

EXPEDITION PROGRAMME
PS145/1 and PS145/2

Polarstern

PS145/1 and PS145/2

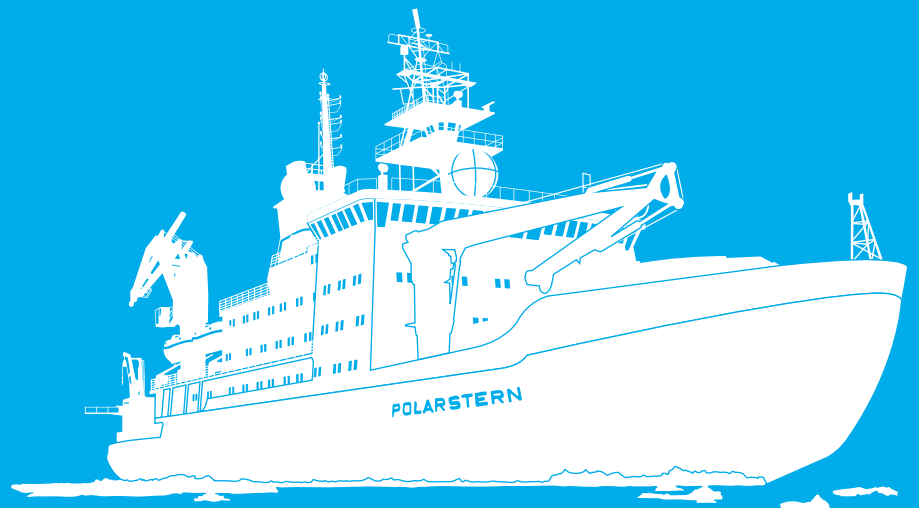
Bremerhaven - Las Palmas - Walvis Bay

24 November 2024 - 21 December 2024

Coordinator: Ingo Schewe

Chief Scientist PS145/1: Claudia Hanfland

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HELMHOLTZ

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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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24 November 2024 – 21 December 2024

Bremerhaven – Walvis Bay

**Chief scientists
Claudia Hanfland
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**Natalie Cornish
(PS145/2 Las Palmas – Walvis Bay)**

**Coordinator
Ingo Schewe**

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1. ÜBERBLICK UND EXPEDITIONSVERLAUF

Claudia Hanfland, Natalie Cornish

DE.AWI

Der Fahrtabschnitt PS145/1 ist der erste Abschnitt der antarktischen Forschungs-Saison 2024/25. Die Expedition PS145 startet in Bremerhaven am 24.11.2024 und endet am 21.12.2024 in Walvis Bay, Namibia (Abb. 1). Am 25.11.2024 wird ein Zwischenstopp in Rotterdam stattfinden, um Treibstoff zu bunkern. Ein zweiter Zwischenstopp wird am 05.12.2024 in Las Palmas stattfinden, der die Fahrt in die Abschnitte PS145/1 und PS145/2 gliedert.

Während PS145 werden folgende Messungen und Tätigkeiten durchgeführt:

1. Bathymetrische Vermessung des Meeresbodens mit den schiffseigenen hydroakustischen Systemen. Die Gesamt-Fahrtzeit von vier Wochen umfasst insgesamt zwei Tage Stationszeit für die regelmäßige Kalibration der Echolotsysteme mittels CTD.
2. Tägliche Wetterbeobachtungen und -vorhersagen durch den Deutschen Wetterdienst.
3. Reparatur- und Prüfarbeiten durch die Schiffslogistik und die Reederei Laeisz.

Während des Abschnitts PS145/1 finden zudem folgende Tätigkeiten statt:

4. POLMAR-TRAIN: Masterstudent:innen der Universitäten Bremen und Potsdam (jeweils Fachbereich Geowissenschaften) sowie Doktorand:innen des AWI nehmen an einer Ausbildung in geophysikalischen Methoden an den hydroakustischen Messsystemen teil. Neben den bathymetrischen Vermessungen mit dem Fächerecholot „Hydrosweep“ wird die Gruppe den Sedimentaufbau der oberen Schichten des Meeresbodens mit dem parametrischen Sedimentecholot Parasound vermessen.

Während des Abschnitts PS145/2 werden zudem:

5. Mitglieder des *Polarstern II* Teams den Fahrtabschnitt zum besseren Kennenlernen des Schiffs und seinen Abläufen begleiten.

