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Space conquest: Should Europe play catch-up?

Where are we really in the race to the stars? Whether it's NewSpace, satellite constellations, or the imminent advent of Europe's SpaceX, in this article we explain why your exploration dreams are about to become reality.

The challenge of satellite constellations

1 for navigation, 1 for Earth observation, and 4 for telecommunications: this is the number of operational satellite constellations belonging to the US in the three application areas. This makes them the world's leading space power, just ahead of Europe.

The Europeans only have two operational constellations (Galileo and Copernicus), which are associated with the first two fields of use. But this year in Toulouse, in the light of the current environmental and political crises, the European Union confirmed its choice to have its own space control and to introduce a new constellation for the third missing category, telecommunications.

ENVOL Junior Études at Anywaves

The great awakening of space start-ups in France

2020 : Anywaves, which aims to become the leader in miniature antennas for satellite constellations, received the Start-Up of the Year award. Its work focuses on antennas no larger than the palm of a hand (left of the previous image).

Space history is being written...

For 2023: Exotrail confirms that the SpaceVan, its satellite space transporter, will be embarked on a SpaceX launch vehicle to become operational that year. The start-up is also continuing to develop its ExoOPS software to automate operations on satellite constellations.

Whether behind or ahead of us, it is undeniable that, on the model of SpaceX, the French private space sector is undergoing an apparent rise in power. This revolution is leading to the creation of a new branch of space: NewSpace. This new way of looking at the sector was born of start-ups working to develop low-cost, public access to space exploration. Since then, nearly one start-up per week has been created in this sector in France. This trend is expected to increase in the coming years given the current political turnaround orchestrated by Bruno Le Maire, the Minister of the Ėconomy and Finance, regarding space programs. In order to catch up industrially, France, for example, wants to give more support to telecommunication start-ups at the expense of CNES (National center for space studies), which recently proposed the Taranis mission to study the energy phenomena associated with thunderstorms.

This decision has led to a wave of protests within CNES. In April 2022, 600 employees went on strike to protest against a lack of ambition from the government and a private sector that is taking up too much space. CNES is notably involved in developing the Ariane rockets, of which the 6th is still an unavoidable option in the coming years.

Space: an emerging political concern

The state is abandoning its defensive reserve on its major space programs. During his visit to ArianeGroup in 2021, it affirmed that ArianeGroup will remain a major competitor to SpaceX by investing in their rocket, but also by contributing to the development of a mini reusable launcher as Elon Musk's company is already doing.

He also took advantage of this visit to make official the "France 2030" recovery plan, in which 1.5 billion euros are reserved for space, 2/3 of which would go to start-ups. Behind this desire to structure NewSpace in France, despite a budget that is fifty times smaller than in the United States, Bruno Le Maire's stated that the ambition is to have a French SpaceX by 2026.

I visited EREMS, a company with over 40 years of experience and expertise in the development of space electronics. It interacts with the biggest European space players (CNES, ESA, Airbus Defence and Space, Thalès Alenia Space, ArianeGroup, OHB, Safran...).

The aim was to get to the heart of this sector of activity in order to perceive the changes that will result from this new directive. Therefore, here is my interview of Mr. Ballot, head of business development at EREMS.

ENVOL Junior Études at CNES

Immersion in the French space sector

What is EREMS?

To reach this key position at EREMS, Mr. Ballot completed an apprenticeship in the engineering school at the Campus d'Enseignement Supérieur et de Formation Professionnelle (CESI), in Labège near Toulouse. He joined EREMS in 2005 and obtained his CESI engineering degree in 2008. Afterward, he moved from electronic engineer to project manager, then manager of responses to calls for tender, and finally manager of business development at EREMS.

But between 2005 and today, the Toulouse-based SME has also evolved. Founded in 1979, it now has 170 employees: it has 43 years of history and experience in the space sector to tell. Its expertise extends to the entire development of equipment and electronic modules in the field of space (energy conversion, high voltage power supply, onboard computer, mass memory, motor control, proximity electronics, etc.). This is what allows Yohann Ballot and his team to be present in the various sectors of space such as telecommunications, nanosatellites, microgravity, earth observation, and exploration and they are looking to position themselves on the launcher markets.

Mr. Ballot also insisted on the fact that EREMS is not a design office, i.e. it controls the entire value chain. Its teams go from design to development, to manufacturing, and finally to marketing, for which it is responsible.

NewSpace is a determining factor in the future of EREMS

According to Yohann Ballot, the new constellation of telecommunication satellites that Europe aims to put in place in the next few years will bring many opportunities and collaboration for EREMS. The company can respond to a large number of needs and this can be seen in its very strong growth in the field of scientific exploration and earth observation. Indeed, every year 20 new employees join the ranks of EREMS.

The emergence of NewSpace in France is of course also a factor that Yohann Ballot must take into account in the evolution strategy of EREMS. From his point of view, there are many meanings to NewSpace, but at EREMS, it was decided to define it as the possibility to adapt and propose technologies, initially not designed for the space domain, in order to favour the increase of possibilities in space conquest. It is now possible to achieve very high levels of performance while lowering costs and increasing production quantities.

The main objective of NewSpace is therefore not to exploit or increase the number of space tourists, but rather to promote technological innovations. As Emmanuel Macron stated at the last European meeting of space ministers, this system of commodification of the industry would be incompatible with the European funding system. Indeed, it is hardly conceivable that public money should be used to develop activities dedicated solely to millionaires, as the example of space tourism illustrates. The ESA (European Space Agency) and the Centre National des Études Spatiales will therefore maintain their guidelines on the subject, i.e. to develop projects for the common good (internet, weather, or monitoring the Earth through the study of glaciers and forests, for example). Finally, private investors such as Elon Musk in the US are free to design space shuttles to take the richest among us into space.

ENVOL Junior Études at Exotrail

More demands mean more constraints

EREMS definitely does not have the profile of the space start-ups that are emerging by the dozen today in France. Nevertheless, as one might naturally expect, Yohann Ballot does not intend to maintain its lead in size by increasing the number of EREMS employees. EREMS is an SME and must remain so for the time being. EREMS is agile and able to adapt quickly to the market, which is essential in the ever-changing NewSpace. It is definitely not the essence of EREMS to mass-produce, it wants to deal with case-by-case offers for space missions that are each unique.

In conclusion, Mr. Ballot's interview highlights the change in our relationship with space. The latter is increasingly attracting private investors, as has been the case in the United States since the early 2000s, with the creation of SpaceX.

This evolution is also accelerated by the increase in funding from the State and Europe, which consider the new economic model initiated by SpaceX to be convincing and effective.. This does not mean that ESA or CNES will disappear behind the hypothetical European SpaceX invoked by Bruno Le Maire in a few years' time. Admittedly, NewSpace implies very constraining adaptability for these large national and European organizations with a great deal of inertia, but let us remember that Anywaves and Exotrail were both incubated respectively by ESA and by the École Polytechnique de Paris, while EREMS's main clients are still ESA and CNES. The ideal of space research is still intact and will continue to benefit the daily lives of the eight billion people we are today.