

The European Space Agency as a European Institution and a Space Law Maker

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Abstract

The European Space Agency was set-up over 40 years ago and has delivered on expectations from the scientific community's quest for more knowledge, from the politicians wishing for more Europe and from the business community developing industrial and operational capabilities. All has been made possible thanks to hard-working scientists and space engineers who created and progressively refined a magic formula of balanced interests and respectful co-operation. The diplomats and lawyers well understood the challenges and so defined long-term policy objectives and a stable legal framework necessary to meet them, therefore providing institutional skills and appropriate financing tools which proved successful, and still today make this particular aspect of Europe. The ESA Convention, along with the activities and programmes based in its framework continue to serve as a living example of how to make Europe with a cooperative formula of a common Agency and law maker, giving access to space for all European citizens.

Keywords: European institution, access to space, innovation and development, space law, international cooperation.

A ESA as a European Institution

The European Space Agency is not only a space development agency. The legitimacy of ESA being a European Institution besides having all the attribution of a space agency, and the motivation of Europeans to seek institutionalized co-operation in space activities is described in the preamble to the ESA Convention: "The States parties to this Convention, CONSIDERING that the magnitude of the human, technical and financial resources required for activities in the space field is such that these resources lie beyond the means of any single European country, [...]"¹ The main impetus is hence to pool resources in order to enable space activities. Such, the preamble to the ESA Convention recognizes that the exploration and use of outer space are resource intensive, making forms of co-operation a political choice.

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1 Sentence 1, Convention for the establishment of a European Space Agency, (ESA Convention) opened to signature in Paris, on 30 May 1975.

The purpose of ESA is to provide for and to promote, for exclusively peaceful purposes, co-operation among European States in space research and technology and their space applications, whether for scientific purposes or operational space application systems.² Such co-operation shall be achieved through four lines of action:

- 1 by elaborating and implementing a long-term European space policy;
- 2 by elaborating and implementing space activities;
- 3 by co-ordinating the European space programme and national programmes;
- 4 by elaborating and implementing an appropriate industrial policy.

ESA is therefore mandated to be operative in the fields of space policy, space activities and space co-ordination. Member states and ESA shall facilitate the exchange of scientific and technical information; ESA shall use and promote those space transport systems developed through its programmes or by a member state, shall make its facilities available to any member state for the latter's national space programmes and shall provide assistance to member states outside its own programmes but within its purpose. ESA is therefore not only a space agency in the meaning used by spacefaring states. It is a facilitator of national programmes, an integrator of national programmes and the creator, co-ordinator and manager of the European space programme.

ESA's activities are limited to 'exclusively peaceful purposes', a well-known term in the context of international law. The legal interpretation and application of this term is to be undertaken in consideration and respect of public international law, having due regard to instruments such as the Charter of the United Nations, the Outer Space Treaty and customary international law. The mechanism of European space co-operation decided in 1975 is that of an international intergovernmental organization (IGO). ESA is a subject of public international law with international legal personality. The international legal personality of an IGO can be concluded from the existence of all main elements required for an IGO by the doctrine of public international law. In the case of ESA, such a conclusion is pre-empted by the ESA Convention clarifying that: "The Agency shall have legal personality";³ it is capable of having and enforcing rights and duties, and it is entitled to actions and responsibilities distinct from the ones of its member states. With the choice of setting up a dedicated IGO, European space co-operation became permanent and institutionalized. The treaty establishing ESA is commonly known as 'the ESA Convention'.

B The Vision for ESA and Space in Europe

The main drivers of ESA, including in its relationships with other actors, are the results of a common vision of space for Europe, of the European space sector and of the role of ESA in the future. The success of European space co-operation over 50 years owes everything to the constructive relationship established between

2 Art. II ESA Convention.

3 Art. XV para. 1 ESA Convention.

ESA and the member states, and the joint understanding of the vision of space for Europe and elaboration of plans for its progressive implementation aiming at making ESA the model 21st century global space agency at the service of Europe.

The conclusions of the EU Competitiveness Council on 26 May 2014⁴ have also “stressed the importance of jointly developing a long-term European space vision and a strategy as a planning tool for major space activities in Europe [...] supporting the optimisation of public resources and skills.” Developing a vision involves taking a view on how the world, and Europe within it, will change, as well as the drivers for space policy and programmes.

