

# CRYOSAT MISSION STATUS

## September 2021

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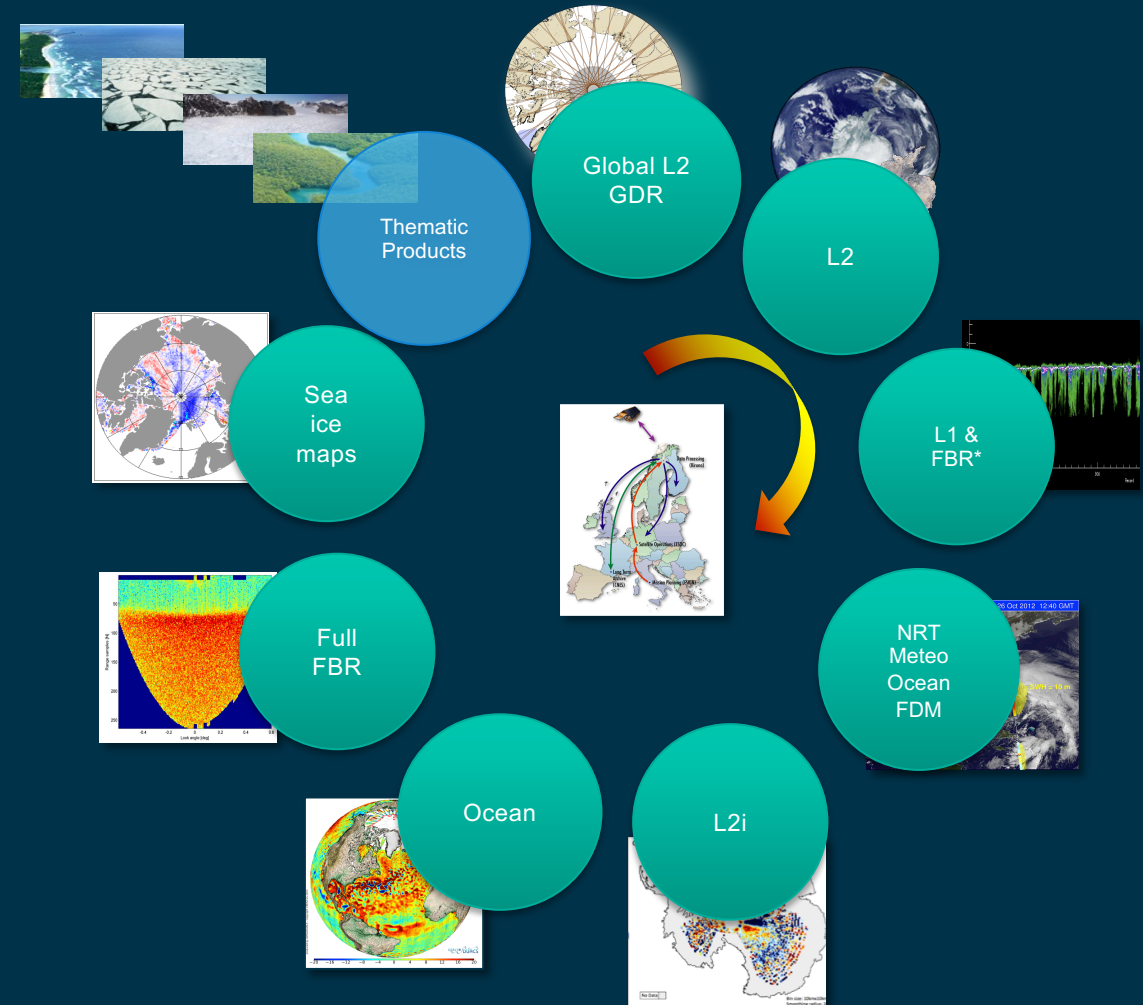
## The overall performance of the mission is **excellent**

- Overall the satellite is in **good condition** after 11 years in space
- Platform is performing well and any sign of degradation are within specifications. The PDCU (2013) and MMFU (2021) are on B side with still some redundancy left on the A side
- Battery capacity is reducing linearly but will ensure enough energy to support the current mission profile (at least) until 2027.
- An issue related to fuel leakage has been understood. The plan is to switch to the Reaction Control System in spring 2023 to secure operations until end of this decade. Lifetime predicted **2027-2030\***
- Instrument is in excellent conditions. The degradation is within expectations and all redundancies are still available
- Procedure to switch to SIRAL-B is under consolidation





