

An ambition in Space for Europe The French vision to 2030

The Space venture began under the shadow of the Cold War and was driven by strategic concerns. While the motives have changed since then, links between Space capacities on the one hand, sovereignty concerns and presence on the international stage on the other hand have remained close. Despite weaknesses in organisation and a lack of clearly identified and sufficiently consensual supra-national motivation, Europe has displayed real strengths in this domain. It has been able to develop Space-related skills and a cutting-edge industry; it has set up the European Space Agency (ESA), whose achievements are largely acknowledged; and it has created an original model based on the primacy of civilian activities.

The institutional change due to the entry in force of the Treaty of Lisbon offers a great opportunity to restore momentum to the European Space policy, which must now be defined by the European Union (EU). The EU could set four major objectives and adopt four approaches to achieve them: 1) meet citizens' needs; 2) contribute to European defence and security; 3) advance scientific knowledge and taking full part in the quest for life in the universe and in the human adventure of exploring the solar system; and 4) promote competitiveness through an industrial policy geared toward developing European technologies, in particular critical technologies. ■

PROPOSALS

- 1 Set four goals for the European Space policy:
 - meet citizens' needs;
 - contribute to European defence and security, mainly through Space situational awareness;
 - advance scientific knowledge and continue to explore the solar system: Mars could be the objective of an international programme that would begin with robotic exploration, followed, some 20 or 30 years later, by manned exploration;
 - set an industrial policy geared towards competitiveness and the development of European products in critical technologies.
- 2 Promote a new European governance in Space activities based on the European Union, the member-States, and the ESA, and gradually integrate the ESA into the Union.
- 3 Secure Europe's autonomous access to Space as far as launchers, critical technologies and Space-related services are concerned.
- 4 Allocate sufficient financial resources and clarify budget instruments in the light of the European Union's new competences, and ensure rigorous management of Space programmes.
- 5 Rely on international cooperation for the exploration of Mars in particular, to meet the European Union's own strategic objectives.

THE CHALLENGES



While displaying political power was the original motivation of most countries for developing their Space activities, civilian and military Space capacities have now become essential for economic activity, research and daily life. Space is more than ever a political, strategic, industrial, commercial and societal stake. Without a capacity to master Space technologies and enjoy their own access to Space, Europe and France could not fully express their sovereignty. Space has also become a mean for the European industry to showcase its scientific and technological achievements.

However, the Space sector currently faces a triple challenge: a governance challenge, as Treaty of Lisbon comes into force and gives the European Union a shared competence in Space matters; a cooperation challenge, as the United States is radically reorienting its Space programme; and a challenge linked to the rise of a number of new members of the “Space club”, questioning international security and the European industry trading positions.

A task force headed up by Emmanuel Sartorius and composed of experts from public institutions, industry and research, regularly met late 2010 and early 2011 to grasp and foresee trends in this essential sector and to outline possible ways to shape a European Space policy, looking forward to the year 2030. This issue of the *Note de synthèse* summarises the main findings of this task force’s report⁽¹⁾.

THE TREATY OF LISBON, AN OPPORTUNITY TO RELAUNCH THE EUROPEAN SPACE POLICY

In just over fifty years, the framework of Space activities has dramatically changed worldwide.

The “club” of Space powers, which originally only included the United States and the Soviet Union, has rapidly expanded to include France and Europe, then Japan, as well as China and India, two great emerging powers, and finally countries that have acquired certain capacities in this area, such as Brazil, South Korea, and Israel. However, barely a dozen countries can now claim they are Space powers.

Space applications⁽²⁾ have also become more diverse and complex since the launch of Sputnik 1 (1957), which was no more than a radio beacon orbiting the Earth. Satellites are now used for telecommunications, Earth observation, meteorology and navigation-geolocation. They have also contributed to further scientific knowledge and our understanding of the universe. Lastly, military forces in all countries have quickly realized the value of these new tools and have used them, especially to meet specific needs, such as for surveillance and tracking, electronic intelligence, early warning, etc.

Meanwhile, political Europe has gradually been built up. In 1957, the Treaty of Rome, establishing the European Economic Community (EEC) was signed by six countries. In 1961, France set up a Space agency, the Centre National d’Etudes Spatiales (CNES). At that time, two European agencies were set up, the European Space Research Organisation (ESRO) for satellites and the European Launcher Development Organisation (ELDO) for launchers. In reaction to the ELDO’s failures and the ensuing crisis, the main European countries set up the European Space Agency in 1975, which has proven to be an effective inter-governmental framework for pooling their activities related to satellites and launchers. Thanks to its continuous 50-year commitment, Europe has acquired the scientific, technical and industrial prowess of a global Space power. These skills have come in both public and industrial general contracting, in equipment suppliers and research laboratories, for both launchers and satellites sectors.