European industry competitiveness and making the maximum use of space systems, both for public sector needs and commercial applications, lie at the heart of the objectives of European space programmes. A group of former ministers⁵ for space has identified that the EU has “[t]he prime responsibility ... to define EU sectoral policies and objectives and to establish the requirements for the development of space technologies and infrastructure able to contribute to the fulfilment of those objectives.”

The evolution of the role of ESA will depend on the actual content of future space activities and programmes and how they are funded, as well as on the position that Europe will have in the global geopolitical context in the years to come. However, ESA’s goal should be to continue to be among the world-leading institutions within the fields of space science, earth observation, space exploration and related technology development and to evolve in the coming years to ensure that it is:

- 1 able to respond, together with the scientific communities, to emerging demands, such as monitoring humankind’s impact on the environment, climate change, the polar regions and food security;
- 2 closer to its member states, contributing to education and innovation, fundamental for supporting sustainable productivity;
- 3 developing further its partnerships with ESA member states, European industry, operators and service providers in order to support the continued development of a globally competitive European sector and to promote the expansion of the European market for services and applications;
- 4 recognized as a long-term partner of choice by European Union (EU) institutions and for developing, with their respective member states, a European space policy and implementing it through relevant programmes.

C The International Space Station and Space Exploration

ESA presented his vision on the ‘European exploration strategy’ aimed at providing for a strong and balanced space exploration programme to three key destinations: low earth orbit (LEO), the earth’s moon and the mars system. This strategy

4 Conclusions towards a shared EU-ESA vision for space fostering competitiveness.

5 *Bringing the Benefits of Space to the European Citizens – Innovation and Growth, A report to the Director General of the European Space Agency by an independent group of former Ministers from ESA Member States*, 17 July 2014.

was designed to allow Europe to enhance its capabilities in critical domains of exploration, taking into account the international context.

Coherently with this strategy, ESA Council of Ministers on 2 December 2014 adopted a programmatic approach focused on the exploitation and utilization of the ISS and on the full ExoMars programme implementation; in addition, it supported the preparation of future exploration missions through the continuation of the Mars Robotic Exploration Preparatory Programme started in 2008 and asked for a definition and future DG actions on the 'Destination Moon', seeking in particular an international, co-operative approach.

Today, the focus remains on the top programmatic priorities: the exploitation and full utilization of the ISS and the ExoMars programme implementation, recognizing that these remain relatively short term but that the longer term relies on the international context and priorities of member states within budgetary constraints.

Furthermore, recent developments in the international approach to the 'LEO Destination' – in particular the announcement of January 2014 by the US Administration of their decision to continue the exploitation of the ISS until 2024 and the co-operation agreement with China in the area of human spaceflight – are creating new opportunities which will need to be prepared for and assessed by member states in time for the next Council meeting at ministerial level, now planned for 2016.

Regarding the 'Moon and Mars Destinations', the preparation of future exploration missions is continuing, following the recommendations expressed at ESA Council of Ministers (in particular the identification of collaborative opportunities for the exploration of the moon): the Lunar Lander, studies and activities on Polar Sample Return, Volatile Resource Analysis, Drill Development and consultations with the scientific and industrial community have been completed, leading to the elaboration of elements for the robotic exploration of the moon in collaboration with international partners.

D ESA Actions in Earth Observation

The vision of ESA is to ensure the maximum benefit of earth observation for science, society and economic growth in Europe, served by European industry. ESA will implement this vision through its earth observation programmes, working in close co-operation with member states, the EU, EUMETSAT and European industry within the widest international framework.

Since the 1980' decision to build the first European Remote Sensing (ERS) satellite, the EO programme has seen a period of constant growth and great success, particularly during the last ten years.

