

# CURRENT DEVELOPMENTS IN SPACE TOURISM: SPACE TOURISM—‘A TOOL TO BREAK THE EXISTING SHACKLES’

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## Abstract

In today's times, there is an increasing scope for space tourism which would help us overcome and connect us in a better way to the seemingly attractive Space World. However, the roles of governmental organizations here play a vital role in exploring this untouched avenue.

Despite having used some billions to develop space technology, government space agencies have not reduced the cost of space travel from what it was when Yuri Gagarin first flew to orbit in 1961. However, private activities aimed at realizing space tourism have recently demonstrated the prospect of achieving sub-orbital space flights at less than 1% the cost of comparable flights performed by NASA in 1961. The escalation of sub-orbital tourism could lead on to orbital tourism services, for which there is known to be very large potential demand. The growth of a large space tourism industry will be very beneficial both for the space industry which is shrinking for lack of demand, and for the world economy as a whole at a time when unemployment is at historically high levels due to lack of new industries.

In this proposal, authors have tried to focus on the unexplored and majorly-hyped avenue of Space Tourism. Moreover, through this paper the writers have tried their best to enlighten the reader with their varied interest in the field of Space Law. Furthermore, the authors have also tried to throw a light upon the Recent Developments in the field of Space Tourism.

## Introduction

The feasibility of space tourism depends centrally on the cost of traveling to and from space. This has remained extremely high through more than 40 years of human space activities, thereby preventing space tourism services from developing. It is widely believed that this high cost is an inherent problem of space flight - the need to accelerate to 8 km/second in a vehicle of which the structure is light enough to carry a large mass of propellants but sufficiently strong to withstand high aerodynamic pressures and re-entry heating. However, recent events have clarified that the current high cost of reaching low Earth orbit is not an unavoidable physical necessity, but is

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largely due to the dominant role in launch activities played by near-monopoly government space agencies over several decades. Although this may seem surprising or improbable to those unfamiliar with the case, it is merely a rather extreme example of the well-understood tendency of monopolies to raise costs and suppress innovation, and it is predicted by the economic theory of bureaucratic organizations.<sup>1</sup>

To date, OECD countries' space agencies - Nasa, Esa, Jaxa and national agencies in Europe - have spent approximately \$1 trillion (measured in current dollars) on nominally civilian space activities, much of it to develop equipment and technologies used in these activities. However, despite this enormous expenditure, when Dennis Tito became the first person to pay for a flight to space in April 2001, he flew on a Soyuz rocket, developed during the 1950s, because this is the cheapest and safest vehicle available. It is also essentially the same rocket that carried Yuri Gagarin 40 years earlier.

This simple fact shows that the cost of travel to and from space today remains the same as it was in 1961, despite OECD countries' space agencies having spent \$1 trillion of taxpayers' money. The only plausible explanation is that these space agencies have not been trying to reduce the cost of travel to space. When one considers the "tidal wave" of new technology that has been developed since 1961 - from wide-body airliners to microcomputers, new materials to satellite navigation, the World Wide Web to mobile telephone networks, supercomputers to nanotechnology - it is obvious that there must be enormous potential to reduce the cost of reaching Earth orbit below the cost in 1961- probably by several orders of magnitude.

Fortunately, concrete proof of this possibility is starting to become available. Scaled Composites Inc's "SpaceShipOne" and other passenger vehicles under development by private companies are showing that the cost of making a short sub-orbital space flight today can be as low as 0.1% of the cost of Alan Shepard's sub-orbital flight in 1961. This implies that the potential for reduction of launch costs by applying some of the many new technological capabilities developed since 1961 is fully three factors of ten below today's expendable and partly expendable vehicles developed and operated by government space agencies. The key flaw in the organisational design of space agencies is that they provide no services to the general public, and so do not experience the continual pressure that keep more successful government organisations' activities reasonably efficient, as described in [2]. Hence they are prone to diverge from contributing to economic growth and to give priority instead to political objectives.

(It is worth noting that the US government's partly reusable "space shuttle" was not designed to carry passengers to orbit at low cost but to carry large military payloads following military specifications. Its nominal cost per passenger is therefore of very little relevance for estimating the cost of carrying passengers in a dedicated vehicle - comparable to the several factors of ten difference in cost per passenger between a Boeing 777 and a B52.)

