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## Ice-breaker Polarstern to explore uncharted seafloor

### *Ship departs Nov. 23 for a place never before investigated*

Huge areas of sea floor (around 3,250 km<sup>2</sup>) have been freed up by the collapse 4 years ago of the Larsen B platform along the Antarctic Peninsula – leaving a blank spot on Antarctic maps. Polarstern, the research flagship of the Alfred Wegener Institute for Polar and Marine Research, will shortly conduct there the first major biological research, studying living communities, from microbes to whales, including bottom fish and squids.



The Polarstern is a double-hulled icebreaker operational at temperatures as low as 50 degrees C.

[Click here for more information.](#)

### THE ITINERARY

DEPARTURE - NOVEMBER 23, 2006: CAPE TOWN

The Polarstern leaves Cape Town, South Africa, heading towards the Weddell Sea (1).

DECEMBER 4/5 TO DECEMBER 14, 2006: NEUMAYER STATION

The Polarstern stops in the Atka Bay in order to supply the German Neumayer Research Station (2).

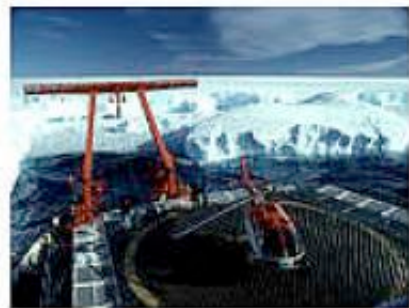
DECEMBER 14 TO JANUARY 26, 2006: ANTARCTIC PENINSULA

The first investigations, on living resources (CCAMLR), take place on the western side of the Antarctic Peninsula, around the South Shetland Islands (3). The subsequent ecological work (CAML) is located around the Larsen A/B area. If the sea ice is not penetrable, an alternative area around Joinville Island will be used instead (4).

ARRIVAL – JANUARY 30, 2007: PUNTA ARENAS

The Polarstern will end its expedition in Punta Arenas, Chile on January 30, 2007 (5).

### THE SCIENCE



The Polarstern can break through ice 1.5 meters thick at a speed of approximately 5 knots.

[Click here for more information.](#)

25 different research projects will be undertaken by 47 scientists, encompassing disciplines as diverse as benthology, planktonology, taxonomy, ecology, physiology, biogeochemistry, genetics, bathymetry, etc.

### FISHERIES MANAGEMENT

The first part of the expedition will focus on biological investigations on fish stocks as a contribution to the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR, [www.ccamlr.org](http://www.ccamlr.org)), following a dozen similar surveys since 1976. Researchers will monitor previously fished areas located in the western part of the Antarctic Peninsula to determine the state of stock recovery.

### GLOBAL WARMING & ICE SHELF COLLAPSE

When Antarctic glaciers reach the coast of the continent, they begin to float and become ice shelves,

from which icebergs are then calved. Since 1974, a total of 13,500 km<sup>2</sup> of ice shelves have disintegrated in the Antarctic Peninsula, a phenomenon linked to the regional temperature rise of more than 2°C in these past 50 years. An increasing number of scientists worry that similar break-ups in other areas could lead to increases in ice flow and cause sea level to rise dramatically. The final collapse of the Larsen B platform in February 2002 is the latest and the biggest of these catastrophic events tentatively related to global warming, freeing an additional 3,250 km<sup>2</sup> of sea bottom of an ice cover that has been estimated to be there for at least 5,000 years.

### **EVOLUTION OF BOTTOM FAUNA**

Meanwhile, the vanishing ice allowing vegetal and animal plankton to reinvade and thrive in these areas offers a perfect opportunity to study the evolution of bottom animal communities depending on this plankton. Sampling with various trawls, grabs and traps and the use of a remote operated vehicle with a video camera will allow the description of new species within this near-pristine environment. A dozen scientific studies will look into groups as different as microbes, sponges, crustaceans, octopuses, starfish and whales, from the grounding line to the open sea areas, and will furthermore give the best benchmark of the early stages of colonization. These studies could become a reference for other parts of Antarctica where such disintegration of ice shelves is already expected on how climate-induced shifts in biodiversity will change in ecosystems structured largely by ice.