The successful development of the Copernicus programme designed originally mainly for environmental and security applications has been the most significant change in European EO data delivery. It offers for the first time an open data source with an unprecedented repeat acquisition rate and guaranteed data continuity for at least 14-24 years and probably much longer. Given past suc-

cesses, ESA proposes an evolution in order to fully adapt to new societal, political, technological and economic challenges today and in decades to come. ESA action therefore embodies several new aspects:

- 1 It consolidates the mechanisms needed to respond to a wide range of societal and institutional challenges deriving from major European players. These include the EU, responsible for creating sustainable earth observation services, supporting EU policies; the increasing EUMETSAT responsibility for operational meteorology; member states' national programmes and commercial and service industries, including from without the space sector, investing in earth observation.
- 2 The scientific rationale of the earth observation programme will be driven by societal needs in combination with scientific excellence and innovation.
- 3 It responds to the ICT revolution that new opportunities in data management, communications, citizen science and data integration to serve wider and more diverse user communities.
- 4 It recognizes that economic factors are of increasing importance in decision-making, such that public programmes face a greater challenge to demonstrate both economic and strategic benefits to society.
- 5 The rising number of new and smaller member states in ESA requires a new orientation to provide a new and attractive portfolio of actions.
- 6 Rapid changes in the market in the space sector and in the information and service sectors, offering opportunities for export, innovation and competitiveness of European industry.

A programmatic approach is proposed which is based on past success but which responds to the challenges posed by the 21st century. The EOP strategy will be implemented via a series of optional ESA programmes addressing the three main pillars served by this strategy, namely science and innovation, meteorology and Copernicus. Individual activities will be defined in partnership with member states, the European Union and European Commission and with EUMETSAT. Underpinning all these is the technical and programmatic implementation of a Core programme, currently known as the EOEP, which provides the basic technology developments and infrastructure necessary for exploitation of all classes of missions. The EOEP programme will also continue to support the development of earth explorers.

These actions will be supplemented by individual elements, implemented today through the Earth Watch programmatic framework, representing more tailored opportunities for member states, industry or other funding partners to invest in areas of specific interest to them. This strategy represents continuity but also adapts to key challenges of the next decades.

ESA will reinforce its role as pioneer of technical development of earth observation technologies, skills and communities to provide the best knowledge about the state of planet earth. Research and development undertaken in the agency will provide the core competence to underpin the development of missions satisfying the requirements of EUMETSAT and the EU and providing long-term sustainable observations of the earth system. ESA will continue to work in direct

partnership with the European science community in the progress of excellent and innovative translational science missions. Security of access to data and continuing development of the different classes of user communities are further key components of the overall approach.

E Access to Space

An independent, reliable and affordable access to space has been continuously, through successive ESA Councils including within the framework of European 'Space Council' meetings, declared to be of strategic and economic value for European customers, both institutional and commercial.

Since the beginning of this decade, access to space for European customers relies upon three launchers:

- 1 Ariane 5 (for the heavy GTO market segment and some institutional missions);
- 2 Soyuz from French Guiana (for the medium market segment and most institutional missions);
- 3 Vega (for the small market segment). These three launchers provide access to space for the full range of European missions, institutional and commercial.

However, the European launch services are facing several challenges, among which:

- 1 The economic balance of the exploitation of Ariane 5 on the commercial market, in spite of its unique reliability, leading to a continuous and substantial support from member states;
- 2 The dependence of a significant part of European institutional missions on the Soyuz launcher;
- 3 The deficit of commonalities between Ariane 5, Soyuz and Vega, limiting the synergies in their exploitation.

Based on this situation, member states decided at the last ESA Council at ministerial level to:

- 1 start industrial activities on Ariane 6 with two main objectives: to respond to institutional market needs and to improve further Europe's competitiveness on the commercial market using synergies with the upper composite of Ariane 5 ME, with a view to eventually eliminating member states' support to exploitation;
- 2 start the developments necessary to increase Vega performances, delivering synergies with the solid propellant part of Ariane 6.

The objectives set for Europe's access to space have not changed over the last two years: using the same launcher for institutional and commercial markets while maximizing synergies among European-developed launchers, to further contribute to increased competitiveness of European launch services. The other factor of competitiveness is governance, in particular a clear definition of respective roles

and responsibilities of institutions and industry, including cost- and risk-sharing. However, two new factors have created the need to adapt these decisions:

- 1 The succession of changes on the commercial market, mostly driven by the successful commercialization of competing launchers;
- 2 The initiative taken by space industries Airbus and Safran to create a joint venture regrouping their launcher businesses.

