



# Sentinel-6 mission overview

## Sentinel-6 Programme/Project Managers

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Sentinel-6 Mission Overview

Status of Sentinel-6 Michael Freilich

Status and plans for Sentinel-6 B

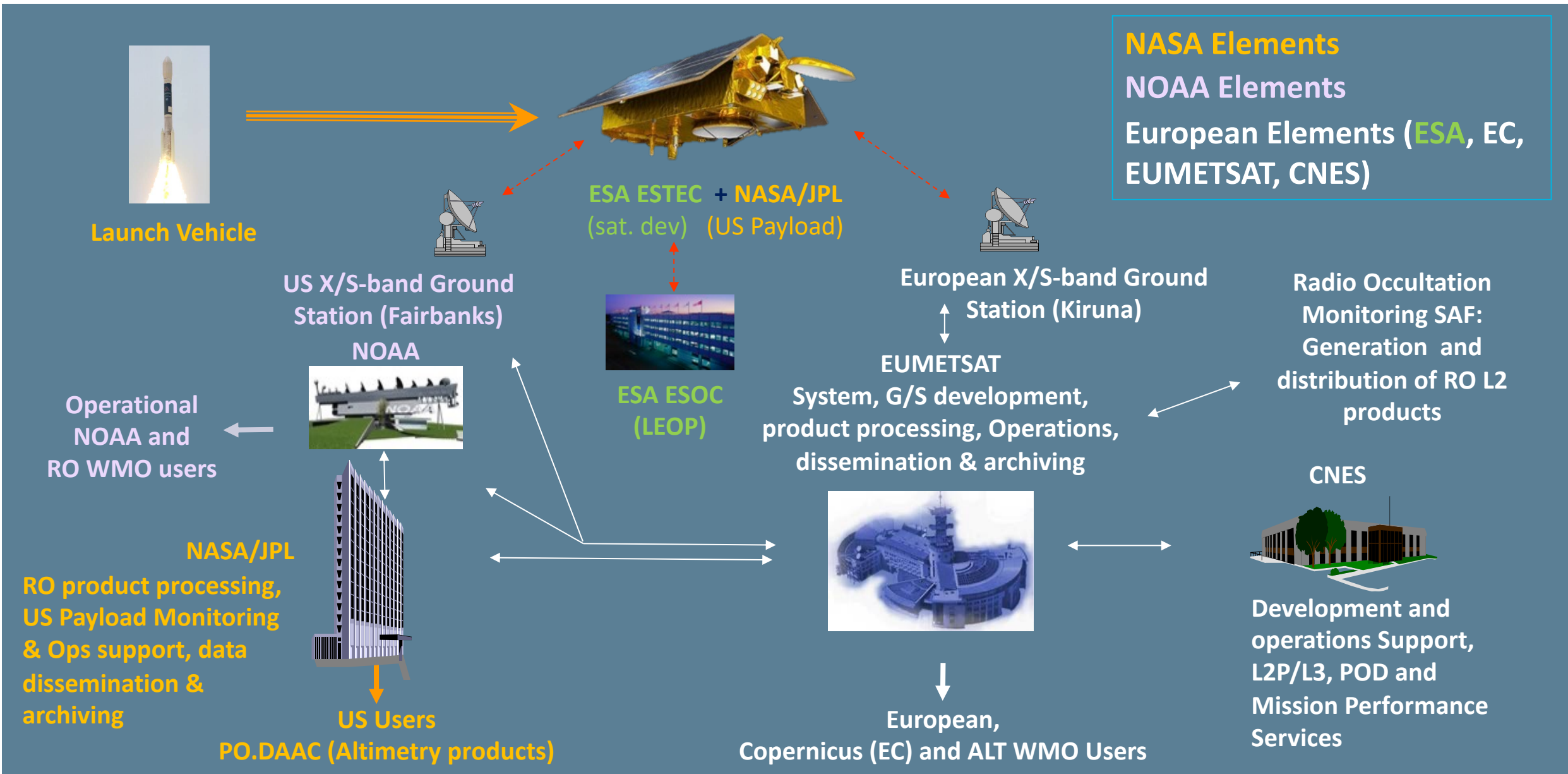
Beyond Sentinel-6 B



- Part of the European Union Copernicus Space Segment component
- Supporting Copernicus services: on Marine Environment Monitoring (CMEMS), and Climate Change (C3S)
- Cooperative mission, with contributions of ESA, NASA, EUMETSAT, NOAA and the support from CNES
- Continuation of the Global Mean Sea Level record initiated by TOPEX
- Continuation of the operational ocean altimetry services provided by Jason-3, in synergy with those from Sentinel-3
- Significant innovations at Space and Ground Segment levels



# Sentinel-6, an international partnership for Copernicus





# Sentinel-6 Michael Freilich- important events and achievements

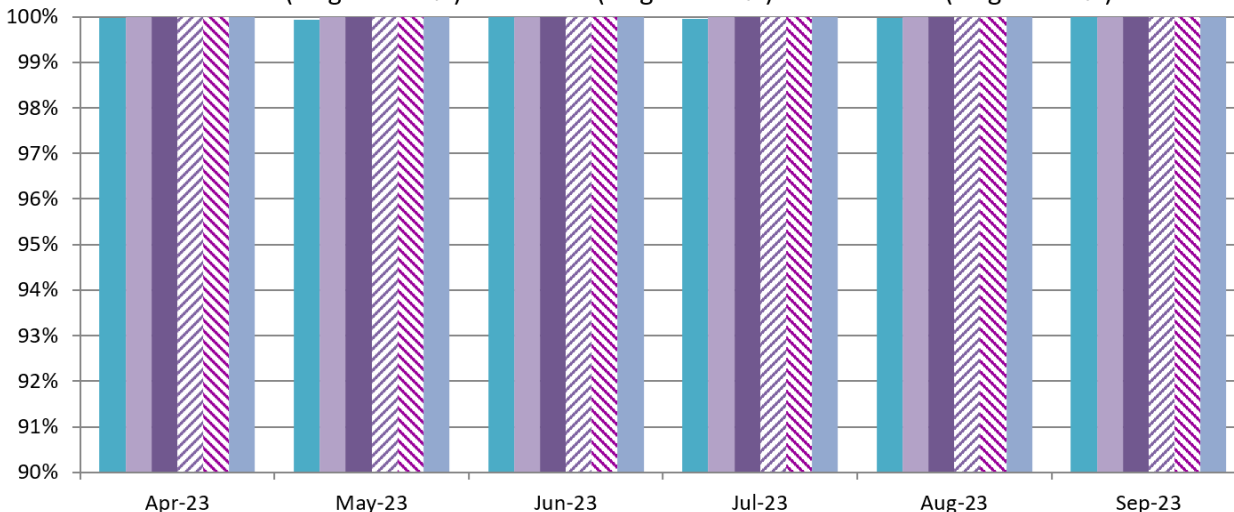
- ✓ The journey into operations was completed with the establishment as reference altimetry mission under CEOS in March 2022, the release of the L2P/3 NRT/STC products in April 2022, as well as of the first re-processed data in July 2022
- ✓ Work ongoing to implement the improvements recommended in the commissioning
  - ✓ Baseline F07 in Sept 2022 (HRMR variables in MWR products, use of ECHO CAL, use of MOGF in NRT)
  - ✓ Baseline F08 in March 2023 (introduction of numerical retracker for LR) followed by Full Mission Reprocessing completed in 2023
  - ✓ Baseline F09 in Q1 2024 (introducing range walk and numerical retracker and VWM correction for HR; HRMR variables in ALT L2 products)
- ✓ L2P and L3 re-processing to be completed by end of the year
- ✓ **Sentinel-6 Validation Team** continues to support these activities by providing valuable independent expert advice on the data quality (e.g. meeting this week focusing on the re-processed data)
- ✓ In this Copernicus mission the partners have joint responsibility for the mission performance: the **Mission Performance Working Group** (NASA/ESA/NOAA/EUMETSAT/CNES) monitors the data and products quality and, together with the **Project Scientists**, steer evolutions and improvements of the overall mission value