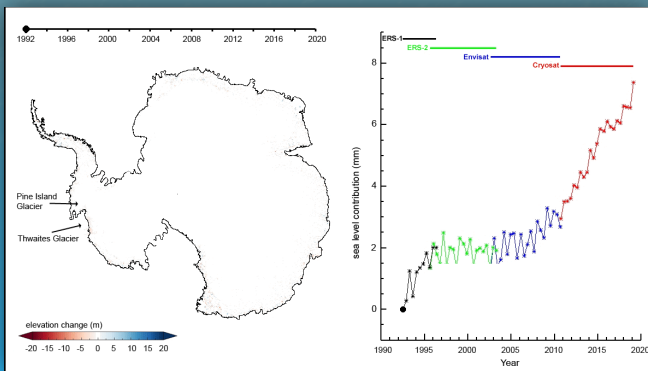
- Ground Segment is functioning well with no major issues since launch.
- Product Portfolio continuously evolving taking into consideration new demands, novel applications, including NRT for operational use
- Number of products generated has doubled since launch – Now focusing on the generation of **EOLIS** and new **Thematic Products** which approach has been followed by other altimetry missions, paving to **CRISTAL**
- Free-and-open data disseminated to users around 50GB/d
- Very good reliability and well fitted to continue exploitation until at least **2025**



## L1/L2 ICE & OCEAN DATA

Prime: EXPRIVIA (IT)

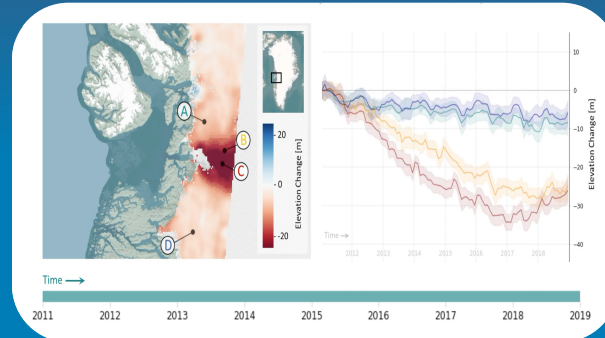
Extend the data record into the next decade, for climate & operational use



## CRYO-TEMPO EOLIS

Prime: EARTHWAVE (GB)

Generate swath & gridded products systemically over ice sheets (soon glaciers)



## FUTURE CRYO-TEMPO

Prime: LANCASTER UNI (GB)

Generate state-of-art L2+ cryosphere and polar marine thematic products







## Swath Processing

Assess time space variability of ice-sheet margins, glaciers and ice caps at high spatial resolution



## Polar Oceanography

To assess mesoscale and large scale oceanic variations in Polar regions in support of climate and emerging operational services



## Operations and Forecast

Assess the impact of product latency to support different operational and forecasting services



## Cryosphere Meteorology

Assess the contribution to cryosphere meteorology: snow fall and melting on sea-ice and land-ice over Polar Regions



## Antarctic Sea-ice

To demonstrate the capability of retrieving a sea-ice thickness in Antarctica oceans and other polar marginal zones



## Long-term Records

To extend the current data record into the next decade and improve the current geophysical retrievals and explore the option of generating new dataset from innovative methods