The changes on the commercial market have led to a further decrease of launch service prices (mainly in the 3-5 tonnes GTO satellite class), which have become the most important criterion for choosing a launch service, as confirmed by regular consultations with main operators. The operators have also admitted their uncertainties as to the exact composition of the market beyond 2020 for what concerns size and mass of satellites, due to the unknown impact of the penetration of electric propulsion technologies for satellites, thus highlighting the need for a launcher able to adapt to evolving market needs.

In addition, the European institutional market will grow in the next years with the building-up of the Galileo and Copernicus constellations, the consolidation of European meteorological services and the continued demand from ESA scientific programmes.

The Ariane 6 launch system, now under development by ESA, has been jointly elaborated by industry and ESA, and it is based on the Vulcain and Vinci engines as well as the P120C booster. Its two configurations (Ariane 62 and Ariane 64) are able to address the medium and heavy market segments, to propose dual launch and to address a large range of orbits. The small LEO payload market segment is addressed by the Vega C, thanks to an improved configuration of Vega, enabling higher performance and cost reduction, through the use of common P120C booster. The proposed family of European launchers can respond in a competitive manner to both the European institutional market (as identified by ESA, EU, EUMETSAT and national agencies) and the worldwide commercial market (as identified by Arianespace and European operators), fully drawing on the benefits of exploiting both market (in particular through the cadence effect), as from 2018 for Vega C and 2020 for Ariane 6.

The main principles of the new governance, associated with the creation of the joint venture, are driven by the objectives of requiring industry to bear the related risks in exploitation and therefore to control the exploitation and thus to be the design authority. As a result, industry is taking the end-to-end responsibility from design to exploitation.

As the Vega C development is more advanced and as such being considered as imposing fewer risks to member states, its development is fully committed, as well as the P120C-specific activities for Vega C, with a view to have the maiden flight of Vega C in 2018.

F Possible Evolutions of ESA

In order to enable ESA to be the long-term partner of choice for the EU and globally, the agency must have a secure and continuously improving foundation in its relationships with ESA member states and their scientific and industrial space communities. The introduction of the 'High Level Forum' involving industry in annual meetings to exchange information on national plans with member states are an important basis for further evolution in these areas.

Space activities in Europe are pursued by many public actors at parallel and legitimate levels: in regions, nationally and at European level either by ESA, the EU and EUMETSAT. The attraction which investing in space has for so many bodies is a unique, inherent feature of the European space environment. It can be a strength, provided these actors co-ordinate effectively their plans and carry out their activities together and with mutual respect.

The first steps in co-ordinating national strategies and plans have proved to be very effective in increasing the level of understanding and awareness on strategies, priority and objectives, confirming the importance of further reinforcing the co-operation between ESA and its member states through a closer co-ordination mechanism, obtaining synergies between ESA and national programmes, skills and resources while safeguarding mechanisms that have already proven successful. There is a clear need to continue and expand the scope of the exchange of information, including with the EU institutions and bodies and EUMETSAT.

The agency must also keep in mind that ESA is, for several of its member states, the primary technical organization through which they are able to implement their national space objectives, programmes and activities and participate in major projects in the space field for which resource requirements lie beyond the means of any single European state.

The ESA Science Programme, as well as the earth science and ELIPS programmes, guarantee that Europe remains at the *forefront of new discoveries of space and in space, as well as achieving a better understanding of the earth and its environment*. The approach of ESA member states to science ensures that the European scientific and industrial stakeholders can plan with a clear outlook based on a regular sequence of missions and thus remain at the forefront of their field. This is recognized globally, and the outstanding scientific results achieved and the number of missions launched put Europe in a position of leadership, and a reference for scientific partnerships worldwide. Fifty years of this heritage must be built on with carefully chosen new partnership programmes.

ESA's importance to the European space industry is as significant as its importance to European scientific communities. Its relationship with industry and its industrial policy have constantly evolved to meet the needs of industry and of its member states and must continue to do so. Industry itself has evolved in parallel, representing the restructuring of a mature industry. ESA was invited by industry to pursue a dialogue with a goal of granting industry more responsibility while increasing support to the industrial sector's competitiveness. In addition to its customer role, ESA is asked to further develop a partner role. In this, it could help industry to anticipate the changes, define trends in institutional and commercial

markets, and optimize the cost-efficiency of products, thus developing further the co-operation between ESA and industry tiers. Industry also highlighted that commercial opportunities may be hampered due to issues of security of supply. A concrete strategy to define for which technologies Europe can accept to be dependent, including a reflection on mutual dependence, is necessary and could be further elaborated by industry, ESA and EU institutions, building on work to date.

