Annual Report 2024/2025

INTERNATIONAL POLAR FOUNDATION

Toccata Lake, southwest of Utseinen.

CONTENTS

LETTER FROM THE CHAIRMAN

The International Polar Foundation's achievements of the last year, have maintained, and even surpassed the pace of previous years.

The Foundation has continued to make strides in reducing the environmental footprint of polar research. The IPF has supported creative talents in increasing engagement with the general public and policymakers, and is committed to educating young people about the polar regions and adopting sustainable practices.

The 2024-25, Belgian Antarctic Research Expedition (BELARE) supported new and exciting research initiatives involving scientists and support staff from over a dozen countries. Scientific research at the Princess Elisabeth Antarctica during the 2024-25 season was carried out in challenging conditions, from the ice shelf up, to the near plateau, and from the Monts Belgica to the Nils LarssenFjella.

The ULTIMO team were able to reach the Belgica Mountains thanks to the assistance of the SWIDA RINGS project which ferried the camp to the blue ice fields where they were able to look for meteorites in an area first visited by the Belgian expedition of 1958-59. The field guide of the team even found a note which had been sitting on the ice for 75 years when an ultra-light plane piloted by the Prince de Ligne crashed in the Belgica Mountains. We extend our heart-felt gratitude to the SWIDA RINGS team for this display on international cooperation in the interests of scientific research.

The FROID project, in turn, made great progress in their quest for the oldest ice. By studying the areas where blue ice is formed it is hoped to be able to identify ice which has become sequestered in one area and does not advance towards the ocean, but instead accumulates over millennia. Searching for million-year-old ice, and hunting for meteorites can provide clues about the formation of our solar system.

In addition to this, scientists from the University of California at Irvine were on the ice-shelf at the area where this adjoins the continent. Observing and better understanding the behaviour of ice shelves in response to a warming ocean, learning more about the ice mass balance of the ice sheet in Antarctica, monitoring seismic activity, collecting weather and climate data to contribute to models and forecasting, provides insight into the rate and direction of ice melt and consequently to sea level rise. A young post graduate even presented the defence of his doctoral thesis while still in Antarctica, thanks to the satellite communications capabilities on site. This was a first for Princess Elisabeth Station, which has routinely provided classes for students of all ages, from Antarctica but has not reached this level before. Scientists around the Princess Elisabeth Station continued to monitor geomagnetic,

seismic and atmospheric conditions. Instruments are also monitoring ozone radiation and a space weather, recording aurora phenomena.

In December 2024, a young engineering team successfully carried out a proof of concept project, and produced green hydrogen from wind and solar energy for the first time at the Princess Elisabeth Antarctica. This hydrogen was used instead of helium for weather balloon launches. This initiative was important in establishing the feasibility of the production of hydrogen on a small scale from the excess energy produced at the Princess Elisabeth Station. It remains to be seen how well this can be scaled up to useful quantities for station operations.

In the North, given the evolving geopolitical situation at the higher latitudes, the annual “Arctic Futures Symposium”, organised in conjunction with more than a dozen Arctic stakeholder partners, provided a valuable forum for discussion in the heart of Europe. The 2024 event attracted more than 200 people for lively discussions on several issues including Arctic geopolitics and security; attracting and keeping a skilled Arctic workforce; critical raw materials and supply chains; youth issues; innovation, entrepreneurship, and Arctic community well-being. The symposium also saw a record number of side events as our Arctic partner countries and peoples enriched Brussels with lively and vibrant cultural events such as the annual Arctic Shorts film evening and a screening of the feature-length documentary about Inuk lawyer Aaju Petersen’s inspiring life journey, “Twice Colonized”. The Laurence Trân Prize was also awarded to young Arctic entrepreneurs for the third time.

Closer to home saw the opening of the “To the Antarctic” exhibition, curated by the MAS museum in Antwerp, Belgium recounting the first scientific overwintering expedition to Antarctica led by Adrien de Gerlache, and showcasing the work done by IPF and scientists today at the Princess Elisabeth Antarctica. The Exhibition drew an impressive 45,000 visitors over its four-and-a half-month run, which concluded in November 2024. Interest in the polar regions is as strong as ever.

In February 2025, the avant-première was held of the documentary film “2050” directed by Eric Goens of the production company Bargoens. This beautifully filmed documentary captures the work of researchers in Antarctica as they battle to establish how the climate will evolve in the coming decades. This is a question that concerns every human being on this planet, as we will all be affected by the evolution of the climate system and the impacts of warming of our fragile biosphere.

IPF educational activities continue to stimulate interest in STEM subjects in young minds, whether at science festivals targeted at young people or leading engaging online or in-person presentations for school classes.

While we take pride in these accomplishments, it is equally important to keep focused on our bold goals for the future. In spite of the current difficult geopolitical situation, climate change remains a long-term threat to humanity. Scientists believe that 2024 was likely the first year to surpass an average global temperature of 1.5°C above pre-industrial levels - the target below which the planet must stay in order to avoid the worst consequences of climate change. This continuous warming contributes to the severity of extreme weather events. Rising temperatures are altering the global water cycle, leading to more intense floods and prolonged droughts, which unfortunately can have deadly consequences. Rampant wildfires have affected Chile, Canada, the western United States and the Amazon Basin.

We are the only species on this planet who is able to understand that we need to make changes to ensure our long-term survival.

We believe that the quest to further reduce the carbon footprint of Antarctic research, and to reduce the wider impact of other human activities must be confronted with intelligence and creativity. The Foundation will continue to examine potential routes to the reduction of environmental impacts, whether through energy management or through the optimal management of water and other resources. This approach is designed to create a mind-set which seeks to bring about a change in consumption patterns aimed at mitigating the runaway processes currently fuelling and exacerbating the extreme climate phenomena. The IPF will seek to collaborate with researchers from all over the world to lead us to make informed decisions for the future.

THE INTERNATION POLAR FOUNDATION

CONNECTING SCIENCE TO SOCIETY

The International Polar Foundation supports polar scientific research for the advancement of knowledge, evidence-based decision making on climate change, and the development of a sustainable society.

Founded by Belgian polar explorer Alain Hubert, Prof. Hugo Decleir, and Prof. André Berger in 2002, the Brussels-based International Polar Foundation provides a novel interface between science and society.

It was recognized by executive order as a private foundation with a public service mandate in 2002.
HM King Philippe is the International Polar Foundation's Honorary President since 2002.

MISSION AND VISION

The Foundation seeks to bring about a keener appreciation of the role of science in evidence-based decision making. In particular, research in the Polar Regions, allows a thorough examination of the planet's interconnections, its fragility, the impact of human actions on the environment, and the evolution of millennial climate cycles.

To achieve its aims, the Foundation has initiated several high-profile projects, including supporting polar science through the creation and operation of the Zero Emissions Princess Elisabeth Antarctica station, which runs entirely on renewable energy. In this, the IPF partners with the Belgian state through the Belgian Polar Secretariat.

The IPF also supports scientists working in Antarctica, directly in field research and development of technical support actions, and indirectly through initiatives such as the fellowship awards for Antarctic researchers, an annual symposium on Arctic issues, organisation of seminars, exhibitions and installations, and development of science and education websites, offering classroom activities and multi-media resources for bolstering STEM learning.

Berthing of the supply ship along the coast of the King Baudouin Ice Shelf (Queen Maud Land).

THE BELGIAN POLAR SECRETARIAT

The Belgian Polar Secretariat is a public-private partnership, which is comprised of six representatives of Belgian ministries (cabinet level) and six representatives of the private sector nominated by the IPF.

Every year, the IPF and the polar secretariat sign an agreement setting out the terms and conditions of the partnership, in line with the original protocol signed in 2010.

This includes operations (logistics, station maintenance and science support) and representation of the Belgian state at certain international coordination meetings, such as the DROMLAN (the Dronning Maud Land Air Network), and the COMNAP (Committee of Managers of National Antarctic Programs).

The IPF also works closely with the different ministries involved in Antarctic matters, in particular the SPF Environment, which is responsible for permitting the activity in Antarctica in line with the Madrid protocol and its enabling legislation.

The IPF submits a permit request to the Belgian competent authorities in collaboration with the Belgian polar secretariat every year, and provides an end of mission environmental impact and mitigation report in line with the conditions of the environmental permit.

Field camp of the ULTIMO expedition at the foot of Mount Belgica.

BELGIAN ANTARCTIC RESEARCH EXPEDITION

BELARE 2024-25

In spite of encountering a few logistical challenges, the 2024-2025 Belgian Antarctic Research Expedition (BELARE) was another resounding success.

With lots of planning, preparation and will, our team is always able to navigate and overcome obstacles and unexpected situations to succeed in assisting the teams of scientists from numerous nations at the station this year to carry out their field work as planned.

Two of the larger research projects this past season were the BELSPO funded ULTIMO and FROID research teams each spent over four continuous weeks at their remote field site's, studying the snow, ice, and origins of the cosmos. Each four-person research team was supported by two IPF field guides that spent the entirety of the expedition supporting the research teams in whatever capacity was needed.

Additionally, there were 15 other research projects taking place at or in the vicinity of the Princess Elisabeth Antarctica during the 2024-2025 BELARE season. There were a total of eight scientific projects funded by the Belgian Federal Science Policy Office (BELSPO), and nine research projects funded by public money from other countries and private organisations. All research projects played a vital role in expanding our understanding in the fields of atmospheric sciences, climatology, paleoclimatology, glaciology, microbiology, meteoritics and cosmochemistry.

Scientists disembark and food supplies are unloaded from the Basler soon after arriving at the the Princess Elisabeth Antarctica airstrip.

Unloading cargo from the Ultima Antarctic Expeditions IL-76 Ilyushin, just arrived from Cape Town.

ACTIVITIES OF THE IPF

Furthermore, this season saw the first production of green hydrogen - produced using 100% wind and solar energy to power the electrolysis of water to produce hydrogen and oxygen gas - at the princess Elisabeth Antarctica. While the produced quantity was relatively smalltion level was small thethis first year and was used to fill weather balloons, in the coming years the IPF team of engineers will experiment with using hydrogen in various ways including as to power vehicles and as a backup energy source, further reducing the carbon footprint of scientists working at the station.

Also during the 2024-2025 season a few members of our team worked to complete infrastructure at Perseus International Airfield, including the installation of 120 solar panels and supporting battery infrastructure to power the main hangar at the facility.

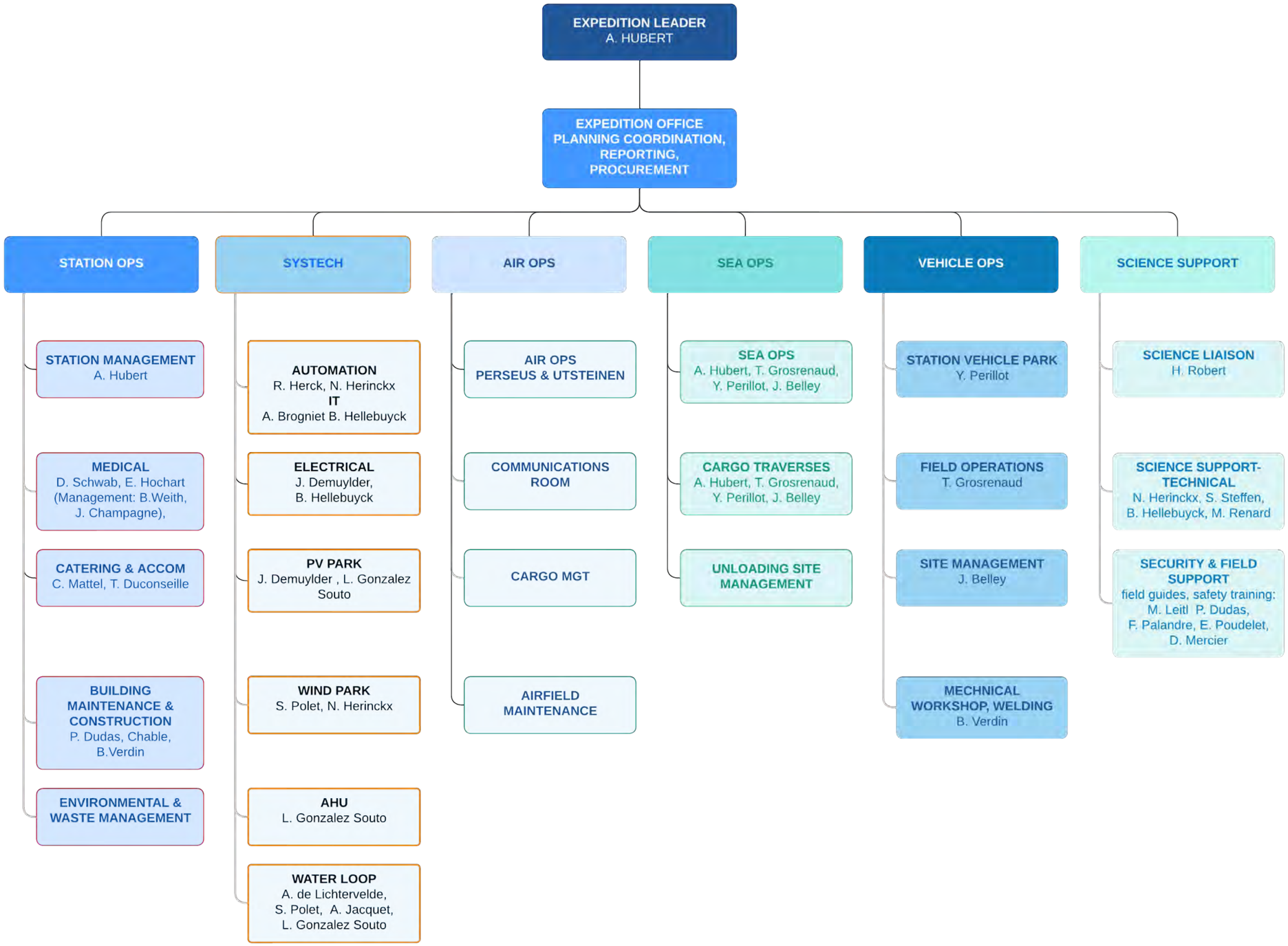
This site is now 100% operational and ready to support a small operationals team as well as planes andscientists that may need logistical support in the Queen Maud Land region of East Antarctica.

Communication and outreach have always been key pillars of the International Polar Foundation.

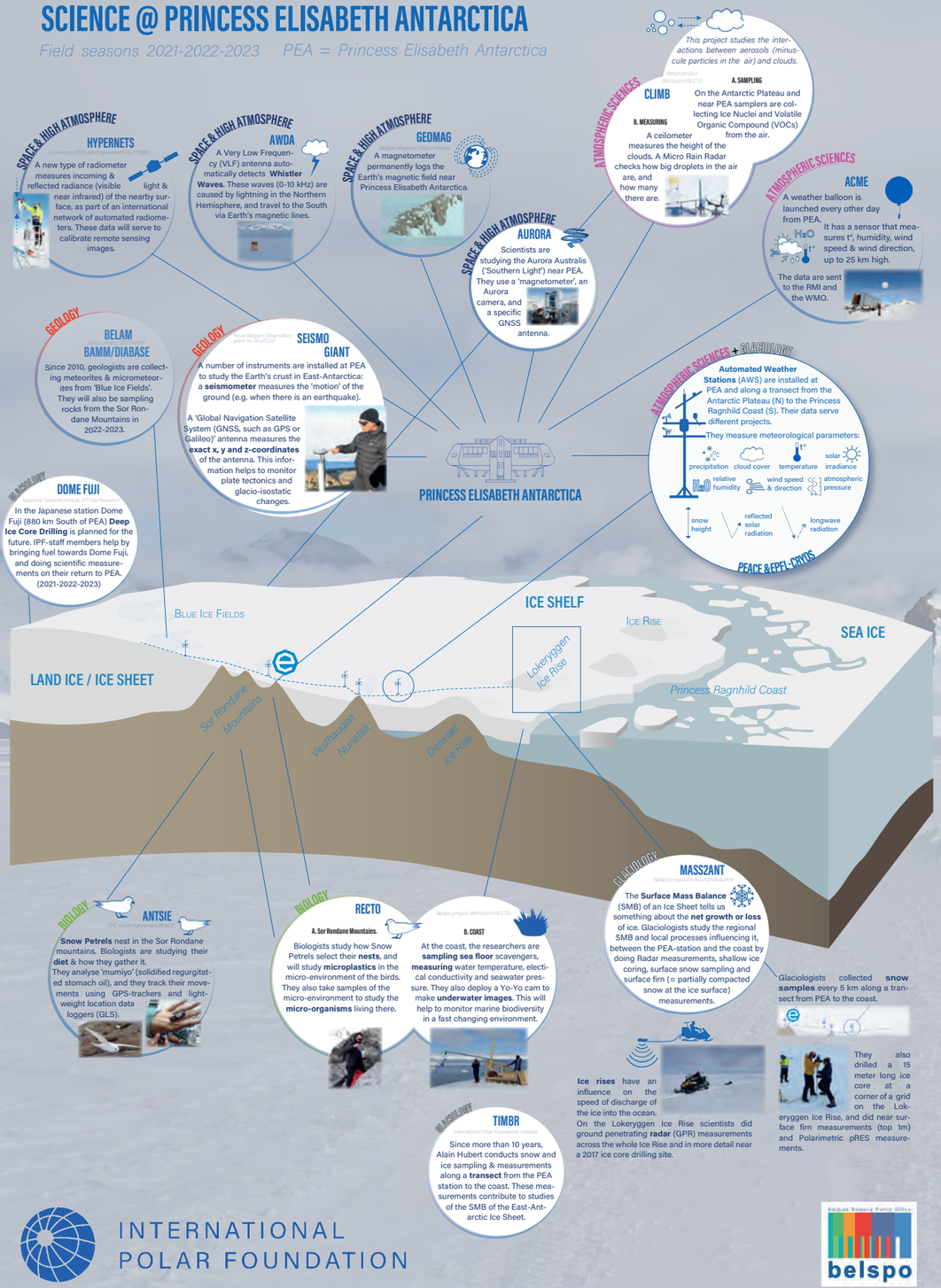
As with every BELARE campaign each year, we prioritize outreach to schools and universities to pass along and share with the next generation of aspiring young scientists and engineers - through online lectures - the practical and scientific knowledge we have garnered over the decades working in Antarctica.

