

Seeing into the Sphere of Navigation, Reconnaissance and Earth Observation & Science



Earth Observation



Reconnaissance



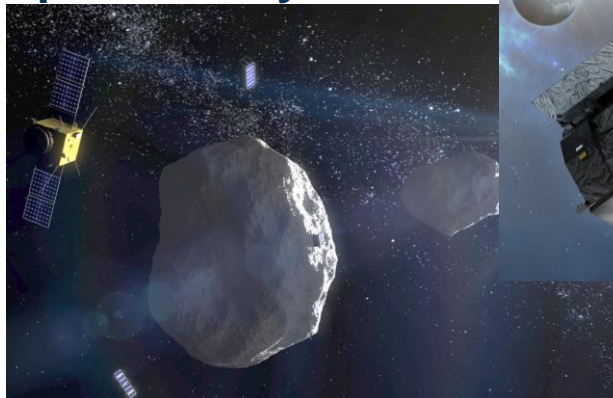
Navigation



Science

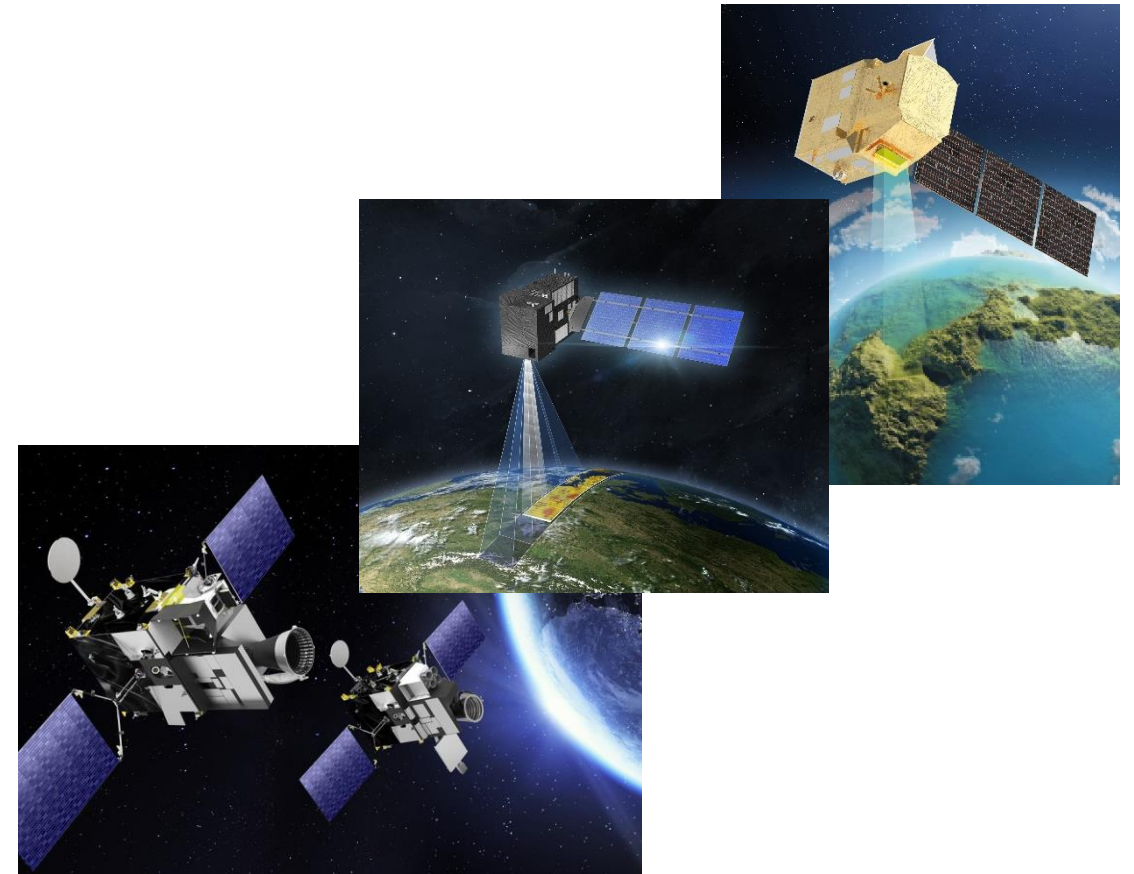


Exploration & Space Safety



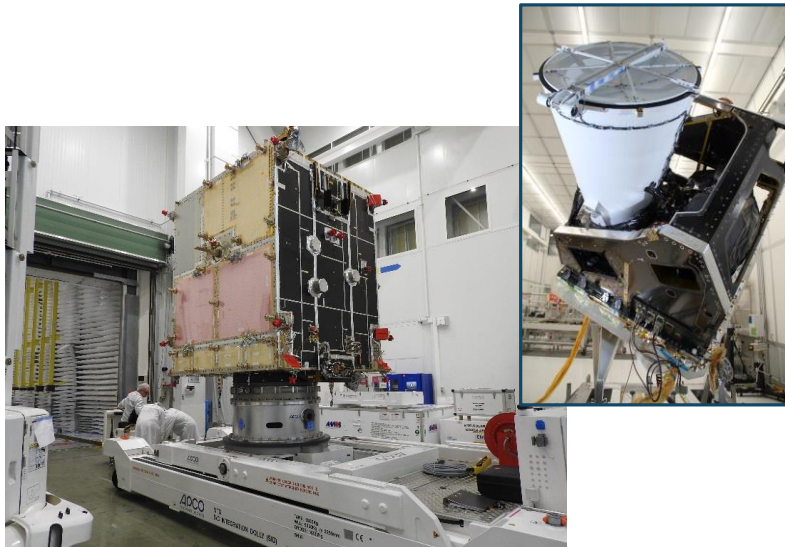
Earth Observation – Foster the Basis

- **Main Earth Observation programs** at OH B are **Meteosat Third Generation (MTG)** and the new **COPERNICUS** missions
