



Kartverket

# Ny-Ålesund: New SLR Site in the Arctic at 79°N

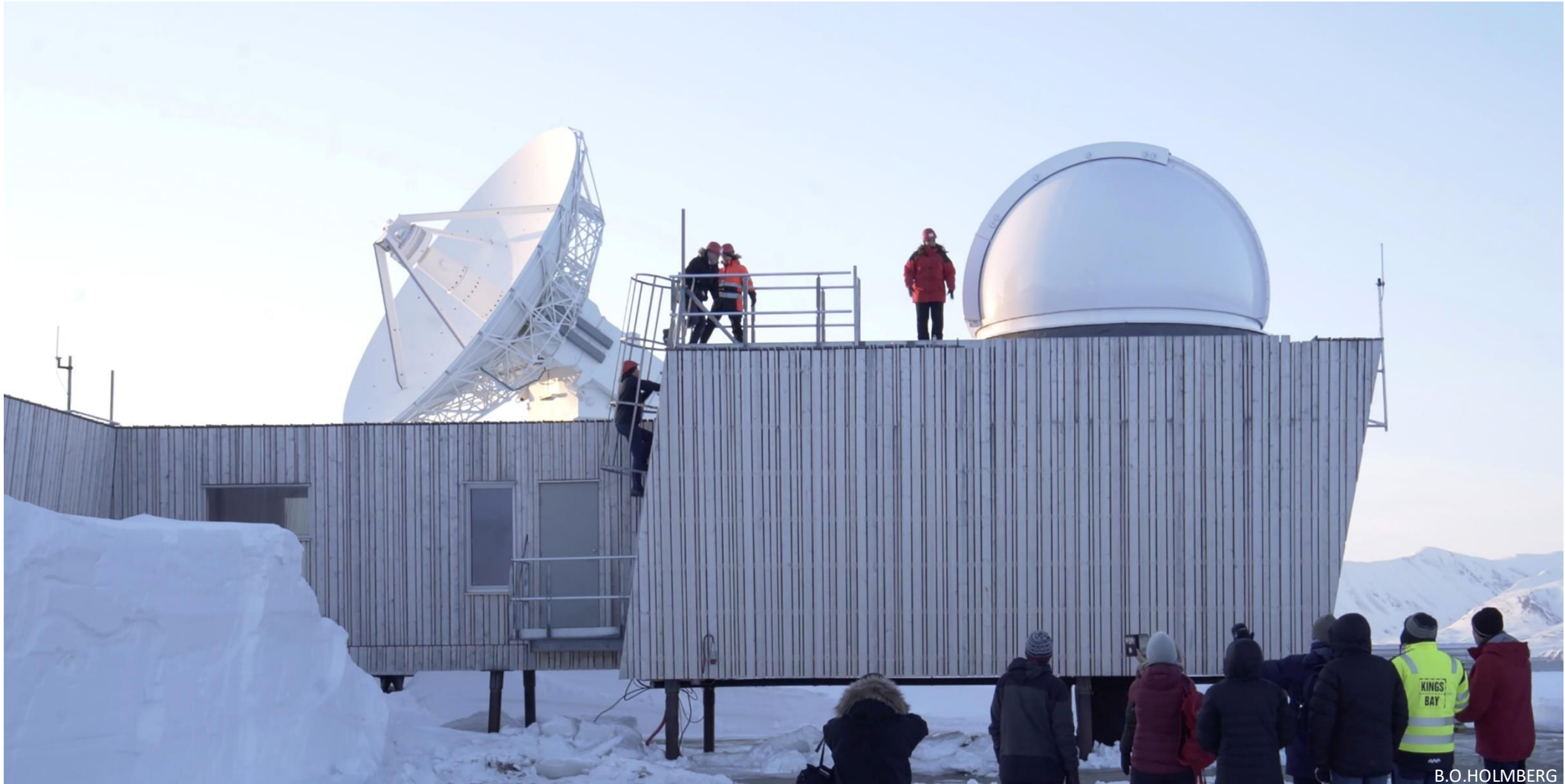
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*22<sup>nd</sup> International Workshop on Laser Ranging, Guadalajara, 7-11 November 2022*



