



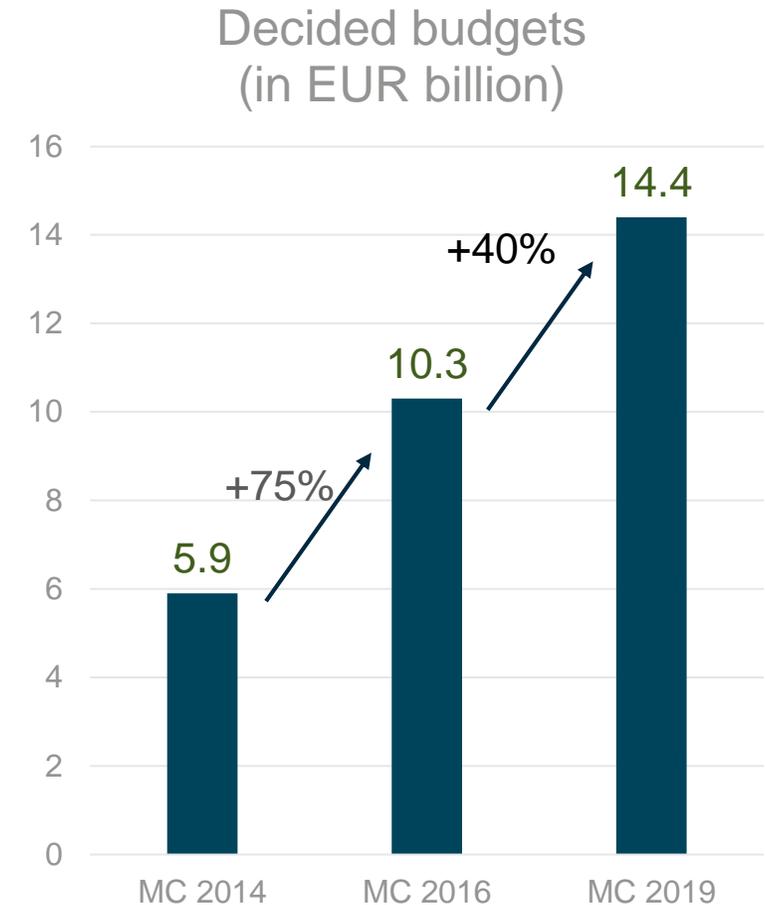
Results ESA Ministerial Council Meeting November 27-28, 2019

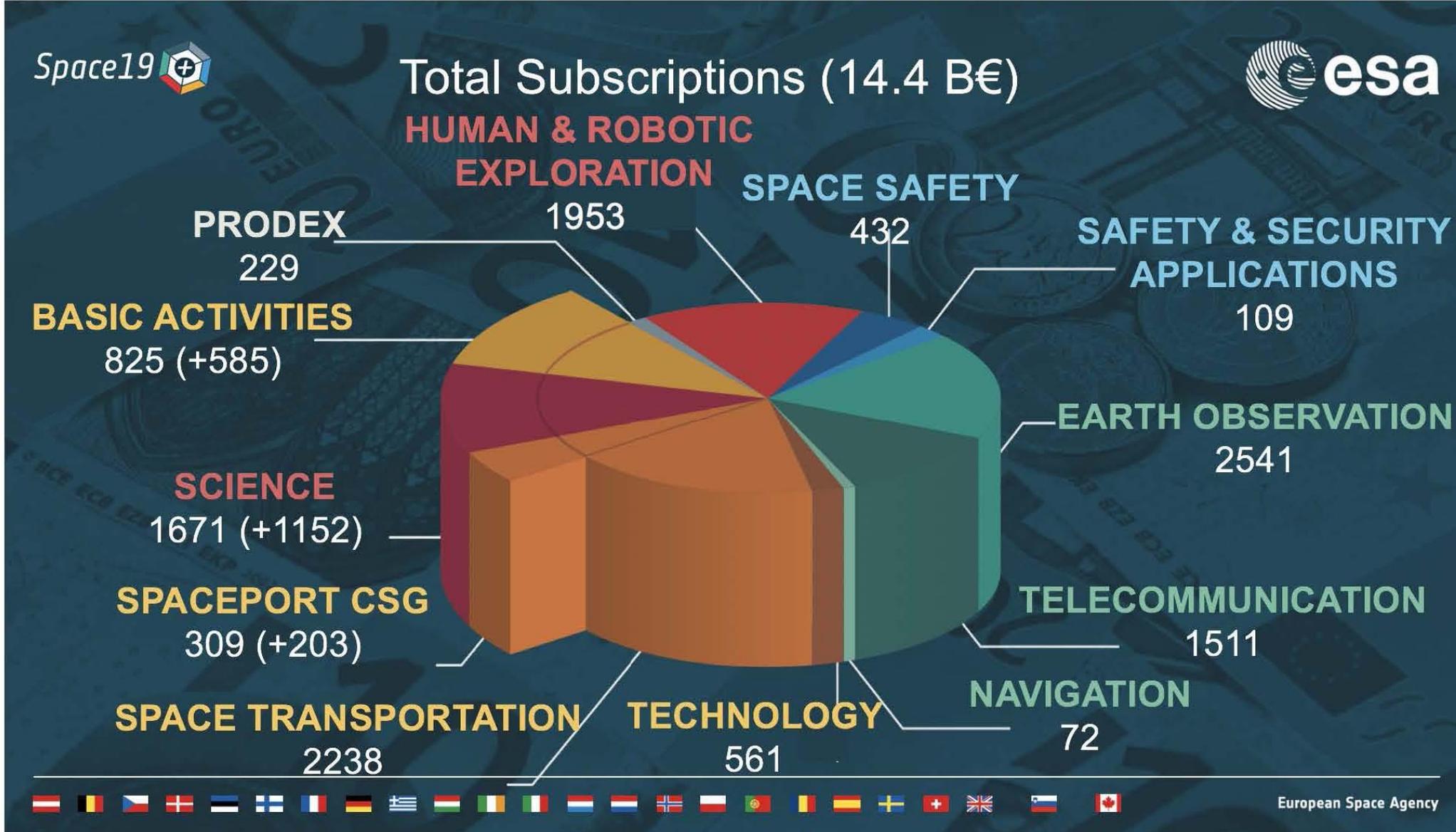
Marco Fuchs, CEO / Kurt Melching, CFO / Dr. Lutz Bertling, CSDO/CDO