Thus it seems clear that, from the technical point of view, orbital passenger transportation services are feasible at much lower cost than the \$10 million/person cost of Soyuz. However, government space agencies and their political overseers have not to date considered it to be in their interests to develop the necessary vehicles; their primary focus has been "technology development" and (on a much smaller scale) scientific research. This might be judged a reasonable use of taxpayers' funds, except that OECD government space agencies also have statutory responsibility for commercialisation; for example, Nasa is required by US federal law to "...encourage to the maximum extent possible the fullest commercial use of space".<sup>2</sup> The public and media largely believe that they are doing this - but space agencies have emphatically not fulfilled their responsibility to date: turnover of commercial space activities is about 1/50 of the scale it would be if the \$1 trillion used to date had been invested in normal commercially successful activities. Indeed, space industry employment has been shrinking due to the very limited demand for satellites launched by expendable rockets, which are the only significant commercial product to have resulted from space agencies' enormous expenditure. Other than telecommunications and broadcasting, space agencies have also made very large investments in remote-sensing satellite systems on the grounds of their being "commercial". However, the commercial interest in this services has been far too small to justify the huge investment to date, and the main users are governments themselves, and particularly military services.<sup>3</sup> Moreover, aerospace companies are moving operations to lower-cost countries which are rapidly improving their technological capabilities.

Despite this very poor result of space agencies' nominal encouragement of commercial uses of space, they have performed almost no research on space tourism - certainly none commensurate with its apparent economic potential, as confirmed in Nasa's own very positive report on the subject,<sup>4</sup> and as revealed by independent research discussed below. Even if the probability of success was estimated to be as low as 1/1,000, a substantial budget should be devoted to related research from space agencies' annual expenditure of nearly \$20 billion on non-science, "space development" activities.

In this context it is important to recognise that little research and development or innovation in the entire aerospace industry is privately financed; most aerospace R&D is, either directly or indirectly, government-supported to some extent. Consequently, in the absence of any significant funding by space agencies, companies and investors are understandably reluctant to invest in developing passenger space vehicles which face technological and regulatory risks in addition to normal business risks (market, financial, management and others). In the absence of investment to develop this new field, the space industry is stagnating, with employment falling markedly in recent years.

## **CHAPTER I**

### **A BRIEF VIEW ON SUB-ORBITAL BREAKTHROUGH**

Fortunately a sub-orbital passenger vehicle can be developed at much lower cost than an orbital vehicle, with far lower technical risk, due to the far smaller propulsive energy used - just 1-2% of an equivalent orbital vehicle - and so proportionately smaller re-entry heating and stress. (For this reason there is no need for fragile ceramic tiles for thermal protection; ordinary aerospace metals can be used; and vehicles can be re-flown repeatedly like aircraft.) Consequently such a project is within the means of private investors, and recently a number of groups are coming close to success. Most notably, on the 100th anniversary of the Wright Brothers' first flight, the rocket-powered "SpaceShipOne" performed the first ever privately-funded supersonic flight, reaching Mach 1.2 during a 60s climb. It is hoped that it and other sub-orbital vehicles will reach space during 2004.

The activities of companies developing low-cost, sub-orbital vehicles will be aided by the emerging competition between would-be commercial "Spaceports", which are becoming increasingly interested in the field of space business that shows the most promising market potential. During the late 1990s it was believed that satellite launch services would grow considerably, and plans for spaceports in several US states focused on this possibility. However, that prospect evaporated with declines in the forecast demand for commercial satellite launches, and managers of several spaceports are refocusing their efforts to concentrate on passenger launch services, starting with sub-orbital flights.

Companies developing sub-orbital passenger vehicles should benefit from growing competition between spaceports in different states and regions. Just as airports compete to provide attractive services to airlines, passengers and the many related businesses that contribute to serving more than 1 billion air travellers/year, prospective spaceports will play a key role in turning the potentially large demand for space flights into a safe, profitable, growing, international business activity with excellent world-wide growth prospects. Over the next few years spaceports will be able to differentiate themselves by providing a friendly government interface to support the growth of "spaceline" operations, as well as many ancillary and related activities, including personnel training and certification, insurance, marketing, and even related entertainment services such as Visitor Centres and spaceflight simulations.

