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LEGAL PARAMETERS OF SPACE TOURISM

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ABSTRACT

The commercial concept of space tourism raises important legal issues not specifically addressed by first generation rules of international space law. The principles established in the nineteen sixties and seventies were inspired by the philosophy that exploration of space was undertaken by and for the benefit of mankind. Technical developments since then have increased the potential for new space applications, with a corresponding increase in commercial interest in space. If space tourism is to develop, legal and regulatory mechanisms should take into account changes in perception about space travel and its control.

This paper briefly traces the generational transition from manned flights with astronauts to new cooperative space projects which could become a realistic platform for space tourism. It demonstrates where regulation is necessary and highlights current international structures in the moves toward furthering space tourism as a viable, regulated, even if exclusive, market.

INTRODUCTION

Space tourism – although in its infancy – is a reality[1]. The past two years have been witness to the ascent of the first two non-professional "space tourists". Space tourism may, however, be less than it appears. Generally it is limited to sub-orbital activities such as gravitational experiences with parabolic flights or training packages with astronaut-like preparation[2]. Although it rarely takes place in space at all, the term is not a misnomer. Adventure tourism is a growth market and the opportunities available at present merely serve to nourish the client crave for "real" space tourism.

Nevertheless, despite the two genuine tourists referred to subsequently in this paper, space activities to date have taken only about 400 people into space[3]. More adventure-inspired people would travel into space if it were to become an affordable exercise. Interest in space travel will rise as it decreases in cost and this has not remained unnoticed. Work is already underway on the development and construction of flight elements for space tourists. After initial market evaluation, EADS Space Transportation GmbH carried out feasibility studies for a space hotel. It is now developing a six-passenger, re-usable transport vehicle, dubbed "Hopper"[4]. These efforts may eventually lead to the "space-coaster", a vehicle capable of carrying up to 12 amateur travellers that could take space tourism into a new era[5].

Nevertheless, discussions about passenger vessels such as the space coaster reinforce the need for an assessment as to what, if any, regulatory provisions governing space activities and applications can or do apply to these new forms of (ad)venture. It is for this very reason that space tourism poses a challenge to the regulatory community at international and national level. Space law, as an intermix of treaty and customary principles of international law, and to a certain extent, national regulation, is progressively interrelated with various other branches of private law, as a result of increasing commercialisation and presence of the private sector in space.

After briefly discussing the current interaction and approach of the private and public sector in space tourism (I), this paper focuses on the legal and policy considerations that determine its viability from a substantive point of view (II). It identifies those areas where steps could and should be taken to propel space tourism into the realms of legally regulated space activity (III). It concludes by summarising conceivable structural developments (IV).

I. CURRENT APPROACH

The immediate success *in tourist terms* of the space missions undertaken by Dennis Tito (USA, aged 60) on 6 May 2001, followed by Mark Shuttleworth (South Africa, aged 28) is based on two significant factors. *Firstly*, both individuals were in such favourable financial circumstances as to be able to afford to fund their travel. While the exact sums themselves are irrelevant, it is important to note that they are beyond the reach of any average tourist. *The second*, and possibly *most significant*, factor was the form of transport used for the missions. Both space tourists were taken aboard the Soyuz taxi to the International Space Station (ISS). The Soyuz taxi is currently the only operational vehicle that meets the accepted criteria for passenger transportation, in this case, to the ISS. Furthermore, the ISS is currently the only realistic destination for such periods of human life in space. The limited capacity of states and private companies at present to provide alternative space transport and life facilities means that today development of the tourist sector is effectively linked to the use of Soyuz. This in turn is of immediate relevance to the Russian space programme[6].

The tourist voyages mentioned were also of *regulatory* importance: Tito and Shuttleworth acted as a personal interface in a sphere traditionally regulated with a very different objective in mind[7]. Space tourism is a side-product of what began as an exercise between nation states to regulate objectives of principle, under the auspices of UNCOPOUS, such as non-appropriation but peaceful exploration of outer space and its celestial bodies, international responsibility of launching states for activities in outer space, alongside centralising the UN Secretary General's role as coordinator and disseminator of information on a state's activities in outer space[8]. The Outer Space Treaty 1967 outlines clear principles of cooperation and mutual assistance, particularly towards astronauts[9].

