of the transmitting channels, the AWI wants to replace the installed sensor unit and carry out a height levelling in order to adjust the newly installed sensor unit and connecting it to the adjacent height mark at the station.

**Area of activity:**

All Argentine stations at the Weddell Sea and Antarctic Peninsula

## 5. LOGISTICS AND DETAILED SCHEDULES

### 5.1 Neumayer, Kohnen

#### Flight schedules and ship calls

##### 5.1.1 DROMLAN intercontinental schedule

For season 05/06 altogether 7 intercontinental flights are scheduled in order to carry personnel and cargo for AWI (Germany), FIMR (Finland), NP (Norway), NIPR (Japan), and RAE (Russia) from Cape Town to Novo Airbase and Troll Airbase.

Date	Flight number	Route	for Novo	for Cape Town
			AWI-pax/cargo	AWI-pax/cargo
03 - 05 November 2005	IL 22	CPT - Novo - CPT	11 / 3936 kg	0 / 20
10 - 12 November 2005	IL 23	CPT - Novo - CPT	15 / 5384 kg	0
25 – 28 November 2005	IL 24	CPT - Novo - CPT	28 / 2874 kg	0
07 – 12 January 2006	C-130	CPT - Troll - CPT	9 / 200 kg	15 / 200 kg
02 – 04 February 2006	IL 25	CPT - Novo - CPT	0	30 / 1700 kg
11 – 13 February 2006	IL 26	CPT - Novo - CPT	0	21 / 680 kg

##### 5.1.2 DROMLAN feeder flights for AWI

Feeder flights (logistics) will be carried out by BT-67 and AN-2 aircraft to various stations and summer camps in Dronning Maud Land. These flights are executed in co-operation between RAE, AWI and ALCI. For AWI 26 scientists and technicians will be transported to Kohnen Station and 35 scientists and technicians to Neumayer.

##### Feeder flights for IL22 (03 – 05 Nov 2005)

Novo – Neumayer by AN-2: (A1-N Novo (2G+1054kg) – Neumayer)

Pax: 2, Cargo: 1054 kg

Neumayer-Novoy by AN-2: (A1-N Neumayer (420kg) – Novo)

Pax: 0, Cargo: 420 kg

Novo – Kohnen by BT-67: (B2-N Novo (8G+700kg) – Kohnen – Novo)

(B3-N Novo (1G+1200kg) – Kohnen – Novo)

Pax: 9, Cargo: 3302 kg

**Feeder flights for IL23 (10 – 16 Nov 2005)**

Novo – Kohnen by BT-67: (B6-N Novo (12G+408kg) – Kohnen –Novo)  
 (B7-N Novo (2G+2500kg) – Kohnen – Novo)  
 (B8-N Novo (2G+2500kg) –Kohnen – Novo)  
 Pax: 15, Cargo: 5408 kg scientific equipment

**Feeder flights for IL24 (25 – 30 Nov 2005)**

Novo – Neumayer by BT-67/AN-2: (B11-N Novo (14G + 800kg) – Neumayer – Novo)  
 (B12-N Novo (12G+2UK+800kg) – Neumayer – Novo)  
 (A12-N Novo (1174 kg) – Neumayer – Novo)  
 Pax: 26 (+2 BAS), Cargo: 2494 kg (+100 kg BAS)

**Feeder flights for C-130 (07 – 11 Jan 06)**

Troll – SANA E IV by Bell 212 (SANAP) – 7 Jan 06:

Pax: 9 (including AWI-VIP), Cargo: 200 kg

SANA E IV – Neumayer by Bell 212 (SANAP) – 7 Jan 06:

Pax: 7 (including AWI-VIP), Cargo: 200 kg

Neumayer – SANA E IV by Bell 212 (SANAP) – 10 Jan 06:

Pax: 2 (AWI-VIP)

Neumayer – Troll by BT-67 (09 – 11 Jan 06): (B3-J S17 – Novo)

(B4-J Novo – Neumayer (10G+200kg) – Troll)

Pax: 10, Cargo: 200 kg

SANA E IV – Troll – Novo by BT-67 (10 – 11 Jan 06):

(B5-J Troll – Aboa (4FI+1520kg) – SANA E IV (3FI+500kg+ 7G)  
 – Troll (2G) – Novo)

Pax: 7 (including AWI-VIP), Cargo: 200 kg

**Feeder flights for IL25 (02 – 04 Feb 2006)**

Neumayer - Novo by BT-67: (B2-F Novo – Neumayer (14G+200kg) – Novo)  
 Pax: 14, Cargo: 200 kg

Kohnen - Novo by BT-67: (B3-F Novo – Kohnen (10G+600kg) – Novo)  
 (B4-F Novo – Kohnen (7G+900kg) – Novo)  
 Pax: 16, Cargo: 1500 kg

