



The past three weeks were mainly marked by the announcement of the IRIS² approval by the European Parliament, the results of the VEGA-C failure investigation, and an unprecedented New Space fundraising in France by Exotrail. This newsletter also includes the first Alba & Co^{smos} game!

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Space Industry and the Space market

EXOTRAIL raises €54M.

EXOTRAIL raised €54M in early February, following two rounds in 2018 (€3,5M) and 2020 (€11M). This smallsat equipment and services company based in Massy and Toulouse is riding on the wave of interest for satellite constellations, and growing significantly. The company currently employs 90 people, and should **hire more than 70 more in the next 12 months**.

Series B fundraising: Bpifrance, already present in the capital via F3A and Digital Venture funds, led this new round via the SPI fund (Sociétés de Projets Industriels) and the Innovation Defense Fund, as well as Eurazeo, a leading European VC investing in tech champions worldwide, and the international software engineering company CELAD. All Exotrail's historic investors – 360 Capital, Karista through the Paris Region Venture Fund, Irdi Capital Investissement, Innovacom, IXO Private Equity and NCI-Waterstart, together with BNP Paribas and Banque Populaire Val de France from BPCE Group – also participated in the round.

Round goals:

- Industrialization of EXOTRAIL's historic products: **spaceware**tm (electric propulsion in space) and **spacestudio**tm (space mission design, simulation and optimization software)
- Launch of new EXOTRAIL products: **spacetower**tm (satellite constellation operations software) and **spacedrop**tm (space logistics service)
- International expansion to US and Asian markets

This fundraising, which closely follows *The Exploration Company's €40M round* (cf past edition) shows **great dynamism in the French Space Startup ecosystem**.

Share My Space/Airbus cooperation for cleaner space

Airbus has signed a contract with French Startup *Share My Space*, which is specialised in space surveillance and operations safety. Airbus will assess the ability of the startup's optical data to improve collision alert's reliability and overall risk management practice in Low Earth Orbit. This contract is a great signal of trust for the French startup which recently settled in Toulouse.

Spacefounders

This dynamism is driven partly by space accelerators such as SpaceFounders , a European initiative aiming at strengthening space startups through a 3 month intensive accelerator programme. French companies such as Share My Space, Stellar, Zephalto, Vortex.io, and others have all been selected by the initiative, which I will keep following as a way of identifying rising NewSpace players.

European Space

A new European Space Strategy for March

Thierry Breton will announce a **new space strategy for Europe in March**, potentially providing details on Europe's tense space access situation, along with new projects that may lead to tenders.

VEGA Update

Although the past months have been a nightmare walk for AVIO, with the failure of VEGA-C's first commercial flight and its grounding for investigation for an undetermined amount time, the company still progresses towards future programmes.

The head of cryogenic propulsion systems at Avio, Mikhail Rudnykh, announced progress on its **M10 methalox engine**, which will equip VEGA-E's third stage. Avio completed 23 engine ignitions in 2022, progressively validating M10's efficiency and safety.

This is an opportunity to look at **what VEGA-E will be**:

- VEGA-E is the newest launcher of the VEGA family, after VEGA-C. It seems similar, but will be made of 3 stages (VEGA and VEGA-C have 4).
- The first and second stage are the same as VEGA-C: P120C for the first stage, and ZEFIRO 40 for the second stage.
- The third stage, with M10, should optimize performances and costs. Propulsion is ensured by a **methane/liquid oxygen ergol**, similar to what will be used on **Prometheus**.
- This third stage will have the ability to be **reignited multiple times**, providing flexibility for complex missions.
- VEGA-E's first flight is **planned for 2026**.

VEGA-C investigation conclusions

VEGA-C's investigation conclusions were announced on Friday 3 March by Joseph Aschbacher (ESA) and Stephane Israël (Arianespace). The first commercial flight of VEGA-C was deliberately destructed as an emergency procedure after its **Zefiro 40 second stage lost pressure**.

Following two months and a half of investigation, it was concluded that the depressurization of the Zefiro 40 was due to an **over erosion of the nozzle throat insert**. This over erosion appears to have been caused by a **lack of homogeneity of the carbon composite/carbon material** used for this critical part. This nozzle throat insert has been subcontracted by Avio since 2017 to the **Ukrainian company Youjnoye**, but is now subcontracted to ArianeGroup.. According to Avio, this part made by Youjnoye is now forbidden to fly.

Following this investigation, ArianeSpace and the European Space Agency are now initiating a **set of corrective actions, notably significant testing**, in order to bring VEGA-C back to the launch pad in time to compensate for Europe's unstable access to space situation.