# Ny-Ålesund SLR by April 2022

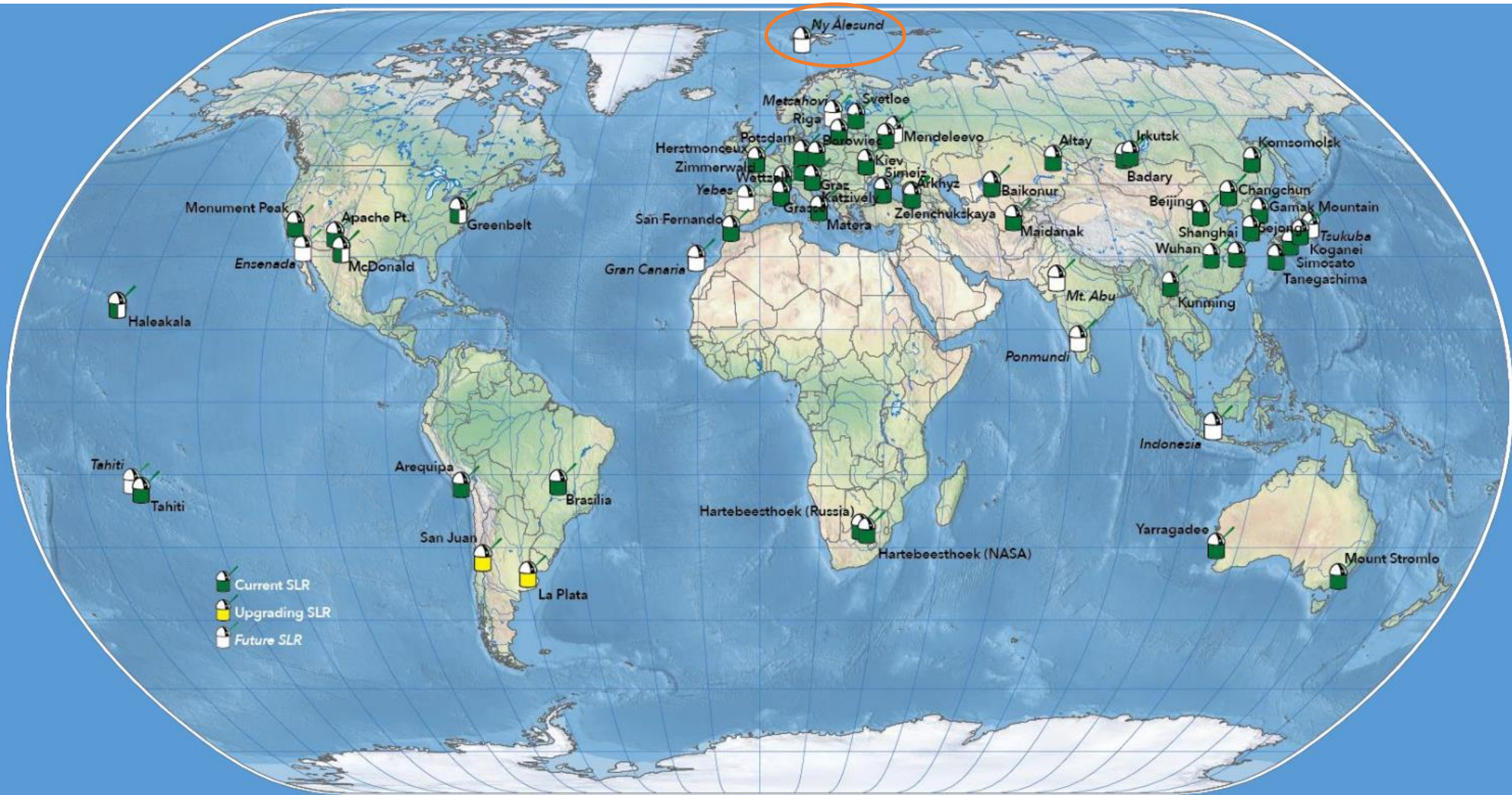


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# Ny-Ålesund will become a Core Site with VLBI/SLR/GNSS/DORIS



- Pavlis 2008: ~30 core sites needed for 1 mm accuracy and 1 mm/decade stability for TRF
- Status 2022: ~8-15 core sites globally




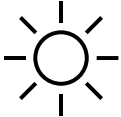
# Ny-Ålesund is a characteristic site



# Ny-Å... *what?*

## NY-ÅLESUND

- “Å” sounds similar to “O” in many languages:
  - “COMO” in Spanish
  - “DOCH” in German
  - “ONNEA” in Finnish
- “ÅL” sounds similar to “ALL” (everybody) in English

“ÅL – E – SUND” = “ALL – E – SUN”  
 

- “NY” means “NEW”
  - New York, New Mexico, Ny-Ålesund... – However, similarity stops there!