Industry also highlighted that the market for space services and applications is a huge and growing market, including opportunities based on the European flagship programmes Galileo and Copernicus. It stressed the benefit which worldwide competitors gain from institutional support, reducing market risks with core contracts, also known as the anchor tenant approach. In this environment, ESA could have a role to play, promoting a possibility of institutional and policy measures to go beyond demonstration projects and encompass ways to support the pre-operational phases; to support certification of services and applications; to open doors to large user organizations, promote space capabilities, develop awareness of space solutions; to perform new analyses, to identify the new services and applications which need to be supported; to define the future space infrastructures in a holistic approach encompassing space and ground infrastructure developments and operations, provision of user equipment, services and applications, in co-operation with a single industry counter.

All such action will be able to support the downstream sector development, such as:

- 1 the competitiveness of European industry lies at the heart of the objectives and success of European space programmes; it requires ESA to continue to improve industrial policy and to support a balanced European space industry;
- 2 the downstream space sector is characterized by significant growth opportunities, and it is essential that European industry reaps the full benefits of the European investments in space;
- 3 competitiveness on the world market requires actions to develop a European market; EU sectoral policies can provide such a market.

In order to foster ESA's role in support to industry competitiveness, growth and employment, as programme management, as an operational and R&D agency having a strategic, long-term and end-to-end approach for the market sectors, ESA intends to work on proposals on:

- 1 the most promising opportunities to adapt the relationship between ESA and industry in co-operative endeavours which balance the share of responsibility, cost and risk with a view to optimizing the economic value of their respective investments;
- 2 innovative ways to procure and support R&D, allowing for prompt decisions for programmes or technology developments when industrial success is at stake, including models currently being used around the world to stimulate lower-cost R&D such as prize funds;

- 3 further development of ESA programmes and activities to support the sustainable development of European industry in the domain of downstream space applications and services, in an end-to-end perspective.

Outside of Europe, ESA has a number of well-established *partnerships with space agencies of the major space-faring nations* for the conduct of specific programmes and projects on a bilateral and multilateral basis. Several of these have been in place for much of the 50 years of European co-operation in space. ESA member states benefit substantially from co-operation with the space powers, ESA's three strategic partners: the United States, Russia and China. Co-operation with them is primarily for scientific or exploration missions, including human spaceflight, and that it does not prevent co-operation with other nations on an opportunity basis. Non-member states with which concrete co-operation is at an advanced stage and prospects for mutual benefits are interesting enough for a future association with ESA: *e.g.* Israel, Australia and South Africa. Over time, such association could build towards the model long established with Canada. For many other international partners, ESA provides a valuable source of data and training, allowing the spread of space expertise in countries which are still developing capabilities and creating future markets in space services.

The common objective of ESA and the EU, and of their respective member states, is to reinforce the global competitiveness of the European space sector, including industry. The improvement of ESA's relationship with its member states, the EU, the European non-member states, industry and the scientific communities, as described above, contributes to this reinforcement.

The combination of a high programmatic workload and the prospect of further growth in the number of member states, alongside fundamental discussions regarding the future relationship between ESA and the EU, put pressure on the activities of the ESA organization. New economic models of relationships between space agencies and space industry have emerged. These offer an opportunity to enhance industrial responsibility and also have the potential to reduce the costs of managing industry, while ensuring that the essential skills and experience that have brought ESA success in the past are preserved. As a result, ESA has already significantly improved its efficiency, since it is carrying out an increased number of missions, of greater complexity, in an environment in which member states' contributions have essentially remained constant. Nevertheless, maintaining this trend while successfully delivering results from programmes, requires a constant effort.

As a result, ESA has continually optimized its business models for the implementation of its programmes, and those of third-party customers, notably in the context of the new public-private partnerships in domains where manufacturing industries and service providers are extending on the commercial market, responding to and partnering the evolving capabilities that industry can offer today. It has additionally introduced policy measures for the improved management of programme and financial risks and is committed to taking further steps in relation to the mitigation of risks associated with the recently concluded Galileo and Copernicus Agreements with the European Union.

