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Ref: ESA-TECQ-HO-2024-001991

Welcome to TRISMAC 2024

What is TRISMAC?

Trilateral Safety and Mission Assurance Conference, jointly organized by ESA, JAXA, and NASA every three years.

This year, ESA is hosting the conference with a focus on ”**Space Exploration: New Challenges and Opportunities**”.

We will be discussing how new space, new players, and new destinations will impact the mission assurance and safety domain (SMA) in the future.


6 main topics

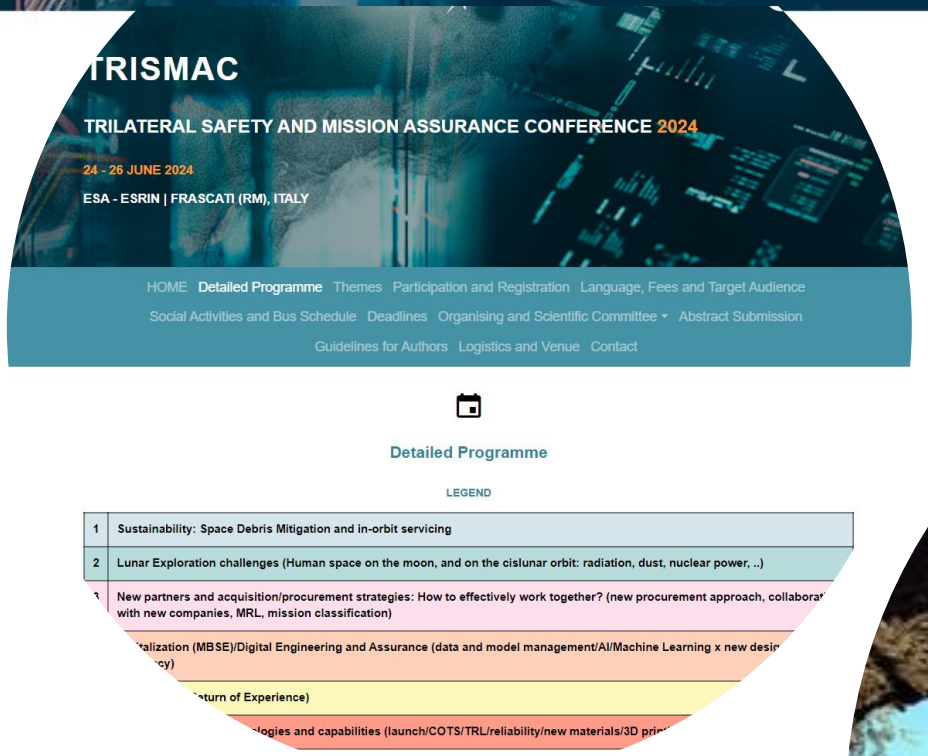

5 keynotes


43 presentations


12 sessions

The conference is organized in presence; however, some presenters will be joining remotely.

