

# **Towards a Space Agency for the European Union**

**Report by Carl Bildt, Jean Peyrelevade, Lothar Späth  
to the ESA Director General**

## 1. Introduction

A Europe without a clear space policy and a clear commitment to space as an integral part of its other policies will be a Europe that limits its own possibilities of success.

For long, space was seen as a special, separate and exclusive activity, very much apart from other types of activities. During the initial decades of space activities, this was to a large extent true. And, as far as it relates to the unending quest for improving human knowledge about our Universe and origins, as we reach further and further in outer space, it will indeed remain so.

But now, space is coming down to earth. Increasingly, space-based assets are integrated with other key developments in our societies. The rapid developments of telecommunication and navigation, which will be of increasing importance to European society, are obvious examples, as is the obvious importance of earth observation for environmental and overall security. We can no longer see space and space policy as separate from other European activities.

Europe is faced with new challenges. The European Union has embarked on a historic enlargement, is developing a common security and defence policy, and aims to create the most competitive knowledge-based economy in the world. There is an important space component to all these challenges.

We are convinced that space policy in Europe must enter a new phase, where it is no longer seen as an exclusive and separate activity, but where it is an integrated aspect of the overall efforts of the countries and institutions of the European Union. It should be an integral part of the efforts of European integration to enlarge, to deepen and to allow Europe to play a more important role in the world.

We thus want policies to be set more clearly, commitments to be stronger, institutions to move closer to each other and artificial barriers and blockages of the past to be taken away. We want space to count in European policies, and Europe to count in the use of space.

## 2. Evolution of space policies world-wide

The space race was for a long time part of the race between the Soviet Union and the Western world, led by the United States. Considerations of prestige and power merged into colossal programmes.

Europe was late in bringing its different efforts together, and it chose a different path for the development of its space capabilities from that of the US or the USSR. Europe initially concentrated on the civilian segment of space activities and decided to develop commercial launchers (Ariane) in a distinct manner from that followed for the missile-derived launchers of the US and the USSR. The development of Ariane eventually turned into a commercial success that demonstrated the potential of Europe.

A first attempt for organising space in Europe was made in 1964 with the creation of ESRO and ELDO, two intergovernmental organisations dedicated to the development of scientific satellites and launchers, which later merged to form the European Space Agency in 1975 for also developing applications of space technologies. The space sector in Europe is now organised around ESA, which is the organisation through which 15 European countries have pooled their resources to develop and use space systems, on a mandatory basis for science and on an optional basis for space infrastructures and applications. ESA has successfully developed and procured a series of launchers and some 50 satellites and has transferred the operation and exploitation of launchers, telecommunications satellites and weather satellites to dedicated operators: Arianespace, Eutelsat, Inmarsat and Eumetsat. ESA programmes account for more than 50% of the European space industry's development activities.

A new situation has developed after the end of the Cold War. Space has stopped being a mere issue of prestige and power and space systems have started to be used for contributing to solve new global concerns such as the protection of the environment. Space assets have also proven to be critical and enabling factors for the Information Society. Finally, new possibilities have arisen for broadly based international cooperation in space, such as the International Space Station.

The USA has understood this change in the way space activities are perceived and is now using space systems as an instrument for political, scientific and economic leadership. This perception – space as a strategic asset, “space dominance” associated with “information dominance” – is reflected in the level of investment, since the US spending in space represents 80% of the world-wide space expenditure, on both the civilian and defence sides, with the military R&D driving space developments to a large extent. This policy is also served by a welter of regulations, controls and standards applicable world-wide and placing US private investors in the best conditions to generate revenues from public infrastructures.

Other international players are also emerging on the space scene, such as Japan, China, India or Brazil, which are developing core space technologies. The fall of the USSR has precipitated the decline of the Russian space programme, although it still keeps a strong scientific technological and operational base. This heritage is being used in joint commercial ventures where US industry has preceded European industry.

Europe has built up technological, scientific and industrial capabilities in space enabling it to meet most of its needs and win a significant share (50% for launchers and 20-30% for satellites) in the world-wide relevant markets, in spite of much lower public investment (about 4.7 B\$ annually) than in the USA (26 B\$ annually). The situation of the European space sector in the world is described in Annex 1.

But because of the more diffuse institutional structure as well as the lower level of investments, Europe is still dependent on non-European systems in some key areas, such as satellite navigation, and does not have the capability of being fully a strategic partner in major efforts. With very lengthy decision-making processes, and with funding to a very large extent coming from numerous national research ministries, Europe does not have the full capability to either compete or to collaborate successfully.