[1] Centre d'analyse stratégique [2011], *Une ambition spatiale pour l'Europe, vision française à l'horizon 2030*, October.

[2] Telecommunications, earth observation, meteorology/climatology, navigation-geolocation, etc.

This policy made Europe one of the world's main Space powers and allowed it to meet its essential needs on a stand-alone basis. It has also created jobs linked directly to the Space sectors (at Space agencies, in industry and research), to the exploitation side (Arianespace, Eutelsat, Eumetsat, etc.) and to the supply and processing of Space data (telecommunications, imagery, meteorology, navigation-geolocation, etc.). However, Europe will face many challenges in the coming decades.

Entered into force on 1st December 2009, the Treaty of Lisbon gave full competence over Space matters to the European Union. This competence is shared with member-States. Article 189 of the Treaty on the Functioning of the European Union (TFEU) provides that to promote scientific and technical progress, industrial competitiveness and the implementation of its policies, the Union shall draw up a European Space policy. To this end, it may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of Space and set up a Space programme.

This institutional shift offers a great opportunity to restore momentum to the European Space policy and to develop new activities. The Galileo (navigation-geolocation) and GMES (Earth observation) programmes, which will meet real needs despite their past and present difficulties, would never have started if the European Commission had not secured sufficient collective political commitment to undertake them. To make the most of the opportunity offered by the Treaty of Lisbon, Europe must set objectives and give itself the means to achieve them.

However, this shift must avoid three main pitfalls. The first has to do with the very uneven awareness of the Space stakes among the 27 member-States, which hinders the design and implementation of a common European Space policy. The second pitfall would be to neglect what Europe has built up in Space over the past half-century. It is essential to define, within a European institutional framework, an effective mode of governance of Space affairs that takes into account these achievements and gives credit to the excellent record of the European Space Agency. This could require a change to the Agency's Convention as well an evolution of the competences, Space capacities and ground-based infrastructures of the

national Space agencies. The third pitfall lies in the European policy of opening markets to the global competition. This strategy is intended to benefit the consumer but it rapidly reaches its limits when applied to an area such as Space, which largely depends on sovereignty issues, and where technological independence and European preferences should thus be the rule.

Europe also faces intrinsic weaknesses such as the lack of a domestic interest in Space activities, whereas other Space powers have been relying on such a dynamic to sustain their policies. Nor can it, like emerging economies, rely on the will to engage in a technology and economy adjustment. It can, however, hope that new Space applications will relay public procurement and ensure growth. Should it be based on an entirely public funding model, such growth is currently hard to imagine amidst the current and potentially long lasting budgetary crisis.

➤ OBJECTIVES FOR A EUROPEAN SPACE POLICY

The European Space policy must set a number of objectives in line with its ambitions. There could be four such goals.

PROPOSAL 1

Set four goals for the European Space policy :

- **meet citizens' needs;**
- **contribute to European defence and security, mainly through Space situational awareness;**
- **advance scientific knowledge and continue to explore the solar system: Mars could be the objective of an international programme that would begin with robotic exploration, followed, some 20 or 30 years later, by manned exploration;**
- **set an industrial policy geared towards competitiveness and the development of European products in critical technologies.**

Meeting citizens' needs and implementing major public programmes in telecommunications, meteorology, climatology, navigation-geolocation, etc., by making Europe a deeply committed player on global risk prevention, as well as natural resources and carbon cycle management

Europe can use its mastery of Space technologies to play a leading role in global environment protection and natural resources management, to preserve equilibriums as important to humankind's future as the carbon cycle, agricultural assets and water resources.

As an example, one major challenge in the fight against climate change consists in monitoring greenhouse gas (GHG) emissions on a global scale in order to understand how their concentration in the atmosphere has been continually increasing, to estimate the impact of carbon sinks, and to assess the effectiveness of mitigation measures that have already been taken. Space-based Earth observation plays an essential role in this area as it complements local policies/interventions. However, satellite-based techniques must be perfected, as current mechanisms for measuring atmospheric concentrations of CO₂ are not effective enough to allow a precise and real-time identification of emissions sources on a global basis, or to monitor CO₂ concentrations in a dynamic way, due to the rapid circulation of these gases in the atmosphere.