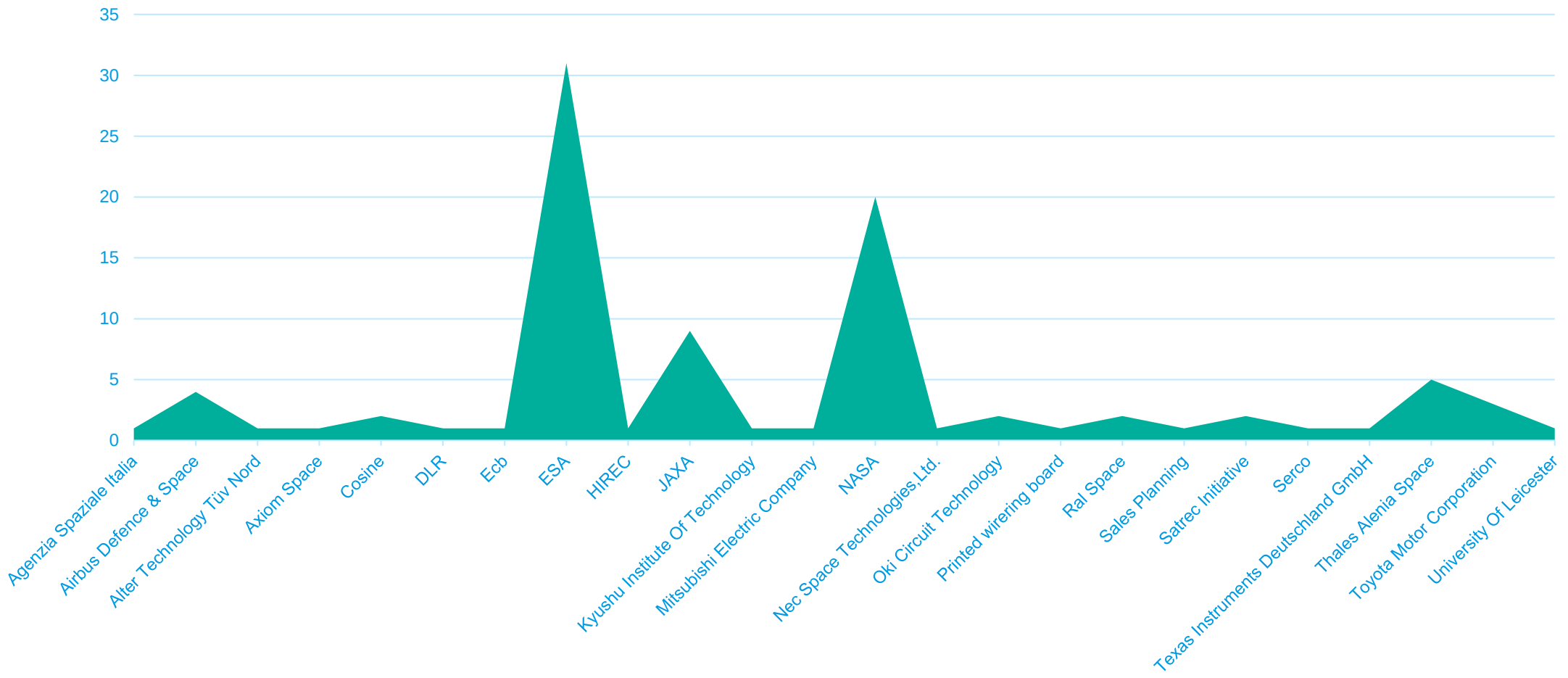
TRISMAC 2024 Programme