**Feeder flights for IL26 (11 – 13 Feb 2006)**

Halley – Neumayer by Twin Otter: (Twin Otter Halley (4UK) – Neumayer)  
 Pax: 4 (BAS), Cargo: 0

Novo - Neumayer by BT-67: (B7-F Novo (1UK) – Neumayer)  
 Pax: 0 (+1 BAS), Cargo: 0

Neumayer - Novo by BT-67: (B7-F Neumayer (9G+ 4UK+520kg) – Novo)  
(B8-F Novo – Neumayer (crew will stay over night))  
(B9-F Neumayer (12 G+300kg) – Novo)  
Pax: 21 (+4 BAS), Cargo: 300 kg

### 5.1.3 Logistic flights for AWI

#### **Logistic flights by BT-67:**

##### Kohnen – Neumayer – Kohnen (11 – 16 Nov 2005):

(B9-N Kohnen (5pax+300kg) – Neumayer)  
Pax: 5, Cargo: 300 kg  
(B10-N Neumayer (1pax+590kg) – Kohnen – Novo)  
Pax: 1, Cargo: 590 kg

##### Neumayer – S17 and stand by (02 - 08 Jan 06):

(B1-J Novo – Neumayer) crew stay over night  
(B2-J Neumayer (3G+1300kg) – S 17)  
Pax: 3, Cargo: 1300 kg scientific equipment, aircraft spare parts

##### Stand by at S17 for Polar 2 flight missions (ANTSYO): (Bs1-J 03 – 08 Jan 2006)

##### Positioning for feeder flights C-130 (09 – 11 Jan 2006):

(B3-J S17 – Novo)  
(B4-J Novo – Neumayer – Troll)  
(B5-J Troll – Aboa – SANA E IV – Troll – Novo)

##### Novo – S17 and stand by (12 – 23 Jan 2006):

(B7-J Novo (2G) – S17)  
Pax: 2, Cargo: personal luggage / spare parts

##### Stand by at S17 for Polar 2 flight missions (ANTSYO): (Bs2-J 13 – 23 Jan 2006)

##### S17 - Neumayer (05 Feb 2006):

(B5-F Novo – S17 (4G+1300kg) – Novo)  
(B6-F Novo (4G+1300kg) – Neumayer – Novo)  
Pax: 4, Cargo: 1300 kg

**Logistic flights by Polar 2**Neumayer – Kohnen – Neumayer (21 Dec 2005):

(Neumayer – Kohnen)

Pax: 0, Cargo: spare parts for tracked vehicles, provisions from NM

(Kohnen – Neumayer)

Pax: 2, Cargo: personnel luggage

Positioning for ANTSYO mission (03 Jan 2006):

(Neumayer – Novo – S17 (03 Jan 2006)

Pax: 0, Cargo: scientific equipment

**S17: ANTSYO flights 04-08 Jan 2006 and 13 – 23 Jan 2006**Positioning for AWI-VIP (08 – 09 Jan 2006):

(S17 – Novo – Neumayer)

Pax: 0, Cargo: 0

AWI-VIP visit at Kohnen (09 – 10 Jan 2006):

(Neumayer – Kohnen – SANAE IV)

Pax: 3 (AWI-VIP), Cargo: personnel luggage

Positioning for ANTSYO mission (12 Jan 2006):

(SANAE IV – Novo – S17)

Pax: 0, Cargo: 0

Re-positioning from S17 (05 Feb 2006):.

(S17– Novo – Neumayer)

Pax: 0, Cargo: scientific equipmant

Logistic flights for EPICA (08-Feb-2006)

(Neumayer - Kohnen – Neumayer)

Pax: 5, Cargo: personnel luggage

**Logistic flights by Twin Otter, BAS**Logistic flights for EPICA (23 – 28 Jan 2006):

(Neumayer – Kohnen – Neumayer)

Pax: 0, Cargo: 3550 kg ice cores from Kohnen to Neumayer

#### 5.1.4 Ship calls for Atka Bay

##### Supply Neumayer:

RV Polarstern (ANT XXIII/2) 05 – 07 December 2005

Pax: 7

Cargo: 13 containers, 8 sledges, 1 Biwak Hut, 1 Chieftain, 1 Pistenbully

Fuel: Polar diesel, Jet A-1, Petrol, 36 drums

##### Back-loading Atka Bay (02 – 13 February 2006)

Back-loading operation will be performed by two ships (BBC Singapore and S.A. Agulhas) for Neumayer and SANAE IV. The whole operation is scheduled for the period from 02<sup>th</sup> to 13<sup>th</sup> of February 2006. The back loading of AWI-cargo for BBC Singapore should be finished until February 09<sup>th</sup>, in order to fly all AWI personnel with IL 26.