Space tourists are referred to in common parlance as "astronauts", or more correctly "cosmonauts" when travelling on Russian spacecrafts. However, international space treaties afford certain privileges to "astronauts", this making it questionable whether space tourists are entitled to the same treatment[10]. Until 2001 manned space missions since Gagarin's flight[11] were state and/or agency operated and funded. The first space tourists have thus begged the question of direct regulation of space tourism by setting out on their space venture ahead of tailor-made tourist rules. At the same time, these voyages have thrown light on the potential of privately funded space tourism as a new source of subsidies for national human space programmes[12]

The interaction between rules of public international and national law complicates regulation of space tourism. The advent of a new era of space activities within the ISS

framework has led to development of ideas for developing commercial use of the station which in turn have led to ideas for developing space tourism. The main framework for the ISS is regulated in the Intergovernmental Agreement (IGA)[13]. The IGA is a multilateral agreement between European partners (represented by ESA), NASA, Canada Japan and Russia on utilisation and the operation of the ISS[14]. It constitutes a source of obligations binding upon the state parties to it and is designed to encourage cooperation between partners on the ISS, while taking its evolutionary capabilities ISS into account[15].

The IGA specifically refers to the operation of the ISS within the primary law framework of international space treaties[16]. It is supplemented by four MOU's that contain rules relevant to cooperation, operational and commercial exploitation of the ISS[17]. In this context, space law relating to ISS operations contains rules of "soft law": the reliance on governmental agreements and codes or *modus operandi* in situations where peremptory rules neither apply nor exist. Space tourism is still in the process of developing and is governed by rules that are binding, cooperative and evolutionary in one.

It is precisely this evolutionary character of space law that should not be forgotten. The rules governing space activities are not yet comparable to those in the maritime or air transport sectors, where national statutes implementing international conventions have led to a unification of law between states.

National space legislation is still progressively developing in various countries, but there is not yet a harmonised or homogeneous body of effective, justiciable space rules at national level[18].

If commercial interests, including space tourism, are to flourish, continued thought will have to be given to the legal structure and enforcement mechanisms that surround commercial space law and dispute resolution. Dispute resolution systems for international trade conflicts between states[19] or between entities[20] are already in existence. The growth of commercial interests in space may lead to an increase in *acta iure gestionis* as seen from an international law perspective. At present, the IGA contains foresees consultation as the chosen method of communication between Cooperating Agencies. In the event of inability to reach agreement between the partners, the IGA contains provisions on dispute resolution[21]. This conciliatory approach reinforces the commercial character of the partners within the ISS framework. It marks a move away from classical dispute settlement between states under international law procedures under the jurisdiction of the International Court of Justice towards international commercial dispute settlement.

II. FROM STATE TO STATUS

The paradox of space tourism is one of status. The Outer Space Treaty defines astronauts as envoys of mankind and installs a code of mutual assistance in case of emergency[22]. The status of professional astronauts on mission is directly linked to that of their national or registering state[23]. The concept, and indeed status, of a space tourist is technically lacking, in that it was not the intention of the treaty makers to cater for this group. Unlike the astronaut, there is no immediate element of rights and duties in relation to a tourist. Space tourists are individuals, who do not represent their countries for research or scientific purposes. This has led to suggestions in support of the term *spaceflight participants*[24]. The private civilian status of space tourists is indisputable. However, space law has not yet installed a definitional model such as that contained in the Chicago Convention, where "crew" are linked to qualification and licensing requirements[25] and passengers are left to the realms of provisions on international carrier liability[26].

The need to adapt the current legal regime to accommodate private law elements that ensue with increasing private interests and activities in space is recognised and Article VI Outer

Space Treaty already foresees that activities be carried on by non-governmental entities. This process of adaptation must extend to procedures for commercial entities and space tourists alike. A distinct selection procedure relating to the qualification of a tourist permitted to travel in flight is needed[27]. Its equivalent already exists for professional expedition crew members[28]. The rules on qualification and suitability of ISS crew currently foresee nomination by the partner state and certification of general suitability towards the Multi-Crew Operation Panel (MCOP). Considerations such as health, compliance with the ISS Code of Conduct (CCOC) and further pre-requisites such as (foreign) language capabilities must be installed for the tourist.

