

In the past month, Ariane 5 launched, Virgin Orbit went bankrupt and the Starship super launcher *almost* managed to successfully launch. This newsletter details ArianeGroup's governance restructuring, the reach of European space startups to United States, and many other updates.

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## Space Industry and the Space market

ArianeGroup's financial results and Ariane 6 delays lead to a change in leadership

ArianeGroup's revenues plunged by 25% in the past year, from €3.1Bn in 2021 to €2.35Bn in 2022, mainly due to the war in Ukraine and the Ariane 6 delays. However, it generated €19M of benefits in 2022, a progress compared to its €39M losses in 2021.

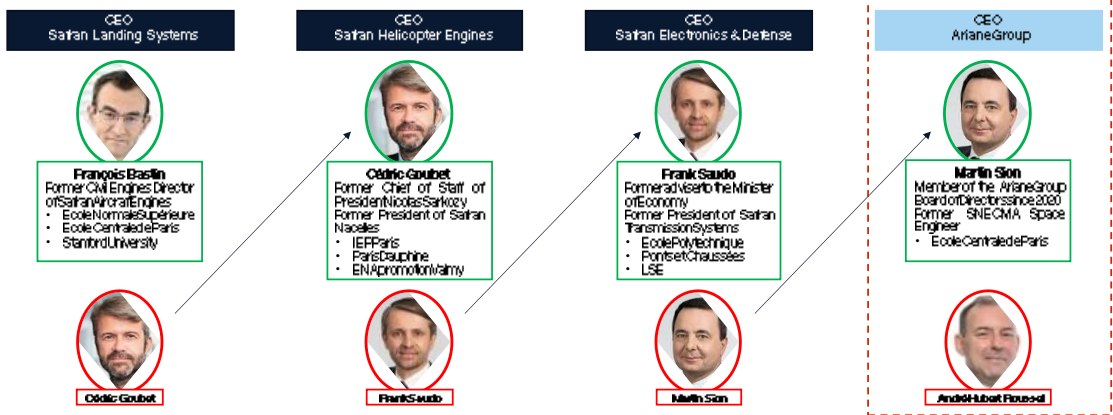
These underwhelming financial results **could be the cause of the change in** CEO operated in April 2023. **André-Hubert Roussel**, who had been ArianeGroup's CEO since 2019, and who

previously was Airbus Defence and Space’s EVP Operations, left its functions last week. He is replaced by Martin Sion, who leaves his functions as CEO of Safran Electronics & Defense. Martin Sion will be the first CEO since the creation of ArianeGroup to come from Safran rather than Airbus<sup>1</sup>.

Sion’s first weeks were marked by two successes: the launch of the JUICE probe on the second to last Ariane 5, as detailed below, and the successful test of a M51 ballistic missile from the submarine *Le Terrible*.

**The change of Chief Executive Officer of ArianeGroup has resulted in a significant reorganization of the management of Safran Group**

LEADERSHIP CHANGES – SAFRAN GROUP (APRIL 2023)



OneWeb successfully completes its constellation

In late March 2023, an Indian LVM3 launcher put in orbit 36 satellites of the OneWeb telecommunications constellation, which is now complete. The goal of this constellation is to provide internet connection to remote users, be it households in isolated areas, airplanes, boats or others.

The constellation is constituted of 618 satellites, and should be able to provide commercial services later this year, after having signed agreements with telecoms operators, such as Orange.

Although doubts remain on the ability of OneWeb to be competitive against cheaper, wider constellations such as the Starlink one, completing its constellation is still a very reassuring sign

<sup>1</sup> ArianeGroup is a 50/50 joint venture between Safran Group and Airbus Group.

for the company that was **rescued from bankruptcy in 2020**, and lost all its launch contracts planned with the Soyuz launcher following the beginning of the war in Ukraine.