Für den Abschnitt PS145/2 verbleiben die Mitglieder des Deutschen Wetterdienstes sowie der Bathymetrie an Bord. Die Teilnehmer:innen des studentischen Trainings gehen in Las Palmas von Bord. Die Teilnehmer:innen des *Polarstern II*-Teams steigen in Las Palmas auf.

SUMMARY AND ITINERARY

PS145/1 marks the first leg of the 2024/25 Antarctic research season. Expedition PS145 will begin in Bremerhaven on 24 November 2024 and end on 21 December 2024 in Walvis Bay, Namibia (Fig. 1). One stop is planned on 25 November in Rotterdam, to bunker fuel. A second stop will be made in Las Palmas, Spain, on 5 December 2024, marking the end of PS145/1 and the start of PS145/2.

The following activities will be carried out on PS145:

1. Bathymetric data collection using *Polarstern*'s acoustic instruments. The expedition's four-week schedule entails a total of 2 days (48 hours) of station time wherein regular CTDs will be taken.
2. Daily weather reports and forecasts are provided by the German Weather Services (DWD).
3. Repair and inspection work by ship logistics and the Laeisz shipping company.

The following additional activities are planned for leg one (PS145/1):

4. POLMAR-TRAIN: Master students completing programs in geosciences at the University of Bremen and Potsdam, as well as doctoral students at AWI will participate in a two-week training course on geophysical, hydroacoustic mapping techniques. The group will map bathymetry, as well as the upper layers of sediment, using the "Hydrosweep" multibeam echosounder and "Parasound" sub-bottom profiler on board.

The following additional activities are planned for leg two (PS145/2):

5. Members of the *Polarstern II* team will familiarize themselves with the ship and its procedures.

Individuals from the bathymetry and the German weather service working groups will remain on board for leg two (PS145/2). All students taking part in the POLMAR training will disembark in Las Palmas. The *Polarstern II* participants will all embark in Las Palmas.