An overview of space legislation reflects a relational imbalance between the public international and private law content of space law. Approximately one third of space law deals exclusively with public international law norms. The remaining two thirds deal with "earth-based principles" as extended to space activities, such as tort, contract, and property, as influenced by national and possibly international policy considerations[29]. This reinforces the increasing public / private interface of space law.

One of the most pervasive issues within this debate is whether national rules on specific earth-related matters[30] automatically extend to space. This has been addressed by the IGA in relation to the ISS where there is a co-existence of the five legal systems of its five partners. Art. 5 IGA repeats the jurisdiction of partners over their property in space, leading to this co-existence of national rules.

Today's objective is to interlink the private commercial sphere of space into the existing environment of public international law rules. These new market parameters demand the development of an optimal regulatory approach that will

- encourage commercial activity in space, including space tourism,
- adjust the public international law regime to allocate responsibility and supervision to the correct authorities (i.e. not just states),
- ensure parallel regulation as between states within the international community.

These points are taken up below.

III. NORMATIVE RULES FOR SPACE TOURISM

An optimal legal regime for commercial space tourism and utilisation of space must address the following issues:

- Rules of Liability in the event of accidents to private persons and property
- Rules for regulation of commercial vehicles and safety of missions
- Permissible interaction between operations and tourists

The UN space conventions, as previously indicated, do address some of these matters[31], but not from a commercially inspired perspective[32]. The provisions applicable in the event of liability and the permissible remit of tourist's activities must be clear. Licensing procedures for space vehicles must be established. It is perfectly conceivable and may be psychologically important that a space tourist be allowed to undertake useful tasks such as space life experiments while in flight. Shuttleworth, for example, performed experiments for three South African universities during his visit of the ISS. This raises potential issues of participation in intellectual property rights. The legal issues involved in space tourism are therefore addressed under the following five headings:

- registration, jurisdiction and control over space tourists (*Flight personnel*)
- regulatory framework for commercial space vehicles

- use of ISS for commercial services
- liability and insurance
- participation in intellectual and Industrial property rights (experiments).

Registration, jurisdiction and control over space personnel

Treaty rules as reiterated by the IGA cover registration and jurisdiction of objects in space. Both the IGA and Memorandum of Understanding (MOU) specify that the IGA should be operated in the spirit of these treaties. Art. II.1 Registration Convention imposes an obligation on member states to register their vehicles or objects launched into space[33]. Art. VIII Outer Space Treaty in conjunction with Art. II.2 Registration Convention, provides that launch partners retain jurisdiction and control over elements Registered and over personnel on the ISS who are its nationals. A state also retains jurisdiction over the "personnel" on the space object.

Space tourists may not fall within the meaning of *personnel* in terms of either the IGA or the Outer Space Treaty. "Personnel" is a specific term relating to official status of employees/ or persons with an official remit. The term is not neutral in the sense of "person". Nevertheless, within the ISS regime, a state extends the applicability of its national space legislation to nationals in outer space, whether crew, personnel or merely flight participants/passengers[34].

The mutual exercise of criminal jurisdiction on board is regulated under Art. 22 IGA, thereby ensuring partners' jurisdiction over their nationals in case of misconduct on board and in order to ensure the safety of the mission.[35]

The combined effect of these provisions in relation to space tourism is that the Russian state retains jurisdiction and control over the Soyuz rocket and personnel. It therefore has jurisdiction over the commercial astronaut/space tourist within the Russian-registered elements. The net result for orbital space tourism[36] is that criminal offences on the ISS can be sufficiently prosecuted, be it by the state of the perpetrator or by other ISS partner states. This may serve as a good model when devising a criminal liability scheme for space tourism.