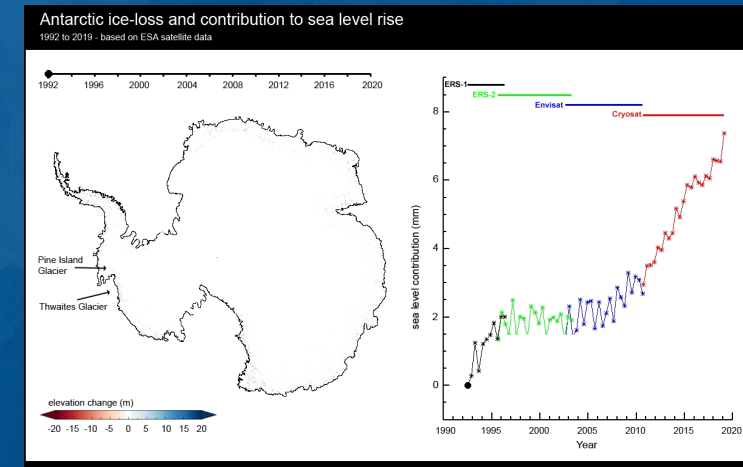
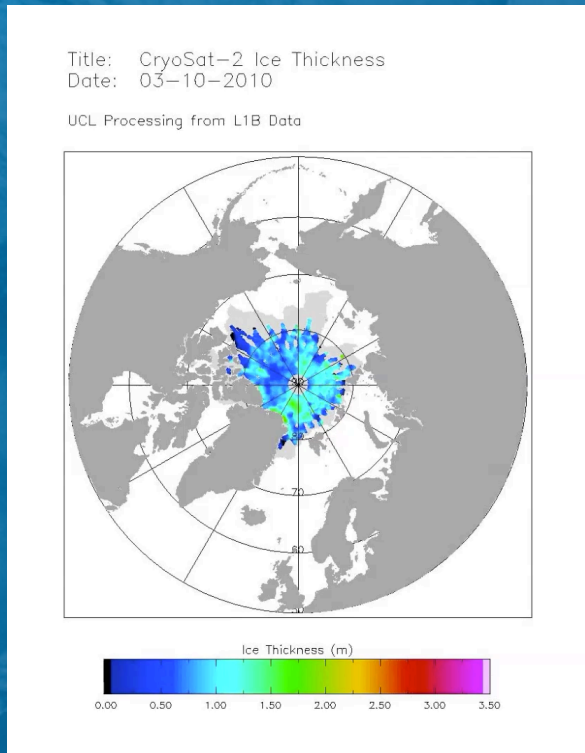
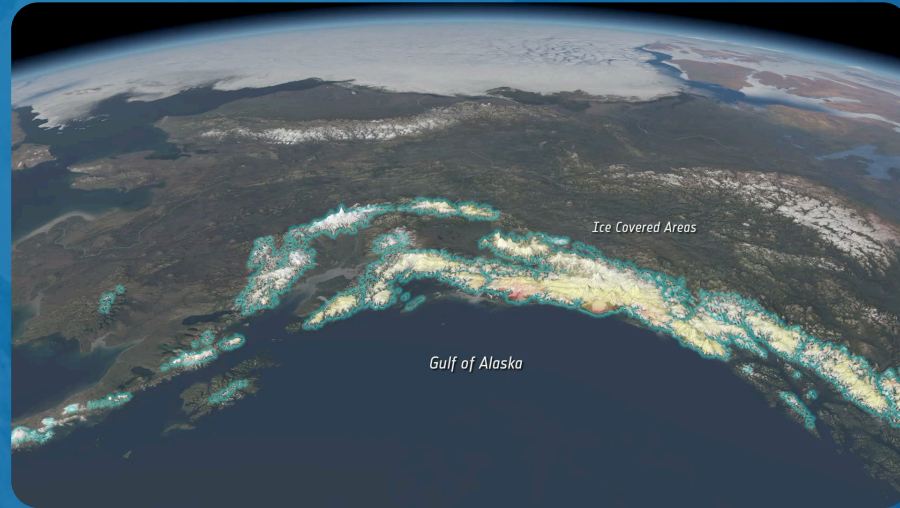
## River and Lakes

To monitor Inland water, river discharge, Lake Volume variations at high spatial resolution