Snow removal from the PEA's annexe roof to reduce the building's weight and constraint on its structure.

PRINCESS ELISABETH OPERATIONS 2024/2025



The Princess Elisabeth Antarctica sitting atop Utsteinen Nunatak with the Sør Rondane Mountains in the background.



SCIENCE AT PEA

The Princess Elisabeth Antarctica and its team has been supporting scientists to carry out their research projects in the Queen Maud land region since its construction in 2007-09. The 2024-25 season was no different, as there were 17 different research projects that were supported in various
capacities.

These research projects cover an entire spectrum of disciplines that help us fill knowledge gaps across multiple fields, such as glaciology (including the study of ice sheets, mass balance, glacier movements and their implications for global sea level rise), atmospheric sciences (including atmospheric properties and composition, formation of clouds, precipitation,and long-range transit of particles) geology, seismology, gravimetry, astronomy, meteoritics and microbiology.

The following section gives an overview of each scientific project supported during the 2024-2025 BELARE campaign.

AWDA

Executors: Royal Belgian Institute for Space Aeronomy (BIRA-IASB)

Eötvös Loránd University (ELTE)

Contact: PI : F. Darrouzet (BIRA-IASB), J. Lichtenberger (SAS-ELTE)

Funding: BIRA-IASB, ELTE

Science support: PEA/IPF

When lightning strikes in one hemisphere, it produces whistler waves that propagate in space from one hemisphere to the other along the Earth's magnetic field lines.

These whistlers can be detected on the opposite side of the globe with ground-based VLF measurements. A global AWDA (Automatic Whistler Detector and Analyzer) network has been initiated and one such VLF antenna was installed in 2016 in close proximity to Princess Elisabeth Antarctica.

The VLF antenna installed in Antarctica is composed of two search coils protected in a wooden box above the ground, which records whistler waves continuously and the data is downloaded the following year.

Fieldwork performed during the 2024-2025 BELARE campaign:

- The instrument was fully checked and inspected including the table and wood box housing as well as the cables, computer set-up, hard disks and NAS IT system.
- The slack length of the cable between the housing and the shelter was checked.
- The recurrent noise problem observed on the data was reduced over the recent BELARE campaigns and the relocation of the instrument didn't negatively affect the clarity of the signal.
- Installation of a mobile test unit in a location that may be implemented in the future.
- Data collected during the season was downloaded on external hard disks and repatriated to the responsible institutions back in Belgium at the end of the expedition.

In order to avoid any interference, the VLF antenna is located several hundreds of meters away from the station's scientific facilities. A cable buried in the ice transmits the data on a continuous basis.

PEACE - ACME

Executor: Royal Meteorological Institute (IRM/KMI) and the IPF

Contact: PI: A. Mangold (RMI - IPF)

Funding: IRM/KMI/IPF

Science support: PEA/IPF

Atmospheric radiosondings by weather balloons allow measuring the vertical variation of temperature, pressure, wind and humidity, up to an altitude of around 25 km above ground level. Radiosonde balloons are launched every other day throughout the summer season. The data is useful for weather forecasting and in general for interpretation of the larger-scale meteorological situation.

Although helium is the usual gas used for filling up our weather balloons.

This past year, a new system was installed at PEA's North scientific shelter to produce green hydrogen. On-site hydrogen production presents a much cheaper alternative to shipping in and out helium fuel tanks which are already now difficult to source. Additionally, to filling our weather balloons, this hydrogen production system allows us to test its feasibility to scale up future production to phase out other greenhouse gas sources in the future.

Fieldwork performed during the expedition:

- Radiosonde balloons were launched by IPF staff every Monday, Wednesday and Friday during the entire season.
- Installation of a new hydrogen production system (to ultimately replace helium).
- Empty helium bottles were shipped back to Cape Town for recycling.

Launch of a radiosonde balloon in front of PEA's north scientific shelter.

PEACE - PRINCESS ELISABETH ANTARCTICA CLIMATE EXPERIMENT - AWS

Executors: International Polar Foundation (IPF), University of Colorado, Boulder (CU), Swiss Federal Institute for Technology (ETHZ)

Contact: PI: S. Steffen (IPF), N. Herinckx (IPF)

Funding: IPF

Science support: PEA/IPF

PEACE regroups projects focusing on the collection of meteorological data (wind speed, wind direction, temperature and relative humidity at different levels from the ground) along a south-north transect, from the Antarctic plateau to the lower slope of the ice shelf.

This long-running project began during the 2012-2013 BELARE campaign and continues to expand the number of automatic weather stations (AWS) in the network.

This past season, a 7th AWS was added on the Vesthaugen Nunatak at the future site of the Andromeda Earth Observatory. This new AWS was installed primarily to determine the amount of renewable energy (wind and sun) present at this location to help us foresee the needs and constraints regarding energy production at the new station.

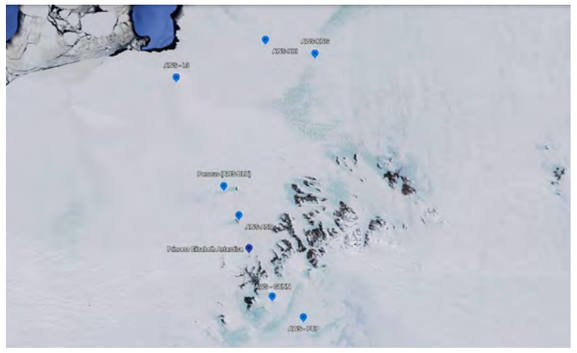
An 8th AWS was also added on the King Baudouin Ice Shelf as part of the NISAR project. This marks the second AWS that has been installed on the ice shelf after the PE-KNG AWS was installed the previous season just above the grounding line, where the ice flowing off the continent starts flowing out over the ocean.

Automatic weather stations are deployed at eight sites along a 250 km transect from the Antarctic Plateau to the coast:

- **PE-AIR** - located just to the northwest of the PEA airstrip - installed during the 2012-13 BELARE campaign.
- **PE-GUNN** - located at the interface between the Sor Røndane Mountains and the plateau - installed during the 2012-13 BELARE campaign.
- **PE-BLU** - located on a blue ice field in the vicinity of Romnoes Nunatak (60km north of PEA) - installed during the 2013-14 BELARE campaign.
- **AWS-L0 -** located at the coast of Droning Maud Land (about 200 km north of PEA) - installed during the 2021-22 BELARE campaign.
- **AWS-PUP -** located at the southernmost point of the transect on the Antarctic Plateau - installed during the 2021-22 BELARE campaign.
- **PE_KNG -** located on the King Baudouin Ice Shelf grounding line - installed during the 2023-24 BELARE campaign.
- **PE_AND** - located on Vesthaugen Nunatak - installed during the 2024-25 BELARE campaign.
- **PE_RBI** - located on the King Baudouin Ice Shelf - installed during the 2024-25 BELARE campaign.

Fieldwork performed during the 2024-2025 expedition:

- Installation of 2 new AWS antenna: AWS-KNG and AWS-AND.
- Like every season, members of the IPF staff visited each station to ensure all instruments are properly functioning, maintained, upgraded or replaced when necessary.
- The CR3000 data logger at PE-KNG was replaced by a CR1000 to be on par with our other installations, which also allowed us to link the station with the satellite and repatriate our data to our server and have it be openly available online.
- Data has been repatriated and made freely available to the scientific community, in accordance with the Antarctic Treaty System.



Simon Steffen preparing a new automatic weather station (AWS) for deployment in the field.

Simon Steffen at sunset on the King Baudouin Ice Shelf after installing a new AWS.

Nicolas Herinckx performing maintenance on an AWS installed previously on King Baudouin Ice Shelf.

PEACE - TIMBR

Executors: International Polar Foundation (IPF), LGGE

Contact: PI : A. Hubert (IPF and University of Grenoble)

Funding: IPF

Science support: PEA/IPF

This is an ongoing long term study to create a long time series of data on glaciers and climate in the Queen Maud Land (of East Antarctica).

Every year IPF Founder and President Alain Hubert leads the work to measure snow density and accumulation along a transect between Vesthaugen Nunatak to the coast of the Queen Maud Land.

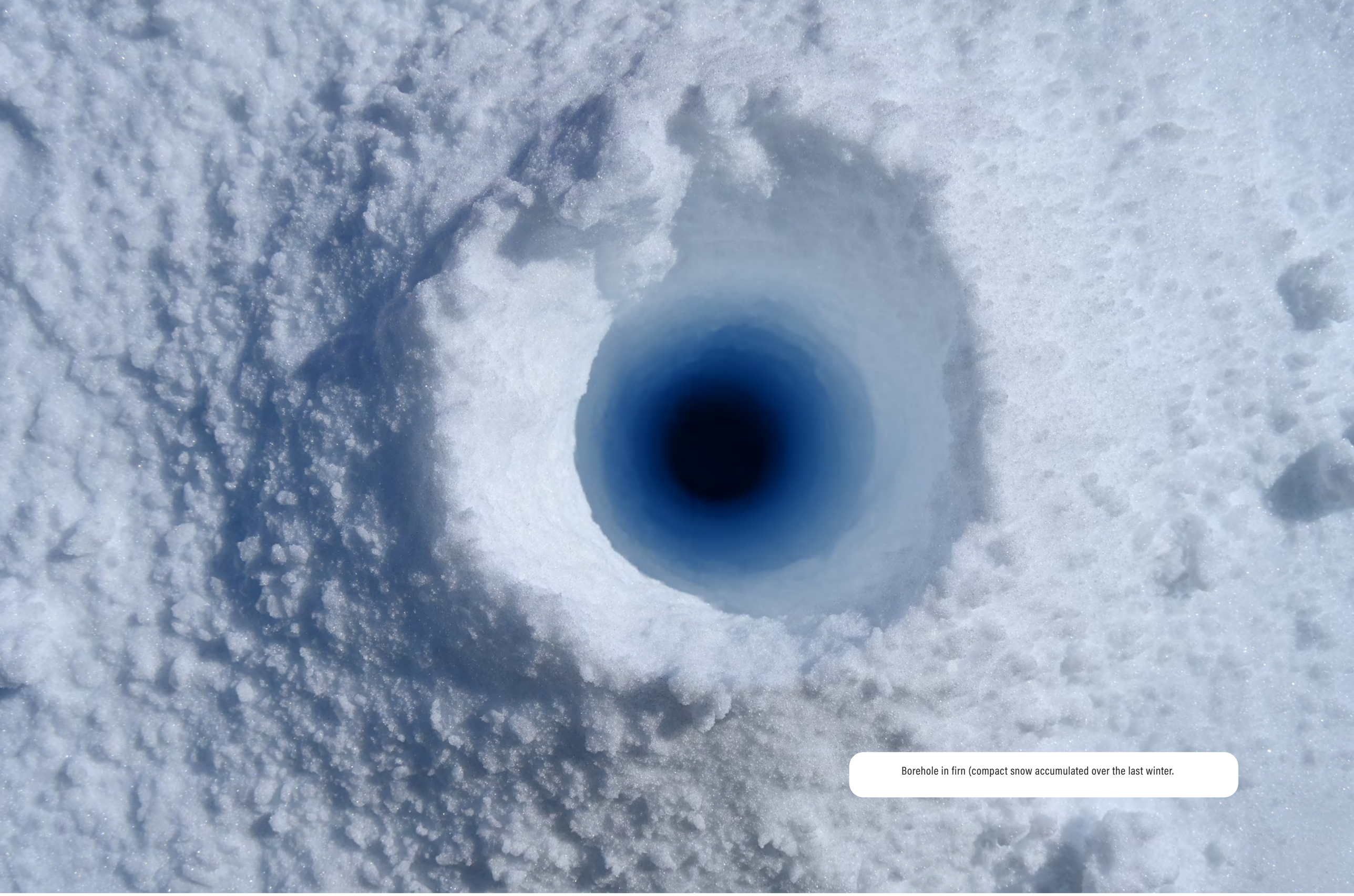
The IPF team uses a network of polycarbonate stakes placed on the surface of the ice sheet to evaluate snow density in accumulation areas, which is then translated into water equivalent accumulation.

The goal is to monitor the surface meteorology and the contribution of surface energy balance to the ablation (direct evaporation) of ice and the surface mass balance of the Antarctic Ice Sheet.

Fieldwork performed during the 2024-2025 expedition:

- In the field, a yearly series of data is collected on snow density and snow accumulation over a 180 km transect marked with 60 stakes, contributing to East Antarctica surface mass balance models.
- GPS coordinates are collected on the standard transect as well as snow accumulation measurements. Shallow snow cores are taken to assess snow accumulation and ice sheet movements over the past year.

Alain Hubert sampling a core of freshly accumulated snow to measure the past season's precipitation.



Borehole in firn (compact snow accumulated over the last winter.

EXPOSOILS

Executors: Universiteit Gent (UGent), Université de Liège (ULiège),

Royal Belgian Institute of Natural Sciences (RBINS)

Contact: PI**:** E. Verleyen (UGent) - A. Wilmotte (ULiège) -

A. Willems (UGent) - Q. Vanhellemont (RBINS)

Funding: BELSPO

Science support: PEA/IPF

EXPOSOILS has been a long running project in the surrounding mountains of the Princess Elisabeth Antarctica.

The primary objective is to study the effects of increased temperature (due to climate change) and snow cover on the biodiversity and genetic functional potential of microbial communities in polar desert and tundra soils in the Arctic and Antarctica.

In 2018 baseline samples were taken, snow fences and open-top chambers were then installed to increase snow cover and soil temperature at certain site locations including in East Antarctica by the Sør Rondane Mountains in close proximity to the Princess Elisabeth Station.

Fieldwork performed during the 2024-2025 expedition:

- Invertebrate sampling in existing field installations (snow fence and control plots, and Open-top-chambers)
- Recovery and installation of georeferenced temperature and humidity loggers along selected gradients in the ice-free regions
- Installation of additional long-term monitoring devices (time lapse cameras) at the Yuboku Valley and Dry Valley sites
- Deployment of two sky cameras active for the duration of the team's presence at PEA
- Visited sites for soil, lichen and rock sampling
- Datalogger set in open top chambers and timelapse photo cameras installations were made at the following locations: Yuboku Valley, Yuboku lakes, Utsteinen nunatak, Teltet nunatak, Ketlersbreen Dry valley, Perlebandet and Pingvinane nunatak

Bjorn Tytgat (UGent) is setting up a time lapse camera to monitor snow accumulation behind a snow fence.

AURORA

Executors: National Institute of Polar Research (NIPR)

Contact: PI : A. Kadokura (NIPR)

Funding: NIPR

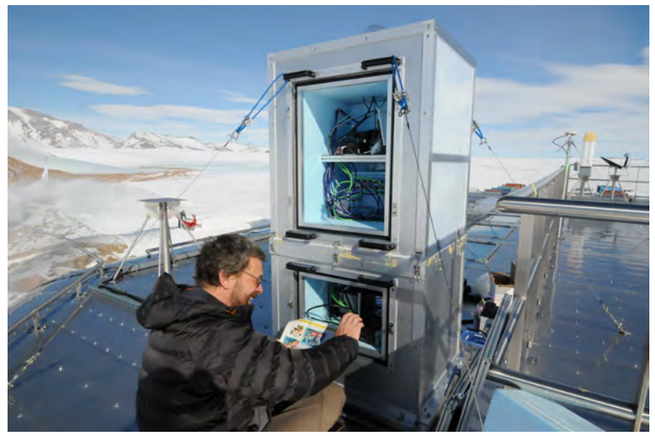
Science support: PEA/IPF

This is a high-precision instrument installed on the roof of the Princess Elisabeth Antarctica that has been collecting data for a number of years. This instrument is specifically designed to study auroral storms and substorms, including mechanisms that drive them, spatial and temporal variation of these storms, wave-particle interaction process during both sub-storms and major storms.

Data collection is made by an Unmanned Auroral Observation system (UAO) composed of a Fluxgate Magnetometer, an aurora camera and a GNSS antenna.

Fieldwork performed during the 2024-2025 BELARE campaign:

- IPF staff performed the annual inspection of the equipment installed on the roof of PEA. Memory cards provided by the scientists replaced old memory cards, which were repatriated to Belgium.



Maintenance of the UAO2 on the roof of PEA.

Data loggers are installed in open top chambers to monitor temperature and humidity inside the artificially modified environment the chambers create.

SEISMO

Executors: Royal Observatory of Belgium (ROB)

Contact: PI : G. Rapagnani (ROB)

Funding: BELSPO

Science support: PEA/IPF

This project aims to gather continuous information on the planet's lithosphere and seismic activity in East Antarctica using a surface seismometer and a GNSS antenna that continuously listens for earthquakes or icequakes.

Fieldwork performed during the 2024-2025 BELARE campaign:

- IPF staff performed the annual inspection of the equipment installed in the GEOS shelter and there were no issues detected.
- Replacement parts provided by the scientists were successfully installed on the system.
- Data is collected on a continuous basis and transmitted to the scientist working remotely at the Royal Observatory in Belgium.

Seismograph installed in PEA's GEOS scientific shelter.

BIRA (CLIMB 2.0)

Executors: Royal Belgian Institute for Space Aeronomy (BIRA-IASB)

Contact: PI : A. Merlaud (OMA)

Funding: BELSPO

Science support: PEA/IPF

The BIRA-IASB (Belgian Institute for Space Aeronomy) installed instruments, including a CIMEL sunphotometer and MAXDOAS instruments. These instruments have been collecting data at the Princess Elisabeth Antarctica for nearly two decades.

They are used for studying aerosols and atmospheric trace gases like nitrogen dioxide, ozone, and oxozone (tetraoxygen). The Cimel sunphotometer has been in operation since February 2009, while the MAXDOAS instrument was installed in December 2015. The CIMEL is a sunphotometer is a type of passive radiometer that measures direct sun and diffuse sky radiances at eight wavelengths.