- **This improved basis shall be strengthened and grown** (e.g. Next Generation COPERNICUS, ESA Earth Explorer programs, commercial EO elements)

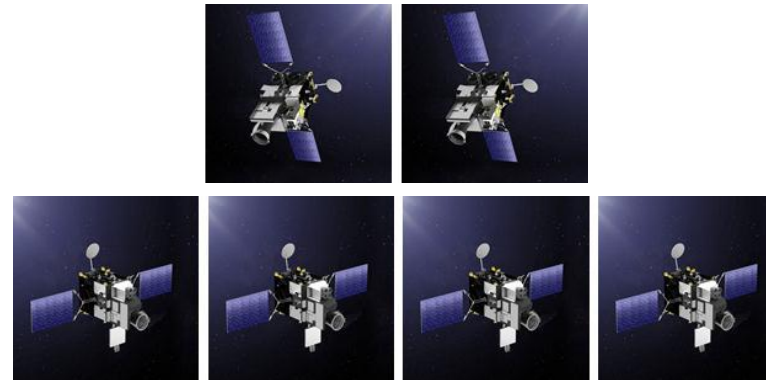


Meteosat Third Generation (MTG)

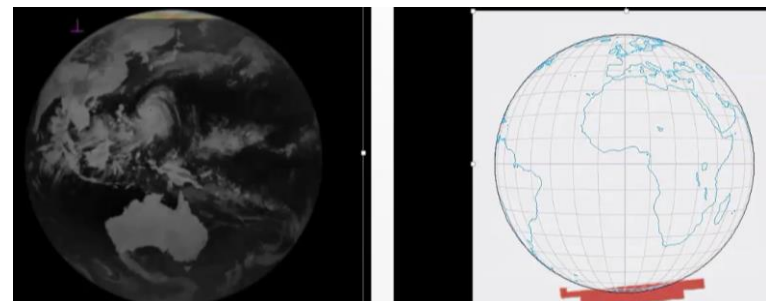
- MTG consists of 4 “imager” satellites and 2 “sounder” weather forecasting satellites (Volume ~ 1B€),
- Launches from 2022 onwards
- Sounder Satellites (as new cutting edge technology elements) are considered to be the future and could create further growth opportunities