G ESA as a Law-Maker

In order to carry out the political and institutional mandates described above, a wide range of legal tools have been put in place over the last 50 years.

The ESA Convention is the prime source and overarching structure for a wide variety of acts, including many which contain legal obligations. The Council besides approving mandatory activities, regularly adopts Resolutions and Recommendations, adopts Rules and Regulations such as Financial Regulations, Staff Regulations, Procurement Regulations, General Clauses and Conditions for ESA contracts, Security Regulations, Rules on Information, Data and Intellectual Property or Rules on Arbitration; these regulatory acts and documents are publicly available.⁶

Following this constitutive approach, and being aware that the VCLT applies to treaties between states, it can be stated that under the ESA system, new treaty law is generated. A 'treaty' means an "international agreement concluded between states in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation."⁷

An international agreement among states is concluded when setting up an optional programme. In such case, the parties are those ESA member states reaching agreement, defined as the 'Programme Declaration'. They are concluded under the frame of the ESA Convention which in its Annex III stipulates the legal conditions for their formation, execution and termination. The Council as organ of ESA can only accept (the principles of) such a programme ex-ante (when it verifies that the scope and objectives are in accordance with the ESA Convention), take note of the related Programme Declaration once it is submitted to it as information, and approve the related implementing rules (since the latter concern the execution of the programme, which is undertaken by ESA, not by the participating states; the execution must therefore be in accordance with the ESA Convention and such implementing rules). Programme Declarations for ESA optional programmes are international agreements. They may also be seen as treaties in the sense of Article 2(1)a VCLT. The actual qualification does not change the assertion that Programme Declarations contain mutual commitments and legal obligations between states.

ESA concluded several international agreements, including international treaties, with third parties, be it ESA member states or other subjects of international law, such as states (represented through governments, governmental agencies or other institutions competent to enter in a respective agreement), or inter-governmental organizations. In these cases, ESA becomes contracting party and assumes legal rights and obligations by which it is bound as organization along with its member states. Here, ESA can be considered an *actor* of international co-

6 <www.esa.int/About_Us/Law_at_ESA>.

7 Art. 2(1)a of the Vienna Convention on the Law of Treaties (VCLT) contains a widely accepted definition of the term 'treaty', suggested by the International Court of Justice (ICJ) to reflect customary international law e.g. ICJ Rep 249 [263] 2002.

operation with legal capacity to be party to and creator of international commitments and acts. This capacity comes as the necessary complement to the inter-governmental mechanism.

Under the umbrella of the ESA Convention, the establishment of international agreements – treaties, implementing agreements, memoranda or exchanges of letters with legally binding provisions – is significantly facilitated: Thanks to the inter-governmental mandate and the effective and clear legal system, it is possible to create, modify, re-arrange, add to or terminate European space programmes without going through the ratification or incorporation processes foreseen for new international obligations at national level. Considering that such mechanism is already contained in the national laws of ratification of the ESA Convention itself, the states representatives are empowered by their national law to conclude such international acts. Also, this is an important aspect of flexible decision-making, indispensable for space co-operation.

While the legitimacy for such acts derives directly from the ESA Convention, the political legitimation is further enhanced by the fact that the Council is not only meeting at delegate level but regularly at ministerial level. In a Council meeting at ministerial level, the governments of ESA member states are therefore represented at highest political level, enabled to exercise their decision-making competence and to commit the financial contributions of states.

The legal and contractual capacity of inter-governmental organizations is widely accepted in national jurisdictions, especially in those of the member states of the respective IGO. For the part of ESA, this acceptance is directly rooted in the acceptance, through ratification, of the ESA Convention by its member states: “[ESA] shall in particular have the capacity to contract, to acquire and dispose of movable and immovable property, and to be a party to legal proceedings.”⁸ It is through this capacity that ESA can fulfil its purposes of implementing space activities and programmes as well as the appropriate industrial policy through placing industrial contracts.

H ESA Actions and Initiatives for Space Law

Since its creation in 1989 under the initiative of the European Space Agency (ESA) and various academics and practitioners, the European Centre for Space Law (ECSL) has aimed to provide a means by which professionals working across all areas of the space sector – including insurance, banking and project financing, policy, regulation and law – can work together to develop both awareness and understanding of space law and policy and encourage growth in the sector through collaboration.

