

EXPEDITION PROGRAMME PS123

# Polarstern

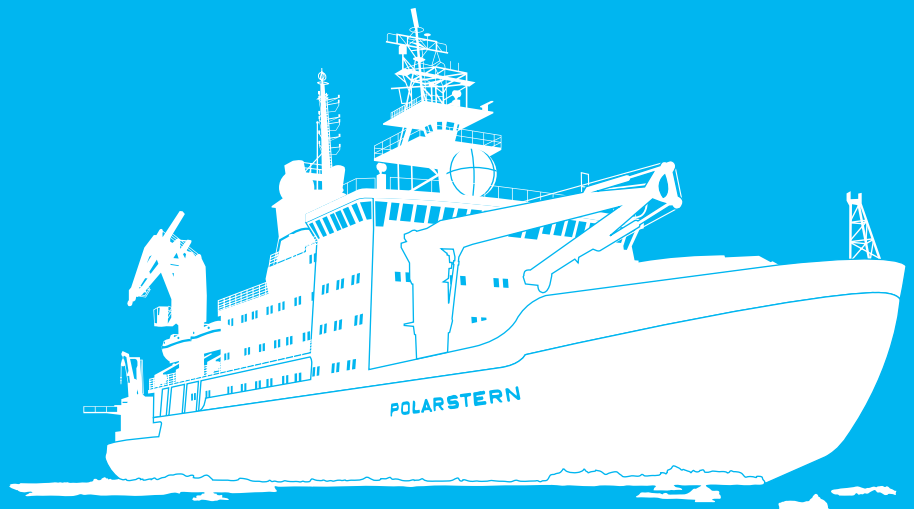
PS123

Bremerhaven - Port Stanley

20 December 2020 - 1 February 2021

Coordinator: Ingo Schewe

Chief Scientist: Tim Heitland



HELMHOLTZ

Bremerhaven, November 2020

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The Expedition Programme *Polarstern* is issued by the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) in Bremerhaven, Germany.

The Programme provides information about the planned goals and scientific work programmes of expeditions of the German research vessel *Polarstern*.

The papers contained in the Expedition Programme *Polarstern* do not necessarily reflect the opinion of the AWI.

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**PS123**

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## **1. ÜBERBLICK UND FAHRTVERLAUF**

Tim Heitland<sup>1</sup>

<sup>1</sup>DE.AWI

Die aktuell bestehende CoV-2 Pandemie ist in vielerlei Hinsicht herausfordernd. Unsere Aufgabe ist es, auch in Zeiten, in denen umfassende Einschränkungen im Privat- und Arbeitsbereich erforderlich sind, die im Zusammenhang mit *Polarstern* und der *Neumayer-Station III* bestehenden Forschungsprojekte aufrechtzuerhalten und die Versorgung der Station sicherzustellen.

Mit PS123 soll das Eintragen des Corona-2 Virus in die Antarktis und letztlich in die *Neumayer-Station III* verhindert werden, ohne dabei auf den Austausch der Überwinternden, die Versorgung der Station mit Nahrung und Betriebsmitteln, sowie die alljährlich notwendige technische Ertüchtigung zu verzichten. Darüber hinaus sollen die laufenden wissenschaftlichen Arbeiten weiter vorangetrieben und die Observatorien, wie jedes Jahr, durch die zuständigen Personen vor Ort betreut werden. Zudem soll die bathymetrische Messkampagne an Bord von *Polarstern* auch im Rahmen dieses Atlantik Transfers fortgesetzt werden.

Um oben genannte Ziele mit größtmöglicher Sicherheit zu erreichen, werden sämtliche FahrtteilnehmerInnen sowie die gesamte *Polarstern* Crew am 12.12.2020 im Hotel Best Western Fischereihafen, Bremerhaven, in Einzelquarantäne gehen. Während der Quarantäne werden zwei PCR Abstriche sowie ein quantitativer ELISA Antikörpertest auf CoV-2 entnommen. Nach erfolgreicher Quarantäne werden o.g. Personen an Bord gehen, ohne die Quarantäne zu brechen. Auf Höhe von Las Palmas wird ein dritter Abstrich an Bord entnommen, kontaktlos an einen Agenten übergeben und zum PCR Test nach Bremerhaven verbracht. Bis zum 24.12.20 wird auch an Bord von *Polarstern* ein verschärftes Hygienekonzept gelten.