These instruments measure total column Aerosol Optical Depth (AOD) and the integrated precipitable water vapour (mm). Aerosol fine mode fraction, Angstrom exponent (measure of how the AOD changes relative to the various wavelengths of light) and single scattering albedo can also be derived.

Fieldwork performed during the 2024-2025 expedition:

- Installation of the CIMEL at the beginning of the season.
- Calibration and maintenance on-site.
- Packed and shipped back for calibration at the end of the season.

Pointer of the CIMEL towards the sun on top of PEA's roof.

Coastal reconnaissance to find a suitable ship unloading site.

GIANT - LISSA

Geodesy for Ice in ANTarctica and “Lithospheric and Intraplate Structure and Seismicity in Antarctica”

Executors: University of Luxemburg (Unillux)

Contact: PI : S. Tabibi (Unilux)

Funded: University of Luxemburg (Unillux)

Science Support: PEA/IPF

The GIANT- LISSA project utilizes geodetic techniques, combining GPS data, gravimetry and seismology to very precisely track horizontal and vertical deformation of the Earth’s surface and focuses on the relation between ice mass variation and crust deformation in the polar regions.

Glaciers deform the underlying crust of the Earth when the mass changes above it. In order to quantify the effect of anthropogenic climate change and the post ice age slow ice melt, it is necessary to combine measurements of surface deformation from GPS data with measurements of variations in gravity using an absolute gravimeter.

Furthermore, this project also shines a light on the internal structure of the Antarctic continent including the crust and upper-mantle structure highlighting past tectonic processes of the area with regard to the formation of the Gondwana supercontinent about 500 million years ago.

Fieldwork performed during the expedition:

- IPF staff maintained the GNSS antennas installed at the GEOS north scientific shelter of PEA and at the former Japanese Asuka station.
- Data was repatriated from the Princess Elisabeth Antarctica and transferred to the scientists.
- Expeditions were undertaken to the former Asuka station where data was physically repatriated on memory sticks.
- At the end of the season the memory stick was swapped with a new one to collect another year’s worth of data.

GNSS antennae are used to monitor the movement of Earth’s crust.

Doing maintenance of the GNSS antenna and its power source at Japan's now-abandoned Asuka Station.

GEOMAG

Executors: Royal Meteorological Institute of Belgium (RMI)

Contact: PI : S. Brake (RMI)

Funding: BELSPO

Science support: PEA/IPFF

The GEOMAG research project aims to conduct long-term observations of Earth's geomagnetic field at the Princess Elisabeth Antarctica.

All instruments have been installed in a specially designed nonmagnetic shelter 600 meters away from the station, at the foot of Utsteinen Ridge.

In order to describe and understand current and future evolution of the planet's geomagnetic field, it is important to observe how the field moves and changes over time. Geomagnetic field observations are particularly important to make in the polar regions, where good geomagnetic observatories are few and unevenly spaced.

This year two scientists from the GEOMAG team also headed out into the field, specifically to the site of the old King Baudouin station, one that Belgium built and operated in the late 1950s to take geomagnetic measurements. The scientists returned to this same location and performed the geomagnetic measurements to see how Earth's magnetic field has changed over the last 60+ years.

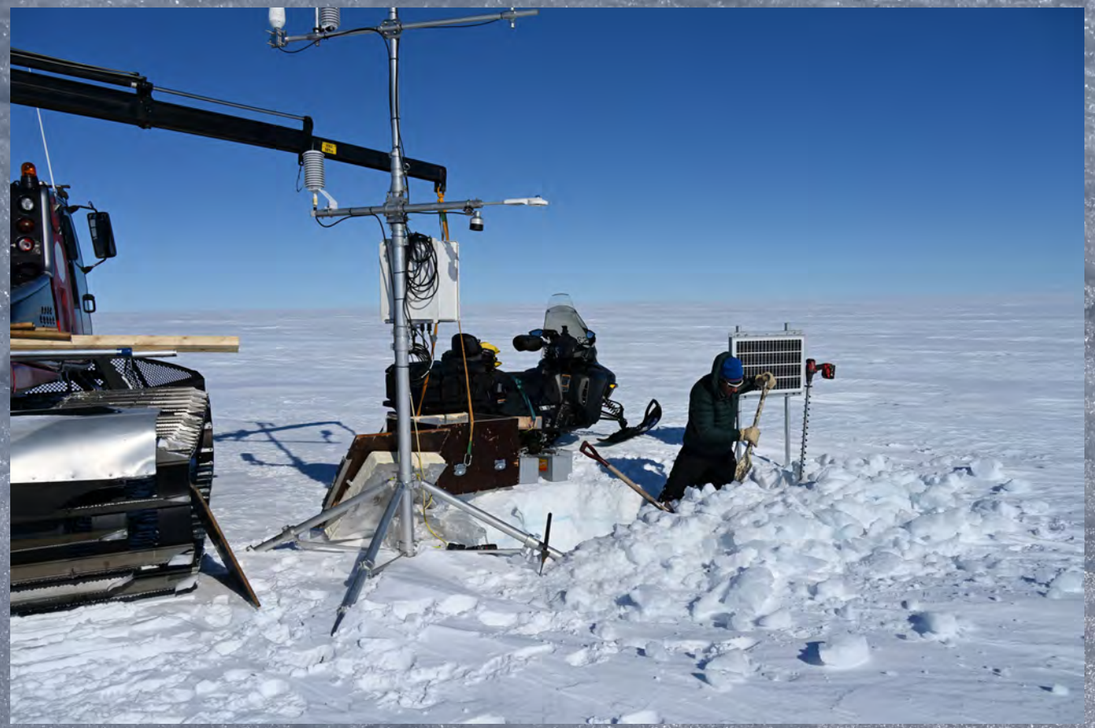
Alexandre Gonsette taking a reference point while measuring Earth's magnetic field.

Fieldwork performed during the 2024-2025 BELARE campaign:

- Maintenance of the GYRODIF instrument (takes automatic absolute measurements of Earth's geomagnetic field).
- Geomagnetic measurements were taken to the former King Baudouin station at the Princess Ragnhild Coast.
- Installation of a variometer, which measures the variation in Earth's magnetic field in three directions.
- Installation of a proton-magnometer which measures the strength of Earth's magnetic field every second.
- Data from these instruments is transferred in real time to the Geophysical Center of Dourbes in Belgium
- Azimuth measurements were taken at Perseus International Airfield.
- IPF staff provided support to the scientists working remotely, providing technical maintenance and network access to ensure continuous direct data transfer.

Azimut measurement at the Perseus International Runway.

GEOMAG team gathering data near the former Belgian station on the King Baudouin Ice Shelf.



Maintenance of an AWS installed during a previous BELARE expedition.

EPFL-CRYOS

Executors: École polytechnique fédérale de Lausanne (EPFL)

Contact: PI : M. Lehnning & H. Huwald (EPFL)

Funding: EPFL and Swiss Polar Institute

Science support: PEA/IPF

Scientists from the Swiss Federal Technology Institute of Lausanne (EPFL) have been conducting research projects in the vicinity of PEA every year since 2016.

The cryospheric sciences laboratory at EPFL investigates the processes that shape snow and ice in polar and alpine regions. In particular, snow cover processes and snow-atmosphere interactions are the focus of current research taking place in the vicinity of the Princess Elisabeth Antartcica station. This includes striving for a deeper understanding of the complicated mass balance and energy exchange processes between the snow, ice and atmosphere as well as predictions of future snow and ice in mountains and high latitudes.

To improve our knowledge of the snow-atmosphere interactions, scientists from EPFL have been operating two automatic weather stations (AWS) near PEA since 2016. The goal is to use year-round measurements to improve the representation of snow transport and sublimation in models of the surface mass balance of the entire Antarctic continent.

Fieldwork performed during the 2024-2025 BELARE campaign:

- General maintenance and data repatriation from the two AWSs deployed in the vicinity of PEA.
- Three sonic anemometers were installed at different heights on the 30 meters tower at PEA to measure blowing snow and heat fluxes along a vertical gradient.
- A photogrammetric study of the ice surface was performed on the Ketlersbreen Glacier to assess and extrapolate the varying albedo of the snow-cover in the area.

Installing three sonic anemometers at different heights on PEA's antenna.

Following maintenance, the IPF team reinstalls the power source on one the the PASPARTOUT project's auto samplers at the Queen Maud Land coast.

PASPARTOUT

Pathways of particles, VOCs and moisture into East-Antarctica in a changing climate

Executors: Royal Meteorological Institute of Belgium (RMI)
Katholieke Universiteit Leuven (KU Leuven)
Universiteit Gent (UGent) Université Libre de Bruxelles (ULB)

Contact: A. Mangold (RMI) - N. Van Lipzig (KU Leuven) -
C. Walgraeve (UGent) - N. Mattielli (ULB)

Funding: BELSPO; programme manager, D. Cox

The PASPARTOUT project is a long-running project carried out by multiple research institutions focusing on atmospheric dynamics, clouds and aerosols in Antarctica.

Atmospheric circulation, the water cycle and cloud-aerosol interactions are vital to Antarctica's climate. Clouds and aerosols affect radiation and precipitation, with aerosols acting as cloud condensation nuclei (CCN) and ice nuclei. Volatile organic compounds (VOCs) may influence CCN formation, linking atmospheric chemistry to climate.

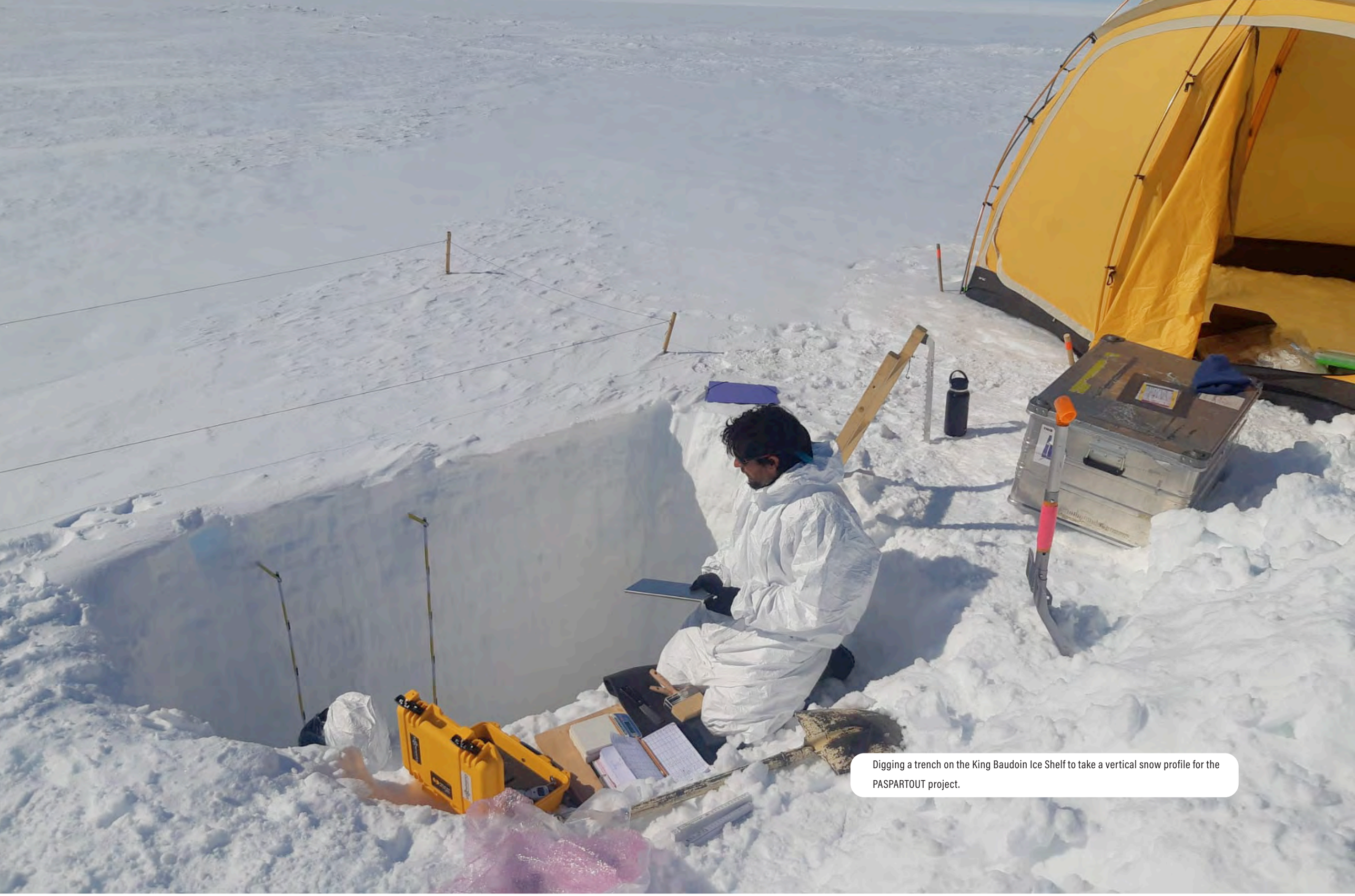
The PASPARTOUT project uses various instruments and models to study these processes. Atmospheric compounds' sources and transport will be connected to particle, VOC, moisture, and precipitation properties.

Year-round VOC and inorganic compound sampling was done, along with snow profile analysis in multiple locations in the vicinity of the Princess Elisabeth Antarctica and near the Queen Maud Land coast on King Baudouin iceshelf. PASPARTOUT will assess future changes in atmospheric circulation, sources and their effects on clouds and precipitation.

Fieldwork performed during the 2024-2025 expedition:

- Support of IPF staff for the instrument installation and/or maintenance: TEOM-FDMS, Aethalometer, Nephelometer, T°, RH, pressure sensors, Condensation Particle counter, Ceilometer, Metek MRR, Disdrometer, Brewer ozone spectrophotometer.
- Installation of active & passive VOC sampler and maintenance + sample collection of snow particle collector (installed at King Baudouin iceshelf).
- IPF is responsible for all data repatriation, storage on virtual machines, management and access to scientists working remotely.

Traverse back to PEA in harsh conditions.



Digging a trench on the King Baudoin Ice Shelf to take a vertical snow profile for the PASPARTOUT project.

Paula Lamprea Pineda preparing the volatile organic compound (VOC) automatic sampler before deployment for the PASPARTOUT project.

NISAR

Executors: University of California, Irvine (UCI), International Polar Foundation (IPF)

Contact: PI : Dr. E. Rignot (University of California, Irvine)

Funding: University of California, Irvine (UCI), International Polar Foundation (IPF)

Science support: PEA/IPF

This project's objective is to acquire radar sounding data along flow lines to calculate ice melt rates by the ocean across the grounding line area of the King Baudouin Ice Shelf, where the ice flowing off of the continent begins to flow over the open ocean as part of the ice shelf.

This past campaign season the investigators focused on interpreting grounding line migration observed from NISAR and collected in-situ data to evaluate satellite estimates of ice shelf melt, combining data derived from NASA's NISAR and ICESat-2 satellites.

The goal of the project is to better understand ice-ocean interactions, particularly in the vicinity of the grounding line, which models still do a poor job of accurately predicting the rate of change, which is paramount in our understanding of an ice sheet's overall contribution to global sea level rise.

Work performed during the expedition:

- ApRES beacon (Automated phase sensitive Radio Echo Sonder) installation for ice thickness change measurements
- Ground Penetrating radar (GEODE) was performed at the ice surface on the King Baudouin Ice Shelf and grounding line.
- Hot Water Drill to assess the King Baudouin Iceshelf thickness (drill got stuck and failed)
- GNSS (Glocalization & Navigation Satellite System) to measure Ice thickness variation
- CTD measurements at the iceshelf edge

Sastrugi are are common wavy snow structures formed by wind erosion.

Gadi Ratnakar and Eric Rignot from the NISAR project testing their equipment while doing a radar survey of the King Baudoin Ice Shelf.

The NISAR team testing their hot water drilling equipment near PEA before their expedition to the coast.

The NISAR team and field guide celebrating the installation of their ground penetrating radar at the King Baudouin Ice Shelf.

FROID - Finding the world's oldest ice record around the Princess Elisabeth Antarctica

Executor: Université Libre de Bruxelles (ULB)

Contact: PI: F. Fripiat (ULB), H. Zekollari (VUB)

Funding: BELSPO; programme manager, D. Cox

Science support: PEA/IPF

The aim of the FROID project is to collect very old ice (800K years to a million years and beyond) from blue ice areas in the vicinity of the PEA station. Based on ice flow modelling, analysis of satellite data, geochemical analysis of previously collected ice samples and meteorites, several sites in the south-western part of the Sør Rondane mountains were identified.

These sites are likely to harbor very old ice at or close to the surface of the ice sheet due to bedrock topography and katabatic winds removing snow and younger ice from the surface. During a first mission (2024-25) data was collected to further explore these sites through radar surveys, the collection of ice samples (and potential meteorites), and mass balance stakes.

Based on the results of this mission, including the dating of near-surface ice samples, a second mission (tentative 2026-27) will go to a site with the best potential to find very old ice, where an ice core of 100-200 m will be drilled to collect some of the oldest ice ever found, hopefully older than one million years, allowing scientists to answer some of the unresolved climate mysteries of the Mid-Pleistocene Transition (MPT)

Fieldwork performed during the 2024-2025 expedition:

- Ice sampling at the south-western part of the Sør Rondane, Nils Larsen Ice Field.
- 230 km or radar transects conducted via snow-mobile.
- 16 shallow (2 meters) ice cores were drilled, collected and shipped back to Belgium.
- 985 surface ice samples were collected.
- ApRES (a ground-based radar system used in glaciology to measure ice deformation and basal melt rates) was deployed in several locations.
- High precision GNSS GPS measurements were deployed.

Sample of ice collected by the FROID team on the Nils Larsen Blue Ice Field.

The FROID team encountered harsh weather onditions near their camp site.

Installing a GNSS antenna as a ground base for taking accurate GPS measurements.