The company ambitions to **leverage its upcoming merger with Eutelsat** to obtain significant contracts. Most notably, its advisory board president expressed his hope that **OneWeb/Eutelsat will be able to contribute significantly to the European military communication constellation IRIS<sup>2</sup>**.

## Virgin Orbit is bankrupt

On the **15<sup>th</sup> of March 2023**, **Virgin Orbit**, Richard Branson's plane supported launcher company, announced it **suspended its activities** as they face a shortage of liquidities. After looking for new funding avenues or a potential buyout for 2 weeks, the company had to **file for bankruptcy in early April**.

Virgin Orbit had **failed its attempt in January to launch a rocket from a Boeing 747** and to be the first to launch a rocket from the UK. It could be expected to **come back the way OneWeb did**, with new owners. The potential buyout offers will be monitored here in the coming months.

## Starship crashed, but is still a win for SpaceX

On the **20<sup>th</sup> of April**, from **StarBase in Boca Chica, Texas**, SpaceX launched **its mega-launcher Starship**, but the vehicle exploded a few minutes after takeoff, when it reached the point of stage separation.

Watching the live launch was confusing, as the reaction in StarBase was overwhelmingly positive, with everyone cheering and applauding even though the booster and its spacecraft very clearly failed to separate and exploded in motion.

Although such an explosion is clearly a negative event for SpaceX, the positive reaction comes from two factors: 1) the obvious inability for commercial reasons for SpaceX to appear anything but hopeful, in risk of tanking its investors trust, and 2) more seriously, the fact that although it did not reach orbit, **Starship took off, flew for a few minutes, and that all this data is invaluable for SpaceX to use for further development**.

This launch was in itself a **test**, with significant **technological constraints**, such as the number of engines in the first stage. Firing **33 Raptor engines**, fueled with liquid **methane** and oxygen, to power the biggest space launcher to be ever created (120m high) and managing takeoff without destroying the launcher is a technological prowess.

The causes of the explosion are not known but it is clear the vehicle exploded as it was trying to separate its first and second stage. It started spinning, seemingly out of course, for a few dozen seconds before being destroyed. A failed separation is thus probably the main reason, without getting into specifics.

Even if this is not a full failure for SpaceX, this explosion offsets the Starship schedule, with Elon Musk announcing that a new attempt will be made in the coming months.

## A zoom on startups

### Anywaves secures an American contract

The satellite antennae startup has been selected by **Maxar Technologies**, a satellite designer and manufacturer, to provide 120 telemetry, navigation and remote control antennas by the end of 2023. **Expansion to the US market** was one of the **key objectives of Anywaves** when it raised **€3M in December 2023**.

### Clearspace expands to the American market

ClearSpace
Headquarters: Renens, Switzerland
Implantation: 3 sites (Switzerland, UK, US)
Team: 95+ (70 engineers)
Funds raised: € 30,7M
Founders: Muriel Richard (CTO) and Luc Piguet (CEO)

Given the ever increasing number of objects sent into space by mankind, the issue of **space debris removal** is becoming an increasingly crucial concern for space institutions and industrials. The Swiss startup ClearSpace made it its mission to be space's first **"tow truck"**, and deorbit **significantly sized debris**. They announced on the 18<sup>th</sup> of April the creation of an **American subsidiary, Clearspace Inc.**

Clearspace has made headlines since December 2020, when it signed an **€ 86M contract with ESA** to perform the **first space debris removal mission, ClearSpace-1, in 2026**. This mission aims at **removing a 112kg debris from the 2013 launch of the VEGA launcher**.

In **February 2023**, it raised **€ 26,7M** from a wide team of investors led by OTB Ventures. This round follows a first one which amounted at CHF 4M (around € 4M) in 2021.

Clearspace is a spin-off of the Swiss university EPFL, in Lausanne.

The company ambitions not only to expand to the American market, but also to **diversify its offer** by **adding a "gas station" to the "tow truck"**. One of the reasons why so many debris exist is that **satellites run out of fuel without a solution for refueling**. Clearspace announced it is working on this with the American satellite operator **Intelsat**.