Während des Transfers soll aus Sicht der Bathymetrie alle 1 bis 3 Tage eine Underway-CTD gefahren werden.

Es ist geplant, die Atka-Bucht um den 18.01.2021 zu erreichen und dann unmittelbar mit der Schiffsentladung zu beginnen. Parallel dazu soll die Wartung des Seismometers und der GPS Station am *Forstefjell Nunatak* durch die Neumayer-Geophysik unter Einsatz eines der Bordhelikopter zeitsparend erfolgen.

Nach Beendigung der Arbeiten wird *Polarstern* mit Crew, sowie den Fahrtteilnehmenden von DWD, Heliservice und Bathymetrie nach Port Stanley verlegen. Alle weiteren Personen werden an der *Neumayer-Station III* verbleiben und dann im Rahmen von PS124 um den 20.03.2021 abgeholt werden.



Abb. 1: geplante Fahrtroute Expedition PS123  
Fig. 1: planned course for expedition PS123

## **SUMMARY AND ITINERARY**

The ongoing CoV-2 pandemic is challenging in many ways. Our task is to facilitate the permanent scientific projects on *Polarstern* and at the *Neumayer Station III* as well as the necessary technical work at the station and their resupply.

PS123 is to prevent the introduction of CoV-2 to Antarctica and the *Neumayer Station III* whilst exchanging the overwintering team, provide technical maintenance and the delivery of food and other needed goods. In addition to that, the permanent scientific work at the station shall continue, the observatories be supervised on site and the bathymetric campaign aboard *Polarstern* be maintained.

To reach these goals with the greatest possible security, all expeditioners and the entire *Polarstern* crew will undergo single quarantine starting 12 December 2020 in the Hotel Best Western Fischereihafen, Bremerhaven. Two CoV-2 PCR swabs and an antibody test will be performed. The transfer to *Polarstern* will be organized in a manner, that will not compromise the quarantine. In Las Palmas a third PCR swab will be taken on board, handed over to an agent and brought to Bremerhaven to be analyzed there. A strict hygiene protocol will apply on board of *Polarstern* until 24 December 2020.

During the transfer, the Bathymetry- Group plans to perform an underway-CTD every 1-3 days. Estimated arrival at *Atka Bay* is around 18 January 2021 and cargo operations shall begin immediately. The Geophysics-Group simultaneously plans to inspect and maintain the GPS and seismic detector at *Forstefjell Nunatak* using one of *Polarstern's* helicopters.

*Polarstern* will then continue to *Port Stanley* with the crew, DWD, Heliservice and the Bathymetric group on board.

The other expeditioner participants will remain at *Neumayer Station III* and be picked up by PS124 around 20 March 2021.



## **2. BATHYMETRIC MAPPING AND GEOPHYSICAL UNDERWAY MEASUREMENTS**

Simon Dreutter<sup>1</sup>, Yvonne Schulze Tenberge<sup>1</sup>  
Boris Dorschel<sup>1</sup> (not on board)

<sup>1</sup>DE.AWI

**Grant-No. AWI\_PS123\_00**

### **Objectives**

Accurate knowledge of the seafloor topography, hence high-resolution bathymetry data, is key basic information necessary to understand many marine processes. It is of particular importance for the interpretation of scientific data in a spatial context. Bathymetry, hence geomorphology, is furthermore a basic parameter for the understanding of the general geological setting of an area and geological processes such as erosion, sediment transport and deposition. Even information on tectonic processes can be inferred from bathymetry. Supplementing the bathymetric data, high-resolution sub-bottom profiler data of the top 10s of meters below the seabed provide information on the sediments at the seafloor and on the lateral extension of sediment successions.