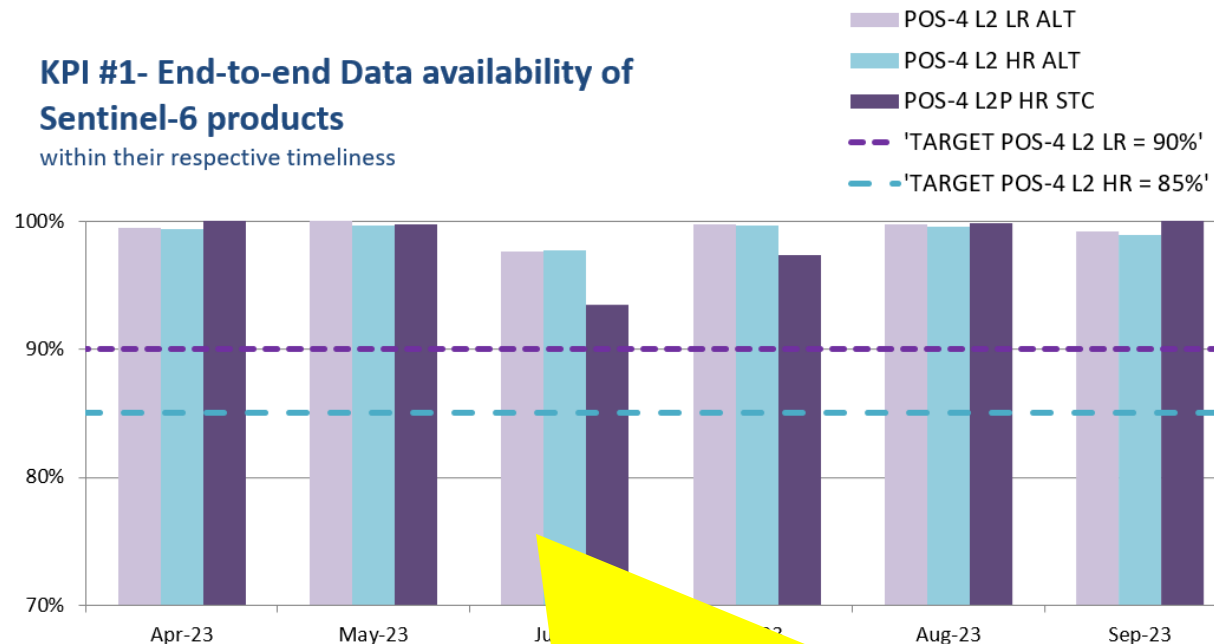
# Sentinel-6 Michael Freilich - Space Segment and services availability

### KPI #3- Relative availability of S6 space segment

■ GNSS-RO (target=99%)   ■ AMR (target = 99.5%)   ■ HRMR (no target)  
 ▨ GNSS-POD (target=99.5%)   ▨ DORIS (target=99.5%)   ■ POS-4 (target = 99%)



### KPI #1- End-to-end Data availability of Sentinel-6 products within their respective timeliness



- ✓ Mission and service availability
- ✓ Second Mission Performance
- ✓ Open access for all data
- ✓ Transition to EUMETSAT historic data (to be completed in the next weeks)

- 03 Jun: FB accidental power cut (4 passes lost)
- 13 Jun: FB repair (3 passes affected)
- Jun-03 Jul: FB network issues
- 24 Jun – 02 Jul: Missing SSALTO aux files affecting STC