### **MUD VOLCANOES**

The expedition will also lead the first biological studies of a recently discovered cold-vent ecosystem in the same Larsen area, the first of its kind known in Antarctica. Uncovered in 2005 by an American geoscience research team, this 8 km zone harbors mounds spewing out fluid and mud particles, as well as clusters of large clams. These mollusks and their associated fauna probably depend on chemical energy from the Earth, rather than one driven by photosynthesis from the sun or from hot emissions rising from inside the planet.

### **OUTREACH OPPORTUNITY: A MEDIA CONTACT OFFICER ONBOARD**

A major anticipated expedition outcome will be extensive media coverage of research findings.

- Through a media contact officer onboard, in direct contact with the AWI chief scientist and his team of researchers assisted by 2 journalists on land,
- Through striking visuals obtained through state-of-the-art technology such as a remotely operated vehicle equipped with video camera and a high-resolution deep-sea still camera,
- Through regular contact with global media via satellite,

### **A RUN UP TO THE INTERNATIONAL POLAR YEAR (IPY)**

With 47 scientists onboard from more than a dozen different nationalities, the Polarstern expedition brings together an international network of research programs that will focus on the biological characteristics of this blank spot, from November 2006 to January 2007. One of the major contributors to the Census of Antarctic Marine Life (CAML), Polarstern's voyage will be a major event in the IPY, and open the way for further polar expeditions.

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### **THE PARTNERS**

#### **ALFRED WEGENER INSTITUTE (AWI)**

The Alfred Wegener Institute for Polar and Marine Research conducts research in the Arctic, the Antarctic and temperate latitudes. The Alfred Wegener Institute for Polar and Marine Research coordinates polar research in Germany, and provides important infrastructure, such as the research icebreaker Polarstern and stations in the Arctic and the Antarctic, for international science organizations. The Alfred Wegener Institute for Polar and Marine Research is one of 15 research

centers of the 'Helmholtz-Gemeinschaft', the largest scientific organization in Germany. See [www.awi-bremerhaven.de/index-e.html](http://www.awi-bremerhaven.de/index-e.html)

### **CENSUS OF MARINE LIFE (CoML)**

The Census of Marine Life is a growing global network of researchers in more than 70 nations engaged in a 10-year initiative to assess and explain the diversity, distribution, and abundance of marine life in the oceans - past, present, and future. See [www.coml.org](http://www.coml.org)

### **CENSUS OF ANTARCTIC MARINE LIFE (CAML)**

The Census of Antarctic Marine Life, which is part of the global Census of Marine Life, will investigate the distribution and abundance of Antarctica's vast marine biodiversity to develop a benchmark for the benefit of humankind. As one of the main International Polar Year endorsed initiatives, the Census of Antarctic Marine Life will be the biggest Antarctic marine science program ever undertaken, investigating all regions, biomes and habitats. See [www.caml.aq](http://www.caml.aq)

### **THE COUSTEAU SOCIETY (TCS)**

The Cousteau Society is an international organization created by Jacques-Yves Cousteau in 1973, focusing, among other goals, on the equilibrium between Humanity and Nature on the World's oceans. TCS has three decades of international experience documenting and communicating the value of natural resources, including within the polar realms. TCS has a strong legacy of preserving Antarctica, which includes Captain Cousteau's worldwide petition that helped keep Antarctica as a "natural reserve, land of science and peace". See [www.cousteau.org](http://www.cousteau.org)

### **INTERNATIONAL POLAR FOUNDATION (IPF)**

The International Polar Foundation communicates and educates on polar research as a way to understand key environmental and climate mechanisms. It will use the International Polar Year as a powerful tool to get its message across a wide audience. Beside its outreach mission for international media, the IPF scientific officer onboard will make the follow-up of the expedition accessible to theyouth through its "45ducapoles" website. See [www.polarfoundation.org](http://www.polarfoundation.org) and [www.educapoles.org](http://www.educapoles.org)

### **THE POLAR EMBASSY**

The Polar Embassy is an official International Polar Year education and outreach project linking scientific knowledge to the public at large. It focuses on topics related to polar areas, sustainable development and global climate change, and their links "From Local to Polar". The Polar Embassy has developed participative actions to raise awareness and educate through a program spanning from 2006 to 2009 and beyond. Some participants will have the opportunity to join exceptional expeditions in the Arctic and Antarctica, onboard a polar vessel, the wandering "Polar Embassy". They will hereafter be entitled "Polar Ambassadors" and endowed with the task of spreading the word about polar regions and their importance for the planet. See [www.polar-embassy.org](http://www.polar-embassy.org)

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