Contributing to European defence and security, mainly through Space situational awareness

Given the lack of a truly European defence policy, Space-related defence and security matters will probably continue to depend more on a national, bilateral or multi-lateral approaches, rather than on the European level (e.g., programmes decided and managed within an EU framework). Even so, some systems clearly require management at a European level. This is typically the case of Space situational awareness, which is both a civilian and military activity, as it is nowadays important for the daily and general functioning of societies and for early- detection of conflict breakouts.

Space situational awareness provides information about orbiting satellites, debris-related threats, space weather

and "near-Earth objects", i.e., the thousands of asteroids and comets whose trajectories can approach the Earth's orbit. Space situational awareness aims at keeping fully informed of the situation in Space in real time, in order to assess threats, issue alerts, and even spot possible attacks.

Space situational awareness is thus of primary importance, and requires international cooperation in order to marshal resources that cannot be summoned on a national level. However, beyond bilateral partnerships, there is currently no Space situational awareness mechanism on a European scale. French and German capacities and competences could be further coordinated to serve as the basis of a future reliable system for all of Europe.

The European project for Space situational awareness must pool and coordinate military and civilian ground facilities (such as radars, telescopes, databases, etc.), almost all of which are national. The European scheme must also be compatible with existing and future systems, particularly those operated by the United States.

For other projects, the European Defence Agency (EDA), in close cooperation with the ESA, could represent the interests of countries that are not part of multi-lateral programmes⁽³⁾. More generally, the EDA, as much as possible, must address European military needs.

Advancing scientific knowledge and taking full part in the quest for life in the Universe as well as in the exploration of the solar system: Mars could be the objective of an international programme that would begin with robotic exploration, followed, some 20 or 30 years later, by manned exploration

Europe must also further knowledge through its scientific and Space-exploration programmes, which answer a more fundamental quest of understanding of the world and discovering new horizons. These programmes have been an important source of technological innovation, as they have raised original questions and allowed a risk taking-based approach due to the use of automated devices and the lack of direct commercial stakes. They are also a way to promote Space activities, particularly among young people and on the international stage. As it will keep undertaking such activities, Europe will spontaneously open ways to cooperate with other Space powers, thus deepening international friendship.



[3] However, without giving up a financial contribution from them.

As it has attempted to understand the Universe better, research, and European research in particular, has sought to answer the four following major questions, which will undoubtedly remain key issues for scientific activities in the next fifteen years:

- ▶ What are the conditions for life and planetary formation?
- ▶ How does the Solar System work?
- ▶ What are the fundamental laws of the Universe?
- ▶ How did the Universe begin and what is it made of?

Such research also explores terrestrial applications. The European Earth-science community has chosen two major axes for future missions:

- ▶ studying the processes governing the physical, chemical and biological functioning of the Earth's enveloping surfaces, including the biosphere, geological substrate, oceans and atmosphere;
- ▶ analysing the impacts of human activities on the functioning of major biogeochemical cycles, as well as the ways human systems adapt to such changes.

It is not the purpose of this *Note de synthèse* to go into detail on the content of European Space science programmes, given how varied such projects are in their missions, sizes and costs. In any case, the European scientific community is well organised. It has long been able to select such projects and, although it does not sometimes exclude national approaches, the ESA's mandatory scientific programme provides a stable programmatic and financial framework to carry out many of these missions. Some of these require international cooperation, such as the study of Jupiter's moons, interferometer observation of gravitational waves, and the building of an X-ray range Space-based telescope.

Regarding Space exploration, understanding the formation and the evolution of the Solar system and searching for extra-terrestrial life are still major drivers. The international community now agrees that Mars is the priority objective. However, sending a man to the Red Planet is still a long-term goal, which will only be achieved in stages, not before several decades. The international community must therefore organise itself accordingly and

set governance rules for a Mars exploration programme, which, taken as a whole, would exceed in cost and complexity any programme ever undertaken worldwide. It must also draw up a roadmap for main stages – robotic exploration, such as the *Mars Sample Return* missions, manned flights to intermediary bodies (the Moon, near-earth asteroids, the Mars satellites Phobos and Deimos⁽⁴⁾, etc.) – and determine which technological advances are necessary (interplanetary propulsion, etc.). Such a project requires a clear view of financial needs (about several hundreds of billions of euros over 40 years) and a breakdown of countries' respective contributions and tasks, in order to benefit from interdependences while avoiding duplication of efforts. Before such cooperation takes place, it is up to the European Union to determine the strategic objectives it will defend during international negotiations.