Both ships will stay at Atka-Bay as follows:

S.A. Agulhas: 02 – 13 February 2006

BBC Singapore 07 – 11 February 2006

##### BBC Singapore: Cape Town – Atka Bay:

Pax: 0

AWI-Cargo: Snow blower (12 tons) including spreader, fresh provisions, polar diesel, Jet A-1, petrol

SANAP-Cargo: Sewage plant

##### Atka Bay – Cape Town – Bremerhaven:

AWI - Pax: 2 (to CT)

AWI - Cargo: 22 container, 6 sledges, 1 Pistenbully

SANAP-Cargo: 6 container, 6 tank containers with contaminated snow and ice

<b>AWI - Antarctic Season 2005 /06 - Participants Neumayer / Kohnen / Polar 2</b>						
<b>03-Nov-2005</b> AWI-Logistics T. Matz						
<b>Arrival /departure with</b>	<b>Date</b>	<b>ID</b>	<b>Route</b>	<b>Arrival</b>	<b>Departure</b>	
aircraft Iljushin 76	(03-05)-11-2005	<b>IL22</b>	CPT – Novo – CPT	11	0	
aircraft Iljushin 76	(10-12)-11-2005	<b>IL23</b>	CPT – Novo – CPT	15	0	
aircraft Iljushin 76	(25- 28)-11-2005	<b>IL24</b>	CPT – Novo – CPT	26	0	
aircraft Hercules C130	(07-12)-01-2006	<b>C130</b>	CPT – Troll – CPT	9	15	
aircraft Iljushin 76	(02-04)-02-2006	<b>IL25</b>	CPT – Novo – CPT	0	30	
aircraft Iljushin 76	(11-13)-02-2006	<b>IL26</b>	CPT – Novo – CPT	0	21	
aircraft Dornier 228-101	16-12-2005 – 13-02-2006	<b>P2</b>	at Neumayer, S17	3	3	
ship Polarstern – ANT XXIII /2	19-11 – (03-07)-12-2005	<b>PS</b>	CPT – Neumayer	7	0	
ship S.A. Agulhas	(05-13)-02-2006	<b>S</b>	Neumayer – CPT	0	0	
BBC Singapore	(07-11)-02-2006	<b>SB</b>	CPT – NM – CPT	0	2	
				<b>DROMLAN Pax in / out:</b>	<b>61</b>	<b>66</b>
				<b>total Pax in / out</b>	<b>71</b>	<b>71</b>
<b>Total number of participants</b>	<b>80</b>					



<b>AWI - Antarctic Season 2005 /06 - Participants Neumayer / Kohnen / Polar 2</b>					
<b>Surname</b>	<b>Given name</b>	<b>Institute/firm</b>	<b>Profession</b>	<b>Arrival</b>	<b>Departure</b>
<b>Neumayer Station</b>					
<b>Logistics:</b>					
Janneck	Juergen	AWI-logistics	engineer / field operator	IL24	IL26
Witt	Ralf	AWI-logistics	technician	PS	IL25
Sulzbach	Frank	maintenance company	technician	IL24	IL25
Waldow	Mario	maintenance company	technician	IL24	IL25
Burfeind	Mathias	maintenance company	technician	IL24	IL25
<b>Observatories / Service</b>					
Koenig-Langlo	Gert	AWI	scientist	IL24	C130
Hofmann	Joerg	FIELAX	engineer	C130	IL26
Müller	Christian	FIELAX	scientist	IL24	C130
<b>IS27DE - Service</b>					
Grasse	Torsten	BGR Hannover	technician	IL24	C130
Vorshelen	Axel van	maintenance company	technician	IL24	C130
Medenwald	Florian	maintenance company	technician	IL24	C130
Eron	Andreas	maintenance company	technician	IL24	C130
<b>PALAOA:</b>					
Ploetz	Joachim	AWI	scientist	IL24	IL25
Bornemann	Horst	AWI	scientist	IL24	IL25
Kindermann	Lars	AWI	scientist	IL24	C130
Boebel	Olaf	AWI	scientist	PS	IL25
Klinck	Holger	AWI	scientist	PS	IL25
Ziffer	Albert	AWI	technician	PS	IL26
Schubert	Holger	AWI	technician	IL22	IL26