ESA's Ministerial Council (MC): Significant increase in the budget over time

- ESA 2019+: United Space in Europe
- Narrative:
Inspiration, competitiveness, responsibility
- Space has become even more relevant since the last MC, space applications provide efficient solutions to today's problems, e.g. EU Parliament declared climate emergency yesterday (earth observation)







Total
Subscriptions
by
Contributor
14.4 B€

Contributor	Subscriptions in M€	Share per Contributor in %
Austria	190	1.3%
Belgium	816	5.7%
Czech Republic	150	1.0%
Denmark	128	0.9%
Estonia	9	0.1%
Finland	110	0.8%
France	2,664	18.5%
Germany	3,294	22.9%
Greece	84	0.6%
Hungary	97	0.7%
Ireland	81	0.6%
Italy	2,282	15.9%
Luxembourg	129	0.9%
Netherlands	345	2.4%
Norway	284	2.0%
Poland	166	1.2%
Portugal	102	0.7%
Romania	44	0.3%
Spain	852	5.9%
Sweden	244	1.7%
Switzerland	542	3.8%
United Kingdom	1,655	11.5%
Slovenia	5	0.0%
Canada	114	0.8%
Total Contributions	14,388	100.0%



Ministerial Councils bring together ESA's Member States every two to three years to decide on new proposals and funding for ESA's next years of work

Budget decision:

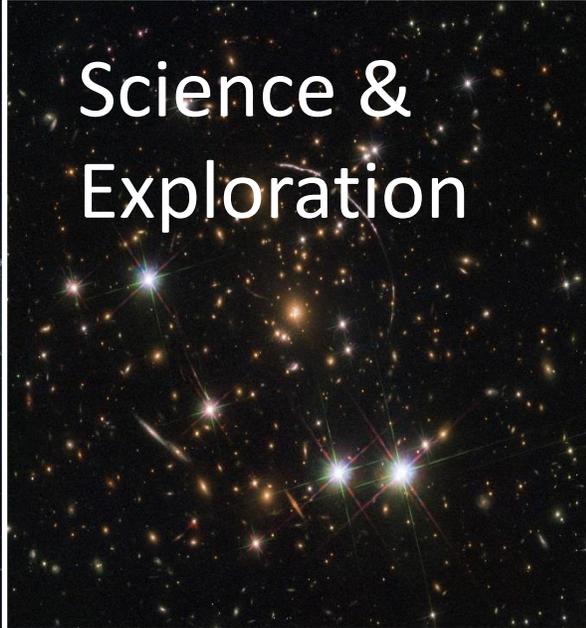
EURO 14.4 billion in total from 22 member states



