

International Cooperation in Space

Remarks of Jean-Jacques Dordain, Director General of the European Space Agency
at the 40th Anniversary of the Universities Space Research Association (USRA)
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I would like first to thank the organizers for inviting me on such a special occasion, namely celebrating 40 years of cooperation among universities involved in space research. 40 years of success is certainly a good opportunity to speak about the future on the basis of lessons learned from the past.

I would also like to thank the organizers for giving me the opportunity to share my experience and my vision about international cooperation in space, which is my daily work as Director General of the European Space Agency, and my dream as the chancellor of ISU, the International Space University.

Being a dreamer helps a lot in your daily life, and being a professor helps a lot when you are a Director General, because you know you have a future, since you are Director General for some time only, while you are professor forever.

So, let's speak about the future. The future belongs to young generations and we, the current space generation, which discovered space when we were teenagers, we have to prepare the young generations. Not to impose the future on them, but to transmit the tools that they need to shape a future, which will be even better than our present.

One of the most important tools is international cooperation. My dream is that the young generation perceives international cooperation not only as a tool, but as a culture, because the future requires a global view and a culture of international cooperation.

The future is global, not individual, and it is certainly the most important message coming from space so far that the future of planet Earth and its inhabitants has to be addressed from a global standpoint. This message is already old, 40 years ago, in December 1968, the crew of Apollo 8 mission circled around the Moon and saw the Earth rising above the Moon's horizon. Bill Anders declared that "We came all this way to explore the Moon, and the most important thing is that we discovered the Earth", which appeared as a very small and finite blue planet, as small as a golf ball seen from the Moon. This message will stay much longer than the fact that the US flag was the first one on the Moon.

Planet Earth belongs to space and not the other way around. We cannot understand the future of planet Earth without understanding the solar system and the universe. Therefore, space is part of our future and our future is global.

This message is all the more important in times of economic crisis, when the tendency is more to define individual solutions than global solutions.

Space, including international collaboration in space, is already a significant element of our life. But we are at the very beginning of the space age: 50 years! Too short to predict the future by mere extrapolation, but long enough to draw some lessons to shape the future.

Space is omnipresent in our daily life and there is not anymore a single citizen in Europe not dependent on space systems even if not all citizens know about this dependency for communication, navigation, management, etc.. Space has become indispensable to scientific progress, to the economy, to education, to development,... And because of this significance of space for more and more aspects of our society, the number of actors has grown significantly, not only for what concerns the number of space powers in the world, but also in terms of actors, not specific to space, that develop and provide ground services based on space systems. This evolution, which is a sign of success and a clear demonstration of space being a part of daily life, will continue and will make collaboration even more complex than today since that collaboration concerns different governments, different industrial actors, different service providers, etc..

Cooperating is complex and difficult. I know that, because it is my daily life at the European Space Agency (ESA). ESA is an intergovernmental organization, ruled by an international treaty called Convention, to which 18 countries of Europe have acceded so far. According to the Convention the Member States are pooling their resources and expertise to develop space systems for both science and applications, i.e. services to the citizens. Our budget is about €3.5 billion/year and we are developing science missions (studying the solar system and the universe, the Earth, the environment, and performing research under microgravity), as well as application missions (meteorology, telecommunication, Earth observation, navigation). We are also developing the launchers that we need to have access to space. A good example for cooperation with NASA is the Cassini- Huygens missions, where the ESA part (Huygens mission) would not have been possible without the NASA part (Cassini mission) and vice versa. Another fantastic example is the ISS programme, where Europe is now a full partner after the launch of Columbus and the very successful mission of the ATV, Jules Verne.

Making 18 governments setting common objectives and pooling their resources and making their industry working together is certainly very difficult, but it works and I am very proud of the success of ESA.

Our successes have attracted a lot of partners, which maybe does not ease our work, but which certainly enhances our successes - partners in Europe and outside Europe.

Inside Europe we have developed a strong cooperation with the European Union (EU) of 27 countries. Together with Norway and Switzerland, which are not members of the EU, but members of ESA, there are today 29 European countries cooperating in space. These countries approved a European Space Policy in 2007 and two flagship programmes: Galileo and GMES (Global Monitoring for Environment and Security). Connecting ESA with the EU means connecting space with the European citizens, because the EU is in

charge for European policies for European citizens. The two “children” of the ESA/EU relationship, Galileo and GMES, are connecting space with European Transport Policy (Galileo) and with European Environment and Security Policy (GMES).

Moreover there are partnerships with industry and operators, which even resulted in real public-private-partnerships. “Real” means partnerships without government guaranteed markets, but where the private partner takes the full risk for the commercial success. There are also partnerships with universities, connecting space with the young generation and attracting them to science and technology.

Outside Europe, ESA is practically cooperating with every space faring nation in the world. Obviously with the USA, which formed the “technical culture” of our space activities, but also with Russia (in science, the ISS programme and launchers), with Japan, China (in science), India or Canada. ESA also cooperates more and more with non space powers in order to share some data with those that have pressing needs and no space capabilities. ESA and the French Space Agency CNES are co-founders of the Charter on Natural Disasters. The members of this Charter make their space systems available to civil protection organizations across the world in case of natural disasters. This European initiative has now become a global initiative since Canada, Japan, India, the USA, Argentina, China have joined the Charter. Since January 2009, i.e. in less than three months, the Charter has been activated 11 times for disasters e.g. in Costa Rica, the USA, France, Marocco, Argentina, Australia, China and Namibia. Whilst natural disasters can happen everywhere in the world, space capabilities are not available in every country. This makes the Charter so important for countries, which have no space capabilities.