2 Sounder Satellites OH B prime and instrument

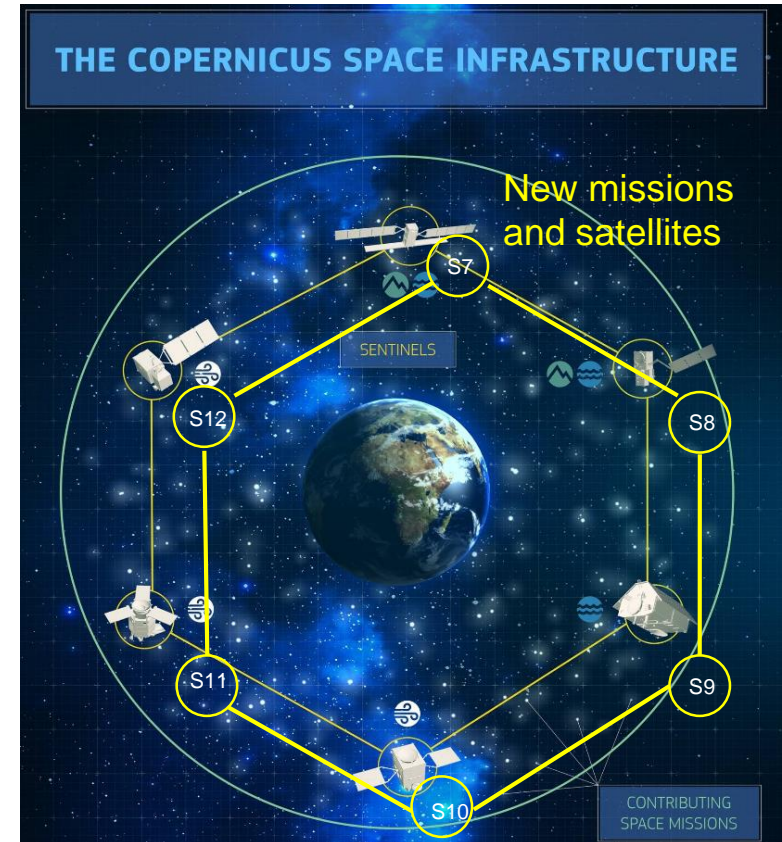


Platforms for 4 Imager Satellites (TAS prime OH B major instrument elements)



Earth Observation – New Sentinels – New Area for OH B

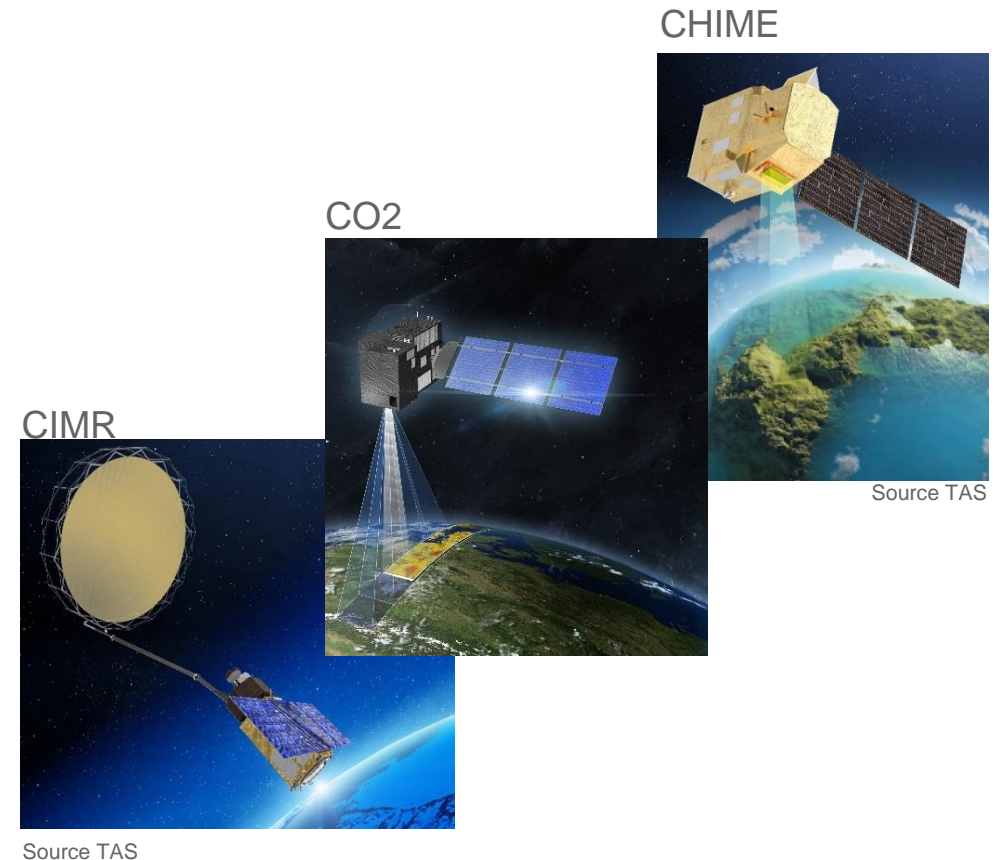
- **Growth** opportunities were OH B was successful in 2020 and will be use opportunities in the future in the major European EO program **COPERNICUS**
- With the success of having been awarded in 2020 with
 - One mission **prime project** CO2M
 - Two **payload prime projects** for OH B
 - CHIME
 - CIMR
 - A total volume > 800 M€OH B has now entered this promising area
- **Further steps are targeted** by the upcoming COPERNICUS next generation missions (for S1 to S6) during the next years