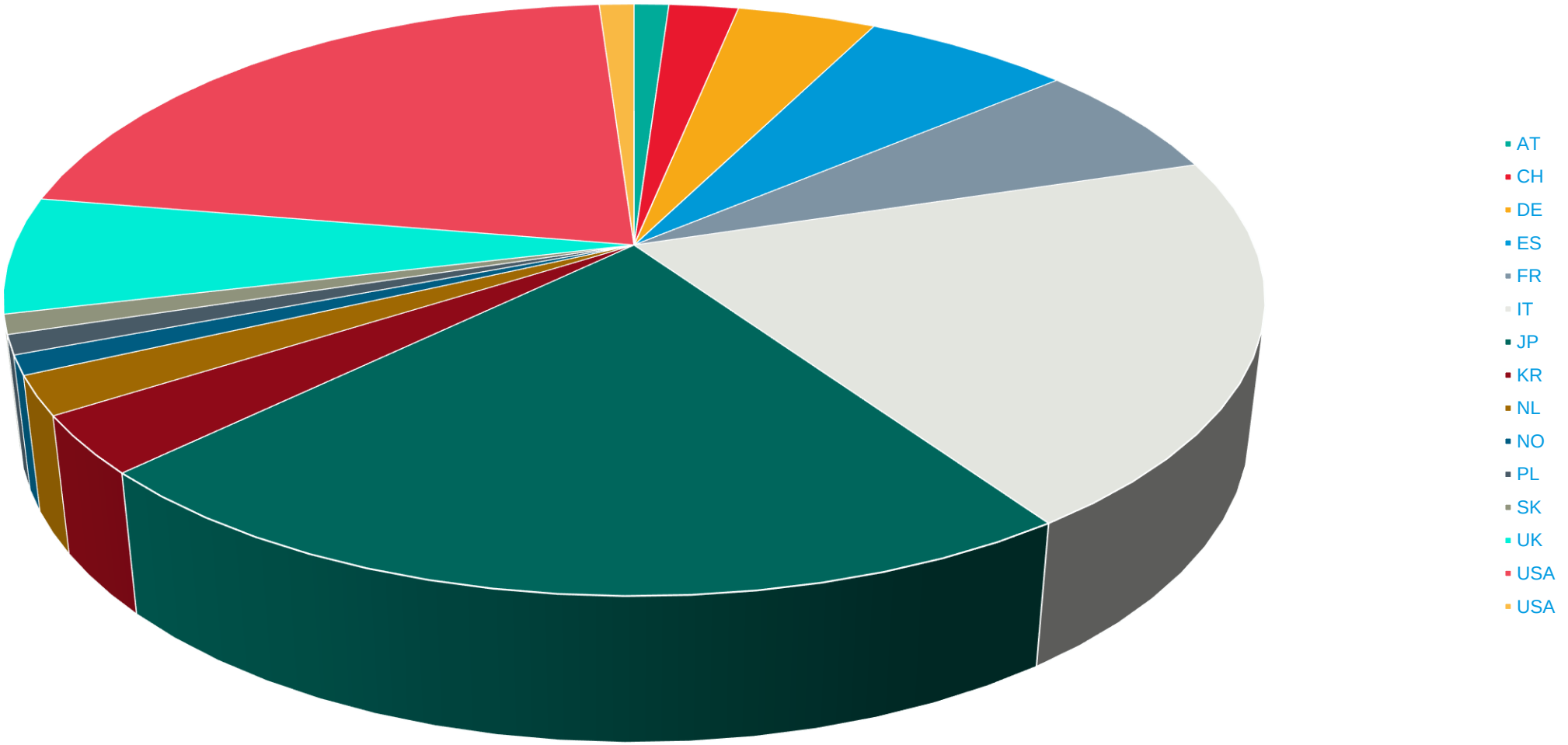
Scan me!