Even in those fields where Europe today is competitive, its position is fragile, since it is often dependent on lessons learnt from the US and perfection in the implementation of those lessons. We have yet to develop our own strength to compete or to collaborate.

### **3. Technologies ahead**

Space systems are routinely used for telecommunications, broadcasting, weather forecasting, localisation, imagery during day and night, etc. Some of these applications are part of commercial businesses (telecommunications, broadcasting), some are part of public services (weather forecast) and some are part of environmental or security-oriented surveillance systems (almost all space applications).

The development of new technologies such as:

- expert systems / artificial intelligence (learning systems, knowledge discovery and management),
- soft computing (unexpected information extraction, information correlation),
- information technology (fast archiving, fast retrieval of larger and larger volume of data),

- telecommunications (near real-time access to distributed data from any point of the globe),

and the combination of data coming from:

- Earth observation satellites, at different resolutions in a wide range of frequencies, from different orbits,
- Navigation satellites, providing high accuracy time reference and localisation of mobiles,

will multiply the number of services associated to space systems.

The combination of globality, real-time, repetitivity and processing of data from different sources will provide constant monitoring of every point on the globe as well as reaction time for decision-making. Selected examples of such potentialities include ground displacement rate in mining areas, glacier velocity field, sea-ice routing, offshore climatology, wave forecasting for offshore operations, ship outfueling, etc..., providing unique information for managing the environment and regional planning, for monitoring risks and for improving security.

For the above examples, the status is still at demonstration level. Transition to operational level depends not only on technology but also on organisational links between the space world and the institutions which are currently still not using, or using little, space data.

Progress in technology is also instrumental for developing commercial services associated with space infrastructure : combination of telephones, computer and navigation terminals providing complete office-like capabilities in cars, aircraft and ships, voice recognition and speech synthesis providing another dimension to internet services to mobile users, availability of wideband data transmission anywhere, tipping the balance between centralising the knowledge and decentralising the manufacturing, are a few examples of such developments. These commercial services are developed by entrepreneurs who are investing where the infrastructure already exists and where the conditions are the best for generating return on investment.

#### **4. Strategic goals of Europe**

Considering the growing importance of space systems for society and markets world-wide, there is a need for a European answer and Europe must integrate its space activities into the wider political and economic strategy. First steps towards such integration are being achieved thanks to the complementary decisions of the ESA Council and the EU Council to develop a joint European Strategy for Space by the end of 2000. A joint document has been prepared and issued by the European Commission and the ESA Director General, attached in Annex 2.

The political and economic strategy of Europe is evolving quickly.

Following the launch of the Euro, the meetings of the European Council in Helsinki in December 99 and in Lisbon in March 2000 have set the new strategic goals for the European Union in the decade ahead.

In Helsinki, enlargement was redefined to encompass all European countries west of Russia and Ukraine, including Turkey, whilst ambitious plans were laid out for the development of a European Security and Defence Policy.

In Lisbon, the radical change in our economies arising out of information technologies was emphasised, and EU leaders defined the Union's new strategic goal for the next decade as "to become the most competitive and dynamic knowledge-based economy in the world".

These are thus the key tasks facing Europe in this decade: a successively larger Union, undergoing radical economic change within a knowledge-based society, and gradually acquiring a common security and defence capability. This is the framework in which a European Space Policy should be set, using space systems as a unique tool to contribute to achievement of these strategic goals.

There is no alternative for Europe to a common Space Policy and the driver of such a European Space Policy is to make Europe not dependent on non-European space infrastructure for any strategic and commercial applications associated to space systems.

By developing its own infrastructures, Europe will firstly prevent the world from relying upon "single point failure" systems and secondly prevent other competitors (from Asia in particular) from developing their own infrastructure. By doing that Europe will become the alternative to the US for the world, will consolidate its number 2 position in space and will therefore be able to become a privileged partner on global issues and large-scale international developments.

This European Space Policy will thus also increase the possibilities of developing co-operation with the US on a balanced basis that gives room also for European initiatives and interests.

A European Space Policy will also provide solid grounds for a closer relationship between Europe and Russia. As a result of the space race of former times and the powerful initiatives of the US, Russia has built up much more institutional and industrial co-operation with US than with European partners. With a European Space Policy emerging, and a more coherent institutional structure for space issues in Europe, there would be greater possibilities of developing co-operation also with Russia. It should be in the interest also of Russia to have a more balanced space relationship with the US and Europe.