## Svalbard Treaty

Treaty recognising the sovereignty of Norway over the Archipelago of Spitsbergen, including Bear Island  
*Traité reconnaissant la souveraineté de la Norvège sur l'archipel du Spitsberg, y compris l'île aux Ours*

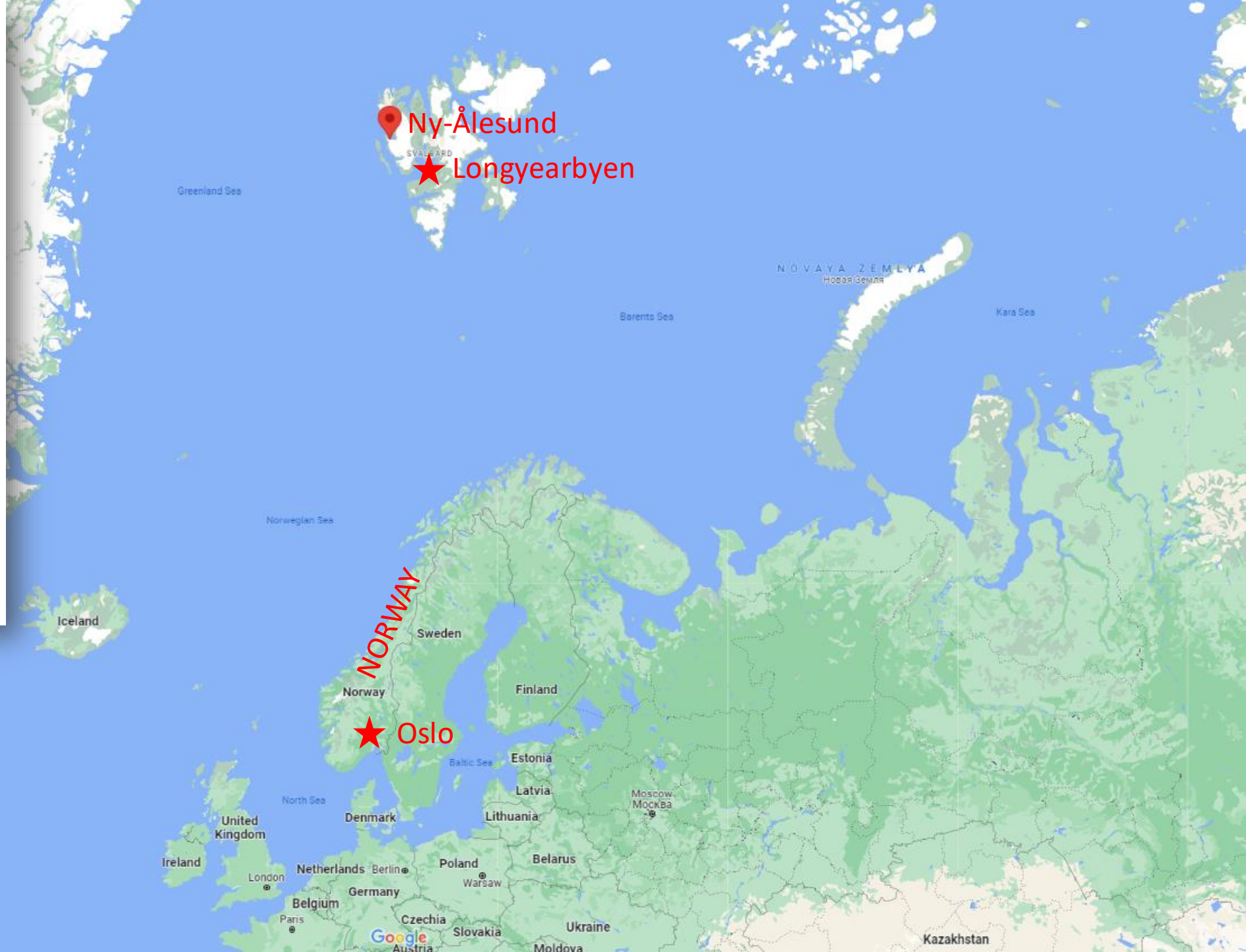


### Ratifications of the treaty

<b>Signed</b>	9 February 1920
<b>Location</b>	<a href="#">Paris, France</a>
<b>Effective</b>	14 August 1925
<b>Condition</b>	Ratification by all the signatory powers
<b>Parties</b>	46 <sup>[1]</sup> - <a href="#">See list</a>
<b>Depositary</b>	Government of the French Republic
<b>Languages</b>	French and English

### Full text

 [Spitsbergen Treaty at Wikisource](#)



## Ny-Ålesund:

- 25 inhabitants from Norway, Germany, England, Italy, Japan and China – during summer much more
- World's northernmost permanent settlement
- Main center for international research on Svalbard
- Meals, accommodation and infrastructure organized by Kings Bay A/S
- Weekly flights to Longyearbyen



## Here and there and everywhere:

- Polar bears (200-350 bears counted)
- Walrus, seal, whale, fox and reindeer
- Birds (30 species)



## Barentsburg:

- 400 inhabitants from Ukraine and Russia
- Coal mine, school, hospital
- Accessible by snowmobile or boat from Longyearbyen

## Longyearbyen:

- 2000 inhabitants, mainly from Norway
- School, shops, hospital
- Daily flights to Norwegian mainland



# Daylight and weather during the last 13 months



B.O.HOLMBERG

- Midnight sun from 16 April to 25 August
- Polar night from 24 October to 18 February
- Temp. varied from  $-24^{\circ}\text{C}$  to  $+16^{\circ}\text{C}$
- 101 days with precipitation
- Snow depth max. 72 cm
- Wind speeds up to 24 m/s (32 m/s gust)

