

## UNDERSTANDING THE ARCTIC: THE SCIENCE ON GLACE

The Arctic region and Greenland in particular have both been considerably affected by global warming. Because of polar amplification, temperatures in the far North have increased by 2-3 °C within the last few decades – well above the globally averaged temperature increase of 1 °C.

One of the most dramatic manifestations of warming in the Arctic relates to the substantial decrease in sea-ice cover, affecting oceanic heat uptake and marine biological production. Increasing temperatures also contribute to accelerating glacier melt both in the Arctic realm and in Greenland, with meltwater contributing to sea-level rise and measurable large-scale ocean circulation changes. Increased nutrient and sediment supply associated with glacial runoff modify coastal and open ocean ecosystems, with shifting phytoplankton communities affecting the entire food chain, including birds and mammals. The warming environment also presents major challenges to local communities, notably affecting natural resources and infrastructures.

From this perspective, furthering our understanding underlying the complex interactions between the **terrestrial biosphere**, the **cryosphere**, the **ocean** and **atmosphere** will offer opportunities to better preserve these unique ecosystems in the future.

## THE SWISS POLAR INSTITUTE

The Swiss Polar Institute SPI was created to provide dedicated support to, offer new opportunities and promote synergies within the polar community in Switzerland. GLACE is the second large expedition of the SPI, emphasising the importance of Swiss polar research on a global level, as well as highlighting the Swiss Polar Institute as a facilitator of major international research activities in polar regions. GLACE is a scientific expedition, organised by the Swiss Polar Institute SPI and supported by the Swiss Polar Foundation.

### IMPRESSUM

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Organiser

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# GLACE

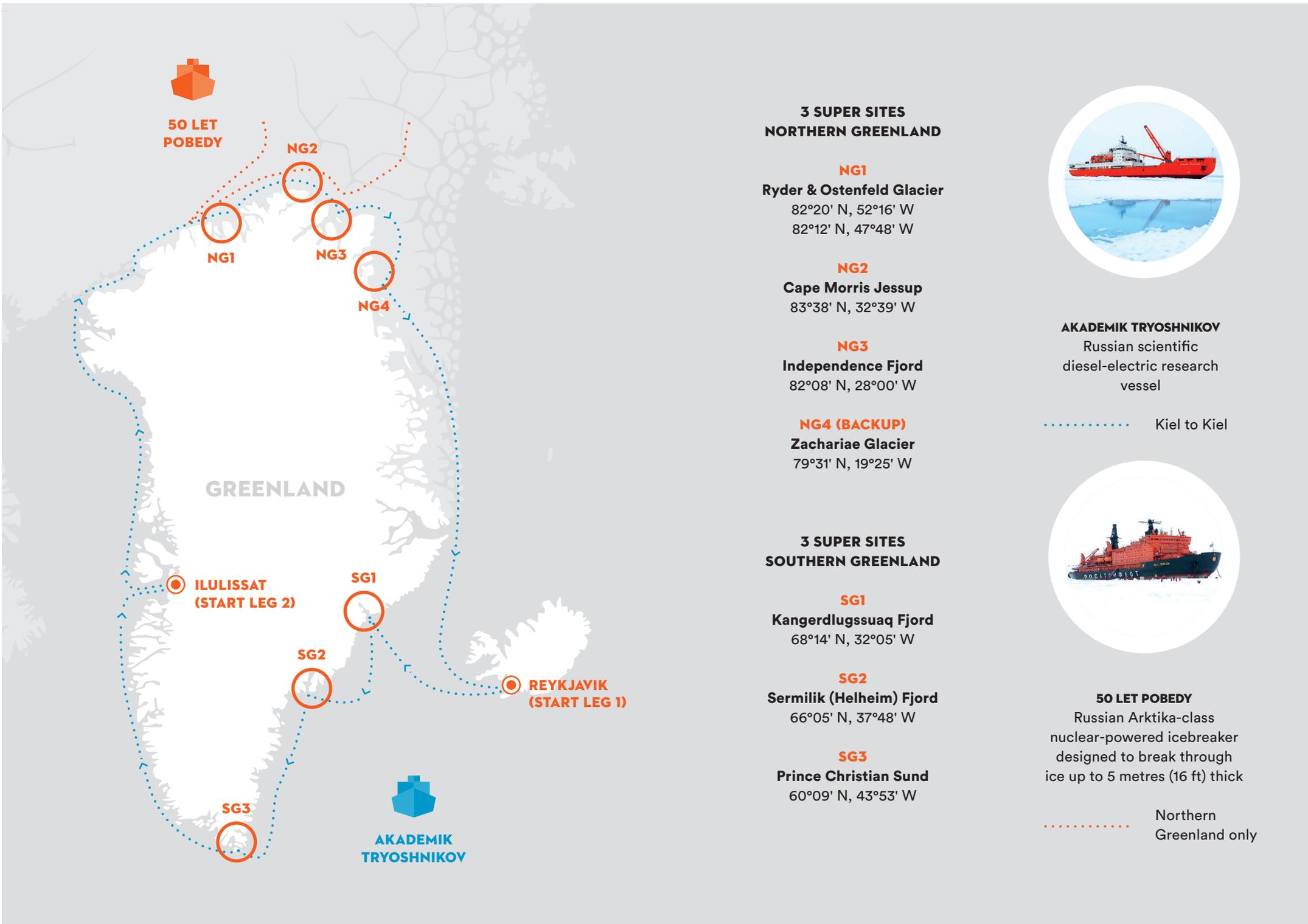
**GREENLAND  
CIRCUMNAVIGATION  
EXPEDITION**