<b>AWI - Antarctic Season 2005 /06 - Participants Neumayer / Kohnen / Polar 2</b>					
<b>Surname</b>	<b>Given name</b>	<b>Institute/firm</b>	<b>Profession</b>	<b>Arrival</b>	<b>Departure</b>
<b>DROMLAN weather service:</b>					
Moeller	Hans-Joachim	DWD	weather forecaster	IL22	C130
Brauner	Ralf	DWD	weather forecaster	C130	IL26
<b>Wintering Team 2005:</b>					
Meyer	Wolfgang	AWI	physician, station leader	2004	IL25
Schartel	Harald	AWI /Laeisz	engineer	2004	SB
Buchholz	Oliver	AWI /Laeisz	electrician	2004	SB
Hennig	Hans-Peter	AWI /Laeisz	IT, radio operator	2004	IL25
Hoeltz	Andre	AWI /Laeisz	cook	2004	IL25
Brüggemann	Marc	AWI	air chemist	2004	IL25
Giedke	Kolja Benjamin	AWI	geophysicist	2004	IL26
Wellmann	J. Florian	AWI	geophysicist	2004	C130
Zoellner	Mathias	AWI	meteorologist	2004	C130
<b>Wintering Team 2006:</b>					
Petzel	Maja	AWI	physician, station leader	IL24	2007
Behrendt	Chris	AWI /Laeisz	engineer	IL24	2007
Buhl	Andreas	AWI /Laeisz	electrician	IL24	2007
Bruecklmeier	Eric-Roger	AWI /Laeisz	IT, radio operator	IL24	2007
Schultz	Corinna	AWI /Laeisz	cook	IL24	2007
Moeller	Andrea	AWI	air chemist	IL24	2007
Bock	Michaela	AWI	geophysicist	IL24	2007
Mueller-Wrana	Tobias	AWI	geophysicist	IL24	2007
Anastou	Anja	AWI	meteorologist	IL24	2007
<b>Public Relations:</b>					
Duecker	Jens	Eikon-Südwest	journalist	IL24	IL25
Rauch	Claudia	Eikon-Südwest	journalist	IL24	IL25

<b>AWI - Antarctic Season 2005 /06 - Participants Neumayer / Kohnen / Polar 2</b>					
<b>Surname</b>	<b>Given name</b>	<b>Institute/firm</b>	<b>Profession</b>	<b>Arrival</b>	<b>Departure</b>
<b>Other activities:</b>					
NN	NN	GU NM III (not confirmed)	engineer	(IL25)	(IL26)
number of participants:					<b>41</b>
<b>Kohnen-Station</b>					
<b>EPICA Drilling Team:</b>					
Wilhelms	Frank	AWI	driller	IL23	IL25
Frenzel	Andreas	AWI	driller	IL23	IL25
Fritzsche	Diedrich	AWI	driller	IL23	IL25
Karlin	Torbjoern	Uni-Stockholm	driller	IL23	IL25
Lawer	Gunther	AWI /extern	driller	IL23	IL25
Valero-Delgado	Fernando	AWI	driller	IL23	IL25
Dick	Dorothee	AWI	driller	IL23	IL25
Miller	Heinz	AWI	driller	IL23	IL25
Twarloh	Birte	AWI	driller	IL23	IL25
Kaufmann	Patrik	Uni-Bern	driller	IL23	IL25
<b>EPICA Science Team:</b>					
Kipfstuhl	Sepp	AWI	scientist	IL23	IL25
Oerter	Hans	AWI	scientist	IL23	IL25
Freitag	Johannes	AWI	scientist	IL23	IL25
Faria	Sergio	AWI / NPI	scientist	IL23	IL25
Weiler	Karin	Uni-Bern	scientist	IL23	IL25
<b>Science:</b>					
Birnbaum	Gerit	AWI	scientist	IL22	IL25

<b>AWI - Antarctic Season 2005 /06 - Participants Neumayer / Kohnen / Polar 2</b>					
<b>Surname</b>	<b>Given name</b>	<b>Institute/firm</b>	<b>Profession</b>	<b>Arrival</b>	<b>Departure</b>
<b>Logistics:</b>					
Druecker	Cord	AWI-logistics	technician / leader logistics	IL22	IL26
Brehme	Andreas	AWI /Laeisz	technician	IL22	IL26
Koehler	Jens	AWI /Laeisz	technician	IL22	IL26
Stoof	Guenter	AWI	technician	IL22	IL26
Lambrecht	Anja	AWI /Laeisz	technician	IL22	IL26
Krischat	Jochen	AWI /Laeisz	technician	IL22	IL26
Trimborn	Klaus	AWI /Laeisz	technician	IL24	IL26
Blattner	Mark	Kaessbohrer	technician vehicles	IL24	IL26
Ackermann	Adolf	AWI /Laeisz	cook	IL22	IL26
Beiersdorf	Hans	AWI	physician	IL22	IL26
number of participants:					<b>26</b>
<b>Aircraft missions (Polar 2)</b>					
<b>ANTSYO:</b>					
Steinhage	Daniel	AWI	scientific leader	PS	IL26
Riedel	Sven	AWI	scientist	PS	IL26
Boebel	Tobias	Optimare	engineer	PS	IL26
Hoeltig	Juergen	Optimare	engineer	C130	IL26
<b>Crew:</b>					
Berns	Hans-Juergen	DLR	chief pilot	P2	P2
Gemsa	Steffen	DLR	pilot	P2	P2
Wolf	Alexander	DLR	technician	P2	IL26
Gebhard	Regina	DLR	technician	C130	P2
number of participants:					<b>8</b>