Setting an industrial policy geared towards competitiveness and the development of European products in critical technologies

The fourth objective of a European Space policy would be to develop a high value-added industry based on state-of-the-art technology, which is a factor of competitiveness and creates high-level jobs. Satellite telecommunications, in which the European industry has become a forefront player, are a perfect example. Indirect benefits of other Space-related activities are also significant. Some of these activities, like Earth observation satellite, have stemmed from the creation and development of markets based on public Space infrastructures. All in all, and at the cost of relatively modest public funding (just 0.06% of European gross national product), Space could be a powerful innovation factor and could create wealth and jobs.

As far as technologies are concerned, Europe is quite competitive worldwide. It possesses a solid industrial base, including a launcher sector and major satellite contractors (Astrium, Thales Alenia Space, and, more recently, OHB⁽⁵⁾), whose activity is spread out over seven countries. Even so, Europe must not rest on its laurels, but rather be aware of the fragility of its position and its dependence on third parties for the supply of certain critical items. There are no permanent incumbents in the



[4] A manned mission to the Mars satellites of Phobos and Deimos would require less energy than a mission to land on Mars and return to Earth and less energy than a trip to the Moon and back [the energy necessary is proportional to the square of the cumulative escape velocities, i.e., 18 km/s for Mars and back, 16 km/s for the Moon and back, and 15 km/s for Phobos and back, compared to 12 km/s for a geostationary satellite]. The difficulties of long trip would obviously be the same as in the case of Mars but the mass to be launched from Earth would be one third as much. Moreover, from Phobos it would be possible to remotely control rovers or other operations on Mars' surface in real time, which transmission times make impossible to do from Earth.

[5] Germany, Spain, France, Netherlands and United Kingdom for Astrium; Germany, Belgium, Spain, France and Italy for Thales Alenia Space; Germany, Belgium, France, Italy and United Kingdom for OHB.

Space industry. Development programmes are particularly costly in both time and money.

Europe must ensure the development and the adaptation of its industrial base. This will require developing and implementing an industrial policy based on the principle of a European preference. For the purposes of efficiency and competitiveness, this policy must undertake a streamlining of the European industrial fabric to eliminate redundancies and useless competition frequently witnessed among equipment suppliers. The scale of the R&D effort that is necessary to remain at a cutting-edge technology level when needs become more and more numerous, means that dispersion of financial resources and overlapping is just not an option. This will require a European R&D programme dedicated to Space technologies that will have to encompass end-to-end processes including prototype building.

Europe must also assemble the resources necessary to master critical technologies, e.g., those that it needs in order to be autonomous, competitive and to achieve leadership, particularly in the field of Space applications, which are often dual in nature. Technologies evolve rapidly. Electronic components (embedded processors, hardened electronic⁽⁶⁾) and high-high-modulus carbon fibres⁽⁷⁾ are nowadays among the most critical ones. In this area, Europe has often been depending on the US, whose regulations on strategic material exports (the ITAR and EAR rules) are subject to unpredictable shifts.

Europe can still make up the ground it has lost but must act rapidly and aim at a long-term strategy, or the latter will be totally ineffective. Such effort will have to be publicly funded to a large extent, as the private sector's margins in purely commercial activities (e.g., telecommunications) are not important enough to fully finance their R&D activities.

Europe is however an exception to the global level in the overwhelming portion of civilian funding of its Space activities, particularly compared to the US, where the military budget plays an essential role.



[6] In other words, that withstands ionising radiations.

[7] Highly rigid.

➤ THE CONDITIONS FOR A EUROPEAN SPACE POLICY

PROPOSAL 2

Promote a new European governance of Space activities based on the European Union, the member-States and the ESA, and gradually integrate the ESA into the European Union.

The Treaty of Lisbon is a good opportunity to promote a new Space policy. To achieve this, the European Union must first and foremost set to developing a governance scheme for the European Space policy, which should be simple, robust and effective. Each of the three procurement entities in the "Space triangle" formed by the European Union and its institutions (the Commission, the Council and the European Parliament), the European Space Agency, the member-States and their Space agencies – should have a role to play in this new governance, and play it fully.