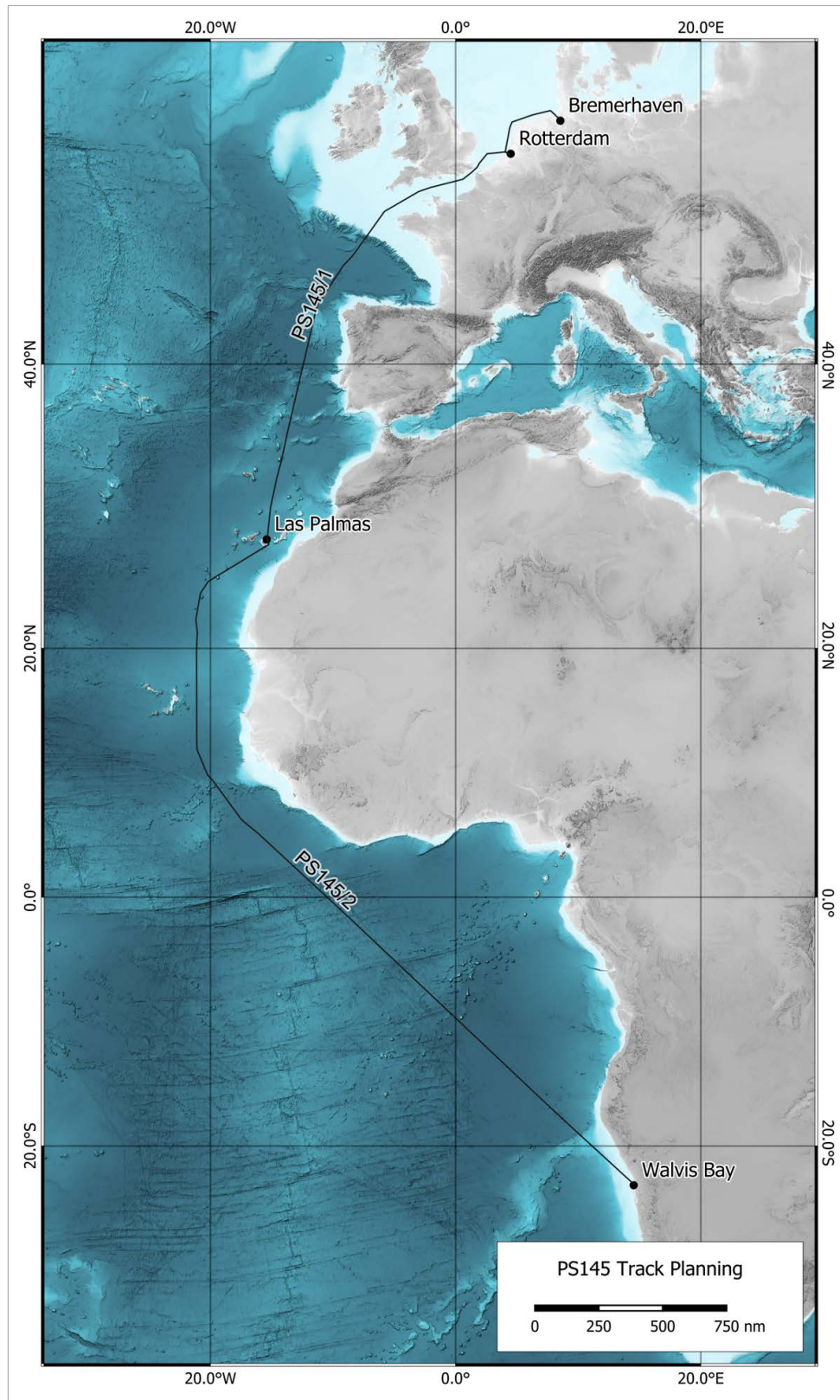


Abb. 1: Geplanter Fahrtverlauf der Expedition PS145/1 und PS145/2

Fig. 1: Planned cruise track of expedition PS145/1 und PS145/2

2. ECHOSOUNDING TRAINING POLMAR-TRAIN

Claudia Hanfland, Tabea Altenbernd-Lang,
Bernhard Diekmann, Estella Weigelt

DE.AWI

Grant-No. AWI_PS145_01

Objectives

The project POLMAR-TRAIN is a training course jointly run by the AWI-based Helmholtz Graduate School for Polar and Marine Research (POLMAR) and the Universities of Bremen and Potsdam and their Departments of Geosciences.

It offers Master students and doctoral candidates from geosciences and related disciplines a hands-on training in operating the hull-mounted echosounding systems of *Polarstern* (multibeam echosounder Teledyne Reson HYDROSWEEP DS3 and sediment echosounder Parasound P70). Both systems will be operated continuously between Bremerhaven and Las Palmas. The course is part of the programme “Master of Sciences Marine Geosciences” at the University of Bremen. This ship-based training complements the PhD education offered by POLMAR. Students will be trained in data acquisition, evaluation, interpretation and visualisation with *en route* collected examples as well as published case studies. This training format has been carried out every other year since 2014.

Work at sea

After embarkation, students will start with a half-day introduction to get familiar with the principles of hydro-acoustic data acquisition, to learn how to use the required software and to know how to operate the echosounding systems. Participants will be trained in all parts of the systems and go on watches in 4-hours shifts. They will learn about sediment properties, reflector horizons, bottom topography and the principles of sediment acoustics.

Practical training on the systems will be complemented through plenary lectures and software training in smaller groups to discuss published case studies. Being able to combine and interpret sediment core and multibeam-bathymetric data with Parasound profiles is a further learning outcome. The training is complemented by exercises in sediment microscopy.

Participants will also be introduced to survey planning, data handling, editing, and visualization with different kind of profiling and GIS mapping software. Being able to produce a map from originally raw data will be one of the outcomes participants can “take home”.

Station time will comprise a CTD cast in the Bay of Biscay. Time permitting, the sound velocity profiler will be deployed for calibration purposes.

Besides the watch duties and learning sessions, students will prepare a group presentation on a selected geographical area along the cruise track.

Given the composition of participants (both Master and PhD students), participants will greatly benefit from each other. By experience we know that peer-learning is an added value in every course. Working and living together on a ship will foster this exchange. Master students can

further clarify their motivation for their next career step, e.g. whether following a PhD is an option for them.

This training is generously supported by funding through the Nippon Foundation – GEBCO Seabed 2030 Project.

Preliminary (expected) results

Expected results will consist of high-resolution seabed and sedimentary maps along the cruise track.

Data management

Environmental data will be archived, published and disseminated according to international standards by the World Data Center PANGAEA Data Publisher for Earth & Environmental Science (<https://www.pangaea.de>) within two years after the end of the cruise at the latest. By default, the CC-BY license will be applied. Furthermore, bathymetric data will be provided to the Nippon Foundation – GEBCO Seabed 2030 Project.