Applications



Safety &
Security

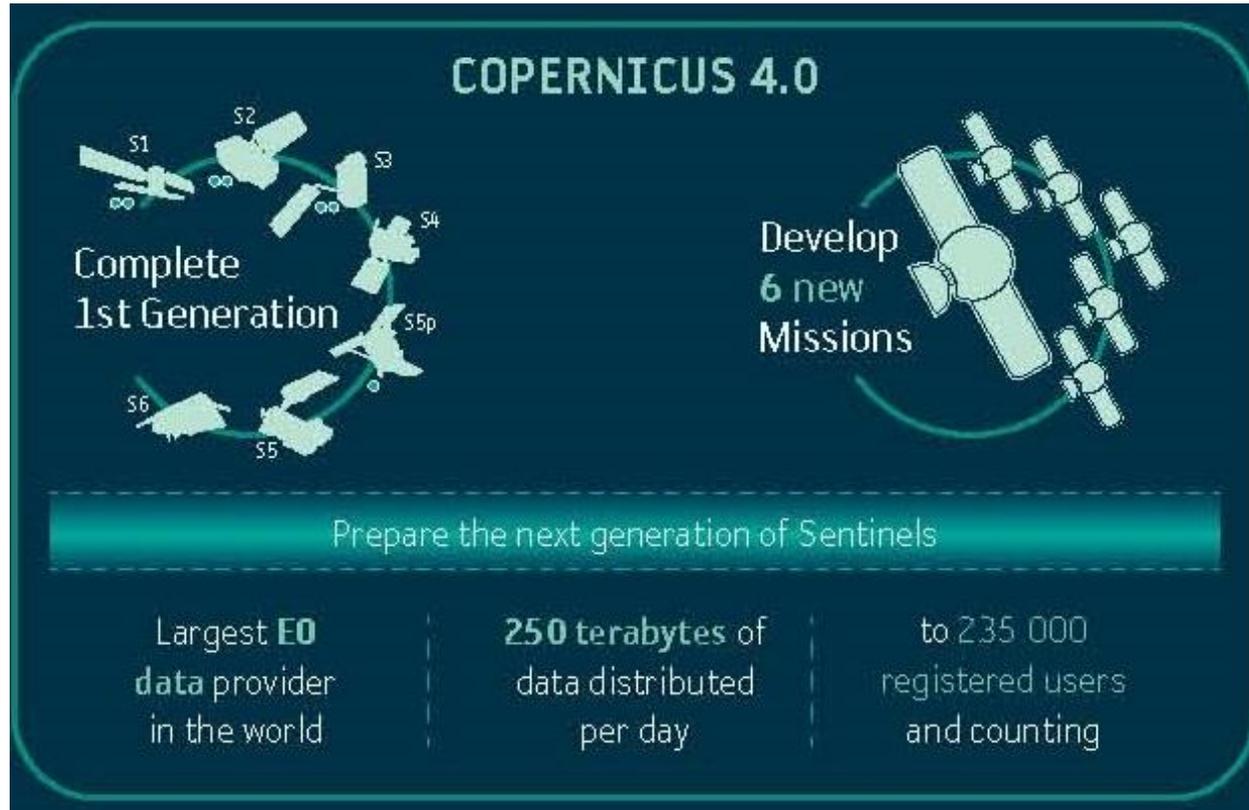


Science &
Exploration



Enabling &
Support

Segment „Applications“

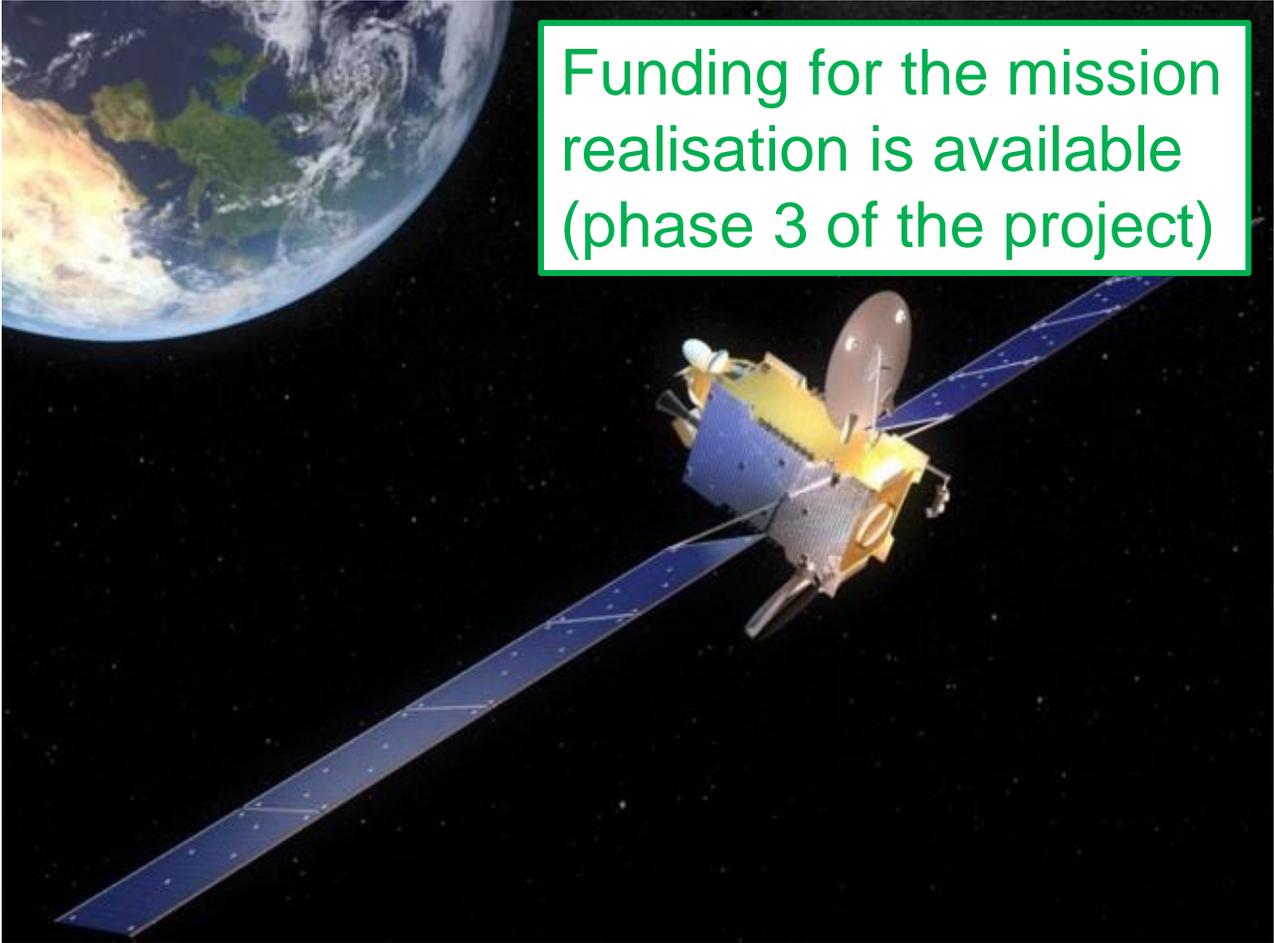


The basis for realisation of the 6 new missions would be funded

6 new copernicus missions:
Being **system prime in 3 studies** and **instrument prime in 1 study** out of 6 missions, OHB is **well positioned to lead two Copernicus Expansion missions** and to participate in more



Segment „Applications“



Funding for the mission realisation is available (phase 3 of the project)

ELECTRA: Innovative platform for telecommunication satellites (electric propulsion)