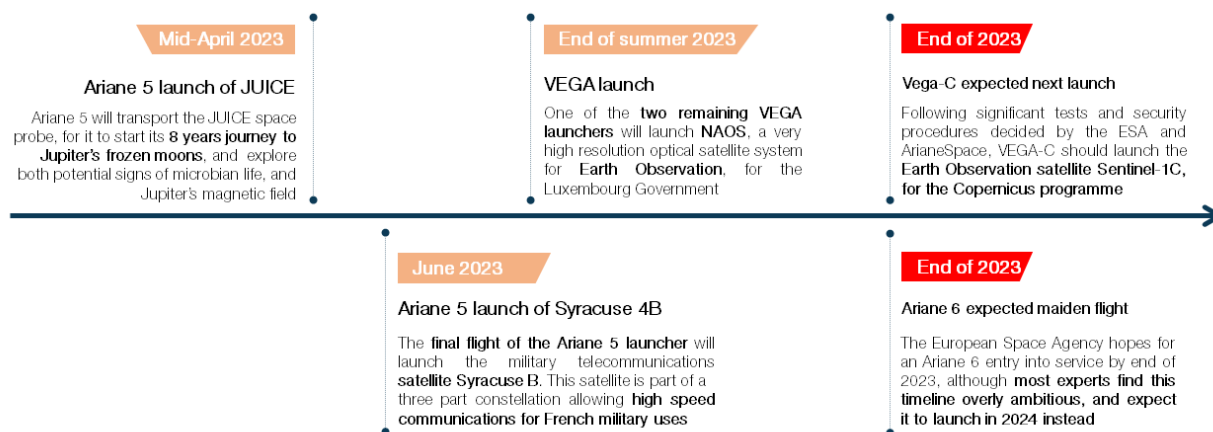
VEGA-C has 13 launches planned, and it is hoped it will be able to fly again by the end of 2023.

There are only two VEGA launchers left, VEGA-C's predecessor that did not use the incriminated Ukrainian part. One of them is expected to launch before this summer.

Here is a timetable of expected European launches for the coming months

The European space access capabilities were hampered by Ariane 6 delays and the Vega-C failure, leading to limited launches for 2023

2023 EUROPEAN SPACE LAUNCHES

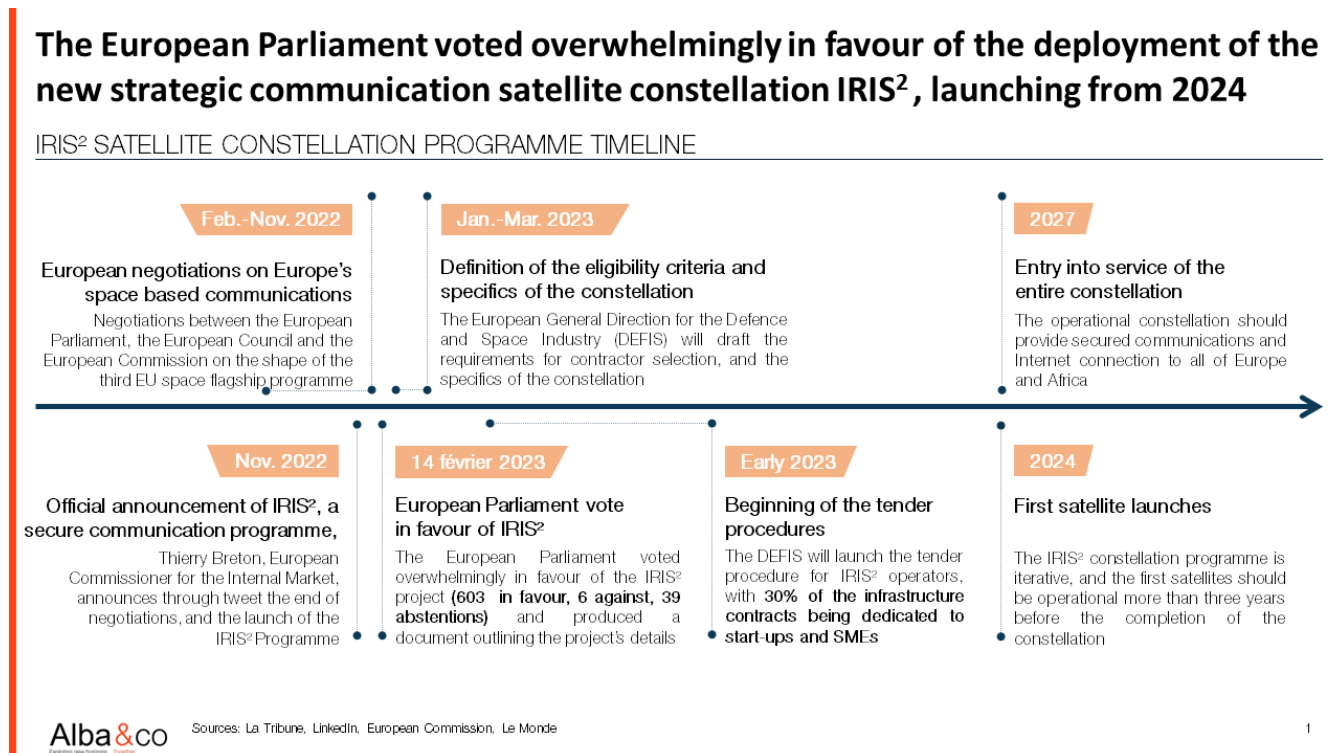


Europe only has 5 launches planned for 2023, including **two that are dependent on highly critical tests**. In comparison, **SpaceX is planning on performing 100 launches in 2023**