This training will contribute to the Helmholtz Research Programme “Changing Earth – Sustaining our Future” Topic 2.

In all publications based on this expedition, the Grant No. AWI_ PS145_01 will be quoted and the following publication will be cited:

Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (2017) Polar Research and Supply Vessel POLARSTERN Operated by the Alfred-Wegener-Institute. Journal of large-scale research facilities, 3, A119. <http://dx.doi.org/10.17815/jlsrf-3-163>.

3. BATHYMETRIC UNDERWAY MEASUREMENTS

Simon Dreutter, Natalie Cornish, Tea Isler DE.AWI
not on board: Boris Dorschel-Herr

Grant-No. AWI_PS145_02

Objectives

High-resolution bathymetry is a key dataset required to understand many marine processes, and is particularly important when interpreting scientific data in a spatial context. Bathymetry contains valuable information on geomorphological features at various spatial scales, from isolated, individual features like knolls or seamounts, to those across large spatial expanses like sand waves or contourites. The spatial nature of bathymetric data means that it also provides context to the broader environment being studied. Further, bathymetry can enhance our knowledge of geological processes such as erosion, sediment transport or even tectonics. In addition to the multibeam swath bathymetry, high-resolution sub-bottom profiler transects reveal insights on subsurface sediment composition and characteristics.

Although global maps give the impression that seafloor topography has been fully mapped, most of the world's ocean floor remains unmapped by hydroacoustic systems. In regions lacking such hydroacoustic measurements, bathymetry is modelled from satellite altimetry which is characterized by relatively low spatial and temporal resolutions, when compared with hydroacoustic data. Bathymetry derived from satellite altimetry thus lacks the resolution necessary to resolve small- to meso-scale geomorphological features (e.g. sediment waves, glacial features and small seamounts). Ship-borne multibeam data provide bathymetric information in a resolution sufficient to resolve those features. The collection of underway data during PS145 will contribute to the bathymetry data archive at AWI, which, in turn, contributes to global bathymetric datasets such as GEBCO (General Bathymetric Chart of the Ocean).

Work at sea

Bathymetric data will be recorded with the Teledyne Reson *HYDROSWEEP DS3*, which is a hull-mounted multibeam echosounder. The bathymetry working group's primary task is to operate hydroacoustic systems during transit. Additionally, sound velocity profiles will be collected via CTD (Conductivity, Temperature, Depth) measurements, underway CTDs, or via SVP (Sound Velocity Profiler) whenever possible. These calibrate the raw bathymetric data by correcting for sound velocity changes in the water column. All multibeam data collected will also be cleaned for erroneous soundings and artefacts.

Preliminary (expected) results

The expected results are high-resolution seabed maps along the cruise track.

Data management

Geophysical and oceanographic data will be archived, published and disseminated according to international standards by the World Data Center PANGAEA Data Publisher for Earth & Environmental Science (<https://www.pangaea.de>), within two years after the end of the cruise at the latest. By default, the data will fall under a CC-BY license. Furthermore, bathymetric data will be provided to the Nippon Foundation – GEBCO Seabed 2030 Project.

This expedition is supported by the Helmholtz Research Programme “Changing Earth–Sustaining our Future” Topic 2, Subtopic 3 Sea Level Change.

In all publications based on this expedition, the **Grant No. AWI_ PS145_02** will be quoted and the following publication will be cited:

Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (2017) Polar Research and Supply Vessel POLARSTERN Operated by the Alfred-Wegener-Institute. Journal of large-scale research facilities, 3, A119. <http://dx.doi.org/10.17815/jlsrf-3-163>.

4. REORGANISATION OF METEOROLOGICAL OBSERVATORY AND TASKS

Holger Schmithüsen, Loretta Preis

DE.AWI

Grant-No. AWI_PS145_00

Objectives

In the new contract between German Weather Forecast (Deutscher Wetterdienst – DWD) and AWI regulating services on board *Polarstern*, the position of Weather Radio Technician (Wetterfunktechniker – WFT) was cancelled. PS145/1 will be the last cruise whereat a WFT of DWD will participate. For this reason, the tasks of WFT have been reorganized.