https://nikal.eventsair.com/trismac-2024/detailed-programme

Registered Organizations

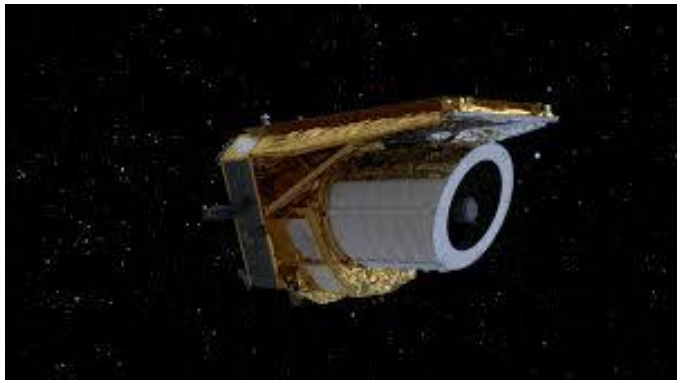


Registered Participants: Nationality



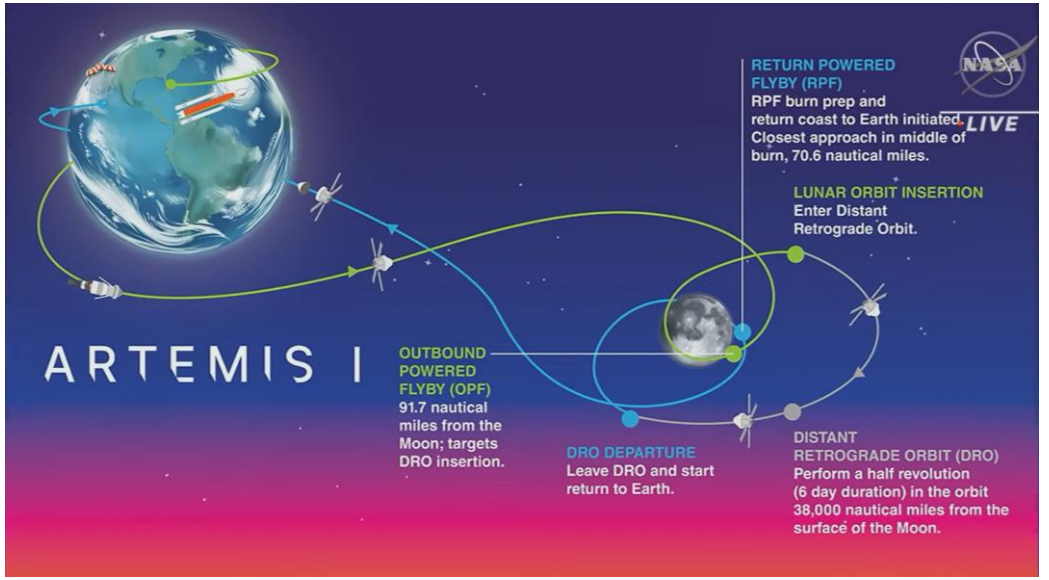
What happened since the last TRISMAC?

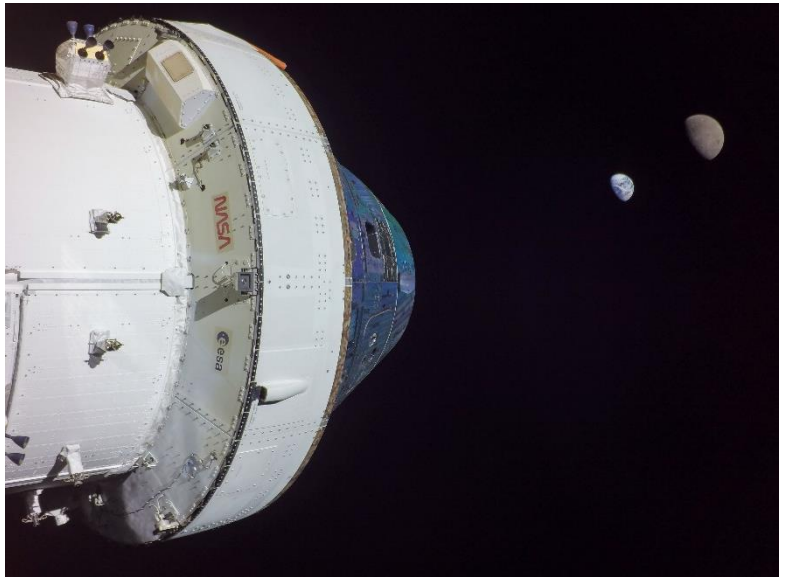
- 2023's highlight was the highly anticipated launch of **JUICE**, Europe's Jupiter Icy Moon Explorer. After an eight-year journey, Juice will observe the giant gas planet and its three large ocean-bearing moons – Ganymede, Calisto, and Europa.
- The **EUCLID** space telescope was launched in July to unravel the enigmas of 'dark matter' and 'dark energy'. Euclid's first images were released in November, revealing razor-sharp astronomical images with detail never before seen by a telescope across such a large patch of the sky.
- In 2022, **NASA's DART** mission impacted a small moonlet of the asteroid Didymos, to actively change its course. ESA's HERA spacecraft will be launched in October 2024 to collect the data after the collision.
- 2023 also saw the first hardware tests for the **second generation of Galileo satellites** but even more importantly the **Galileo High Accuracy Service** was launched in January. This new service delivers centimetre accuracy from space further cementing Galileo's reputation as the most accurate satellite navigation system in the world.