Once sub-orbital space flight services are in successful operation - popular, profitable and growing - investors will have a base on which to develop more ambitious plans. In particular, once a team of experienced engineers proposes a credible orbital passenger vehicle we can expect a consortium of investors, which may include both private and public sector organisations from several countries, to support it. Taking the position that passenger space flight is the concern of private industry alone is not only contrary to space agencies' actual responsibility

for commercial development of space, but would represent a double-standard, whereby governments spend some \$20 billion/year on space agencies' activities that earn a return of some minus 100%, while refusing to aid the development of activities that have much better commercial prospects. That is, government support in some appropriate form is economically better justified than its support for most space agency activities.

### **Orbital Tourism**

To date, the two most detailed proposals for developing orbital tourism are the Japanese Rocket Society's study of the VTOL SSTO "Kankoh-maru"<sup>5</sup> and Bristol Spaceplanes' plans for the HTOL TSTO "Spacebus",<sup>6</sup> both of which featured on Nasa's web-site for several years (when searched for "space tourism"). Once such orbital passenger vehicles are in operation the prospects for further growth of space tourism services will be excellent, due to the very large unsatisfied demand revealed by market research.<sup>7</sup> From a certain stage, investment in orbital tourism services can be expected to grow rapidly to exploit the large number of new business opportunities that will arise - lack of which today is the main cause of the record unemployment around the world.

### **Government's Role In Promoting Orbital Tourism**

Governments' role in the development of space tourism remains to be seen. If governments' activities are appropriately targeted, it will be possible for them to play a very constructive role, considerably accelerating its development, to the great economic benefit of taxpayers. It is very unfortunate that, due to their history and institutional structure, space agencies cannot now encourage the development of space tourism without facing a deep conflict of interest. That is, having resisted the development of passenger travel for decades, the successful development of space tourism services would be humiliating. On the contrary, difficulties, cost over-runs, delays and even accidents in the early stages of tourist space flights would be seen as vindicating space agencies' negative stance to date. It is clear that organisations which have this interest can not be relied upon to develop space tourism as quickly and as well as possible. Consequently it seems likely that aviation organisations, which have far greater experience and expertise in aerospace passenger transportation, will make greater contributions than space agencies - as indicated by the FAA's greater support for the subject than Nasa's.

Recently Apollo scientist-astronaut Harrison Schmidt has called for Nasa to be abolished and replaced with a new organizational structure which would be populated by managers in their 30s and engineers in their 20s, like Nasa during the Apollo project.<sup>8</sup> Perhaps only re-organisation on this scale - equivalent to a fresh start - could overcome the legacy problems described above. In truth it was misguided for taxpayers to trust that government space agencies' activities would be more economically valuable than simply supplying services which the public want to buy - the true "American way". That this mistake should have been made in the USA is particularly extraordinary.

It has been said that fighting a war makes you become like your enemy, and the cold war seems to have had profoundly damaging effects on the USA. Among other influences, the very concepts of a "space agency" and a "space program" which have been adopted and retained so enthusiastically by government officials in the USA, Europe, Japan and elsewhere, came from the Soviet Union. Bureaucrats and politicians everywhere face the same organisational environment and incentives, and once a government monopoly space agency was set up in the USA it proceeded to act in its own interests - at enormous and continuing cost to US taxpayers, as recently described at length in.<sup>9</sup> This costly waste of more than 3 decades must not be allowed to continue; politicians are therefore needed who will press for appropriate change in this matter.

It would clearly be disastrous for governments to continue to rely for space commercialisation on space agencies as they currently exist, having a clear interest in the continuation of the current failure of commercial development of space. However, although space agencies as currently organised have shown themselves unsuited to generating economic value from space activities, governments have the precedent of their successful role in aiding the growth of civil aviation to guide them. In order for taxpayers to reap the economic benefits of space development, responsibility for commercialisation should be removed from space agencies, which are clearly not suited to commercialisation, and some 10% of their budgets allocated to stimulating civil aviation-like space travel services.

## CHAPTER II

### THE FUTURE OF SPACE TOURISM MOVEMENT

It is therefore time to recognise that, far from being an eccentric, even misguided "fringe" activity, space travel and tourism should already be the *mainstream* - and it would have been were it not for the enormous economic and social distortions caused by the cold war. But we do not need to be the passive victims of history - particularly of unfortunate episodes such as the cold war which wasted vast quantities of resources, killed millions of people, and seriously distorted the development of the space industry to focus on missiles and expendable launch vehicles developed from them. Initially this accelerated the development of expendable rockets capable of delivering heavy payloads to orbit, and thereby accelerated the first crewed flights to orbit. But as a result civilian space activities based on expendable vehicles became tangled up in cold war politics, and are still dominated by government space agencies' political agendas, rather than generating economic value.