Work at sea

The WFT was responsible for all sensors and devices measuring and processing meteorological data. AWI staff and crew electronic technician will execute these tasks furthermore. For that reason, several hard and software components have been adjusted. To confirm that the new configuration works properly, operation and tests under real conditions are necessary. The WFT will assist in the tests.

From now on, the nautical officers will make synoptic observations and will enter the data into acquisition tool TuboWin+. The AWI meteorologists will train the nautical officers handling the tool. Nautical officers and meteorologists will confirm guidelines to make observations.

5. TEST OPERATION OF NEW OR RECONDITIONED DEVICES

Andreas Pluder¹, Brieuc Crenan¹, Uwe Hähnel²

¹DE.Laeisz, ²DE.MWB

Grant-No. AWI_PS145_00

Objectives

Several scientific devices have been maintained, repaired or replaced by new ones during shipyard before the cruise. To confirm, that all services were executed successfully, the systems will be tested under real conditions.

Work at sea

The compressor device used for seismic operations was overhauled. As this issue needs complete shipyard time and will be completed short before departure, the tests must be executed during the cruise.

The scientific X band radar system must be renewed, as no spare parts for old system are available anymore. As it is not allowed to operate the radar system in the harbor, all tests will be executed during the cruise.

A new water analyzing system *FerryBox* was installed to replace old system. To avoid soiling the system by dirty harbor water, the initial tests have been executed with fresh water. To confirm that the sea water supply is working proper and the sensors measure plausible data, the test will be repeated on sea.

A leakage in the pCO₂ analyzer had occurred during last season and has been repaired during shipyard. Equal to *FerryBox* a final test with seawater can be executed only at sea.

6. OBSERVATION OF ROUTINE SHIP OPERATIONS *POLARSTERN* BY THE *PSII* TEAM

Tobias Boebel

DE.AWI

Objectives

Part of the team handling the acquisition and build of *Polarstern II* will be participating in PS145/2. This group, consisting of marine engineers, scientists and *PSII* administration officials, will observe both the technical and scientific, as well as everyday ship operations. The goal is to validate the design plans for the new ship and to transfer 40 years of valuable experience and know-how in operating the *Polarstern* to the procurement procedure and build of *Polarstern II*. To achieve this the team will observe every day ship operations and engage with the crew. A close inspection of all regions of the ship will be conducted, focusing on laboratories, working spaces, technical infrastructure and storage spaces. Special themes, including inventory, spare parts, the hull, superstructure, the interior design, nautical and communications equipment, scientific equipment and infrastructure as well as the management of the data flow.

Work at sea

The team will be observing and recording the day-to-day ship operation and will engage in Q&A with the crew and the ships officers. This will happen for all of the major areas of ship operation, will be recorded and finally verified by the responsible crew. Because the team is only serving in an observational capacity on board, no scientific work will be performed on board.

Expected results:

All insights will benefit the procurement procedure and building phase of the new *Polarstern*.

Data management:

The team on board will report back to the *PSII* team. Because of the nature of the public procurement procedure all communication will be classified and not be generally accessible. No scientific data will be generated/published.

APPENDIX

A.1 TEILNEHMENDE INSTITUTE / PARTICIPATING INSTITUTES

A.2 FAHRTTEILNEHMER:INNEN / CRUISE PARTICIPANTS

A.3 SCHIFFSBESATZUNG / SHIP'S CREW

A.1 TEILNEHMENDE INSTITUTE / PARTICIPATING INSTITUTES

Affiliation	Address
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
DE.LAEISZ	Reederei F. Laeisz GmbH Bartelstraße 1 27570 Bremerhaven Germany
DE.MWB	MWB Elektrotechnik Service GmbH Rudloffstr. 49 27568 Bremerhaven Germany
DE.SHIPDESIGN	SDC Ship Design & Consult GmbH Bramfelder Str. 164 22305 Hamburg Germany
DE.UNI-Bremen	Universität Bremen Klagenfurter Straße 2-4 28359 Bremen Germany
DE.UNI-Potsdam	Universität Potsdam Am Neuen Palais 10 14469 Potsdam Germany