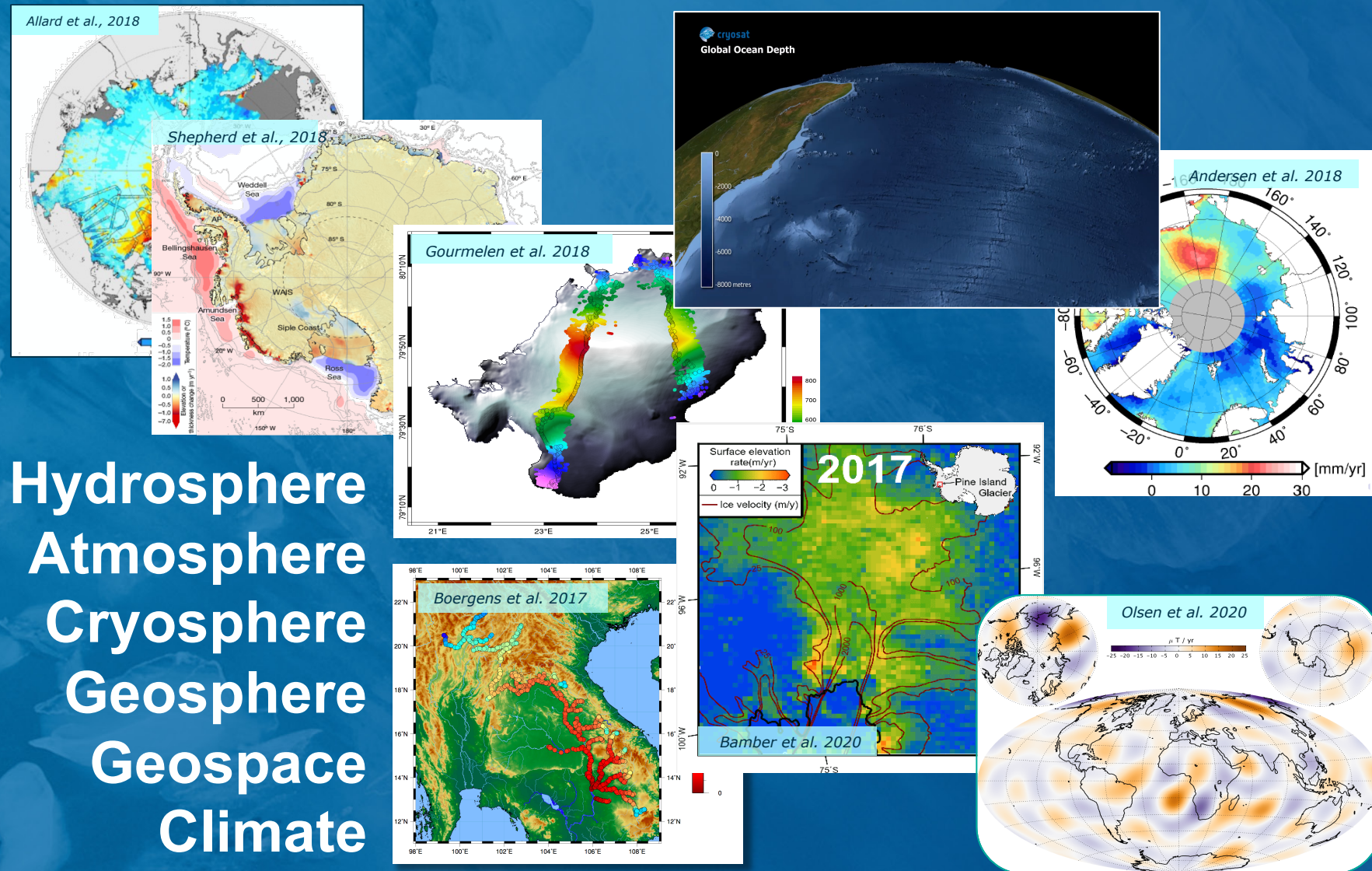


# SCIENCE: PRIME MISSION OBJECTIVES FIRST !



Courtesy of Laxon et al., 2013; Tilling et al., 2015; Ricker et al., 2018. Helm et al., 2014; McMillan et al., 2014; Shepherd et al., 2019. AWI, Helmholtz Centre for Polar and Marine Research, SMOS Mission. University of Edinburgh, Earthwave. Planetary Visions