Satellites: IRIS² protecting strategic communications

On the 14th of February 2023, The European Parliament voted in favour of the **new strategic satellite communication constellation for European governments, IRIS²**. This is big news for both upstream and downstream European space actors, with significant budget allocated to this programme. **30% of the infrastructure budget will be allocated to SMEs and startups**, potentially allowing smaller actors to rise to fame (and fundraising).

Here are some general knowledge slides on the topic:



The IRIS² satellite constellation completes the European satellite capabilities, providing secured communications for governments, and specifically for defence

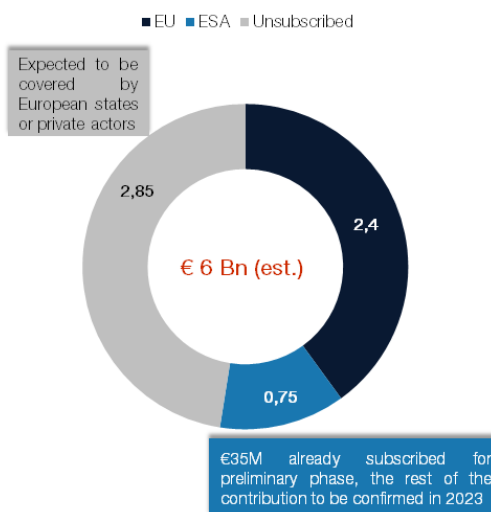
THE THREE PILLARS OF EUROPEAN SPACE

GALILEO: Global navigation satellite system, providing highly accurate guaranteed positioning service under **civilian control** (Operational since 2016)

COPERNICUS: Earth Observation satellite constellation for land management, the marine environment, atmosphere, **emergency response, security and climate change** (First launch in 2014)

IRIS²: multi-orbital **communication** constellation aiming at providing **reliable, cost-effective, and ultra-secure connectivity** for governmental⁽¹⁾ and commercial communication everywhere in Europe and Africa

IRIS² COST AND CONTRIBUTIONS (€BN)

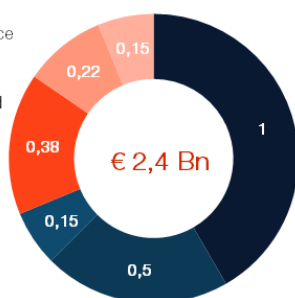


- IRIS² stands for **Infrastructure for Resilience, Interconnectivity and Security by Satellite**
- Thierry Breton has clearly stated that any potential contractor should be **European**, and devoid of external influences. It is clear that **criteria for eligibility will be strict**
- By dedicating **30% of the workload to start-ups**, the intention is for IRIS² to be an **"innovation vector"**. It is expected to channel disruptive technologies such as **quantum cryptography** for secure communications

With a 2,4 Bn EU budget and 750M secured from the European Space Agency, the IRIS² is on the right track to launch tenders for European commercial partners

EU CONTRIBUTION TO IRIS² BY ENVELOPE (€BN)

- MFF Heading 1: Single Market Innovation and Digital
- MFF Heading 5: Security and Defence
- MFF Heading 6: Neighbourhood and the World
- Horizon Europe Programme
- GOVSATCOM
- Neighbourhood, Development and International Cooperation Instrument



POTENTIAL CANDIDATES FOR TENDER (EST.)



The total investment needed is estimated to be around €6Bn, with around €3Bn not subscribed by public entities. This should force European space industrials to form a consortium, in order to launch a fully operational constellation at an acceptable cost by 2027

Fun Facts and Games

Fun Fact

HyPrSpace, a French space launcher startup, won this summer a French government tender for the development of a micro launcher, and announced last week a partnership with Equip'Aero to develop its launcher's cryogenic valves. The micro launcher name? **Orbital Baguette 1 (OB-1)** ! A beautiful nod to both their French roots, and their geeky love for Star Wars. A startup to keep under scrutiny.



Game

Alba & Cosmos 2

16 mots | Indice: éditions 1 & 2

F	U	E	X	O	T	R	A	I	L	T	C	I	H
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P	W	A	S	C	H	B	A	C	H	E	R	W	Q
U	T	Q	Y	M	E	T	H	A	N	E	P	D	S
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C	O	Z	E	F	I	R	O	Q	G	H	L	T	C