A.2 FAHRTTEILNEHMER:INNEN / CRUISE PARTICIPANTS

PS145/1 Bremerhaven – Las Palmas				
Name/ Last name	Vorname/ First name	Institut/ Institute	Beruf/ Profession	Fachrichtung/ Discipline
Altenbernd-Lang	Tabea	DE.AWI	Scientist	Geophysics
Amezcu Montiel	Abril	DE.AWI	PhD student	Geology
Berghöfer	Mai-Britt	DE.UNI-Potsdam	Student (Master)	Geosciences
Cornish	Natalie Roslyn	DE.AWI	Scientist	Geophysics
Crenan	Brieuc	DE.LAEISZ	Engineer	Shipping Company
Diekmann	Bernhard	DE.AWI	Scientist	Geology
Dreutter	Simon	DE.AWI	Technician	Geophysics
Eberlin	Lara	DE.UNI-Bremen	Student (Master)	Geosciences
Fuchs	Lea Tabea Antonia	DE.UNI-Bremen	Student (Master)	Geosciences
Gagliardi	Alessandro	DE.AWI	PhD student	Physics
Güntzel	Janina	DE.AWI	PhD student	Geology
Gatti	Ludovica Martina	DE.UNI-Potsdam	Student (Master)	Geosciences
Hähnel	Uwe	DE.MWB	Engineer	Shipping Company
Hanfland	Claudia	DE.AWI	Scientist	Geology
Hine	Amelia	DE.AWI	Postdoc	Geosciences
Isler	Tea	DE.AWI	PhD student	Geophysics
Krause	Timo	DE.AWI	PhD student	Geophysics
Künzig	Sophia	DE.UNI-Potsdam	PhD Student	Geosciences
Lenz	Kilian Theo	DE.UNI-Potsdam	Student (Master)	Geophysics
Luo	Lingyan	DE.AWI	PhD student	Geophysics
Oliveira Matos	Fernanda	DE.AWI	PhD student	Oceanography
Otte	Frank	DE.DWD	Scientist	Meteorology
Pluder	Andreas	DE.LAEISZ	Engineer	Shipping Company
Providence	Enowyeket Enow	DE.UNI-Bremen	Student (Master)	Geophysics
Riemann- Campe	Kathrin	DE.AWI	Scientist	Data Sciences
Schmithüsen	Holger	DE.AWI	Scientist	Meteorology
Schopen	Lasse Johannes	DE.UNI-Bremen	Student (Master)	Geophysics
Senger	Diren	DE.AWI	Postdoc	Data Sciences
Suter	Patrick	DE.DWD	Scientist	Meteorology

PS145/1 Bremerhaven – Las Palmas				
Name/ Last name	Vorname/ First name	Institut/ Institute	Beruf/ Profession	Fachrichtung/ Discipline
Terschlüsen	Jakob	DE.UNI-Potsdam	Student (Master)	Geosciences
Thorneloe	Alexander	DE.AWI	PhD student	Physics
Thulaseedharan Nair Seema Nair	Rohith	DE.UNI-Bremen	Student (Master)	Geosciences
Weigelt	Estella	DE.AWI	Scientist	Geophysics

PS145/2 Las Palmas – Walvis Bay				
Name/ Last name	Vorname/ First name	Institut/ Institute	Beruf/ Profession	Fachrichtung/ Discipline
Boebel	Tobias	DE.AWI	Scientist	Logistics
Cornish	Natalie Roslyn	DE.AWI	Scientist	Geophysics
Dreier	Stefanie	DE.AWI	Technician	Logistics
Haeusler	Sandra	DE.AWI	Technician	Logistics
Isler	Tea	DE.AWI	PhD student	Geophysics
Koch	Florian	DE.AWI	Scientist	Biology
Kropp	Annika	DE.AWI	Other	Public Outreach
Mariensfeld	Thomas	DE.LAEISZ	Engineer	Shipping Company
Schartow	Matthias	DE.AWI	Technician	Logistics
Trautmann	Michael	DE.DWD	Engineer	Logistics
Utech	Sabine	DE.LAEISZ	Inspector	Shipping Company
Weil	Jörg	DE.SHIPDESIGN	Observer	Logistics