<b>AWI - Antarctic Season 2005 /06 - Participants Neumayer / Kohnen / Polar 2</b>					
<b>Surname</b>	<b>Given name</b>	<b>Institute/firm</b>	<b>Profession</b>	<b>Arrival</b>	<b>Departure</b>
<b>AWI-VIP</b>					
Junker	Reinhard	BMBF	Ministerial Director	C130	C130
Köttgen	Rainer	SfBW	Staatsrat	C130	C130
NN	NN			C130	C130
NN	NN			C130	C130
Thiede	Jörn	AWI	Director	C130	C130
Gernandt	Hartwig	AWI	Head of Logistics	C130	C130
number of participants:					<b>5</b>
<b>Total number of participants:</b>					<b>80</b>

## 5.2 Dallmann Laboratory – Jubany Station

### 5.2.1 Intercontinental flights

Transport of personnel and cargo to Dallmann Laboratory will be done in co-operation with the Instituto Antartico Uruguayo and Instituto Antartico Chileno. These flights will be carried out with a LC-130 aircraft operated by the Uruguayan and Chilean air force between Punta Arenas (PA) and the airfield at Teniente Marsh (TM).

Date	Nation	Route	for Teniente Marsh	for Punta Arenas
			Pax / cargo	Pax / cargo
24 – 29 October 2005	Chile	PA – TM – PA	5 / 1000 kg	0
21 – 26 November 2005	Chile	PA – TM – PA	0	1
05 – 10 December 2005	Chile	PA – TM – PA	6	2
02 – 07 January 2006	Chile	PA – TM – PA	3 / 200 kg	0
20 – 25 January 2006	Uruguay	PA – TM – PA	3 / 200 kg	0
20 – 25 February 2006	Chile	PA – TM – PA	0	7
27 – 30 March 2006	Chile	PA – TM – PA	0	2
01 – 06 April 2006	Uruguay	PA – TM – PA	2	0

### 5.2.2 Ship calls

Date	operator	Route	To Dallmann	To South America
			Pax / cargo	Pax / cargo
22 November 2005	Chilean Navy	MV Oscar Viel	271 kg	0
03 December 2005	Argentine Navy	RV Almirante Irizar	7348 kg	0
07 January 2006	Hapag Lloyd	MV Hanseatic	0	1
13 January 2006	Chilean Navy	MV Oscar Viel	525 kg	0
22 January 2006	Spanish Navy	MV Las Palmas	0	1 / 50 kg
26 January 2006	Hapag Lloyd	MV Hanseatic	0	2 / 75 kg
21 February 2006	Argentine Navy	RV Almirante Irizar	1	0
01 March 2006	Argentine Navy	RV Almirante Irizar	0	1
07 April 2006	AWI / F. Laeisz	RSV Polarstern	0	3

<b>Antarctic season 2005/06 - Participants KGI and other expeditions</b>					
preliminary plan			03 November 2005, G. Kleffel, AWI-Logistics		
<b>Arrival /departure with</b>	<b>Date</b>	<b>Name / Number</b>	<b>Route</b>	<b>Arrival</b>	<b>Departure</b>
C-130 (Chile)	24-29.10.2005	Flight 01	PA - TM - PA	5	0
C-130 (Uruguay)	07-13.11.2005	Flight 02	PA - TM - PA	0	0
BT 67	26-30.10.2005	Flight 03	PA - TM - PA	0	0
C-130 (Chile)	21-26.11.2005	Flight 04	PA - TM - PA	3	1
C-130 (Uruguay)	28.11-03.12.05	Flight 05	PA - TM - PA	0	0
C-130 (Chile)	05-10.12.2005	Flight 06	PA - TM - PA	3	2
C-130 (Chile)	02-07.01.2006	Flight 07	PA - TM - PA	3	0
C-130 (Uruguay)	25.-31.01.2006	Flight 08	PA - TM - PA	3	0
C-130 (Uruguay)	08.-13.02.2006	Flight 09	PA - TM - PA	0	3
BT 67	15.02.2005	Flight 10	TM-PA	0	0
C-130 (Chile)	20-25.02.2006	Flight 11	PA - TM - PA	0	2
C-130 (Chile)	27-30.03.2006	Flight 12	PA - TM - PA	0	2
C-130 (Uruguay)	31.03.-06.04.20056	Flight 13	PA - TM - PA	2	0
Irizar	03.12.2005	Irizar	BA - Ushuaia - Jubany	0	0
Irizar 2-3	26.12.2005 – 26.02.2006	Irizar	Ushuaia - Ushuaia	1	1
Polarstern	07.04.2006	ANT XXIII/4	PA -Jubany - PA	0	3
Las Palmas	20.12.05 - 24.12.05	LP 1	Jubany - Ushuaia	0	0
Las Palmas	22.01. - 26.01.2006	LP 2	Jubany - Ushuaia	0	1
MS Hanseatic	22.02. - 26.02. - 06.03.	HAN 0604	U - Jubany - U	0	5
Astrolabe	15.10. – 30.10.2005	Astrolab 1	Hobart – DdU - Hobart	1	0
Astrolabe	10.12. – 20.12.2005	Astrolab 2	Hobart – DdU - Hobart	0	1
<b>AWI – resp. total in/out:</b>				<b>21</b>	<b>21</b>