Regulatory framework for commercial space vehicles

The importance of maintenance and safety regulation for space vehicles is self-evident[37]. Paradoxically, there are no legal provisions in the body of international space law governing safety of passenger launch vehicles. Nevertheless, international aviation rules could serve as a useful prototype when considering how to regulate this area.

An international aviation regulatory framework has operated under the auspices of the International Civil Aviation Organisation (ICAO) since 1945[38]. Any regulatory system for commercial space vehicles must be international in application to ensure global parity of standards. A parallel *modus operandi* to that of the ICAO for commercial space activities would seem a realistic and optimal goal for space tourist operations[39].

The US Federal Aviation Administration (FAA)[40] has already taken the lead by proposing the formation of an International Space Flight Organisation (ISFO) to mirror the ICAO. It is expected that other countries will respond to this initiative by creating a framework that will promote public safety. Certain states have already gone so far as to establish their own rules for introducing licensing procedures for commercially operated re-usable space vehicles. America[41] has gone down this road and Japan has established research committees to examine the question of commercial space transportation legislation[42]. Progress in this area will encourage other states to follow suit.

As mentioned at the outset, the Russian Soyuz spacecraft is the only carrier that meets the criteria for passenger transportation. ESA

and the Russian Space Agency Rosaviakosmos had signed a framework agreement on terms for cooperating on the ISS in May 2001, thereby allowing European astronauts to access the ISS. Compliance with safety standards for space vehicles, qualifications of space specialists from pilot to mechanic, the regulation of space ports and navigational aids, air traffic control and operational rules such as refuelling facilities, storage, mining plant and equipment *etc.* are all contained in the specific agreements. Imposing regulation on the private sphere permits launching states to retain licensing control over commercial enterprises, and thereby tourists. Technical and safety rules, rules for redress alongside enforcement mechanisms are paramount to the success of commercial operations and private law relations.

Use of ISS for commercial services

The current phase of space philosophy looks towards regulating space life on a more permanent basis. Art. 1(1) IGA confirms the aim "... to establish long-term international cooperative framework ....for the design of a permanent inhabited civil International Space Station ...". Commercial use of the ISS is by no means prohibited and the partners[43] have reached agreement in principle on its commercial use for space tourists. Guidelines drafted by ISS Cooperating Agencies are already in existence[44]. The Multilateral Coordination Board (MCB) formulated rules for the road covering the long-term "expedition missions" to the ISS as well the short-term "taxi missions" which are required to replace the Russian escape vehicle.

These soft law rules are of primary significance in relation to space tourism. They regulate matters mentioned previously ranging from selection of space flight participants (including training pre-requisites), prescribe commercial use of ISS in the form of merchandising, advertising and entertainment, and latterly contain rules relating to conduct for the ISS crew.

For example, concerning the short-term tourist it is US and Russian space agencies that nominate tourists for a ride in the Space Shuttle and the Soyuz spacecraft, respectively. In contrast and with regard to long-term visitors, it is the Multilateral Crew Operation Panel (MCOP) that approves nominated tourists. It should also be recalled that in terms of the deal between ESA and Rosaviakosmos, the third seat on the Soyuz can theoretically be sold to non-professional (and thus fee-paying) passengers. Due to the Columbus disaster, however, it will be Soyuz that has to rotate the permanent ISS crews. Therefore, the agreement to fly European astronauts and tourists with the so-called taxi crews may not be fully implemented and tourist flights to the ISS may be suspended for the time being.

Further provisions deal with scientific research and development on the ISS. The guidelines offer at least an initial framework within which tourism can be operated. Generally, these rules demonstrate more negotiated frameworks rather than substantive legal rules. To acquire individual direct effect these provisions would necessitate implementation at national level[45].

Liability and insurance

Realisation of commercial ventures in space requires a pragmatic attitude to costs and mitigation of liability. There are two major rules that dominate the approach taken to liability:

- National law governs harm caused by space objects to those states co-operating in the space endeavour and to the nationals of those co-operating states, but
- International law (Liability Convention) governs harm caused by space objects to those states not engaged in a common endeavour.