Temperature

October 2021–October 2022



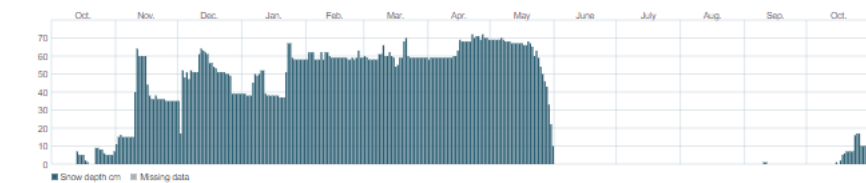
Precipitation

October 2021–October 2022



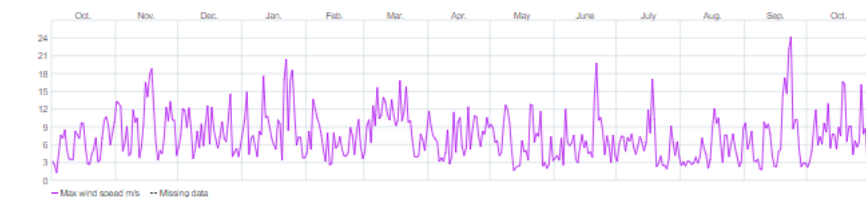
Snow depth

October 2021–October 2022



Wind

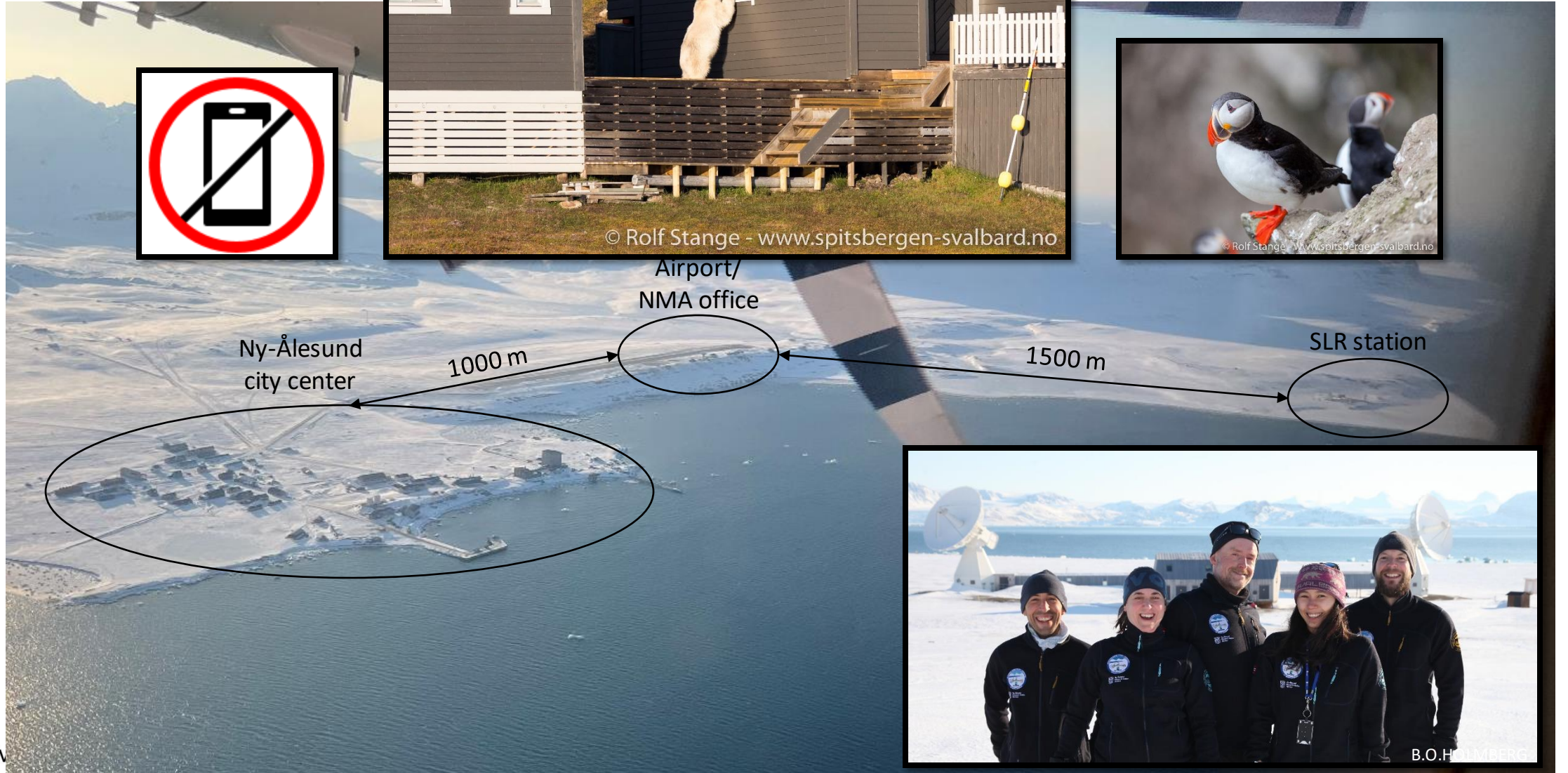
October 2021–October 2022



