ASD-EUROSPACE
The Space group in ASD

Space Exploration

Eurospace views and concerns for CMIN 12

1- Space Exploration, a focus of European excellence, is part of human desire to explore. It drives innovation in scientific and technological fields and generates economic, political and societal benefits and returns.

2- Industry looks for a clear political support with a long-term planning and an adequate funding to:

- Increase the European non-dependency to avoid risks on schedule and funding.

Partnership is a key for Space exploration missions, thus a non-dependant Europe can develop strong and stable international collaboration.

- Improve its technical excellence and competitiveness.

3- Industry supports the on-going programs, notably ExoMars and ISS Exploitation, as well as the preparation of the next long-term exploration missions.

On-going programs are the necessary first steps. The next row of missions shall be scheduled in continuity so that they can benefit from the experience gained on the on-going ones; their preparatory phases should therefore occur in short term.

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Exploration: A European domain of excellence

Through the support of its Member States, European Space industry has acquired leading & highly visible capabilities & technologies across Space exploration:

- In Space Transportation, Europe has become a leader in launchers, with the heavy workhorse Ariane and now also Vega; today it is rapidly expanding entry and re-entry capabilities for both the Earth and other planets.
- In Low Earth Orbit, Europe has exploited its ISS participation to establish capability for pressurised modules: Columbus, the Multi Purpose Pressurized Logistic Modules (MPLM), the nodes and Cupola.
- For Rendezvous and Docking, Europe has established the highly successful ATV and developed technologies such as the International Berthing and Docking Mechanism
- In the Interplanetary environment, Europe has been operating increasingly challenging and world-class missions in orbit around Mars, Venus, en route to a comet, and on Saturn's moonTitan.

Critically, in support of such emblematic projects, Europe has consistently developed a sound and competent industrial base. In order to maintain its level of excellence and benefit from its past investments, Europe now needs a clear program around which to consolidate and exploit that industrial base and its technologies..

Why exploration?

Space exploration is part of human desire to understand our world. It is fully backed by a combination of scientific, technological, economical, political and societal motivations.

As for science, Space exploration improves our knowledge of the solar system, of the origin of life, and of the planets physics including the Earth itself. Return samples from Mars, for instance, will have a unique scientific value to understand the evolution of our solar system.

From an economic standpoint, it stimulates and innovates across a wide range of technologies (robotics, environment control, recycling, energy production and management,...). Space exploration boosts highly qualified employment and investments in high-tech domains, as well as synergies with other sectors. It is a documented motivator of students towards careers in science and technology.

As for politics, it is a driver to consolidate the Union on the internal scene (EU image in the public) as well as on the international scene; demonstrating the European leadership in a global Space exploration programme is a leverage for the European international policy.

For society, the contribution of Europe , as opposed to single nations, to a global Space exploration endeavor will strengthen our identity, setting out for us a clear set of ambitious objectives that can only be achieved together.

Building international cooperation on technologies

Projects such as Cassini Huygens or the International Space Station have demonstrated the capability of Europe to cooperate with other space faring nations. Europe's space industry welcomes the setting up of a high-level structured policy dialogue on the future of Space exploration, started at the Lucca Conference in November 2011.

After having demonstrated its capabilities, it is now the right time for Europe to reinforce them in challenging, but affordable, objectives sustained by robust technology roadmaps and associated programmes, with firm programmatic long-term commitments.

Technologies are the key enablers for Europe to contribute to international cooperation at the level it seeks, i.e. a level that will allow us to be a reliable and valuable partner when it suits, while at the same time, maintaining the possibility of autonomous mission leadership.

Stakes are high for industry and Europe

Currently, Europe risks more than ever before the discontinuation of activities in many areas of Exploration technology. Key capabilities built up with important investments in money and skills are at risk and could be dispersed.

At the same time, the world picture of potential competitors and collaborators is becoming ever more complex, providing both threats and opportunities for Europe. China is powering ahead with capabilities in launchers, human spaceflight and lunar exploration. India too shares a broad ambition and a developing set of capabilities. Our traditional collaborators, the United States, have entered a period of major investment in space transportation infrastructure – a new ultra-heavy launcher and crewed systems – yet lacking the funds to continue collaborations with Europe such as Exomars. Conversely, Russia today appears to seek longer-term partnerships in ESA missions.

If Europe remains outside a worldwide trend towards large space exploration programmes, it will naturally not reap any benefits but will even be adversely affected. Probably the European laboratories could still be involved in scientific experimentations – to a lesser extend and with less influence on the orientations – but European industries and scientific organisations would definitely be set aside the large world-coordinated network which will emerge from the international exploration ventures. Such networking being the basis for endeavours in new fields (energy, environment), our industries and scientific bodies could be out of the game for such new activities.

Also, being excluded from an international space exploration programme will have consequences on European brain drain to other countries. Key to this is the fact that other nations are going forward with their exploration activities, developing technologies and capabilities essential to non space sectors as well, which European industry and citizens will be forced to acquire or outsource.

It must also be stressed that the international cooperation which is taking shape in the framework of space exploration will have structuring effects on space industries all around the world. As a matter of fact, it will provide unique long term perspectives and will stimulate the development of innovative solutions and technologies to overcome this unprecedented challenge. The European space industry not being able to take part to this ambitious endeavour would result in a severe competitive disadvantage. Thus, the participation of Europe to the space exploration initiative is necessary to ensure its industry a level the playing field with its competitors.

Suggestions for improved sustainability of a European Exploration Programme

Seeds of reflection on how to improve the sustainability of a European exploration programme can be summarized as follows:

- Ensure coherence across budgetary lines and between European and national agencies to maximise the impact of technological investment: we note especially that the intimate link between technologies for science-driven planetary missions and wider space exploration needs to be exploited.

- Communicate more effectively to tax payers and politicians the benefits that exploration will bring in terms of knowledge, innovation, spin-offs, highly skilled employment and European identity and cohesion.

- Strive to promote and de-risk innovation via a range of methods for technology demonstration and TRL raising, including the use of dedicated in-orbit platforms, the ISS and other shared opportunities at appropriate cost levels. Low risk, low cost opportunities for maintaining the pace of technology maturation and growth in expertise are strongly welcomed.

- Strengthen good management practice to implement major missions only on the basis of a sufficient and demonstrated technology readiness and integration level. Rigorous use of mission development phasing – particularly for detailed definition - and reviews must apply in all cases.

- Europe can be an effective and reliable mission partner if it can contribute significant or major elements to an international partnership, i.e. through contribution of Autonomous Elements (Building Blocks)/ Capabilities and Key Enabling Technologies. As a mission leader, Europe should ensure only a limited dependency on its partners and have no mission elements on the critical path assigned to those partners.