The EU has now assumed responsibility for defining the European Space policy, a mission for which it will benefit from the advice of the European Space Agency. Thus, article 189 of the Treaty on the Functioning of the European Union states that the Union "*shall establish any appropriate relations with the European Space Agency*" for this purpose, as the ESA possesses all the necessary competence for assisting the Commission in drawing up the EU's Space programmes.

The European Union can also set up a Space programme, which has been adopted by the European Parliament and the Council of the European Union. While the Commission clearly has a role to play in establishing and structuring demand for Space-related services in Europe, the experience of the Galileo and GMES projects has shown the limits of its direct management of Space programmes. While retaining legal and financial accountability for Euro-

pean Space programmes, the Commission should therefore delegate its role of chief procurement agency to actors such as the ESA or the Organisation for Joint Armament Cooperation (OCCAR) – which would appoint industrial companies as general contractors – and delegate the operating management of programmes to *ad hoc* entities, an example of which is Eumetsat.

This raises the issue of an institutional merger between the EU and the ESA. This would require a modification in the current EU-ESA framework agreement, which expires in 2016. The legal obstacles of an EU-ESA merger are due mainly to the fact that some ESA members are not EU members (Norway and Switzerland) and to different procurement rules (the ESA has a geographical return rule, while the EU has competition rule). Such obstacles could be overcome through a partial or total integration of the ESA into the EU. The best solution would probably be a step-by-step approach, culminating in a full integration of the ESA into the EU by 2020, or even by 2030.

The prospect of a partial or total integration of the ESA into the EU within a decade or two could be served by a pragmatic approach in the meantime. For example, from now on, programmes funded by the European Union or member-States under a multilateral agreement framework could be developed within the ESA, which would apply the appropriate management rules, e.g., either those of the EU or those set by the multilateral agreement in question. This would preserve the flexibility needed for implementing the European Space policy.

Similarly, within the “Space triangle”, cooperation should be developed between the ESA and national agencies on the one hand, and between the Commission and national agencies on the other hand. Creating suitable legal and contractual tools would allow national agencies to lend their procurement and innovation skills to the European Space programme, as well as their Space capacities (satellites, instruments, etc.) and their ground-based facilities (control centres and centres for data processing, antennas, radars, Space bases, measurement stations, etc.).

PROPOSAL 3

Secure Europe’s autonomous access to Space as far as launchers, critical technologies and Space-related services are concerned.

The European Union must target complete autonomy in launchers, critical technologies and Space-related services. This is the only way it can remain a member of the exclusive club of world-level Space powers and safeguard this economic sector. This has always been the policy of the United States and the Soviet Union, and then Russia. Today, this is also the strategy adopted by China and India, as the latter is already carving out its own long-term autonomous strategy in Space exploration.

This is especially true as far as access to Space is concerned. Europe will clearly be capable of an ambitious Space policy only if it is able to meet a triple challenge – autonomous access to Space, cost control and activity level of its launchers that makes economic sense. In these areas, Europe cannot depend on outside parties whose attitudes may be guided by prevailing political and economic considerations or their own strategic ambitions. This will require, among other things, to establish the mandatory use of the European launchers for European institutional satellites, just like other Space powers do. This obligation is essential to the long-term survival of the European Space industry.

PROPOSAL 4

Allocate sufficient financial resources and clarify the budget instruments in the light of the European Union’s new competences, and ensure rigorous management of Space programmes.

There can be no ambitious Space policy without commensurate financial resources. These must be clearly identifiable. For a decade, Europe has undertaken ambi-



[6] In other words, that withstands ionising radiations.

[7] Highly rigid.

tious Space programmes in the areas of Earth observation (GMES) and navigation-geolocation (Galileo), while maintaining its focus on scientific programme, launchers, technology and telecommunications. In line with the aforementioned objectives and with the European Space Agency's medium-term plan, which presents three scenarios for Europe out to 2020, a certain number of orientations can be outlined out to 2030:

- ▶ investments in the Science, Technology and Telecommunications programmes and their applications would be slightly increased or maintained at their current level (in constant euros);
- ▶ the navigation-geolocation programme Galileo would move into an operational phase and of satellite constellation replacement for an estimated annual cost of 1 billion euros;
- ▶ Investment in the Earth observation programme, including GMES, would be greatly augmented until 2020 and would then level off, in constant euros;
- ▶ an autonomous Space situational awareness (SSA) programme could be implemented by 2020. Moreover, an innovative project consisting in launching a constellation of Earth-observation satellites dedicated to the monitoring and management of crisis could be operational by 2030;
- ▶ a new family of launchers could be developed by 2025;
- ▶ the Exploration programme would include the continued operation of the International Space Station until 2020 and probably beyond that. Europe's participation in preparing a manned mission to Mars would require an additional annual budget of about 1 billion euros (an estimate based on 2011 prices) out to 2030.