Statistics from yr.no

# Ny-Ålesund

# and SLR station



# Remote control of the SLR is needed



# Traffic in the airspace above Ny-Ålesund

Local aircrafts



SAR helicopters



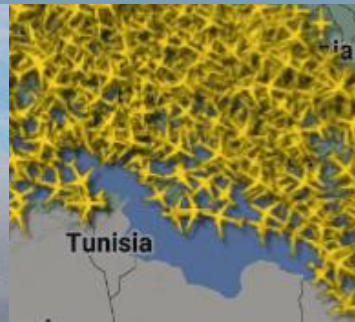
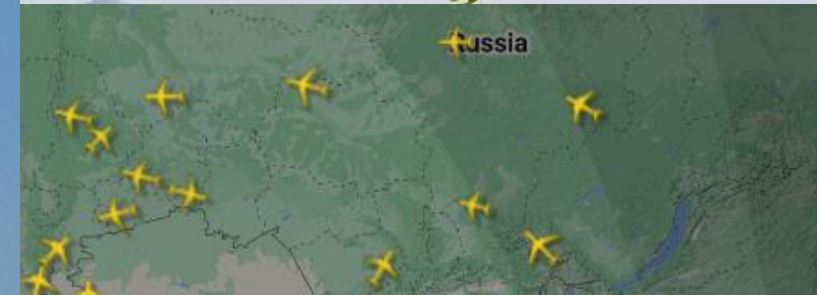
Flights to mainland