As illustrated, ESA has a lot of experience in cooperation and if there is one subject, on which we can teach the world, it is cooperation, which is our daily life.

Cooperation has started in Europe just because we had no alternative but to cooperate. Each individual country of Europe is too small for developing a sound space programme on its own. But after more than 30 years we are glad to cooperate because we learned that beyond the difficulties of cooperating, there is the success of cooperating. We know now that it is always easier not to cooperate, but that it is always more difficult to succeed alone. The cooperation has now crossed the borders of Europe and cooperation is becoming more and more global and, step by step, every country in the world, even the biggest ones, realizes that there are less and less alternatives to international cooperation just because

- Our future is global and global issues require global solutions;
- The benefit to cost ratio is enhanced by cooperation.

In particular as space endeavors are costly and risky. Sharing cost does not reduce the overall cost but makes a project affordable for each partner. Projects can then be realized in nearer future, which is very important for young generations. Pooling the best talents in the world helps to find better solutions and to reduce risks.

What is the recipe for a successful cooperation? First, there is not ONE recipe or ONE model, but there are basic principles, which are applicable to all models:

- Cooperation should be based on concrete projects. This is the only way to define a set of clear and common objectives. There should not be too many objectives, not too far away and they should be defined in successive steps. It is important that the partners define the objectives together and not to give the impression that cooperation means that all partner are paying for the objectives of one;
- Flexibility - cooperation should not be a constraint, but a facilitator;
- Governance based on a balance between the individual partner's interest and the common interest. Balance does not mean the absence of leadership. On the contrary, a clear leadership implies also commitment and assuming responsibility, which are both important for the pursuit of a successful cooperation;
- No exchange of funds basis – the only way to have cooperation co-existing with competition;
- Transparency – the prerequisite for building-up mutual trust.

Beyond these principles, the most important factor for a successful cooperation is the relationship between persons, because cooperation is implemented by people. At ESA persons of 18 different nationalities are working together to reach one common goal: making the best launchers and the best satellites of the world. And when they work together they forget their nationalities. Nevertheless, cooperation does not lead to uniformity. Diversity is a strong asset of ESA, and today our goal is not to be only European – we want to think global and to shape a global future. In conclusion, cooperation is always a combination of personal relationship and institutional relationship: As Robert Schuman said: “nothing is possible without people, and nothing is sustainable without institutions”.

Based on our experience and our successes, we want to contribute to a global future by contributing to global space programmes in particular in the following domains:

- First in science. Science is already global and was the first global endeavour in space thanks to the scientific communities in the world. However science is not a global programme. It is a combination of bilateral and multilateral programmes without yet a global coordination. ESA is opening its calls for proposals worldwide to enhance coordination.
- Second in Earth Observation. A global approach is building-up since the world summit on sustainable development, which took place in 2002, through the establishment of a Global Earth Observation System of Systems (GEOSS). A coordination group (GEO) has been created as a framework, within which the partners can develop new projects and coordinate strategies and investments on the basis of a 10-year implementation plan. 77 governments, the European Commission and 56 international organizations, among which ESA, are members of the group. Governance is not easy and it is not yet a global programme, but it is a first step towards coordination at global level. ESA is contributing together with the European Commission (EC) to GEOSS through the GMES programme.

- Third in Exploration. Exploration may become the first concrete global programme thanks to the experience gained through the ISS programme. The ISS partnership built up in 20 years of cooperation in the ISS programme is the most important asset of the ISS, which will stay much longer than the hardware in orbit. It is a solid partnership because it has been built up while crossing a lot of difficulties and even disasters. This partnership should be the nucleus upon which a global exploration programme should be defined and developed. But this partnership should not be exclusive: it must be opened to become really global. I am glad that among the 14 space agencies, including ESA, which have contributed to developing the Global Exploration Strategy, there are other partners than the ones of the ISS programme, in particular the Chinese National Space Agency and the Indian Space Agency. China and India are significant space powers, which can bring a lot to a global exploration programme, but the inclusion of China or India in the partnership should not be to the detriment of the partnership, which was so long and so difficult to build up on the ISS. This is a lesson learned from ESA again: a cooperation with a non-European partner should not be to the detriment of the European partnership and that is the reason why international cooperation with ESA is subject of decision by unanimity of all ESA Member States.

ESA is obviously ready to contribute to the development of a global exploration programme that is flexible enough to accommodate individual, bilateral and multilateral missions. We are ready to work with the other ISS partners to study under which conditions new partners could consolidate our common goals.

Global cooperation is progressing. Much more progress, however, will have to be made by the next generations and the next generation is still in universities. I would like to conclude my address by another type of cooperation, as important as international cooperation, i.e. cooperation between successive generations. I consider it being our duty to transfer our knowledge and our expertise to the next generations, not to impose them their future, but to make them better prepared to design their own future. This is the reason why, as the Director General of ESA, I have decided to support universities in their effort to transfer our technical experience as well as our international culture to students. ESA supports the International Space University, which is both international and interdisciplinary, and we are promoting the building-up of networks of universities in our Member States in order to stimulate international cooperation as early as possible among students of different universities in different countries. Our support is provided through grants, young graduate trainee programmes, exchange of professors and access to ESA facilities, including opportunities to perform research with/on small satellites.

The important role of universities in the cooperation between successive generations is one reason why, as a Director General and as professor, I was particularly glad to be with you this afternoon. You are doing within the USRA since 40 years what I am trying to support in Europe. I would like to learn from your experience. Let's shape the future together.