All in all, Europe's annual Space budget⁽⁸⁾ is expected to rise from 4.1 billion euros today to 5.3 billion euros in 2020 (estimates based on 2011 euros). Depending on the assumptions used, this increase should correspond to a significant but not considerable increase in the expenditure on Space activities as a portion of European GDP. The development of a Security programme and a new launcher would push it up to 5.7 billion euros by 2030. A European participation in a global programme dedicated to the preparation of a manned mission to Mars would require an additional annual budget of 1 billion euros, i.e., a total of 6.7 billion euros.

Although user fees and markets will also help fund Space activities, the European Space policy will be funded mostly through public resources either directly allocated by the member-States to Space programmes, or transiting through the European Space Agency, or from the European Union budget. Regardless of the level of funding adopted, the outlay will have to be on a sustained basis, i.e., over several decades, without interruption. Hence, it is a better strategy to focus on a few, well-chosen objectives than to try and achieve every possible objective.

The rules for allocating Space budgets, the impossibility of committing resources beyond the multi-year framework of the EU budgets, and the lack of coordination in respective timetables between the EU and the ESA make European Space policy very complex to implement – all the more reason for rigorous budget planning and management of Space programmes.

PROPOSAL 5

Rely on international cooperation for the exploration of Mars in particular, to meet the European Union's own strategic objectives.

The European Space policy must rely on international cooperation. While scientific programmes rely on this type of partnership on a regular basis, the large scale of programmes to explore the universe, in particular those targeting Mars, mean that such projects cannot be undertaken by a single country, even the United States. The importance of the technological challenges and financial resources (several hundreds of billions of euros) they entail, and their duration (several decades), require that the prior setting of a governance structure has to be more than the mere accumulation of bilateral agreements between a leading country (the United States) and other nations. The European Union must prepare itself by defining the strategic objectives it intends to reach in the framework of negotiations of this governance, particularly regarding the technologies it wants to develop.



(8) Budget including all national contributions to the European Space Agency and the European Commission Space budget.

► CONCLUSION

Europe can remain a leading Space power and continue to play a role on the international stage in the 21st century, as long as it has the will, and endows itself with the necessary means to do so. It possesses solid technical strengths; it is able to play a major role in environmental management, which will be a prevalent concern in the coming decades; and it can count on favourable public opinion, which has in the past followed the Moon landings and the Apollo missions closely. However, it must now convince younger generations of the multiple interest of pursuing Space activities.

The strategic plans developed by France's main partners present Space as a commercial opportunity for a competitive industry and for the development of Space-related services. There is no point in denying the validity of such approaches, especially as they apply perfectly to a country like France. However, they fall short of a genuine European vision. Europe is not merely the juxtaposition of twenty-seven domestic markets. Together, Europe can offer a suitable framework for major projects. Notwithstanding obstacles related to governance and funding, demonstrations of this capacity exists in the launcher sector, which has been developing for more than 30 years and in the area of satellite navigation, with the current Galileo programme. Alone, no single European country could have undertaken programmes like Ariane or Galileo. United, Europe can make the most of its industrial facilities, especially if it accepts the principle of European preferences. United, it can rally the public and political support necessary to obtain a reasonable amount of funding for Space-related activities. United, and with worldwide acknowledged skills and resources in Space activities, it can endow itself with the attributes of power and sovereignty that will make it a key player on the global stage.

The achievements in the Space sector are not just of economic, industrial, technological, and scientific value, through their significant leverage, they are also an attribute of national power and sovereignty. This attribute is easily seen in defence programmes but is no less present in civilian applications, some of which are now of critical importance. It is no accident that the club of great Space powers, despite its expansion over the past half-century, has remained so exclusive. This is due to the fact that mastery of Space is within the reach of those powers that have broad geostrategic interests and a high level of technology, as the entry fee in such activities is still very high. If it wants to keep defending its geostrategic interests on the international stage, Europe must be one of these Space powers. This implies that it must preserve its autonomy in both the access to Space and satellite mastery and technologies, and that it must maintain a high-performance industrial infrastructure.

It is around this vision of Space that France must strive to rally its European partners.



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