In view of the mission costs and the corresponding level of liability when accidents occur, waivers of liability and insurance coverage go hand in hand with any space venture. Art. 16 IGA accordingly contains a cross-waiver of liability between the partners. Its purpose is to encourage participation in exploration, exploitation and use of outer space through the ISS, while achieving a reduction in insurance costs. Insurance is only required for commercial ventures in those fields where the cross-waiver does not apply. The cross-waiver applies to "partners involved in protected space operations" as against

- another partner state,
- a related entity of another partner state, and
- employees of any of the entities of another partner state and of a related entity of another partner state.

Effectively, each partner state can extend a cross-waiver of liability to its related entities by requiring subsequent waivers for all claims as against all persons, entities and related entities and persons.

Insurance is necessary for the areas excluded from cross-waiver. These are:

- claims between the partner state and its own entities or related entities
- claims by natural persons and their estates for death, damage or impairment of health
- claims for damage caused by wilful conduct[46]
- intellectual property claims
- claims for damage resulting from a failure of a partner state to extend the cross-waiver of liability to its related entities.

None of the foregoing affects the liability as provided in accordance with the Liability Convention (Art. 17 IGA with reference to Art. 16). Where a claim arises out of the Liability Convention, the partners and ESA will consult on apportionment or defence, as may be necessary.

To conclude: commercial enterprises are relieved of high insurance costs where cross-waivers are involved. Nevertheless the question of general liability for damage to persons and third parties remains an open issue to be addressed by national agencies/ NGOs[47]. There are certainly possibilities for developing insurance consortia with umbrella insurance provisions to cover such liabilities.

In the sphere of insurance, various practicalities come into play. Firstly, insurance policies, whether for life, medical care or accident insurance, loss of revenue *etc.* must cover the space activity in question. Secondly, insurance should cover not only individual damage or illness to the tourist, but also third party liability insurance of the mission/space flight.

This means that specific space insurance must be taken out to cover the individual activity, whether for the commercial operator or individual. The insurance market is already developing to cope with these demands. Certainly, life insurance policies were made available to both space tourists Tito and Shuttleworth via the Russian insurance companies, Avikos and Megaruss respectively[48].

Intellectual and industrial property rights

Of immediate interest for the space tourist is the right to undertake certain beneficial experiments while in space flight. Opportunities for space tourists to assist in flight experiments are certainly conceivable. Whether this takes on the form of any more than assisting in experiments or acquisition of intellectual or industrial rights deserves some attention.

Art. 21(2) IGA contains territorial rules whereby results of experiments are deemed to have occurred in the territory of the partner state that registered that element in which the

experiments took place. If the activity takes place on ESA registered elements, a European partner may deem the activity to have occurred within its territory. There are provisions preventing recovery for infringement of intellectual property rights in more than one European partner state. This is to prevent duplicity of actions resulting from infringements relating to the same property right.

In effect, these provisions mean that results achieved by commercial astronauts and space tourists are protected within the IGA framework. Further details of attribution of ownership vis-à-vis a tourist who is merely carrying out experiments during flight on behalf of a commercial entity would require to be dealt with on a contractual basis.

Finally, it should be noted that, within the framework of the IGA, partners may sell or barter any of their allocations under the utilisation provisions of Art. 9(2) IGA[49]. This effectively entitles exchange of utilisation space in which additional experiments can be carried out.

IV. CONCLUSIONS AND OUTLOOK

There is a distinct need for further regulatory structure within the ISS era if space tourism is to become anything more than a gravitational adventure. The current regime governing human spaceflight reflects its historical origins that developed from the "envoy of mankind" vision of an astronaut. Regulation of space tourism is operated by analogy to the rules constituted, in particular, for ISS operations. They indeed mark a great degree of international cooperation between the partners involved. Their emphasis on multilateral regulation via the IGA, governmental understandings and guidelines, backed up by soft law agreements, such as the Code of Conduct for Crew (CCOC) are effective for such major international projects.

More specific regulation will be needed in the long term to ensure that commercial operations are under control. A *modus operandi*, detailing the finer terms and conditions under which tourists may join spaceflights, can only develop within a distinct framework. This pre-supposes national space legislation directly addressing specific aspects currently regulated in Codes. The next immediate level between the licensed commercial operators and individuals belongs to rules of contract law. Such contracts would have to comply with primary treaty law and include strict adherence to the codes of conduct and ISS operational structure.