The optimism about space development in the USA during the 1950s and 1960s - recorded in documents such as contemporary issues of aerospace journals and publications of the American Rocket Society (which later even disappeared) - should have led on to passenger space travel services starting in the 1970s. With

the development of rocket-planes during the 1960s, commercial sub-orbital space flights could and should have started even before the end of the Apollo project. It is time to face the fact that fully 30 years have been wasted, and the history of the last 30 years has been terribly distorted from how it could have been. If commercial space travel and related activities had been contributing to the US economy for 30 years already, instead of government-run "civilian" space activities having become a \$1 trillion quasi-military burden on taxpayers, the US economy would clearly be in far better shape today. If space had followed the route that aviation, pioneered by the Wright Brothers, followed so successfully through focusing on commercial passenger services, the US lead in space would surely have been maintained, instead of having been diluted to the extent that both Russia and China now have an order-of-magnitude cost-advantage over the USA in space travel.<sup>10</sup>

The growth of what it is now reasonable to call the "Space Tourism Movement" is going to have a hugely beneficial cultural effect, and widen humans' horizons as appropriate for the 21st century. Under its influence, "space development" is going to resume its natural meaning of economic development in space, instead of its present meaning of development of government-selected technology for use in space, generally without economic benefit. And "space age" will have its natural meaning of the era when people go to space - as passengers, customers, employees, operators, managers, tenants - all the roles in life on Earth, instead of just government employees. As such, tourism is going to be not just a small part of future space activity, a small-scale activity dwarfed by government space agency activities - it is going to be the mainstream space activity. It should have been for decades already. It is an extraordinary *and deeply un-American* idea that private citizens traveling to and from space should not be the main activity in space. The idea that government officials know better than the general public how their money should be spent is fundamentally a Soviet one. Of course this idea is very popular among government space agency officials in every country. But after using \$1 trillion on government space activities with no commensurate economic benefit to taxpayers, it is high time for the public to insist that this mistaken policy be corrected and their wishes be made central to space development, as they are in aviation.

### ***Cultural Renewal***

The European Renaissance was a wave of innovation and cultural revival that swept through Europe, mired for centuries in the "Dark Ages". It was fired and propelled by researchers of the day using Arabic mathematics and science to prove that fundamental ideas that had been taught in Europe for more than a thousand years were wrong, and that new ideas based on the scientific method were truer and more valuable than many of those based on traditional authority. Most famously, Copernicus proved that the Ptolemaic system of Earth-centred astronomy supported by the Christian educational establishment was wrong, thereby deeply undermining its authority and world-view. Galileo's prosecution and imprisonment by the supreme church court in Rome for supporting

Copernicus' views even one hundred years later is testimony to the extreme, self-interested resistance of powerful establishments to such valuable new ideas.

The analogy with the change of "paradigm" that is occurring today regarding space activities is surprisingly close. This case cannot of course match the more than 1,000 years of error in European astronomy; but the equally mistaken ideas that access to space is inevitably extremely expensive and available to only a few government-selected individuals, and that there is little of economic value to be done in space, have held sway *through the entire era since the first space flight*. Only recently, with the growth of the Space Tourism Movement, is the possibility that these ideas might be completely wrong beginning to be widely considered.

In this perspective, the start of sub-orbital space flights at a cost 1/1,000 of that achieved by government space agencies has the historic significance of Copernicus' proof that the Earth orbits the Sun. The increasingly complex theory of "epicycles", that had been developed to try to reconcile the false Earth-centred theory with actual observations, is matched by the increasingly bizarre plans by Nasa and other space agencies to continue spending \$20 billion/year on developing massively expensive equipment for "space exploration" *based on expendable* launch vehicles - a technological dead-end unsuited to passenger travel left over from the cold war.