## 5. Recommendations

The recommendations made in this report are focussed on the new steps to meet the strategic goals of Europe. These recommendations rely upon the assumptions that the fundamentals of current space activities in Europe: independent access to space, leading edge of science, are continued, and that the proposals made in the joint ESA/EC document on a European Strategy for Space are implemented, especially for what concerns Galileo and Global Monitoring for Environment and Security. Decisions on the development of a European Navigation Satellite System (Galileo) are urgently needed – since Galileo can achieve the status of a global system only if calendar and performance provide a credible alternative to the American system (GPS).

Science and manned spaceflights are and will remain important parts of space activities, contributing to the public awareness of space programmes as a whole.

We must thus integrate space fully in our over-all policy efforts. This is the difference between a Europe willing also to lead and a Europe only capable of following.

### 5.1. Institutions

There is a need for changes, especially in the relationship between ESA and the EU. With space no longer being a separate and exclusive issue, it makes sense to aim for a closer institutional integration, thus ensuring the place of space issues in the overall evolution of European policies.

Space belongs on the agenda of the European Council at least as much as many of the other issues where policy is now set for Europe on this level.

At the same time, ESA has proved to be an efficient instrument for the efforts of its Member States. This effectiveness must not be impaired and should even be extended to programmes related to the development of a European Defence Policy considering the dual aspects of technology, systems and industry. The open nature of ESA programmes outside the science sector must also be maintained, making it possible for different programmes to be undertaken by different national or other configurations.

In our opinion, the challenges are urgent. We see the need for the institutions starting to work together now, but we also see the need for a process of institutional convergence that does not exclude bringing the present ESA within the treaty framework of the European Union. But with the challenges being urgent, we do not want to delay

changes, and urges the institutions to initiate a process of institutional convergence.

This should aim at the following situation:

- The European Council should define the European Space Policy and the guidelines for its implementation. This could be done every five years.
- The ESA should be the space agency of Europe setting and implementing co-operative programmes (on a reinforced cooperation basis allowing the full participation EU Member States, the European Commission and other countries of Europe), extending its fields of actions to defence requirements and to market-oriented infrastructures, and integrating the public sector expertise and capabilities in Europe within a Network of Technical Centres;
- The European Commission should define the regulatory framework under which space activities are conducted, represent Europe in world-wide fora allocating frequencies and defining market rules, bring together user interests around common objectives, develop jointly with ESA the European Space Policy and propose it to the European Council and the European Parliament. The European Commission should also be a contributor to ESA programmes and, as such, a member of the ESA Council.
- The European Parliament should be given the opportunity to regularly discuss and review the European Space Policy.

First steps towards this structure can be done within the current framework. The joint ESA/EC strategy is already a concrete step, joint programmes are also one step where ESA and EC can join their capabilities moving ESA towards the space agency of Europe, peace-keeping related programmes being implemented within the ESA framework is another step, as well as organising joint meetings of the ESA Council and the relevant Council of Ministers of the EU.

Streamlining the institutions as proposed goes along with increasing the investments made by governments for widening the space technology base and for developing space infrastructure. Considering the ambition for Europe to become an alternative to the US for the rest of the world, as well as to be able to cooperate with the US on a balanced basis, high priority must be given to space investments providing the arguments for increasing the relevant budgets.

## 5.2. Space and the wider European security issues

Space systems constitute the principal means for collecting, transmitting and distributing information at a global scale and are the only non-intrusive means.

Europe has an ambitious policy concerning global environmental issues, which will be increasingly dependent on space-based earth observation assets. It is also evident, that without a clear space component, the evolution towards the European Security and Defence Policy (ESDP) will be incomplete.

Observation from satellites will play a crucial role in environmental security as well as the evolution of the ESDP. Increasingly, we are seeing the interrelationship between changes to man's environment in different respects and global political and security developments. Environmental monitoring is thus not only a question of environmental security, but also has broader dimensions.

Different countries have started to engage in national or multinational related programmes outside the framework of either ESA or the EU. These initiatives must now be federated into common systems responding both to ESDP needs and to national requirements.

Other space programmes have also a ESDP dimension, notably the Galileo programme. It should be recalled that GPS is a US military funded and controlled system, incorporating in particular the capability of selective shutdowns over certain areas in times of conflict. Galileo should have a similar capability, which in turn would imply suitable mechanisms for taking such decisions.

Telecommunication satellites are a unique component also of an overall defence system for transmitting and distributing quickly and safely larger and larger amounts of data.