Source EC

Earth Observation – The New COPERNICUS Sentinels – Earth and Climate

- **CO2M** (COPERNICUS Antropogenetic Carbon Dioxide Monitoring) is the COPERNICUS mission with highest priority for ESA/EC
 - OHB is the overall prime;
 - 2 Satellites but more than 2 satellites likely
 - Mission(s) have a long term perspective
- **CHIME** (COPERNICUS Hyperspectral Imaging Mission)
 - Support of services for agriculture and biodiversity management
 - OHB is payload prime (TAS mission prime)
 - 1-2 satellites/payloads
- **CIMR** (COPERNICUS Imaging Microwave Radiometer)
 - Provide observations of sea-surface temperature, sea-ice concentration, sea-surface salinity
 - OHB-Italy Payload prime (TAS mission prime)



Reconnaissance – Go ahead with the current programs and get prepared for the next generations

- Current main programs are **SARah** and **OptSat** (total Volume > 1.5 B€)
- Both systems will be used to provide **high resolution images** around the globe
- The **national demand** for further enhanced systems **is growing** (e.g. more data, more “real-time”, more system of systems).
- Further growth potential might come due to **the increased national defense fund**



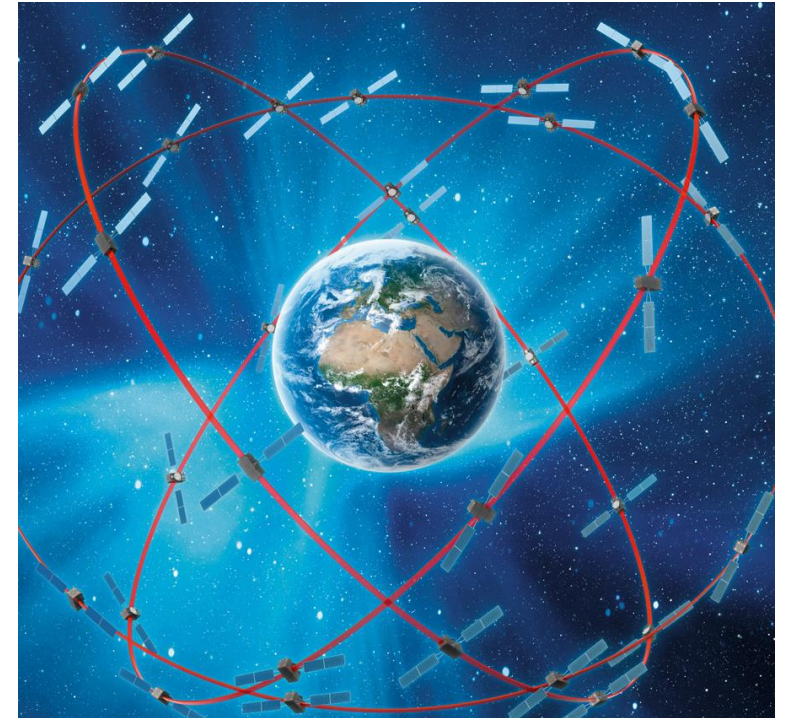
Reconnaissance – Go ahead with the current programs and get prepared for the next generations