Although these false ideas about space flight have held sway for a much shorter time than the millenium for which Earth-centred cosmology was taught, the economic loss due to space agencies' maintaining high launch costs has arguably been greater due to the much faster rate of technological progress today than during the middle ages. The loss of such valuable business opportunities for fully the last third of the 20th century has resulted in serious distortions in the pattern of industrial development, and contributed greatly to the excess competition seen in most business fields today. Consequently the spreading understanding that the "accepted wisdom" taught for decades by government space agencies is wrong - space travel, like air travel, can be economically available to most of the middle class - has revolutionary importance for the continuation of peaceful economic development of the human race. Specifically it offers the hope of preserving the possibility for all humans to have ever-improving standards of living through the coming century.

This is because it is widely believed in government circles that, in order for the "Haves" in the rich countries to protect their own standards of living it is necessary for them to control the "limited resources of Earth" before they are overwhelmingly outnumbered by the "Have nots" in poorer countries. But this belief, which is so unpromising for world peace, is based on the belief that the resources available to humans are limited, which is based in turn on the two false ideas which we have been taught to believe by government space agencies - namely that access to space is inevitably prohibitively expensive, and that there are few activities of economic value to be performed in space. Once these errors are corrected and the cost of a flight to LEO is brought down to less than



\$100,000/person - and then to \$20,000 or less, as is expected with the growth of orbital tourism to 1 million passengers/ year [6, 7] - the unlimited resources of the solar system, including particularly energy and the industrial materials needed to use it, will be easily accessible.

Moreover, the rapid growth of orbital tourism services and related aerospace engineering activities will lead to a spreading boom in economies of participating countries. It is well-known that US student enrolments in physics and engineering courses peaked during the Apollo project and have declined steeply since, at great cost in loss of competitiveness of US manufacturing industry. The urgings of successive Nasa administrators and staff have repeatedly failed to reverse that decline; but is there any real doubt that the growth of space tourism - the understanding by young people that they too will be able to travel and work in space - could do so?<sup>11</sup>

The growth of space tourism can also be expected to lead to wider cultural re-energization analogous to the Renaissance, because many aspects of the cultural and economic stagnation in the rich countries can be traced to this blockage of the economic growth path that should have been taken. These include unpalatable though inescapable facts such as falling educational standards in the USA (especially in engineering and science) and falling average incomes - with more and more people facing the shocking reality that they will not be able to afford to live in the houses of their childhood.<sup>12</sup> In addition, the growth of space tourism will stimulate the development of what will be literally a new culture in "zero-gravity". As a unique new living environment for humans, this will generate new approaches to all aspects of living - from architecture and interior design, to cookery, clothing, hairstyles and human interaction - but these have not begun yet due to government domination of all space activities.

It is thus not overstatement to talk of a "New Renaissance" - a rebirth of innovation and optimism across all fields of human endeavour, fired by the growth of space tourism which has been pent-up for decades. In view of this potential - which is available to us as soon as we decide to do it - we can see that we are living today at the end of one era and the beginning of another. Historians have described the turbulence that occurs at the turning point between eras, as the clash between opposing world-views makes various forms of political turbulence inevitable. Those who profit from the dying world view try to maintain their grip as its justification becomes increasingly hollow and narrowly self-interested - and they try to prevent advocates of the new world-view from gaining influence and power.

In its full flowering over coming decades, economic growth in space is going to lead the human race to a future of economic expansion that sadly is barely conceivable to those trapped in the "pre-Copernican" viewpoint. However, these people's position is becoming increasingly untenable, as shown most recently by the lack of public support for the US administration's "new space policy" - the very best, most "popular" idea that the last spokesmen of the

dying paradigm could think of - a resumption of visits to the lunar surface by Nasa staff. We are truly witnessing the death throes of the idea that a government monopoly agency should decide what US citizens do in space.

However, we must prepare to repel new errors. These include the recent idea that we cannot look forward to peaceful economic growth in space until terrorism has been conquered and the world has been "pacified". This is the opposite of the truth: it is the lack of sufficient new business opportunities that is leading large corporations from the rich countries to become increasingly brutal and dishonest in their dealings with developing countries and governments, thereby causing growing international friction. The defence of the interests of large corporations has in turn led the governments of the richer countries to take deeply hypocritical positions on more and more issues, which are increasingly apparent to those in poorer countries, and undermine any moral authority the more developed countries might otherwise have had.