ARTEMIS 1: A Major Exploration Achievement

ARTEMIS-I launched in November 2022 on the SLS rocket's maiden flight (un-crewed) and demonstrated the Orion vehicle capability during a successful 25.5-day mission





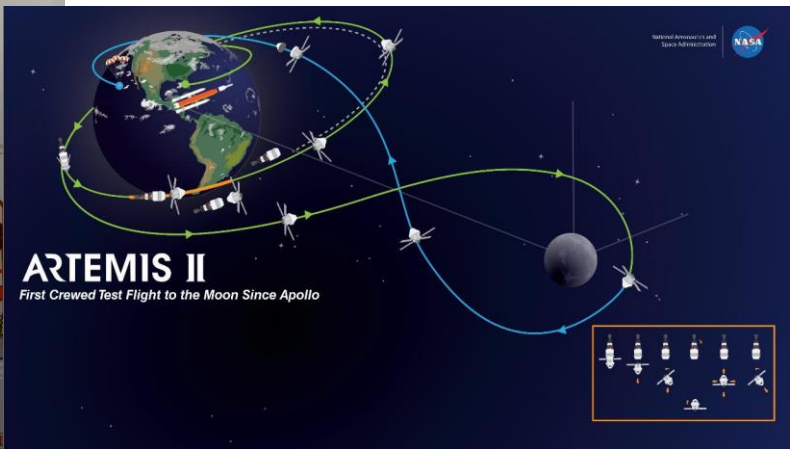
European Service Module (ESM)

ESM-2 is currently at Kennedy Space Center (KSC) in Florida.

It is undergoing final integration and tests for the Artemis II mission planned for September 2025:

- Vacuum test
- Propulsion system test
- RF compatibility test
- Solar array installation and stowage
- MLI finalization
- Propellant loading
- Fairing encapsulation

Artemis II is foreseen to fly a crew of 4 astronauts around the moon on a 10-day mission.