While world bathymetric maps give the impression of a detailed knowledge of worldwide seafloor topography, most of the world's ocean floor remains unmapped by hydroacoustic systems. In these areas, bathymetry is modelled from satellite altimetry with a corresponding low resolution. Satellite-altimetry derived bathymetry therefore lack the resolution necessary to resolve small- to meso-scale geomorphological features (e.g. sediment waves, glaciogenic features and small seamounts). Ship-borne multibeam data provide bathymetry information in a resolution sufficient to resolve those features. The collection of underway data during PS123 will contribute to the bathymetry data archive at the AWI and therefore contribute to bathymetric world datasets like GEBCO (General Bathymetric Chart of the Ocean).

### **Work at sea**

Bathymetric data will be recorded with the hull-mounted multibeam echosounder Atlas Hydrosweep DS3, and sub-bottom data will be recorded with the hull-mounted sediment echosounder Atlas Parasound P70. The main task of the bathymetry group is to run hydroacoustic systems during transit. The raw bathymetric data will be corrected for sound velocity changes in the water column, and will be further processed and cleaned for erroneous soundings and artefacts. Simultaneously recorded sub-bottom data provide information on the sedimentary architecture of the surveyed area.

Sound velocity profiles will be collected with an Underway CTD (Conductivity Temperature Depth) probe whenever possible.

Additionally, magnetic and gravimetric data will be collected with the ship mounted Magnetometer and Gravimeter.

**Preliminary (expected) results**

Expected results will consist of high-resolution seabed maps and sub-bottom information along the cruise track, as well as other geophysical underway data (magnetics and gravimetry).

**Data management**

Geophysical and oceanographic data collected during the expedition will be stored in the PANGAEA ([www.pangaea.de](http://www.pangaea.de)) data repository at the AWI. Furthermore, bathymetric data will be provided to the Nippon Foundation – GEBCO Seabed 2030 Project.

**3. TEILNEHMENDE INSTITUTE / PARTICIPATING INSTITUTIONS**

	<b>Address</b>
DE.AWI	Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung Postfach 120161 27515 Bremerhaven Germany
DE.DWD	Deutscher Wetterdienst Seewetteramt Bernhard Nocht Str. 76 20359 Hamburg Germany

#### 4. FAHRTTEILNEHMER / CRUISE PARTICIPANTS

<b>Name/ Nachname</b>	<b>First name/ Vorname</b>	<b>Institut/ Institute</b>	<b>Beruf/ Profession</b>	<b>Fachrichtung/ Discipline</b>
Baden	Markus	DE.RFL	Electrician	Technics NM III Wintering Team
Bunchek	Jess	DE.DLR	Engineer	Botany NM III Wintering Team
Dornhöfer	Timo	DE.AWI	Scientist	Geophysics NM III Wintering Team
Doron	Tanguy	DE.RFL	Chef	Technics NM III Wintering Team
Dreutter	Simon	DE.AWI	Scientist	Bathymetry PS123
Eder	Pitt	DE.RFL	Technician	Technics NM III
Fromm	Tanja	DE.AWI	Scientist	Geophysics NM III
Geis	Peter	COM.Kässbohrer	Mechanic	Technics NM III
Gischler	Michael	DE.HeliService	Technician	Aviation PS123
Heitland	Tim	DE.AWI	Chief Scientist FOM Surgeon	PS123 NM III Logistics
Jens	Holger	DE.DWD	Meteorologist	Meteorology PS123
Jonczyk	Peter Marcellus	DE.AWI	Surgeon station leader	Medicine NM III Wintering Team
Koch	Florian	DE.RFL	Engineer	Technics NM III Wintering Team
Laubach	Hannes	DE.RFL	Technician	Technics NM III
Lemm	Rene	DE.RFL	Housekeeping NM III	Housekeeping NM III
Marten	Lorenz	DE.AWI	Scientist	Geophysics NM III Wintering Team
Ockenfuß	Paul	DE.AWI	Scientist	Meteorology NM III Wintering Team
Ort	Linda Martina	DE.AWI	Scientist	Atm. Chemistry NM III Wintering Team
Piotrowski	Lukas	DE.HeliService	Chief Pilot	Aviation PS123