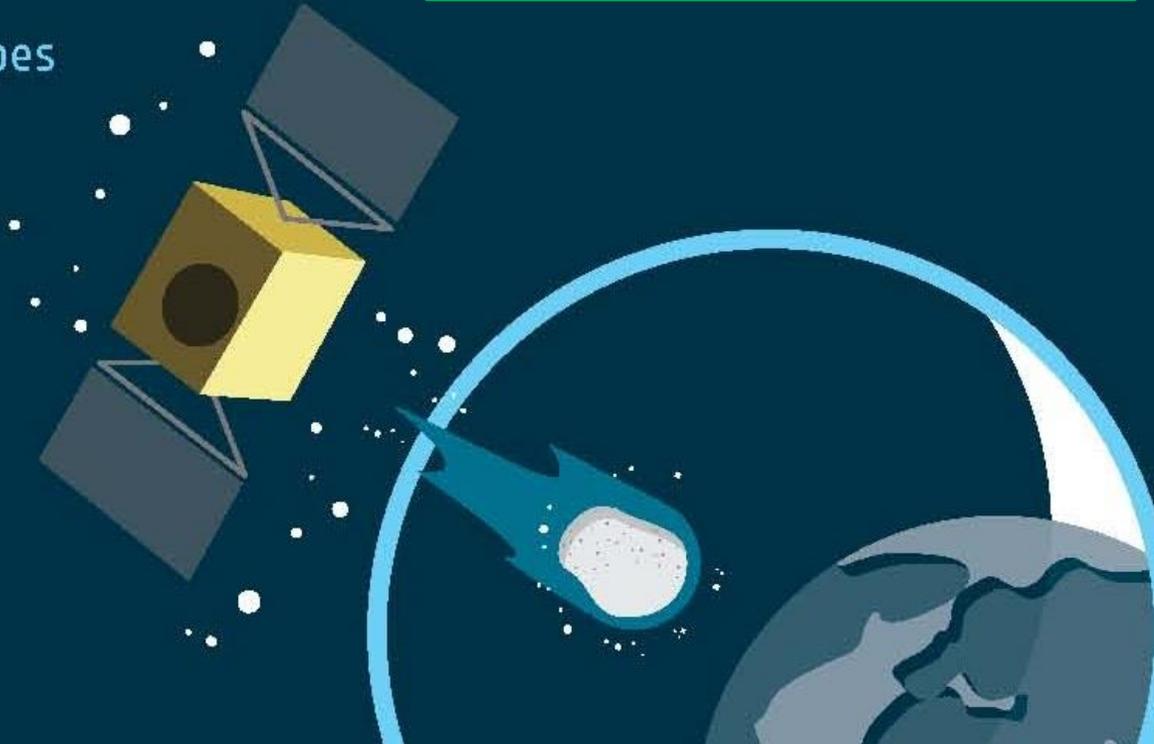
Financing of the initial mission: various potential customers are under discussion for contract conclusion

Segment „Safety & Security“

→ PLANETARY DEFENCE

Any medium or large **asteroid impact** could have **devastating** human, natural and economic **effects**.

While the **Flyeye telescopes** spot risky asteroids, the **Hera mission** would be part of the world's first-ever test of asteroid deflection.



HERA fully funded
(oversubscription):
mission will be realised

HERA:

OHB System is leading a study for the possible future mission

Flyeye telescope:
OHB Italia is prime contractor for the first Flyeye telescope

Segment „Safety & Security“

→ SPACE WEATHER

A major solar event, like the 1859 Carrington event, could cause over **€15 billion economic loss** to Europe.

ESA's Lagrange mission would see such a storm coming and feed data into a new **early warning system**, enabling us to act to **protect vital ground and space infrastructure**.

Lagrange mission: over threshold, capability for instrument TRL rise (preparation for MC 2022)

OHB System AG is conducting a **study** in which investigations will be carried out for a mission to "Lagrange Point 5", it is about 150 million kilometers from Earth

