

# **ESA's position on privately-funded suborbital spaceflight**

## **10 April 2008**

There are different possible definitions of space tourism. In this document, the term "Space Tourism" will be meant to encompass the execution of suborbital flights by privately-funded and/or privately-operated vehicles and the associated technology development driven by the space tourism market.

### **The need for an ESA position on Space Tourism**

Activities linked to Space Tourism have been gaining momentum and registered a number of remarkable achievements during the last few years. There is large public interest in human suborbital flights. The large figures of prospective paying customers quoted in recent market surveys<sup>1</sup> show that Space Tourism offers the potential for sustained progress in a fashion similar to what happened in the early days of aviation.

These developments might have deep and significant implications for space activities as a whole. Being at the core of Europe's space activities, ESA is expected to have a position on space tourism, and needs to have a coordinated and corporate approach with respect to these activities. This document outlines the different aspects linked to Space Tourism which may have an impact on ESA, and proposes the major features of such a position.

### **The different aspects of Space Tourism**

Space Tourism raises a number of issues relevant to ESA, which are briefly described below.

#### **Technology and operations**

The development of Space Tourism would encompass significant new developments in aerospace technologies, and bring an aeronautics perspective to space technology development and operations, in particular concerning the aspects of reusability and routine processes associated to the high flight rates<sup>2</sup>. In the aeronautics sector, these

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<sup>1</sup> The cost for human suborbital flights is initially projected at about 200 000 US\$ with over 200 private persons having made an advance payment to fly on SpaceShipTwo in the case of Virgin Galactic, and expected subsequently to drop to about 50 000 US\$ with roughly 16 000 passengers interested to fly in 2021 according to the "Space Tourism Market Study" conducted in 2002 by FUTRON, a US-based space consultancy firm.

<sup>2</sup> What has been demonstrated is that sub-orbital flight at ~100 km can be done a few times with a prototype vehicle. The real challenge will be to have a vehicle that allows flying the mission many times, with associated operations, in a profitable way.

developments could lead in the long term to high-speed vehicle concepts with the potential to reduce drastically the duration of long distance flights.

### **Commercialisation and partnership development**

Space Tourism efforts are also linked with the ultimate goals of human spaceflight programmes, i.e. enabling routine human access to space and the preparation of the long-term, sustained human exploration of the Solar System. In this sense there is also a link of space tourism efforts with exploration programmes, even if the end-objectives and requirements are completely different.

There is thus a clear interest in supporting the emergence of private business in the context of human spaceflight, also because privately developed and operated infrastructure elements, derived from space tourism undertakings, could one day become building blocks of a wider space exploration scenario.

### **Legal aspects and regulatory framework**

There are different aspects to be addressed from a legal standpoint. Space Tourism will be carried out substantially in the airspace of a given country, and therefore the civil aviation regulatory authorities of the countries concerned and the competent agencies of the European Community should be at the forefront of the setting up of a regulatory framework for Space Tourism in Europe. Space Tourism will certainly have a significant influence on aerospace industry, in view of the opportunities it may create, but also of the competition it may foster. Also, since in the longer term space tourism will involve travelling to outer space, some rules of space law may find application for Space Tourism; in particular, the “launching State(s)”, through its administrative national agency designated for carrying out space activities, will have a role to play in exercising jurisdiction and control over that activity.

### **Communication aspects and visibility of space activities**

The development of a larger space tourism market and potentially a larger number of citizens experiencing spaceflight will have an impact on the visibility and perception of human spaceflight/exploration in the general public. ESA will have to consider such development in its communication strategy in order to take profit from such additional outreach for the benefit of the space sector, but also to illustrate/explain the differences between the complexities and ambitions of space tourism and those of classical human spaceflight/exploration activities.

### **Major Guidelines of ESA’s position**

Considering the balance between the potential advantages of Space Tourism - high visibility of space, additional development efforts of space technologies, increased

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appeal for science & technology education, creation of new commercial markets, etc. - , and its potential risks and/or drawbacks – environmental aspects, safety issues, exclusiveness of an activity aimed initially at a very small and wealthy minority of the population -, we recommend a position of **cautious interest and informed support**, along the following guidelines:

1. ESA should monitor the relevant technology activities and assess whether spin-ins and spin-offs could be envisaged for/from European space programmes.
2. While avoiding interfering in the development of a fully competitive market, ESA should further reflect on possible partnership with European ventures or support actions, based on mutual interest and demonstrated technical and commercial maturity, without nevertheless exposing the Agency to any liabilities related to business exploitation. To this end, legal schemes should be defined to allow for such activities, as allowed within the principles laid out in the ESA Convention.
3. Provision of services by the Agency in the domain of human spaceflight, in particular “astronaut training”, i.e. provision of expertise for developing dedicated training programmes and/or facilities for specific tourist flight opportunities, and “space medicine”, i.e. provision of expertise to develop dedicated medical preparation programmes of space tourists, should also be explored for mutual benefit, making available ESA’s competences under conditions to be defined.
4. ESA should contribute in the development of a regulatory frame for Space Tourism in Europe, involving both civil aviation regulatory authorities and competent bodies from the EC, aiming also at a more level playing field for all worldwide players, and supporting the interests of European industry.
5. ESA should facilitate the free flow of ideas among all interested European players, e.g. by establishing a platform for voluntary information exchange.