Military aircrafts



Long distance routes



Aircraft laser safety ensured through three independent systems



**Barrier A:  
Danger Zone**



**Barrier B:  
ON/OFF Switch**



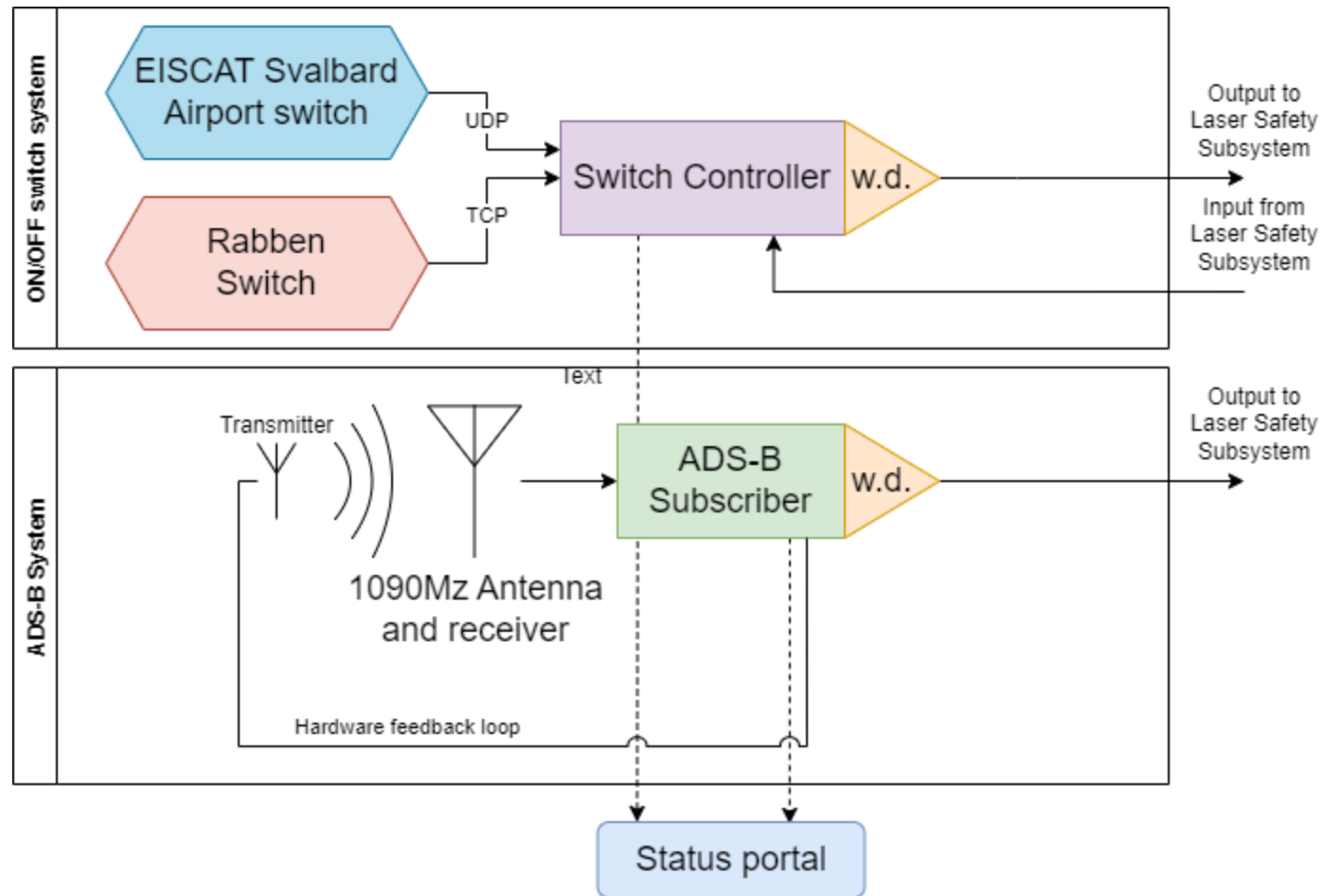
**Barrier C:  
ADS-B System**



The systems interface with NASA's SGSLR Laser Safety Subsystem (LSS)