A.3 SCHIFFSBESATZUNG / SHIP'S CREW PS145/1

No.	Position/ Rank	Nachname/ Last name	Vorname/ First name
1	Master (P)	Kentges	Felix
2	Chief Mate (P)	Langhinrichs	Jacob
3	Chief Mate Cargo (P)	Janik	Michael
4	2nd Mate (P)	Hering	Igor
5	2nd Mate (P)	Rathke	Wulf
6	Doctor	Goessmann-Lange	Petra
7	Chief Engineer (P)	Grafe	Jens
8	2nd Engineer (P)	Baehler	Stefanie
9	2nd Engineer (P)	Brose	Thomas
10	2nd Engineer (P)	Farysch	Tim
11	2nd Engineer (P)	Loske	Sven
12	Electrical Engineer – Communication (P)	Hofmann	Joerg
13	Electrical Engineer (P)	Ejury	René
14	Electrical Engineer (P)	Huettenbraeucker	Olaf
15	Electrical Engineer (P)	Jaeger	Vladimir
16	Electrical Engineer (P)	Pliet	Johannes
17	Electrical Engineer (P)	Redmer	Jens
18	Bosun	Sedlak	Andreas
19	FA/D	Ackenhausen	Hendrik
20	FA/D	Burzan	Gerd-Ekkehard
21	FA/D	Deutschbein	Felix Maximilian
22	FA/D	Fischer	Sascha
23	FA/D	Klaehn	Anton
24	FA/D	Klee	Philipp
25	FA/D	Kryszkiewicz	Maciej
26	FA/D	Roeth	Benedikt
27	FA/M	Haenert	Ove
28	FA/M	Juszczuk	Michal

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No.	Position/ Rank	Nachname/ Last name	Vorname/ First name
29	FA/M	Klinger	Dana
30	FA/M	Muenzenberger	Boerge
31	FA/M	Schroeder	Paul
32	Carp.	Neisner	Winfried
33	Fitter/E	Preussner	Joerg
34	Cook	Hofmann	Werner
35	2./Cook	Dietrich	Emilia
36	2./Cook	Hammelmann	Louisa
37	C/Stew.	Pieper	Daniel
38	Steward(ess) / Nurse	Schwantes	Andrea
39	2./Stew.	Arendt	René
40	2./Stew.	Braendli	Monika
41	2./Stew.	Chen	Dansheng
42	2./Stew.	Cheng	Qi
43	2./Stew.	Dibenau	Torsten
44	2./Stew.	Tiesler	Anja

A.3 SCHIFFSBESATZUNG / SHIP'S CREW PS145/2

No.	Position/ Rank	Nachname/ Last name	Vorname/ First name
1	Master (P)	Kentges	Felix
2	Chief Mate (P)	Langhinrichs	Jacob
3	Chief Mate Cargo (P)	Janik	Michael
4	2nd Mate (P)	Hering	Igor
5	2nd Mate (P)	Rathke	Wulf
6	Doctor	Goessmann-Lange	Petra
7	Chief Engineer (P)	Grafe	Jens
8	2nd Engineer (P)	Baehler	Stefanie
9	2nd Engineer (P)	Brose	Thomas
10	2nd Engineer (P)	Farysch	Tim
11	Electrical Engineer – Communication (P)	Hofmann	Joerg
12	Electrical Engineer (P)	Huettebraeucker	Olaf
13	Electrical Engineer (P)	Jaeger	Vladimir
14	Electrical Engineer (P)	Pliet	Johannes
15	Electrical Engineer (P)	Redmer	Jens
16	Bosun	Sedlak	Andreas
17	FA/D	Ackenhausen	Hendrik
18	FA/D	Burzan	Gerd-Ekkehard
19	FA/D	Deutschbein	Felix Maximilian
20	FA/D	Fischer	Sascha
21	FA/D	Klaehn	Anton
22	FA/D	Klee	Philipp
23	FA/D	Kryszkiewicz	Maciej
24	FA/D	Roeth	Benedikt
25	FA/M	Haenert	Ove
26	FA/M	Juszczuk	Michal
27	FA/M	Klinger	Dana
28	FA/M	Muenzenberger	Boerge

Expedition Programme PS145/2

No.	Position/ Rank	Nachname/ Last name	Vorname/ First name
29	FA/M	Schroeder	Paul
30	Carp.	Neisner	Winfried
31	Fitter/E	Preussner	Joerg
32	Cook	Hofmann	Werner
33	2./Cook	Dietrich	Emilia
34	2./Cook	Hammelmann	Louisa
35	C/Stew.	Pieper	Daniel
36	Steward(ess) / Nurse	Schwantes	Andrea
37	2./Stew.	Arendt	René
38	2./Stew.	Braendli	Monika
39	2./Stew.	Chen	Dansheng
40	2./Stew.	Cheng	Qi
41	2./Stew.	Dibenau	Torsten
42	2./Stew.	Tiesler	Anja