Nevertheless, if commercial activities are to increase, it would appear reasonable to develop a structure that is similar to that achieved for air space activities over land. This current ISS era provides a perfect time for both the international space community and the partner states of the ISS to look towards the next regulatory phase. By that stage, the national legislator will have provided a suitable legal basis from which private space tourist contracts, even if not very common, are subject to legal control.

REFERENCES

[1] Market forecasts predict that, by 2021, commercial space travel could amount to an industry worth US$ 1 Billion. See Futron Corporation, *Space Tourism Market Study* (2002).

[2] *E.g.* centrifuge rides, training in the neutral buoyancy tank or mission simulations in a Soyuz simulator in Star City.

[3] The Economist, 30 August 2003 at 9. The cost to the tax payer has not been quantified here.

[4] See "Astrium Explores Challenge of Outer Space Tourism". See Space Daily, online: <www.spacedaily.com/news/tourism-00a.html> (date accessed: 27 September 2003).

[5] Even more developments are taking place in the US. For different concepts of commercial space transportation with relevance to space tourism in the US see especially FASS/AST, *2003 U.S. Commercial Space Transportation Developments and Concepts: Vehicles, Technologies, and Spaceports* (2003). See FAA, online: <http://ast.faa.gov/files/pdf/newtech03_final.pdf > (date accessed: 27 September 2003).

[6] NASA did not originally construct the Shuttle with a view to serving tourist purposes. It appears due for re-certification in 2010. See The Economist, *supra* note 3.

[7] It came as no surprise that the US space agency, NASA, initially opposed any tourist trips to International Space Station, arguing that the presence of amateur tourists would endanger the ISS astronauts.

[8] The first generation of treaties and conventions comprises the following conventions: *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, 27 January 1967, 610 U.N.T.S. 205, 18 U.S.T. 2410, T.I.A.S. No. 6347, 6 I.L.M. 386 [hereinafter *Outer Space Treaty*] (entered into force on 10 October 1967); *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space*, 22 April 1968, 672 U.N.T.S. 119, 19 U.S.T. 7570, T.I.A.S. No. 6599, 7 I.L.M. 151 [hereinafter *Rescue Agreement*] (entered into force 3 December 1968); *Convention on the International Liability for Damage Caused by Space Objects*, 29 March 1972, 961 U.N.T.S. 187, 24 U.S.T. 2389, T.I.A.S. No. 7762 [hereinafter *Liability Convention*] (entered into force on 1 September 1972); *Convention on Registration of Objects Launched Into Outer Space*, 14 January 1975, 1023 U.N.T.S. 15, 28 U.S.T. 695, T.I.A.S. No. 8480, 14 I.L.M. 43 [hereinafter *Registration Convention*] (entered into force on 15 September 1976); *Agreement Governing the Activities of States on the Moon and other Celestial Bodies*, 5 December 1979, 1363 U.N.T.S. 3, 18 I.L.M. 1434 [hereinafter *Moon Agreement*] (entered into force 11 July 1984).

[9] Art. V Outer Space Treaty.

[10] Astronauts are considered to be envoys of all mankind and entitled to all possible assistance in case of accidents, distress, or emergency landing. See *ibid.* However, the space treaties neither contain a definition of this term, nor of the terms "envoys of mankind" and "personnel". It could be argued that a "space tourist" should not be afforded the same rights because the space treaties were drafted without knowing the concept of space tourism. However, Article VI Outer Space Treaty expressly allows private activities so that, *de lege lata*, the scope of the international space treaties should also cover space tourists even if this may not be suitable for the future of space tourism. See *infra* note 23. Some authors maintain that tourists have some traits of astronauts, though not all, and as such they can be called "pseudo astronauts". See R. Jakhu & R. Bhattacharya, "Legal Aspects of Space Tourism", IAC-02-IISL.2.09 (2002).

[11] Juri Gagarin became the first man in space on 12.04.1961, travelling in the "Wostok 1".