<b>Antarctic season 2005 /06 - Participants KGI and other expeditions</b>					
<b>Name</b>	<b>Given name</b>	<b>Institute/Company</b>	<b>Profession</b>	<b>Arrival</b>	<b>Departure</b>
<b>Dallmann Laboratory</b>					
<b>Logistics:</b>					
Steinmetz	Richard	AWI	technican	Flight 01	Flight 6
Kleffel	Guido	AWI	engineer	Flight 07	Flight 9
Fiedler	Harald	Hiemann	technican	Flight 07	Flight 9
Ferber	Thorsten	AWI	technican	Flight 07	Flight 9
<b>Science:</b>					
Abele	Doris	AWI	scientist	Flight 01	Flight 4
Heise	Katja	AWI	scientist	Flight 01	Polarstern
Weihe	Ellen	AWI	scientist	Flight 01	LP 2
Halder	Felix	AWI	scientist	Flight 01	Flight 06
Kopp	Matthias	Uni Jena	scientist	Flight 06	HAN 0604
Nordt	Anna	Uni Jena	scientist	Flight 06	Flight 12
Leya	Thomas	MPI	scientist	Flight 08	HAN 0604
Remias	Daniel	MPI & Insbruck	scientist	Flight 08	HAN 0604
Wilbert	Norbert		scientist	Flight 08	Flight 12
Thiede	Jörn	AWI	scientist, SCAR-President	Flight 13	Polarstern
Wiencke	Christian	AWI	Scientist, scientific-coordinator Dallmann	Flight 13	Polarstern
<b>Art:</b>					
NN	NN	TV	TV, Deutsche Welle	Own resp.	own resp.
NN	NN	TV	TV, Deutsche Welle	Own resp.	Own resp.
NN	NN	TV	TV, Deutsche Welle	Own resp.	Own resp.
number of participants:					<b>18</b>
<b>Bellingshausen</b>					
Peter	H.-Ulrich	Uni Jena	scientist	Own resp.	Own resp.
Pfeiffer	Simone	Uni Jena	scientist	Flight 4	Flight 11
Mustafa	Osama	Uni Jena	scientist	Flight 4	HAN 0604
Fröhlich	Anne	Uni Jena	scientist	2006	2007



<b>Antarctic season 2005 /06 - Participants KGI and other expeditions</b>					
<b>Name</b>	<b>Given name</b>	<b>Institute/Company</b>	<b>Profession</b>	<b>Arrival</b>	<b>Departure</b>
Büßer	Christina	Uni Jena	scientist	Flight 4	HAN 0604
Ritz	Markus	Uni Jena	scientist	Flight 6	Flight 11
number of participants:					<b>6</b>
<b>Alm. Irizar</b>					
Gütz	Sonja	AWI	scientist	IRIZAR 2-3	IRIZAR 2-3
number of participants:					<b>1</b>
<b>Dumont d'Urvile</b>					
Zimmer	Ilka	AWI	scientist	Astrolabe 1	Astrolabe 2
number of participants:					<b>1</b>
number of participants (AWI-expeditions)					<b>17</b>
number of participants (foreign expeditions)					<b>9</b>
<b>total number of participants:</b>					<b>26</b>