Using a GNSS antenna to take accurate GPS measurements on the Nils Larsen Blue Ice Field.

The FROID team with the IPF technical support crew and a field guide. From left to right: Veronica Tollenaar, Maaike Izeboud, Nicolas Grosrenaud, Etienne Legrain, Harry Zekollari and François Pallandre.

ULTIMO

UnLocking The sclentific potential of the Belgica Mountains

East Antarctica

Executors: Vrije Universiteit Brussel (VUB)

Université Libre de Bruxelles (ULB)

Royal Belgian Institute of Natural Sciences (RBINS)

Contact: S. Goderis (VUB) - V. Debaille (ULB) - S. Decrée (RBINS)

Funding: BELSPO; program manager, D. Cox

Science support: PEA/IPF

The Antarctic environment is one of the final frontiers in terrestrial scientific exploration. For more than 10 years, the VUB-ULB-RBINS-NIPR consortium has focused on determining the origin and evolution of both rocks (terrestrial and space-borne) and ice in proximity to the Belgian Princess Elisabeth Antarctica station by using a highly interdisciplinary approach.

To date, this project has already led to the recovery of more than 1,300 meteorites from blue ice fields, as well as the retrieval of roughly 50,000 microscopic extra-terrestrial particles from high-altitude sedimentary deposits! This is already one of the largest international collections.

Together, the rock and ice samples have unlocked an astonishing treasure of information on the origins of the solar system, the formation of planets, past climatological conditions, not to mention the formation and exposure of regional geological and glaciological features.

This past season the ULTIMO project took its continued search for long unanswered questions to the next level by traveling once again to the Belgica Mountains located some 300 kilometers southeast of the Princess Elisabeth Antarctica.

The aims of the ULTIMO project are to:

- Test existing machine learning approaches to trace meteorite accumulation in the blue ice regions of Antarctica, which must be validated by going to these locations to collect and characterize these samples.
- Learn about the early evolution of the solar system by expanding the current collection of meteorites and micro meteorites
- Sampling the blue ice regions surrounding the Belgica Mountains in search of ancient ice (1+ million-year-old). This will be done by mapping stable isotope variations of oxygen-18 (δ18O) and deuterium (a heavy isotope of hydrogen) (δD), drilling and measuring the age of the surface ice and modeling the local ice flow.
- To investigate the geological and exposure history of the Belgica Mountains and associated moraines.

Fieldwork performed during the 2024-2025 expedition:

-Over 100 meteorites were collected by the four scientists and two field guides that were assigned to this expedition over a three-week period in the vicinity of the Belgica Mountains and surrounding blue ice fields.
- Multiple kilograms of fine-grained sediment were collected at the Belgica Mountains and surrounding moraines to find micrometeorites present in this sediment.
- All the samples collected were preserved in freezer boxes and shipped back to Belgium to be analyzed by scientists to further our understanding of the solar system and the origins of life on Earth.

The passage of a Prinoth tractor uncovered a crevasse in the surface of the ice sheet.

Foodstuffs and camping equipment left during a Belgian expedition to Mount Belgica in the 1960s.

During the ULTIMO expedition lead by the VUB/ULB in December-January 2024-2025, four scientists and 2 field guides ventured out some 300 km away from the Princess Elisabeth Antarctica research station to the Belgica Mountains in the search of meteorites, micro-meteorites and “old ice”.

During this expedition an unexpected discovery was made by the two field guides (Martin Leitl and Polo Dudas) during a reconnaissance to the little “Sphinx”-mountain range 20km north of the main Belgica Mountains range. Searching for the evidence of meteorites they drove 3km direction Northwest on the blue ice field at the northern end of Sphinx and came across a pile of former expedition material stacked on what appeared to be some sort of a sledge made of wooden skis, bamboo sticks and a metal construction tied together with some camping equipment (in an advance state of decomposition).

After bringing most parts back to the main camp and discussions amongst the team they realized that they had just discovered some old historical artefact dating from the first expeditions performed in the area by the Belgians in 1958. Later on, back at PEA, the artefacts could finally be opened and analyzed.

The finding was indeed composed of a sledge that could be taken apart to make skis and sticks with a small tent, sleeping bag and a box of food. In this box, a survival food kit was meticulously packed with dried sausages, soups, crackers, pasta, tomato paste, butter, chocolate, coffee, concentrated milk, tuna cans, energy bars among many other treats that could make a few people survive for a few days.

Most touching and interesting, laid on top of all the food, a small piece of paper with some inscription was found. Despite some degradation of the paper due to several decade spent on the ice, facing the harshness of the Antarctic climate, most of the text is still readable from the small note written with a ball pen:

nous vous cherchons en avion
si vous revenez ici
ne pas bouger et
attendre sur place

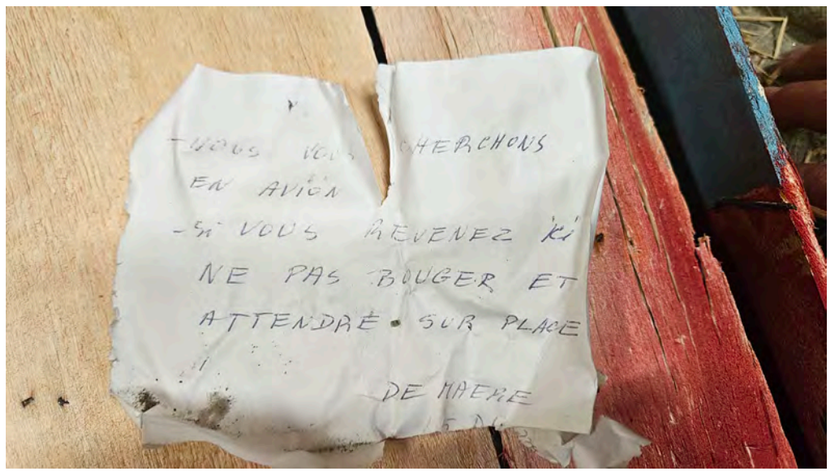
DE MAERE, 15/12

After some research it seems that in December 1958 a team of four people from the King-Baudoin Base on the King Baudouin iceshelf was indeed exploring the Belgica moutains, which they have reached by using a little plane. Due to an accident during landing they couldn`t use the plane again to get back to the costal base and therefore got stuck at th isolated mountain range.

At King Baudoin Base a search and rescue mission was prepared but this mission got itself stuck on its way towards the Belgica Mountains. Finally a Russian Airplane under chief pilot Viktor Mikhailovich Perov set of from Mirny Station more than 2000km away to give the necessary help: day by day they performed several rescue flights around the Belgica Mountains until they found an empty tent with other equipment close to the Sphinx. They put the tent together and left a food-box with a hand written notice in case the lost team would come back to this point. That is what our two IPF field guide have found 67 years later.

Luckily the lost party was found by the russian plane later on that day well alive and brought back to the Roi Baudoin Base.

A great story about help and cooperation in Antarctica with no regards of border or political systems during the cold war times.



Plane crash site and remains of the aircraft's fuselage from a former Belgian expedition to Mount Belgica.

Remote campsite of the ULTIMO team searching for meteorites near the Belgica Mountains.

Meteorite found at Mount Belgica during the ULTIMO expedition.

Meteorites are easy to spot on the surface of the blue ice.

GAMMA SPECTROMETER

Executors: Sint-Pieterscollege Jette

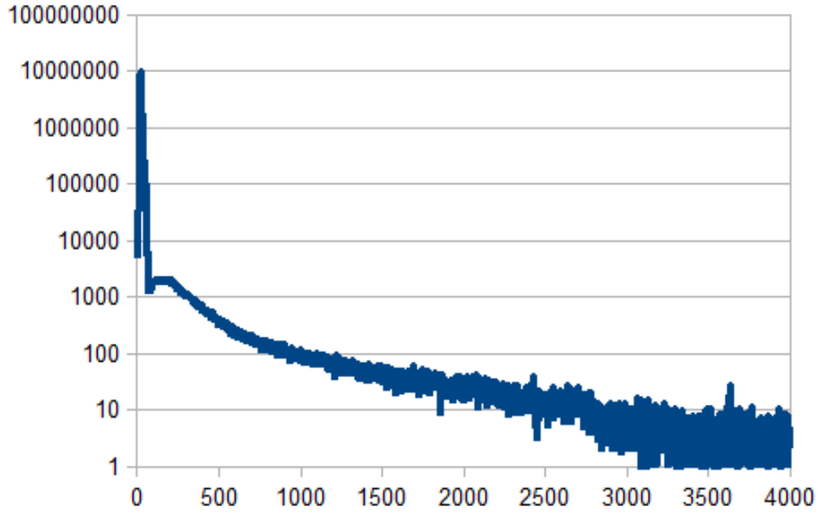
Contact: PI : Erik de Schrijver (Sint-Pieterscollege Jette)

Funding: Science support: PEA/IPF

This is a special project undertaken by a Belgian school teacher, Erik de Schrijver, and his students from Brussels who took the time to build their own instrument, which was installed at the Princess Elisabeth Antarctica to collect data for the entire 2024-2025 BELARE campaign.

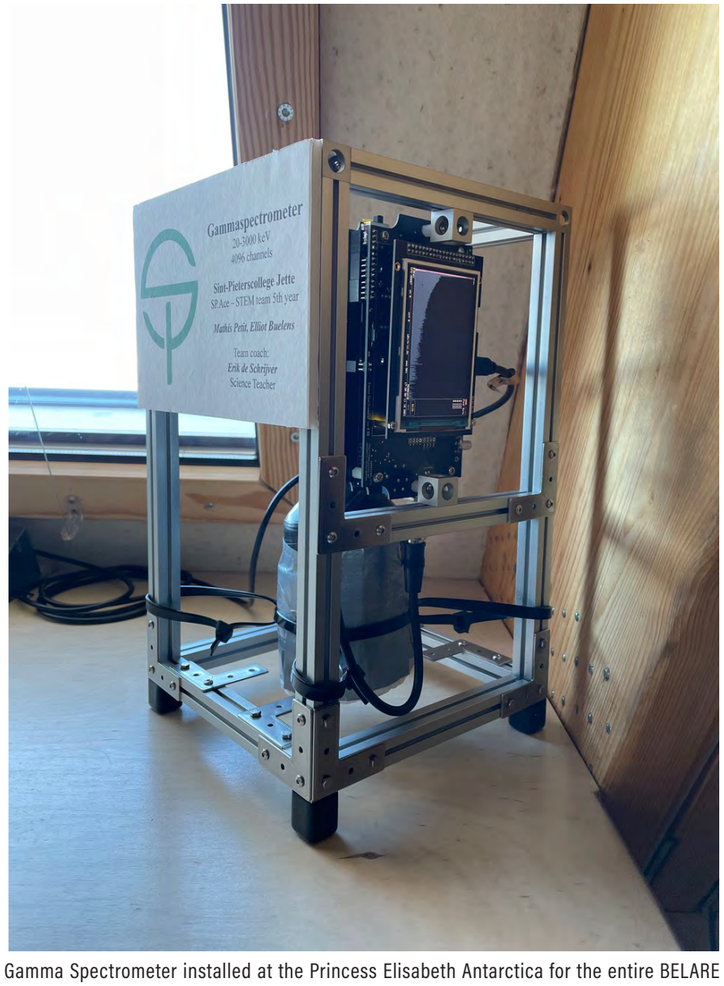
The objective of the project is to measure the background gamma radiation present in our cosmos. This radiation can have an atmospheric (exogenic) origin - for example when gamma rays are emitted by the sun - or they can be part of the cosmic background radiation present throughout the universe. However, gamma radiation can also have a terrestrial (endogenic) origin, coming from Earth's atmosphere as a result of the interaction of the solar wind or the cosmic background radiation interacting with air in our atmosphere.

As Earth's magnetic field deviates charged particles in the solar wind towards the poles, this makes high-latitude areas ideal for measurements investigating both exogenic and endogenic atmospheric gamma radiation.



Fieldwork performed during the expedition:

- Installation of the Gamma Spectrometer at the Princess Elisabeth Antarctica. The instrument ran for the entire duration of BELARE 24-25 and was brought back to Belgium after the expedition for maintenance and data repatriation.
- Unfortunately, the instrument malfunctioned two weeks into its mission and therefore not as much data was collected as originally expected. The instrument will be recalibrated and sent back to Antarctica during a future campaign.



Gamma Spectrometer installed at the Princess Elisabeth Antarctica for the entire BELARE 2024-2025 expedition.

RINGS – AWI / SWIDA

Executors: Scientific Committee on Antarctic Research (SCAR)

Contact: PI: Kenny Matsuoka (Polar Research Institute of China) for CHINARE;

Daniel Steinhage (AWI) for the Alfred Wegener Institute.

Funding: International cooperation

Science support: PEA/IPF

This is a multinational undertaking from over a dozen countries that are contributing to this airborne geophysical survey of where Antarctica's ice sheet meets the southern ocean. Teams operating out of Princess Elisabeth Antarctica are helping to fill the knowledge gap about the Antarctica Ice Sheet in Queen Maud Land, East Antarctica.

The primary objective of RINGS is to develop a comprehensive reference bed topography dataset around the entire Antarctic coast, and the secondary objective is to characterize the boundary conditions and processes responsible for varying mass balance around the Antarctic coast (RINGS Action Group, 2022). This survey is composed of the primary RINGS project, which focuses on the study of the bed topography for current ice discharge.

Fieldwork performed during the 2024-2025 BELARE campaign:

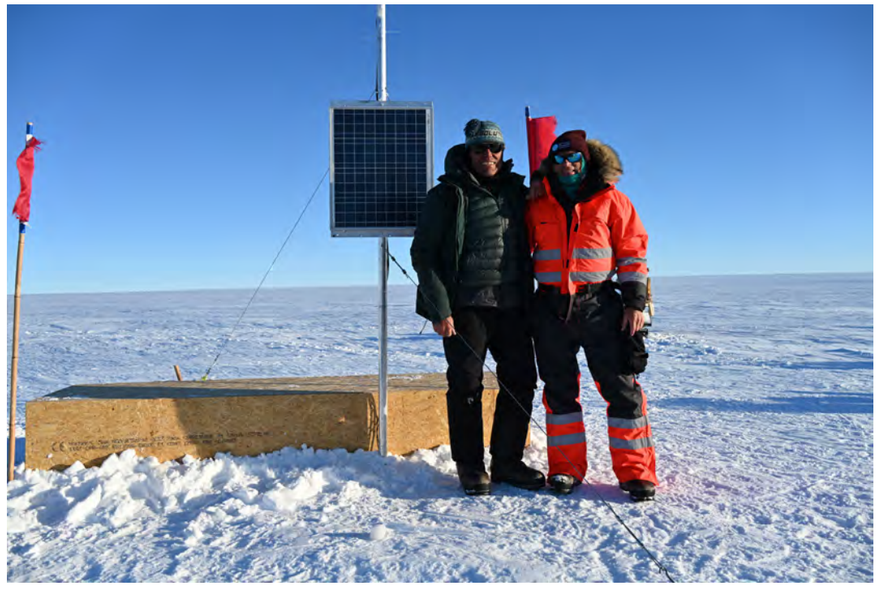
- The IPF team provided assistance for all landing, take-off, powering equipment and refueling of the AWI Polar 6 Basler (which performed the survey flights from PEA to the Queen Maud Land coast and the Antarctic plateau), and the SWIDA two Twin Otters and two helicopters.
- Based at PEA station, the AWI team successfully finished 15 long flights to cover the coastal area of Queen Maud Land and the Antarctic plateau. While the SWIDA team performed radar survey flights above the Antarctic plateau south-west of the Sør Rondane Mountains.

Two Twin Otter and a Basler from the SWIDA RINGS project parked on the PEA's airstrip.

Two Twin Otters and a Basler from the SWIDA RINGS project parked on PEA's airstrip.

A nursery of emperor penguins (molting juveniles in the background) and Adélie penguis n (the smaller ones on front) observed along the coast of Queen Maud Land.

Eric Rignot and Gadi Ratnakar celebrating Gadi's PhD defense performed at PEA (Feb. 2025).



Alain Hubert and Eric Rignoton front of the freshly installed ground penetrating radar at the Roi Baudouin ice shelf grounding lane.

OTHER SPECIAL PROJECTS/EVENTS

UC IRVINE PH.D STUDENT DEFENDS HIS THESIS AT PEA

Graduate student Ratnakar Gadi from UC Irvine's Department of Earth System Science made history by successfully defending his Ph.D. dissertation at the Princess Elisabeth Antarctica. It was only the second thesis defense ever conducted on Earth's southernmost continent.

Dr Gadi's dissertation focused on a comprehensive study of the under-ice dynamics at two significant glaciers: Petermann Glacier in Northwest Greenland and Thwaites Glacier in West Antarctica. By combining modelled ice melt rates, satellite-derived melt maps, and various other data sources, he examined the critical ice grounding zones (regions where a glacier or ice sheet transitions from being grounded on land to floating on top of open water) as an extension of the same glacier. This floating extension of ice over the water is called an ice shelf.

His research revealed that seawater intrusion into these grounding zones plays a considerably stronger role in ice sheet deterioration and global sea level rise than previously thought. His work calls for a rethinking by climate modellers about how warming ocean waters affect the stability of these vulnerable areas, ultimately offering fresh insights into the broader implications of global climate change for ice sheets.

Dr Gadi had travelled to Antarctica with Professor Rignot from UC Irvine to take part in a 24-day field expedition to survey the King Baudouin Ice Shelf in the Queen Maud Land. The expedition involved fellow scientists and experts, including polar explorer Alain Hubert and mountain guide Daniel Mercier. The field experience allowed Dr Gadi and Professor Rignot to collect an enormous amount of useful data, bringing insights into the dynamics that govern the behaviour of ice shelves.

Tabular icebergs resulting from the fragmentation of the ice shelf slowly drifting away with the water curent along the coast of Queen Maud Land.