# NMA Aircraft Avoidance System (AAS)



For details, please visit our poster *“Laser safety in Ny-Ålesund: Aircraft Avoidance System (AAS)”*

# Ny-Ålesund Core Site in pictures

2014 – Construction started



2018 – Observatory opened (without SLR)



2022 – SLR installation started

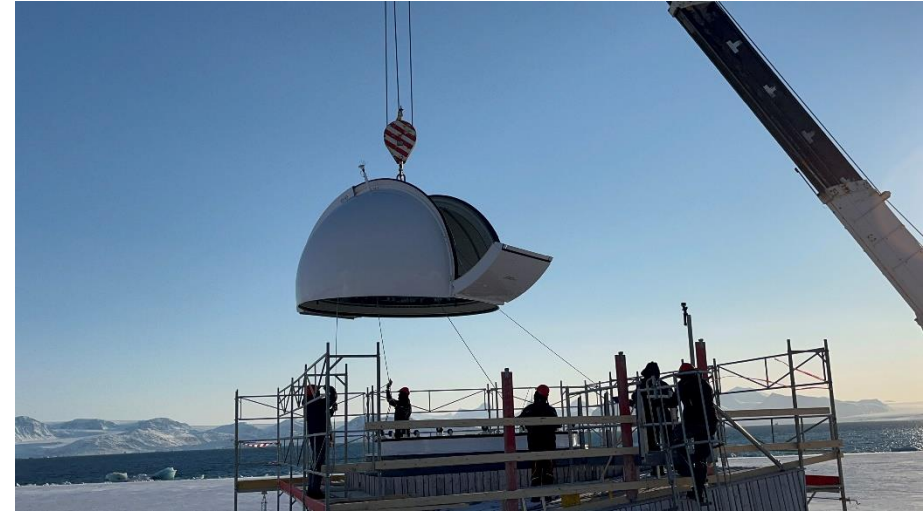
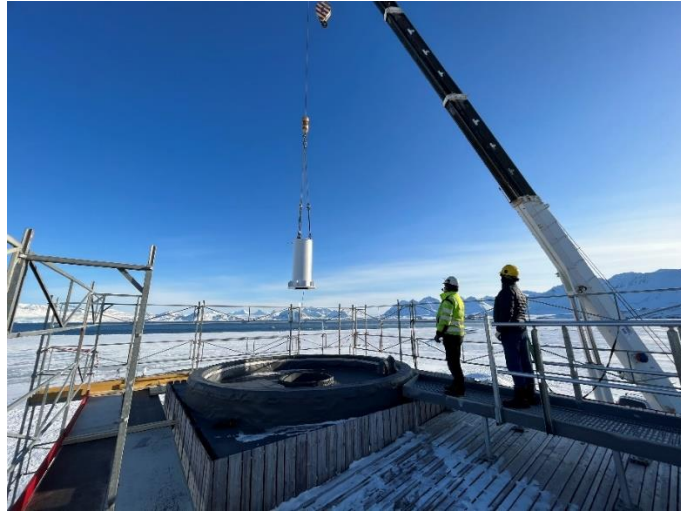


# 2014-2018: SLR pier and shelter built





# April 2022: Riser and dome installed



# Time schedule for the Ny-Ålesund SLR

Action	Date
Telescope installation	March 2023
System tests/ver. at GGAO	September 2023
Collocation with MOBILAS-7	April 2024
SLR-system Pre-ship Review	September 2024
All SLR-HW at Ny-Ålesund	October 2024
Start SLR ranging at Ny-Ålesund	January 2025
SLR ranging with Nearby-remote	December 2025



# Acknowledgement

We thank our colleagues at NASA and KBR for the cooperation and efforts on the way towards having a complete SLR station installed in Ny-Ålesund.



Questions?



Thank you!