# Sentinel-6B satellite and launcher status

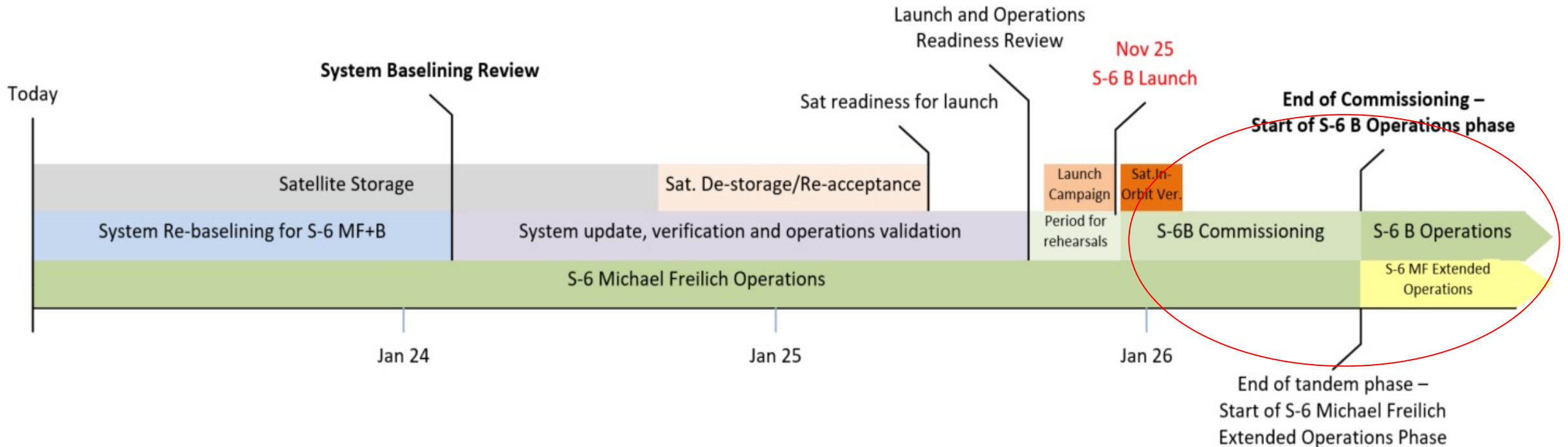
- Satellite in storage since October 2022
- First yearly activation concluded successfully in October 2023
- De-storage mid-Oct 2024
- Re-Acceptance Review summer 2025, followed by transport to launch site
- Launcher and launch site confirmed: SpaceX Falcon 9 from Vandenberg
- Re-assessment of satellite and launcher interfaces ongoing





# Roadmap to launch and operations of Sentinel-6 B

- Re-establishment of system baseline ongoing
- Ground Segment update project kicked-off at EUMETSAT
- Operations Build-up for Sentinel-6 B to start in Q2 2024
- Significant change: addition of the services of a third ground station, in order to complement Fairbanks and Kiruna capability during tandem and dual operations of Sentinel-6 Michael Freilich and Sentinel-6 B