SCIENTIFIC PUBLICATIONS FROM RESEARCH AT PEA

Over several years of the BELARE expeditions around the Princess Elisabeth Station, data were collected by scientists from all over the world leading to the publication of nearly 120 peer reviewed publications, reports, notes in journals or conference communications. During the year 2024/2025, several papers were published in fields as diverse as remote sensing energy production, meteorite research, microbiology, geology, biology and biogeography.

List of publication from or mentioning research at PEA for 2024/2025:

------2025------

Веприкова, А. А., Чернышев, И. Л., & Сверчков, Н. А. 2025. Инновации в проектировании научно-исследовательских станций в условиях Крайнего Севера.

Boutros, F. 2025. New multi-objective optimization approaches for Autonomous DC Microgrids. Doctoral dissertation, Nantes Université; Université Saint-Joseph (Beyrouth). Ecole supérieure d'ingénieurs de Beyrouth.

González-Herrero, S. 2025. A tall tower to measure the blowing snow in Antarctica. Nature Reviews Earth & Environment, 1-1.

Honan, E. M., Wakefield, E. D., Phillips, R. A., Grecian, W. J., Prince, S., Robert, H., Descamp, S., Rix, A., Rus Hoelzel, A. McClymont, E. L. 2025. The foraging distribution and habitat use of chick-rearing snow petrels from two colonies in Dronning Maud Land, Antarctica. Marine Biology, 172(7), 1-17.

Jin, Y., Ai, S., Xiao, Z., Ali Shah, S., & Chu, X. 2025. Worldwide aviation connections with Antarctica: examining global linkages and their roles in scientific expeditions. International Journal of Digital Earth, 18(1), 2534500.

Legrain, E., Tollenaar, V., Goderis, S., Ardoin, L., Blard, P. H., Claeys, P., Cordero, RR., Debaille, V., Fripiat, F., Huybrechts, P., Imae, N., Izeboud, M., Pattyn, F., Pourkhorsandi, H., Seguinot, J., Shirai, N., Van Cappellen, M., Van Ginneken, M., Wauthy, S., Yamaguchi, A., Yesiltas, M., Zekollari, H. 2025. Absence of elevation-dependent warming in Antarctica inferred from blue ice paleoclimate records. Geophysical Research Letters, 52(9), e2024GL113165.

Mooshammer, H. 2025. Decolonising Ocean Matter. Ocean and Society, 2.

Senese, A., Ahmad, A., Maugeri, M., & Diolaiuti, G. A. 2025. Assessing the Carbon Footprint of the 2024 Italian K2 Expedition: A Path Towards Sustainable High-Altitude Tourism. Sustainability, 17(1), 344.

Sun, H., Xue, Y., Dou, Y., & Xu, J. 2025. Breaking the Ice With Green Power: China's Pioneering Antarctic Energy System [Newsfeed]. IEEE Electrification Magazine, 13(2), 87-90.

Treiman, A., Schwenzer, S. P., Brandon, A., Day, J., & Walker, R. J. (2025). 2025 Jessberger Award to Prof. Vinciane Debaille. Meteoritics & Planetary Science, Early-Access.

Vannitsem, S., Docquier, D., Wauthy, S., Corkill, M., & Tison, J. L. 2025. Sources of low-frequency δ18O variability in coastal ice cores from Dronning Maud Land (Antarctica). Climate Dynamics, 63(1), 1-19.

Van Schaik, B., Lehning, M., Huwald, H. 2025. Assessing Wind Dynamics and Turbine Power at Princess Elisabeth Station, Antarctica, Using Doppler Wind Lidar and Vertical Array Anemometers. Available at SSRN: https://ssrn.com/abstract=5361209 or http://dx.doi.org/10.2139/ssrn.5361209

van Tiggelen, M., Smeets, P. C., Reijmer, C. H., Kuipers Munneke, P., & van den Broeke, M. R. 2025. IMAU Antarctic automatic weather station data, including surface radiation balance (1995–2022). Earth System Science Data Discussions, 2025, 1-38.

------ 2024 ------

Aerts, D. N., Kolder, A., Lepoint, G., Michel, L. N., & Schön, I. 2024. Divergent realized ecological niches of sister species of the Antarctic amphipod genus Charcotia. bioRxiv, 2024-08.

Aksaker, N., Bayazit, M., Kurt, Z., Yerli, S. K., Aktay, A., & Erdoğan, M. A. 2024. Astronomical site selection for Antarctica with astro-meteorological parameters. Experimental Astronomy, 58(2), 4.

Babinec, S., Baring-Gould, I., Bender, A. N., Blair, N., Li, X., Muehleisen, R. T., ... & Ovaitt, S. 2024. Techno-economic analysis of renewable energy generation at the South Pole. Renewable and Sustainable Energy Reviews, 193, 114274.

Berne, A. and Ferrone, A. 2024. Antarctic precipitation: distributed observations during the POPE and AWACA campaigns, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-6664, https://doi.org/10.5194/egusphere-egu24-6664, 2024.

Boonants, T., Goderis, S., Soens, B., Van Maldeghem, F., Chernonozhkin, S. M., Vanhaecke, F., ... & Claeys, P. 2024. Elemental and oxygen isotopic fractionation recorded in highly vaporized cosmic spherules from Widerøefjellet, Sør Rondane Mountains (East Antarctica). Meteoritics & Planetary Science.

Brean, J., Beddows, D. C., Asmi, E., Virkkula, A., Quéléver, L. L., Sipilä, M., ... & Dall´ Osto, M. 2024. Multiple eco-regions contribute to the seasonal cycle of Antarctic aerosol size distributions. EGUsphere, 2024, 1-44.

Chen, L., Ding, M., She, Y., Zhang, L., Zeng, Z., Jia, J., Che, H. (2024). Regional Aerosol Optical Depth over Antarctica. Atmospheric Research, 107534.

Cui, X. 2024. Characterizing Basal conditions of the ice sheet in East Antarctica through Airborne survey. Dynamic Poles and High Mountain Environments, 41.

De Vis P, Howes A, Vanhellemont Q, Bialek A, Morris H, Sinclair M and Ruddick K. 2024. Feasibility of satellite vicarious calibration using HYPERNETS surface reflectances from Gobabeb and Princess Elisabeth Antarctica sites. Frontiers in Remote Sensing. 5:1323998. doi: 10.3389/frsen.2024.1323998

De Vis, P., Goyens, C., Hunt, S., Vanhellemont, Q., Ruddick, K., & Bialek, A. 2024. Generating hyperspectral reference measurements for surface reflectance from the LANDHYPERNET and WATERHYPERNET networks. Frontiers in Remote Sensing, 5, 1347230.

de Witt, M., Chung, C., & Lee, J. 2024. Mapping Renewable Energy among Antarctic Research Stations. Sustainability, 16(1), 426.

González-Herrero, S., Sigmund, A., Haugeneder, M., Hames, O., Huwald, H., Fiddes, J., & Lehning, M. 2024. Using the Sensible Heat Flux Eddy Covariance-Based Exchange Coefficient to Calculate Latent Heat Flux from Moisture Mean Gradients Over Snow. Boundary-Layer Meteorology, 190(5), 1-22.

Mangold, A., De Causmaecker, K., Laffineur, Q., Van Overmeiren, P., Deramaix, C., Walgraeve, C., Mattielli, N., and Delcloo, A.: Atmospheric aerosol characterization at Princess Elisabeth station, East Antarctica and identifying source regions using backward trajectory modelling, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-17439, https://doi.org/10.5194/egusphere-egu24-17439, 2024.

Mattielli, N., Gili, S., Boxho, S., Vanderstraeten, A., Mangold, A., Walgraeve, C., ... & Bonneville, S. 2024. Modern mineral dust depositions in East Antarctica: faithful geochemical tracers of Southern Africa dust contributions and evolution of the climate during the Holocene (No. EGU24-18596). Copernicus Meetings.

Nielsen HEF. Atomic energy for Antarctica: the rise and fall of"Nukey Poo". 2024. Polar Record 60(e17): 1–11. https://doi.org/10.1017/S0032247424000111

Ruddick KG, Bialek A, Brando VE, De Vis P, Dogliotti AI, Doxaran D, Goryl P, Goyens C, Kuusk J, Spengler D, Turpie KR and Vanhellemont Q. 2024. HYPERNETS: a network of automated hyperspectral radiometers to validate water and land surface reflectance (380–1680 nm) from all satellite missions. Frontiers in Remote Sensing. 5:1372085. doi: 10.3389/frsen.2024.1372085

Sauerland, F., Souverijns, N., Possner, A., Wex, H., Van Overmeiren, P., Mangold, A., ... & van Lipzig, N. 2024. Ice-nucleating particle concentration impacts cloud properties over Dronning Maud Land, East Antarctica, in COSMO-CLM2. Atmospheric Chemistry and Physics, 24(23), 13751-13768.

Sauerlannd, F., Gorodetskaya, I., Souverijns, N., Gossart, A., Mangold, A., & Van Lipzig, N. 2024. Ceilometer observations taken at Princess Elisabeth Station, Dronning Maud Land, East Antarctica.

Savaglia, V., Durieu, B., Tytgat, B., Elster, J., Vyverman, W., Verleyen, E., & Wilmotte, A. 2024. Soil substrate shapes edaphic cyanobacterial communities in the Sør Rondane Mountains, East Antarctica. In Global Antarctic research event, SCAR 2024

Savaglia, V., Durieu, B., Tytgat, B., Elster, J., Vyverman, W., Verleyen, E., & Wilmotte, A. 2024. Cyanobacterial communities of the Sør Rondane Mountains (East Antarctica) differ by substrate types. In 12th European Workshop on the Biology of Cyanobacteria.

Savaglia, V., Lambrechts, S., Tytgat, B., Vanhellemont, Q., Elster, J., Willems, A., ... & Vyverman, W. 2024. Geology defines microbiome structure and composition in nunataks and valleys of the Sør Rondane Mountains, East Antarctica. Frontiers in Microbiology, 15, 1316633.

Scarci, K., Scott, R. C., Ghiz, M. L., Vogelmann, A. M., & Lubin, D. 2024. Broadband and filter radiometers at Ross Island, Antarctica: detection of cloud ice phase versus liquid water

influences on shortwave and longwave radiation. Atmospheric Chemistry and Physics, 24(11), 6681-6697.

Shukla, S., Wouters, B., Picard, G., Wever, N., Izeboud, M., de Roda Husman, S., ... & Lhermitte, S. 2024. Large Variability in Dominant Scattering from Sentinel-1 SAR in East Antarctica: Challenges and Opportunities. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing.

van Ginneken, M., Wozniakiewicz, P. J., Brownlee, D. E., Debaille, V., Della Corte, V., Delauche, L., ... & Zolensky, M. 2024. Micrometeorite collections: a review and their current status. Philosophical Transactions A, 382(2273), 20230195.

Van Maldeghem, F. 2024. Unraveling the Solar System: Tracing the cosmic dust flux to Earth using polar sediments.

Van Maldeghem, F., Goderis, S., Hyde, W. R., Vandoorne, W., & Claeys, P. 2024. Exploring Cosmic Dust: Insights from Sedimentary Traps in Western Greenland. LPI Contributions, 3036, 6271.

Van Maldeghem, F., Maeda, R., Soens, B., Suttle, M. D., Ruggiu, L. K., Cordier, C., ... & Goderis, S. 2024. Chrome-rich spinels in micrometeorites from modern Antarctic sedimentary deposits. Earth and Planetary Science Letters, 641, 118837.

Van Overmeiren, P., Demeestere, K., De Wispelaere, P., Gili, S., Mangold, A., De Causmaecker, K., Mattielli, N., Delcloo, A., Van Langenhove, H., Walgraeve, C. 2024. Four Years of Active Sampling and Measurement of Atmospheric Polycyclic Aromatic Hydrocarbons and Oxygenated Polycyclic Aromatic Hydrocarbons in Dronning Maud Land, East Antarctica. Environmental Science & Technology. 2024, 58, 3, 1577–1588

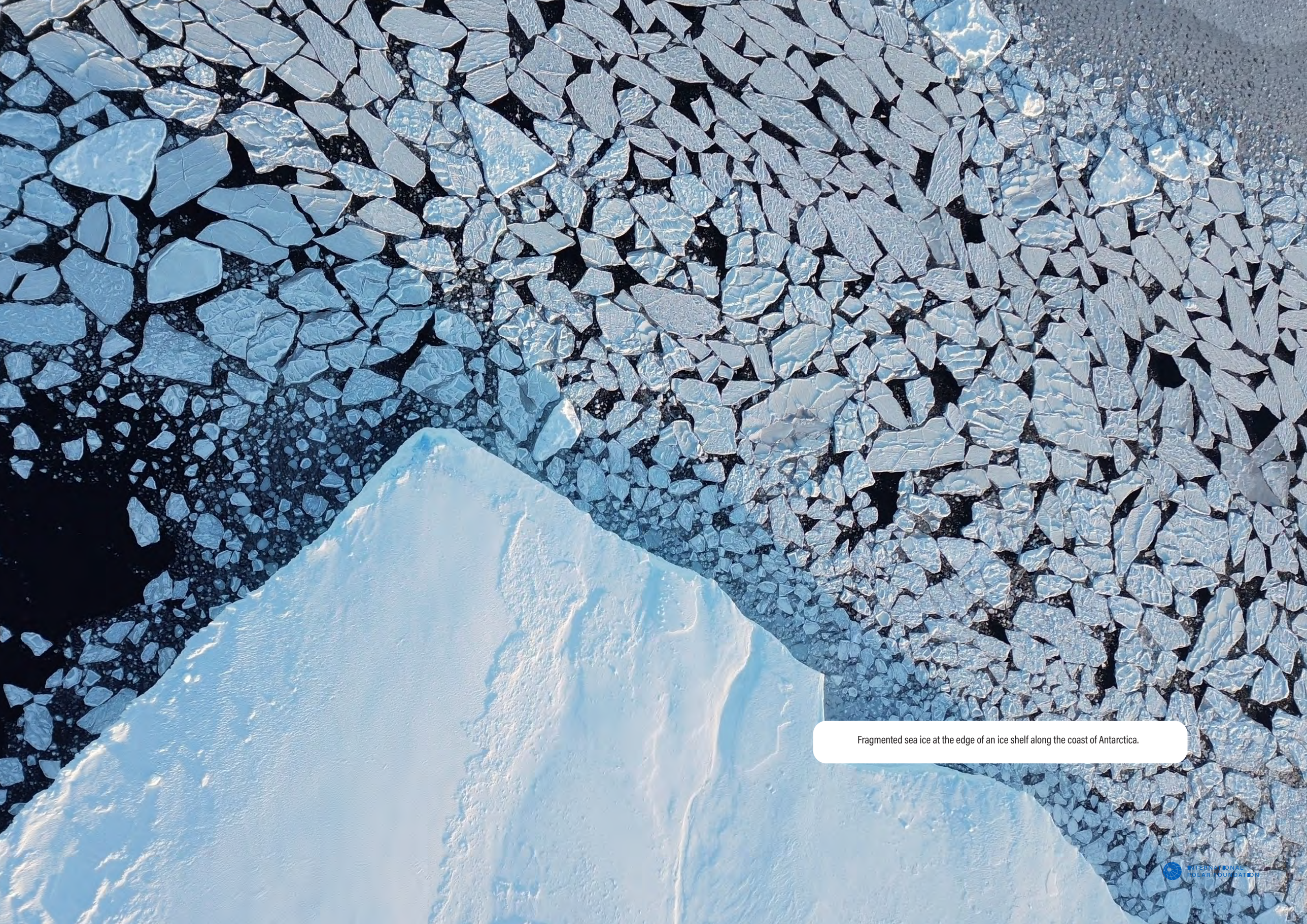
Wang, Y., Su, J., Xue, Y., Chang, X., Li, Z., & Sun, H. 2024. Toward on Rolling Optimal Dispatch Strategy Considering Alert Mechanism for Antarctic Electricity-Hydrogen-Heat Integrated Energy System. IEEE Transactions on Sustainable Energy.

Wauthy, S., Tison, J. L., Inoue, M., El Amri, S., Sun, S., Fripiat, F., ... & Pattyn, F. 2024. Spatial and temporal variability of environmental proxies from the top 120 m of two ice cores in Droning Maud Land (East Antarctica). Earth System Science Data, 16(1), 35-58.

Wex, H., Eckermann,O., Juranyi, Z.. Weller, R., Mangold, A., Van Overmeiren, P., Zeppenfeld, S., van Pinxteren, M., Dall'Osto, M., Henning, S. 2024. Antarctica's Unique Atmosphere: Really Low INP concentrations. Authorea. October 21.

Wilmotte, A., Van Hellemont, Q., Savaglia, V., Lambrechts, S., Willems, A., Verleyen, E., ... &

Vyverman, W. 2024. Belgium at the Science-Policy interface in the Antarctic Treaty System: creation of a protected area for environmental and scientific values. In Global Antarctic research event, SCAR 2024.



Fragmented sea ice at the edge of an ice shelf along the coast of Antarctica.

CONFERENCES & EVENTS

On Tuesday, December 3rd, Cinema Galleries in Brussels welcomed the 6th edition of the annual Arctic Shorts evening.

As an official cultural diplomacy side event of the annual Arctic Futures Symposium, the event is open to both symposium participants and locals interested in Arctic cinema.

A popular event, more than 200 people attended, with the room where the films were screened filled to capacity. Following introductions by Claude Véron-Réville (Head of Division for Western Europe and Special Envoy for Arctic Matters, EEAS) and Gizem Eras (Counsellor and Head of Section for Agriculture, Fisheries and Environment, Mission of Canada to the EU), cinema goers were treated to the following films:

ARCTIC CIRCLE ASSEMBLY

For the third year in a row, representatives from the International Polar Foundation participated in the annual Arctic Circle Assembly in Reykjavik, Iceland, from October 17th to 19th, 2024, along with the associated Arctic Circle Business Forum.

The foundation's presence was marked by significant contributions to high-level discussions, technological showcases, and direct public engagement, effectively highlighting its expertise and commitment to sustainable polar research. The delegation consisted of board member Marie-Anne Coninsx and systems engineer Aymar de Lichtervelde.