Hydrosphere  
 Atmosphere  
 Cryosphere  
 Geosphere  
 Geospace  
 Climate

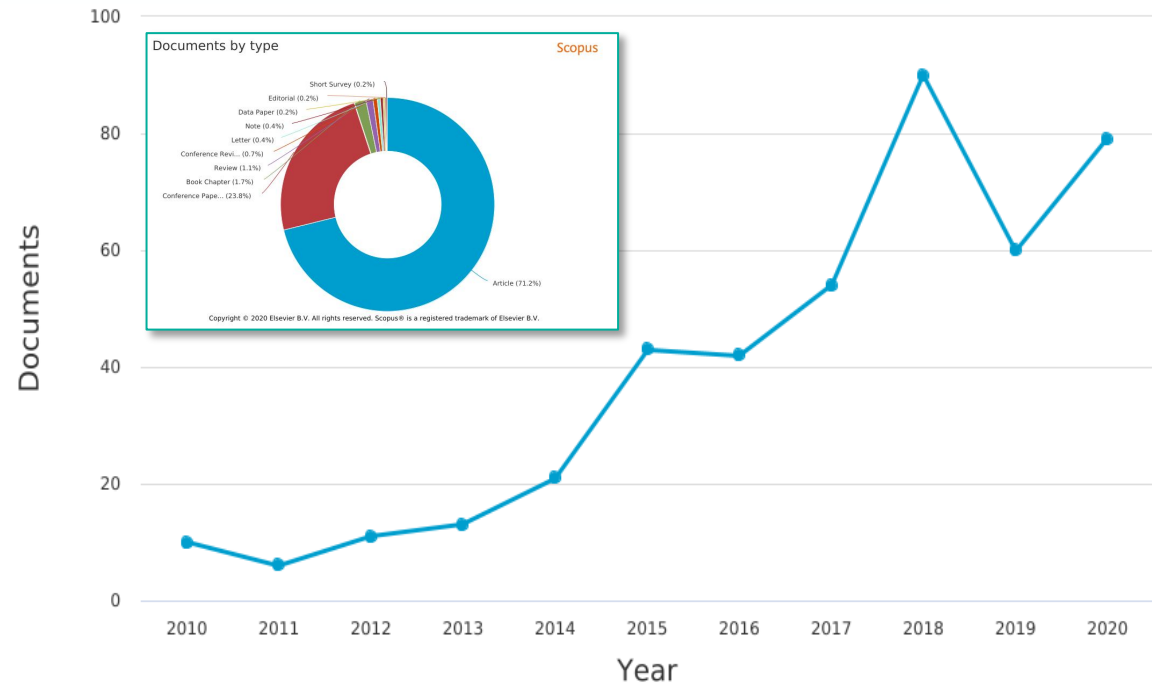


The ESA CryoSat team graciously welcomed new users and accommodated their needs. Each time a new camel pushed its nose into the tent, a bigger tent was built