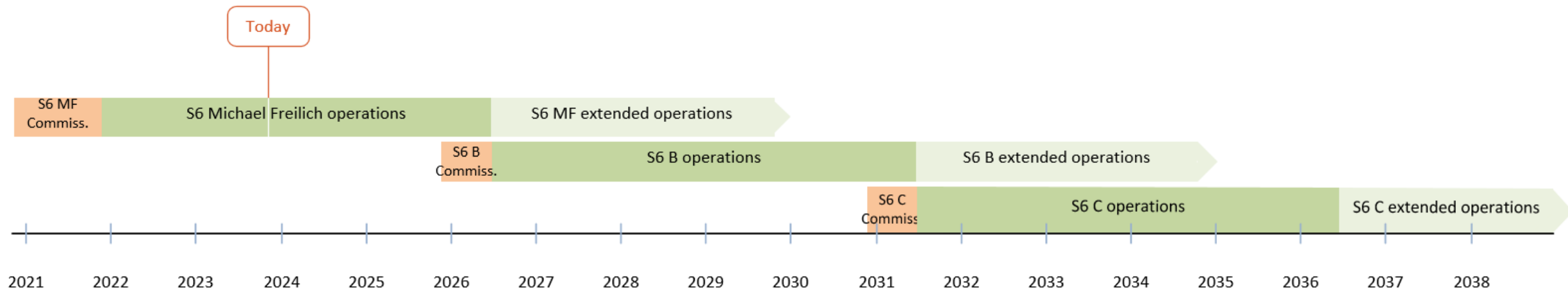






# Beyond Sentinel-6 B

- A third satellite in the series (Sentinel-6 C) is now part of the Copernicus Long Term Scenario
- Continuing the successful European-USA international partnership for the Sentinel-6 mission
- Industrial studies ongoing to assess technology obsolescence and also opportunities to continue and enhance the value of the Sentinel-6 mission for the user community





# Conclusions and outlook

- Sentinel-6 is a cooperative mission within the EU Copernicus Programme, with contributions from ESA, NASA, EUMETSAT and NOAA and the support from CNES
- Focus is on continuation of the global mean sea level record and of operational ocean altimetry services in synergy with Sentinel-3, with important innovations at Space and Ground Segment levels
- Sentinel-6 Michael Freilich is currently the High Precision Ocean Altimetry reference mission under CEOS, with excellent performance and taking over from Jason-3, with excellent performance
- Sentinel-6 B is planned for launch in November 2025 on a Space X Falcon9 from Vandenberg, the satellite is in storage, the build-up for operations will start in Q2 2024, including the addition of the ground station services from a third location
- With respect to Sentinel-6 C, industrial studies ongoing to assess technology obsolescence and also opportunities to continue and enhance the value of the Sentinel-6 mission for the user community



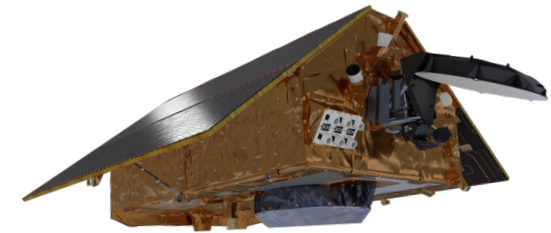
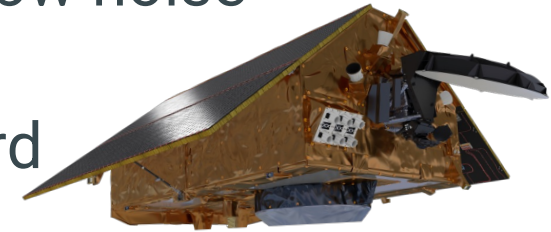
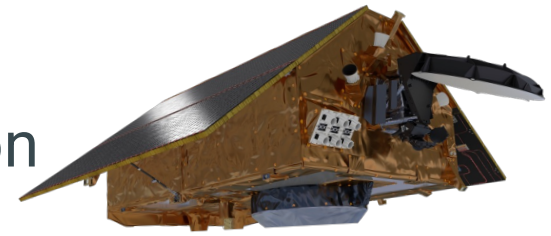
# Thank you!

Questions are welcome

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On behalf of the Sentinel-6 PMs

- **Open Burst SAR (HR)**
  - Gives simultaneously conventional (LR) -> seamless transition from previous missions
- **Digital** altimeter architecture
  - Along with the high pulse repetition frequency, leads to very low noise
- HR and LR **everywhere**
  - Upon popular request, and without degradation: using onboard compression to provide HR and LR everywhere
- **Climate quality** by design
  - Stringent drift requirement (less than 1 mm/year) in EURD
- **1.5-centimeter NRT orbit** accuracy on reference mission
  - Thanks to GNSS NRT processing on-ground (like Sentinel-3)
- **Coastal focus** on reference mission
  - Allowed by HR altimeter processing and HRMR radiometer





# Sentinel-6 Michael Freilich – High Precision Ocean Altimetry reference mission