## ISAR Aerospace: the German startup raises \$165mn

At the end of March 2023, the German launcher startup **Isar Aerospace** raised \$ 165M from investors including 7-Industries Holding and Bayern Kapital, bringing its **total raised at \$ 330M**.

Isar Aerospace was founded in 2018 by three former Technical University of Munich students. It aims at launching its **Spectrum rocket in the second half of 2023 from Andøya in Norway**.

Earlier in March, it announced to have run 124 hotfire tests of its Aquila engine in 2022.

### ISAR Aerospace

Headquarters: Ottobrunn, Germany

Implantation: 2 sites (Germany, Sweden)

Team: 300+

Funds raised: \$ 330M (4 rounds)

Founders: Daniel Metzler (CEO), Markus Brandl, Josef Fleischmann (COO)

## European Space

### Spain joins the list of institutional European space actors

Spain finally gave itself the resources to reach for the stars. In March 2023, the Spanish Council of Ministers signed the statute approving the **operational launch of the Agencia Espacial Española (AEE)**.

Based in Seville, this Spanish Space Agency starts with a budget of **€ 700M for 2023**, including **funding for launch startups (€ 45M)**. Although Spain has not been the most prominent space nation in Europe, its NewSpace ecosystem is growing, giving the Spanish government a good reason to ramp up its institutional space ambitions.

Most notably, the **startup PLD Aerospace** is making noise in the NewSpace community, as it gets **closer to launching its Miura micro launcher**. Miura-1 should launch any week now, from the military site of Huelva in Andalusia, and be **the first private spacecraft to be launched from Europe**.

### A European in Space

On the 18<sup>th</sup> of April, the European Space Agency signed a **letter of intent with Swedish National Space Agency** to send a **European astronaut to space**, more specifically the International Space Station, on an **Axiom mission** for 10 days.

This agreement is **coherent with the ESA's goals for 2030** in terms of **human exploration of space**. During the 2022 ESA Council of Ministers, the ESA had restated its ambition to further its position as a leader in space activity, notably by progressively **reducing its dependence on NASA** in terms of human access to space.

## ESA new Paris Headquarters

After 3 years of refurbishment, the European Space Agency's headquarters reopened on the 11<sup>th</sup> of April, to welcome **400 employees**, as well as many visitors and decisionmakers, notably in its 800 seats modern conference centre.

## Innovation

### How to avoid collisions: Space situational awareness and autonomous satellites

As mentioned above, space collisions have become one of the biggest concerns of the space industry, along with decarbonation. In addition to solutions of space debris removal such as the one developed by ClearSpace, the industry further innovates on how to mitigate this risk.

If **ClearSpace** is the “**tow truck**” of orbital systems, other companies are trying to develop solutions like the “**Waze**” of satellites. Look Up Space is a startup created by France's first Space Commander Michel Friedling, along with Juan Carlos Dolado Perez, who was responsible for Space Surveillance at the CNES.