August – September 2019



**SWISS POLAR  
INSTITUTE**





**50 LET POBEDY**

**NG2**

**NG1**

**NG3**

**NG4**

**GREENLAND**

**ILULISSAT (START LEG 2)**

**SG1**

**SG2**

**REYKJAVIK (START LEG 1)**

**SG3**

**AKADEMIK TRYOSHNIKOV**

**3 SUPER SITES  
NORTHERN GREENLAND**

**NG1**

**Ryder & Ostenfeld Glacier**

82°20' N, 52°16' W

82°12' N, 47°48' W

**NG2**

**Cape Morris Jessup**

83°38' N, 32°39' W

**NG3**

**Independence Fjord**

82°08' N, 28°00' W

**NG4 (BACKUP)**

**Zachariae Glacier**

79°31' N, 19°25' W

**3 SUPER SITES  
SOUTHERN GREENLAND**

**SG1**

**Kangerdlugssuaq Fjord**

68°14' N, 32°05' W

**SG2**

**Sermilik (Helheim) Fjord**

66°05' N, 37°48' W

**SG3**

**Prince Christian Sund**

60°09' N, 43°53' W



**AKADEMIK TRYOSHNIKOV**  
Russian scientific diesel-electric research vessel

..... Kiel to Kiel



**50 LET POBEDY**  
Russian Arktika-class nuclear-powered icebreaker designed to break through ice up to 5 metres (16 ft) thick

..... Northern Greenland only

**15 PROJECTS,  
ONE EXPEDITION**

GLACE is composed of 15 distinct yet synergistic research projects, bringing together scientists from a wide range of disciplines and from around the globe. Research questions will target the physics, chemistry and biology of sea-ice, glaciers, lake sediments, terrestrial ecosystems, the ocean, and the sea floor.

Swiss polar science has a strong standing on the expedition, as six of the research projects are led by scientists from Swiss research institutions.

For this first full circumnavigation of Greenland, the 44 selected scientists will have helicopters and zodiacs at their disposal, as well as different laboratories. This will allow them to collect, analyse and store unique samples and data. The scientists on board the expedition will benefit from a large support team composed of mountain guides, zodiac and helicopter pilots, lab assistants and technicians, as well as a management team with a wide range of competences.

After loading in Kiel, Germany, the circumnavigation will start on 4 August 2019 in Reykjavik, Iceland, proceeding clockwise around Greenland with a stopover in Ilulissat, on Greenland's West coast, around the middle of August. Three super sites in Southern Greenland and three plus one back-up site in Northern Greenland have been identified for prolonged stops to allow for multi-disciplinary and land-based investigations. By 23 September, the research vessel will reach Reykjavik again and transit back to Kiel, where the cruise ends.

During the expedition, interested scientists and the wider public will be able to follow the work and life on board through the expedition's blog and social media.

@GLACEexpedition [www.GLACEexpedition.ch](http://www.GLACEexpedition.ch)

**2**

vessels

**62**

days on board

**44**

selected scientists

**7'250**

nautical miles covered by GLACE