[12] This paper does not assess or evaluate the economic aspects of space tourism. Space activities are not cost-effective, with the result that development of the private commercial sphere is inhibited by regulatory aspects that do not (necessarily) apply to public activities. This point has been addressed elsewhere. See The Economist, *supra* note 3. See also Futron Corporation, *supra* note 1.

[13] See *Agreement among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America concerning cooperation on the Civil International Space Station*, 29 January 1998 [hereinafter IGA] (entered into force 27 March 2001).

[14] The European partners are Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, Switzerland and UK.

[15] Art. 14 IGA.
[16] Art. 2(1) IGA.
[17] The Memoranda of Understanding serve to involve the national space agencies and describe their respective roles and responsibilities with regard to design, development and operations of the ISS.
[18] For full texts of national space legislation see Office for Outer Space Affairs, online: <www.oosa.unvienna.org/SpaceLaw/national> (date accessed: 29 September 2003).
[19] Arts. 34-36 *Statute of the International Court of Justice*, 26 June 1945, 59 Stat. 1055, T.S. No. 993, regulate the Court's competence and jurisdiction; the WTO has its own dispute settlement panel. See *Understanding on Rules and Procedures Governing the Settlement of Disputes*, which is annex 2 of the *Agreement Establishing the World Trade Organization*. See WTO, online: <www.wto.org/english/docs_e/legal_e/legal_e.htm#dispute> (date accessed: 29 September 2003).
[20] *E.g.* the International Chamber of Commerce.
[21] Art. 23(4) IGA
[22] Art. V Outer Space Treaty. The *Rescue Agreement*, *supra* note 8, develops on these principles and gives expression to the duties contained in the Outer Space Treaty.
[23] The classification of "astronauts as envoys of mankind in outer space" in Art. V Outer Space Treaty is inappropriate for commercial travellers.
[24] Spaceflight participants are individuals (e.g. commercial, scientific and other programs; crewmembers of non-partner space agencies, engineers, scientists, teachers, journalists, filmmakers or tourists) sponsored by one or more partner(s). See Art. III of the *Principles Regarding Processes and Criteria for Selection, Assignment, Training and Certification of ISS (Expedition and Visiting) Crewmembers*, (2001). See SpaceRef, online: <www.spaceref.com/news/viewsr.html?pid=4578> (date accessed: 29 September 2003).
[25] See Art. 32 of the *Convention on International Civil Aviation*, 7 December 1944, 15 U.N.T.S. 295, ICAO Doc. 7300/6 [hereinafter *Chicago Convention*].
[26] See C. Sgrosso, "Legal Status of the Crew in the International Space Station IAC-99-IISL.1.07 (1999).
[27] See Art. 11 IGA on selection of crew by each ISS partner and compliance with Code of Conduct.
[28] For ISS-Crew criteria, see ESA, online: <www.esa.int/export/esaHS/ESA9L2G18ZC_astronauts_0.html > (date accessed: 29 September 2003).
[29] See W. Kowal, "Legal Pre-requisites", Astrium/ EADS Working Paper (2002) at 25.
[30] *E.g.* copyright protection laws.
[31] In particular, registration under the Registration Convention and absolute and fault based liability under the Liability Convention and Outer Space Treaty.
[32] The allocation of state responsibility under Art. VI Outer Space Treaty for all national activities in space, whether governmental or non-governmental entities, beleaguers states in cases of vicarious liability for private undertakings.
[33] The obligation extends to notifying the UN Secretary General of the same.
[34] See Art. 5(2) IGA.
[35] Canada, the European partners, Japan, Russia and the US have mutual rights to exercise criminal jurisdiction over their respective nationals in relation to personnel or any flight element.
[36] Sub-orbital space tourism should be covered by existing air law instruments. See *Convention on Offences and Certain Other Acts Committed on Board Aircraft*, 14 September 1963, ICAO Doc. 8364; *Convention for the Suppression of Unlawful Seizure of Aircraft*, 16 December 1970, ICAO Doc. 8920; *Convention for the Suppression of Unlawful Acts Against the Safety of Civil Aviation; Protocol for the Suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation, Supplementary to the Convention for the Suppression of Unlawful Acts Against the Safety of Civil Aviation, Done at Montreal on 23 September 1971*, 24 February 1988, ICAO Doc. 9518; *Convention on the Marking of Plastic Explosives for the Purposes of Detection*, 1 March 1991, ICAO Doc. 9571.
[37] A detailed discussion of such technical matters goes beyond the ambit of this paper. See generally ISU, *Space Tourism – From Dream to Reality*, Final Report of the Summer Session Program 2000 (Illkirch-Graffenstaden: ISU, 2000).
[38] ICAO was founded in November 1944 during an International Civil Aviation Conference in Chicago. Fifty-four States attended the conference and 32 States signed the Convention setting up ICAO. See *Chicago Convention*, *supra* note 26. Because of delays in the ratification of the Convention, the conference had signed an