On Thursday, October 17th, IPF board member, former EU Arctic Ambassador and a Senior Fellow at the Egmont Institute Marie-Anne Coninsx was a featured panelist in a discussion titled "Navigating the New Arctic: The Role of Non-Arctic States in Shaping the Future."

Organized by the Egmont Institute, this high-level panel brought together key stakeholders to discuss the evolving geopolitical landscape of the Arctic. Former Ambassador Coninsx was joined by Mads Qvist Frederiksen, Director of the Arctic Economic Council, Andreas Østhagen from the Fridtjof Nansen Institute, and official representatives from the foreign ministries of Finland, Japan, Ireland, and Germany.

This participation positioned the IPF at the center of crucial policy dialogues concerning international cooperation and the future governance of the Arctic region.

Then on Friday, October 18th, IPF systems engineer Aymar de Lichtervelde represented IPF in a technical panel discussion co-organized by Battelle, Arctic Trucks, and ArkTiKa. The session, "Emerging Technologies for Better Human Health and Safety in Remote Polar Regions," provided a platform for Mr. de Lichtervelde to present the advanced engineering behind the Princess Elisabeth Antarctica research station's new water treatment system.

As a veteran of the Belgian Antarctic Research Expeditions (BELARE) and a co-designer of the station's new system, Mr. de Lichtervelde detailed how the world's first zero-emission polar research station exceeds the environmental protection standards of the Madrid Protocol to the Antarctic Treaty. He showcased the groundbreaking, fully integrated system for treating and reusing wastewater, demonstrating a tangible solution for minimizing the environmental footprint of scientists as they conduct their important work to better understand Antarctica.

Throughout the three-day assembly, Mr. de Lichtervelde manned a dedicated booth on the second floor of Harpa Conference Centre, which featured a detailed scale model of the Princess Elisabeth Antarctica's new water treatment system and information about the zero emission research station. The exhibit attracted significant interest from conference attendees.

Mr. de Lichtervelde conducted numerous mini-presentations, explaining the innovative technologies and sustainable solutions employed at the station. This direct outreach was highly effective in educating a diverse international audience about IPF's pioneering and innovative work.

Engineer Aymar de Lichtervelde presenting PEA's newly installed water treatment system at the Arctic Circle Assembly in Reykjavik.

Aymar de Lichtervelde taking part in a panel session organized by Batelle at the Arctic Circle Assembly 2024.

ARCTIC FUTURES SYMPOSIUM

The 2024 Arctic Futures Symposium took place on Monday, December 2nd and Tuesday, December 3rd at the Residence Palace in Brussels' EU Quarter.

Titled "Finding Solutions in Uncertain Times," the symposium featured multi-stakeholder discussions on topics of great importance to those who call the Arctic home and those with interests in the region. About 200 people including local, regional, national, and EU policy-makers, indigenous peoples, scientists, academics, and industry representatives took part in the event.

Following a welcome by IPF and a Quuliq lighting ceremony performed by Inuk lawyer Aaju-Peter, attendees were treated to keynote speeches from Secretary General of the European External Action Service Stefano Sannino, Director General of Maritime Affairs and Fisheries Charlina Vitcheva, State Secretary of Norway Maria Varteressian, and ICC International Chair Sara Olsvig.

The second day of the symposium included keynote speeches from Deputy Prime Minister and Minister of Foreign Affairs, Industry and Trade of the Faroe Islands Høgni Hoydal and Inuk Lawyer Aaju-Peter. It also featured the ceremony for the Laurence Trân Arctic Futures Award, a €7,500 prize aimed at supporting young Arctic entrepreneurs.

The symposium concluded with a summary and closing remarks from Former EU Arctic Ambassador, IPF Board Member and Senior Fellow at the Egmont Institute Marie-Anne Coninsx and US Ambassador-at-Large for Arctic Affairs, Mike Sfraga.

The symposium included several topical panels:

- Reflections and Aspirations from the Norwegian and Kingdom of Denmark Arctic
- Council Chairships Transatlantic Cooperation in the Arctic in 2025 and Beyond
- The Current Security and Geopolitical Status of the Arctic Innovation, Entrepreneurship, and Regional Collaboration to Meet Arctic Challenges Sustainably
- Building and Maintaining an Arctic Workforce and Resilient Arctic Communities
- Critical Raw Materials and Resource Supply Chains: Tensions and Trade-offs

In addition to the main symposium, several side events took place, including:

- The annual Arctic Shorts evening
- A panel discussion on Sustainable Ocean Development and the Green Transition co-hosted by Arctic Frontiers Abroad and the University of Bergen (UiB)
- A screening of the film Twice Colonized (a biopic of Inuk Lawyer Aaju-Peter) hosted by the Permanent Representation of Denmark to the European Union
- An evening focused on "Observing, Understanding and Responding to Arctic Change," hosted by the INTERACT Nonprofit Association (INPA) and the Embassy of Monaco to Belgium, to mark the transition of the INTERACT consortium from an EU-funded project to a non-profit association.

SYMPOSIUM PARTNERS AND SPONSORS

Partners:

The Mission of Canada to the European Union

The Permanent Representation of Denmark to the European Union

The Mission of the Faroes to the European Union

The Permanent Representation of Finland to the European Union

The East and North Finland European Office

The Representation of Greenland to the European Union

The Mission of Iceland to the European Union

The Mission of Norway to the European Union

The Royal Norwegian Embassy in Belgium

The North Norway European Office

The Québec Government Office

The North Sweden European Office

Contributors:

The Arctic Economic Council

The Arctic Mayors Forum

Arctic PASSION

The Arctic Six University Alliance:

Nord University
UiT- The Arctic University of Norway
Umeå University
Luleå University of Technology
University of Oulu
University of Lapland

The symposium was recorded and uploaded on the IPF YouTube Channel:

<https://www.youtube.com/watch?v=yzMd7wSN0uQ&list=PLUd2Ya71uzhoRfwd-pIQ1nw-x681vUkV7x>

LAURENCE TRÂN ARCTIC FUTURES AWARD

During the 15th annual Arctic Futures Symposium, the 3rd Laurence Trân Arctic Futures Award was given to Siu-Tsiu, a Greenlandic social enterprise that gives young people work experience with the goal of helping them transition to business or higher education.

Based in Nuuk, Tasiilaq, and Qaqortoq, Siu-Tsiu was chosen as the winner among candidates from across the Arctic because it empowers marginalised youth and fosters a sense of purpose and belonging, which helps them build a better future.
The enterprise also motivates people to make a difference locally, which in turn contributes to the overall health and well-being of Arctic communities.

Two runners up were also selected: Air Vitalize Innovations, an Alaska-based clean-tech startup making solar-powered air filtration systems, and Sulacare, a Sámi-managed Med-tech company that developed an innovative solution to make catheter insertion safer for patients.

Established in 2022, the Laurence Trân Arctic Futures Award, funded by the Trân Family, gives €7,500 of financial assistance to a startup run by young entrepreneurs based in the Arctic.
This year's winner was chosen by an international jury of experts on startups, innovation and entrepreneurship from various parts of the Arctic.

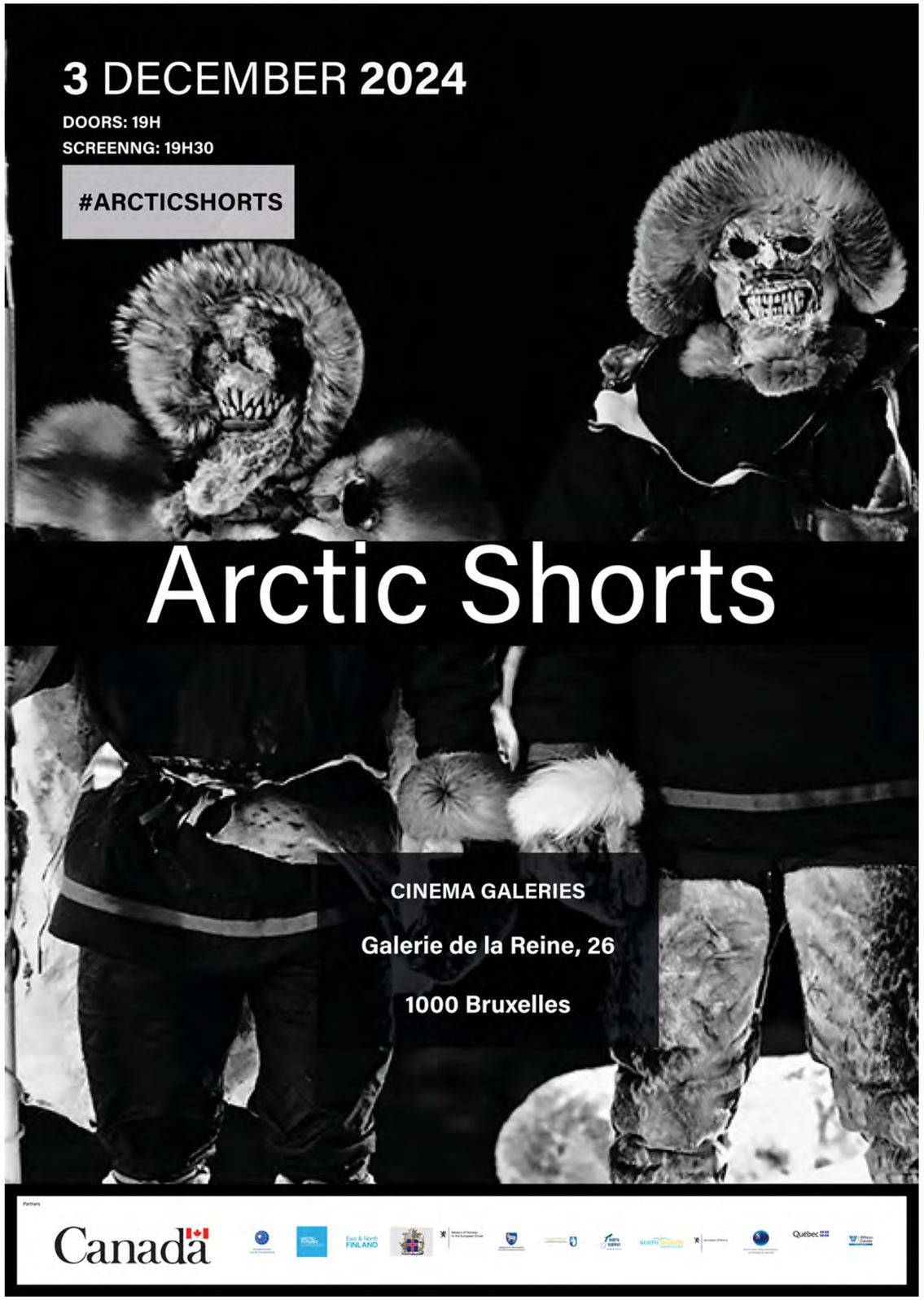
INTERACT NON-PROFIT ASSOCIATION (INPA) LAUNCH

In the evening of Wednesday December 4th, 2024, the INTERACT Non-Profit Association (INPA) and the Mission of Monaco to the European Union hosted the final official side event of the 15th Arctic Futures Symposium: Observing, Understanding and Responding to Arctic Change at Town Hall Europe, near the European Parliament.

The event marked the official launch of the INTERACT Non-Profit Association (INPA) as an organisation to continue the 15 years of work done by 95 research stations around the Arctic and in boreal and alpine regions through the INTERACT EU-funded project (to which the International Polar Foundation contributed a report on reducing the environmental footprint of polar research stations). It was also an occasion to recognise the efforts and attention Monaco has given to the poles.

The event was opened by the Ambassador of Monaco to Belgium Frédéric Labarrere, INPA Board member and Lund University Professor of Margareta Johansson, Italian actor Giorgio Lupano, and Honorary President, founder of INTERACT and University of Sheffield Professor Terry Callaghan CMG.

The evening event brought together experts in panel discussions to address the pressing challenges posed by climate change in the Arctic and to explore collaborative solutions for a sustainable future. With guests that included experts and stakeholders such as President of Saami Council Per-Olof Nutti, EU Special Envoy for Arctic Matters Claude Véron-Réville, University of Bristol Professor Jonathan Bamber, and INTERACT Station Manager Forum Co-Leader from University of Copenhagen Morten Rasch, the discussions explored Arctic change from different perspectives, including from indigenous knowledge, diplomacy and science, and examined how best to collaborate to address climate change.



ARCTIC SHORTS

On Tuesday, December 3rd, Cinema Galleries in Brussels welcomed the 6th edition of the annual Arctic Shorts evening.

As an official cultural diplomacy side event of the annual Arctic Futures Symposium, the event is open to both symposium participants andThose in Brussels interested in Arctic cinema. More than 200 people attended this popular sold-out event.

Following introductions by Claude Véron-Réville (Head of Division for Western Europe and Special Envoy for Arctic Matters, EEAS) and Gizem Eras (Counsellor and Head of Section for Agriculture, Fisheries and Environment, Mission of Canada to the EU), cinema goers were treated to the following films:

Nalujuk Night (Canada)
Eadni (Sweden)
Fár (Iceland)
A Culinary Tale of Greenland's Changing Climate (Greenland)
Les adieux de la Grise (Québec)
Cock (Kuk) (Norway)
Farewell (Hyvästi jää) (Finland)
Brother Troll (Faroe Islands)

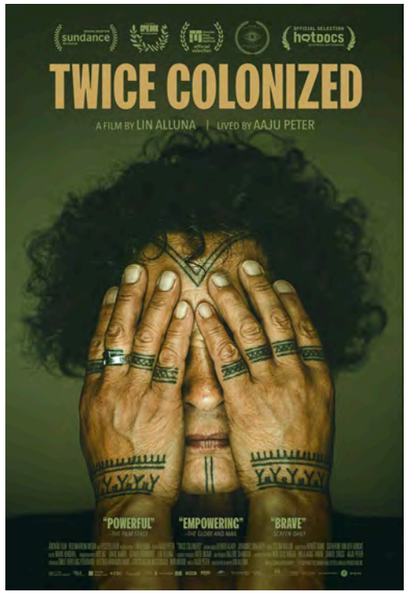
The Arctic Shorts film evening is made possible thanks to the Mission of Canada to the European Union and financial support from the Canadian government.

SCREENING OF TWICE COLONIZED

Screened as an official side event of the 15th annual Arctic Futures Symposium at the Permanent Representation of Denmark to the European Union on Wednesday, December 4th, 2024, Twice Colonized is a documentary film profiling Aaju Peter, an Inuk lawyer and activist who has lived in both Greenland and Nunavut during her lifetime.

The award-winning film, which first premiered at the 2023 Sundance Film Festival, documents Aaju Peter's activism for Inuit rights and her personal life journey, including the tragedy of losing her youngest son to suicide.

The screening at the Permanent Representation of Denmark to the European Union, attended by 80 guests, opened with speeches by Permanent Secretary for the Greenland Foreign Affairs Mininguaq Kleist and the Director of the Mission of Greenland to the European Union Inuuteq Holm Olsen. Following the film, Aaju Peter, director Lin Alluna and producer Emile Hertling Péronard took questions from the audience.



ARCTIC FRONTIERS ABROAD

On the morning of Wednesday, December 4th, Arctic Frontiers and the University of Bergen (UiB) organized an official side event for the Arctic Futures Symposium titled "License to Operate: Sustainable Ocean Development and the Green Transition."

Held at the NH Carrefour de l'Europe Hotel, the event convened stakeholders from Norwegian and European policy, business, and academia. The primary goal was to explore how Arctic science diplomacy and ocean governance can contribute to a sustainable green transition.

Co-hosted by Anu Fredriksen, CEO of Arctic Frontiers, and Nils Nilsen, Director of the North Norway European Office, the event featured three panel discussions. Key topics included:

The new EU-Norway Green Alliance (Den grønne alliansen), which aims to strengthen collaboration on energy, industry, and climate change, with a special focus on offshore wind.
The social acceptance of both onshore and offshore wind energy projects.

The national and local benefits of domestic energy, such as using domestic technology and creating economic advantages for small communities through local value chains.

The event welcomed about 100 participants, including experts from the European Commission and top Arctic universities.

2050

March 2025 saw the official release of 2050, the highly anticipated film by renowned Belgian filmmakers Eric Goens and Kristoff Van Den Bergh of Bargoens TV.

The feature-length documentary provides a window into daily life during a BELgian Antarctic Research Expedition (BELARE) at the Princess Elisabeth Antarctica research station, discusses the consequences of climate change on the polar regions, and recounts the first overwintering expedition in Antarctica led by Belgian explorer Adrien de Gerlache. Filled with breathtakingly beautiful landscapes, 2050 shines a light on past and present science taking place in Antarctica and Greenland, and how changes happening in the polar regions will have widespread implications for the rest of the planet.

Financed by Syensqo, the acclaimed documentary features IPF founder Alain Hubert, Hélène de Gerlache de Gomery (granddaughter of Adrien de Gerlache, the leader of the first overwintering expedition on the Belgica in 1897-99), UC Irvine glaciologist Prof. Eric Rignot, the late Swiss glaciologist Dr. Konrad Steffen and his son IPF technician Simon Steffen, IPF mechanic Tim Grosrenaud, IPF systech engineers Nicolas Herinckx and Aymar de Lichtervelde, and several scientists who have spent time in Antarctica at the Princess Elisabeth station.