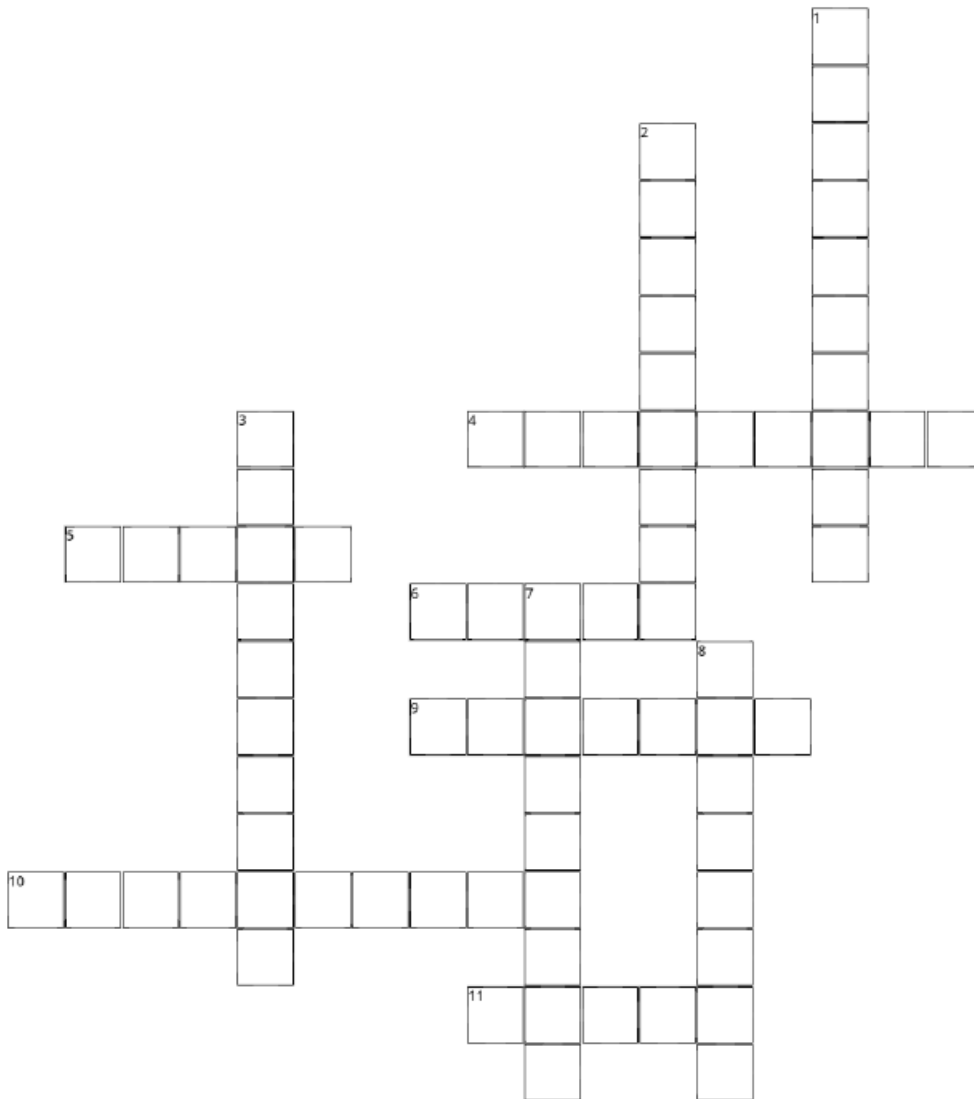
The goal of the startup is to provide comprehensive **space situational awareness** from ground based sensors following space objects, and software analysing launch data and orbital catalogs. In the US, **LeoLabs** is developing a similar technology. These new solutions should allow to anticipate collisions and act accordingly, providing to satellite operators the same type of intelligence that Waze provides to drivers.

Although such situational awareness would be groundbreaking, in order for it to be truly useful, the information must be acted upon. Satellites in orbit need to correct their trajectory more and more regularly in order to avoid debris, which is costly to perform from ground stations. But the **CNES** is looking into making **satellites autonomous**. Based on a 2015 CNRS algorithm, the CNES is developing an embarked software that can calculate the **probability of a crash**, and autonomously **change the satellite's trajectory** accordingly.

## Games

### Alba & Cosmos 3

hints can be found in both editions 2 and 3



#### Horizontal

4. The ideal launcher startup to deliver croissants to orbit
5. She might be the first of its kind to take off in Europe
6. A new institutional space actor
9. Innovative space launcher fuel
10. We wish him all the best for his new space responsibilities
11. A jovian space explorer

#### Vertical

1. Call them if your satellite breaks on the side of the road
2. The Spectrum company is based in ...
3. To see Josef Aschbacher, go to 6, r. ...
7. The ESA wants to send one in space as soon as possible
8. It is working with the United States!