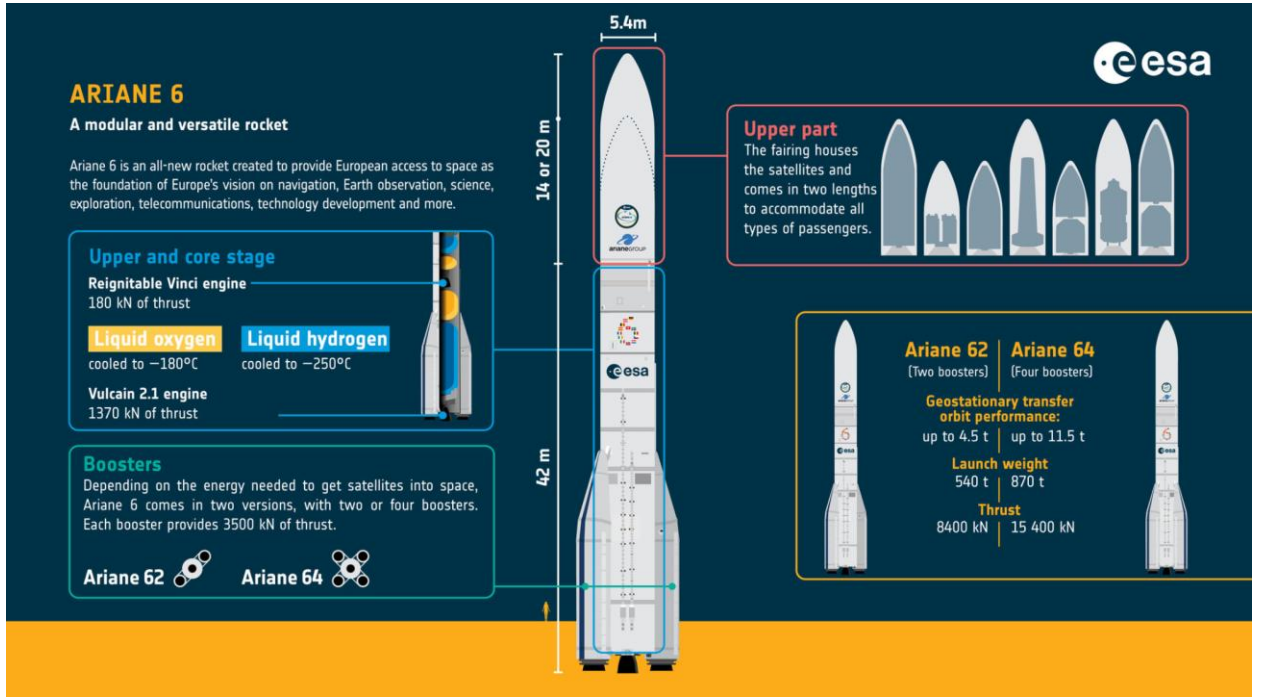


2024: A busy year for ESA

- Since 27th April, two new Galileo Satellites have joined the ESA constellation.
- On 20th May, the ESA/JAXA mission EarthCARE was launched from Vandenberg.
- Ariane 6 will be ready for its first flight from Europe's Spaceport in Kourou on 9th July.
- Vega-C will return to flight in September to continue to provide Europe with its affordable lightweight launcher.
- As mentioned earlier, Hera will be launched in October from KSC.
- Proba-3 will then be launched in November from India. It will demonstrate precise formation flying by flying two satellites to achieve observation of the Sun's inner corona.
- Finally, ESM-3 will be shipped to the United States for mating with its Orion capsule to support the third Artemis mission.

ARIANE 6 – Europe's Access to Space

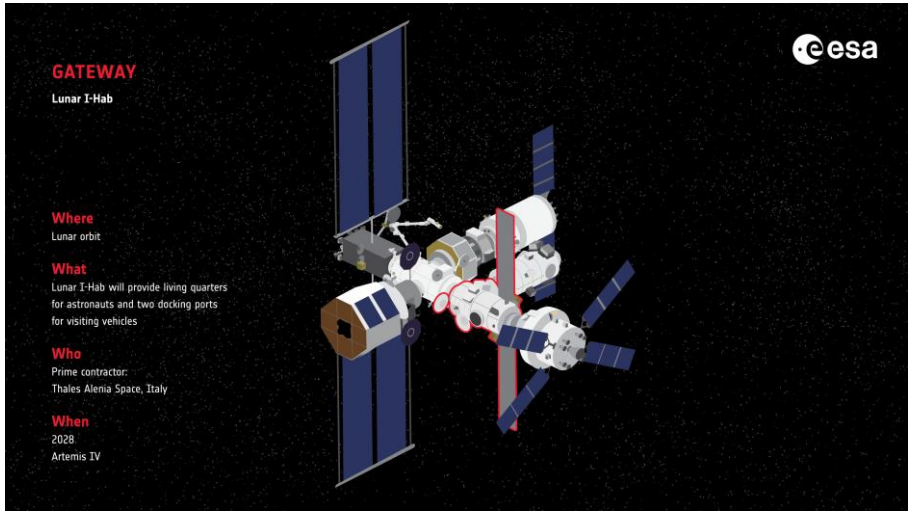
In 2023, the legacy of Ariane 5 came to an end. Europe's new and versatile heavy-duty launcher Ariane 6 will now continue the success story. The preparation for the inaugural flight from Europe's Spaceport in Kourou is in full swing. The Launch Readiness Review is scheduled for 5th July. The launch is currently scheduled for the 9th July.

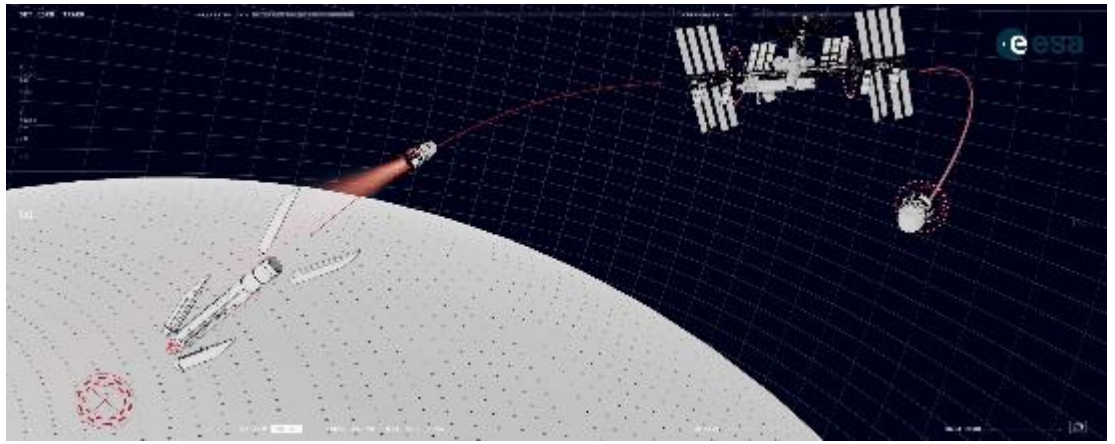


Ambitious Exploration Program

Foster human spaceflight, science, technology, and commercialization development and explore collaboration in low Earth orbit destinations other than the International Space Station.