Embarking on development of a European defence system including also a space component will also provide a significant part of European public investment that is missing today compared with the US. This in turn will place Europe firmly in the number two spot in space and establish its credentials both as a credible alternative to the US for the world and as a credible partner for co-operation with the US.

Increasingly, we see the space infrastructure necessary for commercial and other public sector applications moving together with those necessary for different security needs. This is obvious both in earth observation, telecommunications and in navigation. We thus see it as logical to use the capabilities of ESA also for the development of the more security-oriented aspects of the European Space Policy.

As the efforts of the European Union in these fields are geared to the so-called Petersberg tasks of peace strengthening in the form of conflict prevention and crisis management, including civil and environmental emergencies, we do not see any problem with the Convention of ESA.

### 5.3. Space as business

Space systems can often offer competitive solutions to the needs of society, compared to ground systems. This is currently the case for part of the telecommunications markets. Considering the progress of techniques in space and on ground, it is difficult to predict the share of the respective markets.

Increasingly, space and ground based systems will merge into one telecommunications infrastructure, with the importance given to space and ground components varying over time and with the different tasks. The competitiveness of space solutions relies upon continuous progress of space technologies and on the assessment of the capabilities of ground solutions.

Progress of technologies, in particular technology breakthroughs, are drivers by their ability to fix the standards and to shorten the time to market.

Most of the technology breakthroughs in space are coming from public investments, largely from the US. European public investments in space technologies must be reinforced in order to strengthen European standards globally. Private investments will then be stimulated in using these standards.

A permanent observatory must be created by ESA and the European Commission putting together chief technologists of European communications industries in order to globally assess where the ground technologies and solutions are evolving world-wide and to identify the fields where investments should be made in space technologies.

In addition to be a solution responding to specific needs, space infrastructures can be the basis for private investors to develop new services and new products. Initially, these infrastructures will in most cases have to be financed by public money, although with the possibility of rapid commercialisation.

The use of the GPS system illustrates how an infrastructure initially developed to exclusively cover the needs of the US Navy has become a source of multiple services developed by private entrepreneurs using the GPS data for traffic, sport and leisure, generating large

revenues. The development of such business cases requires not only the existence of an infrastructure, but also a permanent dialogue between the space sector and the entrepreneurial sector in order to increase the awareness of such potentialities. Permanent consultative fora putting together potential users, financial services and technology providers should be organised.

We are convinced that the increasing interaction between ground- and space-based systems, as well as between private and public investments and activities, will demand changes also in the way in which ESA is operated. There must be continuous and close dialogue and interaction between ESA and the commercial sector in line with our overall recommendation of integrating space efforts more clearly into the wider European efforts.

## **6. The Way Forward**

We are convinced of the need for Europe in general, and the European Union in particular, to fully integrate space into its efforts to strengthen peace and prosperity in all of Europe.

We thus want to reinforce the political role of the European Union when it comes to space policy and their integration into its other policies, while at the same time developing the professional competence, operational flexibility and open nature of the present ESA. In our view, a European Space Policy should be decided at the highest political levels in the European Union in order to facilitate integration with other core political and economic strategies of Europe.

While moving towards making ESA the de facto Space Agency of the European Union, we want to preserve its openness to those countries not presently members of the Union. The instrument of reinforced cooperation should, when applied to these issues, not be restricted to only the present members of the European Union.

This will make it possible for space activities to be integrated in the other activities necessary to safeguard peace and promote prosperity, primarily in Europe but also in the wider global environment. We see a strong role for space activity in both environmental and more classical security, with space instruments integrated and coordinated also with the emerging European Security and Defence Policy.

Thus, we see Europe emerging as more capable of both collaboration and competition on the global scene. We are convinced that this will strengthen the possibilities of Europe to achieve its other aims as well. For us, it's the difference between a Europe not only restricted to following, but also of giving leadership on key issues for the development of our societies.

This will never happen by itself. There is an urgent need to discuss the place of space in the policies of Europe and, in our opinion, start to move decisively in the directions recommended in this report.

This report has been called by the Director General of ESA in order to provide him with independent advice on the evolution of the European Space Agency.

The mandate of the group of high level persons who has established the report is attached.

The group consists of:

**Carl Bildt, Chairman of the Group**  
Former Prime Minister of Sweden

**Jean Peyrelevade**  
President of Credit Lyonnais

**Lothar Späth**  
CEO of JENOPTIK AG  
Former Prime Minister of the State Baden-Württemberg