## Peer-review articles published per annum

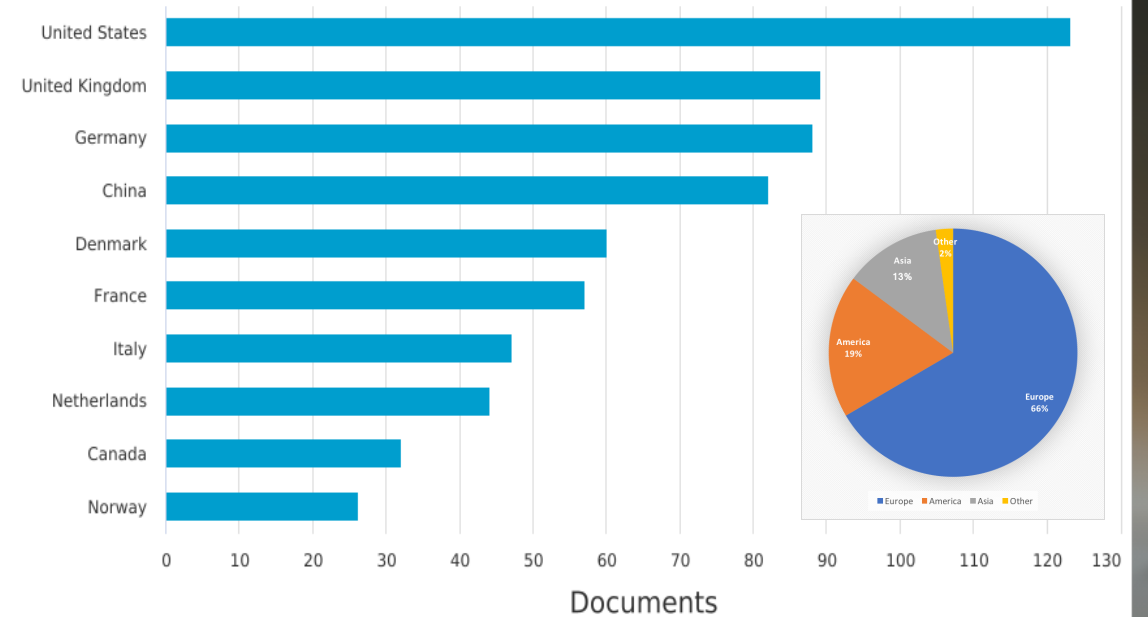
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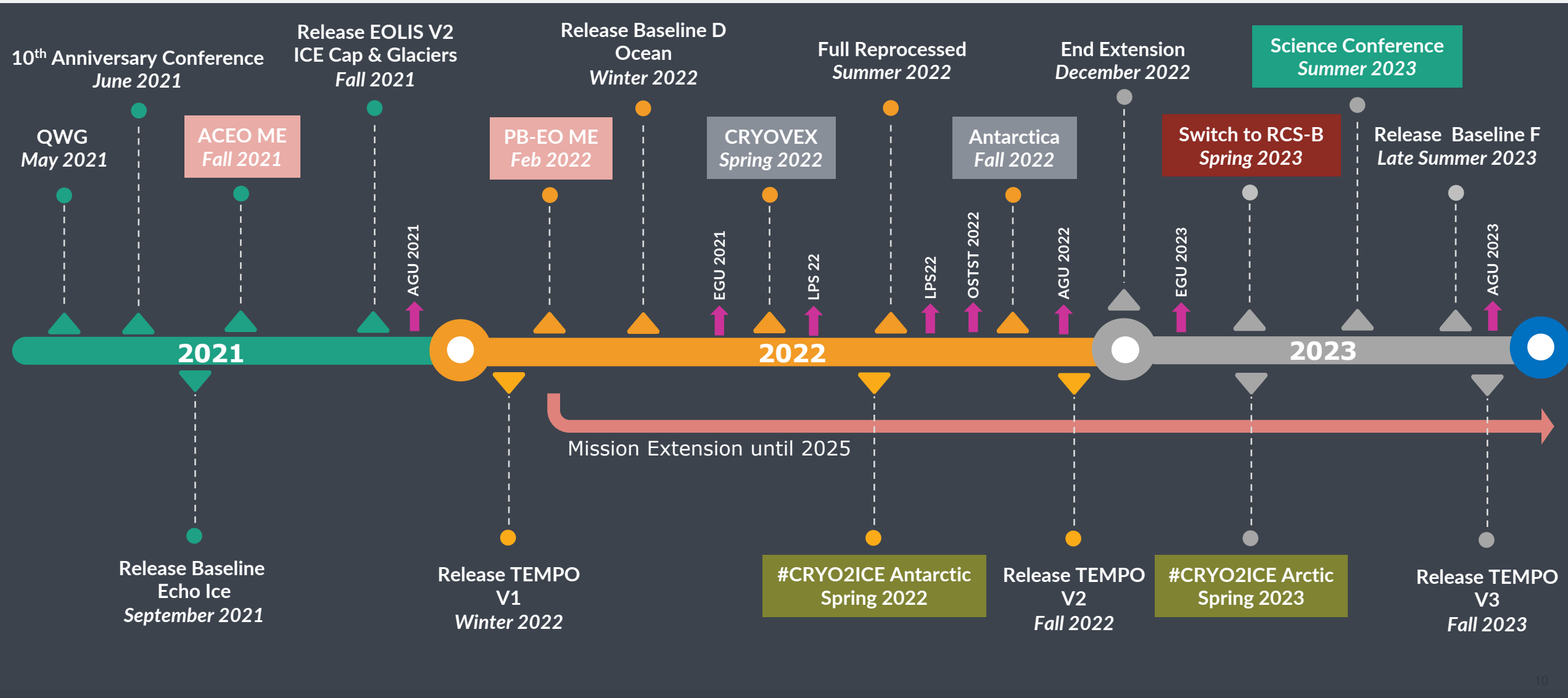
## Authors affiliation by country

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# CRYOSAT MISSION TIMELINE [2021-2023]





The overall performance of the mission is very good. None of the space or ground segment issues are critical. The performance of the instrument is excellent. Its technology and scientific importance has paved the way to missions like S3 and S6 and future ones like CRISTAL

In 11 years, the mission has provided a unique dataset and systematic observational capability for pan-Arctic sea ice thickness and for Greenland and Antarctica ice sheet mass balance which are **essential climate records**. The mission is supporting numerous scientific and operational applications in oceanography, meteorology and hydrology.

The orbit change, Cryo2Ice, is offering a unique (and unrepeatabe) possibility to have spatial and quasi-temporal coincident laser and altimeter data over polar areas which are key to understand climate change and its societal impact

The preparation of the next mission extension is ongoing and, pending authorisation of Member States, the mission will be extended until end of 2025. We are fully engaged in fulfilling the new strategic mission objectives until that time and beyond.