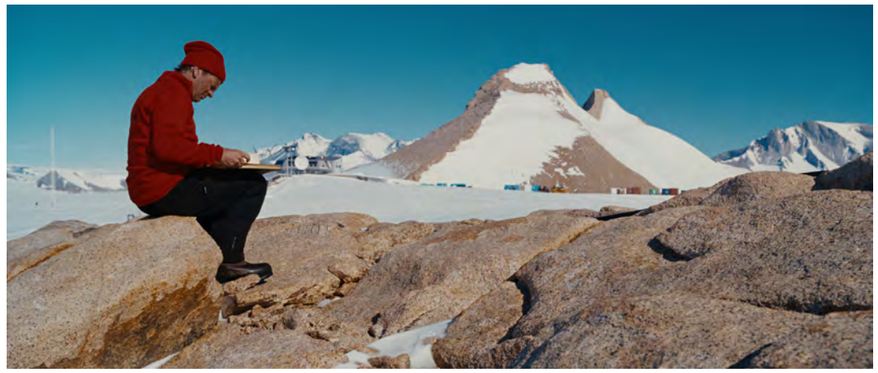
The filmmakers travel with Hélène de Gerlache de Gomery to the Antarctic Peninsula where she sails in the same waters first traversed in 1897 by her grandfather, Adrien de Gerlache, and which are today called the Gerlache Strait in his honour. The audience is also taken along for a ride with IPF Founder Alain Hubert on a field expedition to support scientists, visit with Prof Eric Rignot as he studies the consequences of a warming climate and ocean on the King Baudouin Ice Shelf, and learn from engineers as they perform their daily duties running the Princess Elisabeth Antarctica, the world's first and to date only zero-emission polar research station.

Prior to its official release on March 5th in Belgian cinemas, 2050 was first shown to a large public audience of 1,500 people on February 8th, 2025, on the closing day of the annual Oostende Film Festival. It was chosen as one of the audience's favourite films of the festival.

A few weeks later, MOS Vlaanderen, an educational organisation that integrates environmental stewardship into local school curricula, screened the film to teachers at two locations in Belgium: in Leuven on February 18th and in Ghent on February 19th. Each event was followed by a panel discussion with Eric Goens and Belgian scientists who had been to the Princess Elisabeth Antarctica to do research. At the event in Ghent, IPF Education and Outreach Coordinator Mieke Sterken also joined the panel discussion.

And finally, the film's official avant-premiere at Kinepolis in Antwerp on the evening of Thursday February 27th welcomed hundreds of people to the red-carpet event attended by ministers from the Belgian government and the Flemish Parliament, along with several Belgian scientists who have been to Antarctica, including Jean-Jacques Derwael, who took part in Belgian expeditions to Antarctica in the 1960s.

IPF Founder and BELARE expedition leader Alain Hubert, freshly arrived from Cape Town after finishing the 2024-25 research season in Antarctica, joined Hélène de Gerlache de Gomery, Simon Steffen and filmmakers Eric Goens and Kristoff Van Den Bergh on the red carpet at Kinepolis Antwerp before viewing the film. The documentary was screened in two different rooms in the cinema complex to allow for a larger audience to experience the magic. After each screening the filmmakers and members of the cast answered questions about the film and their experiences working in Antarctica.



Expedition leader Alain Hubert walking on the ice in the windscoop next to Utsteinen.

Preview of Eric Goens's movie 2025 featuring Alain Hubert and Simon Steffen from IPF in the company of the film's director and producer - Simon Steffen, Kristof Van Den Bergh, Eric Goens, Ilhan Kadri, Hélène de Gerlache de Gomery, Alain Hubert.

EDUCATION & OUTREACH

Throughout 2024–2025, the International Polar Foundation (IPF) deepened its mission to connect science, education, and the public by bringing the polar regions closer to thousands of people across Belgium, Europe, and beyond. Our activities spanned schools, science festivals, exhibitions, conferences, film screenings, and online platforms. From hands-on puzzle workshops for children to high-level international conferences, the Foundation ensured that the realities of polar science were not only explained but also experienced in engaging and accessible ways.

Inspiring the Next Generation: Schools & Youth Outreach

Polar Puzzle Workshops

Our unique polar puzzle workshops continued to thrive as a gateway into polar science. Seven sessions were held at primary and secondary schools as well as university colleges, from VIVES University College Bruges and Torhout to the Lycée Français in Uccle. Children as young as 8, alongside future teachers and sustainability students, discovered the complexity of the polar environment through tactile learning.
A highlight came on May 8th, 2025, when students at Sint-Pieterscollege Jette reversed roles, guiding their peers across all grades (1st–6th year) through polar puzzles and climate change explanations, after having visited the IPF earlier in the year.

Hands-on Science Experiences

In February 2025, at the Egied Van Broeckhoven Secondary School in Molenbeek, pupils explored the professions behind Antarctic science. Students experimented with techniques such as measuring Secchi depth and analysing sediment cores, discovering first-hand how paleolimnologists work in the field.

Live Presentations in Schools

Engineers and scientists from IPF brought stories directly into classrooms:In January, Wouter Paesen spoke at Heilig Hart Secondary School in Bree.In May, Nicolas Herinckx presented in French at Secondary School Saint-Hubert.

Online Classroom Connections

Eight live Zoom sessions were organized with schools and universities across Belgium, the UK, Spain, and Catalonia. From the Princess Elisabeth Antarctica Station itself, IPF experts answered questions from primary pupils, university students, and curious teenagers, creating real-time dialogue between Antarctica and European classrooms.

Engaging the Public: Science Fairs, Festivals & Shows

Science festivals

- At the Day of Science Brussels (November 2024), IPF reached children and families through puzzles and a lively talk.
- At the Ekoli Inclusive Science Festival in Ghent (May 2025), IPF welcomed around 600 visitors. The program featured puzzle workshops and an Antarctica & Climate Escape Room for children aged 7–12, giving some 40 participants the thrill of discovery through play.

Science Shows & Media

- IPF contributed to Nerdland for Little Nerds (December 2024), where Antarctic vlogs by Johan Demuylder and colleagues introduced 15,000 children and parents to life at the Princess Elisabeth Station.
- The launch of 2050 by filmmaker Eric Goens included exclusive screenings for teachers, with IPF experts participating in panel discussions in Leuven and Gent.

Exhibitions & Public History

From June to November 2024, IPF partnered with MAS in Antwerp for the exhibition *To the Antarctic*, which attracted an estimated 45,000 visitors. Highlighting the voyage of the Belgica and linking it to modern Antarctic research, the exhibition received strong media attention across Belgian and international press, TV, and radio

Supporting Scientists & Partners

- IPF supported researchers Alexander Mangold and Nadine Matielli in delivering workshops at Brussels schools for TADA.
- Press support was provided for the Belspo-funded ULTIMO and FROID projects, resulting in strong national media coverage of meteorite discoveries and ancient ice research.
- IPF guided journalists covering life in remote Antarctic conditions, connecting them with experts from KU Leuven, VUB, and RBINS.

Impact numbers

- 21 education and outreach activities between January–March 2025 alone.
- Thousands of children, students, and teachers engaged through workshops, school visits, Zoom calls, and festivals.
- 45,000 visitors reached through the MAS exhibition To the Antarctic.
- 180 participants in the Arctic Futures Symposium, with global decision-makers in attendance.
- Extensive press coverage across Belgian and international media.
- Growing digital footprint via YouTube, the new IPF Education site, and regular web articles.

THE GORGONEION COLLECTIVE

Field testing

Researcher Veronica Tollenaar, together with Mieke Izeboud, tested the Gorgoneion garments during fieldwork.
The prototypes were worn and evaluated in real conditions, providing us with important insights into their performance.

Veronica shared that she loved the garments overall, particularly their comfort, warmth, and practicality in harsh environments. At the same time, she offered a number of constructive comments that will guide the next stage of development, ensuring that the garments continue to evolve in response to women's actual field experiences.

Gorgoneion is more than a clothing line. It is a collection, an archive, and a community. Each garment is a piece of functional equipment but also part of a broader narrative: an archive of women's presence in polar research, and a space to make visible the realities, adaptations, and innovations required for their participation.

Through this double role, practical and symbolic, the project contributes to a wider conversation about gender equality in science and fieldwork, addressing both the material challenges and the cultural invisibility women often face.

We are deeply grateful for Veronica's enthusiastic participation and her willingness to continue contributing to the project. She will also be joining us in the upcoming APECS presentation, where her first-hand perspective as a researcher who tested the garments in the field will add depth to the discussion. By sharing her insights alongside our design and research process, we aim to highlight how collaborative innovation can help build a safer, more inclusive, and more equitable future for all scientists in the field.

Veronica Tollenaar and Maaike Izeboud taking ApRES radar measurements of the ice near the Winter Park close to PEA before heading out into the field.

Stunning landscape at the edge of the ice shelf along the coast of Queen Maud Land.

IPF ON THE WEB

Websites

www.polarfoundation.org

With new ambitions come new In September 2024, the IPF launched a brand new website designed by Atelier Brückner. The entirely new design has both a standard menu to find news stories and press releases, as well as information about the Foundation. It also features a photo and video gallery, as well as an interactive globe on its homepage that users can click on to discover more about IPF's activities in Antarctica, Brussels and other parts of the world.

The new corporate website also absorbs much of the information from the former *www.antarcticstation.org* website, but presents it in a more dynamic way. If one zooms in on Antarctica on the globe, one can click through different layers to learn more about the Foundation's work in Antarctica, including the Princess Elisabeth Antarctica, as well as all scientific and logistical research projects taking place at the station or within the 300 km radius around the station. You can also learn more about Perseus International Airfield, which guarantees Belgium and other countries access to Antarctica in the current challenging geopolitical times, and the Andromeda Earth Observatory, IPF's next big project in Antarctica!

www.artcifutures.org

This website is essential for anyone interested in learning more about the must-attend Arctic event in Brussels every autumn, the Arctic Futures Symposium. With a growing number of collaborators and side events, interest in this multinational and multidisciplinary forum at which stakeholders from the Arctic, Brussels, and elsewhere congregate, continues to grow as interest in the Arctic also grows. The website features information about the symposium discussion topics, speakers, program, location, registration and news about the symposium's many side events. It also features information about how to apply to the Laurence Trân Arctic Futures Award.

ipf-education.org

The main website of our educational activities hosts recently made educational materials and posts news about the most recent workshops, seminars, and other events organised by the Foundations' educational team. Teachers and educators can book anin-person workshop or online webinar for young learners of all ages from pupils in elementary school to students in university.

Legacy websites

Our legacy websites are no longer updated, but contain valuable information and materials that users continue to seek.

www.antarcticstation.org

This website, which has gone dormant since the new corporate IPF website went online in September 2024, features useful information about the IPF's flagship project, the Princess Elisabeth Antarctica - the world's first zero emission polar research station. In addition to providing a wealth of information about the station, the website contains archives of news, photos, and videos of operations at the station, science projects, and the renewable energy systems and smart grid used at the station.

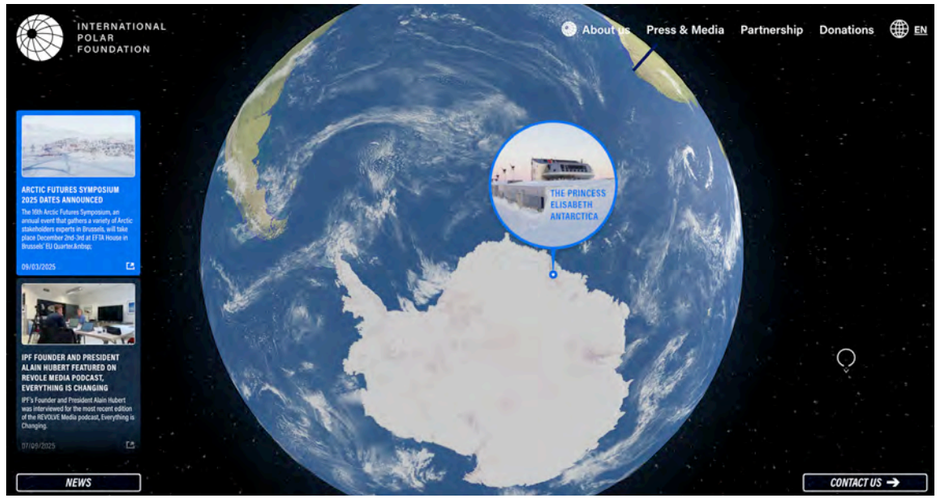
www.educapoles.org

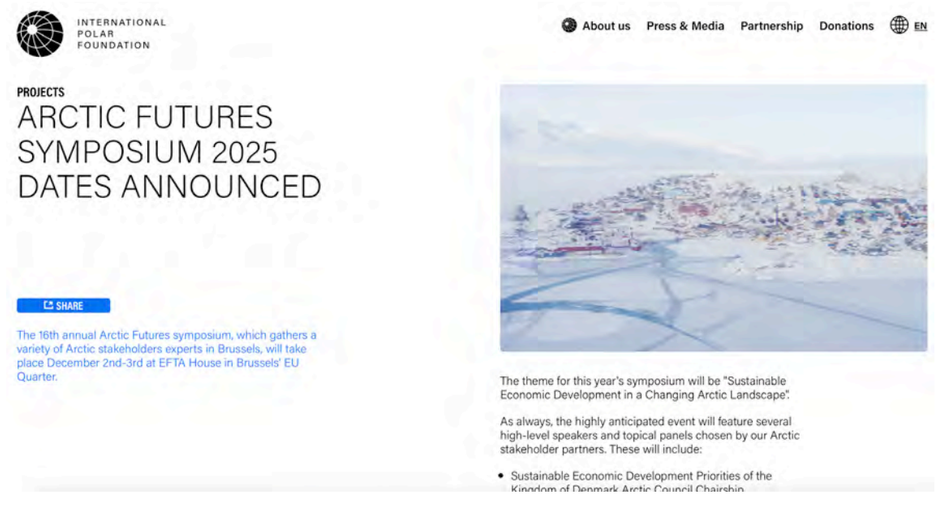
This website, created in 2005 when the education department was created at the International Polar Foundation, hosts many multimedia educational materials available to down-

load at no cost to teachers and educators in three languages: English, Dutch, and French. These materials include pedagogical dossiers, animations, videos, picture galleries, tailored stories, and readymade content such as quizzes, scientific experiments, and classroom activities. The site also raises awareness of the Polar Regions as an early warning system for climate change and a unique place to conduct research, and mobilises citizens to take informed actions against climate change.

www.sciencepoles.org

Another dormant website of the foundation that was managed by science journalists, it features polar science articles and interviews with top polar scientists. The goal of the website was to help raise the profile of science communication, explain important topics in polar science, and bridge the science-society divide.





Young emperor penguin taking refuge in a rift in the King Baudouin Ice Shelf (Queen Maud Land).

SOCIAL MEDIA

The International Polar Foundation maintains an active presence on multiple social media platforms, allowing us to keep a wide audience informed about IPF's activities throughout the year, which is important considering this has become a primary news source for many individuals.

The IPF is active on six social media platforms:

Facebook (@intpolarfoundation), Instagram (@international_polar_foundation), X (@Polar-Foundation), LinkedIn, TikTok (@int.polarfoundation) and since this part year we are also active on Threads (international_polar_foundation)

Given that different platforms are aimed at different audiences, communicating on a variety of social media platforms is essential for IPF to project its message to a broad cross-section of the general public.

The majority of the content shared on social media includes photos and videos related to activities of scientists and the IPF team at PEA station, events organised by IPF or events in which we take part, our education and outreach activities, and announcements for our aforementioned events and activities.

The IPF Instagram account (international_polar_foundation), which has been active since 2020, continues to grow in popularity. This is a great platform to show off photos and videos, especially those we take during our missions in the Queen Maud Land region of East Antarctica. The demographic for Instagram tends to skew a bit younger, with 62% of users in the 18-34 age range, although there are an increasing number of users above 40. By mid-2025, the account had 3391 followers, a steady increase compared to last year when we reported 2,883 members by the time of publication. In addition to posting photos and reels, we also post stories live from events we organise or attend, as well as share posts from other profiles, or to draw attention to important content.

IPF's Facebook account (intpolarfoundation), was started back in 2012, and is used in a similar way to its Instagram account, as we post photos, videos, and stories. While there are still many people in the 25-34 age demographic, fewer younger people tend to use this platform. The majority of interactions on the IPF Facebook account tends to happen with slightly older users with the 35-44 age group making up 29.5% of our followers. In the past year, our facebook account has had 2,253 interactions and we currently have 3,437 followers but have been able to reach thousands of more people through our content and posts.

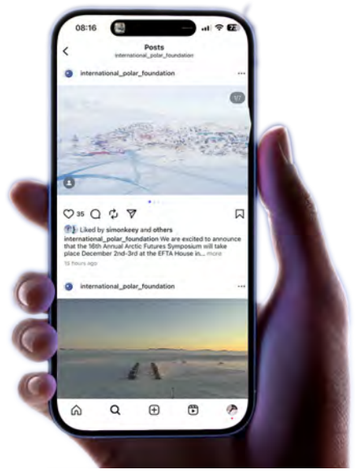
IPF's X account (@PolarFoundation) has been active since 2012. For the first time since the account has been active it lost several hundred followers, bringing our total number of followers to 7705 by mid-2025. This decrease is likely due to several account holders choosing to no longer be on the platform given the controversial views of its owner and uncensorted nature of the material , which may not be in line with the views of some of IPF's followers. Nonetheless, we continue to post photos, videos, announcements, and other information on this platform given it still has a very wide reach, and we believe it is important to continue to communicate to a broad spectrum of people. Users of this platform tend to be young men under 35, a majority of which are based in the United States.

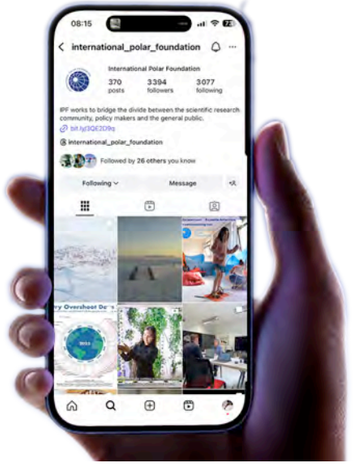
In 2024, IPF also started using Threads (international_polar_foundation) to access a wider audience and in response to the ever-evolving social media landscape, with many new Threads users migrating away from X. Users tend to fall within the 25-34 age range, and the majority of its users are young men. Since its creation, the IPF Threads account has attracted 523 followers.