The ECSL is composed of a board of members who are nationals of ESA member states. In order to ensure that the centre continues to fully represent all those involved in space law and policy, the board is made up of both academics and professionals all with considerable experience in the field. The ECSL also has a full-

8 Art. I sentence 2 of Annex I to the ESA Convention.

time Secretariat provided by Legal Services, responsible for the management and promotion of the centre.

Membership of the ECSL runs from January to December each year and includes students, individual academics or professionals and corporate members. In recent years, corporate membership has grown which reflects the ECSL's continued commitment to fostering co-operation with the European space industry.

The ECSL encourages the continued establishment of local and national promoters in order to facilitate the transfer of information and the organization of activities. In particular, the ECSL works closely individuals or corporate or academic institutions, in the administration and sponsorship of events like conferences, symposia or research projects. These types of event bring together various national actors in the space industry and can help develop the market which may be of particular significance for emerging space states in Europe.

I Practitioners' Forum

At its core, the ECSL is intended to act as a network in which those involved in the fields of space law and policy – both academic and professional – are able to seek opportunities to work together, and in doing so, encourage growth and development in these fields. One way in which this is achieved is through the Practitioners' Forum which the ECSL has been organizing since 1992. Each year, the Forum focuses on a question which is of particular interest or contention to the space sector. In recent years, it has focused on the issue of space insurance (2012), satellite registration (2013), export control regulations (2014) and space governance in Europe (2015). In addition to addressing pertinent issues through keynote speeches and lively discussions on these questions and possible solutions, this event is a networking opportunity intended to bring together practitioners working across Europe and elsewhere. Indeed, it is the result of industry-centred events like the Practitioners' Forum that corporate membership to the ECSL has increased in recent years.

II ECSL Sponsored Conferences

Another event which seeks to address the major issues facing the space industry today is the annual symposium jointly organized by the ECSL and the International Institute of Space Law (IISL). This event usually takes place during the first day of the meeting of the Legal Sub-Committee of the UN Committee on the Peaceful Uses of Outer Space in Vienna, Austria. The theme for each year is chosen to reflect and directly address important legal questions which also have ramifications for the wider space industry. The theme for 2015 was space traffic management, and in 2016, the subject of the Symposium will be the registration of space objects. The ECSL has been at the forefront of other professional gatherings, most notably its sponsorship of the Paris-Saclay International Air and Space Law Colloquium in October 2014. The centre welcomes the opportunity to work closely with businesses and academic institutions in developing such conferences.

III ECSL Benefits for the Space Sector

- 1 Creation of a continuously expanding network of academic and, increasingly, corporate members working across a range of space-related fields;
- 2 Organization of numerous events for networking and professional collaboration;
- 3 Distribution of information to members in the form of newsletters, current event quarterlies and professional opportunities;
- 4 Compilation of pertinent space law and policy resources through the ECSL library, archives and online database.

IV Student-Focused Events

In light of its aim to widen interest in the fields of space law and policy, the ECSL is active in encouraging students to engage in a number of events it organizes and sponsors each year. Three main activities are run each year in this respect:

- 1 The ECSL student essay competition: this project allows students to address real issues facing the industry, such as this year's theme which will focus on the pertinent commercial, policy and legal considerations for non-orbital flights.
- 2 The European rounds of the Manfred Lachs Space Law Moot Court Competition: in addition to organizing the event and working with different hosting universities across Europe, the ECSL also provides funding opportunities for teams to participate and finances academics and practitioners to attend the event as judges.
- 3 The ECSL Summer Course on Space Law and Policy: this event is aimed at students and young professionals specialized in space law and policy and has taken place across Europe, most recently at the International Telecommunications Union in Geneva (2014), and this year in Caen, France. By involving practitioners across the space sector through sponsorship and teaching of the courses, the ECSL has been able to generate interest in the field and provide occasions for professional collaboration.

I Summary – Conclusions

The European Space Agency was set-up over 40 years ago and has delivered on expectations from the scientific community's quest for more knowledge, the politicians wishing for more Europe and the business community developing industrial and operational capabilities. All has been made possible thanks to hard-working scientists, engineers and lawyers who created and progressively refined a magic formula of balanced interests and respectful co-operation. The legal and institutional skills have found the appropriate tools which, until a new formula proves successful, best served Europe until today.