- OH B is delivering both, **electro-optical** and **radar** systems with high resolution.
- Synergies with the EO-Domain are used within the projects
- Studies for next generation for SARah and OptSat will start 2021
- On group level OH B-System together with OH B-DC is working on the **reconnaissance system for the future**.



Navigation – The Cornerstone to Continue

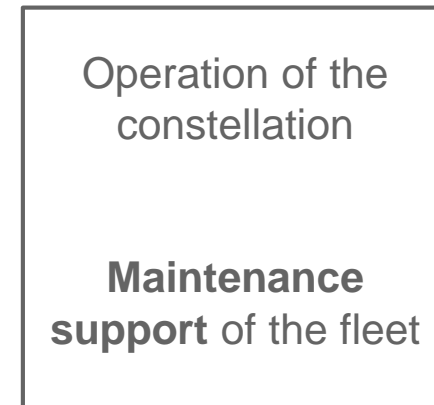
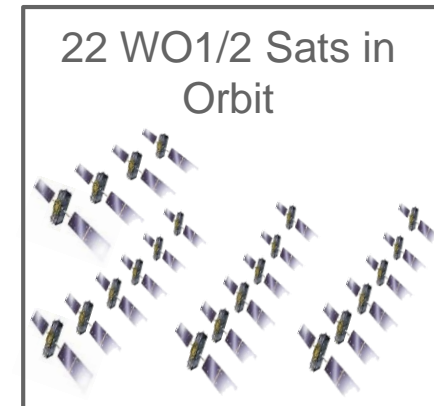
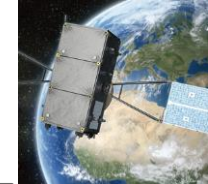
- Navigation with the Galileo Satellites is one of the cornerstones in OH B System with 22 satellites in operation and 12 satellites to be delivered.
- Not succeeding for the first round of Galileo Second Generation satellites (G2G) is a significant disappointment for OH B and has an impact on OH B System.



Source EC

Galileo Status (1) – Current Constellation

- **22 WO-1/2** satellites launched and working well
- **Maintenance support** for satellite fleet ongoing well
- The Galileo constellation is operational and has to be maintained which requires **satellites for refurbishment**



Galileo Status (2) – Replenishment / Improvement

- **12 Batch 3** (single source) satellites under production

Status:

- First **two satellites “ready”**, launch planned by ESA/EC around September 2021
- All other satellites **on track** in different status of production
- Two further launches planned within 12 months after September 2021 Launch

- Procurement for **Transition/Second Generation Satellites**

- first batch decided
- next batch procurement to come in the next (very) few years