New future qualified European low Earth orbit (LEO) cargo and/or crew transportation services, at market rates and commercially viable terms and conditions, also as a means for offsetting future ESA astronaut missions





Lunar I-Hab is an ESA habitation module on the lunar Gateway, an international space station being built around the Moon. The Gateway is providing a place to live and work in lunar orbit as part of NASA's Artemis programme returning humankind to the Moon.

The pressurised module will provide around 10 cubic metres of living space for astronauts visiting the Gateway. Together with NASA's Habitation and Logistics Outpost module there will be enough room on the station for four astronauts staying up to 90 days. Lunar I-Hab will also provide large deployable radiators, playing an essential role in the thermal control of the Gateway station.

Pioneering Technologies in Space

One small s-curve deposited in liquefied stainless steel equals a giant leap forward for in-orbit manufacturing: this is the very first metal 3D printing aboard the International Space Station, which took place a few weeks ago, aboard ESA's Columbus laboratory module.

Ref: https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration

New Graduates ESA Astronauts

The newly graduated ESA astronauts are:

Sophie Adenot

Pablo Álvarez Fernández

Rosemary Coogan

Raphaël Liégeois

Marco Sieber

Also, as a testament to ESA's commitment to international collaboration,

Katherine Bennel-Pegg

from the Australian Space Agency graduated with her fellow ESA classmates.

What's Next at ESA

Currently, ESA is in a transformation process defining a new and agile way of working. Some aspects that will affect Mission Assurance and Safety are the Modernization of the European Standardisation System ECSS and the ESA Mission Classification.

ESA is also preparing the CM25 – the Ministerial Conference with ESA's Member States - to agree on future endeavours in space.

Strategic goals are :

1. Drive space sustainability for a green future
2. Advance science and exploration towards the next frontier
3. Integrate space solutions for European resilience and security
4. Build a cohesive and vibrant European space ecosystem
5. Enable a strategically autonomous and competitive European space sector

Zero Debris implementation

ESA Zero Debris Approach

A step-by-step approach, leading by example to implement Zero Debris by 2030. This approach is enabled by technical advancements and implemented through a state-of-the- art space debris mitigation technical standard, applicable to ESA missions.

Zero Debris Charter

Engaging like-minded actors of the space sector in a collective effort towards space safety and sustainability

Zero Debris Technical Booklet

List of needs, technical solutions and contributions gathered through the Zero Debris community to achieve the jointly defined sustainability targets by 2030

Planetary Protection

ESA Agenda 2025 and Terra Nouae uision 2040+

- Ambitious space exploration plans for the next years, aiming to increase European autonomy and leadership in space. These plans include the search for extraterrestrial life, returning samples from Mars, the unprecedented desire for a stable European presence on the Moon's surface and crewed missions to Mars.
- The complexity of such missions has enhanced the importance of safety aspects, as well as challenging current methods and approaches.
- The debate over the governance, legal, scientific and commercial aspects of space exploration must evolve to consider the interests of new actors in space exploration.

Challenges

- The decisions we make now about planetary protection, the tools we develop and the procedures we put in place will determine the kind of missions that future scientists can carry out and the quality of data that they can collect.
- Multidisciplinary approach, development of credible tools to enable space explorations, while ensuring safety and sustainability.
- New COSPAR PP policy under review and risk informed decision approach.

TRISMAC

Trilateral Safety and Mission Assurance Conference 2024

24–26 June 2024

ESA-ESRIN | Frascati (RM), Italy

ENJOY!