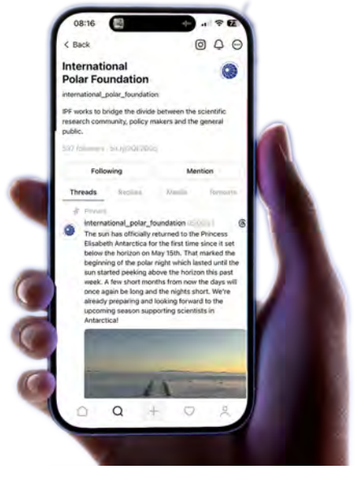
The IPF LinkedIn page (international-polar-foundation) targets professional contacts and organisations relevant to IPF's core areas of expertise of sustainability, renewable energy, polar research, and polar research. While the audience is more career-focused and includes a higher percentage of older professionals compared to more casual social platforms, the majority of users are still young and mid-careers professionals. Over the last year, the IPF

Linkedin page has gained 421 followers to reach a total of 1099.

The IPF TikTok account (@int.polarfoundation) debuted in November 2021 featuring primarily content from the Princess Elisabeth Antarctica research station and has grown ever since, thanks to many viral videos. Users tend to be much younger, with many falling between 18 and 34, although about 10% of users are over 50. As the majority of content on this account are educational photos and videos aimed at a younger audience and thus require a significant time investment, the account tends to be active primarily only during the Antarctic research season when our social media activity is stronger. As of mid-2025 the IPF account had 16.8K followers and a total of 960.8K likes.







Aerial view of the Mount Belgica. Picture takedown during the deployment of the ULTIMO team during BELARE 2024-2025 expedition.

IN MEMORIAM: CRAIG MASSON

The BELARE community was sad to learn that one of our longtime team members, Craig Masson, passed away on Friday the 16th of May, 2025 following an accident at work.

Craig was a much-loved and popular member of the team. He participated in the construction of the Princess Elisabeth Station during the 2007-08 season, and in nine seasons altogether.

A creative technician, he could solve problems with the installations that would defy most people and his quiet humour was much appreciated by all.

Our sincere condolences go to his family, who are devastated by this loss.

A long-time friend, Craig has been a pillar of the construction and the technical development of the Princess Elisabeth Antarctica Station. He always impressed us with his talent, his energy and his ability to find solutions to the many challenges we encountered in our joint projects. This is a chapter in all of our lives that is turning.

Thank you, Craig, for all you have been to us.

Helicopter unloading equipment form the supply ship in February 2025.

STRUCTURE & GOVERNANCE 2024/2025

INTERNATIONAL POLAR FOUNDATION

HONORARY PRESIDENT:

- HM King Philippe of Belgium

FOUNDERS:

- Alain Hubert, Civil Engineer, Polar Explorer, Mountain Guide
- André Berger, Climatologist, Emeritus Professor at UCL (Belgium), Honorary President of the European Geosciences Union
- Hugo Decleir, Glaciologist, Emeritus Professor at VUB (Belgium) +

HONORARY MEMBERS:

- Roger Barry, National Snow and Ice Data Centre (NSIDC), USA +
- Paul Crutzen, Max Planck Institute, Mainz, Germany +
- Ivan Frolov, Arctic and Antarctic Research Institute (AARI), Russia +
- Claude Lorius, Laboratoire de Glaciologie et Géophysique de l'Environnement (LGGE), France +
- Lawrence Mysak, McGill University, Canada
- Olav Orheim, Norwegian Research Council, Norway
- Dahe Qin, China Meteorological Administration (CMA), China
- Chris G. Rapley, University College London (UCL), UK
- Kazuyuki Shiraishi, NIPR
- Susan Solomon, Massachusetts Institute of Technology (MIT), USA
- Konrad Steffen, WSL, Switzerland +
- Svein Tveitdal, GRID Arendal, UNEP, Norway
- Okitsugu Watanabe, National Institute of Polar Research (NIPR), Japan

EXECUTIVE COMMITTEE:

- Alain Hubert, President, International Polar Foundation
- Nighat Amin, Head of Environmental and International Affairs at the IPF
- Nicolas Van Hoecke, Managing Director

FINANCIAL:

- Alain Thierry Barrera, Liaison with the Financial Control of the Polar Secretariat
- Arnaud de Viron: IPF Finance and Accounting

BOARD OF DIRECTORS:

- Alain Hubert, Founder President, Chairman of the Board (mandate: 20/12/2018 - 20/12/ 2023) Member of the Belgian Polar Secretariat
- André Berger, Founder (mandate: 20/12/2018 - 31/12/2022)
- Nighat Amin, Director (mandate: 27/09/2019 - 27/09/2024)
- Piet Steel, Non Executive Director (mandate: 20/12/2018 - 20/12/2023) Member the Belgian Polar Secretariat
- Marc Speeckaert, Non Executive Director, Member of the Belgian Polar Secretariat (mandate : 20/12/2018 - 20/12/2023)
- Alain Dewaele, Non Executive Director (mandate: 20/12/2018 - 20/12/2023)
- Olivier Périer, Non Executive Director (mandate: 27/09/2019 - 27/09/2024)
- Eric Goens, Non Executive Director, Chairman of the Board of BELARE (mandate: 27/09/2019 - 27/09/2024)
- Jacques de Mevius, Non Executive Director (mandate: September 2019 - September 2024)
- Marie-Anne Coninsx, Non-Executive Director, Former EU Arctic Ambassador, Senior Fellow of the Egmont Institute (27/04/2019-27/04/2027)

BELARE

EXECUTIVE COMMITTEE:

- Alain Hubert, President, International Polar Foundation
- Nighat Amin, Head of Environmental and International Affairs, International Polar Foundation
- Nicolas Van Hoecke, Managing Director, International Polar Foundation

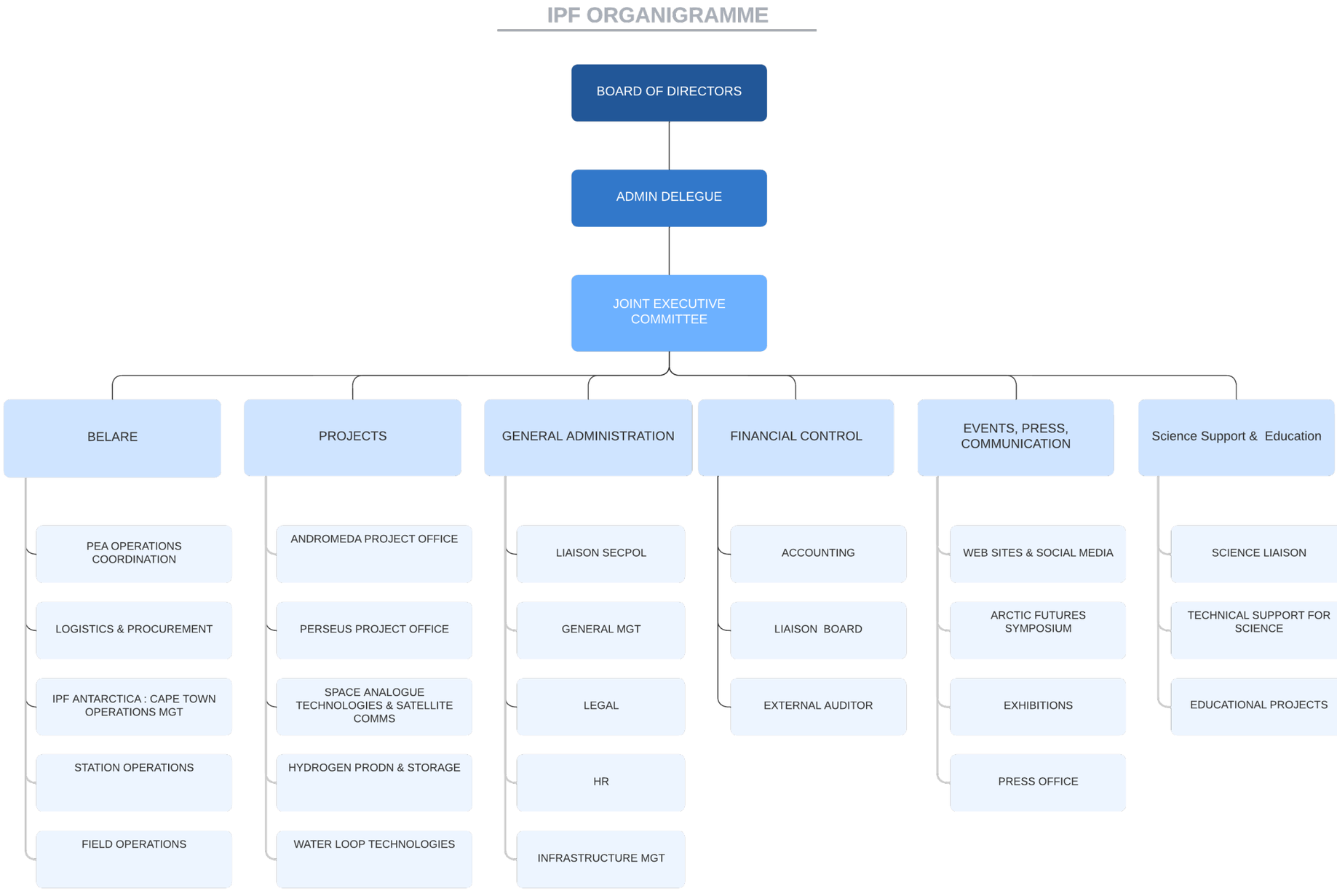
FINANCIAL:

- Alain Thierry Barrera, Liaison with the Financial Control of the Polar Secretariat
- Arnaud de Viron: IPF Finance and Accounting

BOARD OF DIRECTORS:

- Eric Goens, Chairman of the Board of BELARE (mandate: 27/09/2019 - 27/09/2024)
- Nighat Amin, Director (mandate: 20/12/2018 - 20/12/ 2023)
- Alain De Waele, Non Excecutive Director (mandate: 20/12/2018 - 20/12/2023)
- Jacques de Mevius, Non Excecutive Director (mandate: September 2019 - September 2024)

IPF ORGANIGRAMME 2024/2025



FINANCIAL REPORTING

ACCOUNTS

OPERATING YEAR	2020	2021	2022	2023-2024	2024-2025*
REVENUE & EXPENDITURE	EUROS	EUROS	EUROS	EUROS	EUROS
Revenue	3 718 000	4 022 000	3 579 000	5 632 000	**4 017 000**
Belgian Polar Secretariat		3 068 000	3 247 000	4 764 000	**3 366 000**
Science Support		211 000	39 000	433 000	**213 000**
Technical Project support		325 000			**133 000**
Donation & bequests		231 000	75 000	151 000	**159 000**
Other		187 000	218 000	284 000	**146 000**
Expenditure	3 444 000	3 744 000	3 674 000	6 108 000	**4 343 000**
Antarctic Operations		3 323 000	2 926 000	4 675 000	**3 385 000**
Other Projects		421 000	748 000	1 433 000	**958 000**
Profit/(Loss) for the Period	274 000	278 000	- 95 000	- 476 000	**- 326 000**
BALANCE SHEET					
Non-Current Assets**	4 000	16 000	285 000	779 000	**1 143 000**
Current Assets	1 210 000	2 091 000	1 144 000	2 730 000	**2 727 000**
Total Assets	1 214 000	2 107 000	1 429 000	3 509 000	**3 870 000**
Reserves	966 000	1 242 000	1 146 000	706 000	**345 000**
Accounts Payable	248 000	865 000	283 000	2 803 000	**3 525 000**
Total Liabilities	1 214 000	2 107 000	1 429 000	3 509 000	**3 870 000**

* First accounting period aligned for BELARE asbl and the International Polar Foundation, covering 12 months from 1 July 2024 to 30 June 2025 for both entities

** In line with the valuation rules

FINANCIAL STATEMENT

The financial year ending 30 June 2025 marked the first 12-month accounting period jointly aligned for the International Polar Foundation (IPF) and BELARE asbl, following the harmonisation of accounting periods initiated during the previous financial year.
The total balance sheet for 2024–2025 amounts to €3.869.648, compared to €3.508.929 for the previous period — an increase of €360.719. This growth mainly results from various investments in tangible and intangible assets, and from the higher first instalment of the BELARE 2025–2026 campaign budget, which rose by €73.322 compared to the previous year.

The net book value of tangible assets stands at €982.911, up from €776.952 in the prior period. This increase reflects new investments linked to the Perseus and Andromeda projects. For Perseus, the addition of a new wind turbine represents a key strategic step toward fully renewable energy operations. For Andromeda, costs mainly relate to architectural development in partnership with the Brussels-based firm A2M, covering design plans scheduled for completion in 2025–2026.

The net book value of intangible assets totals €159.300, corresponding to the completion of two web platforms: the Foundation's new main website and the BELARE technical and scientific registration portal.

Trade receivables amount to €2.500.340, primarily consisting of the outstanding balance of the first instalment of the BELARE 2025–2026 budget (€2.263.245). Additional receivables include income to be received, notably the final invoice for the last instalment of the BELARE 2024–2025 campaign (€118,301), issued after year-end following the approval of the Inspector General of Finance in July 2025.

The liability account 41 stands at €14.403, compared to €590.781 in the previous period, mainly due to the current account with BELARE decreasing from €548.869 to €0. During the previous campaign (2023–2024), the IPF had already received the first SECPOL instalment for the next campaign and transferred part of the funds to BELARE in advance. In contrast, for 2024–2025, no advance was possible since the first SECPOL instalment for 2025–2026

had not yet been received by the closing date. This delay also explains the decrease in available cash, as reflected in accounts 54/58. The missing SECPOL instalment (€2.263.245) was paid in July 2025. Therefore, a short-term financial debt of €90,000 was contracted to address temporary liquidity constraints.

The gross margin improved to –€23.083, compared to –€101.777 the previous year. This improvement is mainly due to reduced costs at IPF Brussels.

The negative result remains linked to IPF's financial coverage of BELARE's 2024–2025 campaign losses, primarily caused by higher-than-expected logistical expenses.

Educational activities remain a core and longstanding mission of the IPF, reflecting a commitment to long-term partnerships and sustainable financing. A global strategy is being developed to secure funding and strengthen the Foundation's educational outreach, particularly among younger generations.

IPF MANAGEMENT REPORT SUMMARY ON ACTIVITIES

The BELARE 2024–25 campaign concluded successfully despite persistent logistical challenges. The season featured several major scientific projects — notably ULTIMO and FROID — each involving teams of four researchers conducting fieldwork for over four weeks with logistical support from IPF field guides.

Their research focused on snow, ice, and cosmic origins. In total, 16 scientific projects were carried out, half funded by BELSPO and half by international or private partners, contributing to research in atmospheric sciences, climatology, palaeoclimatology, glaciology, microbiology, cosmochemistry, and meteorite studies.

Significant investments were also made at Perseus, where construction continues on the new intercontinental airfield, designed to operate entirely on renewable energy and aligned with the environmental philosophy of the Princess Elisabeth Antarctica Station.

Simultaneously, the IPF advanced the Andromeda Project, aiming to establish a zero-emission international research station in Antarctica. This facility will host an international university research centre, R&D infrastructure, and a satellite ground station — forming part of a proactive strategy to attract leading scientists and strengthen geopolitical independence in response to climate and global challenges.

The Arctic Futures Symposium continued its strong growth, gathering nearly 200 participants in Brussels in December 2024 for discussions on Arctic geopolitics and security, workforce retention, critical raw materials, innovation, and community well-being. The 2024 edition also featured a record number of side events, including the Arctic Shorts cultural evening.

In education and outreach, throughout 2024–2025 the IPF continued its mission of linking science, education, and society, reaching thousands of people in Belgium, Europe, and beyond through schools, festivals, exhibitions, conferences, film screenings, and online platforms.

IMPORTANT EVENTS SINCE THE END OF THE FINANICAL YEAR

The Polar Secretariat has approved the budget for the 2025-2026 BELARE campaign, in accordance with the Arrêté royal du 20 mai 2009 fixant les règles de la gestion du service de l'Etat à gestion séparée « Secrétariat polaire » / Koninklijk besluit van 20 mei 2009 tot vaststelling van de regels voor het beheer van de Staatsdienst met afzonderlijk beheer "Poolsecretariaat" defining the privileged partnership between the Belgian State and the IPF.

Adult emperor penguins on the fast ice along the edge of the ice shelf in Queen Maud Land.

INTERNATIONAL POLAR FOUNDATION HQ

FONDATION D'UTILITÉ PUBLIQUE
42B, RUE DES VÉTÉRINAIRES BTE 1
B-1070 BRUSSELS
- BELGIUM -

INFO@POLARFOUNDATION.ORG
+32 2 520 34 40

WWW.POLARFOUNDATION.ORG
WWW.ANTARCTICSTATION.ORG

BRUSSELS OFFICE

ALAIN HUBERT
NIGHAT JOHNSON-AMIN
NICOLAS VAN HOECKE
ALAIN-THIERRY BARRERA
JOSEPH CHEEK
AYMAR DE LICHTERVELDE
NICOLAS HERINCKX
HENRI ROBERT
MIEKE STERKEN

INTERNATIONAL POLAR FOUNDATION ANTARCTICA

SOMERSET SQUARE
UNIT 1885, 8005 GREENPOINT
CAPE TOWN
REPUBLIC OF SOUTH AFRICA

INFO@POLARFOUNDATION.ORG
+27 66 1498 740

CAPE TOWN OFFICE

NIGHAT JOHNSON-AMIN
LISA FRANCO

UNITED KINGDOM

The annexes and the south scientific shelter at Princess Elisabeth Antarctica during a windy day.

FOLLOW US

WEB :

www.polarfoundation.org

www.antarcticstation.org

www.arcticfutures.org

www.ipf-education.org

LINKED-IN:

www.linkedin.com/company/international-polar-foundation/mycompany/

FACEBOOK:

www.facebook.com/intpolarfoundation/

X :

https://x.com/PolarFoundation

INSTAGRAM :

www.instagram.com/international_polar_foundation/?hl=fr

YOUTUBE :

www.youtube.com/channel/UCAo5lcdnM3CKw8Fw_Rpa0Rw

TIKTOK :

www.tiktok.com/@int.polarfoundation

The Princess Elisabeth Antarctica sitting atop Utsteinen Nunatak with the Sør Rondane Mountains in the background.