Science – Foster the Domain and Grow

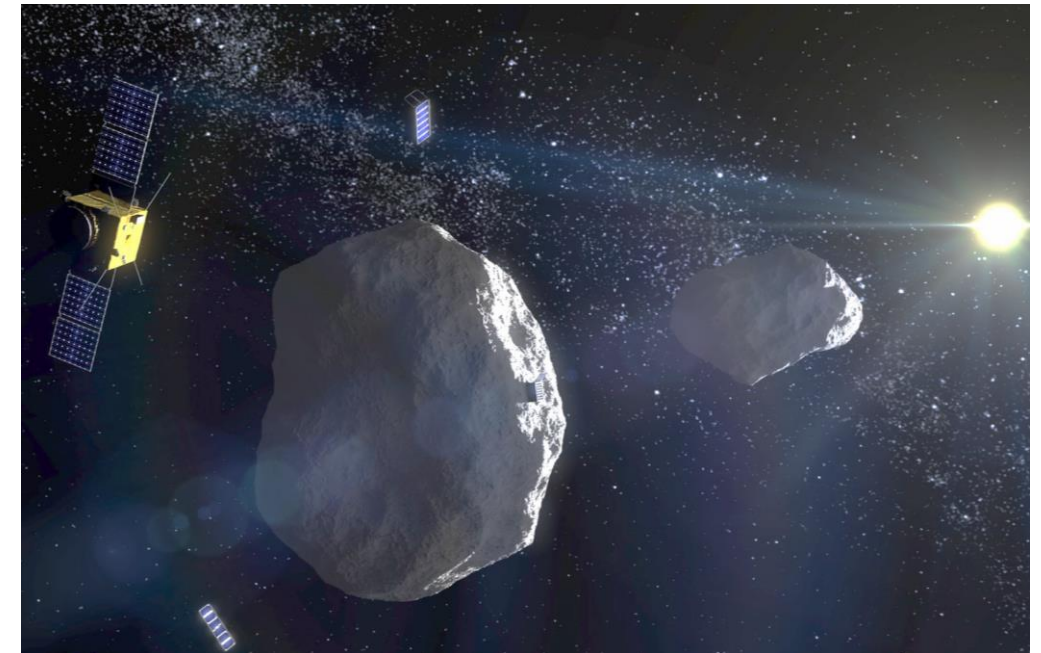
PLATO - Searching for Earth-like Exoplanets

- **OHB's first ESA science prime mission PLATO** (won in 2018) is now under implementation; **status is still fully nominal**
- OHB performs several **studies for next science missions**
- Based on the current success further **growth opportunities** exist in the science area (around the next ESA MC 2022 and ESA long term planning)



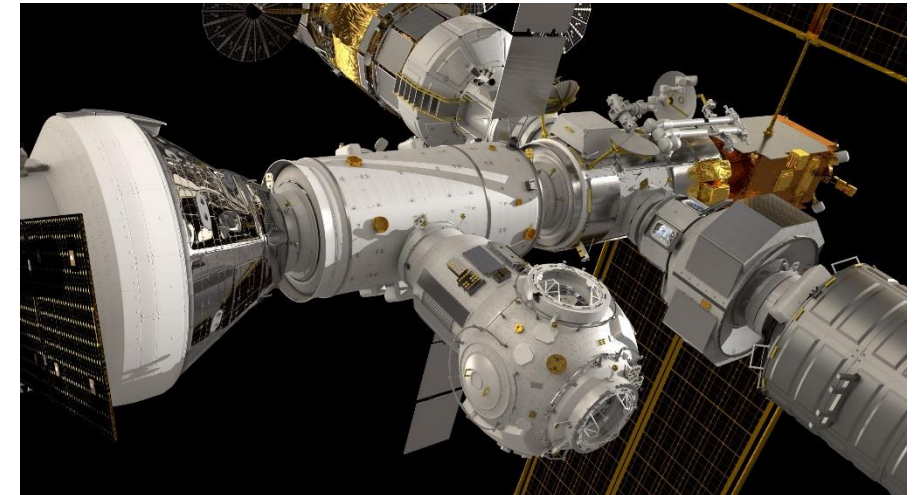
Space Safety – A New Field to be Shaped - Asteroid Deflection - HERA

- **Space19+** approved **ESA's HERA** asteroid mission to the Didymos double asteroid system.
- Hera's up-close observations (2026, launch 2024) will turn **asteroid deflection** (based upon the NASA impact mission in (2024)) into a well-understood planetary defence technique.
- **The contract has been signed in September 2020.** OHB is prime contractor and the implementation status is fully nominal.
- The HERA mission is a **cornerstone** for OHB in the new area **Space Safety**.



Exploration & Human Spaceflight – Balance the Mix and Enter new Areas

- OH B has **fostered the role** for complex scientific payloads in Exploration and human Spaceflight.
- General objective is to **take over major elements** and prime responsibilities based on mission and platform heritage.
- OH B is partner to TAS-F for the ESPRIT module in particular the refuelling element of the **Deep Space Gateway**
- OH B participates the first time in a **new space station** and is responsible for the new Technology: **Xenon-Refuelling in orbit**
- Preparations for the MC 22 ongoing to get major parts of the new systems on/around Moon



Seeing into the Sphere Navigation, Reconnaissance, Earth Observation & Science