## 6. PARTICIPANTS

### Neumayer and Kohnen Station

<b>Name</b>	<b>First Name</b>	<b>Institute</b>	<b>Profession</b>
Ackermann	Adolf	AWI /Laeisz	cook
Anastou	Anja	AWI	scientist
Behrendt	Chris	AWI /Laeisz	engineer
Beiersdorf	Hans	AWI	physician
Berns	Hans-Juergen	DLR	chiefpilot
Birnbaum	Gerit	AWI	scientist
Blattner	Mark	Kaessbohrer	technician
Bock	Michaela	AWI	scientist
Boebel	Olaf	AWI	scientist
Boebel	Tobias	Optimare	engineer
Bornemann	Horst	AWI	scientist
Brauner	Ralf	DWD	weather forecaster
Brehme	Andreas	AWI /Laeisz	technician
Bruecklmeier	Eric-Roger	AWI /Laeisz	engineer
Brüggemann	Marc	AWI	scientist
Buchholz	Oliver	AWI /Laeisz	electrician
Buhl	Andreas	AWI /Laeisz	electrician
Burfeind	Mathias	ManPower	technician
Dick	Dorothee	AWI	driller
Druecker	Cord	AWI-logistics	technician
Duecker	Jens	Eikon-Südwest	journalist
Eron	Andreas	ManPower	technician
Faria	Sergio	AWI / NPI	scientist
Freitag	Johannes	AWI	scientist
Frenzel	Andreas	AWI	driller
Fritzsche	Diedrich	AWI	driller
Gebhard	Regina	DLR	technician

<b>Name</b>	<b>First Name</b>	<b>Institute</b>	<b>Profession</b>
Gemsa	Steffen	DLR	pilot
Gernandt	Hartwig	AWI	scientist
Giedke	Kolja Benjamin	AWI	scientist
Grasse	Torsten	BGR Hannover	technician
Hennig	Hans-Peter	AWI /Laeisz	engineer
Hoeltig	Juergen	Optimare	engineer
Hoeltz	Andre	AWI /Laeisz	cook
Hofmann	Joerg	FIELAX	engineer
Janneck	Juergen	AWI-logistics	engineer
Junker	Reinhard	BMBF	Ministerialdirektor
Karlin	Torbjoern	Uni-Stockholm	driller
Kaufmann	Patrik	Uni-Bern	driller
Kindermann	Lars	AWI	scientist
Kipfstuhl	Sepp	AWI	scientist
Klinck	Holger	AWI	scientist
Koehler	Jens	AWI /Laeisz	technician
König-Langlo	Gert	AWI	scientist
Köttgen	Rainer	SfBW	Staatsrat
Krischat	Jochen	AWI /Laeisz	technician
Lambrecht	Anja	AWI /Laeisz	technician
Lawer	Gunther	AWI /extern	driller
Medenwald	Florian	ManPower	technician
Meyer	Wolfgang	AWI	physician
Miller	Heinz	AWI	driller
Moeller	Hans-Joachim	DWD	scientist
Moeller	Andrea	AWI	scientist
Mueller-Wrana	Tobias	AWI	scientist
Müller	Christian	FIELAX	scientist
NN	NN	BMBF	minister
Oerter	Hans	AWI	science

<b>Name</b>	<b>First Name</b>	<b>Institute</b>	<b>Profession</b>
Petzel	Maja	AWI	physician
Ploetz	Joachim	AWI	scientist
Rauch	Claudia	Eikon-Südwest	journalist
Riedel	Sven	AWI	scientist
Schartel	Harald	AWI /Laeisz	engineer
Schubert	Holger	AWI /Laeisz	technician
Schultz	Corinna	AWI /Laeisz	cook
Steinhage	Daniel	AWI	scientist
Stoof	Guenter	AWI	technician
Sulzbach	Frank	Self-employed	technician
Thiede	Jörn	AWI	scientist, director
Trimborn	Klaus	AWI /Laeisz	technician
Twarloh	Birte	AWI	driller
Valero-Delgado	Fernando	AWI	driller
Vorshelen	Axel van	ManPower	technician
Waldow	Mario	ManPower	technician
Weiler	Karin	Uni-Bern	scientist
Wellmann	J. Florian	AWI	scientist
Wilhelms	Frank	AWI	driller
Witt	Ralf	AWI	technician
Wolf	Alexander	DLR	technician
Ziffer	Albert	AWI	technician
Zoellner	Mathias	AWI	scientist

## Dallmann Laboratory and other activities

<b>Name</b>	<b>First Name</b>	<b>Institute</b>	<b>Profession</b>
Abele	Doris	AWI	scientist
Büßer	Christina	Uni Jena	scientist
Ferber	Thorsten	AWI	technician
Fiedler	Harald	Fa. Hiemann	technician
Fröhlich	Anne	Uni Jena	scientist
Gütz	Sonja	AWI	scientist
Halder	Felix	AWI	scientist
Heise	Katja	AWI	scientist
Kleffel	Guido	AWI	engineer
Kopp	Matthias	Uni Jena	scientist
Leya	Thomas	MPI	scientist
Mustafa	Osama	Uni Jena	scientist
NN	NN	TV	TV, Deutsche Welle
NN	NN	TV	TV, Deutsche Welle
NN	NN	TV	TV, Deutsche Welle
Nordt	Anna	Uni Jena	scientist
Peter	H.-Ulrich	Uni Jena	scientist
Pfeiffer	Simone	Uni Jena	scientist
Remias	Daniel	Uni Innsbruck	scientist
Ritz	Markus	Uni Jena	scientist
Steinmetz	Richard	AWI	technician
Thiede	Jörn	AWI	SCAR-President
Weihe	Ellen	AWI	scientist
Wiencke	Christian	AWI	scientist
Wilbert	Norbert	Uni Bonn	scientist
Zimmer	Ilka	AWI	Scientist