Segment „Safety & Security“

→ SPACE DEBRIS & CLEANSPACE

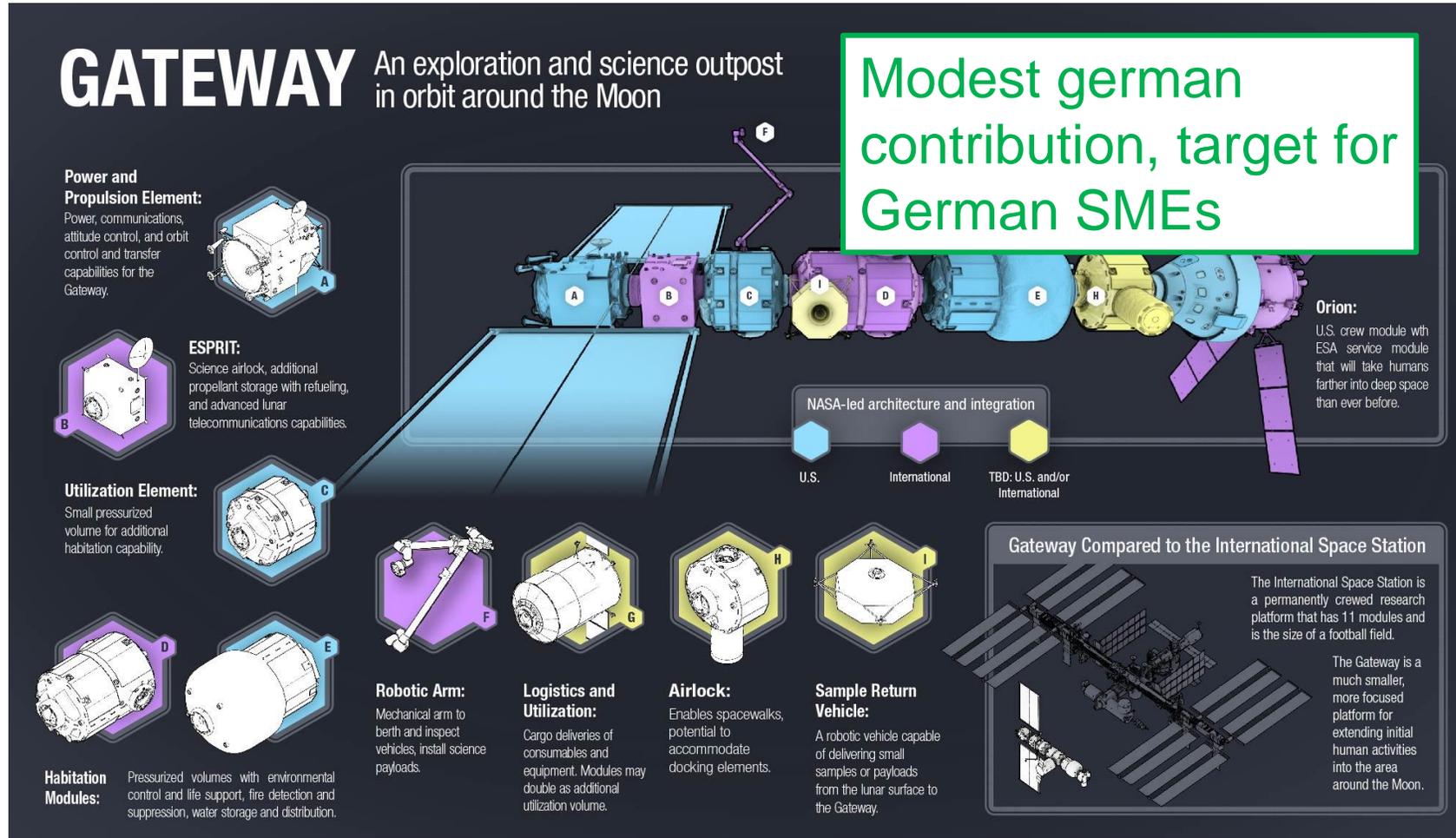
The increasing quantity of **space debris in orbit around Earth** means our vital satellites and the daily services they provide are at risk.

An **automated collision avoidance** system – managing warnings and designing, recommending and executing avoidance manoeuvres – would **keep our satellites safe**.

Adrios will be realised

Adrios:
Pathfinder mission for technology probing, in which OHB Sweden could participate

Segment „Science & Exploration“



Modest german contribution, target for German SMEs

ESPRIT Module: OHB System is handling in the context of a study key development tasks (design work on the structure of the module, the thermal system and the xenon-refueling system) as a subcontractor for Thales Alenia Space

Habitat: MT Aerospace (structural elements)

Segment „Science & Exploration“

Cornerstone four

→ MARS ROBOTIC EXPLORATION

Mars is a sister Planet to the Earth.
We want to know why it aged so quickly, freezing its water and losing its magnetic field and atmosphere.

ExoMars 2020 will look for past and maybe still **present traces of life.**

In the next decades, humans will **walk on Mars** and understand its potential for life.

As a pathfinder, we will send **a robotic campaign** to make the first return trip and bring back samples.

The Mars Sample Return campaign is the **most advanced** robotic planetary exploration campaign so far conceived. It is composed of several missions that will **collect Martian samples**, send them into orbit and bring them **back to Earth.**



Mars Sample Return
Mission: Moderate
German contribution

OH B system made a **significant contribution to the Exomars 2016/2020 mission** and is now well prepared to contribute to the Mars Sample Return campaign

Segment „Enabling & Support“



Beside MT Aerospace's contribution to the new developed Ariane 6 launcher, an additional budget is requested for

- the development of technologies which could enhance the launcher in the mid-term future, e.g. carbon-composite technologies
- a kick-stage for the Ariane 6.2 configuration and for the smaller launcher Vega

A significant budget has been created for the optimisation of Ariane 6