In this delicate situation, the growth of a major new axis of business development in space will greatly expand the arena of business activities (including particularly for the aerospace industry, which is still proportionately larger in richer countries), and thereby help to alleviate the excess competition in existing fields of business which is having increasingly damaging effects world-wide. The opening of hugely wider fields for business growth will permit the flowering once again of the best of capitalism rather than the worst, of the admirable "can do" culture of innovative, ambitious, independent businesses rather than the monopolistic practices, government subsidy, large-scale fraud and financial instability seen increasingly in recent years. In an earlier era Cooperative and Quaker companies famously proved that honesty and treating workers fairly is not incompatible with capitalist vigour and profitability - but they cannot survive unfair competition from companies benefiting from government collusion and other contemporary business practices.

The flowering of space tourism will also prove wrong those who argue that humans are "running out of work". The world-wide crisis of unemployment, with the highest levels of unemployment experienced since the 1930s in Japan, Europe and the USA, as well as in many poorer countries, is said to be inevitable due to ever-increasing productivity reducing the demand for labour. In near-Earth space, which is readily economically accessible through the development of passenger space vehicles, there is limitless scope for economic growth through development of new services for which there is strong commercial demand from those with middle-class incomes and higher. This is obviously an infinitely more attractive prospect than the "solution" to the unemployment of the 1930s - except to those who profit from war. Their interests must not be permitted to prevent the start of humans' peaceful economic expansion through the solar system, but in order to achieve this, their mistaken world-view must be corrected.

Ultimately, by reducing the cost of space activities, the development of space travel will lead to the permanent and progressive expansion of human culture into

space. In doing so it will enable the realisation of the vision which inspired so many great space pioneers in many countries, many of whom could have had the opportunity to visit space themselves if governments had given priority to supporting passenger space travel, as they did earlier to supporting passenger air travel: visionary writers such as Heinlein, Anderson, Brunner and Roddenberry; rocket engineers such as Goddard, Korolev, Braun, Hunter, Cleaver, and many others.

The Space Tourism Movement is becoming unstoppable, and through realising the limitless scope for growth and innovation in space travel offerings it is going to show the way to a brighter future for the human race than the “race to the bottom” under way today as international corporations compete in over-supplied markets to reduce costs by any means, leading collectively to falling standards of living.<sup>13</sup> In democracies, governments’ role is to manage the legal system as required to achieve overall social benefits that competition between companies can not achieve. For example, companies have an endless interest in reducing wages; but if they impoverish the population they stifle economic growth. Thus governments must be able to resist short-term commercial interests. But this very ability is greatly weakened by the present high levels of unemployment, giving large corporations greater leverage over governments, which they use to further their own interests, including blocking needed innovation. The opening of wide new fields for business expansion in space offers an alternative to this vicious circle of stagnation. Maximising the benefits of this opportunity depends on the public in many countries compelling their governments to make the institutional changes needed to overcome the decades-long stagnation of space activities maintained by the space agencies and their clients who profit from present arrangements.

Humans have outgrown the Earth. The truth is that we outgrew it several decades ago. It is time to correct the accident of history that led to governments subsidising expendable launch vehicles for generations, and thereby deceiving both themselves and the public into believing the myth that space is a barrier rather than a sea of opportunity. Over-turning this myth has taken a long time, but with the rapidly improving prospects for the start of sub-orbital passenger space flight operations from newly-developed commercial spaceports, we are near to a break-through—to the realisation that Earth is not a prison growing increasingly crowded, but the cradle of a space-faring species. All that is delaying this development which will so benefit the world, is lack of imagination and leadership - and these the Space Tourism Movement can supply in full measure.

## **Conclusion**

### *Legal aspects and regulatory framework*

The challenges for space tourism are not only technical ones. Especially in the European context, there are important aspects to be addressed from a legal standpoint. Space tourism will be carried out substantially in the airspace of a given country and therefore, it will be subject to the local legal framework—

which might be different from country to country. It is therefore essential that the civil aviation regulatory authorities of the countries concerned and the competent agencies of the European Union are at the forefront of the setting up of a regulatory framework for space tourism adapted to the European scenario. ESA must also consider other legal matters. 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. In order to support the emergence of new European capabilities without distorting such competition, ESA should carefully define the boundaries of any space tourism support activities in line with the ESA.

Convention. Finally, since in the longer term space tourism should involve traveling in space, some rules of space law may also find application for space tourism; in particular, the notion of '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.

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