Interim Agreement, creating a Provisional International Organization of a technical and advisory nature for collaboration in the field of international civil aviation (PICAO). It operated from August 1945 to April 1947 when ICAO finally became operational.

[39] Given that even orbital space tourism will use airspace prior to entering outer space and given that there is no right to overflight over national airspace, ICAO has to play a coordinative role for the launch and re-entry phase. See also *supra* note 36.

[40] In the US, legal uncertainty is arising from the regulatory treatment of Reusable Launch Vehicles (RLV), a prerequisite for successful space tourism in the future. Currently both, the Aircraft Certification and Regulations Office, entrusted with regulating the commercial airline industry, and the Associated Administrator for Commercial Space Transportation, in charge of expendable launcher, compete for jurisdiction over commercial space flight. On regulatory issues for space tourism see also P. H Diamandis & P. Collins, "Creation of an Accredited Passenger Regulatory Category for Space Tourism Services", Conference on Space Tourism (1999).

[41] The Associate Administrator for Commercial Space Transportation regulates the commercial space transportation industry under 49 U.S.C., Subtitle IX, Chapter 701. In the US, repeated attempts are made to foster commercial space activities. Two bills are currently before the US congress that aim at creating space related tax incentives. See *Bill to amend the Internal Revenue Code of 1986 to encourage the timely development of a more cost effective United States commercial space transportation industry, and for other purposes*, H.R. 2358, sponsors: Rep. Calvert [CA-44] (introduced 6/5/2003) and *Bill to amend the Internal Revenue Code of 1986 to provide tax incentives for investing in companies involved in space-related activities*, H.R.914, sponsor: Rep Rohrabacher, Dana [CA-46] (introduced 2/25/2003).

[42] See generally N. Sugita, "Amendment to the Law Concerning the National Space Development Agency of Japan" (Proceedings of the Project 2001 – Workshop on Legal Issues of Privatising Space Activities, Vienna, Austria, 19 July 1999) 118-125. For an overview on Japanese space legislation see M. Sato, "The Japanese Legal Framework: Third Party Liability Resulting From NASDA Launch Activities?" (1998) 41 Proceed. of Colloq. on L. of Outer Sp. 128-129. See also Kowal, *supra* note 29 at 19.

[43] The cooperation exists between USA, eleven member states of ESA, Canada, Japan and Russia, defined as "partner states".

[44] See *Principles Regarding Processes and Criteria for Selection, Assignment, Training and Certification of ISS (Expedition and Visiting) Crewmembers*, *supra* note 24.

[45] *E.g.* in Canada by the *Civil International Space Station Agreement Implementation Act* (1999, c.35).

[46] Generally, wilful misconduct is an insurance exclusion and its coverage would drastically increase premiums.

[47] For other aspects of financial responsibility relevant to space tourism see Dennis J. Burnett "Space Tourism: A New Opportunity to Manage the Risks" IAC-03-IISL.1.08 (2003).

[48] See Avicos, online: <www.avicos.ru/Main> (date accessed: 27 September 2003). See also <www.space.com/missionlaunches/shuttleworth_isurance_020208.html> All risks have been reinsured on the western market.

[49] Where non-partner states are involved, all partners must consent.