



On 7 February 2022, the Chair of Contemporary Strategic Issues welcomed Mr Bruno Sainjon, Chairman and CEO of ONERA (The French Aerospace Lab) for a conference on "spatial technologies as indicators of the state power". Focusing simultaneously on the new technological and geopolitical challenges, and on France's place with respect to both, Mr. Sainjon states that future interstate rivalry will revolve around three elements: hypersonics, quantics, and aerospaceality.

As a result of its overwhelming media hype, the terminology "hypersonic" has lost some of its technical relevance. Indeed, it would be more appropriate to label the latest Russian and Chinese technological breakthroughs as 'hypervelocity' missiles. The term 'hypervelocity' highlights both the tremendous speed and the excellent manoeuvrability of these cruise missiles. In addition, we should add two other hypersonic devices that have galvanised competition between great powers for several decades: the hypersonic glider and the manoeuvrable nuclear warhead. In this realm, France is not to be overlooked. The world's first ramjet was first developed in France in 1933, and now MBDA is continuing to refine this French savoir-faire by developing a new-generation ramjet (ASN4G) for the year 2035. In demonstrating that it is now almost impossible to intercept hypervelocity missiles, Mr Sainjon recalled that in the field of armaments "speed is an absolute, whereas stealth is a relative factor." Moreover, based on his experience at the Ministry of the Interior, our speaker reiterated that France's acquisition of hypersonic devices was only part of its deterrence policy, unlike other countries such as China, India, and Russia.

As for the quantum revolution, Mr Sainjon sees three areas in which it is necessary to remain competitive: the first is the quantum computer, which would increase the problem-solving capabilities of our computers by a thousandfold. The second, the quantum sensor, should make it possible to measure what is not yet measurable, such as time or gravity. In addition, the compatibility of these quantum sensors with naval vessels or submarines may become a real challenge for the years to come. Finally,

quantum communication could improve our resilience to cyber threats, as well as tracking down cybercriminals.

Finally, Mr Sainjon observes that the control of our airspace is not to be underestimated. The growth of AI to guarantee greater autonomy for drones or the weaponisation of space by orbital constellations are prime examples of this. Concerning space, it is no longer a place of dissuasion as it used to be during the Cold War. From now on, simple blinding to render satellites inoperable no longer is sufficient for France to evolve in this domain. France must retain its "space sovereignty". That is, its ability to send into space what it wants, when it wants and where it wants. Nevertheless, although some sixty countries have at least one satellite in orbit, France can stand out as it is part of a closed club of countries capable of autonomously sending a satellite into space from within the European Union. However, France must also be able to be aware of any space occurrences at any time. The launch of the GRAVES system in 2005 was revolutionising in this respect. Indeed, when the United States realised it was no longer the only power able to locate satellites precisely, it immediately stopped publishing the geolocation of French satellites and France was finally given a seat on the negotiation table with the main space player.

To preserve its innovative power in the space field, France must finance bold projects so as not to be overtaken by other actors. Today, the French aerospace industry is recognised worldwide for its expertise and technological advances such as adaptive optics. According to ONERA's Chairman, only funding research and "cyber research" can allow new technologies to be developed.