

## **Weekly Report No. 9 (3.1. – 9.1.2005)**

Our progress out of the ice was slow. In the beginning, extremely thick ice (sometimes more than 5 m in thickness) and a snow cover of an additional meter or more slowed down Polarstern's speed. We left the pack ice on Wednesday and fog prevented us from going faster, since a lot of larger and smaller icebergs swam in the water, where they were difficult to detect, even with the ship's radar. The fog finally disappeared late on Thursday afternoon and strong winds (strength up to 8) were encountered. We passed the South Orkneys during the night without seeing any of the islands. Our last CTD-station was performed already north of the Antarctic Treaty area, just 10` north of 60° S on Friday. It is a tradition that one of the sampling bottles, coming back from the deep-sea (4200 m), does not sample the water but contains some drinkable mixture. Saturday the wind decreased to force 6 and the sun came out at air temperatures of +5° C. This was taken as a good sign for the next day, when we wanted to pay a visit to Grytviken on South Georgia. On the evening before an auction was performed with ISPOL and Polarstern souvenirs. The earnings of this auction will be donated for relief of the Tsunami victims together with additional money from the ship's bar.

At South Georgia one AWI scientist, who is working on the island for two months, was happy to meet some colleagues, while we enjoyed the sunny weather (+11°C), the magnificent landscape, the museum, the old whaling station, and the wildlife. Just to name the most abundant: King penguins, elephant seals and fur seals.

During the week, the first groups presented their preliminary results. One of the reports came from our Finish meteorologists, who studied exchange processes between air and ice. Their interest centred around three themes: 1) The heat balance of the air, ice and snow, which controls melting and freezing of snow and ice. 2) The effect of wind and turbulence and the question of how these affect the movement of sea ice floes as driving forces. 3) The radiation and penetration of light into the snow and ice. The latter is of importance to the growth of sea ice algae. For the measurements, weather and air-ice turbulence masts, radiation stations and drifting

satellite buoys were used. Some of the stations transmitted data to the ship by cable, others by radio, and by satellite. Predominantly, the measurements were carried out successfully and valuable data were obtained. However, the break of the ISPOL floe during the Christmas Night damaged a 10 m high meteorological profile mast seriously. As to the scientific results, two general characteristics may be mentioned. First, although the ISPOL cruise being in an early mid-summer period in terms of thermal conditions, snow melting, and penetration of light into the snow, the transition to summer has progressed only very gradually. Mostly, this was because the snow remained very white and therefore light-reflective throughout the period. Accordingly, still in the end of ISPOL the measurements indicated that over 75 % of the sunlight was reflected back to space. From the beginning of the period the portion of the light penetrating the snow and ice had increased just by a little over 10 %. The second result showed the wind-to-ice friction coefficient in the western Weddell Sea to be larger than expected and to that used in current meteorological, sea ice and ocean models.

**S**ome scientists had to use patches against sea sickness on our way back to Cape Town, since wind speeds increased to 8 again on Sunday evening. Other than that all expedition members are healthy and send sincere greetings.

Michael Spindler