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<b>Name/ Nachname</b>	<b>First name/ Vorname</b>	<b>Institut/ Institute</b>	<b>Beruf/ Profession</b>	<b>Fachrichtung/ Discipline</b>
Preis	Loretta	DE.AWI	Technician	Meteorology NM III
Riess	Felix	DE.RFL	Engineer	IT NM III
Rothenburg	Mark	DE.HeliService	Technician	Aviation PS123
Schmithüsen	Holger	DE.AWI	Scientist	Meteorology NM III
Schubert	Holger	DE.RFL	Mechanic	Technics NM III
Schulze Tenberge	Yvonne	DE.AWI	Scientist	Bathymetry PS123
Schütt	Philipp	DE.RFL	Technician	Technics NM III
Sterbenz	Thomas	DE.RFL	Head of Technicians	Technics NM III
Thoma	Theresa	DE.RFL	Engineer	IT NM III Wintering Team
Vrakking	Vincent	DE.DLR	Technician	Botany NM III
Weißsohn	Jörn	DE.HeliService	Pilot	Aviation PS123
Weller	Rolf	DE.AWI	Scientist	Atm. Chemistry NM III
Wenzel	Julia	DE.DWD	Meteorologist	Meteorology PS123

## 5. SCHIFFSBESATZUNG / SHIP'S CREW

No.	Name	Rank
1.	Langhinrichs, Moritz	Master
2.	Lauber, Felix Thomas	C/M
3.	Langer, Carl	2nd Mate 1
4.	Peine, Lutz Gerhard	2nd Mate 2
5.	Ziemann, Olaf	Chief Eng
6.	Ehrke, Tom	2nd. Eng
7.	Rusch, Torben	2nd. Eng 1
8.	Bähler, Stefanie	2nd. Eng 2
9.	Hofmann, Walter Joerg	Chief Elec.Eng.1
10.	Schwedka, Thorsten	Elec./Eng. Labor
11.	Pommerencke, Bernd	Elec./Eng. SET
12.	Zivanov, Stefan	Elec./Eng. Winde
13.	Foelster, Michael	Bosun
14.	Peper, Sven	MP Rating/D 2
15.	Dannhauer, Darius	MP Rating/D 3
16.	Buchholz, Joscha	MP Rating/D 5
17.	Köpnick, Ulrich	MP Rating/D 7
18.	Johns, Björn	MP Rating/D 8
19.	Schade, Tom	MP Rating/D1
20.	Schwarz, Uwe	MP Rating/M 1

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<b>No.</b>	<b>Name</b>	<b>Rank</b>
21.	Thiele, Linus	MP Rating/M 2
22.	Meier, Jan	MP Rating/M 3
23.	Clasen, Nils	MP Rating/M 4
24.	Hansen, Jan Nils	MP Rating/M 5
25.	Plehn, Marco Markus	Fitter/E 1
26.	Erlenbach, Colin	App.MP 1
27.	Schnieder, Sven	Cook 1
28.	Martens, Michael	2nd Cook 1
29.	Baade, Paul	2nd Cook 2
30.	Krause, Tomasz	C/Stwd. 1
31.	Pommerencke, Kerstin	Stwd./KS
32.	Pieper, Daniel	2nd Stwd. 2
33.	Bachmann, Julia Maria	2nd Stwd. 3
34.	Hu, Guo Yong	2nd Stwd. 4
35.	Shi, Wubo	2nd Stwd. 5
36.	Chen, Quanlun	2nd Stwd. 6
37.	Goessmann - Lange, Petra	Doc. 1