## 7. PARTICIPATING INSTITUTES

### Institute/Company

### Address

ALCI	Antarctic Logistics Centre Intl. (Pty.) Ltd. 97, Keerom Street Cape Town 8001 Republic of South Africa
AWI	Alfred-Wegener-Institut für Polar- und Meeresforschung in der Helmholtz-Gemeinschaft Postfach 12 01 61 27515 Bremerhaven
BAS	British Antarctic Survey High Cross, Madingley Road Cambridge CB3 0ET Great Britain
Briese Schifffahrt	Briese Schifffahrts GmbH & Co. KG Hafenstr. 12 26789 Leer
CEPE	Centre d'Ecologie et Physiologie Energétiques UPR9010 Centre National de la Recherche Scientifique 23 rue Becquerel 67087 Strasbourg Cedex 02 France
DAP	DAP Antarctica LTDA O'Higgins 891 Punta Arenas Chile
DLR	German Space and Air Centre Postfach 1116 82234 Wessling
DNA	Dircción National del Antártico Cerrito 1248 1010 Buenos Aires Argentina
DWD	Deutscher Wetterdienst Bernhard-Nocht Str. 76 20359 Hamburg
Eikon Südwest	Eikon Film Bergmannstraße 102 10961 Berlin
FACH	Fuerza Aero de Chile, División Antártica Tarpaca No. 1129, 2°Piso Santiago de Chile

	Chile
FAU	Fuerza Aero de Uruguay Av. 8 de Octubre 2958 Montevideo 11600 Uruguay
Fielax	Fielax Gesellschaft für wissenschaftliche Datenverarbeitung mbH Schifferstraße 10 – 14 27568 Bremerhaven
Hapag Lloyd	Hapag-Lloyd Kreuzfahrten GmbH Ballindamm 25 20095 Hamburg
Heli-Tranair	Heli Transair GmbH Postfach 11 02 63323 Egelsbach
Hiemann	Kran- und Stahlbau Hiemann Ferdinand-Schultze-Str. 85/87 13055 Berlin-Lichtenberg
IAA	Instituto Antártico Argentino Cerrito 1248 1010 Buenos Aires Argentina
IAU	Instituto Antártico Uruguayo Av. 8 de Octubre 2958 Montevideo 11600 Uruguay
IMPT	Fraunhofer Institut für Biomedizinische Technik AMBT – Berlin Invalidenstraße 42 10115 Berlin
INACH	Instituto Antártico Chileno Plaza Munoz Gamero 1055 Punta Arenas, Chile
IPEV	Institut Polaire Française Paul Emile Victor Technopole Brest Iroise BP 75 29280 Plouzané France
Kässbohrer	Kässbohrer Geländefahrzeug AG Kässbohrerstr. 11 88471 Laupheim
KORDI	Korea Polar Research Institute 1270, Sa-2-dong, Sangrokgu, Ansan 426-744 Korea

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Laeisz	Reederei F. Laeisz GmbH Barkhausenstraße 37 27568 Bremerhaven
ManPower	MANPOWER GmbH Personaldienstleistungen Bürgermeister-Smidt-Str.16-18 27568 Bremerhaven
NPI	Norwegian Polar Institute Polar Environmental Centre 9296 Tromsø Norway
NPIR	National Institute of Polar Research 9-10, Kaga Chome, Itabashi-ku Tokyo 173-8515 Japan
Optimare	Optimare Sensorsysteme AG Am Luneort 15a 27572 Bremerhaven
SANAP	Department of Environmental Affairs and Tourism Directorate: Antarctica and Islands P.O. Box 8172, Roggebaai 8012 Cape Town 9012 Republic of South Africa
SPC	Spanish Polar Committee Comité Polar Español Ministerio de Educación y Ciencia José Abascal 4 28003 Madrid Spain
SPRC	The Swedish Polar Research Secretariat P.O. Box 50003 SE-104 05, Stockholm Sweden
RAI	Russian Antarctic Expeditions 38, Bering St. 199397 St. Petersburg Russia
University of Bern	Hochschulstraße 4 3012 Bern Schweiz
University of Bonn	Institut für Zoologie 53115 Bonn
University of Heidelberg (IUPH)	Institut für Umweltphysik (IUPH) Im Neuenheimer Feld 229 16120 Heidelberg



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07743 Jena

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14195 Berlin